





Validation report form for post-registration changes for CDM programme of activities

(version 01.0)

Complete this form in accordance with the "Attachment: Instructions for filling out the validation report form for post-registration changes for CDM programme of activities" at the end of this form.

VALIDATION REPORT ON POST-REGISTRATION CHANGES (PRCs)

Title and reference number of the programme of activities (PoA)	Solar Water Heater Programme in Tunisia 4659
Process track	<input type="checkbox"/> Prior approval <input checked="" type="checkbox"/> Issuance <input type="checkbox"/> Renewal of crediting period
Version number of the validation report on PoA PRCs	02
Completion date of the validation report on PoA PRCs	29/04/2017
Version number of PoA-DD and/or CPA-DD applicable to this validation report	PoA-DD Version 6 CPA-DD, Version 6.1
Type(s) of PoA PRCs	<input checked="" type="checkbox"/> Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline <input checked="" type="checkbox"/> Corrections <input type="checkbox"/> Changes to the start date of the crediting period <input type="checkbox"/> Inclusion of a monitoring plan to a registered PoA <input type="checkbox"/> Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline <input type="checkbox"/> Types of changes specific to afforestation and reforestation activities <input type="checkbox"/> Changes to the programme design of a registered PoA <input type="checkbox"/> Changes to project design of generic component project activities or specific-case component project activities
Coordinating/managing entity (CME)	Agence Nationale pour la Maîtrise de l'Energie-ANME-
Host Party(ies)	Tunisia
Sectoral scope(s)	Sectoral scope 1 - Energy industries (renewable - / non-renewable sources)
Selected methodology(ies)	AMS.I.C. Thermal energy production with or without electricity, version 17
Selected standardized baseline(s), where applicable	N/A

Name of DOE	 LGAI Technological Center, S.A. (Applus+)
Name, position and signature of the approver of the validation report on PoA PRCs	 B.U. System Certification Area Manager: Juan Sendin Caballero

SECTION A. Executive summary

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LGAI Technological Center, S.A. (hereinafter referred as *Applus+ LGAI*) has been contracted by the *Agence Nationale pour la Maîtrise de l'Energie* (the project participant for this PoA and hereinafter referred as *ANME*) to perform the verification conduction of *Solar Water Heater Programme in Tunisia* (UNFCCC Ref. No.4659).

Applus+ LGAI confirms that the following documentation has been reviewed:

- a) The already registered PoA-DD as well as CPA-DD's, including the monitoring plan and the applicable validation report;
- b) Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board;
- c) UNFCCC procedures, methodologies and guidelines.
- d) Monitoring report of this PoA and all applicable documentation which is implied under Request for Issuance stage.

Solar Water Heater Programme in Tunisia (UNFCCC Ref. No.4659) is a small-scale programme of activities (hereafter referred to as "the PoA"). It is based on the installation of domestic solar water heaters (hereafter referred to as "SWH") in households throughout Tunisia. The objective of the PoA is to support the development of solar energy for water heating in Tunisia, in line with the 11th Plan set by the Tunisian government.

This PoA is regarded as a voluntary action which is not required by law. The same was launched in January 2007 by the *Tunisian National Agency for Energy Conservation* (*Agence Nationale pour la Maîtrise de l'Energie – ANME*) and is undertaken in conjunction with a nation-wide loan support solar programme known as "Prosol 2 – Residential". The stated goal of the PoA was to install around 30,000 SWH per year in households, thereby displacing carbon intensive electricity from the grid and fossil fuels currently used to provide hot water in the households.

As a result, thanks to this PoA it has been installed 103,427 SWH's across Tunisia; which means that the total number of installed square meters of collectors of each individual CPA remains below the small-scale threshold of 64,000 m² applicable to solar energy projects, as per Appendix B to the decision 21/cp.8 of the document FCCC/CP/2002/7/Add.3. The typical capacity of the storage tank ranges from 200 to 300 litres and the typical surface of the collector are between 2 and 4 m². The capacity and surface varies according to the household's choice and demand.

The project started implementation on 23/01/2007, but only the SWH's installed between 01/01/2008 and 31/12/2011 have been taken into account within this PoA and the different CPA's which are referred here below.

The aim of this Post Registration Changes validation report, hereinafter referred as PRC, is to address DOE's requested corrections after on-site assessment conduction which refer to project information, being focused on the already registered PoA and CPA's. These corrections do not affect the design of the PoA and as a result, as per current version of CDM Project Standard, the same do not require prior approval by the CDM Executive Board (the Board).

PoA consist on 8 CPA's which are clearly detailed in the below table (Table 1).

Table 1.

In this table, which correspond to section A.1.2 in the applicable Monitoring Report, it is given the name and version number of the generic CPA to which the specific-case CPA applies. All CPA's apply the same generic CPA which has version number 5 as published at UNFCCC under "generic CPA".

a) Generic CPA(s)

Title, identification/reference number and/or version number of the generic CPA(s) of the PoA	Sectoral scope(s)	Applied methodology(ies) or combination of methodologies and/or standardized baseline(s)
Solar Water Heater Programme in Tunisia – Generic CPA X - Version 5 dated 16/02/2011	Sectoral scope 1 - Energy industries (renewable - / non-renewable sources)	AMS.I.C. Thermal energy production with or without electricity, version 17

b) Specific-case CPA(s) covered in this monitoring report

Reference number of the specific- case CPA included in the PoA as of the end of this monitoring period	Title, identification/ reference number and version number of the specific CPA to which the specific-case CPA applies	Crediting period dates of the specific-case CPA	Is this specific-case CPA covered in this monitoring report? (yes/no)
4659-0001	Solar Water Heater Programme in Tunisia – CPA 1 – Version 6 .1(Updated after this verification)	13/05/2011 – 12/05/2021	yes
4659-0002	Solar Water Heater Programme in Tunisia – CPA 2 - Version 3	24/08/2012 – 23/08/2022	yes
4659-0003	Solar Water Heater Programme in Tunisia – CPA 3 - Version 3	24/08/2012 – 23/08/2022	yes
4659-0004	Solar Water Heater Programme in Tunisia – CPA 4 - Version 3	24/08/2012 – 23/08/2022	yes
4659-0005	Solar Water Heater Programme in Tunisia – CPA 5 - Version 3	24/08/2012 – 23/08/2022	yes
4659-0006	Solar Water Heater Programme in Tunisia – CPA 6 - Version 3	24/08/2012 – 23/08/2022	yes
4659-0007	Solar Water Heater Programme in Tunisia – CPA 7 - Version 2	15/12/2012 – 14/12/2022	yes
4659-0008	Solar Water Heater Programme in Tunisia – CPA 8 - Version 2	02/01/2013 – 01/01/2023	yes

In concrete terms, during the desk review and on-site inspection conducted by Applus+ LGAI within September-October 2015, it was identified that within CPA-1, some significant differences regarding the description of SWH's between the documentation which was already registered and the documentation which was submitted for request for issuance. These differences refer to:

- CPA-1 for request for issuance referred to new models of SWH's which were not described within the previous already registered version. In concrete terms, the following models were added to the new version: 307, 1401, 2101, 2102, 2103, 2104, 2201 and 2202.
- CPA-1 already registered document referred to some parameters regarding Emission Reduction (ER) calculation under an incorrect way. In concrete terms, it was found that the parameters known as O_k factor (MWh/y) and Annual energy output of the SWH were incorrectly defined. To illustrate this point,

SWH model identified as 1901, O_k factor was defined as 2278 MWh/y where it should be 1400 and SWH model identified as 1902, O_k factor was defined as 2000 MWh/y where it should be 2538.

- In addition, comparing the O_k values for each SWH model with all the Workbooks applicable for CPA's 1 to 8, some inconsistencies for 17 SWH's have been found. In concrete terms, these inconsistencies have been found for the SWH models identified as: 305, 1401, 1402, 1403, 1801, 1802, 1803, 1804, 1901, 1902, 2002, 2101, 2102, 2103, 2104, 2201, 2202).

As a result, the aforementioned inconsistencies derived in differences between the ER calculation results. In concrete terms, ER under CPA 1 shall refer to 71598 tCO₂ instead of 72421 tCO₂e of the CPA-1 original Ed5. The emission reduction calculations for CPA1 as well as the global ER value have been updated accordingly. For the sake of clarity, all O_k values and ER calculations for CPA2-8 have been carefully checked under the same scope of finding and the same have been regarded as correct.

To sum up, this finding was regarded as Corrective Action Request which implies PP to correct applicable documentation. This finding is also described under Applus+ LGAI CAR #1 in appendix 4 of Final verification report, as well as under section D of this PRC Validation report.

Once PP has worked on requested corrections, Applus+ LGAI has determined that the proposed or actual post-registration changes to the registered CDM PoA and/or CPA comply with the relevant CDM requirements.

All in all, Applus+ LGAI confirms that the PoA is currently implemented in accordance with the already validated and registered CPA-DD's and conducted corrections.

SECTION B. Validation team, technical reviewer and approver

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B.1. Validation team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader	IR	Sitjes Cabanas	Miquel (MSC)	Applus+ LGAI (Central Site)	X	X	X	X
2.	Auditor	IR	Rodrigo Vega	Natalia (NRV) ¹	Applus+ LGAI (Central Site)	X	X	X	X

B.2. Technical reviewer and approver of the validation report on PoA PRCs

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	EI	Shen	Simon	Applus+ Shanghai
2.	Approver	IR	Sendin Caballero	Juan	Applus+ LGAI

SECTION C. Means of validation**C.1. Desk review**

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The Monitoring Report version 01 dated 25/06/2015 (document referred as /01/ in Appendix 3) submitted by the PP was made publicly available on the UNFCCC website before the verification activities started. The published CDM-POA-MR was assessed based on all the relevant documents. The aim of the assessment in the desk review was to:

- Verify the completeness of the data and the information presented in the CDM-POA-MR;
- Evaluate the compliance of the CDM-POA-MR with regarding the monitoring plan depicted in the registered PoA—DD Ver 06 dated 16/02/2011 (document referred as /02/ in Appendix 3), with the generic CPA (document /03/) and with the 8 CPA's (different versions and dates, documents: /04/, /05/, /06/, /07/, /08/, /09/, /10/, and /11/).
- Verify that the applied monitoring methodology and monitoring plan were carried out accordingly. In addition, it was applied particular attention to the frequency of measurements, the quality of the metering equipment, the quality assurance and quality control procedures;
- Evaluate the data management and the quality assurance and quality control system in the context of their influence regarding the generation and reporting of emission reductions;
- Evaluate the following documentation:

(a) The registered PoA-DD (doc /02/) as well as registered CPA-DD's (docs: /04/, /05/, /06/, /07/, /08/, /09/, /10/, and /11/), including the monitoring plan and the applicable validation report: TUV Sud, number 600500202, dated 28/03/2011 (document /12/).

(b) Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board;

(c) All information and references relevant to the project activity's resulting in emission reductions.

¹ Natalia Rodrigo was already qualified as auditor when this PRC Report was edited.

A complete list of documents reviewed is available in Appendix 3 of this report.

C.2. On-site inspection

Duration of on-site inspection: 28/09/2015 to 02/10/2015				
No.	Activity performed on-site	Site location	Date	Team member
1.	<ul style="list-style-type: none"> - Initial meeting - Confirm the implementation and operation of the project; - Review the data flow for generating, aggregating and reporting the monitoring parameters; - Confirm the correct implementation of procedures for operations and data collection; - Cross-check the information provided in the CDM-POA-MR documentation with other sources; - Review the calculations and assumptions used to obtain the GHG data and ER; - Evaluate the monitoring methodology against the requirements of the CPA-DD and the approved methodology, including calibrations, maintenance, etc.; 	PP's Offices (Tunisia)	28/09/2015	MSC NRV
2.	<ul style="list-style-type: none"> - Confirm if the sampling approach conducted by ANME was accordingly implemented in line with UNFCCC requirements regarding the ER calculation methodology. 	Different provinces of Tunisia:	29/09/2015 30/09/2015 01/10/2015	MSC NRV
	<i>On site visits SWH (1a)</i>	<i>Nabeul province (Zone West)</i>	<i>29/09/2015</i>	<i>MSC</i>
	<i>On site visits SWH (1b)</i>	<i>Grand Tunis – province Manzah</i>	<i>29/09/2015</i>	<i>NRV</i>
	<i>On site visits SWH (2a)</i>	<i>Grand Tunis – province Mannouba</i>	<i>30/09/2015</i>	<i>MSC</i>
	<i>On site visits SWH (2b)</i>	<i>Nabeul province (Zone East)</i>	<i>30/09/2015</i>	<i>NRV</i>
	<i>On site visits SWH (3a)</i>	<i>Bizerte province</i>	<i>01/10/2015</i>	<i>MSC</i>
	<i>On site visits SWH (3b)</i>	<i>Grand Tunis – province Ben Arous</i>	<i>01/10/2015</i>	<i>NRV</i>
	<ul style="list-style-type: none"> - Cross-check the information provided in the CDM-POA-MR documentation with other sources - Review the calculations and assumptions used to obtain the GHG data and ER - Identify if the quality control and quality assurance procedures are in place to prevent or correct errors or omissions in the reported parameters. - Final meeting 	PP's Offices (Tunisia)	02/10/2015	MSC NRV

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1	Jaafar	Afef	Project Manager, ANME	28/09/2015	Operation of the project activity; Implementation of the monitor plan of the project activity; Data collection and data achievement; Equipment maintenance	MSC / NRV
2	Besbes	Mouna	Project Coordinator, ANME	28/09/2015	Operation of the project activity; Implementation of the monitor plan of the project activity; Data collection and data achievement; Equipment maintenance	MSC / NRV
3	Fischer	Inga	CO ₂ Operations Project Manager, Solvay Energy Services	28/09/2015	Operation of the project activity; Implementation of the monitor plan of the project activity; Data collection and data achievement; Equipment maintenance	MSC / NRV
4	Selected Households of DOE Sampling Plan (refer to Appendix 5)			29/09/2015	SWH Installation date	MSC / NRV
5	Selected Households of DOE Sampling Plan (refer to Appendix 5)			30/09/2015	Frequency of SWH usage	MSC / NRV
6	Selected Households of DOE Sampling Plan (refer to Appendix 5)			01/10/2015	Conformance with SWH	MSC / NRV

C.4. Clarification requests, corrective action requests and forward action requests raised

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PoA-DD and/or CPA-DD form(s)	-	1	-
Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline	1	-	-
Corrections	-	1	-
Changes to the start date of the crediting period	-	-	-
Inclusion of a monitoring plan in a registered PoA	-	-	-
Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline	-	-	-
Types of changes specific to afforestation and reforestation project activities	-	--	-
Changes to the programme design of a registered PoA	-	-	-
Changes to project design of generic component project activities or specific-case component project activities	-	-	-
Others (please specify)	-	-	-

Total	1	2	-
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SECTION D. Validation findings

D.1. Compliance with PoA-DD and/or CPA-DD form(s)

Means of validation	By means of desk review and interview during on-site assessment, Applus+LGAI proceeded to raise CAR#2 which imply corrections on already registered CPA-1. As these correction also imply a PRC process, it is indispensable to evaluate if CPA-1 version is in line with the current one.
Findings	As per VVS and CDM PS requirements and after evaluating current version of CPA form and comparing the same with the already registered one, it is confirmed that CPA-1 version is needed to be updated to the current one. As a result, CAR#2 has been raised.
Conclusion	PP has provided updated version of CPA-DD (version 6.1) as per current applicable template. DOE, after means of desk review does confirm that the scope and content of corrected CPA-DD is in line with current criteria. Therefore, CAR#2 is closed.

D.2. Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline

Means of validation	Desk review and interview with PP.
Findings	During completeness check stage, it was found that the PoA-DD and CPA-DDs stated that the number of operating units were needed to be determined through an annual verification implemented by the ANME. However, the monitoring report and verification report stated that the monitoring frequency of the failure rate of the SWH ($F_{x,y}$) is once per monitoring period (paragraph 299 of the VVS version 09.0) (CL#1)
Conclusion	In line with CL#10 scope, PP justified that the reason of selecting a monitoring frequency of the failure rate of the SWH ($F_{x,y}$) as once per monitoring period, is in line with the following: The randomly established plan implied a high number of on-site visits within Tunisia. Moreover, besides the fact that it was very costly, Tunisia's post revolution context made the access to many region very difficult. All these reasons made the monitoring plan on an annual basis quite impossible. The approach taken has been proven to be conservative since the failure rate used for the whole monitoring period is the one related to the year that immediately precede the end of the monitoring period which can only be higher or equal to the failure rate of the first years of the monitoring period following the registration of the PoA and the inclusion of the CPAs. The justification provided by PP is proved as realistic and conservative, in line with VVS 9. In addition, no affections to additionality, project design or ER calculations are found. CL#1 is closed

D.3. Corrections

Means of validation	During the desk review and on-site inspection conducted by Applus+ LGAI on September-October 2015, it was identified that within CPA-1, some significant differences regarding the description of SWH's between the documentation which was already registered and the documentation which was submitted for request for issuance. These differences refer to: <ul style="list-style-type: none"> - CPA-1 for request for issuance referred to new models of SWH's which were not described within the previous already registered version. In concrete terms, the following models were added to the new version: 307, 1401, 2101, 2102, 2103, 2104, 2201 and 2202.
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	<ul style="list-style-type: none"> - CPA-1 already registered document referred to some parameters regarding Emission Reduction (ER) calculation under an incorrect way. In concrete terms, it was found that the parameters known as O_k factor (MWh/y) and Annual energy output of the SWH were incorrectly defined. To illustrate this point, SWH model identified as 1901, O_k factor was defined as 2278 MWh/y where it should be 1400 and SWH model identified as 1902, O_k factor was defined as 2000 MWh/y where it should be 2538. - In addition, comparing the O_k values for each SWH model with all the Workbooks applicable for CPA's 1 to 8, some inconsistencies for 17 SWH's have been found. In concrete terms, these inconsistencies have been found for the SWH models identified as: 305, 1401, 1402, 1403, 1801, 1802, 1803, 1804, 1901, 1902, 2002, 2101, 2102, 2103, 2104, 2201, 2202).
Findings	<p>The aforementioned inconsistencies derived in differences between the ER calculation results. In concrete terms, ER under CPA 1 shall refer to 71598 tCO₂ instead of 72421 tCO₂e.</p> <p>As a result, it was not possible to verify CPA-1 as per its already registered description.</p> <p>This finding was regarded as Corrective Action Request //CAR #1// which implies PP to correct applicable documentation.</p>
Conclusion	<p>PP has proceeded to correct affected CPA-1. The emission reduction calculations for CPA1 as well as the global ER value have been updated accordingly.</p> <p>Applus+ LGAI confirms that the submitted documentation and applicable corrections are found correct as per previous description of finding.</p> <p>Therefore, //CAR #1// is closed.</p>

D.4. Changes to the start date of the crediting period

Means of validation	Not applicable for this PoA
Findings	-
Conclusion	-

D.5. Inclusion of a monitoring plan in a registered PoA

Means of validation	Not applicable for this PoA
Findings	-
Conclusion	-

D.6. Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline

Means of validation	Not applicable for this PoA
Findings	-
Conclusion	-

D.7. Types of changes specific to afforestation and reforestation activities

Means of validation	Not applicable for this PoA
Findings	-
Conclusion	-

D.8. Changes to the programme design of a registered PoA

Means of validation	Not applicable for this PoA
Findings	-
Conclusion	-

D.9. Changes to project design of generic component project activities or specific-case component project activities

Means of validation	Not applicable for this PoA
Findings	-
Conclusion	-

SECTION E. Internal quality control

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As a final step of validation, the final documentation including the PRC validation report needs to follow an internal quality control conducted by the Technical Reviewer. Each report has to be finally approved either by the DOE's Technical Manager or the Deputy. In case one of these two persons is part of the verification team, the approval can only be given by the person who is not a part of the verification team. If the documents have been satisfactorily approved, the Request for Issuance is submitted to the CDM-EB along with the relevant documents.

SECTION F. Validation opinion

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Applus+ LGAI has been contracted by Agence Nationale pour la Maîtrise de l'Energie to perform the 1st periodical verification of Solar Water Heater Programme in Tunisia (UNFCCC Ref. No.4659) in the period 13/05/2011 - 31/12/2014.

Applus+ LGAI concludes that the CDM Project "Solar Water Heater Programme in Tunisia", as described in the monitoring plan contained in the registered PoA-DD (Ver 06 dated 16/02/2011 - doc /02/), in the eight registered CPA's: different versions and dates, documents: /04/ CPA-1 registered, (/23/ CPA-1 has been updated after the on-site verification, see CAR-01), /05/, /06/, /07/, /08/, /09/, /10/, and /11/) and in the Monitoring Report version 02 dated 10/11/2015 (document referred as /22/ in appendix 3), meets all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The verification is conducted in line with the VVS 9 requirements. The Project is implemented according to selected monitoring methodology (AMS.I.C/ Thermal energy production with or without electricity, version 17. Document /26/ in appendix 3 and the monitoring plan contained in the registered PoA-DD (doc /02/). The monitoring equipment was installed and maintained in a proper manner. The monitoring system is in place and the Project is generating GHG emission reductions as a CDM project.

Applus+ LGAI confirms that the project is implemented in accordance with the validated and registered PoA-DD /02/. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents. Based on the information seen and evaluated we confirm that the implementation of the project has resulted in 90,148.0 tCO₂e emission reductions during the period 13/05/2011 – 31/12/2014 (both days included).

Applus+ LGAI therefore issues the positive validation opinion.

Appendix 1. Abbreviations

Abbreviations	Full texts
ACM	Approved Consolidated Methodology
AM	Approved Methodology
AMS	Approved Methodology Small Scale
ANME	Agence Nationale pour la Maîtrise de l'Energie
Applus+ LGAI	LGAi Technological Center, S.A. (Applus). DOE CDM-0032
BM	Build Margin
CAR	Corrective Action Requested
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CER	Certified Emission Reduction
CM	Combined Margin
CMP	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
EIA	Environmental Impact Assessment
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	Greenhouse Gas(es)
IPPC	Intergovernmental Panel on Climate Change
IRL	Information Reference List
IRR	Internal Rate of Return
KP	Kyoto Protocol
MP	Monitoring Plan
CDM-POA-MR	Monitoring Report
NGO	Non-Governmental Organization
OM	Operational Margin
PP	Project Participant
PRC	Post Registration Changes
SWH	Solar Water Heater
UNFCCC	United Nations Framework Convention for Climate Change
VVS	Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers

WORK TEAM MEMBER	TECHNICAL ROLES	SHORT PRESENTATION
Miquel Sitjes Cabanas	CDM Technical Manager and Lead Auditor for the assessment of this PoA	<p>CDM-PoA-MR. Miquel Sitjes Cabanas has a Bachelor Science degree in Chemistry by the Universidad de Barcelona – Spain (1975). He has 15 years of experience in a Spanish chemical group company specialized in the manufacturing of raw chemical products, where he worked as the Manager of Production and Quality and Environmental Control. He also worked in the Spanish pharmaceutical industry for 7 years as Quality, Manufacturing and Environmental Manager.</p> <p>Currently, he works for Applus+ LGAI Technological Center since 1999.</p> <p>Since 2006, he is the Technical Manager of Applus+LGA, working under quality, and environmental standards such as ISO 9001, ISO 14001, GHG Verification, CDM, VCS and GS.</p> <p>He is qualified as Lead Auditor and Technical Reviewer under sectoral scopes 1 and 13.</p>
Simon Shen	CDM Technical Reviewer for this PoA	<p>CDM-PoA-MR. Simon Shen has a Master Degree in Thermal Energy Engineering and a Bachelor Degree in Environmental Engineering. Simon is a qualified Lead Auditor and Technical Reviewer appointed by Applus+ LGAI for the GHG project assessment. He is based on Shanghai. He has several years of work experience in environmental protection field. Before he joined Applus+ LGAI, he had been worked for TÜV SÜD as a GHG Validator/Verifier and ISO 9001/14001 Lead Auditor for 3.5 years. Simon has been working for Applus since 2010.</p> <p>He is qualified as Lead Auditor and Technical Reviewer under sectoral scopes 1 and 13 by our DOE.</p> <p>Simon is a world widely appreciated lead auditor/technical reviewer within CDM activity.</p>
Ms. Natalia Rodrigo	CDM Auditor	<p>Ms. Natalia Rodrigo Vega has a Bachelor's Degree on Environmental Engineering and Master's Degree on Environmental and Quality Management System (under ISO 9001 and 14001).</p> <p>She Works in Applus Environmental and Quality Management Systems Department since March 2012, being specially involved on technical support tasks related to CDM-VCS and GS Standards, among others (i.e GHG verification and Proyecto Clima)</p>

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
Basic Documents (Monitoring Report, Project Design Documents, Previous Validation Report)				
/01/	ANME	Monitoring report Ver01	ver 1.0, date 25/06/2015)	PP
/22/	ANME	Monitoring report Ver02 (file: MR_MP#1_PoA-4659_0001-0008_10NOV2015_CLEAN VERSION)	Ver 2.0 date 10/11/2015	PP
/23/	ANME	Monitoring report Ver03 (file:version 4, 29/03/2017)	Ver 4.0 date 29/03/2017	PP
/02/	ANME	POA-DD design document registered	(Version 6, 16/02/2011)	PP
/03/	ANME	Generic CPA design document	(Version 5, 16/02/2011)	PP
/04/	ANME	CPA-DD 1 real case (registered)	(version 5, 16/02/2011)	PP
/23/	ANME	CPA-DD 1 real case (updated after this verification, file: UPDATED2016_CPA-DD-01 real case CLEAN)	(version 6.1, CLEAN VERSION 29/09/2016	PP
/05/	ANME	CPA-DD 2	(version 3, 16/07/2012)	PP
/06/	ANME	CPA-DD 3	(version 3, 16/07/2012)	PP
/07/	ANME	CPA-DD 4	(version 3, 16/07/2012)	PP
/08/	ANME	CPA-DD 5	(version 3, 16/07/2012)	PP
/09/	ANME	CPA-DD 6	(version 3, 16/07/2012)	PP
/10/	ANME	CPA-DD 7	version 2, 29/11/2012)	PP
/11/	ANME	CPA-DD 8	(version 2, 29/11/2012)	PP
/12/	TUV SUD	Validation Report PoA (TUV SUD)	Ver 4, 25/02/2011	UNFCCC WorkFlow
/13/	ANME	WB_MP#1_PoA-4659_0001 (Excel sheet)	(Date 19/06/2015)	PP
/24/	ANME	WB_MP#1_PoA-4659_0001_10NOV2015 (Updated)	Date 10/11/2015	PP
/14/	ANME	WB_MP#1_PoA-4659_0002	Date 19/06/2015	PP
/15/	ANME	WB_MP#1_PoA-4659_0003	Date 19/06/2015	PP
/16/	ANME	WB_MP#1_PoA-4659_0004	Date 19/06/2015	PP
/17/	ANME	WB_MP#1_PoA-4659_0005	Date 19/06/2015	PP
/18/	ANME	WB_MP#1_PoA-4659_0006	Date 19/06/2015	PP
/19/	ANME	WB_MP#1_PoA-4659_0007	Date 19/06/2015	PP
/20/	ANME	WB_MP#1_PoA-4659_0008	Date 19/06/2015	PP
/21/	ANME	WB_summary_MP#1_PoA-4659_0001-0008	Date 19/06/2015	PP
/25/	ANME	WB_summary_MP#1_PoA-4659_0001-0008_10NOV2015	Date 10/11/2015	PP

		UPDATED		
References and requirements at UNFCCC/IPCC/etc.				
--	UNFCCC	VVS, Version 09.0	20/02/2015	UNFCCC
--	UNFCCC	PS, Version 09.0	20/02/2015	UNFCCC
/26/	UNFCCC	AMS-I.C. (version 17.0.0): // EB54_repan09_AMS-I.C_ver17 (applicable methodology to this PoA)	25/11/2005	UNFCCC
--	UNFCCC	Guidance to Complete "Monitoring Report Form (F-CDM-MR), Version 05.1" as accordance with the Attachment "Instructions for filling out the monitoring report form"	04/05/2015	UNFCCC
--	UNFCCC	Tool to calculate the emission factor for an electricity system (Version 02.2.1)	29/09/2011	UNFCCC
--	IPCC	IPCC Guidelines Vol. 2	Year 2006	IPCC
/37/	UNFCCC	Standard - Sampling and surveys for CDM PA and PoA V4.1	28/11/2013	UNFCCC
/38/	UNFCCC	Guideline - Sampling and surveys for CDM PA and PoA V3.0	04/10/2013	UNFCCC
/46/	UNFCCC	Tool to calculate the emission factor for an electricity system (annex 1)	29/09/2011	UNFCCC
Project implementation information				
/27/		File SWH example		PP
/28/		% ancien mode de chauffage - CPA1		PP
/29/		RetScreen13		PP
/30/		IPCC 2006 page 24-25		PP
/31/		CL5_IPCC 2006_value transformation		PP
/32/		Rapport technique Calculation production SWH kWh-y		PP
/35/		Tourisme tunisien en chiffres 2008.tif		PP
/36/		ra_steg_2005		PP
/39/		fiche_controle		PP
/40/		fiche_validation_echantillonnage		PP
/42/		solo_2000_doc		PP
/43/		Thermometer		PP
/44/		STEG Electricity Retrospective Statistics 2000-2010.		PP
/45/		STEG – Statistiques Rétrospectives d'Electricité 1997-2007.		PP
Procedures and standards				
/41/		ANME procedure visites control Prosol	15/09/2014	PP
Legislative Conformance				
/47/		Decree 2009-362- <i>Tunisian Industry and Energy Ministry Definition of grants regarding energy management sector,</i>		
Others (Evidences CAR – CL)				
/33/		CAR1_OK_values_check_10NOV2015_v2	10/11/2015	PP

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 2. CL from this validation

No applies

CL ID	#1	Section no.	D	Date: 14/02/2017
Description of CL				
It was also found that the PoA-DD and CPA-DDs stated that the number of operating units were needed to be determined through an annual verification implemented by the ANME. However, the monitoring report and verification report stated that the monitoring frequency of the failure rate of the SWH ($F_{x,y}$) is once per monitoring period (paragraph 299 of the VVS version 09.0) (CL#1)				
CME's response				Date: 29/03/2017
<p>The PoA-DD and CPA-DDs state that the number of operating units is to be determined through an annual verification implemented by the ANME. However, the monitoring report and verification report state that the monitoring frequency of the failure rate of the SWH ($F_{x,y}$) is once per monitoring period. As a result, a temporary deviation was opened.</p> <p>This choice was made because, following the sample plan randomly established, the monitoring implies a high number of visits on the field all around Tunisia. Moreover, besides the fact that it's very costly, Tunisia's post revolution context made the access to many region very difficult. All these reasons made the monitoring on an annual basis quite impossible.</p> <p>The approach taken has been proven to be conservative since the failure rate used for the whole monitoring period is the one related to the year that immediately precede the end of the monitoring period which can only be higher or equal to the failure rate of the first years of the monitoring period following the registration of the PoA and the inclusion of the CPAs.</p>				
Documentation provided by CME				
Corrected MR, version 4 dated 29/03/2017 (section E).				
DOE assessment				Date: DD/MM/YYYY
<p>In line with CL#10 scope, PP justified that the reason of selecting a monitoring frequency of the failure rate of the SWH ($F_{x,y}$) as once per monitoring period, is in line with the following: The randomly established plan implied a high number of on-site visits within Tunisia. Moreover, besides the fact that it was very costly, Tunisia's post revolution context made the access to many region very difficult. All these reasons made the monitoring plan on an annual basis quite impossible.</p> <p>The approach taken has been proven to be conservative since the failure rate used for the whole monitoring period is the one related to the year that immediately precede the end of the monitoring period which can only be higher or equal to the failure rate of the first years of the monitoring period following the registration of the PoA and the inclusion of the CPAs.</p> <p>The justification provided by PP is proved as realistic and conservative, in line with VVS 9. In addition, no affections to additionality, project design or ER calculations are found.</p> <p>CL#1 is closed</p>				

Table 3. CAR from this validation

CAR ID	#01	Section no.	D	Date: 16/11/2015
Description of CAR				

The PP is requested to clarify why given values for O_k (*Annual energy output of each type of SWH, MWh/y*) differ from data defined within applicable and registered CPA's, which also means, they differ from the O_k data parameters contained within the calculation sheet named as *WB_MP#1_PoA-4659_000n, sheet 5, SWH data*. This issue is also found within Monitoring Report (MR), version 1.

e.g:

Model 1901

CPA-1, $O_k = 2.278$ MWh/y and calculation sheet = 2.278

CPA-2, 1.4 MWh/y and calculation sheet = 1.4

In MR = 2.278

Model 1902

CPA-1, $O_k = 2.000$ MWh/y and calculation sheet = 2.000

CPA-2, 2.538 MWh/y and calculation sheet = 2.538

In MR = 2.538

Model 2002

CPA-2, 1.658 MWh/y and calculation sheet = 1.658

In MR = 2.006

CME's response

Date: 25/01/2016

All OK values which were used in the emission reduction calculations have been verified in different cross-checks. Each check is in detail described below. The resulting updates in the excel calculations are explained as well. Finally the additional proof documents have been listed.

CHECK 1: WB CPA "1" versus WBs CPA"2-8":

- By comparing the OK values for each SWH model between all the Workbooks CPA1-8 inconsistencies for 17 SWH models have been found. (305, 1401, 1402, 1403, 1801, 1802, 1803, 1804, 1901, 1902, 2002, 2101, 2102, 2103, 2104, 2201, 2202). More precisely it could be concluded that inconsistencies occurred exclusively for CPA1.

CHECK 2: ER PDD ex-ante CPA "1" versus ER PDD ex-ante CPA "2-8":

- By comparing the OK values for each SWH model between all ER PDD ex-ante CPA1-8 the identical inconsistencies have been found as in CHECK 1.

CHECK 3: OK value currently listed in ANNEX MR:

- In a next step it was checked which OK value was listed in the Annex of the Monitoring Report version 1, CPA 1 (meaning incorrect value) or CPA2-8 (meaning correct value). In total 10 incorrect values have been listed. (305, 1801, 1803, 1804, 1901, 2002, 2101, 2102, 2104, 2201). These 10 values have been updated.

Conclusion for correct value: always "2-8":

- For the sake of clarity, all OK values for CPA2-8 are correct. A more detailed proof was provided.
- The emission reduction calculations for CPA1 as well as the global ER value have been updated accordingly.

Conclusion for CAR1:

- Update WB CPA1 with correct values was done.
- Update WB summary with correct values was done.

Update MR Annex with correct values was done.

Documentation provided by CME

- CAR1_OK_values_check_10NOV2015_v2.xlsx
- WB_MP#1_PoA-4659_0001_10NOV2015.xlsx
- WB_summary_MP#1_PoA-4659_0001-0008_10NOV2015.xlsx
- MR_MP#1_PoA-4659_0001-0008_10NOV2015_track change.pdf

DOE assessment

Date: 20/01/2016

Data information included within the submitted documentation is regarded as enough and sufficient, the O_k parameter has been reviewed and updated in cases of mistake, for each SWH, in updated MR, updated CPA-1 and updated Calculation Sheet-1. The ER have been re-calculated in Calculation Sheet-1, Sheet Summary, MR and found correct.

CAR-1 is CLOSED due to the submitted documentation and applicable corrections are found correct.

CAR ID	#02	Section no.	D	Date: 01/09/2016
Description of CAR				
PP is requested to update CPA-DD1 under current applicable version as per the requirements of Post Registration Changes process, described under current versions of VVS and CDM PS.				
CME's response				Date: 29/09/2016
CPA-DD 1 has been accordingly modified. Version 6.1, date 29/09/2016				
Documentation provided by CME				
CPA-DD 1 has been accordingly modified. Version 6.1, date 29/09/2016				
DOE assessment				Date: 29/09/2016
PP has provided updated version of CPA-DD as per current applicable template.				
DOE, after means of desk review does confirm that the scope and content of corrected CPA-DD is in line with current criteria.				
Therefore, CAR#2 is closed.				

Table 4. FAR from this validation

No applies

FAR ID	xx	Section no.		Date: DD/MM/YYYY
Description of FAR				
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Document information

Version	Date	Description
01.0	5 June 2015	Initial publication.

Decision Class: Regulatory
Document Type: Form
Business Function: Registration
Keywords: post-registration change, programme of activities, validation report