



POA VALIDATION REPORT

“Hot Water Heating Programme for South Africa”

REPORT No. 2012-9102

REVISION No. 01

DET NORSKE VERITAS



POA VALIDATION REPORT

Date of first issue: 27 March 2012	ConCert Project No.: PRJC-365132-2012-CCS-ITA
Approved by: Michael Lehmann	Organisational unit: DNV KEMA Energy & Sustainability Accredited Climate Change Services
Client: International Carbon Ltd	Client ref.: Laura Lathi

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Summary:

Title of PoA: Hot Water Heating Programme for South Africa

Country: South Africa

Methodology: AMS-I.C. and AMS-II.C.

Version: 19 and 13 respectively

GHG reducing Measure/Technology: Hot water heating resulting in reduction in electricity consumption

ER estimate of PoA: 53 152 tCO₂e per year (average)

Size

☐ Large Scale ☒ Small Scale

Validation Phases:

☒ Desk Review

☒ Follow up interviews

☒ Resolution of outstanding issues

Validation Status

☐ Corrective Actions Requested

☐ Clarifications Requested

☒ Approval and submission for registration

☐ Rejected

In summary, it is DNV's opinion that the programme of activity "Hot Water Heating Programme for South Africa", as described in the PoA-DD, version 7 of 26 September 2012, meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology AMS-II.C., version 13 and AMS-I.C. version 19. Hence DNV requests the registration of the project as a CDM programme of activities.

Report No.: 2012-9102	Subject Group: Environment
Report title: Hot Water Heating Programme for South Africa	
Work carried out by: Francesca Feller, Philippe Decq, Elfride Covarrubias	
Work verified by: Nitin Kapoor	
Date of this revision: 3 October 2012	Rev. No.: 01
Number of pages: 33	

Indexing terms

Key words

Climate Change

Kyoto Protocol

Validation

Clean Development Mechanism

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***Abbreviations***

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CPA-DD	CDM component project activity design document
CH ₄	Methane
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CPA	Component project activity
DNV	Det Norske Veritas
DNA	Designated National Authority
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of approval
N ₂ O	Nitrous oxide
NGO	Non-governmental Organisation
MoC	Modalities of communication
ODA	Official Development Assistance
PoA	Programme of activities
PoA-DD	CDM programme of activities design document
PS	Clean Development Mechanism Project Standard
SABS	South African Bureau of Standards
SANS	South African National Standards
tCO ₂ e	Tonnes of CO ₂ equivalents
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Clean Development Mechanism Validation and Verification Standard



1 EXECUTIVE SUMMARY – VALIDATION OPINION

DNV Climate Change Services AS (DNV) has performed a validation of the programme of activity (PoA) “Hot Water Heating Programme for South Africa” including generic information relevant to all component project activities (CPAs) to be included in this PoA. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The host Party is South Africa and the Annex I Party is Lichtenstein. Both Parties fulfil the participation criteria and have approved the PoA and authorized the project participants I Carbon (Pty) Ltd, International Carbon Ltd, Low E Solutions (Pty) Ltd. The DNA from South Africa confirmed that the project assists in achieving sustainable development.

The PoA correctly applies the baseline and monitoring methodology AMS-II.C. “Demand-side energy efficiency activities for specific technologies”, version 13 and AMS-I.C. version 19 “Thermal energy production with or without electricity”.

The programme supports the installation of heat pumps and solar water heaters for both domestic and industrial use, replacing electric geysers. As a result, the PoA results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the PoA and typical component project activities (CPAs) are not a likely baseline scenario. Emission reductions attributable to the PoA are hence additional to any that would occur in the absence of the project activity.

The total emission reductions of all CPAs expected to be included to the PoA are estimated to be on the average 53 152 tCO₂e per year.

The monitoring plan provides for the monitoring of the PoA’s emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the PoA design and it is DNV’s opinion that the project participants are able to implement the monitoring plan.

In summary, it is DNV’s opinion that the PoA “Hot Water Heating Programme for South Africa”, as described in the PoA-DD, version 7 dated 26 September 2012 meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology AMS-II.C., version 13 and AMS-I.C. version 19. Hence, DNV requests the registration of the PoA as a CDM PoA.

Milan and Oslo, 3 October 2012

Francesca Feller
Validator
DNV City, Country

Michael Lehmann
Director of Services and Technologies
DNV Climate Change Services AS



2 INTRODUCTION

International Carbon Ltd has commissioned DNV Climate Change Services AS (DNV) to perform a validation of the proposed small-scale CDM Programme of Activities (PoA) “Hot Water Heating Programme for South Africa” (hereafter called “project”). This report summarises the findings of the validation of the PoA including generic information relevant to all component project activities (CPAs) to be included in this PoA, performed on the basis of UNFCCC criteria for CDM PoAs, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, the simplified modalities and procedures for small-scale CDM project activities and the subsequent decisions by the CDM Executive Board.

2.1 Objective

The purpose of a validation is to have an independent third party assess the small-scale PoA design document (PoA-DD) including the description of the generic component project activity (CPA) with generic information relevant to all CPAs to be included in this PoA. In particular, the eligibility criteria for inclusion and demonstration of additionality of CPAs, the programme's baseline determination, monitoring plan, and the programme's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the programme design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM PoAs and is seen as necessary to provide assurance to stakeholders of the quality of the programme and its intended generation of certified emission reductions (CERs).

2.2 Scope

The validation scope is defined as an independent and objective review of the PoA-DD including the description of the generic component project activity (CPA) with generic information relevant to all CPAs to be included in this PoA. The PoA-DD was reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, the simplified modalities and procedures for small-scale CDM project activities, Standard for the demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities /26/ and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology AMS-II.C., version 13 and AMS-I.C. version 19.

The validation of the programme has also considered the completed CPA-DD for the CPA with the title *Hot Water Heating Programme for South Africa – CPA-001* submitted together with the PoA-DD

The validation was carried out in accordance with the principles and the requirements for validation contained in the Validation and Verification Standard /23/.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.



3 METHODOLOGY

The validation consisted of the following three phases:

- I document review
- II follow-up actions (e.g. on-site visit and telephone or email interviews)
- III the closing out of validation findings and the issuance of the final validation report and opinion

The following sections outline each step in more detail.

3.1 Document review

The following tables list the documentation that was reviewed during the validation.

3.1.1 Documentation provided by the project participants

- /1/ International Carbon: *CDM-SSC-PoA-DD for PoA titled "Hot Water Heating Programme for South Africa"*, Version 1 dated 24 January 2012, and version 7 dated 26 September 2012
- /2/ International Carbon: *Generic CDM-SSC-CPA-DD for PoA titled "Hot Water Heating Programme for South Africa"*, Version 1 dated 24 January 2012
- /3/ International Carbon: *CDM-SSC-CPA-DD for CPA titled "Hot Water Heating Programme for South Africa – CPA-001"*, Version 1 dated 24 January 2012, and version 7 dated 26 September 2012
- /4/ International Carbon: *Emission reductions calculations for CPA001*, 11 September 2011
- /5/ International Carbon: *Hot Water Heater PoA PoA-DD Annex I*, version 1, 2 February 2012
- /6/ International Carbon: *Local Stakeholder Participation email communication*, 12 March 2012
- /7/ International Carbon: *Local Stakeholder Participation email registers*, 12 March 2012
- /8/ International Carbon: *Pictures of Hot Water Heating public meetings*, 12 March 2012
- /9/ International Carbon: *Advert for HWH PoA final Sunday Times*, 9 October 2011
- /10/ International Carbon: *LSP queries and answers phone log*, 12 March 2012
- /11/ International Carbon: *Personal invite to HWH pub meeting*, 13 October 2011
- /12/ International Carbon: *Personal Stakeholder Invitation List*, 12 October 2011
- /13/ International Carbon: *Cession of rights to carbon and Eskom subsidy*, template
- /14/ Industrial Development Corporation: *Environmental Policy*, 18 March 2009
- /15/ International Carbon: *Cession of rights to carbon and Eskom subsidy*, template
- /16/ International Carbon: *LoA application form*, 21 May 2012
- /17/ International Carbon: *Modalities of communication*, 31 July 2012
- /18/ International Carbon: *Annex-1 of the monitoring plan*, 22 June 2012
- /19/ International Carbon: *Confirmation of Authority to act affidavit*, 3 august 2012
- /20/ Low E Co: *Presentation*, 12 March 2012

3.1.2 Letters of approval

- /21/ Republic of South Africa, Department of Energy: *Letter of Approval*, 13 June 2012



/22/ Office of Environmental Protection: *Letter of Approval*; 6 July 2012

3.1.3 Methodologies, tools and other guidance by the CDM Executive Board

- /23/ CDM Executive Board: *Clean Development Mechanism Validation and Verification Standard*, version 02.0
- /24/ CDM Executive Board: *Clean Development Mechanism Project Standard*, version 01.0
- /25/ CDM Executive Board: *Clean Development Mechanism Project Cycle Procedure*, version 01.0
- /26/ CDM Executive Board: *Standard for the demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities*, version 01.1
- /27/ CDM Executive Board: *Baseline and monitoring methodology AMS-I.C.*, version 19
- /28/ CDM Executive Board: *Baseline and monitoring methodology AMS-II.C.*, version 13
- /29/ CDM Executive Board: *Guidelines for demonstrating additionality of microscale project activities*, Version 03, EB 63, 29 September 2011
- /30/ CDM Executive Board: *Procedures for registration of a programme of activities as a single CDM project activity and issuance of certified emission reductions for a programme of activities*, Version 04.1, EB 55, 2 August 2010
- /31/ CDM Executive Board: *Baseline and monitoring methodology AMS-I.D* version 17, 3 June 2011
- /32/ CDM Executive Board: *General Guidelines to SSC methodologies*, version 18, 2 March 2012
- /33/ CDM Executive Board: *Guidelines on the demonstration of additionality of small-scale project activities*, version 9.0, 20 July 2012
- /34/ CDM Executive Board: *Guidelines on the demonstration of additionality of small-scale project activities*, version 9, 20 July 2012
- /35/ CDM Executive Board: *Tool to calculate baseline, project and/or leakage emissions from electricity consumption*, version 01, 16 May 2008
- /36/ CDM Executive Board: *Tool to calculate the emission factor for an electricity system*, version 02.2.1, 29 September 2011
- /37/ CDM Executive Board: *Standard for sampling and surveys for CDM project activities and programme of activities*, version 3.0, 13 September 2012

3.1.4 Documents used by DNV to validate / cross-check the information provided by the project participants

- /38/ Republic of South Africa: *Government Notice R.543 in Government Gazette 33306*, 18 June 2010
- /39/ UNFCCC: *CDM*, available at <http://cdm.unfccc.int/>
- /40/ Nelisiwe Magubabe: *Speaking notes of the acting director-general of Department of Energy Ms Nelisiwe Magubabe at the solar water heating conference at Indaba Hotel, Fourways*, 5 November 2009
- /41/ O.D.Dintchev, Tshwane University of Technology: *Evaluation of domestic solar water heaters*, Domestic use of Energy Conference 2004
- /42/ Harris, A.; Kilfoil, M; and Uken, E-A, Cape Peninsula University of Technology: *Options for residential water heating*, 2008



- /43/ Solar Direct: *Solar water heating systems*, 2 May 2010, available at: <http://www.solardirect.com/swh/swh.htm>
- /44/ Republic of South Africa – Department of Energy: *Re: Letter of no objection for heat pump and hybrid solution programme for South Africa*, 4 November 2010
- /45/ South African Bureau of Standards: *SWH conformity report – 110l*, 26 January 2012
- /46/ South African Bureau of Standards: *SWH conformity report – 150l*, 14 December 2011
- /47/ South African Bureau of Standards: *SWH conformity report – 200l split*, 14 December 2011
- /48/ Eskom: *Residential heat pump rebate programme, Supplier requirements*, 25 February 2011
- /49/ Tasol: *Domestic Heat Pump – TAS 4-DU*
- /50/ Solar Academy of South Saharan Africa: *SASSA low pressure solar water heater programme*, 23 February 2011
- /51/ Solar Academy of South Saharan Africa: *How hot will my solar water heated water get?* Available at: http://www.sessa.org.za/divisions/swh/frequently-asked-questions-sw/tem/how-hot-will-my-solar-heated-water-get?category_id=108
- /52/ Eskom: *Data requirements for calculating the carbon emission factor (CEF) for the South African grid*, 2012
- /53/ Eskom: *Effective water heating*, November 2009
- /54/ Eskom: *Programme requirements*, 2 May 2012
- /55/ Eskom: *Eskom solar water heating programme*, 29 June 2011
- /56/ Eskom: *Eskom heat pump programme questionnaire*, 1 October 2011
- /57/ Republic of South Africa, Department of Energy: *South Africa CDM projects portfolio*, June 2012
- /58/ Eskom: *Residential Heat Pump Rebate Programme*, 18 February 2011
- /59/ Milton and Kaufman: *Solar Water Heating as a Climate Protection Strategy: The Role for Carbon Finance*, November 2005
- /60/ Eskom: *Frequently Asked Questions*, available at http://www.eskomdsm.co.za/?q=Solar_water_heating_FAQs
- /61/ Eskom: *Effective Water Heating*, 2009
- /62/ Eskom: *Using Heat Pumps for Domestically, Commercial and Industrial Applications to Save Energy*, 2010
- /63/ Eskom: REF: *Solar water heater rebate programme*, 23 May 2012
- /64/ Holme: *Market Survey of Solar Water Heating in South Africa for EDC and CEF*, 23 May 2005
- /65/ Sassa: *Warranty and maintenance plan: domestic heat pumps*, 11 March 2012
- /66/ Holleys Plumbing: *Geysers*, available at: http://www.holleysplumbing.co.za/index.php?option=com_content&view=article&id=112&Itemid=131#pr (accessed: September 2012)
- /67/ The drain corporation: *Rates*, available at: <http://www.draincorp.net/pricelist.html> (accessed: September 2012)
- /68/ Eskom, *Solar Water Heating Programme - Weekly Administrative Dash Board*, August 2011 available at:
- /69/ Keh-Chin Chang et al., *Dissemination of solar water heaters in South Africa*, August 2011 available at: <http://www.erc.uct.ac.za/jesa/volume22/22-3change-et-al.pdf>
- /70/ Kzn Energy, *eThekwin Shisa Solar Programme*, available at: <http://www.kznenergy.org.za/projects.aspx?cat=37>



- /71/ Eskom, How to choose a solar water heating system – easy checklist, available at: <http://www.eskomidm.co.za/residential/residential-technologies/step-by-step-guide-to-choosing-a-solar-water-heating-system>
- /72/ Eskom, *Annual report 2010*, available at: http://financialresults.co.za/2010/eskom_ar2010/eskom_abridged-ar2010/index.html
- /73/ USAID, *Booklet of standardized small and medium enterprises definition*, 22 August 2007

3.2 Follow-up actions

On 12-13 March 2012 DNV visited Johannesburg and performed interviews with project stakeholders. At the same time, DNV met the South African DNA in Pretoria.

	Date / Type of interview	Name / Organization	Topic
/74/	2012-03-12/13 <input checked="" type="checkbox"/> On-site <input type="checkbox"/> Face-to-face at office <input type="checkbox"/> Telephone <input type="checkbox"/> E-mail	Laura Lathi International Carbon	<ul style="list-style-type: none"> • Programme design; • Programme implementation; • Additionality; • Methodology application; • Environmental impacts; • Stakeholder consultation; • Emission reductions; • Monitoring plan.
/75/	2012-03-12/13 <input checked="" type="checkbox"/> On-site <input type="checkbox"/> Face-to-face at office <input type="checkbox"/> Telephone <input type="checkbox"/> E-mail	Olivia Tuchten International Carbon	<ul style="list-style-type: none"> • Programme design; • Programme implementation; • Additionality; • Methodology application; • Environmental impacts; • Stakeholder consultation; • Emission reductions; • Monitoring plan.
/76/	2012-03-12 <input checked="" type="checkbox"/> On-site <input type="checkbox"/> Face-to-face at office <input type="checkbox"/> Telephone <input type="checkbox"/> E-mail	Rafikh Ismail Industrial Development Corporation	<ul style="list-style-type: none"> • Programme additionality; • Official development aid; • Environmental impacts; • Stakeholder consultation.
/77/	2012-03-13 <input checked="" type="checkbox"/> On-site <input type="checkbox"/> Face-to-face at office <input type="checkbox"/> Telephone	Chris Nelson Solar Academy of Sub-Saharan Africa	<ul style="list-style-type: none"> • Programme implementation; • Data management system; • Equipment



	<input type="checkbox"/> E-mail		specifications;
/78/	2012-03-13 <input checked="" type="checkbox"/> On-site <input type="checkbox"/> Face-to-face at office <input type="checkbox"/> Telephone <input type="checkbox"/> E-mail	Leandi Streeter Solar Academy of Sub-Saharan Africa	<ul style="list-style-type: none"> • Methodology application. • Programme implementation; • Data management system; • Equipment specifications; • Methodology application.
/79/	2012-03-13 <input checked="" type="checkbox"/> On-site <input type="checkbox"/> Face-to-face at office <input type="checkbox"/> Telephone <input type="checkbox"/> E-mail	Riaan Swanepoel Solar Academy of Sub-Saharan Africa	<ul style="list-style-type: none"> • Programme implementation; • Data management system; • Equipment specifications; • Methodology application.
/80/	2012-03-13 <input checked="" type="checkbox"/> On-site <input type="checkbox"/> Face-to-face at office <input type="checkbox"/> Telephone <input type="checkbox"/> E-mail	Raj Pandaram Eskom	<ul style="list-style-type: none"> • Energy efficiency subsidies; • Programme additionality; • Confirmation of baseline; • Existence of barriers.
/81/	2012-03-12 <input type="checkbox"/> On-site <input type="checkbox"/> Face-to-face at office <input type="checkbox"/> Telephone <input checked="" type="checkbox"/> E-mail	Ndiafhi Patrick Tuwani DNA of South Africa	<ul style="list-style-type: none"> • Programme contribution to sustainable development; • LoA issuance; • applicable regulations; • confirmation of baseline; • confirmation of barriers; • environmental licences.
/82/	2012-03-12 <input type="checkbox"/> On-site <input type="checkbox"/> Face-to-face at office <input type="checkbox"/> Telephone	Lufuno Mukwevho DNA of South Africa	<ul style="list-style-type: none"> • Programme contribution to sustainable development; • LoA issuance;



	<input checked="" type="checkbox"/> E-mail		<ul style="list-style-type: none"> • applicable regulations; • confirmation of baseline; • confirmation of barriers; • environmental licences.
/83/	2012-03-12	Takalani Rambau	
	<input type="checkbox"/> On-site	DNA of South Africa	<ul style="list-style-type: none"> • Programme contribution to sustainable development; • LoA issuance; • applicable regulations; • confirmation of baseline; • confirmation of barriers; • environmental licences.
	<input type="checkbox"/> Face-to-face at office		
	<input type="checkbox"/> Telephone		
	<input checked="" type="checkbox"/> E-mail		
/84/	2012-03-12	Sandra Motshwanedi	
	<input type="checkbox"/> On-site	DNA of South Africa	<ul style="list-style-type: none"> • Programme contribution to sustainable development; • LoA issuance; • applicable regulations; • confirmation of baseline; • confirmation of barriers; • Environmental licences.
	<input type="checkbox"/> Face-to-face at office		
	<input type="checkbox"/> Telephone		
	<input checked="" type="checkbox"/> E-mail		

3.3 Closing out of validation findings

The objective of this phase of the validation was to resolve any issues which needed be clarified prior to DNV's conclusion on the PoA's compliance with applicable CDM requirements. In order to ensure transparency a validation protocol was customised for the project. The protocol shows in a transparent manner the criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a PoA is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of four tables. The different columns in these tables are described in the figure below. The completed validation protocol for the project activity "Hot Water Heating Programme for South Africa" is enclosed in Appendix A to this report.



Table 2 of the validation protocol documents the findings of the desk review of the project design documentation and follow-up interviews with project stakeholders. Any findings raised in Table 2 are listed in Table 3 of the protocol, and changes to the description of the project design as a result of these findings are addressed in Table 3. Table 2 thus may not reflect all aspects of the project as described in the final PoA-DD submitted for registration.

A corrective action request (CAR) is raised if one of the following occurs:

- (a) The project participants have made mistakes that will influence the ability of the PoA to achieve real, measurable additional emission reductions;
- (b) Applicable CDM requirements have not been met;
- (c) There is a risk that emission reductions cannot be monitored or calculated.

A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A forward action request (FAR) is raised during validation to highlight issues related to project implementation that require review during the first verification of CPAs of the PoA. FARs shall not relate to the CDM requirements for registration.

The validation identified eight CARs, sixteen CLs and no FARs. The CARs and CLs were satisfactorily addressed by the project participants by among other revising the PoA-DD (please refer to Table 3 in Appendix A for further details). In addition to the changes made to the PoA-DD as a result of the validation findings, the following changes to the PoA-DD (version 01 of 24 January 2012) were made compared to the version of the PoA-DD published for stakeholder comments (version 7 dated 26 September 2012):

- Due to the publication by the CDM Executive Board of the Validation and Verification Standard and of the Project Standard, the validation has started under the Validation and Verification Manual and then integrated with the requirements of the Validation and Verification Standard;
- The PoA-DD and CPA-DD were initially published for global stakeholder consultation with version 1 of the PoA and CPA templates, and were subsequently modified by the project participant to adapt to version 2 of the templates;
- The revision of Attachment A to Appendix B published at EB68 established the programme is automatically additional.



Validation Protocol Table 1: Mandatory Requirements for CDM programme of activities (PoA)				
Requirement	Reference	Conclusion		
The requirements the PoA must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided (OK) or a corrective action request (CAR) if a requirement is not met.		

Validation Protocol Table 2: Requirement Checklist				
Checklist question	Reference	Means of verification (MoV)	Assessment by DNV	Draft and/or Final Conclusion
The various requirements in Table 1 are linked to checklist questions the PoA should meet. The checklist is organised in different sections, following the logic of the PoA-DD	Gives reference to documents where the answer to the checklist question or item is found.	Means of verification (MoV) are document review (DR) , interview (I) or any other follow-up actions (e.g., on site visit and telephone or email interviews) and cross-checking (CC) with available information relating to projects or technologies similar to the proposed CDM PoA under validation.	The discussion on how the conclusion is arrived at and the conclusion on the compliance with the checklist question so far.	OK is used if the information and evidence provided is adequate to demonstrate compliance with CDM requirements. A corrective action request (CAR) is raised when project participants have made mistakes, the CDM requirements have not been met or there is a risk that emission reductions cannot be monitored or calculated. A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. A forward action request (FAR) during validation is raised to highlight issues related to project implementation that require review during the first verification of the project activity.

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Corrective action and/or clarification requests	Ref. to checklist question in table 2	Response by project participants	Validation conclusion
The CARs and/ or CLs raised in Table 2 are repeated here.	Reference to the checklist question number in Table 2 where the CAR or CL is explained.	The responses given by the project participants to address the CARs and/or CLs.	The validation team's assessment and final conclusions of the CARs and/or CLs.

Validation Protocol Table 4: Forward Action Requests		
Forward action request	Ref. to checklist question in table 2	Response by project participants
The FARs raised in Table 2 are repeated here.	Reference to the checklist question number in Table 2 where the FAR is explained.	Response by project participants on how forward action request will be addressed prior to first verification.

Figure 1: Validation protocol tables



3.4 Internal quality control

The validation report underwent a technical review performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3.5 Validation team

<i>Role</i>	<i>Last Name</i>	<i>First Name</i>	<i>Country</i>	<i>Type of involvement</i>						
				Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	TA 1.2 competence	TA 3.2 competence
Team leader (Validator)	Feller	Francesca	Italy	✓	✓	✓	✓		✓	✓
Validator from 30 July	Covarrubias	Elfride	Italy	✓		✓			✓	
Validator until 29 July	Decq	Philippe	France	✓		✓			✓	
Technical reviewer	Kapoor	Nitin	India					✓	✓	✓

The qualification of each individual validation team member is detailed in Appendix C to this report.



4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the PoA design as documented and described in the PoA-DD, version 7 dated 26 September 2012.

4.1 Comments by Parties, stakeholders and NGOs

The PoA-DD, version 01 dated 24 January 2012, was made publicly available on the CDM website on <http://cdm.unfccc.int/ProgrammeOfActivities/Validation/DB/XTDJA013UQ2PQJ27WUW1N56DOXJUMB/view.html> and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 11 February 2012 to 11 March 2012.

No comments were received.

4.2 Approval, authorization and contribution to sustainable development

The coordinating/managing entity of the PoA is Low E Solutions (Pty) Ltd trading as Low E Co, which is the entity that communicates with the CDM EB.

The project participants are Low E Co (registered as Low E Solution (Pty) Ltd) of South Africa, I Carbon (Pty) Ltd of South Africa, and International Carbon Ltd of Lichtenstein. The host Party (South Africa) and the Annex I Party (Lichtenstein) meet all relevant participation requirements.

A letter of approval (LoA) /21/ was issued by DNA of South Africa on 13 June 2012, authorizing Low E Co of South Africa as project participant and confirming that the project assists in achieving sustainable development. The DNA of Lichtenstein issued the LoA /22/ on 6 July 2012 and authorized International Carbon Ltd as project participant.

The coordinating/managing entity has obtained authorization of its coordination of the proposed CDM PoA as part of the Letter of Approval from the host Party /21/.

The letters of approval were received from the project participants. The approval by the host country DNA was cross-checked with the list of CDM projects and their status which is made available by the South Africa DNA on their website /57/. The list confirms that the PoA has been approved by the DNA. DNV does not doubt the authenticity of the letters of approval. DNV considers the letters are in accordance with paragraphs 39-42 of the VVS /23/.

4.3 Modalities of communications

The project participants have submitted the Modalities of Communication, which follow the correct version of the template. These are supported by a “Confirmation of authority to act” which authorises Laura Aleksandra Lahti and Pillay Deven – as signatory of the MoC – to act on behalf of the three project participants /19/.

DNV has performed due diligence on the Modalities of Communications (MoC) statement submitted by the project participants /19/ in accordance with applicable requirements in the VVS as documented in section A.4 of Table 2 in the validation protocol in Appendix A to this



report. DNV was able to confirm the information contained in the MoC and that the MoC complies with all relevant forms and requirements.

4.4 PoA design and description of each generic CPA

The technologies employed within the SSC PoA are clearly defined, and consist of heat pumps and solar water heaters, installed either separately or in combination in residential or commercial (small and medium size Enterprises, hereafter referred to as SMEs) buildings. The accuracy of the project description was verified on site through interviews with the project participants /74//75//76/.

The boundary of the PoA consists of the residential or SME buildings (as per the United Nations Industrial Development Organization definition /73/) within the borders of the Republic of South Africa in which the HPs and SWHs will be installed, including all power plants connected physically to the electricity system (grid) that the project equipment is connected to. This is clearly stated in the PoA-DD, and therefore satisfies the requirements of the Project Standard /25/. The boundary of the PoA complies with the requirements of both applicable methodologies /28//27/.

The programme starting date has been set on 12 February 2012, the date for publishing the PoA for Global Stakeholder Consultation /42/. The length of the PoA has been set at 28 years, in accordance with the requirements of the Project standard /25/. The supplier will ensure maintenance of the HPs/SWHs within a CPA for 10 years, which coincides with the duration of the crediting period of a typical CPA. Confirmation that maintenance will be provided for a period of 10 years was provided by SASSA, one of the installers involved in the programme /77//78//79/, as well as by Eskom /80/, which supports the programme through subsidies.

With regard to compliance with the eligibility criteria of the General Guidance to SSC methodologies, the project participant submitted calculations transparently showing the maximum number of devices that can be installed in order for the CPA to remain under the small-scale threshold for type I and II activities /5/: for the renewable energy component of the project, which consists of the installation of solar water heaters, the maximum number of installations has been estimated as 21 543 units. For the energy efficiency component, which consists of the installation of heat pumps, the maximum number of devices that can be installed has been estimated as 6 431. The calculations submitted show that the CPA will comply with the requirements of the general guidelines for SSC CDM methodologies /32/, in that each component (type I and type II activities) will meet the applicable threshold, and the sum of the size of components belonging to the same type will not exceed the limits for small-scale project activities.

The creation of job opportunities for installation, maintenance and monitoring of the programme activity are explicitly mentioned in the description of the programme.

Moreover, interviews with SASSA, the equipment supplier, confirmed that training and maintenance needs will be addressed for the duration of the programme /77//78//79/, as stated in the warranty and maintenance plan submitted /67/.

DNV considers the project description of the project contained in the PoA-DD to be complete and accurate. The PoA-DD complies with the relevant forms and guidance for completing the CDM-SSC-PoA-DD.



4.5 Demonstration of additionality for PoA

The programme is a voluntary coordinated action in that there are currently no laws in South Africa mandating the deployment of the technology used by the programme.

This was confirmed by representatives of the Host Country DNA /81//82//83//84/, as well as representatives of the Industrial Development Corporation /76/ and Eskom /80/.

Moreover, the PoA-DD lists a number of barriers that are faced by the PoA.

Other barriers: Financial resources

Although the programme benefits from a once-off subsidy to homeowners to support the installation of the devices, provided by Eskom as part of the Demand Side Management initiative, these subsidies are not sufficient to cover all cost associated with the installation, maintenance and monitoring of HPs and SWHs over a 10 year period. In fact, since the launch of the Eskom subsidy programme in February 2011, approximately 200 units have been installed nationwide under the Eskom programme /58/. This is mainly because of the high upfront costs constituting a significant barrier for HPs and SWHs /59/: according to Eskom, the average cost of a household HP is between ZAR 12 000 and ZAR 16 000 for 0.5 to 1.9 kW devices, and the average cost for installed household SWHs is between ZAR 12 000 and ZAR 35 000 for 150-300 liter devices /60//61//62/. This is two to three times more than typical electric geysers cost: the electric geyser from main electric geyser producer in South Africa, purchased through individual suppliers and plumbers (the manufacturer does not distribute directly), can costs on average between 5 000 and 7 200 ZAR /66//67/. The Eskom subsidy for Heat Pumps is between ZAR 3 668 and ZAR 4 320 (depending on the size) and for SWHs between ZAR 3 280 and ZAR 8 969 (depending on the SWH type and size) /58//63/. For commercial and industrial installations Eskom has three different programmes: Standard Offer, Standard Product and ESCo Model. Under these programmes the following subsidies are paid: 0.7 ZAR per kWh saved for SWH; and 0.42 ZAR per kWh saved for HPs, or 70 % of the estimated saving over a 3 years. Despite these subsidies resulting in a relatively short payback period, the high upfront costs are a barrier for most South African households: This is particularly evident when the programme for the distribution of low pressure SWH is compared to the distribution of high pressure heaters: the Eskom subsidy programme for SWHs was initiated in 2008, and by August 2011 the number of units installed had increased to almost 150 000 /68/, but most of the installation are the cheaper low pressure units, which are not part of this PoA. As already mentioned, only approximately 200 high pressure SWH units have been installed nationwide under the Eskom programme /58/. Moreover, the barrier is confirmed by publicly available information: a paper by the National Cheng King University and the Tainan University of Technology focusing specifically on the South African SWH market /69/, which states: *“However, the subsidy programs offered by the government of South Africa may not be sufficient to facilitate diffusion. This is attributed to the high initial capital cost of the system and low affordability of the majority of the South Africa population with low income. Alternative financing mechanisms are required”*, and the description of the eThekweni Shisha Solar Programme in South Africa /73/, targeting the same middle to high income market segment targeted by the proposed PoA, which confirms that *“One of the key barriers to SWH uptake in South Africa is the price of individual SWH units”* (the referenced programme in fact consists of a "volume purchasing" system: once there are 10 people in a neighbourhood interested in installing hot water devices in their homes, the



project team will link the participants to pre-selected service providers, who will provide quotations for the units, allowing participants to pay less for SWHs).

In addition to the supporting evidence provided in relation to the discussion of the above barriers, all three barriers were confirmed by representatives of the Industrial Development Corporation /76/, by Eskom /80/, and by the host country DNA /81//82//83//84/.

Revenues from the sale of CERs will alleviate these barriers by allowing the CME to perform a number of crucial tasks which are currently not well performed by the existing SWH industry:

- Selection of reliable products;
- Marketing, supply, installation and maintenance of the HP and SWH systems;
- Organize and provide the funding for the installation of the HPs and SWHs on behalf of the households/ supplier. This includes a 10 years guarantee/support, which is currently not offered by manufacturers and distributors, and that will be offered to users free of charge thanks to carbon revenues, a call centre providing information and support to users, management of an easy payment option for corporate customers (via salary deduction);
- Delivery of educational awareness campaigns in order to intensify the demand for HP and SWH products, including marketing material/media distributed through corporations' channels e.g. email, flyers, newsletters, intranets, etc, as well as through the Low E website.

The PP has submitted a copy of their operational model /20/, with details of the steps and responsible entities involved in each step, i.e. 1st point of contact and choice of supplier and unit, sales and ordering process, order approval and installation, payment process and proactive maintenance and technical queries handling.

The demonstration of barriers presented by the project participant complies with the requirements of the Guidelines on the demonstration of additionality of small-scale project activities version 09.0 /34/.

4.6 Demonstration of additionality of the generic CPA

The demonstration of additionality of the generic CPA is based on the positive list of technologies and project activity types presented in the "Guidelines on the Demonstration of Additionality of Small-Scale Project Activities" /34/.

The PP demonstrated how a generic CPA complies with the requirements of the guidelines, in that it is solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale CDM thresholds. The PP has submitted calculations showing that the 5% limit is respected /5/, and restricted the type of users to domestic or SME buildings through eligibility criteria.



4.6.1 Additionality - Conclusion

The demonstration of additionality of typical CPAs to be included to the PoA is in accordance with section A of the “Standard for demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities” /26/, and it is demonstrated that in the absence of CDM, none of the CPAs would occur.

The following eligibility criteria (refer to section 4.7 for the complete list of eligibility criteria) ensure that a CPA meets the conditions that ensure that CPAs meet the requirements pertaining to the demonstration of additionality as described above.

- The CPAs to be included in this PoA shall meet the criteria for automatic additionality as per the paragraph 2 C of the “Guidelines on the Demonstration of Additionality of Small-Scale Project Activities”. Hence each installation done under this PoA shall be below:
 - HP < 3000 MWh;
 - SWH < 320 m²;
- Installation shall take place in residential and/or SMEs (as per the United Nations Industrial Development Organization definition /73/) thin the geographical boundaries of South Africa.

4.7 Eligibility criteria for including CPAs to the PoA

1. The SWHs to be included in the CPA shall meet the applicability requirements of the CDM methodology AMS.I.C. Thermal energy production with or without electricity, version 19 which are
 - The CPAs included in this PoA comprise renewable energy technologies that supply users with thermal energy that displaces fossil fuel based grid energy;
 - The methodology comprises technologies such as solar thermal water heaters;

The HPs to be included in the CPA shall meet the applicability requirements of the CDM methodology AMS.II.C. Demand-side energy efficiency activities for specific technologies, version 13 which are

 - The CPAs included in this PoA comprise energy-efficient equipment, which replaces existing equipment, or possibly are installed at new sites;
 - The aggregate energy savings of the CPA will not exceed the equivalent of 60 GWh electric energy per year;
 - The level of the output/service (e.g. water temperature) will not be significantly smaller(maximum - 10%) or significantly larger (maximum + 50%) than in the baseline situation;

The CPA shall apply both methodologies if both SWHs and HPs are installed within one CPA. However, a CPA may also consist of only SWHs or HPs, in which case only the relevant applicability requirements of the technology in question shall apply. This criterion makes it possible to ensure the applicability of a methodology by CPAs in accordance with the requirements of paragraph 14 (e) of the PoA Standard;
2. The Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities shall be applied also for monitoring, and hence a 95/10 confidence/precision is requested as per section B.7.2 of the PoA-DD. This criterion adequately sets the conditions to make it possible to meet the sampling requirements for the PoA in accordance with the approved guidelines/standard from the Board;



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3. The CPAs to be included in this PoA shall meet the criteria for automatic additionality as per the paragraph 2 C of the “Guidelines on the Demonstration of Additionality of Small-Scale Project Activities”. Hence each installation done under this PoA shall be below:
 - HP < 3000 MWh;
 - SWH < 320 m²;

This criterion is considered sufficient to ensure every CPA meets the requirements pertaining to the demonstration of additionality as per the “Guidelines on the Demonstration of Additionality of Small-Scale Project Activities” /34/;
4. Each system included under the programme shall fulfil the relevant debundling rules i.e. annual savings ≤ 600 MWh and for SWHs absorber ≤ 640 m² as per Section C of the PoA-DD. This criterion is considered adequate to ensure that the requirements for the debundling check are met by CPAs;
5. Installation shall take place in residential and/or SMEs (as per the United Nations Industrial Development Organization definition) within the geographical boundaries of South Africa. This criterion is considered sufficient to ensure that the geographical boundary of CPAs is consistent with the geographical boundary of the PoA;
6. The start date of the CPA is determined to be the first signed installation/carbon cession form agreement with the household and/or business under that CPA. The starting date of the CPA cannot be prior the date of 12 February 2012, which is the date of the global stakeholder consultation /42/;
7. All the HPs and SWHs under the SSC-CPA shall comply with all relevant SABS/SANS Standard Specification for HP or SWH systems. Each supplier or CPA implementer, (if not Low E Co.) shall provide copies of relevant SABS/SANS Standard Specification to the CME before Inclusion under this PoA. This is considered adequate specification of the technology/measure to be used by CPAs;
8. In order to ensure that all CPAs under this PoA are neither registered as an individual CDM project activity nor included in another registered PoA:
 - a. Each CPA shall be uniquely identified and defined by way of the unique identifying numbers (serial numbers) attached to each SWH and HP;
 - b. Each supplier and household will sign an agreement with the CME which; 1) cedes the carbon to the CME, and 2) clarifies that the installations are not part of another CDM activity. This criterion, together with criterion 10, is sufficient to avoid double counting of emission reductions by CPAs, in that it contributes to the unique identification of products and end-users location, as required by the PoA-standard /26/;
9. All participants joining the programme shall have electricity connection and an existing electric geyser. The electricity connection meter number as well as power (kW) and size (litre) of electric geyser shall be recorded for each installation as per section B.7.2 of the PoA-DD. This criterion, together with criterion 5, sufficiently defines the selected target group;
10. All participants joining the programme shall have a proof of identity (ID), or corporate registration certificate. The ID/ registration number shall be recorded in the database as per section B.7.2 of the PoA-DD and electronic copies of these documents will be stored. This criterion, together with criterion 8, is sufficient to avoid double counting of emission reductions by CPAs, in that it contributes to the achievement of unique identification of product and end-user location, as required by the PoA-standard /26/;



11. No public funding from parties included in Annex I is involved in this programme. This shall be confirmed for each CPA by providing details of the funding to the validating/ including DOE. This criterion is sufficient to ensure that funding from Annex-1 parties does not result in a diversion of official development assistance;
12. Each SSC-CPA must be approved by the coordinating entity and Designated Operational Entity (hereafter referred to as “DOE”) prior to its incorporation into the PoA. This criterion, together with criterion 8, is sufficient to avoid double counting of emission reductions by CPAs;
13. When installing heat pumps the level of the output/service (e.g. water temperature) shall not be significantly smaller (maximum - 10%) or significantly larger (maximum + 50%) than in the baseline situation. Hence, the supplier/CPA Developer is requested to set the thermostat in the same level than in the baseline scenario i.e. typically between 55-60°C;
14. The local stakeholder consultation and environmental impact analysis was undertaken at PoA level and hence there is no specific requirements at CPA level.

The eligibility criteria for including CPAs are in accordance with section B of the “Standard for demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities” /26/.

4.8 Application of methodologies

For the renewable energy component (SWHs), AMS-I.C.: Thermal Energy Production with or without electricity, Version 19 is used.

For the energy efficiency component (HPs) AMS-II.C.: Demand-side energy efficiency activities for specific technologies, Version 13 is used.

In both cases, the version applied is a valid version published on the UNFCCC website /42/.

The application of multiple methodologies by the proposed programme is in accordance with the requirements of the *Standard for the demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities*, which states:

“Combinations of technologies/measures and/or methodologies for a PoA are eligible where it is demonstrated that there are no cross effects between the technologies/measures applied.”

In this case, the two technologies will be installed each in different households, and the measurement, monitoring and recording procedures will be kept separate in the database.

4.9 Management system of the PoA

(a) A clear definition of roles and responsibilities of personnel involved in the process of inclusion of CPAs, including a review of their competencies;

The definition of roles and responsibilities of personnel are clearly allocated and described in the PoA-DD, including the allocation of each task foreseen as part of the programme.

The tasks described include the review of CPA monitoring data and report.



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To avoid including CPAs that have already been registered either as CDM project activity or as a CPA of another PoA, eligibility criterion 8 has been created. Moreover, in order to avoid double counting of CERs, the CME will make sure that each system installed is uniquely identified and recorded by means of a unique serial number that will be recorded in the users database.

Record keeping arrangements established by the CME consist in a database where the following information for each HP or SWH installed in a SSC-CPA is recorded:

- Site details – address and GPS coordinates;
- Residence/Company details – first name and surname, or company name in case of SMEs; ID number or company registration number, contact details;
- Installed details – installation date, installer name, company name, contact details;
- Installation details – serial number, HP/SWH type, HP/SWH size, HO input power, HO/SWH heating capacity, SWH absorber area, SWH back up element size;
- Baseline details;
- CPA identification number – power and size of existing geyser;
- CPA identification number;
- Confirmation that the building has electricity and water connection;
- Copy of carbon Ceding for signed by the resident/company together with a copy of installation form.

At the time of the site visit, installations had not yet started, and the database had not yet been finalized. However, the PP confirmed that it will be based on the structure of the databases developed for a registered PoA also consisting of the installation of solar water heaters, which DNV observed on site. It is hosted by a specialized database company and populated either directly via a web interface or by database synchronisation with electronic data entry devices to be used by installers. Meter records are visible in real time from the database.

It is confirmed in the PoA-DD that the data will be archived for two years once the 10 year crediting period has lapsed.

Provisions are in place to ensure that recipients are aware and have agreed to transfer carbon rights to the project participant, so that double counting of emission reductions is avoided. DNV was provided with a template agreement and could verify the completeness of the information /14/.

In relation to the sampling approach to be used at verification stage, the PoA-DD indicates under the operational and management plan for the programme: "Verification of each CPA shall be done by an appointed DOE".

The management system of the proposed PoA is in accordance with the "Standard for demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities" /26/.



4.10 Environmental impact

With regards to the need for an EIA, Environmental Impact Assessments in South Africa are regulated through the National Environmental Management Act (NEMA) /42/.

The NEMA identifies the activities that require basic assessment, scoping, or full EIA. Such activities are listed in three listing notices published as integrations to the NEMA. DNV checked the activities included in the three listing notice and can confirm that the activity implemented by the proposed programme of activity is not included. Therefore, the proposed programme does not require an environmental impact assessment according to the environmental regulation of the host Party. This was also confirmed by representatives of the Host Country DNA /81//82//83//84/.

However, an informal environmental impact assessment has been performed and submitted to South Africa's DNA as part of the LoA application process /16/, and was approved by the host country DNA. Moreover, the Industrial Development Corporation – who provides part of the funding for this project, has an environmental policy in place /14/ which applies to all project in which the organisation is involved with, including the proposed project activity. Funding would therefore not have been approved should the project have failed to meet IDC's environmental policy.

No significant anticipated negative impacts on the environment and/or on people through this programme. The project reduces the consumption of non-renewable natural resources, such as fossil fuels, and further reduces the GHG emission as well as airborne particulates (ash) and pollutant gases which cause air quality problems. The installations will take place in existing infrastructures i.e. residential and commercial buildings. The heat pumps installed under this programme will use non ozone depleting refrigerants.

DNV could determine that no significant environmental impacts are expected from the project activity and that possible impacts were adequately mitigated.

4.11 Local stakeholder consultation

As described in the PoA-DD, the key stakeholders were identified to be the municipal managers, the Designated National Authority, the Department of Energy, Eskom, funders and some corporations, as well as HP/SWH suppliers. The public participation meeting was held on October 24 in Sandton, Gauteng. Two meetings took place at 2 pm and 5 pm. In these meetings the implementation framework, the Clean Development Mechanism, technical details and corporate rollout was presented. Comments were invited until 24 May 2010.

As evidence, the Project Participant submitted an scanned copy of the invitation published on the Sunday Times newspaper /9/, a copy of the personal invitation sent to stakeholders /11/, the stakeholder invitation list /12/, participants' attendance records /7/, photographs of the meeting taking place /8/, comments received by email /6/, and a log of queries received by phone /10/.

A summary of stakeholder comments received is included in the PoA-DD. They are as follows:



- Details of the public participation meeting (date and venue);
- How to participate in the programme as supplier;
- When will the programme start in other parts (than Gauteng) of South Africa;
- Implementing Structure (what will the Special Purpose Vehicle structure comprise, how will the markets be identified, which municipalities are being considered in the programme);
- Financing Structure (i.e. whether suppliers would have to cover the maintenance costs, how carbon credits are calculated, how will the Eskom subsidy be facilitated, what are the payment terms per unit, how suppliers can be assisted in terms of acquiring capital for installation roll-outs, and who will be responsible for the warranties and guarantees);

Most of the comments and questions received were around how to join the programme as supplier and how the programme is structured, and as such did not require changes in the programme design /6//10/.

DNV considers the local stakeholder consultation carried out adequately.

4.12 Application of selected baseline and monitoring methodology(ies) by each generic CPA

The fulfilment of all the applicability criteria by a typical CPA has been assessed as follows:

AMS-I.C.

- Biomass-based cogeneration systems are included in this category

Not applicable – the project does not make use of biomass-based cogeneration systems.

- Emission reductions from a biomass cogeneration system can accrue from one of the following activities:
 - (a) Electricity supply to a grid;
 - (b) Electricity and/or thermal energy (steam or heat) production for on-site consumption or for consumption by other facilities;
 - (c) Combination of (a) and (b).

Not applicable – the project does not make use of biomass-based cogeneration systems.

- The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW thermal

The project participant submitted calculations /5/ transparently showing the maximum number of devices that can be installed in order for a typical CPA to remain under the small scale threshold for type I activities for the duration of the crediting period (21 543). Since the



calculations are based on estimated parameters for which actual values will be available ex-post, distribution will be monitored to make sure the thresholds are respected.

Moreover, the calculations submitted show that a typical CPA will comply with the requirements of the general guidelines for SSC CDM methodologies /32/, in that each component (type I and type II activities) will meet the applicable threshold, and the sum of the size of components belonging to the same type will not exceed the limits for small-scale project activities.

- For co-fired systems, the total installed thermal energy generation capacity of the project equipment, when using both fossil and renewable fuel, shall not exceed 45 MW thermal;

The project participant submitted calculations transparently showing the maximum number of devices that can be installed in order for a typical CPA to remain under the small scale threshold for type I activities for the duration of the crediting period (21 543). Since the calculations are based on estimated parameters for which actual values will be available ex-post, distribution will be carefully monitored to make sure the thresholds are respected.

Moreover, the calculations submitted show that a typical CPA will comply with the requirements of the general guidelines for SSC CDM methodologies /32/, in that each component (type I and type II activities) will meet the applicable threshold, and the sum of the size of components belonging to the same type will not exceed the limits for small-scale project activities.

- The following capacity limits apply for biomass cogeneration units:
 - a) If the project activity includes emission reductions from both the thermal and electrical energy components, the total installed energy generation capacity (thermal and electrical) of the project equipment shall not exceed 45 MW thermal. For the purpose of calculating this capacity limit the conversion factor of 1:3 shall be used for converting electrical energy to thermal energy (i.e. for renewable energy project activities, the maximal limit of 15 MW(e) is equivalent to 45 MW thermal output of the equipment or the plant);
 - b) If the emission reductions of the cogeneration project activity are solely on account of thermal energy production (i.e. no emission reductions accrue from the electricity component), the total installed thermal energy production capacity of the project equipment of the cogeneration unit shall not exceed 45 MW thermal;
 - c) If the emission reductions of the cogeneration project activity are solely on account of electrical energy production (i.e. no emission reductions accrue from the thermal energy component), the total installed electrical energy generation capacity of the project equipment of the cogeneration unit shall not exceed 15 MW.

Not applicable – the project does not consist of biomass cogeneration units.

- The capacity limits specified in the above paragraphs apply to both new facilities and retrofit projects. In the case of project activities that involve the addition of renewable energy units at an existing renewable energy facility, the total capacity of the units added



by the project should comply with capacity limits in paragraphs 4 to 6, and should be physically distinct⁵ from the existing units

Not applicable: the project does not consist of the addition of renewable energy units at an existing renewable energy facility.

- Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category;

Not applicable: the project does not seek to retrofit or modify an existing facility for renewable energy generation.

- New Facilities (Greenfield projects) and project activities involving capacity additions compared to the baseline scenario are only eligible if they comply with the related and relevant requirements in the General Guidelines to SSC CDM methodologies.

The project is a greenfield project in that no renewable energy generation was present in the baseline scenario. PAs will have to demonstrate compliance with the related and relevant requirements in the General Guidelines to SSC CDM methodologies as part of the demonstration of eligibility under the PoA;

- If solid biomass fuel (e.g. briquette) is used, it shall be demonstrated that it has been produced using solely renewable biomass and all project or leakage emissions associated with its production shall be taken into account in the emissions reduction calculation

Not applicable – no solid biomass fuel is used.

- Where the project participant is not the producer of the processed solid biomass fuel, the project participant and the producer are bound by a contract that shall enable the project participant to monitor the source of the renewable biomass to account for any emissions associated with solid biomass fuel production. Such a contract shall also ensure that there is no double-counting of emission reductions.

Not applicable – no solid biomass fuel is used.

- If electricity and/or steam/heat produced by the project activity is delivered to a third party i.e. another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into that ensures there is no double-counting of emission reductions.

Not applicable – the heat produced is not delivered to a third party. In fact, the systems are sized to cover the thermal needs of the household/facility on which they are installed /5//4/.



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- If the project activity recovers and utilizes biogas for power/heat production and applies this methodology on a stand-alone basis i.e. without using a Type III component of a SSC methodology, any incremental emissions occurring due to the implementation of the project activity

Not applicable – the project activity does not recover and utilize biogas for power/heat production.

- Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources provided:
 - a) Charcoal is produced in kilns equipped with methane recovery and destruction facility; or
 - b) If charcoal is produced in kilns not equipped with a methane recovery and destruction facility, methane emissions from the production of charcoal shall be considered. These emissions shall be calculated as per the procedures defined in the approved methodology AMS-III.K.7 Alternatively, conservative emission factor values from peer reviewed literature or from a registered CDM project activity can be used, provided that it can be demonstrated that the parameters from these are comparable e.g. source of biomass, characteristics of biomass such as moisture, carbon content, type of kiln, operating conditions such as ambient temperature.

Not applicable - the project activity does not consist of charcoal based biomass energy generation

AMS-II.C.

- This methodology comprises activities that encourage the adoption of energy-efficient equipment/appliance (e.g., lamps, ballasts, refrigerators, motors, fans, air conditioners, pumping systems) at many sites. These technologies may replace existing equipment or be installed at new sites. In the case of new facilities, the determination of baseline scenario shall be as per the procedures described in the general guidance to SSC methodologies under the section ‘Type II and III Greenfield projects (new facilities)’. The aggregate energy savings by a single project may not exceed the equivalent of 60 GWh per year for electrical end use energy efficiency technologies. For fossil fuel end use energy efficient technologies, the limit is 180 GWh thermal per year in fuel input.

The typical CPA meets this criterion in that it consists in the adoption of energy-efficient equipment/appliance (heat pumps) at many sites, to replace existing equipment (electric geysers). With regard to compliance with the eligibility criteria of the General Guidance to SSC methodologies, the project participant submitted calculations transparently showing the maximum number of devices that can be installed in order for a typical CPA to remain under the small scale threshold for type II activities for the duration of the crediting period (6 431). Since the calculations are based on estimated parameters for which actual values will be



available ex-post, distribution will be carefully monitored to make sure the thresholds are respected.

Moreover, the calculations submitted show that a typical CPA will comply with the requirements of the general guidelines for SSC CDM methodologies /32/, in that each component (type I and type II activities) will meet the applicable threshold, and the sum of the size of components belonging to the same type will not exceed the limits for small-scale project activities.

- For each replaced appliance/equipment/system the rated capacity or output or level of service (e.g., light output, water output, room temperature and comfort, the rated output capacity of air-conditioners etc.) is not significantly smaller (maximum - 10%) than the baseline or significantly larger (maximum + 50%) than the baseline.

The project equipment will be regulated to achieve the same output level of service as the baseline, in this case a water temperature between 55-60 °C. This temperature range is selected because the water temperature for domestic use is controlled by regulation to not exceed 65°C /74//77/, and Eskom's subsidy programme requires a minimum water temperature of 55°C /54/. The fact that a water temperature of between 55-60 °C constitute common practice in South Africa is also confirmed by publicly available information /51//53/. Temperature regulation is achieved by setting the thermostat to the required temperature: whenever this drops below the set point (typically 6°C below), the electric element switches on in order to reheat the water in the geyser to the set point.

- If the energy efficient equipment contains refrigerants, then the refrigerant used in the project case shall be CFC free. Project emissions from the baseline refrigerant and/or project refrigerants shall be considered in accordance with the guidance of the Board (EB 34, paragraph 17). This methodology credits emission reductions only due to the reduction in electricity consumption from use of more efficient equipment/appliances.

The heat pumps used as part of the programme will make use of refrigerants not containing ozone layer depleting substances, since this is also an eligibility set by Eskom as part of their rebate programme, so that heat pumps utilising ozone layer depleting substances in their refrigerants will not be eligible for funding /48/.

The approved baseline methodologies have been correctly applied to identify the baseline scenario, and the identified baseline scenario most reasonably represents what would occur in the absence of the proposed CDM project activity.

All the assumption and data used by the project participants are listed in the PoA-SSC-DD and/or supporting documents. All documentation relevant for establishing the baseline scenario and correctly quoted and interpreted in the PoA-SSC-DD. Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable. Relevant national and/or sectoral policies and circumstances are considered and listed in the PoA-SSC-DD.



POA VALIDATION REPORT

The assessment of the generic CPA's compliance with the applicability criteria of AMS-II.C. version 13 and AMS-I.C. version 19 are documented in detail in section B.2 of Table 2 in the validation protocol in Appendix A to this report.

The following eligibility criteria (refer to section 4.7 for the complete list of eligibility criteria) ensure that a CPA meets the conditions that ensure that CPAs meet the requirements pertaining to the demonstration of additionality as described above.

- The SWHs to be included in the CPA shall meet the applicability requirements of the CDM methodology AMS.I.C. Thermal energy production with or without electricity, version 19. The HPs to be included in the CPA shall meet the applicability requirements of the CDM methodology AMS.II.C. Demand-side energy efficiency activities for specific technologies, version 13. The CPA shall apply both methodologies if both technologies SWHs and HPs are installed within one CPA. However, a CPA may also consist of only SWHs or HPs, in which case only the relevant applicability requirements of the technology in question shall apply.

4.13 Project boundary of each generic CPA

Components and facilities used to mitigate GHGs are clearly defined in the PoA-DD.

The system boundaries consist of the residential or commercial buildings in which the project equipment is installed on, as well as the connected electricity system the equipment is connected to.

	<i>GHGs involved</i>	<i>Description</i>
<i>Baseline emissions</i>	<i>CO₂</i>	<i>Emissions associated with grid electricity that would have been used in the absence of the project activity.</i>
<i>Project emissions</i>	<i>CO₂</i>	<i>Emissions due to the energy consumption of the project equipment</i>
<i>Leakage</i>	<i>N/A</i>	<i>Leakage emissions are not considered in accordance with the applicable methodologies.</i>

The identified boundary and selected sources and gases are justified for the generic CPA. The validation of the generic CPA did not reveal other greenhouse gas emissions occurring within the proposed CPA boundary as a result of the implementation of the proposed project activity which are expected to contribute more than 1% of the overall expected average annual emission reduction, which are not addressed by AMS-I.C. version 19 and AMS-II.C. version 13.

4.14 Baseline scenario identification and description for each generic CPA

The proposed CPA applies two indicative simplified baseline and monitoring methodologies /27//28/.

Both methodologies indicate as baseline the fuel consumption of the technologies that would have been used in the absence of the project activity, which is the baseline identified by the proposed programme. In the case of South Africa, water heating is predominantly achieved



through the use of electric geysers. The credibility of the baseline was verified against publicly available information /40//42//43/, and confirmed by the host country DNA through interviews /81//82//83//84/.

The approved baseline methodology has been correctly applied to identify a complete list of realistic and credible baseline scenarios, and the identified baseline scenario most reasonably represents what would occur in the absence of the proposed CDM project activity.

All the assumption and data used by the project participants are listed in the PoA-DD and/or supporting documents. All documentation relevant for establishing the baseline scenario and correctly quoted and interpreted in the PoA-DD. Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable. Relevant national and/or sectoral policies and circumstances are considered and listed in the PoA-DD.

4.15 Algorithms and/or formulae used to determine emission reductions of each generic CPA

4.15.1 Explanation of methodological choices

Project Emissions:

- Heat pumps:

The description of project emissions calculations in the PoA-DD is in accordance with equations 5 and 6 of AMS-ILC.: project emissions are calculated as the energy consumption of the project technology, times the grid emission factor, plus project emissions from physical leakage of refrigerants.

- Solar water heaters:

AMS.I.C paragraph 45 requires project emissions to be calculated according the “Tool to calculate baseline, project and/or leakage emissions from electricity consumption” /35/. Equation 1 of the tool is used for this purpose (generic approach). Project emissions are calculated as the quantity of electricity consumed, times the grid emission factor, adjusted to account for transmission and distribution losses.

Baseline Emissions:

- Heat pumps:

According to the PoA-DD, baseline emissions from the energy efficiency component are calculated based on the energy consumption in the baseline, the CO₂ emission factor of the electrical grid, and the quantity and global warming potential of the refrigerant used by the baseline technology, through equations 1 and 2 of AMS-ILC. For the purpose of the estimation of the emission reductions achieved by a typical CPA, emissions from the leakage of refrigerant were considered as 0 because the refrigerant used by a typical CPA will be CFC free (as per Eskom requirements /48/)

- Solar water heaters:

The PoA-DD indicates that baseline emissions for the SWH component are calculated according to methodology AMS-ID /31/, since the activity displaces the use of electricity



from the grid. Baseline emissions are calculated based on the quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity times the carbon emission factor of the grid, in accordance to equation 1 of AMS-1.D /31/. The net electricity supplied is the energy output determined by SABS tests (used for ex-ante calculations).

Leakage emission:

According to both methodologies, leakage shall be considered if the equipment is transferred from outside the boundary of the project activity.

Furthermore both methodologies state that in the case of PoAs, if the project activity involves the replacement of equipment, the leakage effect of the use of the replaced equipment in another activity can be neglected if the replaced equipment is scrapped, and independent monitoring of scrapping of replaced equipment is implemented.

Under this PoA, CPAs will only install new SWH/HP. In the case of SWH, the existing electric geysers is downgraded and used as a backup element for the SWH, and its emissions will be monitored under the project emissions (the water geyser will be monitored separately from other household appliances). In the case of HPs the electric element is scrapped.

Leakage (LE_{ν}) is therefore considered to be zero under this programme.

Grid emission factor:

The relevant grid has been identified in South Africa's national grid, and the calculations of the combined margin only consider only grid-connected power plants, which is acceptable according to Stem 2 of the tool.

For the calculation of the operating margin, the PP has selected the simple average operating margin option, as coal power stations have been considered as low-cost-must-run resources, and these represent over 50% of the overall generation for the past 5 years. The data used to determine this were cross-checked with publicly available information made available by Eskom on their website and found to be correct /52/. Moreover, the Project Participant has selected to calculate the grid emission factor *ex ante* for the duration of the first crediting period.

Option A1 has been selected, where the emission factor of each power unit is calculated based on the net electricity generation and a CO₂ emission factor of each power unit. The emission factor of each power unit is calculated based on the amount of fuel consumed, fuel NCV, fuel emission factor, and electricity generation.

The built margin emission factor has been calculated ex ante as the emission factor for the 5 most recent units plus CDM project activities. Since none of the identified power plants started operation less than 10 years ago, the set the power units registered as CDM project activities was included. The identified sample did not comprise 20% of the generation, therefore two plants, Majuba and Kendal were added, so that the 20% threshold is reached.



The combined margin has been calculated based on the weighted average approach. The weighting selected to calculate the combined margin is $W_{OM} = 0.5$ and $W_{BM} = 0.5$. This is in accordance with the tool since the project does not involve wind or solar power generation.

The combined grid emission factor has been calculated to be 0.967 tCO₂/MWh.

The methodological choices applied for the calculation of emission reductions are in accordance with the applicable methodologies, AMS-I.C. and AMS-II.C., and with the Tool to calculate the emission factor for an electricity system version 02.2.1.

4.15.2 Parameters determined ex-ante

The following parameters will be made available *ex-ante* (at the time of inclusion) by individual CPAs:

- Emission factor for the electricity system: the PP has selected to calculate this parameter once at PoA level, and keep it fixed for all CPAs to apply, since inclusion of all CPAs will take place in the first year of the PoA. The calculation of the grid emission factor has been performed according to the Tool to calculate the emission factor for an electricity system, based on data on energy production made publicly available by Eskom /52/. The grid emission factor identified is 0.967 tCO_{2e}/MWh;

4.16 Monitoring plan

The monitoring plan is documented according to the approved methodology in a complete and transparent manner both in the PoA-DD and in the CPA-DD. Moreover, the PoA-DD lists the parameters that will be monitored by each CPA and provides a description of how the data will be collected. The coordinating entity will contract a specialised data management company, which will establish and maintain a database for the PoA that contains sufficient data, specific to each CPA and each installation, to allow the DOE to calculate the emission reductions for each individual CPA. For each CPA, data will be archived for two years over the 10 year crediting period.

The sampling approach used to design the monitoring plan is based on the requirements of the Standard for sampling and surveys for CDM project activities and programme of activities /37/. The standard requires a 95/10 confidence/precision, and the Project Participant intends to analyse the monitoring records 3 months after the start of the crediting period and 6 month after the start of the crediting period to see whether or 95/10 confidence/precision level is achieved. The sample size can then be adjusted to meet the 95/10 confidence/precision level based on the measurement results.

As required by the two methodologies applied, the monitoring plan will consist of the following:

Heat pumps:

- Metering of energy use;
- Number of HPs operating in the year.



Solar water heaters:

- Annual hours of operation of the average system;
- Number of systems operating.

More information on the sample size of metered and non-metered devices is provided in the section on monitored parameters below.

The monitoring plan is in compliance with the monitoring methodologies AMS-I.C. and AMS-II.C. It is DNV's opinion, that the project participants are able to implement the monitoring plan.

4.16.1 Parameters monitored ex-post by each generic CPA

The parameters that are to be monitored by CPAs are the following:

- N_{HP} : Number of HP operating in the year. Monitoring will be based on an annual check of a representative sample of installations in each CPA. The sample size is determined jointly for both HP and SWH, at that has been calculated as 97 installations, to meet the requirements of the Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities for a 95/10 confidence/precision reliability. The calculation of the sample size, including all assumptions can be found in Annex 1 of the monitoring plan /19/. The database will annually allocate the 97 sites for inspection by an automated random number generator. The installers/ suppliers of the SWH/HPs will inspect the determined SWH/HPs. A value of 100% will initially be used to estimate emission reduction, since the equipment will be new. This value will be adjusted ex-post with the results of the checks and reported failures;
- E_y : Annual energy consumption of the heat pump. This parameter will be monitored by metering a representative sample of units, selected through simple random sampling. The sample size has been calculated based on 3 reference values for operating time of water heaters gathered from literature and the expected maximum capacity of a heat pump, in order to calculate a possible variation in the energy consumption, and calculate the mean. Standard deviation has been calculated following the "rule of thumb" approach, and the maximum number of units considered is 100 000. Based on the calculations performed, the sample size has been determined to be 57 units. The calculation of the sample size, including all assumptions can be found in Annex 1 of the monitoring plan /19/. However, it should be noted that sample size of 57 is only an estimate and the real samples size will be adjusted to reach 95% confidence level required, once the initial monitoring results will provide more accurate values for standard deviation. In fact, the project participant intends to install monitoring equipment on the first installation, and thereafter to every 20th installation until a sample size reaching 95 % confidence level is reached. The measured energy consumption will be used together with the power of the heat pump to calculate the operational hours, and applied to the power of the baseline electric heaters to calculate baseline emissions as well;
- N_{SWH} : Number of SWH operating in the year. Monitoring will be based on an annual check of a representative sample of SWH in each CPA to ensure that they are still operating. The sample size is determined jointly for both HP and SWH, at that has been



calculated as 97 installations, to meet the requirements of the Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities for a 95/10 confidence/precision reliability. The calculation of the sample size, including all assumptions can be found in Annex 1 of the monitoring plan /19/. The database will annually allocate the 97 sites for inspection by an automated random number generator. The installers/ suppliers of the SWH/HPs will inspect the determined SWH/HPs. A value of 100% will initially be used to estimate emission reduction, since the equipment will be new. This value will be adjusted ex-post with the results of the checks and reported failures;

- Q_y : solar energy used by the household in the year y . This parameter refers to the energy generated by SHWs on which baseline emissions are based. This parameter will be calculated based on the rated capacity of the SWH, and the measurement of inlet and outlet temperature and water flow, as detailed in the following three entries in this list;
- Q_{rated} : rated capacity of the SWH: this is calculated based on SABS heating value (MJ) and 86 400s (seconds in a day), and will be sourced from the technical specification of the SWH;
- V : volume of daily warm water usage (water flow). This will be measured by a volumetric flow meter at the inlet of the SWH (i.e. the amount of water entering the tank). The calibration of the flow meter will take place as per manufacturer specifications, but at least once in three years. A representative sample of SWH will be selected through systematic random sampling, and the sample size has been calculated based on a number of assumptions. The estimated water flow has been based on the PP's (and installers) experience as 50 liters of hot water per person, plus 50 liters to cover generic domestic use (a figure also confirmed by information published on the Eskom's website /73/), and the SWH capacity foreseen for the programme (150 and 300 liters). The variation has also been estimated based on experience to range from 75 to 200 liters. Mean water usage has been estimated based on the rules for sizing the SWH to be 175 liters, and the standard deviation has been calculated based on the "rule of thumb" approach to be 31.25. Based on the above assumption, the sample size has been determined to be 13 for 200 liters units, 16 for 250 liters units, and 10 for 300 liters units. The calculation of the sample size, including all assumptions can be found in Annex 1 of the monitoring plan /19/. However, this sample size is only an estimate, and the real samples size will be adjusted to reach 95% confidence level required, once the initial monitoring results will provide more accurate values for standard deviation. In fact, the project participant intends to install monitoring equipment on the first installation, and thereafter to every 50th installation until till a sample size reaching 95 % confidence level is reached;
- T_{inlet} : temperature of water inlet point. The temperature will be monitored with a temperature probe. The probe must be installed on the inlet of the SWH before any recirculation stream enters the solar panel. The calibration of the temperature probe will take place as per manufacturer specifications, but at least once in three years. A representative sample of SWH will be selected through systematic random sampling, and the sample size has been determined based on measured weather data from two locations in South Africa, one inland (Ekurhuleni) and one on the coast (eThekweni), for two months, one in winter (May) and one in summer (January), in order to determine the likely variation of outdoor temperatures over the year. Based on these data, the PP calculated the variation, mean and standard deviation, and calculated that the desired 95/10 confidence/error will be achieved with a sample size of 15 installations. The



calculation of the sample size, including all assumptions can be found in Annex 1 of the monitoring plan /19/. However, this sample size is only an estimate, and the real samples size will be adjusted to reach 95% confidence level required, once the initial monitoring results will provide more accurate values for standard deviation. In fact, the project participant intends to install monitoring equipment on the first installation, and thereafter to every SWH that is equipped with flow meter until a sample size reaching 95 % confidence level is reached;

- T_{outlet} : temperature of water outlet point. This will be monitored through minute measurement with a temperature probe. The probe must be installed on the outlet before distribution to the house. If the hot water is mixed with cold water (to prevent the hot water temperature rising above 55 °C degrees i.e. for safety reasons) the probe must be installed at the mixing point before distribution to the house. The calibration of the temperature probe will take place as per manufacturer specifications, but at least once in three years. A representative sample of SWH will be selected through systematic random sampling, for which the sample size has been determined based on data from SASSA, one of the installers involved in the programme. The minimum temperature considered is 55°C, as eligibility for the Eskom subsidy requires a minimum outlet temperature setting of 55°C. while the upper value considered is 91°C, based on SASSA's experience. The standard deviation can then be calculated based on "rule of thumb" to be 10°C. Based on these data, the sample size able to provide a 95/10 confidence level has been calculated to be 8. The calculation of the sample size, including all assumptions can be found in Annex 1 of the monitoring plan /19/. However, this sample size is only an estimate, and the real samples size will be adjusted to reach 95% confidence level required, once the initial monitoring results will provide more accurate values for standard deviation. In fact, the project participant intends to install monitoring equipment on the first installation, and thereafter to every SWH that is equipped with flow meter until a sample size reaching 95 % confidence level is reached;
- p_i : Power of the devices of the group of "i" for project devices. Measurement will consist of recording the power of the HP as indicated in the nameplate of the device. This parameter will not be measured based on sampling, but all nameplate will be recorded;
- p_i : Power of the devices of the group of "i" for baseline devices. Measurement will consist of recording the power of the baseline equipment (electric geyser) being replaced by heat pumps, as indicated in the nameplate of the equipment. This parameter will not be measured based on sampling, but all nameplate will be recorded;
- o_i : Average annual operating hours of the devices of the group of "i" project. This will be calculated based on the metered energy consumption and the power of the device;
- EC_{pj} : annual energy usage by the back-up element. This will be measured continuously through an electricity meter for a sample of installations. The sample size has been determined in the same way as for the energy consumption of the heat pumps. The sample size has been calculated based on 3 reference values for operating time of water heaters gathered from literature and the expected maximum capacity of a heat pump, in order to calculate a possible variation in the energy consumption, and calculate the mean. Standard deviation has been calculated following the "rule of thumb" approach, and the maximum number of units considered is 100 000. Based on the calculations performed, the sample size has been determined to be 35 units. The calculation of the sample size, including all assumptions can be found in Annex 1 of the monitoring plan /19/. However, it should be noted that sample size of 35 is only an estimate and the real samples size will be adjusted



- to reach 95% confidence level required, once the initial monitoring results will provide more accurate values for standard deviation. In fact, the project participant intends to install monitoring equipment on the first installation, and thereafter to every SWH that is equipped with flow meter until a sample size reaching 95 % confidence level is reached.;
- $TDL_{j,y}/I_y$: 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. For the purpose of estimating emission reductions, a value of 8.45% was used based on Eskom's annual report from 2010 /73/. This will be monitored annually based on literature;
 - $Q_{ref, PJ}$: Average annual quantity of refrigerant used in the project to replace the refrigerant that has leaked, t/year. In case any of the HPs apply a refrigerant with a GHG potential, and this refrigerant is replaced due to leakage, the amount of refrigerant replaced shall be recorded. The extent of a leakage (amount of refrigerant discharge/recharge) is measured through pressure measurement. This parameter will not be measured based on sampling, but all leaks/discharge/recharges will be recorded;
 - $Q_{ref, BL}$: Average annual quantity of refrigerant used in the baseline to replace the refrigerant that has leaked, t/year. This parameter will not be measured as the baseline technology (electric geyser) does not make use of any refrigerant;
 - $GWP_{ref, PJ}$: Global warming potential of the refrigerant that is used in the project equipment. This parameter will be monitored based on literature (1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual, and following revisions).

4.16.2 Management system and quality assurance

Low E Co is the coordinating/managing entity that will ensure that all participating suppliers and HP/SWH systems meet the specified standards of the programme thereby ensuring that the quality of both the systems and the installations is not compromised.

The coordinating entity will contract a specialized data management company, which will establish and maintain a database for the PoA that contains sufficient data, specific to each CPA and each installation, to allow the DOE to calculate the emission reductions for each individual CPA.

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APPENDIX A

POA AND GENERIC CPA VALIDATION PROTOCOL

Table 1 Mandatory requirements for CDM programme of activities (PoA)

Requirement	Reference	Conclusion
About Parties		
1. The programme shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	OK
2. The programme shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The programme shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	OK
4. The programme shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK
5. In case public funding from Parties included in Annex I is used for the programme, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	OK
About Design of Programme		
10. The CDM-POA-DD sets a framework for the implementation of the PoA and defines unambiguously a CPA under the PoA.	PoA Procedures § 6	OK
11. The coordinating/managing entity shall be identified.	PoA Procedures § 6 (a)	OK

Requirement	Reference	Conclusion
12. The boundary for the PoA in terms of a geographical area (e.g., municipality, region within a country, country or several countries) within which all CPAs included in the PoA will be implemented is defined.	PoA Procedures § 6 (b)	OK
13. Eligibility criteria are defined for inclusion of a project activity as a CPA under the PoA, which shall include criteria for demonstration of additionality, and the type and/or extent of information (e.g. criteria, indicators, variables, parameters or measurements) that shall be provided by each CPA in order to ensure its eligibility.	PoA Procedures § 6 (g)	OK
14. The length of the PoA is not exceeding 28 years.	PoA Procedures § 6 (h)	OK
15. The operational and management arrangements established by the coordinating/managing entity for the implementation of the PoA is described, including a description of a record keeping system for each CPA under the PoA, a system/procedure to avoid double accounting e.g. to avoid the case of including a new CPA that has been already registered either as CDM project activity or as a CPA of another PoA, the provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA.	PoA Procedures § 6 (i)	OK
16. The proposed statistically sound sampling method/procedure to be used by DOEs for verification of the amount of emission reductions achieved by CPAs under the PoA is described. In case the coordinating/managing entity opts for a verification method that does not use sampling but verifies each CPA there is a transparent system defined and described that ensures that no double accounting occurs and that the status of verification can be determined anytime for each CPA.	PoA Procedures § 6 (k)	OK
About additionality		
17. Additionality of the programme as a whole is demonstrated because in the absence of the CDM (i) the proposed voluntary measure would not be implemented, or (ii) the mandatory policy/regulation would be systematically not enforced and that non-compliance with those requirements is widespread in the country/region, or (iii) that the PoA will lead to a greater level of enforcement of the existing mandatory policy /regulation.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43 PoA Procedures § 6 (e)	OK
18. It is demonstrated for the PoA and generic CPA that in the absence of CDM, none of the implemented CPAs would occur	PoA Standard § 7	OK

Requirement	Reference	Conclusion
19. Additionality of a typical CPA is demonstrated through eligibility criteria for inclusion in the PoA.	PoA Procedures § 7 (g)	OK
About application of baseline and monitoring methodology		
20. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
21. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	OK
22. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK
23. The monitoring plan for a typical CPA is developed in accordance with the approved monitoring methodology, and identification of the monitoring provisions and data parameters a CPA has is to apply/monitor	PoA Procedures § 6 (j)	OK
24. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	OK
About forecast emission reductions		
25. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK
About environmental impacts		
26. Documentation on the analysis of the environmental impacts of the programme activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the programme participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	<input checked="" type="checkbox"/> Analysis at PoA level <input type="checkbox"/> Analysis at CPA level
About stakeholder comments		
27. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	<input checked="" type="checkbox"/> Analysis at PoA level

Requirement	Reference	Conclusion
		<input type="checkbox"/> Analysis at CPA level
28. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK
Other		
29. The project design document shall be in conformance with the CDM-PoA-DD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK

Table 2 Requirements checklist

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
PART I. Programme of activities (PoA)						
A General description of project activity						
A.1	Title of the PoA (PS § 31, VVS § 62-63)					
A.1.1	Does section A.1 of the PoA-DD include a clearly identifiable project title, version number of the PoA-DD and date of the PoA-DD?	/1/	DR	<input checked="" type="checkbox"/> Clearly identifiable title of the project activity <input checked="" type="checkbox"/> Version number of the PoA-DD is included <input checked="" type="checkbox"/> Date of the PoA-DD is included.		OK
A.1.2	Is the PoA-DD is in accordance with the applicable requirements for completing PoA-DD?	/1/	DR	<input checked="" type="checkbox"/> Yes		OK
A.2	Description of the PoA (VVS § 64-69, (PS § 138, VVS § 189 and VVS § 150-157 for small-scale project activities, as applicable)					
A.2.1	How was the design of the PoA assessed?	/1/ /2/ /3/	DR CC	<i>What type is the project?</i> <input checked="" type="checkbox"/> Project in existing facility or utilizing existing equipment(s) <input type="checkbox"/> Project is either a large scale project or a small scale project with emission reductions exceeding 15 000 tCO ₂ e per year. In this case, a site visit must be performed. <input type="checkbox"/> Project is a bundled small scale project, with each project in the bundle with emission reductions not exceeding 15,000 tCO ₂ e per year. In such case the number of physical site visits may be based on sampling, if the sampling size is appropriately justified through statistical		OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				<p>analysis.</p> <p><input type="checkbox"/> The project is an individual small scale project activity with emission reductions not exceeding 15 000 tCO₂e per year. In this case, DOE may not conduct a physical site visit as appropriate.</p> <p><input checked="" type="checkbox"/> Greenfield project</p> <p><i>How was the design of the project assessed?</i></p> <p><input checked="" type="checkbox"/> Physical site inspection</p> <p><input checked="" type="checkbox"/> Reviewing available designs and feasibility studies</p>		
A.2.2	If a greenfield project, describe the physical implementation of the project when the validation was commenced.	/1/	DR	At the time the validation was commenced, no CPA had started implementation.		OK
A.2.3	If physical site visits were performed based on sampling (only applicable for bundled small scale projects, each with emission reductions not exceeding 15 000 tCO ₂ e per year), justify the sampling through a statistical analysis:	/1/	DR	Not applicable: this is not a bundled project.		OK
A.2.4	Does the PoA-DD and generic CPA-DD describe the framework for the implementation of the proposed CDM PoA and inclusion of CPAs under the PoA?	/1/ /2/ /3/	DR CC	The PoA-DD and generic CPA-DD describe the framework for the implementation of the proposed CDM PoA and inclusion of CPAs under the PoA.		OK
A.2.5	Does the PoA involve alteration of existing installations? If so, have the differences between pre-project and post-project activity been clearly described in the PoA-DD?	/1/	DR	The PoA involves alteration of existing installations, in that existing electric geysers are replaced by solar water heaters and heat pumps. The differences between pre-project and post-project activity been clearly described in the PoA-DD.		OK
A.2.6	Does the PoA design engineering reflect current good practices?	/1/	DR	The PoA design engineering reflect current good practices, in that the technology used will have to		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				comply with national standard (SABS/SANS tests).		
A.2.7	Would the technology result in a significantly better performance than any commonly used technologies in the host country? Is any transfer of technology from any Annex-I Party involved?	/1/	DR	The technology result in a significantly better performance in terms of environmental impact than the technology constituting the project baseline.		OK
A.2.8	Does the PoA qualify as a small scale CDM project activity as defined in paragraph 6(c) of decision 17/CP.7 on the modalities and procedures for the CDM?	/1/ /5/	DR	<p>The proposed programme is a combination of type I and type II activities, in that it involves both renewable energy and energy efficiency measures. For this reason, in order to qualify as SSC CDM project activities, each component needs not exceed 15 MW (or an appropriate equivalent) of energy generation, as well as reductions in energy consumption by up to the equivalent of 60 GWh hours per year. With regards to project size, the <i>General Guidelines to SSC methodologies</i> clarifies that for thermal applications of solar energy projects, the eligibility limit in terms of aperture area is 64 000 m² of the collector.</p> <p>Eligibility of CPAs as SSC project activities is addressed through eligibility criteria for inclusion under a PoA.</p> <p><u>See CAR2.</u></p>	CAR2	OK
A.2.9	Is the small scale project activity a debundled component of a larger project activity in accordance with the rules defined in appendix C of the simplified modalities and procedures for small-scale CDM project activities?	/1/	DR	Not applicable: the project activity is not a debundled component of a larger project.		OK
A.3 Programme Boundaries (VVS § 191-192) Programme Boundaries are the limits and borders						

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
<i>defining the GHG emission reduction project.</i>						
A.3.1	Are the programme's spatial boundaries (geographical) clearly defined?	/1/	DR	The boundary of the PoA is defined as the Republic of South Africa. This is clearly stated in the PoA-DD, and therefore satisfies the requirements of the <i>Procedures for registration of a programme of activities as a single CDM project activity and issuance of certified emission reductions for a programme of activities.</i>	OK	OK
A.3.2	Are the programme's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR	The technologies employed within the SSC PoA are clearly defined. These consist of heat pumps and solar water heaters, installed either separately or in combination in residential or commercial/industrial buildings.		OK
A.3.3	Do the programme boundaries take into consideration all applicable national and/or sectoral policies and regulations within the chosen boundary?	/1/	DR	The boundary of the PoA is defined as the Republic of South Africa, therefore national policies are considered.		OK
A.3.4	Can each CPA under the PoA be clearly identified individually including spatial boundaries (geographical) clearly defined?	/1/ /28/ /27/	DR	CAR1: <i>According to the methodology, "The project boundary is the physical, geographical location of each measure (each piece of equipment) installed". The CPA-DD indicates that: the physical boundary of CPA-001 is defined as the geographical area within which all the implemented, small-scale, Clean Development Mechanism programme activities (hereafter referred to as "SSC-CPAs") included in the CPA-001 will occur.</i> <i>The project boundary identified does not comply with the requirements of the methodology.</i>	CAR1	OK
A.4 Participation and authorization (VVS § 38-52) <i>Referring to Part A.3 and A.4, Appendix 1 and 2 of the</i>						

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
<i>PoA-DD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.</i>						
A.4.1	Do all participating Parties fulfil the participation requirements as follows:	/1/	DR			OK
				<div>South Africa (host) Lichtenstein Country Y</div> <div> a) Party has ratified the Kyoto Protocol <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No </div> <div> b) Party has designated a Designated National Authority <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No </div> <div> c) The assigned amount has been determined <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No </div>		
A.4.2	Do the letters of approval meet the following requirements?	/1/	DR	<p>CL2: <i>According to the Procedures for registration of a programme of activities as a single CDM project activity and issuance of certified emission reductions for a programme of activities:</i></p> <p><i>9. The coordinating/managing entity shall obtain letters of approval from each host Party and Annex I Party which wishes to be involved in the PoA. Letters of approval shall be issued in accordance with the guidance provided by the Board (EB 16 report, Annex 6).</i></p> <p><i>10. The coordinating/managing entity shall obtain letters of authorization of its coordination of the PoA from each host Party.</i></p> <p><i>Neither LoA nor letter of authorization has been submitted.</i></p>	CL2	OK

Checklist Question		Ref	MoV	Assessment by DNV				Draft Concl.	Final Concl.
		South Africa (host)		County X		Country Y		CL2	OK
a) LoA confirms that Party has ratified the Kyoto Protocol		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
b) LoA confirms that participation is voluntary		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
c) The LoA confirms that the project contributes to the sustainable development of the host country?		<input type="checkbox"/> Yes	<input type="checkbox"/> No	NA		NA			
d) The LoA refers to the precise project activity title		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
e) The LoA is unconditional with respect to (a) to (d) above		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
f) The LoA is issued by the respective Party’s DNA		<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
g) The LoA was received directly by the DNA or the PP		<input type="checkbox"/> DNA	<input type="checkbox"/> PP	<input type="checkbox"/> DNA	<input type="checkbox"/> PP	<input type="checkbox"/> DNA	<input type="checkbox"/> PP		
h) In case of doubt regarding the authenticity of the letter of approval, describe how it was verified that the letter of approval is authentic									
A.4.3	Have all private/public project participants been authorized by an involved Party?	/1/	OK	See CL2				CL2	OK
A.4.4	Has the coordinating/managing entity of the programme been identified?	/1/	OK	The coordinating/entity of the programme has been identified in International Carbon, which is also the Project Participant from the Lichtenstein.					OK
A.4.5	Has the coordinating/managing entity provided letters of authorization of its coordination of the PoA from each host Party?	/1/	OK	See CL2				CL2	OK
A.5 Modalities of communications (VVS § 53-61)									
A.5.1	How has the corporate identity of all project participants and focal points included in the MoC, as well as the personal identities, including specimen signatures and employment status, of their authorized signatories, been validated?	/1/ /19/ /19/	DR CC	<input checked="" type="checkbox"/> Directly checking evidence for corporate, personal identity and other relevant documentation; <input type="checkbox"/> Notarized documentation; <input checked="" type="checkbox"/> Written confirmation from the project participant or the coordinating/managing entity that submits to it the MoC statement that all corporate and personal details,					OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				<p>including specimen signatures, are valid and accurate. If this case was selected, DNV has confirmed that:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> the MoC statement was received from a project participant with whom DNV has a contractual relationship. <input type="checkbox"/> the official who submits the MoC statement to the DOE and the official who signed the written confirmation (if a different person) is/are duly authorized to do so on behalf of the respective project participant 		
A.5.2	Has the MoC statement been correctly completed and duly authorized? Check that all three requirements listed in the next column are complied with.	/1/ /19/ /19/	DR CC	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> The latest version of the form F-CDM-MOC has been used; <input checked="" type="checkbox"/> The information required as per the F-CDM-MOC, including its annex 1, is correctly completed; <input checked="" type="checkbox"/> The project participant is authorized signatories signing the F-CDM-MOC correspond to the project participant is authorized signatories included in F-CDM-MOC, annex 1. 		OK
A.6	Public funding of the project activity (CDM Modalities and Procedures Appendix B § 2)					
A.6.1	In case public funding from Parties included in Annex I is used for the project activity, have these Parties provided an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is	/1/	DR	Conditions are in place to provide an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance:		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
not counted towards the financial obligations of these Parties?				Funding for the CPA may not come from Official Development Aid from Annex I Countries.		
A.7 Verification of CPAs (PoA procedure § 6 k)						
A.7.1	If case the coordinating /managing entity does not wish to have all CPAs verified, is there a 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?	/1/	DR	The PoA-DD indicates that the verification of each CPA will be done by an appointed DOE.		OK
B Demonstration of additionality and development of eligibility criteria						
B.1 Additionality of the Programme of Activities (VVS § 195) <i>Assessment of the additionality of the PoA as a whole in accordance with the PoA standard</i>						
B.1.1	Has it been demonstrated that the programme is a voluntary coordinated action that would not be implemented in the absence of CDM?	/1/ /81/ /82/ /83/ /84/	DR I	The programme is a voluntary coordinated action in that there are currently no laws in South Africa mandating the deployment of the technology used by the programme. This was confirmed by representatives of the Host Country DNA.		OK
B.1.2	If the programme is implementing a mandatory policy/regulation, has it been demonstrated whether the policy/regulation is being enforced? If it is enforced, has it been demonstrated that the programme will lead to a higher level of enforcement?	/1/ /81/ /82/ /83/ /84/	DR I	The programme is a voluntary coordinated action in that there are currently no laws in South Africa mandating the deployment of the technology used by the programme. This was confirmed by representatives of the Host Country DNA.		OK
B.2 Additionality determination of each generic CPA						

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
(VVS § 101-129 and VVS § 158-161 for small-scale project activities, as applicable)						
B.2.1	What approach/tool does the PoA use to demonstrate additionality of each generic CPA? Is this in line with the methodology? In case of small-scale CDM project activities, is Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities applied considering also the “Non-binding best practice examples to demonstrate additionality for SSC project activities”.	/1/ /2/ /34/	DR CC	<p>The additionality of CPAs is demonstrated through additionality criteria, in accordance with the <i>Standard for the demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities</i>.</p> <p>Both methodologies require the application of <i>Standard for the demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities</i> to Appendix B to demonstrate additionality.</p> <p>The PoA-DD clearly indicates that CPA will demonstrate additionality through <i>Standard for the demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities</i>.</p>		OK
B.2.2	Have the regulatory requirements correctly been taken into account to evaluate the project activity and the alternatives?	/1/	DR	Regulatory requirements correctly been taken into account in demonstrating the additionality of a typical CPA.		OK
B.2.3	Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	Third party evidence is provided in support to the additionality of the PoA.		OK
B.2.4	What is the additionality of each generic CPA mainly based on (Investment analysis or barrier analysis)?	/1/	DR	The additionality of the generic CPA is demonstrated based on barrier analysis.		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
Investment analysis (VVS § 117-123) <i>The list of questions below must be adjusted to the parameters in the investment analysis relevant to the project under validation. <u>All</u> input parameters need to be assessed.</i>						
B.2.5	Does each generic CPA or any of the remaining alternatives generate revenues apart from CDM? Is this reflected in the PoA-DD?	/1/	DR	Not applicable: no investment analysis has been performed.		OK
B.2.6	Do any of the alternatives to each generic CPA involve investment? Is this reflected in the PoA-DD?	/1/	DR	Not applicable: no investment analysis has been performed.		OK
B.2.7	Is the choice of benchmark analysis, investment comparison or simple cost analysis correct?	/1/	DR	Not applicable: no investment analysis has been performed.		OK
B.2.8	Is the benchmark/discount rate the latest available at the time of decision?	/1/	DR	Not applicable: no investment analysis has been performed.		OK
B.2.9	What is the financial indicator? Is it on equity/project basis? Before/after tax? Is the financial indicator in correspondence with the benchmark?	/1/	DR	Not applicable: no investment analysis has been performed.		OK
B.2.10	Are the underlying assumptions appropriate, e.g. what is considered as waste in the baseline is considered to have zero value?	/1/	DR	Not applicable: no investment analysis has been performed.		OK
B.2.11	Does the income tax calculation take depreciation into account? Is the depreciation year in accordance with normal accounting practice in the host country?	/1/	DR	Not applicable: no investment analysis has been performed.		OK
B.2.12	Is the time period of the investment analysis and operating time of each generic CPA realistic? Has salvage value been taken into account? Is working capital returned in the last year of operation?	/1/	DR	Not applicable: no investment analysis has been performed.		OK
B.2.13	When a feasibility study report or similar approved by the government is used as the basis for the investment analysis: Can it be confirmed that the values used in the PoA-DD are fully consistent with the FSR and is the period of time	/1/	DR	Not applicable: no investment analysis has been performed.		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	between finalization of the FSR and the investment decision adequate?					
B.2.14	How was the amount of output (e.g. sales of electricity) assessed?	/1/	DR	<input type="checkbox"/> The plant load factor provided to banks and/or equity financiers while applying the project activity for project financing, or to the government while applying the project activity for implementation approval <input type="checkbox"/> The plant load factor determined by a third party contracted by the project participants (e.g. an engineering company) <input type="checkbox"/> Other approach. <i>Provide details on how the load factor was validated::</i> Not applicable: no investment analysis has been performed.		OK
B.2.15	How was the output price (e.g. electricity price) assessed?	/1/	DR	<input type="checkbox"/> Cross-check against third-party or publicly available sources (e.g. invoices or price indices) <input type="checkbox"/> Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants <i>Provide details on how the output price was validated:</i> Not applicable: no investment analysis has been performed.		OK
B.2.16	How were the investment costs assessed? Were the data available and valid at the time of decision?	/1/	DR	<input type="checkbox"/> Cross-check against third-party or publicly available sources (e.g. invoices or price indices) <input type="checkbox"/> Review of feasibility reports, public announcements, contracts and annual financial reports related to the project and the project participants <i>Provide details on how the investment costs were validated:</i>		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				Not applicable: no investment analysis has been performed.		
B.2.17	How were the O&M costs assessed? Were the data available and valid at the time of decision?	/1/	DR	<input type="checkbox"/> Cross-check against third-party or publicly available sources (e.g. invoices or price indices) <input type="checkbox"/> Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants <i>Provide details on how the O&M costs were validated:</i> Not applicable: no investment analysis has been performed.		OK
B.2.18	Describe the assessment of the other input parameters. Were the data available and valid at the time of decision?	/1/	DR	<input type="checkbox"/> Cross-check against third-party or publicly available sources (e.g. invoices or price indices) <input type="checkbox"/> Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants <i>Provide details on how other input parameters were validated:</i> Not applicable: no investment analysis has been performed.		OK
B.2.19	Was the financial calculation spreadsheet verified and found to be correct?	/1/	DR	Not applicable: no investment analysis has been performed.		OK
B.2.20	Sensitivity analysis: Have the key parameters contributing to more than 20% of the revenue/costs during operating or implementation been identified? Has possible correlation between the parameters been considered?	/1/	DR	Not applicable: no investment analysis has been performed.		OK
B.2.21	Sensitivity analysis: Is the range of variations is reasonable in the project context?	/1/	DR	Not applicable: no investment analysis has been performed.		OK
B.2.22	Have the key parameters been varied to reach the benchmark and the likelihood of this to happen been justified to be small?	/1/	DR	Not applicable: no investment analysis has been performed.		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
Barrier analysis (VVS § 124-127)						
B.2.23	Are the barriers identified complimentary to a potential investment analysis? Does the barrier have a clear impact on the financial returns so that it can be assessed in an investment analysis? Each barrier is discussed separately.	/1/ /34/	DR	The barriers identified are in accordance with Attachment A to Appendix B.		OK
B.2.24	How were the <u>investment barriers</u> assessed to be real? Are the investment barriers substantiated by a source independent of the project participants?	/1/	DR	Not applicable: no investment barrier has been claimed.		OK
B.2.25	How does CDM alleviate the investment barriers?	/1/	DR	Not applicable: no investment barrier has been claimed.		OK
B.2.26	Is each generic CPA prevented by the investment barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	Not applicable: no investment barrier has been claimed.		OK
B.2.27	How were the <u>technological barriers</u> assessed to be real? Are the technological barriers substantiated by a source independent of the project participants?	/1/	DR	Not applicable: no technological barrier has been claimed.		OK
B.2.28	How does CDM alleviate the technological barriers?	/1/	DR	Not applicable: no technological barrier has been claimed.		OK
B.2.29	Is each generic CPA prevented by the technological barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	Not applicable: no technological barrier has been claimed.		OK
B.2.30	How were the <u>barriers due to prevailing practise</u> assessed to be real? Are the barriers due to prevailing practise substantiated by a source independent of the project participants?	/1/	DR	Not applicable: no barriers due to prevailing practice have been claimed.		OK
B.2.31	How does CDM alleviate the barriers due to prevailing practise?	/1/	DR	Not applicable: no barriers due to prevailing practice have been claimed.		OK
B.2.32	Is each generic CPA prevented by the barriers due to prevailing practise and at least one of the possible alternatives to the project activity is feasible under the same	/1/	DR	Not applicable: no barriers due to prevailing practice have been claimed.		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
<p>circumstances?</p> <p>B.2.33 How were the <u>other barriers</u> assessed to be real? Are the other barriers substantiated by a source independent of the project participants?</p>	<p>/1/ /34/ /76/ /80/</p>	<p>DR</p>	<p>The additionality of a typical CPA is demonstrated against two of the barriers foreseen by the <i>Standard for the demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities</i>:</p> <p>Other barriers: Financial resources Other barriers: Limited information.</p> <p>Both barriers were confirmed by representatives of the Industrial Development Corporation and by Eskom.</p> <p>Moreover, CPAs have the option of demonstrating their automatic additionality if they are eligible to be considered microscale activities in accordance with the <i>Guidelines for demonstrating additionality of microscale project activities</i>.</p> <p><u>See CAR3.</u></p>	<p>CAR3</p>	<p>OK</p>
<p>B.2.34 How does CDM alleviate the other barriers?</p>	<p>/1/ /34/</p>	<p>DR</p>	<p>Revenues from the sale of CERs will alleviate these barriers by allowing the CME to perform a number of crucial tasks which are currently not well performed by the existing SWH industry:</p> <ul style="list-style-type: none"> - Selection of reliable products; 		<p>OK</p>

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				<ul style="list-style-type: none"> - Marketing, supply, installation and maintenance of the HP and SWH systems; - Organize and provide the funding for the installation of the HPs and SWHs on behalf of the households/ supplier; - Delivery of educational awareness campaigns in order to intensify the demand for HP and SWH products 		
B.2.35	Is each generic CPA prevented by the other barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/ /34/	DR	No alternatives have been identified, as this is not required by attachment A to appendix B.		OK
Common practice analysis (VVS § 128-130)						
B.2.36	What is the geographical scope of the common practice analysis? Is this justified?	/1/ /34/	DR	No common practice analysis has been performed, since this is not required by attachment A to Appendix B.		OK
B.2.37	What is the scope of technology and size (e.g. capacity of power plant) for the common practice analysis and how has this been justified?	/1/	DR	No common practice analysis has been performed, since this is not required by attachment A to Appendix B.		OK
B.2.38	What is the data source(s) used for the common practice analysis?	/1/	DR	No common practice analysis has been performed, since this is not required by attachment A to Appendix B.		OK
B.2.39	How many similar non-CDM-projects exist in the region within the scope?	/1/	DR	No common practice analysis has been performed, since this is not required by attachment A to Appendix B.		OK
B.2.40	How were possible essential distinctions between the project activity and similar activities assessed?	/1/	DR	No common practice analysis has been performed, since this is not required by attachment A to Appendix B.		OK
B.2.41	What is the conclusion of the common practice analysis?	/1/	DR	No common practice analysis has been performed, since this is not required by attachment A to Appendix B.		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
Conclusion					
B.2.42 What is the conclusion with regard to the additionality of the project activity?	/1/	DR	A conclusion on additionality will be reached once relevant CAR/CL haven been closed.		OK
B.3 Eligibility Criteria (VVS § 196) <i>Eligibility criteria to assess eligibility of CPAs to be included to PoA.</i>					
B.3.1 Are the geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA?	/1/	DR	<p>The geographical boundary of the CPAs have been addressed in the eligibility criteria through the following criterion:</p> <p>Installation shall take place in residential, commercial and industrial buildings within the geographical boundaries of South Africa.</p> <p>Such criterion will ensure the geographical boundaries of the PoA are not exceeded.</p>		OK
B.3.2 Are there conditions that avoid double counting of emission reductions like unique identifications of product and end-user locations (e.g. programme logo)?	/1/	DR	<p>Conditions that avoid double counting of emission are included as follows:</p> <p>Each CPA shall be uniquely identified and defined by way of the unique identifying numbers (serial numbers) attached to each SWH and HP, to ensure that all CPAs under its PoA are neither registered as an individual CDM project activity nor included in another registered PoA.</p> <p>All participants joining the programme shall have a proof of identity, or corporate registration certificate.</p> <p>Each SSC-CPA must be approved by the coordinating entity and Designated Operational Entity (hereafter referred to as “DOE”) prior to its incorporation into the PoA.</p>	CL	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				<p>Moreover, double-counting of emission reductions due to multiple claims are avoided through the following criterion:</p> <p>All participants joining the programme shall cede the rights to the subsidy and carbon to the coordinating entity.</p> <p><i>CL1:</i> <i>The Project Participant is requested to submit evidence of how carbon rights will be transferred to the CME from each entity involved in the project.</i></p>		
B.3.3	Are there specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications?	/1/	DR	<p>Specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications have been set for CPAs through the following criterion:</p> <p>All the HPs and SWHs under the SSC-CPA shall comply with all relevant SABS/SANS Standard Specification for HP or SWH systems.</p>		OK
B.3.4	Are there conditions to check the start date of the CPA through documentary evidence?	/1/	DR	<p>CAR2: <i>Not all minimum eligibility criteria listed in the Standard for the demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities are included in the proposed PoA's eligibility criteria for inclusion of CPAs.</i></p>	CAR2	OK
B.3.5	Are there conditions that ensure compliance with	/1/	DR	Criteria that ensure compliance with methodologies are included in the list of		OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
applicability and other requirements of single or multiple methodology/ies applied by CPAs?			<p>eligibility criteria as follows:</p> <p>The SWHs to be included in the CPA shall meet the applicability requirements of the CDM methodology AMS.I.C. Thermal energy production with or without electricity, version 19; The HPs to be included in the CPA shall meet the applicability requirements of the CDM methodology AMS.II.C. Demand-side energy efficiency activities for specific technologies, version 13.</p>		
B.3.6 Are there conditions that ensure that CPAs meet the requirements pertaining to the demonstration of additionality, and are these in accordance with the requirements of the PoA Standard?	/1/	DR	<p>One eligibility criterion refers to the demonstration of additionality:</p> <p>The CPAs to be included in this PoA shall meet SSC additionality, leakage and debundling rules, relevant to PoAs.</p> <p>CAR3: <i>According to the Standard for the demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities:</i> <i>PoAs that consist of one or more microscale projects as CPAs shall include eligibility criteria derived from all the relevant requirements of the Guidelines for demonstrating additionality of microscale project activities.</i></p> <p><i>PoAs that consist of one or more small-scale projects as CPAs shall include eligibility criteria derived from all the relevant requirements of</i></p>	CAR3	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				<i>attachment A of Appendix B of the Simplified modalities and procedures for small-scale CDM project activities.</i>		
B.3.7	Are there PoA-specific requirements stipulated by the CMEs including any conditions related to undertaking local stakeholder consultations and environmental impact analysis?	/1/	DR	<u>See CAR2.</u>	CAR2	OK
B.3.8	Where applicable, are the target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/off-grid) and distribution mechanisms (e.g. direct installation) specified?	/1/	DR	Target groups have been identified as follows: Installation shall take place in residential, commercial and industrial buildings within the geographical boundaries of South Africa. All participants joining the programme shall have electricity and water connection, as well as existing electric geyser.		OK
B.3.9	Where applicable, are there conditions related to sampling requirements for a PoA in accordance with the approved guidelines/standard from the Board pertaining to sampling and surveys?	/1/	DR	<u>See CAR2.</u>	CAR2	OK
B.3.10	Where applicable, are there conditions that ensure that CPA in aggregate meets the small-scale or micro-scale threshold criteria and remain within those thresholds throughout the crediting period of the CPA?	/1/	DR	<u>See CAR2.</u>	CAR2	OK
B.3.11	Where applicable, are there requirements for the debundling check, in case CPAs belong to small-scale (SSC) or microscale project categories?	/1/ /5/	DR CC	Requirements for a debundling check have been included as follows: The CPAs to be included in this PoA shall meet SSC additionality, leakage and debundling rules, relevant to PoAs. Each system included under the programme shall fulfil the relevant debundling rules i.e. annual savings \leq 600 MWh and/or absorber area \leq 640		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				m ² .		
B.3.12	Are there conditions to provide an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance?	/1/	DR	Conditions are in place to provide an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance: Funding for the CPA may not come from Official Development Aid from Annex I Countries.		OK
B.3.13	Are all eligibility criteria verifiable, and sufficiently objective and comprehensive to permit the assessment of the inclusion of CPAs in the PoA?	/1/	DR	See CAR2	CAR2	
B.4 Application of methodologies by the PoA (VVS §190)						
B.4.1	Does the PoA apply approved methodologies and the correct and valid version thereof? If during the course of validation the originally applied version of the methodology expires, a CAR shall be raised in Table 3 of the validation protocol. Any new requirements of the revised version of the methodology not yet validated in Table 2 of the validation protocol shall be validated in Table 3 as part of the assessment of the CAR raised.	/1/ /28/ /27/	DR CC	without electricity, Version 19 is used. For the energy efficiency component (HPs) AMS-II.C.: Demand-side energy efficiency activities for specific technologies, Version 13 is used. In both cases, the version applied is the most recent valid version published on the UNFCCC website /42/.		OK
B.4.2	If the programme applies multiple methodologies, is their application in accordance with the PoA Standard?	/1/ /28/ /27/	DR CC	the application of multiple methodologies by the proposed programme is in accordance with the both the requirements of the <i>Standard for the demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities</i> , and the requirements of the General guidelines to SSC CDM methodologies. In fact, the SSC Guidelines indicate that any combination		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			of SSC methodologies that has been applied in a registered project may also be applied in the context of PoAs without the preapproval of combinations as long as the project proponent is able to demonstrate that there are no interactive or cross effects between the measures applied in respective component methodologies; or that if there are such cross effects they are conservatively accounted for in the calculation of CERs. The combination of methodologies applied by the proposed programme has have been previously applied in a registered project activity, i.e. project No 0079.		
B.4.3 If the PoA applies small-scale methodologies, does the PoA also comply with the general guidelines to SSC CDM methodologies, which provides guidelines on equipment capacity, equipment performance/lifetime, baseline identification for type-II/III Greenfield project activities, sampling and other monitoring-related issues?	/1/ /28/ /27/	DR CC	The PoA also comply with the general guidelines to SSC CDM methodologies		OK
B.5 Management system of the PoA (VVS § 186) <i>Assessment of the PoA management systems in accordance with the PoA standard</i>					
B.5.1 Is there a clear definition of roles and responsibilities of personnel involved in the process of inclusion of CPAs, including a review of their competencies?	/1/ /26/ /74/ /75/ /76/	DR CC I	International Carbon is the coordinating Entity that will ensure that all participating suppliers and HP/SWH systems meet the specified standards of the programme, thereby ensuring that the quality of both the systems and the installations is not compromised. A special purpose vehicle, Low Eco, has been established to operate the programme. This was explained on site by representatives of		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				International Carbon and the Industrial Development Corporation.		
B.5.2	Are there records of arrangements for training and capacity development for personnel?	/1/	DR	At the time of the site visit, formal procedures for training of monitoring personnel had not yet been identified.		OK
B.5.3	Are there procedures for technical review of inclusion of CPAs?	/1/ /26/	DR CC	At the time of the site visit, formal procedures for review of reported results had not yet been identified.		OK
B.5.4	Is there a procedure to avoid double counting (e.g. to avoid the case of including a new CPA that has already been registered either as a CDM project activity or as a CPA of another PoA)?	/1/ /26/	DR CC	<p>Conditions that avoid double counting of emission are included as follows:</p> <p>Each CPA shall be uniquely identified and defined by way of the unique identifying numbers (serial numbers) attached to each SWH and HP, to ensure that all CPAs under its PoA are neither registered as an individual CDM project activity nor included in another registered PoA. All participants joining the programme shall have a proof of identity, or corporate registration certificate.</p> <p>Each SSC-CPA must be approved by the coordinating entity and Designated Operational Entity (hereafter referred to as “DOE”) prior to its incorporation into the PoA.</p> <p>Moreover, double-counting of emission reductions due to multiple claims are avoided through the following criterion:</p> <p>All participants joining the programme shall cede the rights to the subsidy and carbon to the coordinating entity.</p>	CL1	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				<i>CLI:</i> <i>The Project Participant is requested to submit evidence of how carbon rights will be transferred to the CME from each entity involved in the project.</i>		
B.5.5	Is there a records and documentation control process for each CPA under the PoA?	/1/ /26/	DR CC	At the time of the site visit, formal procedures for review of reported results had not yet been identified.		OK
B.5.6	Are there measures for continuous improvements of the PoA management system?	/1/ /26/	DR CC	Development of the management structure is listed under the responsibilities of the CME.		OK
B.5.7	Do the operational and management arrangements established by the coordinating entity include provisions to ensure that CPA implementers are aware and have agreed that their activity is being subscribed to the PoA?	/1/ /26/	DR CC	To ensure that CPA implementers are aware and have agreed that their activity is being subscribed to the PoA, an eligibility criteria for CPAs has been developed specifically to address this: <i>Each SSC-CPA must be approved by the coordinating entity and Designated Operational Entity (hereafter referred to as "DOE") prior to its incorporation into the PoA.</i>		OK
C Duration of the PoA, Crediting Period (VVS § 197)						
C.1.1	Is the PoA starting date and length of the PoA clearly defined and evidenced?	/1/ /26/	DR CC	The programme starting date has been set on 26 January 2012, the expected date of signature of the contract between International Carbon and DNV. The length of the PoA has been set at 28 years, in accordance with the requirement of the <i>Procedures for registration of a programme of activities as a single CDM project activity and issuance of certified emission reductions for a programme of activities.</i>		OK
C.1.2	D.2. Does the PoA design documentation confirm that the length of the PoA does not exceed 28 years (60 years for	/1/ /26/	DR CC	The PoA-DD explicitly indicates that the length of the PoA is 28 years.		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A/R)?						
D Environmental Impacts (VVS § 134-137, VVS § 199-200)				<input checked="" type="checkbox"/> Analysis at PoA level <input type="checkbox"/> Analysis at CPA level This section must only be completed if the analysis of environmental impacts is at PoA level.		
D.1.1	Are there any host country requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved? Does the approval contain any conditions that need monitoring? For small-scale project activities, is an assessment of the environmental impacts of the proposed CDM project activity is required by the host Party?	/1/ /76/	DR I	<p>According to the PoA-DD there are no significant anticipated negative impacts on the environment and/or on people through this programme. The project reduces the consumption of non-renewable natural resources, such as fossil fuels, and further reduces the GHG emission as well as airborne particulates (ash) and pollutant gases which cause air quality problems. The installations will take place in existing infrastructures i.e. residential and commercial buildings. The heat pumps installed under this programme will apply non ozone depleting refrigerants.</p> <p>Hence, the environmental effects gained from the project implementation are of a positive nature.</p> <p>In support to the claim that the programme has no negative environmental impacts, IDC confirmed that a preliminary assessment of the project was undertaken before IDCs' formal involvement in the initiative. The preliminary assessment concluded that the programme has no negative environmental impacts.</p> <p><i>CL3:</i> <i>The PP is requested to submit evidence that the</i></p>	CL3	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				<i>proposed programme is not expected to have negative environmental impacts.</i>		
D.1.2	Does the PoA comply with environmental legislation in the host country?	/1/ /42/ /81/ /82/ /83/ /84/	DR I CC	<p>Environmental Impact Assessments in South Africa are regulated through the National Environmental Management Act (NEMA) /42/.</p> <p>The NEMA identifies the activities that require basic assessment, scoping, or full EIA. Such activities are listed in three listing notices published as integrations to the NEMA. DNV checked the activities included in the three listing notice and can confirm that the proposed programme of activity is not included.</p> <p>Therefore, the proposed programme does not require an environmental impact assessment according to the environmental regulation of the host Party.</p> <p>This was also confirmed by representatives of the Host Country DNA /81//82//83//84/.</p>		OK
D.1.3	Will the PoA create any adverse environmental effects?	/1/ /76/ /81/ /82/ /83/ /84/	DR I	<p>In support to the claim that the programme has no negative environmental impacts, IDC confirmed that a preliminary assessment of the project was undertaken before IDCs' formal involvement in the initiative. The preliminary assessment concluded that the programme has no negative environmental impacts.</p> <p>This was also confirmed by representatives of the Host Country DNA /81//82//83//84/.</p>		OK
D.1.4	Have identified environmental impacts been addressed in the PoA design?	/1/	DR	No negative environmental impacts have been identified.		OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
D.1.5	Has an analysis of the environmental impacts of the PoA and each generic CPA been sufficiently described?	/1/	DR	No negative environmental impacts have been identified.		OK
D.1.6	Are transboundary environmental impacts considered in the analysis?	/1/ /81/ /82/ /83/ /84/	DR I	The programme complies with environmental legislation in the host country in that the type of activities it involves are not listed among those requiring an environmental impact assessment according to the NEMA. This was also confirmed by representatives of the Host Country DNA /81//82//83//84/.		OK
E Local stakeholder consultation (VVS § 138-140, VVS § 201-202)				<input checked="" type="checkbox"/> Consultation at PoA level <input type="checkbox"/> Consultation at CPA level This section must only be completed if the analysis of environmental impacts is at PoA level.		
E.1.1	Have relevant stakeholders been consulted?	/1/ /6/ /7/ /8/ /9/ /10/ /11/ /12/	DR I CC	As described in the PoA-DD, the key stakeholders where identified to be the municipal managers, the Designated National Authority, the Department of Energy, Eskom, funders and some corporate, as well as HP/SWH suppliers. The public participation meeting was held on October 24 in Sandton, Gauteng. Two meetings took place at 2 pm and 5 pm. In these meeting the implementation framework, the Clean Development Mechanism, technical details and corporate rollout was presented. Comments were invited until the May 24, 2010. As evidence, the Project Participant submitted an scanned copy of the invitation published on the Sunday Times newspaper /9/, a copy of the personal invitation sent to stakeholders /11/, the stakeholder invitation list /12/, participants'		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				attendance records /7/, photographs of the meeting taking place /8/, comments received by email /6/, and a log of queries received by phone /10/.		
E.1.2	Have appropriate media been used to invite comments by local stakeholders?	/1/ /9/ /11/ /12/	DR I CC	Comments from local stakeholders where invited via a national newspaper /9/ and through personal invites /11/, which where send to the key stakeholders. The newspaper advert was placed on October 9 in Sunday Times inviting people to a public participation meeting, and to submit comments and queries via phone, email and mail. Altogether 74 personal invites where send out /12/.		OK
E.1.3	If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/ /42/	DR CC	Stakeholder consultation regulation in South Africa is linked to that on environmental impact assessments /42/. Since an EIA was not required for this type of activities, no regulation in the host country applies to the proposed programme.		OK
E.1.4	Is a summary of the stakeholder comments received provided?	/1/	DR	A summary of stakeholder comments received is included in the PoA-DD. They are summarised as follows: Details of the public participation meeting; How to participate in the programme as supplier; When will the programme start in other parts (than Gauteng) of South Africa. Implementing Structure; Financing Structure.		OK
E.1.5	Has due account been taken of any stakeholder comments received?	/1/	DR	The comments raised were answered in the course of the consultation meeting, and did not require changes to the programme design.		OK

PART II. Generic component project activity (CPA)					
A Description of each generic CPA (VVS § 189)					
A.1.1	Does the description of each generic CPA sufficiently cover all relevant elements, is accurate and does it provides the reader with a clear understanding of the nature of the proposed CPAs?	/1/ /2/	DR CC	The description of each generic CPA sufficiently cover all relevant elements, is accurate and does it provides the reader with a clear understanding of the nature of the proposed CPAs	OK
A.1.2	If applicable, are all different types of generic CPAs clearly described?	/1/ /2/	DR CC	Only one type of CPA is considered for this PoA.	OK
B Application of a baseline and monitoring methodology(ies)					
B.1 Title and reference of the approved baseline and monitoring methodology(ies) selected					
B.1.1	Are the exact reference and title of approved methodology(ies) and tools listed?	/1/ /2/	DR CC	Exact reference and title of approved methodology(ies) and tools are listed	OK
B.1.2	Are valid version of approved methodology(ies) and tools applied?	/1/ /2/	DR CC	Valid version of approved methodology(ies) and tools are applied	OK
B.2 Applicability of methodology (and tools) (VVS § 73-77)					
Insert a row for each applicability criteria of the applied methodology (and tools)					
AMS-I.C					
B.2.1	How was it validated that each specific CPA complies with the following applicability criteria: Biomass-based cogeneration systems are included in this category.	/1/ /2/ /28/ /27/	DR CC	Not applicable – the project does not make use of biomass-based cogeneration systems.	OK
B.2.2	How was it validated that each specific CPA complies with	/1/ /2/	DR	Not applicable – the project does not make use of biomass-based cogeneration systems.	OK

	the following applicability criteria: Emission reductions from a biomass cogeneration system can accrue from one of the following activities: (d) Electricity supply to a grid; (e) Electricity and/or thermal energy (steam or heat) production for on-site consumption or for consumption by other facilities; (f) Combination of (a) and (b).	/28/ /27/	CC		
	B.2.3 How was it validated that each specific CPA complies with the following applicability criteria: The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW thermal.	/1/ /2/ /28/ /27/	DR CC	<p>The project participant submitted calculations transparently showing the maximum number of devices that can be installed in order for the CPA to remain under the small (21 543) and micro (6 500) scale threshold for type I activities for the duration of the crediting period. Since the calculations are based on estimated parameters for which actual values will be available ex-post, distribution will be carefully monitored to make sure the thresholds are respected.</p> <p>Moreover, the calculations submitted show that the CPA will comply with the requirements of the general guidelines for SSC CDM methodologies /32/, in that each component (type I and type II activities) will meet the applicable threshold, and the sum of the size of components belonging to the same type will not exceed the limits for small-scale project activities.</p>	OK
B.2.4	How was it validated that each specific CPA complies with the following applicability criteria: For co-fired systems, the total installed thermal energy generation capacity of the project equipment, when using both fossil and renewable fuel, shall not exceed 45 MW thermal.	/1/ /2/ /28/ /27/	DR CC	The project participant submitted calculations transparently showing the maximum number of devices that can be installed in order for the CPA to remain under the small (21 543) and micro (6 500) scale threshold for type I activities for the duration of the crediting period. Since the calculations are based on estimated parameters for which actual values will be available ex-post, distribution will be carefully monitored to make	OK

			<p>sure the thresholds are respected.</p> <p>Moreover, the calculations submitted show that the CPA will comply with the requirements of the general guidelines for SSC CDM methodologies /32/, in that each component (type I and type II activities) will meet the applicable threshold, and the sum of the size of components belonging to the same type will not exceed the limits for small-scale project activities.</p>		
<p>B.2.5 How was it validated that each specific CPA complies with the following applicability criteria:</p> <p>The following capacity limits apply for biomass cogeneration units:</p> <p>d) If the project activity includes emission reductions from both the thermal and electrical energy components, the total installed energy generation capacity (thermal and electrical) of the project equipment shall not exceed 45 MW thermal. For the purpose of calculating this capacity limit the conversion factor of 1:3 shall be used for converting electrical energy to thermal energy (i.e. for renewable energy project activities, the maximal limit of 15 MW(e) is equivalent to 45 MW thermal output of the equipment or the plant);</p> <p>e) If the emission reductions of the cogeneration project activity are solely on account of thermal energy production (i.e. no emission reductions accrue from the electricity component), the total installed thermal energy production capacity of the project equipment of the cogeneration unit shall not exceed 45 MW thermal;</p> <p>If the emission reductions of the cogeneration project activity are solely on account of electrical energy production (i.e. no emission reductions accrue from the thermal energy component), the total installed electrical energy generation capacity of the project equipment of the cogeneration unit shall not exceed 15 MW.</p>	<p>/1/ /2/ /28/ /27/</p>	<p>DR CC</p>	<p>Not applicable – the project does not consist of biomass cogeneration units.</p>		<p>OK</p>
<p>B.2.6 How was it validated that each specific CPA complies with</p>	<p>/1/ /2/</p>	<p>DR</p>	<p>Not applicable: the project does not consist of the addition of renewable energy units at an existing</p>		<p>OK</p>

	the following applicability criteria: The capacity limits specified in the above paragraphs apply to both new facilities and retrofit projects. In the case of project activities that involve the addition of renewable energy units at an existing renewable energy facility, the total capacity of the units added by the project should comply with capacity limits in paragraphs 4 to 6, and should be physically distinct ⁵ from the existing units	/28/ /27/	CC	renewable energy facility.		
B.2.7	How was it validated that each specific CPA complies with the following applicability criteria: Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category.	/1/ /2/ /28/ /27/	DR CC	Not applicable: the project does not seek to retrofit or modify an existing facility for renewable energy generation.		OK
B.2.8	How was it validated that each specific CPA complies with the following applicability criteria: New Facilities (Greenfield projects) and project activities involving capacity additions compared to the baseline scenario are only eligible if they comply with the related and relevant requirements in the General Guidelines to SSC CDM methodologies	/1/ /2/ /28/ /27/	DR CC	The project is a greenfield project in that no renewable energy generation was present in the baseline scenario, and does not consist of a capacity addition as the back-up element is downsized. CPAs will have to demonstrate compliance with the related and relevant requirements in the General Guidelines to SSC CDM methodologies as part of the demonstration of eligibility under the PoA;		OK
B.2.9	How was it validated that each specific CPA complies with the following applicability criteria: If solid biomass fuel (e.g. briquette) is used, it shall be demonstrated that it has been produced using solely renewable biomass and all project or leakage emissions associated with its production shall be taken into account in the emissions reduction calculation	/1/ /2/ /28/ /27/	DR CC	Not applicable – no solid biomass fuel is used.		OK
B.2.10	How was it validated that each specific CPA complies with the following applicability criteria: Where the project participant is not the producer of the processed solid biomass fuel, the project participant and the producer are bound by a contract that shall enable the project participant to monitor the source of the renewable biomass to account for any emissions associated with solid biomass fuel production.	/1/ /2/ /28/ /27/	DR CC	Not applicable – no solid biomass fuel is used.		OK

	Such a contract shall also ensure that there is no double-counting of emission reductions.				
B.2.11	How was it validated that each specific CPA complies with the following applicability criteria: If electricity and/or steam/heat produced by the project activity is delivered to a third party i.e. another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into that ensures there is no double-counting of emission reductions.	/1/ /2/ /28/ /27/	DR CC	Not applicable – the heat produced is not delivered to a third party. In fact, the systems are sized to cover the thermal needs of the household/facility on which they are installed /5//4/.	OK
	B.2.12 How was it validated that each specific CPA complies with the following applicability criteria: If the project activity recovers and utilizes biogas for power/heat production and applies this methodology on a stand-alone basis i.e. without using a Type III component of a SSC methodology, any incremental emissions occurring due to the implementation of the project activity.	/1/ /2/ /28/ /27/	DR CC	Not applicable – the project activity does not recover and utilize biogas for power/heat production.	OK
AMS-II.C					
B.2.13	How was it validated that each specific CPA complies with the following applicability criteria: Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources provided: a) Charcoal is produced in kilns equipped with methane recovery and destruction facility; or b) If charcoal is produced in kilns not equipped with a methane recovery and destruction facility, methane emissions from the production of charcoal shall be considered. These emissions shall be calculated as per the procedures defined in the approved methodology AMS-III.K.7 Alternatively, conservative emission factor values from peer reviewed literature or from a registered CDM project activity can be used, provided that it can be	/1/ /2/ /28/ /27/	DR CC	Not applicable - the project activity does not consist of charcoal based biomass energy generation.	OK

	demonstrated that the parameters from these are comparable e.g. source of biomass, characteristics of biomass such as moisture, carbon content, type of kiln, operating conditions such as ambient temperature				
B.2.14	How was it validated that each specific CPA complies with the following applicability criteria: This methodology comprises activities that encourage the adoption of energy-efficient equipment/appliance (e.g., lamps, ballasts, refrigerators, motors, fans, air conditioners, pumping systems) at many sites. These technologies may replace existing equipment or be installed at new sites. In the case of new facilities, the determination of baseline scenario shall be as per the procedures described in the general guidance to SSC methodologies under the section 'Type II and III Greenfield projects (new facilities)'. The aggregate energy savings by a single project may not exceed the equivalent of 60 GWh per year for electrical end use energy efficiency technologies. For fossil fuel end use energy efficient technologies, the limit is 180 GWh thermal per year in fuel input	/1/ /2/ /28/ /27/	DR CC	<p>The proposed CPA meets this criterion in that it consists in the adoption of energy-efficient equipment/appliance (heat pumps) at many sites, to replace existing equipment (electric geysers). With regard to compliance with the eligibility criteria of the General Guidance to SSC methodologies, the project participant submitted calculations transparently showing the maximum number of devices that can be installed in order for the CPA to remain under the small (6 431) and micro (3 500) scale threshold for type II activities for the duration of the crediting period. Since the calculations are based on estimated parameters for which actual values will be available ex-post, distribution will be carefully monitored to make sure the thresholds are respected.</p> <p>Moreover, the calculations submitted show that the CPA will comply with the requirements of the general guidelines for SSC CDM methodologies /32/, in that each component (type I and type II activities) will meet the applicable threshold, and the sum of the size of components belonging to the same type will not exceed the limits for small-scale project activities.</p>	OK
B.2.15	How was it validated that each specific CPA complies with the following applicability criteria: For each replaced	/1/ /2/	DR CC	The project equipment will be regulated to achieve the same output level of service as the	OK

	appliance/equipment/system the rated capacity or output or level of service (e.g., light output, water output, room temperature and comfort, the rated output capacity of air-conditioners etc.) is not significantly smaller (maximum - 10%) than the baseline or significantly larger (maximum + 50%) than the baseline	/28/ /27/		baseline, in this case a water temperature between 55-60 °C. This is because the water temperature for domestic use is controlled by regulation to not exceed 65°C /74//77/, and Eskom's subsidy programme requires a minimum water temperature of 55°C /54/. The fact that a water temperature of between 55-65 °C constitute common practice in South Africa is also confirmed by publicly available information /51//53/.		
B.2.16	How was it validated that each specific CPA complies with the following applicability criteria: If the energy efficient equipment contains refrigerants, then the refrigerant used in the project case shall be CFC free. Project emissions from the baseline refrigerant and/or project refrigerants shall be considered in accordance with the guidance of the Board (EB 34, paragraph 17). This methodology credits emission reductions only due to the reduction in electricity consumption from use of more efficient equipment/appliances.	/1/ /2/ /28/ /27/	DR CC	The heat pumps used as part of the programme will make use of refrigerants not containing ozone layer depleting substances, since this is also an eligibility set by Eskom as part of their rebate programme, so that heat pumps utilising ozone layer depleting substances in their refrigerants will not be eligible for funding /48/.		OK
B.2.17	Is the selected baseline or baseline(s) described in the methodology and this hence confirms the applicability of the methodology?	/1/ /2/ /28/ /27/	DR CC	The selected baseline is the one described in the methodology. Hence the applicability of the methodology is confirmed.		OK
B.3	Project boundary of each generic CPA (VVS § 82-87)					
B.3.1	What are each generic CPA's system boundaries (components and facilities used to mitigate GHGs)? Are they clearly defined and in accordance with the methodology?	/1/ /2/	DR CC	Components and facilities used to mitigate GHGs are clearly defined in the PoA-DD. The system boundaries consist of the residential or commercial buildings in which the project equipment is installed on, as well as the		OK

			connected electricity system the equipment is connected to		
B.3.2	Which GHG sources are identified for the project? Does the identified boundary cover all possible sources linked to the project activity? Give reference to documents considered to arrive at this conclusion.	/1/ /2/	DR CC	The GHG sources identified are project and baseline CO ₂ emissions. These are in accordance with the two methodologies applied.	OK
B.3.3	Does the project involve other emissions sources not foreseen by the methodologies that may question the applicability of the methodology? Do these sources contribute with more than 1% of the estimated emission reductions of the project?	/1/ /2/	DR CC	The validation of the project activity did not reveal other greenhouse gas emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed project activity which are expected to contribute more than 1% of the overall expected average annual emission reduction, which are not addressed by AMS-I.C. version 19 and AMS-II.C. version 13.	OK
B.4	Baseline scenario determination and description (VVS § 88-95 / Identification of alternatives to the project activity (VVS § 113-116) Ensure that the evaluation of all alternatives provided and required by the methodology and also possible alternatives/offshoots of alternatives are discussed. If baseline alternatives required to be considered by the methodology are considered not applicable, please assess the justification for this.	B.5			
B.5.1	Which baseline scenarios have been identified? Is the list of baseline scenarios complete? Does the list include as one of the options that the project activity is undertaken without being registered as a proposed project activity? Does the list contain all plausible alternatives which are viable means of supplying the comparable outputs or services that are to be supplied by the proposed project activity?	/1/ /2/ /28/ /27/ /40/ /42/ /43/ /79/	DR CC	Since the PoA only accepts CPAs that apply indicative simplified methodologies AMS-I.C. and AMS-II.C., the baseline scenario for all CPAs is the one indicated by these methodologies. Both methodologies identify as baseline scenario the water heating systems that would have been used in the absence of the project activity. In South Africa, hot water is predominantly	OK

			heated by electric water heating systems. The domestic sector uses about 13 % from the total electricity consumption in the country and about 40 % of it is used for water heating. There are approximately 11 million households in the country of which the high and middle income households use electric geysers to heat water. More than 76 % of these income groups have an electric geyser. The annual geyser element sales in South Africa total over 720 000 units /40//42//43/. Electric hot water geysers/cylinders are pressurized electric hot water heaters. The geysers are normally connected to the main supply continuously, while the thermostat keeps the hot water at the set temperature (typically between 55-60 °C). Whenever it drops below the set point (typically 6°C below, in practice), the electric element switches on in order to reheat the water in the geyser to the set point /79/.		
B.5.2	How have the other baseline scenarios been eliminated in order to determine the baseline?	/1/ /2/ /28/ /27/	DR CC	This is not applicable since indicative simplified methodologies do not require the identification of alternative scenarios.	OK
B.5.3	What is the baseline scenario?	/1/ /28/ /27/	DR CC	The baseline scenario is the water heating systems that would have been used in the absence of the project activity	OK
B.5.4	Is the determination of the baseline scenario in accordance with the guidance in the methodology?	/1/ /2/ /28/ /27/	DR CC	The baseline scenario is the only one contemplated by the methodology.	OK
B.5.5	Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /28/ /27/	DR CC	The baseline scenario is the only one contemplated by the methodology.	OK
B.5.6	Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies? Does the baseline	/1/ /28/	DR CC	Both methodologies identify as baseline scenario the continuation of the “business as usual”, i.e.	OK

	scenario comply with all applicable and enforced legislation?	/27/		technologies that would have been used in the absence of the project activity. Such baseline scenario implicitly reflects relevant national and/or sectoral policies, macro-economic trends and political aspirations.		
B.5.7	Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/ /2/ /28/ /27/	DR CC	The baseline scenario is in accordance with the literature sources provided. In particular, the Project Participant makes reference to: N. Magubabe 2009, Speaking Notes of the Acting Director-General of Department of Energy Ms Nelisiwe Magubabe, Johannesburg 5 November 2009 /40/; A paper produced by the Tshwane University of Technology on the testing and evaluating procedures for domestic solar water heaters /42/; A paper produced by the Cape Peninsula University of Technology exploring options for residential water heating /43/. These sources support the baseline scenario identified by the Project Participant.		OK
B.5.8	Is the baseline determination adequately documented in the PoA-DD? <ul style="list-style-type: none"> • All assumptions and data used by the project participants are listed in the PoA-DD and related document to be submitted for registration. The data are properly referenced. • All documentation is relevant as well as correctly quoted and interpreted. • Assumptions and data can be deemed reasonable • Relevant national and/or sectoral policies and circumstances are considered and listed in the PoA-DD. • The methodology has been correctly applied to identify 	/1/ /2/ /28/ /27/	DR CC	The baseline determination adequately documented in the PoA-DD		OK

	what would occurred in the absence of the proposed CDM project activity					
B.6 Demonstration of eligibility for each generic CPA						
B.6.1	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? The SWHs to be included in the CPA shall meet the applicability requirements of the CDM methodology AMS.I.C. Thermal energy production with or without electricity, version 19. The HPs to be included in the CPA shall meet the applicability requirements of the CDM methodology AMS.II.C. Demand-side energy efficiency activities for specific technologies, version 13. The CPA shall apply both methodologies if both technologies SWHs and HPs are installed within one CPA. However, a CPA may also consist of only SWHs or HPs, in which case only the relevant applicability requirements of the technology in question shall apply.	/1/ /2/ /26/	DR CC	The assessment of eligibility will be carried out at CPA level.		OK
B.6.2	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? The Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities shall be applied also for monitoring, and hence a 95/10 confidence/precision is requested as per section B.7.2 of the PoA-DD.	/1/ /2/ /26/	DR CC	The assessment of eligibility will be carried out at CPA level.		OK
B.6.3	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? The CPAs to be included in this PoA shall meet either the SSC additionality rules as per Attachment A to Appendix B of the Simplified modalities and procedures or the microscale additionality rules as per the Guidelines for demonstrating additionality of microscale project activities. The CPA-DD shall identify whether SSC or microscale additionality rules are applied as per section B.5. of the Po-DD.	/1/ /2/ /26/	DR CC	The assessment of eligibility will be carried out at CPA level.		OK
B.6.4	Has it been sufficiently justified that each generic CPA	/1/	DR	The assessment of eligibility will be carried out at		OK

	complies with the following eligibility criteria? Each system included under the programme shall fulfil the relevant debundling rules i.e. annual savings ≤ 600 MWh and/or absorber area ≤ 640 m ² as per Section C of the PoA-DD.	/2/ /26/	CC	CPA level.		
B.6.5	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? Installation shall take place in residential, commercial or industrial buildings within the geographical boundaries of South Africa.	/1/ /2/ /26/	DR CC	The assessment of eligibility will be carried out at CPA level.		OK
B.6.6	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? The start date of the CPA is determined to be the first signed installation/carbon cession form agreement with the household and/or business under that CPA. The starting date of the CPA cannot be prior the date of 12 February 2012, which is the date of the global stakeholder consultation.	/1/ /2/ /26/	DR CC	The assessment of eligibility will be carried out at CPA level.		OK
B.6.7	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? All the HPs and SWHs under the SSC-CPA shall comply with all relevant SABS/SANS Standard Specification for HP or SWH systems.	/1/ /2/ /26/	DR CC	The assessment of eligibility will be carried out at CPA level.		OK
15.	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? In order to ensure that all CPAs under this PoA are neither registered as an individual CDM project activity nor included in another registered PoA: a. Each CPA shall be uniquely identified and defined by way of the unique identifying numbers (serial numbers) attached to each SWH and HP; b. Each CPA developer/supplier and household will sign an agreement with the CME which; 1) cedes the carbon to the CME, and 2) clarifies that the installations are not part of another CDM activity.	/1/ /2/ /26/	DR CC	The assessment of eligibility will be carried out at CPA level.		OK

B.6.8	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? All participants joining the programme shall have electricity and water connection, as well as existing electric geyser.	/1/ /2/ /26/	DR CC	The assessment of eligibility will be carried out at CPA level.		OK
B.6.9	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? All participants joining the programme shall have a proof of identity, or corporate registration certificate.	/1/ /2/ /26/	DR CC	The assessment of eligibility will be carried out at CPA level.		OK
B.6.10	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? Funding for the CPA may not come from Official Development Aid from Annex I Countries.	/1/ /2/ /26/	DR CC	The assessment of eligibility will be carried out at CPA level.		OK
B.6.11	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? Each SSC-CPA must be approved by the coordinating entity and Designated Operational Entity (hereafter referred to as “DOE”) prior to its incorporation into the PoA.	/1/ /2/ /26/	DR CC	The assessment of eligibility will be carried out at CPA level.		OK
B.6.12	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? When installing heat pumps or hybrid solutions the level of the output/service (e.g. water temperature) shall not be significantly smaller (maximum - 10%) or significantly larger (maximum + 50%) than in the baseline situation	/1/ /2/ /26/	DR CC	The assessment of eligibility will be carried out at CPA level.		OK
B.6.13	Has it been sufficiently justified that each generic CPA complies with the following eligibility criteria? The local stakeholder consultation and environmental impact analysis was undertaken in the PoA level and hence there is no specific requirements in the CPA level	/1/ /2/ /26/	DR CC	The assessment of eligibility will be carried out at CPA level.		OK

B.7 Algorithms and/or formulae used to determine emission reductions of each CPA (VVS § 96-100)					
Data and parameters that are available at validation and that are not monitored					
B.7.1	How was the emission factor for the electricity system available at validation verified?	/1/ /5/ /28/ /27/ /37/ /35/	DR CC	This parameter has been calculated at PoA level, as per the tool to calculate the emission factor for an electricity system.	OK
B.7.2	How was the daily solar energy output by the SWH in the day available at validation verified?	/1/ /5/ /28/ /27/ /37/ /35/	DR CC	The value used for this parameters has been based on SANS 6211-1:2003 equipment tests.	OK
B.7.3	How was the Estimated contribution of solar geyser/ hybrid solution of the total energy need (compared to baseline situation) available at validation verified?	/1/ /5/ /28/ /27/ /37/ /35/	DR CC	The parameter has been based on literature (Eskom 2009, Measurement and Verification, Project name: SHL and RLM Research Study, page 10 (for value given below) or supplier specifications)	OK
B.7.4	How was the estimated number of units installed under the CPA available at validation verified?	/1/ /5/ /28/ /27/ /37/ /35/	DR CC	This has been estimated based on the CPA design	OK
B.7.5	How was the power of the devices of the group of “i” for both baseline and project devices available at validation verified?	/1/ /5/ /28/ /27/	DR CC	The following values can be applied for ex ante calculations, if relevant to the CPA design: Baseline:	OK

		/37/ /35/		<p>ρ_i= 3 to 4 kW40</p> <p>Project:</p> <p>Pi: 0.5-0.95 kW (domestic)</p> <p>Pi: 1.06-1.9 kW (commercial)</p> <p>Any comment: Please note that the baseline capacities</p>		
B.7.6	How was the Average annual operating hours of the devices of the group of “i” project devices available at validation verified?	/1/ /5/ /28/ /27/ /37/ /35/	DR CC	This is estimated based on literature or measurements		OK
B.7.7	How was the Global Warming Potential of the refrigerant that is used in the project equipment available at validation verified?	/1/ /5/ /28/ /27/ /37/ /35/	DR CC	<p>This is based on literature: 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.</p>		OK
B.7.8	In case any of the parameters above were determined based on sampling, was the sample adequate and did it comply with the specific guidance in the applicable methodology or, if no such guidance is available in methodology, did it achieve a 90/10 confidence/precision as the criteria for reliability of sampling efforts for small-scale project activities and 95/10 for large scale project activities?	/1/ /5/ /28/ /27/ /37/ /35/	DR CC	Parameters based on sampling comply with the 90/10 confidence/precision as the criteria for reliability of sampling efforts for small-scale project activities and 95/10 for large scale project activities.		OK
Baseline emissions						
B.7.9	Are the calculations documented according to the approved methodology and tool and in a complete and transparent manner?	/1/ /5/ /28/ /27/ /37/	DR CC	<p><u>Energy efficiency:</u></p> <p>According to the PoA-DD, baseline emissions from the energy efficiency component are calculated based on the energy consumption in the baseline, the CO₂</p>	€AR4	OK

	/35/		<p>emission factor of the electrical grid, and the quantity and global warming potential of the refrigerant used by the baseline technology, through equations 1 and 2 of AMS-II.C.</p> <p><u>Renewable energy:</u> The PoA-DD indicates that baseline emissions for the SWH component are calculated according to methodology AMS-I.D /31/, since the activity displaces the use of electricity from the grid. Baseline emissions are calculated based on the quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity times the carbon emission factor of the grid, in accordance to equation 1 of AMS-I.D. The net electricity supplied is the energy output determined by SABS tests (used for ex-ante calculations) adjusted by the estimated solar geyser contribution (when this is used as a back-up).</p> <p><u>See CAR4.</u></p> <p>For hybrid solutions where SWH and HP are installed in conjunction, with the HP replacing the electric geyser as highly efficient back-up heat source an efficiency of 90% is assumed /49/, in accordance with the commercial brochure of the hybrid system.</p>		
B.7.10 Have conservative assumptions been used when calculating the baseline emissions?	/1/ /5/	DR CC	<u>See CAR4</u>	€AR4	OK

	/28/ /27/ /37/ /35/				
B.7.11 Are uncertainties in the baseline emission estimates properly addressed?	/1/ /5/ /28/ /27/ /37/ /35/	DR CC	<u>See CAR4</u>	CAR4	OK
B.7.12 If the calculations of baseline emissions are based on sampling, does this comply with the Standard for sampling and surveys?	/1/ /5/ /28/ /27/ /37/ /35/	DR CC	<u>See CAR4</u>	CAR4	OK
Project emissions					
B.7.13 Are the calculations documented according to the approved methodology and tool and in a complete and transparent manner?	/1/ /5/ /28/ /27/ /37/ /35/	DR CC	<u>Energy efficiency:</u> The description of project emissions calculations in the PoA-DD is in accordance with equations 5 and 6 of AMS-II.C.: project emissions are calculated as the energy consumption of the project technology, times the grid emission factor, plus project emissions from physical leakage of refrigerants. <u>Renewable energy:</u> AMS.I.C paragraph 45 requires project emissions to be calculated according the “Tool to calculate baseline, project and/or leakage emissions from electricity	CAR4	OK

			consumption”. Equation 1 of the tool is used for this purpose (generic approach). Project emissions are calculated as the quantity of electricity consumed, times the grid emission factor, times transmission and distribution losses. <i>CAR4:</i> <i>In the spread sheet submitted, the calculations do not follow the equations indicated in the methodology.</i> <i>The PP is requested to follow the equations indicated in the methodology.</i> The grid emission factor is calculated by applying the “Tool to calculate the emission factor for an electricity system”, as required by both methodologies.		
B.7.14	Have conservative assumptions been used when calculating the project emissions?	/1/ /5/ /28/ /27/ /37/ /35/	DR CC	<u>See CAR4</u>	CAR4 OK
B.7.15	Are uncertainties in the project emission estimates properly addressed?	/1/ /5/ /28/ /27/ /37/ /35/	DR CC	<u>See CAR4</u>	CAR4 OK
B.7.16	If the calculations of project emissions are based on sampling, does this comply with the Standard for sampling and surveys?	/1/ /5/ /28/ /27/	DR CC	<u>See CAR4</u>	CAR4 OK

	/37/ /35/				
Leakage					
B.7.17 Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /5/ /28/ /27/ /37/ /35/	DR CC	<p>According to both methodologies, leakage shall be considered if the equipment is transferred from outside the boundary to the project activity. Furthermore both methodologies state that in the case of PoAs, if the project activity involves the replacement of equipment, the leakage effect of the use of the replaced equipment in another activity can be neglected if the replaced equipment is scrapped, and independent monitoring of scrapping of replaced equipment is implemented.</p> <p>Under this PoA only new SWH/HP technology is installed. In the case of solar geysers the electric element is typically downgraded and used as a backup element for the SWH, and hence these emissions will be monitored under the project emissions (project emissions are monitored through the household meter, which records all energy consumption occurring in the house). In the case of HPs the electric element is scrapped. Leakage (LE,y) is considered to be zero under this programme.</p> <p><i>CLA:</i> <i>The PP is requested to clarify how independent monitoring of scrapping of replaced equipment, as requested by the applied methodologies, is implemented.</i></p>	CAR4	OK
B.7.18 Have conservative assumptions been used when calculating the leakage emissions?	/1/ /5/ /28/	DR CC	Not applicable, as leakage emissions are not considered.		OK

		/27/ /37/ /35/				
B.7.19	Are uncertainties in the leakage emission estimates properly addressed?	/1/ /5/ /28/ /27/ /37/ /35/	DR CC	Not applicable, as leakage emissions are not considered.		OK
B.7.20	If the calculations of leakage emissions are based on sampling, does this comply with the Standard for sampling and surveys	/1/ /5/ /28/ /27/ /37/ /35/	DR CC	Not applicable, as leakage emissions are not considered.		OK
Emission Reductions						
B.7.21	Algorithms and/or formulae used to determine emission reductions: <ul style="list-style-type: none"> All assumptions and data used by the project participants are listed in the PoA-DD and related document submitted for registration. The data are properly referenced All documentation is correctly quoted and interpreted. All values used can be deemed reasonable in the context of the project activity The methodology has been correctly applied to calculate the emission reductions and this can be replicated by the data provided in the PoA-DD and supporting files to be submitted for registration. 	/1/ /5/ /28/ /27/ /37/ /35/	DR CC	<u>See CAR4</u>	CAR4	OK
B.8 Monitoring plan (VVS § 131-133)						
Data and parameters monitored						
B.8.1	Do the means of monitoring described in the plan comply with the requirements of the methodology?	/1/	DR	CAR5: <i>The list of monitored parameters in section E.7.1 does not include all parameters required by the applicable methodologies.</i>	CAR5	OK

		<p>The sampling approach used to design the monitoring plan is based on the requirements of the General Guidelines for Sampling and Surveys for Small-Scale CDM Project Activities. The Guidelines require a 90/10 confidence/precision, and the Project Participant intends to analyse the monitoring records 3 months after the start of the crediting period and 6 month after the start of the crediting period to see whether or 90/10 confidence/precision level is achieved. The sample size can then be adjusted to meet the 90/10 confidence/precision level based on the measurement results.</p> <p><u>Monitoring for operationality:</u> this will establish the number of systems in operation, as well as serve as quality check to ensure the data is captured correctly in the database.</p> <p>The project participant calculated that a sample of 68 units will satisfy the 90/10 requirement for sampling and survey. The database will annually allocate the 68 sites for inspection by an automated random number generator, which will be set to never select the same site for inspection over the 10 year period.</p> <p><u>Leakage of refrigerant:</u> The amount/extend of physical leakage of refrigerant from the project equipment is measured through pressure measurement. The results (amount of refrigerant discharge/recharge) are reported into the database, and applied for the ex post emission reduction calculations.</p>		
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B.8.2	Does the monitoring plan contains all necessary parameters, and are they clearly described?	/1/	DR	See CAR5	CAR5	OK
B.8.3	In case parameters are measured, is the measurement equipment described? Describe each relevant parameter.	/1/	DR	<i>CL5: The Project Participant is requested to clarify how the requirements of the applicable methodologies relative to monitoring equipment will be met.</i>	CAR5	OK
B.8.4	In case parameters are measured, is the measurement accuracy addressed and deemed appropriate? Describe each relevant parameter.	/1/	DR	<u>See CL5.</u>	CAR5	OK
B.8.5	In case parameters are measured, are the requirements for maintenance and calibration of measurement equipment described and deemed appropriate? Describe each relevant parameter.	/1/	DR	<u>See CL5.</u>	CAR5	OK
B.8.6	Is the monitoring frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR	<u>See CL5.</u>	CAR5	OK
B.8.7	Is the recording frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR	<u>See CL5.</u>	CAR5	OK
B.8.8	In case any of the parameters will be determined based on sampling, is the sample plan adequate and does it comply with the specific guidance in the applicable methodology or, if no such guidance is available in methodology, does it achieve a 90/10 confidence/precision as the criteria for reliability of sampling efforts for small-scale project activities and 95/10 for large scale project activities?	/1/	DR	The sample plan is adequate and complies with the requirement for a 95/10 confidence/precision level for PoAs.		OK
Ability of project participants to implement monitoring plan						
B.8.9	How has it been assessed that the monitoring arrangements described in the monitoring plan are feasible within the project design?	/1/ /74/ /75/	DR	The monitoring arrangements described in the monitoring plan are feasible within the project design. Moreover, the CME is currently managing a similar PoA in the same host country.		OK
B.8.10	Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and	/1/ /74/	DR	The coordinating entity will contract a specialised data management company, which will establish		OK

	how to process performance documentation)?	/75/		and maintain a database for the PoA that contains sufficient data, specific to each CPA and each installation, to allow the DOE to calculate the emission reductions for each individual CPA. At the time of the site visit, this had not yet been finalized.		
B.8.11	Are the data management and quality assurance and quality control procedures sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified?	/1/ /74/ /75/	DR	The data management and quality assurance and quality control procedures are sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified		OK
B.8.12	Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/ /74/ /75/	DR	All monitored data required for verification and issuance will be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later		OK
Monitoring of sustainable development indicators/ environmental impacts						
B.8.13	Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/ /74/ /75/	DR	The data management and quality assurance and quality control procedures are sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified		OK
B.8.14	Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/ /74/ /75/	DR	All monitored data required for verification and issuance will be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later		OK
B.8.15	Are the sustainable development indicators in line with stated national priorities in the host country?	/1/ /74/ /75/	DR	The data management and quality assurance and quality control procedures are sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified		OK

Table 3 Resolution of corrective action requests and clarification requests

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>CAR1: <i>According to the methodology, “The project boundary is the physical, geographical location of each measure (each piece of equipment) installed”. The CPA-DD indicates that: the physical boundary of CPA-001 is defined as the geographical area within which all the implemented, small-scale, Clean Development Mechanism programme activities (hereafter referred to as “SSC-CPAs”) included in the CPA-001 will occur.</i> <i>The project boundary identified does not comply with the requirements of the methodology.</i></p>	A.2	<p>The PoA-DD and CPA-DD has been revised accordingly. Please see sections A.5 of the PoA-DD as well as A.7. and D.3 of the CPA-DD.</p>	<p>The boundary of the PoA consists of the residential or commercial/industrial buildings within the borders of the Republic of South Africa in which the HPs and SWHs will be installed, including all power plants connected physically to the electricity system (grid) that the project equipment is connected to.</p> <p>The boundary of the PoA complies with the requirements of both applicable methodologies /28//27/.</p> <p>CAR1 is closed.</p>
<p>CAR2: <i>Not all minimum eligibility criteria listed in the Standard for the demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities are included in the proposed PoA’s eligibility criteria for inclusion of CPAs.</i></p>	A.4	<p>The eligibility criteria have been revised to include criteria as per <i>Standard for the demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities</i>. Please see section B.5. of the PoA-DD.</p>	<p>The list of eligibility criteria for inclusion includes all the minimum criteria required by the <i>Standard for the demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities</i>.</p> <p>The list of eligibility criteria therefore complies with the relevant EB requirements.</p> <p>CAR2 is closed.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>CAR3: <i>According to the PoA Standard: PoAs that consist of one or more microscale projects as CPAs shall include eligibility criteria derived from all the relevant requirements of the Guidelines for demonstrating additionality of microscale project activities.</i></p> <p><i>PoAs that consist of one or more small-scale projects as CPAs shall include eligibility criteria derived from all the relevant requirements of attachment A of Appendix B of the Simplified modalities and procedures for small-scale CDM project activities.</i></p>	A.4	<p>The CPAs to be included in this PoA shall meet either the SSC additionality rules as per Attachment A to Appendix B of the Simplified modalities and procedures or the microscale additionality rules as per the Guidelines for demonstrating additionality of microscale project activities. The CPA-DD shall identify whether SSC or microscale additionality rules are applied as per section B.5. of the PoA-DD.</p>	<p>The PoA includes conditions that ensure that CPAs meet the requirements pertaining to the demonstration of additionality in accordance with the requirements of the <i>Standard for the demonstration of additionality, development of eligibility criteria, and application of multiple methodologies for programme of activities.</i></p> <p>In fact, once of the eligibility criteria for inclusion explicitly requires SSC CPAs to demonstrate additionality in accordance with Attachment A to Appendix B of the Simplified modalities and procedures or the microscale additionality rules, and micro-scale CPAs to demonstrate additionality in accordance with the Guidelines for demonstrating additionality of microscale project activities.</p> <p>CAR3 is closed.</p>
<p>CAR4: <i>In the spread sheet submitted, the calculations do not follow the equations indicated in the methodology. The PP is requested to follow the equations indicated in the methodology.</i></p>	E.5.	<p>The excel calculations have been revised accordingly.</p>	<p>The emission reduction calculations are in accordance with both applicable methodologies.</p> <p>CAR4 is closed.</p>
<p>CAR5: <i>The list of monitored parameters in section E.7.1 does not include all parameters required by the applicable methodologies.</i></p>	E.10.	<p>Missing parameters have been added to the revised DDs.</p>	<p>The list of monitored parameters has been updated, and reflects the parameters required by the applicable methodologies to determine emission reductions.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			CAR5 is closed.
<p><i>CL1:</i> <i>The Project Participant is requested to submit evidence of how carbon rights will be transferred to the CME from each entity involved in the project.</i></p>	A.4.	<p>Each individual household as well as company will cede the carbon rights over the CME. This is a condition of join the PoA/CPA and receiving a SWH/HP under the SPV.</p> <p>An example of a draft Cession of Rights to Carbon has been provided to the DOE.</p>	<p>Provisions are in place to ensure that recipients are aware and have agreed to transfer carbon rights to the project participant, so that double counting of emission reductions is avoided.</p> <p>CL1 is closed.</p>
<p><i>CL2:</i> <i>According to the Procedures for registration of a programme of activities as a single CDM project activity and issuance of certified emission reductions for a programme of activities:</i> <i>9. The coordinating/managing entity shall obtain letters of approval from each host Party and Annex I Party which wishes to be involved in the PoA. Letters of approval shall be issued in accordance with the guidance provided by the Board (EB 16 report, Annex 6).</i> <i>10. The coordinating/managing entity shall obtain letters of authorization of its coordination of the PoA from each host Party.</i></p> <p><i>Neither LoA nor letter of authorization has been submitted.</i></p>	A.4.	<p>LoA approval process will be started in South Africa, as soon as a revised signed validation report is reached. Approval from UK can be obtained only after receiving the host country approval.</p>	<p>A Letter of Approval dated 13 June 2012 has been issued by the DNA of South Africa.</p> <p>The DNA of Lichtenstein issued the LoA /22/ on 6th July 2012 and authorized International Carbon Ltd as project participant</p> <p>CL2 is closed.</p>
<p><i>CL3:</i> <i>The PP is requested to submit evidence that the proposed programme is not expected to have negative environmental impacts.</i></p>	C.1.	<p>The programme does not cause negative environmental impacts on air quality, water pollution, waste management, noise, visual impacts, traffic, or safety. The impacts of the programme on environment are rather</p>	<p>The proposed programme does not fall into the list of activities that require a formal environmental impact assessment. However, an informal environmental impact assessment has been performed and</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		<p>on positive nature as the programme activity reduces the demand of fossil fuel based grid electricity.</p> <p>The programme activity will replace exiting electric water heating systems in existing buildings and therefore does no harm or results in negative impacts to biodiversity and ecosystems.</p> <p>As explained in the PoA-DD the National Environmental Management Act lists activities that must either be subjected to a Basic Assessment or to the more thorough Scoping and EIA process. SWH or HP installations are not part of this list. Furthermore, IDC follows an environmental policy which requires its activities to be environmentally friendly and socially responsible (see IDC Eco Meeting 18/03/2009, Environmental Policy)</p>	<p>submitted to South Africa's DNA as part of the LoA application process /16/, and this was approved by the DNA. Moreover, IDC – who provides part of the funding for this project, has an environmental policy in place /14/ which applies to all project in which the organisation is involved with, including the proposed project activity. Funding would therefore not be approved should the project fail to meet IDC's environmental policy.</p> <p>CL3 is closed.</p>
<p><i>CL4:</i> The PP is requested to clarify how independent monitoring of scrapping of replaced equipment, as requested by the applied methodologies, is implemented.</p>	E.7.	<p>In case of new installation (i.e. no pre-feed or retrofit) the electric element is disconnected. By disconnecting the electric element they geyser is made unusable. In most cases the geyser is left in its old place in the house (please note that SWH is installed on the roof and HP outside by the wall), as it is the homeowner's property.</p> <p>Pre-feed or retrofit installation which accounts for approx. 5% of installations under the Eskom subsidy scheme, the</p>	<p>In the case of new installations, the electric geyser is disconnected by the independent installers subcontracted as part of the programme, and left in its old place in the house, since it is the property of the home owner. This was confirmed by one of the installation firms involved in the programme /79//77/.</p> <p>In the case of retrofit, the old element is left in place but downgraded to comply with the requirements of Eskom's subsidy scheme.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		<p>existing element is left in place. However, the element is downgraded in order to apply for Eskom subsidy. In case of any pre-feed or retrofit installation the electricity usage of the element is monitored and will form part of project emissions, and hence is not a leakage.</p> <p>Please see: Eskom. New Installation Guidelines for SWH requirement 9.3 on p 9; Emailing 02 May 2012, with Raj Pandaram from Eskom; Eskom basic requirements for participation on the heat pump rebate; Eskom Programme Requirements.</p>	<p>In these cases, however, any energy consumption of the old equipment is recorded by the electricity meter for each household, and as such it is recorded in the calculations of project emissions.</p> <p>CL4 is closed.</p>
<p><i>CL5: The Project Participant is requested to clarify how the requirements of the applicable methodologies relative to monitoring equipment will be met.</i></p>	E.10.	<p>ACM.II.C, the following shall be monitored in case of heat pumps:</p> <ul style="list-style-type: none"> • Metering the “energy use” of an appropriate sample of the devices installed. • Annual checks of a sample of non-metered systems to ensure that they are still operating. <p>Furthermore, the number and “power” of the devices replaced shall be recorded and captured into the database.</p> <p>As per paragraph 50, No 1 of the ACM.I.C the following shall be monitored in case of SWHs:</p> <ul style="list-style-type: none"> • the number of systems operating, 	<p>The PoA-DD indicates that meters will be calibrated according to the manufacturer’s specifications, but at least once every three years. This is in line with the requirements of the applicable methodologies, and of the general guidelines to SSC CDM methodologies /32/.</p> <p>CL5 is closed.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		<p>and;</p> <ul style="list-style-type: none"> estimating the annual hours of operation of the average system. <p>For the purpose of metering electrical meters will be installed in a sample of HPs, and cold flow meters, inlet and outlet temperature probes will be installed in a sample of SWHs.</p>	

Table 4 Forward action requests

Forward action request	Reference to Table 2	Response by project participants
No FAR have been identified.		

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APPENDIX B

PROTOCOL FOR ASSESSING COMPLIANCE OF SPECIFIC CPA WITH POA REQUIREMENTS

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A. Description of CPA (PS § 31, VVS § 62-63, § 189)						
A.1. Title, Technical description of CPA and Parties involved						
A.1.1	Does section A.1 of the CPA-DD include a clearly identifiable project title, version number of the CPA-DD and date of the CPA-DD?			<input type="checkbox"/> Clearly identifiable title of the project activity <input type="checkbox"/> Version number of the PoA-DD is included <input type="checkbox"/> Date of the PoA-DD is included.		
A.1.2	Is the CPA-DD is in accordance with the applicable requirements for completing CPA-DDs?					
A.1.3	Does the description of the CPA sufficiently cover all relevant elements, is accurate and does it provides the reader with a clear understanding of the nature of the proposed CPA?					
A.1.4	Does the CPA-DD provide information on the CPA implementer(s)? CPA implementers can be project participants of the PoA, under which the CPA is submitted, provided the name is included in the registered PoA.					
A.1.5	Does the CPA-DD describe all the technologies and/or measures to be employed and/or implemented by the CPA including a list of the facilities, systems and equipment that will be installed and/or modified by the CPA					
A.1.6	Does the CPA-DD adequately list all Party(ies) and CPA implementer(s) involved in the CPA and provide contact information in Appendix 1? Are all listed Party(ies) and CPA implementer(s) included in the PoA?					
A.1.7	Does the CPA-DD provide geographic reference or other means of identification that allows for the unique identification of the CPA?					

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A.2. Duration of the CPA and crediting period						
A.2.1	Is the CPA starting date and operational lifetime clearly defined and evidenced?					
A.2.2	Has the crediting period been clearly defined and is the start of the crediting period deemed to be reasonable?					
A.2.3	Has it been confirmed that the length of the CPA crediting period does not exceed the end of PoA?					
A.3. Estimated amount of emission reductions from the CPA						
A.3.1	Has the emission reduction forecast been checked and is it deemed likely that the stated amount is achieved given that the underlying assumptions do not change?					
A.4. Public funding						
A.4.1	In case public funding from Parties included in Annex I is used for the project activity, have these Parties provided an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties?					
A.5. Confirmation for CPA						
A.5.1	Has a confirmation been provided that the CPA is neither registered as an individual CDM project activity nor is part of another registered PoA?					
A Environmental impacts (PS § 63-64, VVS § 134-135) <i>It is assessed whether environmental impacts of the CPA have been properly addressed.</i>				<input type="checkbox"/> Analysis at PoA level <input type="checkbox"/> Analysis at CPA level This section must only be completed if the analysis of environmental impacts must be at CPA level.		
D.1.2.	Has an analysis of the environmental impacts of the CPA					

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	been sufficiently described?					
D.1.3.	Are there any Host Party requirements for an Environmental Impact Assessment (EIA)?					
D.1.4.	Will the programme create any adverse environmental effects?					
D.1.5.	Are transboundary environmental impacts considered in the analysis?					
D.1.6.	Have identified environmental impacts been addressed in the programme design?					
D.1.7.	Does the programme comply with environmental legislation in the host country?					
B Stakeholders' comments (PS § 65-69, VVS § 138-140) <i>It is assessed whether stakeholders have been properly consulted in the development of the CPA.</i>				<input type="checkbox"/> Consultation at PoA level <input type="checkbox"/> Consultation at CPA level This section must only be completed if the analysis of environmental impacts is at PoA level.		
C.1.1.	Have relevant stakeholders been consulted?					
C.1.2.	Have appropriate media been used to invite comments by local stakeholders?					
C.1.3.	If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?					
C.1.4.	Is a summary of the stakeholder comments received provided?					
C.1.5.	Has due account been taken of any stakeholder comments received?					

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
C Application of a baseline and monitoring methodology(ies)					
D.1. Title and reference of the approved baseline and monitoring methodology(ies) selected					
D.2.2. Are the exact reference and title of approved methodology(ies) and tools listed?					
D.2.3. Are valid version of approved methodology(ies) and tools applied?					
D.2. Applicability of methodology (and tools) (VVS § 73-77) <i>The applicability of the methodology is checked through the eligibility criteria specifying the conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by CPAs</i>					
D.3.2. Do the eligibility criteria in D.5 below, in particular the eligibility criteria specifying the conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by the CPA, sufficiently demonstrate that the CPA complies with the applicability criteria of the applied methodology (and tools)? If not, provide below and assessment of the CPAs compliance with the applicability criteria.					
D.3.3. If not already sufficiently demonstrated through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: insert applicability criteria 1?					
D.3.4. If not already sufficiently demonstrated through relevant eligibility criteria, how was it validated the CPA complies with the following applicability criteria: insert applicability criteria 2?					

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
D.3. Project boundary of CPA (VVS § 82-87)					
D.3.1. What is the CPA's system boundaries (components and facilities used to mitigate GHGs)? Are they clearly defined and in accordance with the methodology?					
D.3.2. Is the CPA located within the geographical boundary of the proposed or registered PoA?					
D.3.3. Which GHG sources are identified for the project? Does the identified boundary cover all possible sources linked to the project activity? Give reference to documents considered to arrive at this conclusion.					
D.3.4. Does the project involve other emissions sources not foreseen by the methodologies that may question the applicability of the methodology? Do these sources contribute with more than 1% of the estimated emission reductions of the project?					
D.4. Baseline scenario determination and description (VVS § 88-95 / Identification of alternatives to the project activity (VVS § 113-116) <i>Ensure that the evaluation of all alternatives provided and required by the methodology and also possible alternatives/offshoots of alternatives are discussed. If baseline alternatives required to be considered by the methodology are considered not applicable, please assess the justification for this</i>					
D.5.2. Which baseline scenarios have been identified? Is the list of baseline scenarios complete? Does the list include as one of the options that the project activity is undertaken without being registered as a proposed project activity? Does the list contain all plausible alternatives which are viable means of supplying the comparable outputs or services that are to be supplied by the proposed project activity?					
D.5.3. How have the other baseline scenarios been eliminated in					

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
order to determine the baseline?					
D.5.4. What is the baseline scenario?					
D.5.5. Is the determination of the baseline scenario in accordance with the guidance in the methodology?					
D.5.6. Has the baseline scenario been determined using conservative assumptions where possible?					
D.5.7. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies? Does the baseline scenario comply with all applicable and enforced legislation?					
D.5.8. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?					
D.5.9. Is the baseline determination adequately documented in the PoA-DD? <ul style="list-style-type: none"> • All assumptions and data used by the project participants are listed in the PoA-DD and related document to be submitted for registration. The data are properly referenced. • All documentation is relevant as well as correctly quoted and interpreted. • Assumptions and data can be deemed reasonable • Relevant national and/or sectoral policies and circumstances are considered and listed in the CPA-DD. • The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity 					
D.5. Demonstration of eligibility for the CPA					
D.6.2. Has it been sufficiently justified that the CPA complies with the following eligibility criteria? The SWHs to be included in the CPA shall meet the					

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
<p>applicability requirements of the CDM methodology AMS.I.C. Thermal energy production with or without electricity, version 19 which are</p> <ul style="list-style-type: none"> - The CPAs included in this PoA comprise renewable energy technologies that supply users with thermal energy that displaces fossil fuel based grid energy; - The methodology comprises technologies such as solar thermal water heaters; <p>A SSC-CPA individually does not exceed the applicable SSC threshold which is 64 000 m² i.e. the CPAs are below the 64,000 m² threshold. The HPs to be included in the CPA shall meet the applicability requirements of the CDM methodology AMS.II.C. Demand-side energy efficiency activities for specific technologies, version 13, which are:</p> <ul style="list-style-type: none"> - The CPAs included in this PoA comprise energy-efficient equipment, which replaces existing equipment, or possibly are installed at new sites; - The aggregate energy savings of the CPA will not exceed the equivalent of 60 GWh electric energy per year; - The level of the output/service (e.g. water temperature) will not be significantly smaller (maximum - 10%) or significantly larger (maximum + 50%) than in the baseline situation. <p>The CPAs shall apply both methodologies, if both technologies SWHs and HPs are installed within one CPA. However, a CPA may also consist of only SWHs or HPs, in which case only the relevant applicability requirements to the technology in questions shall apply.</p>					
<p>D.6.3. Has it been sufficiently justified that the CPA complies with the following eligibility criteria?</p> <p>The Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities shall be applied also for monitoring, and hence a 95/10 confidence/precision is</p>					

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
requested as per section B.7.2 of this document.						
D.6.4.	<p>Has it been sufficiently justified that the CPA complies with the following eligibility criteria?</p> <p>The CPAs to be included in this PoA shall meet the criteria for automatic additionality as per the paragraph 2 C of the “Guidelines on the Demonstration of Additionality of Small-Scale Project Activities”. Hence each installation done under this PoA shall be below:</p> <ul style="list-style-type: none"> - HP < 3000 MWh; - SWH < 320 m²; 					
D.6.5.	<p>Has it been sufficiently justified that the CPA complies with the following eligibility criteria?</p> <p>Each system included under the programme shall fulfil the relevant debundling rules i.e. annual savings for HPs _ 600 MWh and for SWHs absorber area _ 640 m² as per Section C of this document.</p>					
D.6.6.	<p>Has it been sufficiently justified that the CPA complies with the following eligibility criteria?</p> <p>Installation shall take place in residential and/or SMEs (as per the United Nations Industrial Development Organization definition)²⁴ within the geographical boundaries of South Africa.</p>					
D.6.7.	<p>Has it been sufficiently justified that the CPA complies with the following eligibility criteria?</p> <p>The start date of the CPA is determined to be the first signed installation/carbon cession form agreement with the household and/or business under that CPA. The starting date of the CPA cannot be prior the date of 12 February 2012.</p>					
D.6.8.	<p>Has it been sufficiently justified that the CPA complies with the following eligibility criteria?</p> <p>All the HPs and SWHs under the SSC-CPA shall comply with all relevant SABS/SANS Standard Specification for HP</p>					

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
or SWH systems. Each supplier or CPA implementer, (if not Low E Co.) shall provide copies of relevant SABS/SANS Standard Specification to the CME before inclusion under this PoA.					
<p>D.6.9. Has it been sufficiently justified that the CPA complies with the following eligibility criteria?</p> <p>In order to ensure that all CPAs under this PoA are neither registered as an individual CDM project activity nor included in another registered PoA:</p> <ul style="list-style-type: none"> a. Each CPA shall be uniquely identified and defined by way of the unique identifying numbers (serial numbers) attached to each SWH and HP; b. Each supplier and household will sign an agreement with the CME which; <ul style="list-style-type: none"> 1) cedes the carbon to the CME, and 2) clarifies that the installations are not part of another CDM activity. 					
<p>D.6.10. All participants joining the programme shall have electricity connection and an existing electric geyser. The electricity connection meter number as well as power (kW) and size (litre) of electric geyser shall be recorded for each installation as per section B.7.2 below.</p>					
<p>D.6.11. Has it been sufficiently justified that the CPA complies with the following eligibility criteria?</p> <p>All participants joining the programme shall have a proof of identity (ID), or corporate registration certificate. The ID/ registration number shall be recorded in the database as per section B.7.2 below and electronic copies of these documents will be stored.</p>					
<p>D.6.12. Has it been sufficiently justified that the CPA complies with the following eligibility criteria?</p> <p>No public funding from parties included in Annex I is</p>					

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
involved in this programme. This shall be confirmed for each CPA by providing details of the funding to the validating/ including DOE.					
D.6.13. Has it been sufficiently justified that the CPA complies with the following eligibility criteria? Each SSC-CPA must be approved by the coordinating entity and Designated Operational Entity (hereafter referred to as “DOE”) prior to its incorporation into the PoA.					
D.6.14. Has it been sufficiently justified that the CPA complies with the following eligibility criteria? When installing heat pumps the level of the output/service (e.g. water temperature) shall not be significantly smaller (maximum - 10%) or significantly larger (maximum + 50%) than in the baseline situation. Hence, the supplier/ CPA Developer is requested to set the thermostat in the same level than in the baseline scenario i.e. typically between 55-60 °C.					
D.6. Algorithms and/or formulae used to determine emission reductions of the CPA (VVS § 96-100)					
Data and parameters that are available at validation and that are not monitored					
D.7.2. How was the insert parameter available at validation verified?					
D.7.3. How was the insert parameter available at validation verified?					
D.7.4. How was the insert parameter available at validation verified?					
D.7.5. How was the insert parameter available at validation verified?					
D.7.6. In case any of the parameters above were determined based on sampling, was the sample adequate and did it comply with the specific guidance in the applicable methodology or, if no					

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
such guidance is available in methodology, did it achieve a 90/10 confidence/precision as the criteria for reliability of sampling efforts for small-scale project activities and 95/10 for large scale project activities?					
Baseline emissions					
D.7.7. Are the calculations documented according to the approved methodology and tool and in a complete and transparent manner?					
D.7.8. Have conservative assumptions been used when calculating the baseline emissions?					
D.7.9. Are uncertainties in the baseline emission estimates properly addressed?					
D.7.10. If the calculations of baseline emissions are based on sampling, does this comply with the Standard for sampling and surveys?					
Project emissions					
D.7.11. Are the calculations documented according to the approved methodology and tool and in a complete and transparent manner?					
D.7.12. Have conservative assumptions been used when calculating the project emissions?					
D.7.13. Are uncertainties in the project emission estimates properly addressed?					
D.7.14. If the calculations of project emissions are based on sampling, does this comply with the Standard for sampling and surveys?					
Leakage					
D.7.15. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?					

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
D.7.16. Have conservative assumptions been used when calculating the leakage emissions?					
D.7.17. Are uncertainties in the leakage emission estimates properly addressed?					
D.7.18. If the calculations of leakage emissions are based on sampling, does this comply with the Standard for sampling and surveys					
Emission Reductions					
D.7.19. Algorithms and/or formulae used to determine emission reductions: <ul style="list-style-type: none"> • All assumptions and data used by the project participants are listed in the CPA-DD and related document submitted for registration. The data are properly referenced • All documentation is correctly quoted and interpreted. • All values used can be deemed reasonable in the context of the project activity • The methodology has been correctly applied to calculate the emission reductions and this can be replicated by the data provided in the PoA-DD and supporting files to be submitted for registration. 					
D.7. Monitoring plan (VVS § 131-133)					
Data and parameters monitored					
D.7.1. Do the means of monitoring described in the plan comply with the requirements of the methodology?					
D.7.2. Does the monitoring plan contains all necessary parameters, and are they clearly described?					
D.7.3. In case parameters are measured, is the measurement equipment described? Describe each relevant parameter.					
D.7.4. In case parameters are measured, is the measurement accuracy addressed and deemed appropriate? Describe each					

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
relevant parameter.						
D.7.5.	In case parameters are measured, are the requirements for maintenance and calibration of measurement equipment described and deemed appropriate? Describe each relevant parameter.					
D.7.6.	Is the monitoring frequency adequate for all monitoring parameters? Describe each parameter.					
D.7.7.	Is the recording frequency adequate for all monitoring parameters? Describe each parameter.					
D.7.8.	In case any of the parameters will be determined based on sampling, is the sample plan adequate and does it comply with the specific guidance in the applicable methodology or, if no such guidance is available in methodology, does it achieve a 90/10 confidence/precision as the criteria for reliability of sampling efforts for small-scale project activities and 95/10 for large scale project activities?					
Ability of project participants to implement monitoring plan						
D.7.9.	How has it been assessed that the monitoring arrangements described in the monitoring plan are feasible within the project design?					
D.7.10.	Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?					
D.7.11.	Are the data management and quality assurance and quality control procedures sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified?					
D.7.12.	Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever					

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
occurs later?					
Monitoring of sustainable development indicators/ environmental impacts					
D.7.13. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?					
D.7.14. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?					
D.7.15. Are the sustainable development indicators in line with stated national priorities in the host country?					

APPENDIX C

CURRICULA VITAE OF THE VALIDATION TEAM MEMBERS

Francesca started working in 2004 on research and training on sustainable development and CSR for businesses in Italy. From 2007 she worked as Climate Change Officer in London, in a large urban regeneration project. The role involved achieving carbon reductions in all new developments (residential, schools, hospitals, commercial), by embedding energy efficiency, renewable energy technologies, and improved energy distribution in planning conditions. The role also included ensuring compatibility with a large district heating scheme under construction, and incorporating climate change adaptation measures in new developments. In 2009 Francesca moved to a company specialised in taking part to tenders financed by the United Nations, the World Bank, the European Union and the Italian Ministry of Foreign Affairs for development programmes. Her role as Project Manager focused on the supply of off-grid renewable energy technologies for rural electrification. The current Project Manager position involves executing and managing CDM/JI validation and verification assignments, executing and managing verification under voluntary schemes, and providing global support and training in the relevant specialized technical areas within the DNV global Climate Change Services team.

Philippe Decq holds a Master Degree in Geography and has an overall experience of around 20 years. Prior to joining DNV, he has 10 years' experience in Environmental consulting in Africa and France. Philippe was involved in Environmental impact study, due diligence audit, Environmental Management Systems auditing and was Project Manager for large Oil and Gas or Waste Management projects including composting and landfill. He has experience of around 10 years as Environmental Management System Auditor including 5 years in validation and verification of CDM projects/JI and other 3rd party validation/verification services (including EU ETS verification). His qualification, industrial experience and experience in CDM demonstrate him sufficient sectoral competence in waste handling and disposal and Energy Generation from renewable energy sources.

Elfride Covarrubias is the DNV KEMA Manager in charge of Climate Change and Environmental Services in South Europe, Africa and Middle East; in the last years she has been developing business in Africa bridging European initiatives and funds into the African market.

Ms. Covarrubias holds two Master Degrees, once on Pollution & Environmental Control, and on Environmental Science, she holds the Bachelor's Degree in Environmental Engineering. She has 20 years of working experience at international level. Prior to joining DNV KEMA she has been working in projects in Latin America through the World Bank programme in Bolivia; on the O&G sector in Mexico with a consultancy division of Bureau Veritas, and into the manufacturing car maker General Motors in Mexico. In DNV KEMA, she has followed ISO 14001/EMAS activities with customer and as interface with Accreditation bodies/Surveillance Committees. Moreover, during the last 10 years she has been fully involved into Climate Change activities & projects like those under CDM, EU-ETS systems, ISO 14064, WRI&GHG protocol and other voluntary schemes. Ms. Covarrubias has been working on Climate Change projects developed in Europe, Africa and Middle East, as well as, in China.

Nitin Kapoor holds a Bachelor in Chemical Engineering from BITS-Pilani and is also a qualified Chartered Financial Analyst (CFA) He has an overall experience of 15 years and 4

months as on date (October 2010). Prior to joining DNV he had experience of 10 years and 5 months in Oil & Gas as well as manufacturing sector (food) with leading MNC's like ITC, Coca Cola and Enron Oil and Gas. During his stint in industry part his responsibilities included carrying out energy audits and to identify potential areas of improvement. His experience includes analysis of specific consumptions (primarily on energy, raw materials and utilities) of processes based on historical data, carrying out material balances (heat and mass), analysis of equipment performance and identification and measurement of energy saving opportunities. He has also been responsible for the operations of the complete Crude Distillation Unit in the refinery, complete platform operations in Oil and Gas sector as well as for the utilities like steam, AHU while at ITC. He also has been responsible of the ETP operations in Coca Cola and ITC as well as Water and Sewage treatment plants while working offshore. He has been responsible for EMS and QMS at ITC and Coca Cola. He has experience of around 3.5 years in validation and verification of numerous CDM projects within DNV. He is also a Lead Auditor for QMS, auditor for EMS and Safety. His qualification, industrial experience and project experience in CDM demonstrate his sufficient sectoral competence in Energy Generation from renewable energy sources, energy efficiency, heat distribution energy demand as well as waste handling and disposal. His direct work experience in Oil and Gas and food sector demonstrates his sectoral competence in these industries as well.

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