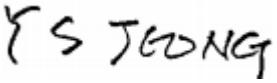
Validation report form for renewal of crediting period for CDM project activities

(Version 03.0)

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION	
Title and UNFCCC reference number of the project activity	· Title: Catalytic N_2O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co. · Ref. no.: 0490
Number and duration of the next crediting period	· Number: 3rd · Crediting Period: 15/09/2020 ~ 14/09/2027
Version number of the validation report	· Version 01.4
Completion date of the validation report	· 25/10/2019
Version number of PDD to which this report applies	· Version 05.1
Project participants	· Carbon Egypt Ltd. · RWE Power AG · Carbon Climate Protection GmbH
Host Party	· Arab Republic of Egypt
Applied methodologies and standardized baselines	· ACM 0019 (version 04.0) N_2O abatement from nitric acid production · No standardized baselines applicable
Mandatory sectoral scopes	· Sectoral scope: 5-Chemical industries
Conditional sectoral scopes, if applicable	· Not applicable
Estimated amount of annual average GHG emission reductions or GHG removals by sinks in the next crediting period	· 1,110,125 tCO_{2e}
Name and UNFCCC reference number of the DOE	· E-0025 : Korean Foundation for Quality (KFQ) · Ref. No.: E-0025
Name, position and signature of the approver of the validation report	Yu Shim JEONG  Technical Managing Director

SECTION A. Executive summary

CARBON Climate Protection GmbH has commissioned Korean Foundation for Quality (KFQ) to carry out the validation of renewal of crediting period of the project activity "Catalytic N2O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co.". This report contains the findings from the validation and validation opinion.

Purpose and general description of the project activity
The CDM project for GHG emission reduction by catalytic N_2O destruction was implemented in Abu Qir, Egypt. The EnviNOx® process used in the Abu Qir II nitric acid (hereinafter called "NA") plant is based on the catalytic reduction of NOx (NO and NO_2) with ammonia (NH_3) and of nitrous oxide (N_2O) with a hydrocarbon. The hydrocarbon used is natural gas of which the main constituent is methane (CH_4). The reactions take place over two iron zeolite catalyst beds.

Validation objective
The objective of the validation for the renewal of crediting period of an existing project activity is to determine whether the project participants have updated the PDD in the sections related to baseline, estimated emission reductions and monitoring plan using the most recent version of the baseline and monitoring methodology applicable for the project activity.

Validation scope
The validation scope is defined as an independent and objective review of the updated project design document (PDD), the validity of the original baseline scenario, estimated emission reductions, monitoring plan and other relevant documents. The information in these documents is reviewed against the criteria stated in the Project Standard for Project Activity (version 02.0) and the relevant decisions by the CDM Executive Board including the approved baseline and monitoring methodology. KFQ has, based on the recommendations in the Validation and Verification Standard for Project Activity (version 02.0) employed a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

Validation process
The validation process includes desk review of the PDD, emission reduction calculation spreadsheets and other supporting documents provided by the PPs. Further, onsite assessment and interviews with relevant personnel are conducted. This is followed by preparation of draft validation report summarizing desk review and on-site assessment findings (i.e. CARs, CLs, and FARs). Upon successful closing of the CARs and CLs raised (if any), the final validation report is prepared. The final report then undergoes a technical review and final approval according to KFQ's internal quality assurance procedures.

Description of the project activity

Host Party	Arab Republic of Egypt
Title of project activity	Catalytic N_2O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co.
UNFCCC Reference Number	0490
Project Participants	CARBON Egypt Ltd. RWE Power AG CARBON Climate Protection GmbH
Baseline and monitoring methodology	ACM0019 (Version 04.0)
Location of the project activity	Address Abu Qir, Al-Iskandariyah Province (Alexandria Province), Arab Republic of Egypt
	GPS Coordinates:

	N31.272513 ° E30.09755 °
Registration Date	07/10/2006
3rd Crediting Period	15/09/2020 ~ 14/09/2027

Conclusion

A CL and a CAR were raised during the course of validation process of renewable crediting period and have been successfully closed.

SECTION B. Validation team, technical reviewer and approver

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/document review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader(*)	IR	CHO	Jin Seok	KFQ	√	√	√	√
2.	Validator	IR	JANG	Pyung Hee	KFQ	√	√	√	√
3.	Validator(*)	IR	LEE	Mi Jung	KFQ	√		√	√

(*) means personnel with technical expertise in technical area 5.2

B.2. Technical reviewer and approver of the validation report for RCP

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	IR	KANG	Yeong Kyeong	KFQ
2.	Approver	IR	JEONG	Yu Shim	KFQ

Please refer to Appendix 2 below for demonstration of how the team meets the competence required for the verification.

SECTION C. Means of validation

C.1. Desk/document review

KFQ's validation is based on the PDD (v05.0 dated 06/08/2019) and the ER spreadsheet (v01.0). Furthermore, the registered PDD and its corresponding validation report for 2nd crediting period were reviewed as well as monitoring reports, the applied baseline and monitoring methodology and any other information and references relevant to the project activity. A complete list of all documents reviewed is shown in Appendix 3 to this report.

C.2. On-site inspection

The following checks and activities in accordance with the VVS (version 02.0) were performed.

Duration of on-site inspection: 27/08/2019				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1	Confirm the project facilities and monitoring equipment against updated PDD	Nitric acid plant of Abu Qir Fertilizer Co.	27/08/2019	Jin Seok CHO Pyung Hee JANG
2	Validity of the baseline - impact of new relevant national and/or sectoral policies	Nitric acid plant of Abu Qir Fertilizer Co.	27/08/2019	Jin Seok CHO Pyung Hee JANG
3	Assess monitoring plan updates - Document review and check of all supporting documentation	Nitric acid plant of Abu Qir Fertilizer Co.	27/08/2019	Jin Seok CHO Pyung Hee JANG
4	Data check for estimation of ER	Nitric acid plant of Abu Qir Fertilizer Co.	27/08/2019	Jin Seok CHO Pyung Hee JANG

C.3. Interviews

No.	**Interviewee**			**Date**	**Subject**	**Team member**
	Last name	**First name**	**Affiliation**			
1	Montasser	Bader	Abu Qir Fertilizer Co.	27/08/2019	Environmental Regulation Production and operating status	Jin Seok CHO Pyung Hee JANG
2	Bichler	Sonja	Carbon Climate Protection GmbH	27/08/2019	Overall management of CDM project	Jin Seok CHO Pyung Hee JANG
3	Fathy	Ashour	Carbon Climate Protection GmbH	27/08/2019	Management of CDM project, Reporting and QA/QC	Jin Seok CHO Pyung Hee JANG
4	Mahmoud	Roshdy	Carbon Climate Protection GmbH	27/08/2019	Management of CDM project, Reporting and QA/QC	Jin Seok CHO Pyung Hee JANG

C.4. Sampling approach

The validation team didn't apply any sampling approach for the project activity. The site visit was conducted for the complete project implemented in the locations/site as mentioned in the PDD.

C.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Area of validation findings	**No. of CL**	**No. of CAR**	**No. of FAR**
Compliance with PDD form	0	0	0
Application and selection of methodologies and standardized baselines	0	0	0
Validity of original baseline or its update	0	0	0
Estimated emission reductions or net anthropogenic removals	1	1	0
Validity of monitoring plan	0	0	0
Crediting period	0	0	0
Project participants	0	0	0
Post-registration changes	0	0	0
Others (please specify)	0	0	0
Total	1	1	0

SECTION D. Validation findings

D.1. Compliance with PDD form

Means of validation	The validation team has checked the updated PDD provided by the PP against the latest version of the PDD form in order to determine, whether the PDD is in compliance with it.
Findings	It was found that there are no deviations between the PDD and the latest PDD form.
Conclusion	The PDD (v05.0) and the updated PDD (v05.1) are compliant with the latest PDD form, following the instructions therein. Hence the validation team confirms that the project participants used the latest version of the PDD form for the updated PDD than the version of the form of the registered PDD. The information transferred to the updated PDD (v05.1) is materially the same as that in the registered PDD (v4.2).

D.2. Application and selection of methodologies and standardized baselines

Means of validation	The validation team assessed the application of methodology through physical observation on site, review of relevant data and information and registered PDD, validation and verification reports. The applicable version of methodology was checked through UNFCCC webpage.
Findings	The PPs have applied the latest methodology, ACM0019 (v04.0) in combination with the applicable tools "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" (v03.0) and "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (v03.0) to the project activity. Compliance with each applicability condition as listed in the chosen baseline and monitoring methodology has been demonstrated in the updated PDD correctly. Furthermore, it was found that there are no standardized baselines applied in the project activity.
Conclusion	KFQ confirms that the chosen baseline and monitoring methodology as well as the tools are applicable to the project activity (no standardized baselines are used in the project activity) and the methodology and tools were applied in accordance with the applicable requirements in the 'CDM project standard for project activities (v02.0)' and 'Validation and Verification Standard for project activities' (v02.0).

D.3. Validity of original baseline or its update

Means of validation	The validation team assessed the validity of the original baseline scenario of its update applying methodological tool "Assessment of the validity of the original/current baseline and update baseline at the renewal of the crediting period (v03.0.1)" and CDM VVS PA (v02.0). For this assessment, the validation team reviewed relevant environmental and climate change related policies and regulations as well as market circumstances relevant to the baseline. As well relevant permit license document from government and operational data were also reviewed and personnel was interviewed at the project site. And all parameters fixed ex-ante determined for the 3rd crediting period were assessed against the applied methodology and tools as well as the registered PDD. According to the Methodological tool of "Assessment of the validity of the original/ current baseline and update of the baseline at the renewal of the crediting period (Version 03.0.1)", the stepwise procedure to assess the continued validity of the baseline and to update the baseline at the renewal of a crediting period are as follows: **Step 1: Assess the validity of the current baseline for the next crediting period** According to the latest version of the "CHECKLIST FOR REQUESTS FOR RENEWAL OF CREDITING PERIOD OF PROJECT ACTIVITIES" approved by the CDM Executive Board, updated PDD is required to incorporate the impact of national and/or sectoral policies and circumstances existing at the time of requesting for renewal of the crediting period on the current baseline emissions, except for the case where the project activity applies the valid version of an

	applicable standardized baseline that standardizes baseline scenario. The validity of the current baseline is assessed using the following Sub-steps: **Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies** As described in the updated PDD, the NOx emissions at nitric acid plant are limited to 400 mg/m^3 for the AFC nitric acid plant in accordance with the existing environmental law, which is in force at the time of requesting for renewal for the crediting period. References, laws and regulations have been reviewed by the validation team. The validation team confirms that the current baseline complies with this policy as verified with the plant's operating parameters records which were provided for the time where the plant operated a SCR DeNOx unit before the start of the project activity in October 2006. No other national and / or sectoral policies applicable to the project activity came into effect after the submission of the project activity for validation, which was attested by document from Egyptian Environmental Affairs Agency, DNA of Egypt.
Findings	**Step 1.2: Assess the impact of circumstances** Since the baseline scenario identified at the validation of the project activity was the continuation of the current practice without any investment -the continuation of emitting N_2O destruction or abatement technologies- an assessment of the changes in the market characteristics shall be applied. Based on the sectoral expertise of the validation team, it confirms that in such kind of projects no potential marketable (by) product exits and thus no financial benefit other than CERs can be generated. It is confirmed that the conditions used to determine the baseline emissions in the previous crediting period are still valid. The assessment of availability of new fuels or raw materials and the impact of electricity or fuel prices in the identification of the current practice for the baseline emissions is not applicable for this kind of projects. **Step 1.3: Assess whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested**. The baseline scenario identified at the validation of the project activity (CDM-PDD version 2(b) dated 20/06/2006) was the continuation of emitting N_2O to the atmosphere at the Abu Qir II nitric acid plant, without the installation of N_2O destruction or abatement technologies. The plant installed in 1987 is a dual pressure plant, manufactured by Uhde GmbH (TKIS). There is no specific lifetime for the nitric acid plant, especially as the NA plant owners are applying continuous maintenance & replacement activities in accordance with supplier recommendation, which increase the operation stability with the highest ongoing performance level. Further, the baseline contains SCR DeNOx unit installed at the plant. Using our sectoral expertise, the validation team confirms that the dual pressure nitric acid plant with SCR DeNOx is currently the state-of-the-art technology, for nitric acid production and NOx abatement respectively considering operational level, the yield rate and reduction level of NOx as well as maintenance status. As demonstrated with technical report issued by Uhde, several nitric acid plants started their operation approximately 25 years ago and are still operational. Taking into account periodic maintenance and lifetime of the nitric acid plant, it is believed that the nitric acid plant can be operated over the renewal crediting period. Thus, it is confirmed that the remaining technical lifetime of the equipment that would have continued to be used in the absence of the project activity, as determined in the CDM-PDD, exceeds the crediting period for which renewal is requested. **Step 1.4: Assessment of the validity of the data and parameters** Parameters fixed ex-ante, which were determined at the start of the 2nd crediting period, are still valid for the 3rd crediting period.

Data & Parameters fixed ex-ante for baseline

Parameter not to be monitored (unit)	Value(s) applied	Assessment
Operating pressure Operating pressure of the ammonia burner (kPa)	383	Same value as used in the 2nd crediting period. Crosschecked the value with NA Plant manual by manufacturer, Uhde and physical inspection.
$EF_{historical}$ Historical baseline emission factor of the nitric acid plant (kg N_2O/t HNO_3)	7.23	This value is based on monitoring data collected during the 1st crediting period and is constant over the 2nd and 3rd crediting period according to the applied methodology, since the NA plant used AM0028 in the 1st crediting period. Crosscheck of the value with the registered PDD for the 2nd crediting period was done. Accordingly, for the 3rd crediting period, the value is valid as used in the 2nd crediting period.
$EF_{default,y}$ Default emission factor according to the operating pressure of the ammonia burner in year y (related to 100 percent pure acid) (kg N_2O/t HNO_3)	value for medium pressure will be applied every year as given in the applied methodology	Same as used for the 2nd crediting period. As confirmed above, the project plant is operating under medium AOR operating pressure. Crosschecked with the applied methodology.
$EF_{new,y}$ Baseline N2O emission factor for nitric acid production in year y (related to 100 percent pure acid) (kg N_2O/t HNO_3)	value will be applied every year as given in the applied methodology	Same as used for the 2nd crediting period. Crosschecked with the applied methodology.
$P_{product,\ max}$ Design capacity of nitric acid production during the first crediting period ($tHNO_3$)	700,800	This value was obtained during the 1st crediting period. As the project falls in applying case 1, same value as used for the 1st and 2nd crediting period Accordingly, for the 3rd crediting period, the value is valid as used in the 2nd crediting period
GWP_{N2O} Global warming potential of N_2O valid for the commitment period (t CO_2e/t N_2O)	298	Same value as used in 2nd crediting period. The Value is correctly applied in accordance with the relevant decision by the CMP & applied methodology.

Therefore, the current baseline does not need to be updated for the 3rd crediting period.

	Step2: Update the current baseline and the data and parameters **Step 2.1: Update the current baseline** As discussed on Step 1.1 through 1.3, the original baseline remains valid. **Step 2.2: Update the data and parameters** As stated in Step 1.4 above, all parameters are same as used in the 2nd crediting period.
Conclusion	KFQ confirms that · The current baseline considers and complies with new relevant national and/or sectoral policies and circumstances on the baseline at the time of requesting renewal of the crediting period. · The current baseline is still valid for the 3rd crediting period. · All parameters are completely addressed in the updated PDD (v05.1) as per the latest version of ACM0019 (v04.0). · Data and parameters are applied correctly in complying with the requirements of the latest version of ACM0019 (v04.0).

D.4. Estimated emission reductions or net anthropogenic removals

Means of validation	The parameters and equations presented in the updated PDD, as well as other applicable documents, have been compared with the information and requirements presented in the methodology and respective tools. Formulae comparison has also been performed to ensure consistency between all the formulae presented in the spreadsheet and in the updated PDD, methodology and tools. The validation team has also assessed appropriateness of the data, parameters and calculations. Furthermore, KFQ has assessed, whether any assumptions, emission factors, default values, GWPs or other reference values – as applicable – used by the PPs have been justified and correctly applied, in line with the requirements. KFQ has further crosschecked – as applicable - any information with other sources available, such as but not limited to daily data for the 2nd crediting period and previous monitoring reports, etc.
Findings	A CL and a CAR were raised (Appendix 4 / Table 1 / CL ID 01, Table 2 / CAR ID 01). After the PPs have submitted revised version of the PDD (v05.1), It was found that the applied values are appropriate for the estimation of emission reductions. The GHG emission reductions have been estimated to be 1,110,125 tCO_2e annually for the crediting period and the total GHG emission reductions in the 3rd crediting period is 7,770,876 tCO_2e for 7 years. The baseline GHG emissions, 8,766,232 tCO_2e for this crediting period are based on $P_{production,y}$, $P_{production,max}$, $EF_{existing,y}$, $EF_{existing,new}$, h_y and $h_{r,y}$. The values for $P_{production,max}$, $EF_{existing,y}$, $EF_{existing,new}$ are appropriately applied as determined in accordance with the applied methodology. The values for $P_{production,y}$, h_y and $h_{r,y}$ are estimated reasonably considering operational data for the 2nd crediting period. The project GHG emissions, 995,355 tCO_2e for this crediting period are consisting of $PE_{N2O,y}$ and $PE_{CO2,tertiary,y}$. The values for these parameters are estimated reasonably considering operational data for the 2nd crediting period. Accordingly, the estimate of emission reductions is considered reasonable as the calculations have been reproduced by the validation team. The emission reductions estimated for the 3rd crediting period are higher than assumed in the initial version 2(b), dated 20 June 2006 due to the change of methodology and the use of more accurate information from the 2nd crediting period.
Conclusion	The raised CL and CAR have been completely resolved. Accordingly, KFQ confirms that: · All assumptions and data used by the PPs are listed in the updated PDD (v05.1), including their references and sources; · All documentation used by the PPs as the basis for assumptions and source of data is correctly quoted and interpreted in the updated PDD (v05.1); · All values used in the updated PDD (v05.1) are considered reasonable in the context of the proposed project activity;

	· The baseline methodology and corresponding tools have been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions; · The result of the baseline emissions calculation can be replicated using the data and parameter values provided in the updated PDD (v05.1); · The used monitored data or parameters are reasonable for estimating the emissions reductions in the updated PDD (v05.1); · Different options for equations and parameters are selected approximately; · The data and parameters fixed ex-ante are conservative and appropriate. · The baseline, the estimated GHG emission reductions or net anthropogenic GHG removals, and the monitoring plan in the updated PDD comply with the applicable requirements in the CDM PS for PA (v02.0) and applied methodology. The GHG reductions calculation of the project activity is as per the applied methodology and relevant tools.

D.5. Validity of monitoring plan

Means of validation	Monitoring plan in the updated PDD was reviewed against the applied methodology, ACM 0019 (version 04.0) and applicable tools. The validation team identified the list of parameters required by the methodology and applicable tools and reviewed the monitoring plan and relevant documents such as list of instruments containing manufacturer's specification against the methodology and tools. As well the validation team inspected physical instruments as applicable as well as interview with project participants and document review of previous validation and verification reports.
Findings	It was found that the monitoring plan in the updated PDD contains all necessary parameters and are described as per the applied methodology and applicable tools. No deviation from the methodology and applicable tools have been found. The validation team has verified all parameters in the monitoring plan against the requirements of the methodology and no deviations have been found. It was also found that the monitoring arrangements for all monitoring parameters are feasible within the project design and QA/QC procedures are sufficient to ensure emission reductions achieved by/ resulting from the project activity as described in the updated PDD in compliance with the methodology.
Conclusion	KFQ confirms that · The monitoring plan in updated PDD (v05.1) is in compliance with the monitoring methodology ACM0019 (v04.0), and "Tool to determine the mass flow of a greenhouse gas in a gaseous stream (v03.0)" and "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion (v03.0)" · The monitoring plan will give opportunity for real measurements of achieved emission reductions. · The project participants are able to implement the monitoring plan.

D.6. Crediting period

Means of validation	The project lifetime, starting date and selected crediting period were reviewed. The purpose of a validation related to the duration or day of renewal of the crediting period of a project is an assessment according to the VVS PA 02.0 and includes an assessment of an updated PDD in accordance with the relevant sections of the PS related to the duration of renewal of crediting period and in particular to the next crediting period of the registered CDM project activity.
Findings	The project activity was registered on 07/10/2006 selecting renewable crediting period. The 3rd crediting period will start on 15/09/2020 and will end on 14/09/2027. Which falls in the 25 years expected lifetime of the project activity as stated in the registered PDD (version 2(b) dated 20/06/2006) from starting date of the project activity, 09/10/2004. The 3rd crediting period will start on 15/09/2020 which is immediately after the expiration of the 2nd crediting period, 14/09/2020.
Conclusion	KFQ confirms that the next crediting period of the project activity commences on the day immediately after the expiration of the current crediting period (2nd crediting

	period). And the start date and the length of the crediting period are in compliance with the project standard.

D.7. Project participants

Means of validation	Review of MoC and Interview with project participants were conducted as well as crosschecking with UNFCCC website.
Findings	The names of the PPs included in the updated PDD are consistent with the name stated on UNFCCC website as well as latest MoC statement.
Conclusion	The names of PPs included in the updated PDD (v05.1) are consistent with the names of the PPs in the latest version of the MoC statement on UNFCCC website.

D.8. Post-registration changes

Type of post-registration changes (PRCs)	**Confirmation** (Y/N)	**Validation report for PRCs**	
		Version	**Completion date**
Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents[1]	n/a	n/a	n/a
Corrections	n/a	n/a	n/a
Change to the start date of the crediting period	n/a	n/a	n/a
Inclusion of a monitoring plan	n/a	n/a	n/a
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	n/a	n/a	n/a
Changes to the project design	n/a	n/a	n/a
Changes specific to afforestation and reforestation project activities	n/a	n/a	n/a

SECTION E. Internal quality control

According to KFQ's Procedure for deciding whether to proceed request for renewal crediting period, the final validation report and validation findings underwent a technical review before being submitted to the PPs for requesting renewal crediting period. The technical review was performed by technical review team composed of a person qualified for this project activity in accordance with KFQ's qualification scheme for CDM project validation and verification.

SECTION F. Validation opinion

KFQ has performed a validation of the request for renewal of the crediting period of the aforementioned existing CDM project activity. Standard auditing techniques have been used for validation process. The validation has been performed following the requirements of the latest version of the CDM VVS for PA version 02.0.

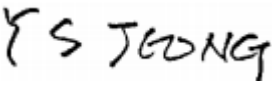
The review of the project design documentation, subsequent follow-up interviews, and further verification and validation of references have provided to KFQ with sufficient evidence to determine the validity of the original baseline and to confirm that the estimated emission reductions are in line with the applied methodology.

[1] Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied (selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents.

Taking into account that the project is implemented as designed, the project is likely to achieve the estimated amount of annual emission reductions of 1,110,125 tCO_2e and a total estimated of 7,770,876 tCO_2e as specified within the updated PDD (v05.1) for the 3rd crediting period. The findings raised during this validation have been closed satisfactorily.

In our opinion, the project activity, 'Catalytic N2O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co.', as described in the updated PDD (v05.1), meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology (ACM0019 v04.0). Thus the project activity will hence be commended by KFQ for requesting for renewal of crediting period to UNFCCC.

Signed on behalf of the Korean Foundation for Quality

Signature : 

Name : Yu Shim JEONG, Technical Managing Director

Date : 25 October 2019

Appendix 1. Abbreviations

Abbreviations	Full texts
ACM	Approved Consolidated Methodology
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CL	Clarification Request
CMP	COP/MOP Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
CO_2	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
DOE	Designated Operational Entity
DNA	Designated National Authority
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
KFQ	Korean Foundation for Quality
MoC	Modalities of Communication
MP	Monitoring Plan
NA	Nitric Acid
N_2O	Nitrous oxide
PA	Project Activity
PDD	Project Design Document
PP	Project participant
PS	Clean Development Mechanism Project Standard
TKIS	ThyssenKrupp Industrial Solutions AG (formally known as Uhde GmbH)
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers

CERTIFICATE OF COMPETENCE

Name: Jin Seok CHO

Qualification:

	Validation	Verification
-Lead auditor	■	■
-Auditor	☐	☐
-Technical Expert	☐	☐
-Local Expert	☐	☐

Scopes of Expertise:

Technical Area (TA)

1.1	Thermal energy generation
1.2	Renewables
13.1	Solid waste and wastewater
13.2	Manure
5.2	Caprolactam, Nitric acid, Adipic acid

He is approved as the qualification above according to the KFQ's procedure of Qualifying and Maintaining of Auditor on 11 March 2019

Sustainability Management Institute
Mi Jung LEE

CERTIFICATE OF COMPETENCE

Name: Pyung-Hee JANG

Qualification:

	Validation	Verification
-Lead auditor	■	■
-Auditor	☐	☐
-Technical Expert	☐	☐
-Local Expert	☐	☐

Scopes of Expertise:

Technical Area (TA)

1.1 Thermal energy generation
1.2 Renewables

He is approved as the qualification above according to the KFQ's procedure of Qualifying and Maintaining of Auditor on 31 March 2016.

Sustainability Management Institute
Sang Yeon PARK

CERTIFICATE OF COMPETENCE

Name: Mi Jung LEE

Qualification:

	Validation	Verification
-Lead auditor	■	■
-Auditor	☐	☐
-Technical Expert	☐	☐
-Local Expert	☐	☐

Scopes of Expertise:

Technical Area (TA)

1.1	Thermal energy generation
1.2	Renewables
3.1	Energy demand
5.1	Chemical Industry
5.2	Caprolactam, nitric and adipic acid
11.1	Emission of Fluorinated gases
11.2	Refrigerant gas production
13.1	Solid waste and wastewater
13.2	Manure

She is approved as the qualification above according to the KFQ's procedure of Qualifying and Maintaining of Auditor on 5 July 2019.

Sustainability Management Institute
Yu Shim JEONG

CERTIFICATE OF COMPETENCE

Name: Yeong Yeong KANG

Qualification:

	Validation	Verification
-Lead auditor	■	■
-Auditor	☐	☐
-Technical Expert	☐	☐
-Local Expert	☐	☐

Scopes of Expertise:

Technical Area (TA)

1.2 Renewables

5.2 Caprolactam, Nitric acid, Adipic acid

13.1 Solid waste and wastewater

15.1 Agriculture

She is approved as the qualification above according to the KFQ's procedure of Qualifying and Maintaining of Auditor on 5 July 2019.

Sustainability Management Institute
Mi Jung LEE

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	Project participants	CDM Project Design Document ・Version 05.0 ・Version 05.1 ER spreadsheet ・Version 01.0 ・Version 01.1	 From 06/08/2019 From 05/09/2019 From 06/08/2019 From 05/09/2019	
2	Project participants	CDM Project Design Document ・1st crediting period: Version 2(b) ・2nd crediting period: Version 4.2	 From 20/06/2006 From 13/12/2017	Project participants
3	TUV SUD	Validation Report for the CDM project "Catalytic N2O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co." ・1st crediting period: Report No. 611173 ・2nd crediting period: Report No. 00824EM Validation Report on the PRC from year 2017	 From 03/07/2006 From 02/12/2013 From 22/12/2017	Others
4	 DNV TUV NORD	Verification reports for the CDM project "Catalytic N2O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co." ・1st crediting period ・2nd crediting period	 From 15/09/2006 to 14/09/2013 From 15/09/2013 to 10/01/2019	Others
5	Ministry of housing and utilities	NA Plant Operating Permanent License No. 1210	From 09/02/1987	Project participants
6	Ministry of Environment	The National Environment Law in Egypt ・Law Number 4 ・Amended by Law No. 9 for 2009 ・Amended by Law No. 105 for 2015 The Prime Minister's Decree No. 1963	 From 1994 Published under: *http://www.eeaa.gov.eg/en-us/laws/envlaw.aspx* From 06/09/2017 Published under: *http://www.eeaa.gov.eg/en-us/laws/envlaw.aspx*	others
7	Egyptian Environmental Affairs Agency	Official letter confirming that there is no N2O regulation in Egypt, issued by Egypt DNA, Ministry of Environment	From 07/10/2019	Project participants
8	TKIS/Uhde	Memorandum on the Abu Qir plant's design capacity	From 28/06/2006	Project participants
		Uhde Manual_NA_Introduction NA Plant manual_AOR pressure NA Plant manual_AOR temperature	From September 1989	
		EnviNOx flow diagram Abu Qir Nitric acid Plant flow diagrams	From 29/11/2005 From 19/09/1989	
9	TKIS/ Uhde	Design capacity References of Selective Catalytic NOx Reduction	From 28/06/2006 From August	Project participants

			2019	
10	UBA Federal Environment Agency, Austria	State-of-the-art for the production of nitric acid with regard to the IPPC directive	From 2001	Project participants
11	Project participants	Internal procedure “Nitric Acid Production” (Issue No. 3)	From 01/05/2017	Project participants
12	Uhde	Guarantee Test Run Procedure of EnviNOx system	From 04/09/2006	Project participants
13	Uhde	Test log sheet of EnviNOx system	From 03/10/2006	Project participants
14	TUV NORD	Confirmation of the proper installation of EnviNOx system	From 12/10/2006	Project participants
15	Project participants	Internal procedure for CDM Project “Catalytic N2O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co.” (Revision 21)	From 01/08/2019	Project participants
16	Project participants	Historic operation data for the CDM project “Catalytic N2O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co.” ・1st &2nd crediting period	From 01/10/2006 to 14/09/2013 From 15/09/2013 to 14/09/2020	Project participants
17	AIRTEC	AST Report ・Performed on 20/04/2018	From 25/04/2018	Project participants
18	AIRTEC	QAL2 Report ・Performed on 15 to 17/04/2019	From 25/05/2019	Project participants
19	EMERSON ROSEMOUNT TUV Rheinland ROSEMOUNT RMS KROHNE ROSEMOUNT ROSEMOUNT ROSEMOUNT ROSEMOUNT ROSEMOUNT ROSEMOUNT ROSEMOUNT	CDM Project Instruments accuracy class and calibration frequency references: ・AT-218002 Carbon-Uhde_MLT N2O accuracy ・FT-21411 accuracy_manufacturer manual ・FT-21492 accuracy QAL 1 certificate ・FT-21411 calibration_manufacturer manual ・FT-218002 accuracy_manufacturer manual ・FT-218002 calibration_supplier statement ・PT-218004 accuracy & calibration_manufacturer manual ・TE-21014/ 21015/ 21020/ 21021 accuracy _manufacturer manual ・TE-21014/ 21015/ 21020/ 21021 calibration _manufacturer manual ・TE-218004 accuracy_manufacturer manual ・TE-218004 calibration_manufacturer manual ・TE-21042 calibration_manufacturer manual ・TE-21042 accuracy_manufacturer manual	From13/07/2007 From 04/2010 From 05/03/2018 From 10/2010 From 02/2013 From 25/07/2019 From 02/2017 From 02/2019 From 08/2013 From 08/2013 From 02/2019 From 02/2019 From 08/2013	Project participants
20	SGS	Certificate ISO 9001	From 05/07/2018	Project participants
21	SGS	Certificate ISO 14001	From 05/07/2018	Project participants
22	Project participants	MoC statement	From 15/11/2018 Published under: *https://cdm.unfccc.int/Projects/DB/TUEV-SUED1151930566.53/view?cp=1*	Project participants

23	CDM Executive Board	Methodology ACM0019 “N2O abatement from nitric acid production” (Version 04.0)	From 29/11/2018 Published under: *https://cdm.unfccc.int/methodologies/DB/HKCO7RKOQO748WNXJNDEW3BJT9XN8L*	Others
		TOOL 03. Tool to calculate project or leakage CO2 emissions from fossil fuel combustion (v03.0)	From 22/09/2017	
		TOOL 08. Tool to determine the mass flow of a greenhouse gas in a gaseous steam (v 03.0)	From 27/11/2015	
		TOOL 11. Assessment of the validity of the original/current baseline and update baseline at the renewal of the crediting period (v03.0.1)	From 02/03/2012 All published under: *http://cdm.unfccc.int/Reference/tools/index.html*	
		Standards, Procedures & Checklists ・Standard – CDM validation and verification standard for project activities (Version 02.0) ・Standard – CDM project standard for project activities (Version 02.0) ・Procedure – CDM project cycle procedure for project activities, version 02.0. ・Checklist – Checklist for requests for renewal of crediting period of project activities (Version 02.0) ・Form - Project design document form (Version 11.0) ・Form - Validation report form for renewal of crediting period for CDM project activities (Version 03.0)	From 29/11/2018 From 29/11/2018 From 29/11/2018 From 23/08/2019 From 31/05/2019 From 31/05/2019 All published under: *https://cdm.unfccc.int/Reference/index.html*	

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

Table 1. CL from this validation

CL ID	01	**Section no.**	D.4	**Date:** 05/09/2019
Description of CL				
As for the value applied for $C_{H2O,t,db,n}$, please indicate an estimate of the data that will be monitored during the 3rd crediting period of the project activity.				
Project participant response				**Date:** 06/09/2019
Throughout the whole 2nd crediting period the measurement of moisture content of the gaseous stream ($C_{H2O,t,db,n}$) was performed annually according to the "USEPA CF42 method 4 – Gravimetric determination of water content" as required by the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream". All such measurements showed that the moisture content was well below the threshold of 0.05 kg H_2O/m^3 dry gas (= 50,000 mg H_2O/m^3 dry gas). Therefore, in the revised PDD (v05.1) in parameter table $C_{H2O,t,db,n}$ "Below 50,000 mg H_2O/m^3 dry gas" is given.				
Documentation provided by project participant				
· Revised PDD (v05.1)				
DOE assessment				**Date:** 20/09/2019
The value for $C_{H2O,t,db,n}$ in monitoring reports verified of 2nd crediting period were reviewed. And it was confirmed that the description on the estimate of data for $C_{H2O,t,db,n}$, "Below 50,000 mg H_2O/m^3 dry gas" on the revised PDD (v05.1) is appropriate taking into account how to reflect the value in the calculation formulae of emission reductions.				

Table 2. CAR from this validation

CAR ID	01	**Section no.**	D.4	**Date:** 05/09/2019
Description of CAR				
Historical values during 2nd crediting period were applied for the calculation of $P_{production,y}$. However, it is identified that there was an error with regard to the applied data of daily HNO_3 production when calculating $P_{production,y}$.				
Project participant response				**Date:** 06/09/2019
PPs revised the ex-ante ER calculation correcting the parameter $P_{production,y}$ and adapted the PDD accordingly.				
Documentation provided by project participant				
· Revised PDD (v05.1) · Revised ER Spreadsheet (v01.1)				
DOE assessment				**Date:** 20/09/2019
It is confirmed that the applied valued for $P_{production,y}$ reasonably figured out average operating days, and daily HNO_3 production of the 2nd crediting period, PDD and ER spreadsheet were revised correctly.				

Table 3. FAR from this validation

FAR ID	n/a	**Section no.**	n/a	**Date:** n/a
Description of FAR				
n/a				
Project participant response				**Date:** n/a
n/a				
Documentation provided by project participant				
n/a				
DOE assessment				**Date:** n/a
n/a				