CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 03 - in effect as of: 28 July 2006

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SECTION A. General description of project activity

A.1. Title of the project activity:

"Catalytic N_2O destruction project at the new nitric acid plant PANNA 4 of Enaex S.A."

Version 1.0

Date of Completion: 25/07/2011

A.2. Description of the project activity:

The sole purpose of the proposed project activity is to significantly reduce expected levels of N_2O emissions from the production of nitric acid at the PANNA 4 plant of Enaex S.A., Chile. The PANNA 4 nitric acid plant was erected in 2010 as part of the Enaex S.A. chemical complex site, Prillex®[1] América, at Mejillones. The new nitric acid plant, designed for a capacity of 925 metric tonnes of HNO_3 per day, has been commercially operational since November 2010 and produces nitric acid as an intermediate product for the ammonium nitrate plant within the complex. The plant was designed to operate with a dual pressure process, where the ammonia oxidation reactor is operated at a design pressure of about 4.44 bar (medium pressure combustion plant) and a design temperature of about 870°C. The proposed project activity (secondary N_2O destruction) will be implemented in the PANNA 4 nitric acid plant.

General Introduction

Nitrous oxide (N_2O) is an unwanted, invisible and previously neglected by-product of the manufacture of nitric acid. It is formed alongside the main, desired product nitric oxide (NO) during the catalytic oxidation of ammonia in air over noble metal gauzes. N_2O is a potent greenhouse gas with a Global Warming Potential (GWP) of 310. The production of nitric acid takes place in three main process steps as indicated by the following reactions:

1. Ammonia (NH_3) combustion to form nitric oxide (NO):

   Ammonia is reacted with air on noble metal catalyst in the oxidation section of nitric acid plants. Nitric oxide and water are formed in this process according to the following equation:

   $$4NH_3 + 5O_2 \rightarrow 4NO + 6H_2O \qquad \text{(main reaction 1)} \qquad \textbf{(1)}$$

   Simultaneously, nitrous oxide (N_2O), nitrogen (N) and water (H_2O) are formed as well, in accordance with the following equations:

   $$4NH_3 + 3O_2 \rightarrow 2N_2 + 6H_2O \qquad \text{(side reaction 1)} \qquad \textbf{(2)}$$

   $$4NH_3 + 4O_2 \rightarrow 2N_2O + 6H_2O \qquad \text{(side reaction 2)} \qquad \textbf{(3)}$$

   NO yield depends mainly on pressure and temperature in the ammonia oxidation process and usually is in a range of 95% to 97%.

2. NO is oxidised to nitrogen dioxide (NO_2):

[1] ®Prillex is a registered brand of Enaex S.A.

$$2\,NO + O_2 \rightarrow 2\,NO_2$$ (main reaction 2) **(4)**

3. (According to the technical process) Absorption of NO_2 in water to form nitric acid (HNO_3):

$$3\,NO_2 + H_2O \rightarrow 2\,HNO_3 + NO$$ (main reaction 3) **(5)**

(NO is oxidised to NO_2 according to main reaction 2)

Nitric acid plants are, in the vast majority of cases, part of a chemical complex and are built and operated to supply acid for consumption in downstream process units. The most common use for nitric acid is for fertilisers, with smaller quantities going into the manufacture of organic compounds and mining explosives. In the case of PANNA 4, nitric acid is employed as a feed stock to produce ammonium nitrate (NH_4NO_3), which is used as a raw material for mining and civil explosives, which are used in the mining and construction industries. The nitric acid is also used as raw material for other explosives (PETN and Nitro-glycerine), which are also used as civil and mining explosives.

Enaex has an internal policy not to sell any explosive that can be used for military purposes, however there are special corps inside the Military Forces in Chile that perform civil works as demolition, construction of secondary paths and also destruction of anti-personal mines in the north of the country. In case of any future explosives sales for Military Institutions, Enaex will demand a Certificate of Final Use to be absolutely sure of the use of the required explosive.

On leaving the ammonia oxidation reactor, there is no relevant loss of N_2O in the tail gas section unless a N_2O destruction facility is installed. N_2O that leaves the ammonia oxidation reactor is thus discharged to atmosphere in the tail gas, and has no economic value.

Description of catalytic decomposition process

Under the project activity, a N_2O catalyst will be inserted below the primary catalyst (NH_3 catalyst) in the ammonia oxidation reactor. The N_2O catalyst will largely result in decomposition of N_2O to nitrogen (N_2) and oxygen (O_2) without any further energy, nor material inputs.

Catalytic decomposition of N_2O occurs when the N_2O is split into its constituent elements by contact with a catalyst. A catalyst is a material which accelerates the speed of the reaction without itself being transformed or consumed by the reaction.

Overall reaction:

$$2\,N_2O \rightarrow 2\,N_2 + O_2$$ **(6)**

Products of N_2O decomposition are the substances that result from decomposition reaction (N_2 and O_2).

The project's aim will be to reduce N_2O emissions at the nitric acid plant PANNA 4. The project activity won´t result in any revenues except the income from the sale of CERs. The catalytic N_2O destruction project activity is expected to reduce more than 90 % of the N_2O emissions that would be emitted without the project activity.

A.3. Project participants:

Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Republic of Chile (Host)	Enaex S.A.	No
Republic of Austria	Carbon Climate Protection GmbH	No
(*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.		

Host country is the **Republic of Chile**. Chile ratified the Kyoto Protocol on August 26, 2002.

Project applicant, sponsor and operator is Enaex S.A. (herein after called Enaex), a private owned entity registered under the laws of the Republic of Chile and an incorporated company listed on the Santiago stock exchange, major shareholder is Sigdo Koppers S.A. Enaex is a leading producer of explosives and raw materials for rock fragmentation. Based in Chile, the company also supplies operational and technical support for its explosives to the mining industry. Enaex's range of products cover open pit and underground mine blasting, as well as boosters and accessories. Major customers are the most important mining companies of South America, such as CODELCO, BHP Billiton, Anglo American, Antofagasta Minerals, Southern Perú Copper, Phelps Dodge and Placer Dome. Enaex sells explosives for mining and civil purposes only.

Enaex has well established people, management principles and practices that enable an integral development of its employees. Given the nature of its manufacturing and service operations, Enaex has a strict and high standard of selecting its workers throughout the organisation, which allows to have highly qualified personnel in all of its areas. Enaex's comprehensive people programs include performance management, health, well-being, training and development.

Some of the programs in place:

- Quality Assurance
- Continuous Education and Training
- Consulting on Drug and Alcohol addiction
- Health Plans
- Housing Plans
- Social Technical advising benefits
- Bonus and Equity participation systems
- Creativity Award
- Internal communications
- Sports, Recreation and integration of the family

In 2002, the company received "The Carlos Vial Espantoso Award" for best people management practices. The Prillex® América production facility of Enaex, of which PANNA 4 is one, is certified according to ISO 9001:2008 NCh 9001. Of 2009.

The proposed project activity will be installed in the PANNA 4 nitric acid plant and it is Enaex´ intention to include the PANNA 4 nitric acid plant as well as all CDM monitoring equipment in the quality management system.

Project participant, Carbon Climate Protection GmbH (herein after called CARBON), is a limited liability company located and registered in Austria under Austrian law. CARBON is responsible for the project development. The company is an experienced financing and investment company, focussing on the development and implementation of Greenhouse Gas reduction projects according to Article 6 of the Kyoto Protocol (Joint Implementation) and Article 12 of the Kyoto Protocol (Clean Development Mechanism). CARBON has experience with CDM project development in Africa, Latin America and Asia and is specialised in the catalytic N_2O destruction in the tail gas of nitric acid plants. It has developed the methodology for destruction of N_2O in the tail gas of nitric acid plants (AM0028) and has implemented the first N_2O destruction CDM project at nitric acid plants at Abu Qir Fertilizer Company in Egypt as well as similar CDM project at three nitric acid plants at Hu-Chems Fine Chemicals Corporation in Korea and ENAEX S.A. in Chile.

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

A.4.1.1. Host Party(ies):

Republic of Chile

A.4.1.2. Region/State/Province etc.:

2nd Region (Region of Antofagasta), Province of Antofagasta

A.4.1.3. City/Town/Community etc.:

Planta Prillex® America
City: Mejillones
Address: Avenida Costanera Norte N°300

A.4.1.4. Details of physical location, including information allowing the unique identification of this project activity (maximum one page):

The new PANNA 4 nitric acid plant is part of Enaex S.A.’s Prillex® América ammonia nitrate complex, located in Mejillones, Northern Chile (Province of Antofagasta, 2nd Region). Mejillones is located 65 km north of Antofagasta, the region’s capital city and it is surrounded by the Pacific Ocean to the west and by one of the most arid deserts in the world (Desierto de Atacama) to the east. Since the past two centuries, the port of Antofagasta has been playing an important role for the export of raw materials extracted in the area, shifting from guano and sodium nitrate (saltpetre) to potassium nitrate and copper over the years. In this field, the port of Mejillones has also playing an important role. Currently, the population of Mejillones is more than 8,500 and main economic activities are linked to the mining industry.

Figure 1: Location of the project

ENAEX Prillex® América Plant
Avenida Costanera Norte N°300
Mejillones

Latitude:	23° 5' 50.64"S
Longitude:	70° 25' 48.55"W

A.4.2. Category(ies) of project activity:

Sectoral Scope: 5 Chemical Industry

A.4.3. Technology to be employed by the project activity:

The employed technology will be a secondary N_2O abatement technology. N_2O, once formed, is removed by a catalyst inside the ammonia oxidation reactor. The preferred position of choice for secondary methods is directly after the gauzes.

The new PANNA 4 nitric acid plant was designed to produce nitric acid as an intermediate product for the ammonium nitrate production plant in this complex with a designed capacity of 925 metric tonnes of HNO_3 per day. The plant is designed to operate as a dual pressure nitric acid plant, whereas the ammonia oxidation reactor is operated at a design pressure of about 4.44 bar (medium pressure combustion plant) and a design temperature of about 870°C.

The PANNA 4 nitric acid plant will be equipped with a secondary N_2O abatement, by installing baskets inside the ammonia oxidation reactor and equipping them with the N_2O decomposition catalyst right below the platinum gauze in the high temperature zone of the reactor.

The measurement devices for the monitoring of N_2O concentration and tail gas flow will be located directly in the stack.

A secondary approach offers a number of advantages:

- Reduction >90 % can be achieved
- No influence on NO_x yield
- Works with all Pt-gauzes
- Drop in solution with moderate investment costs
- Low operation cost

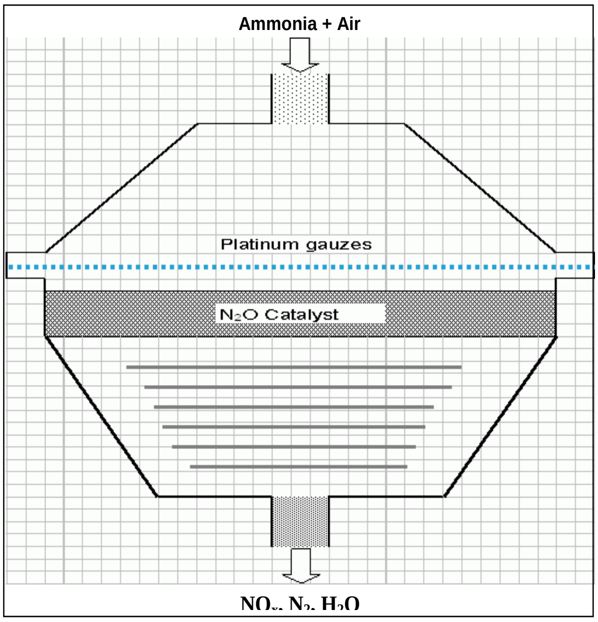

Figure 2: Location of a secondary catalyst inside the AOR reactor

A.4.4. Estimated amount of emission reductions over the chosen crediting period:

The implementation of the project activity will result in an ex-ante estimation of GHG emission reductions conservatively calculated at about 2.4 million tCO_2e over ten years crediting period. Please note that estimations of GHG emission reductions are made for reference purposes only – actual emission reductions will be determined based on measurement results on ex-post basis. The global warming potential of N_2O is set at 310 according to the methodology.

As the project is planned to start on 01/12/2011 with a ten years crediting period, the emission reductions during the crediting period are estimated as shown in the table below.

Table: Summary of Emission Reductions 2011-2021

Years (First Crediting Period)	**Annual estimation of emission reductions in tonnes of CO_2e**
12/2011	28,498
2012	321,618
2013	301,258
2014	280,899
2015	270,719
2016	250,360
2017	230,001
2018	209,642
2019	199,462
2020	179,103
01-11/2021	164,178
Total estimated reductions (tonnes of CO_2e)	**2,435,738**
Total number of crediting years	**10 years**
Annual average over the crediting period of estimated reductions (tonnes of CO_2e)	**243,574**

A.4.5. Public funding of the project activity:

No public funds are available for the financing of the project activity.

SECTION B. Application of a baseline and monitoring methodology

B.1. Title and reference of the approved baseline and monitoring methodology applied to the project activity:

This Project Design Document is based on the approved consolidated baseline and monitoring methodology ACM0019 "N_2O abatement from nitric acid production" (Version 01.0.0).

B.2. Justification of the choice of the methodology and why it is applicable to the project activity:

The proposed project activity destroys N_2O emissions by the catalytic reduction of N_2O by installing baskets inside the ammonia oxidation reactor and equipping them with the N_2O decomposition catalyst right below the platinum gauze in the high temperature zone of the reactor of the new nitric acid plant PANNA 4 (secondary N_2O abatement).

The applicability criteria of the chosen methodology are met by the proposed project activity. These are:

- The PANNA 4 nitric acid plant started its commercial operation in November 2010. Neither is currently any secondary or tertiary abatement technology installed in the PANNA 4 nitric acid plant, nor has this been the case at any time since the commercial start of operation.

- Continuous real-time measurements of the N_2O concentration and the total gas volume flow can be carried out in the tail gas stream after the abatement of N_2O emissions throughout the crediting period of the project activity. A dedicated Automated Monitoring System (AMS) will be installed in the plant prior to the beginning of the crediting period of the project activity in line with the requirements of the monitoring methodology.

- Currently, no laws or regulations exist, which mandate the complete or partial destruction of N_2O from nitric acid plants in the host country, the Republic of Chile. In the absence of regulations on N_2O emissions in Chile it is obvious that there is no incentive for the plant operator to install N_2O abatement technologies in its nitric acid plant. This is due to the fact, that N_2O destruction facilities generate no financial or economic benefits (other than CDM related incomes).

B.3. Description of the sources and gases included in the project boundary:

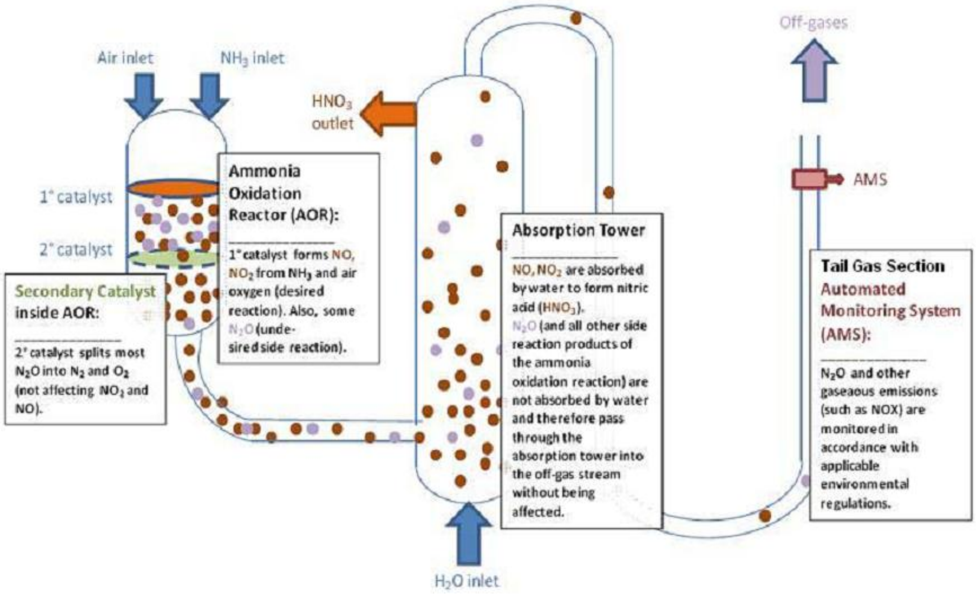

Figure 3: Project boundary if the Project Activity

The spatial extent of the project boundary encompasses the facility and equipment for the nitric acid production process from the inlet of the ammonia burner to the outlet of the tail gas section.

Since the project activity introduces only secondary and no tertiary N_2O abatement, the only gas to be included as project emissions is the N_2O, which is not destroyed and still present in the tail gas stream of the plant (see Figure 3 above). The following table illustrates in detail, which emissions sources are included and which are excluded from the project boundary for determination of both baseline and project emissions.

Table: GHG included in or excluded from the project boundary:

Source		**Gas**	**Included?**	**Justification / Explanation**
Baseline	NH_3 oxidation at primary catalyst gauze	CO_2	No	The project activity has no influence on these types of emissions, if present
		CH_4	No	
		N_2O	Yes	Included, main emission source
Project activity	NH_3 oxidation at primary catalyst gauze	CO_2	No	The project activity has no influence on these types of emissions, if present
		CH_4	No	
		N_2O	Yes	Included, main emission source
	Operation of a tertiary N_2O Abatement facility	CO_2	Yes	In some cases, fossil fuels are used as reducing agent and/or for decomposing the tail gas as part of a tertiary N_2O abatement facility. In this case the fossil fuels are mainly converted to CO_2. CO_2 emissions arising from the production of ammonia are assumed to be small and **not** taken into account
		CH_4	No	

		N_2O	Yes	Included

GHG emissions from the operation of a tertiary N_2O abatement facility are not included, since the proposed CDM project activity does not comprise the installation of a tertiary N_2O abatement technology.

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

In the following section the approved consolidated baseline and monitoring methodology ACM0019 "N_2O abatement from nitric acid production" is applied to the "Catalytic N_2O destruction project at the nitric acid plant PANNA 4 of Enaex S.A." in order to identify the baseline scenario:

There are no direct Chilean regulations applicable to NO_x emissions at new nitric acid plants. The actual voluntary commitment of Enaex is based on the Swiss regulation (reference: Swiss Confederation Federal Law, October 7, 1983). According to resolution Number 102/2006 (Antofagasta, 26th May 2006, Comisión Regional del Medio Ambiente – COREMA) the NO_x emission limit for Enaex' Prillex® América nitric acid plants is 100 ppm and covers the new PANNA 4 nitric acid plant also.

Currently, no laws or regulations exist, which mandate the complete or partial destruction of N_2O from nitric acid plants in the host country, the Republic of Chile. This was attested by a letter of the Ambient Evaluation Service of Chile, which can be reviewed during validation. Therefore in accordance with the approved consolidated baseline and monitoring methodology ACM0019 "N_2O abatement from nitric acid production", Enaex has no economic incentives to take any N_2O abatement measures in its nitric acid plants in the absence of regulations requiring such measures, as this would entail capital and operating costs, but no financial benefits. Consequently, the proposed CDM project "Catalytic N_2O destruction project at the new nitric acid plant PANNA 4 of Enaex S.A." is considered additional and the baseline scenario is the N_2O emitted to the atmosphere with no N_2O abatement measure implemented.

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality):

According to the applied methodology ACM0019 the CDM project activity is considered additional in case of the absence of regulations requiring the abatement of N_2O emissions, as the operator of the nitric acid plant has no economic incentives to take any N_2O abatement measures.

Since it was clearly demonstrated in section B.4 above that in Chile no regulations exist, which require the abatement of N_2O emissions in nitric acid plants, the proposed project activity "Catalytic N_2O destruction project at the new nitric acid plant PANNA 4 of Enaex S.A." is considered additional.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

BASELINE EMISSIONS

According to *Section II* of the approved consolidated baseline and monitoring methodology ACM0019 “N_2O abatement from nitric acid production” the baseline emissions are calculated as follows:

$$BE_n = P_{NA,n} * EF_{BL,N2O,n} * GWP_{N2O} * 10^{-3} \quad \textbf{(7)}$$

Where:

BE_n	=	Baseline emissions in monitoring period n (tCO_2e)
$P_{NA,n}$	=	Nitric acid produced in the monitoring period n ($tHNO_3$)
$EF_{BL,N2O,n}$	=	Baseline N_2O emission factor for nitric acid production in the monitoring period n (kgN_2O / $tHNO_3$)
GWP_{N2O}	=	Global Warming Potential of N_2O valid for the commitment period

Determination of the baseline N_2O emission factor ($EF_{BL,N2O,n}$)

The baseline N_2O emission factor in the monitoring period n ($EF_{BL,N2O,n}$) shall be determined as a default emission factor $EF_{default,y}$ given for each calendar year y for which BE_n is calculated (see monitoring tables for $EF_{default,y}$), as follows:

$$EF_{BL,N2O,n} = EF_{default,y} \quad \textbf{(8)}$$

Where:

$EF_{BL,N2O,n}$	=	Baseline N_2O emission factor for nitric acid production in the monitoring period n (kgN_2O / $tHNO_3$)
$EF_{default,y}$	=	Default N_2O baseline emissions factor in the calendar year y of the monitoring period n (kgN_2O / $tHNO_3$)

The default emission factors $EF_{default,y}$ for each calendar year are given in the following table:

Year	Emission factor (kgN_2O/HNO_3)
2005	5.10
2006	4.90
2007	4.70
2008	4.60
2009	4.40
2010	4.20
2011	4.10
2012	3.90
2013	3.70
2014	3.50
2015	3.40
2016	3.20
2017	3.00
2018	2.80
2019	2.70
2020	2.50
2021	2.50

2022	2.50
2023	2.50
…	…
Year n	2.50

If the monitoring period n spans across two (or more) calendar years, the baseline emissions (BE_n) shall be calculated separately for each calendar year, first establishing $EF_{BL,N2O,n}$ and then applying this to the nitric acid production of that calendar year.

PROJECT EMISSIONS

Project emissions include N_2O emissions, which have not been destroyed by the project activity and, in case of the installation of a tertiary N_2O abatement facility, CO_2 emissions resulting from the operation of the N_2O abatement facility. As the proposed CDM project activity does not comprise the installation of a tertiary N_2O abatement technology, no CO_2 emissions from the operation of such a facility need to be considered or monitored.

Project emissions are calculated as follows:

$$PE_n = PE_{N2O,n} + PE_{CO2,tertiary,n} \quad \textbf{(9)}$$

Where:

PE_n	=	Project emissions in monitoring period n (tCO_2e)
$PE_{N2O,n}$	=	Project emissions of N_2O from the project plant in monitoring period n (tCO_2e)
$PE_{CO2,tertiary,n}$	=	Project emissions of CO_2 from the operation of the tertiary N_2O abatement facility in monitoring period n (tCO_2)

Project emissions of N_2O from the project plant ($PE_{N20,n}$)

The amount of N_2O emissions from the project activity includes two emission sources:

a) The N_2O contained in the tail gas stream of the plant which is released to the atmosphere; and
b) In the case of a tertiary N_2O abatement, the N_2O contained in any by-pass streams to the tertiary N_2O abatement facility. As the proposed CDM project activity does not comprise the installation of a tertiary N_2O abatement technology, no emissions need to be considered or monitored.

Accordingly, $PE_{N2O,n}$ is determined as follows:

$$PE_{N2O,n} = (Q_{N2O,tailgas,n} + Q_{N2O,by-pass,n}) * GWP_{N2O} \quad \textbf{(10)}$$

Where:

$PE_{N2O,n}$	=	Project emissions of N_2O from the project plant in monitoring period n (tCO_2e)
$Q_{N2O,tail\ gas,n}$	=	Amount of N_2O released through the tail gas of the project plant to the atmosphere in monitoring period n (tN_2O)
$Q_{N2O,by-pass,n}$	=	Amount of N_2O released through the by-pass to a tertiary N_2O abatement system to the atmosphere in monitoring period n (tN_2O)

GWP_{N2O} = Global Warming Potential of N_2O valid for the commitment period

Determination of $Q_{N2O,tail\ gas,n}$

The amount of N_2O emissions from the tail gas stream of the project plant shall be determined using the “Tool to determine the mass flow of a greenhouse gas in a gaseous stream”. In applying the tool, the following provisions apply:

- Throughout the crediting periods of the project activity, the N_2O concentration and volume or mass flow of the tail gas are to be monitored continuously. The monitoring system is to be installed and maintained throughout the crediting period based on the European Norm 14181 (2004), or any more recent update of that standard;
- The monitoring system should provide separate hourly average values for the N_2O concentration and the volume or mass flow of the tail gas based on 2 seconds (or shorter) interval readings that are recorded and stored electronically. These N_2O data sets shall be identified by means of a unique time / date key indicating when exactly the values were observed;
- The correction factors derived from the calibration curve of the QAL2 audit for the monitoring components as determined during the QAL2-test in accordance with EN14181 must be applied to both the N_2O concentration and the volume or mass flow of the tail gas. This can either be applied automatically to the raw data recorded by the data storage system at the plant or it can be applied to the calculated hourly averages as part of the calculation of project emissions;
- If data for either the N_2O concentration or the volume or mass flow of the tail gas are not available for more than 1/3 of any hour while the plant was in operation, the value for that hour shall be replaced with the maximum value of N_2O concentration or volume or mass flow of the tail gas observed during the monitoring period. If data for neither the N_2O concentration nor the volume or mass flow of the tail gas are available for more than 1/3 of any hour while the plant was in operation, the maximum value of mass flow of N_2O calculated during the monitoring period shall be applied to any such hour. Values observed during five operating hours before and after a plant start-up and shut-down shall not be used for the determination of the maximum values;

According to the “Tool to determine the mass flow of a greenhouse gas in a gaseous stream” (Version 02.0.0) the mass flow of greenhouse gas i in the gaseous stream in time interval t ($F_{i,t}$) is calculated based on measurements of (a) the total volume flow or mass flow of the gas stream, (b) the volumetric fraction of the gas in the gaseous stream and (c) the gas composition and water content. The flow and volumetric fraction may be measured on a dry basis or wet basis. The tool covers the possible measurement combinations, providing six different calculation options to determine the mass flow of a particular greenhouse gas (Option A to F).

Based on the currently available information Option A of the tool will be applied, which states two ways how to demonstrate that the gaseous stream is dry. These are:

a) Measure the moisture content of the gaseous stream ($C_{H2O,t,db,n}$) and demonstrate that this is less or equal to 0.05 kg H_2O/m^3 dry gas; or
b) Demonstrate that the temperature of the gaseous stream (T_t) is less than 60°C (333.15 K) at the flow measurement point.

Option A of the tool can be applied since currently available information shows that the moisture content of the gaseous stream ($C_{H2O,t,db,n}$) will be less than 0.05 kg H_2O/m^3 dry gas and therefore the gas is

considered to be dry. The moisture content of the gaseous stream will be measured according to relevant current norms and standards.

The hourly values are then aggregated for the duration of the monitoring period n, as follows:

$$Q_{N2O,tailgas,n} = \sum_{h=1}^{h=h_n} F_{N2O,tailgas,h} * 10^{-3} \quad \textbf{(11)}$$

Where:

$Q_{N2O,tail\ gas,n}$	=	Amount of N_2O released through the tail gas of the project plant to the atmosphere in monitoring period n (tN_2O)
$F_{N2O,tail\ gas,h}$	=	Mass flow of N_2O in the gaseous stream of the tail gas in the hour h (kgN_2O/h)
h_n	=	Number of hours in monitoring period n during which the plant was in operation

During any periods in which a tertiary abatement system is by-passed, $F_{N2O,tail\ gas,h}$ is set to zero in order to avoid double counting of project emissions. Since the project activity applies only a secondary N_2O abatement facility this needs not to be considered according to the methodology.

Determination of $Q_{N2O,by\text{-}pass,n}$

This emission source only needs to be estimated if a tertiary N_2O abatement facility is installed under the project activity. Since the project activity applies only a secondary N_2O abatement facility the amount of N_2O released through the by-pass to a tertiary N_2O abatement system to the atmosphere in monitoring period n ($Q_{N2O,by\text{-}pass,n}$) is considered to be zero.

Project emissions from the operation of the tertiary N_2O abatement facility ($PE_{CO2,tertiary,n}$)

This emission source only needs to be estimated if a tertiary N_2O abatement facility is installed under the project activity and if fossil fuels are used to operate the facility or re-heat the gas after the facility.

Since the project activity applies only a secondary N_2O abatement facility the project emissions of CO_2 from the operation of the tertiary N_2O abatement facility in monitoring period n ($PE_{CO2,tertiary,n}$) are considered to be zero.

LEAKAGE

According to the methodology any leakage emissions sources are deemed to be negligible.

EMISSION REDUCTION

Emission reductions are calculated as follows:

$$ER_n = BE_n - PE_n \quad \textbf{(12)}$$

Where:

ER_n	=	Emission reductions in monitoring period n (tCO_2e)
BE_n	=	Baseline emissions in monitoring period n (tCO_2e)
PE_n	=	Project emissions in monitoring period n (tCO_2e)

B.6.2. Data and parameters that are available at validation:

Data / Parameter:	$EF_{default,y}$
Data unit:	$kgN_2O/tHNO_3$
Description:	Default N_2O baseline emissions factor in the calendar year y of the monitoring period n
Source of data used:	The default N_2O baseline emission factor will vary every year. In year 2005 the emission factor will be 5.1 and then it will decrease every year until it reaches a final value of 2.5 in the year 2020. The value of 2.5 will remain constant after 2020.
Value applied:	see table below
Justification of the choice of data or description of measurement methods and procedures actually applied:	Specified in the methodology
Any comment:	The decrease in the value for the baseline emission factor over time is to reflect the technological development

Year	**Emission factor (kgN_2O/HNO_3)**
2011	4.10
2012	3.90
2013	3.70
2014	3.50
2015	3.40
2016	3.20
2017	3.00
2018	2.80
2019	2.70
2020	2.50
2021	2.50
…	…
Year n	2.50

Data / Parameter:	GWP_{N2O}
Data unit:	tCO_2e/tN_2O
Description:	Global warming potential of N_2O valid for the commitment period
Source of data used:	Relevant decisions by the CMP
Value applied:	310
Justification of the choice of data or	Decision 2/CP.3 Methodological issues related to the Kyoto protocol (FCCC/CP/1997/7/Add.1)

description of measurement methods and procedures actually applied:	
Any comment:	Not available (NA)

Parameters from the tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 02.0.0)

Data / Parameter:	R_u
Data unit:	Pa.m³/kmol.K
Description:	Universal ideal gases constant
Source of data used:	"Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 02.0.0)
Value applied:	8,314
Justification of the choice of data or description of measurement methods and procedures actually applied:	Specified in the tool
Any comment:	NA

Data / Parameter:	MM_i		
Data unit:	kg/kmol		
Description:	Molecular mass of greenhouse gas i		
Source of data used:	"Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 02.0.0)		
Value applied:	**Compound**	**Structure**	**Molecular mass (kg/kmol)**
	Nitrous oxide	N_2O	44.02
Justification of the choice of data or description of measurement methods and procedures actually applied:	Specified in the tool		
Any comment:	NA		

B.6.3. Ex-ante calculation of emission reductions:

Ex-ante estimation of emission reduction is made by projecting nitric acid output, N_2O formation and efficiency of the catalytic N_2O destruction process. Estimation is for reference purposes only, actual project and baseline emissions will be determined on measurement results on an ex-post basis.

The following data are applied for the ex-ante calculation of emission reduction:

- Nitric acid production of 328,375 $tHNO_3$/a;

- Tail gas mass flow rate of 153,705 kg/h (actual conditions);
- Concentration of N_2O prior to the N_2O abatement catalyst of about 1,200 ppmv;
- Removal rate of 90 % of N_2O emissions, resulting in an outlet concentration of about 120 ppmv;
- Yearly operation is assumed to be 355 days, which leads to yearly operating hours of 8,520.

BASELINE EMISSIONS

Baseline emissions are calculated as below:

$$BE_n = P_{NA,n} * EF_{BL,N2O,n} * GWP_{N2O} * 10^{-3}$$

Year	BE_n	$PA_{NA,n}$	$EF_{BL,N2O,n}$	GWP_{N2O}
	tCO_2e	$tHNO_3$	kgN_2O / $tHNO_3$	
12/2011	**34,780**	27,365	4.10	310
2012	**397,005**	328,375	3.90	310
2013	**376,646**	328,375	3.70	310
2014	**356,287**	328,375	3.50	310
2015	**346,107**	328,375	3.40	310
2016	**325,748**	328,375	3.20	310
2017	**305,389**	328,375	3.00	310
2018	**285,030**	328,375	2.80	310
2019	**274,850**	328,375	2.70	310
2020	**254,491**	328,375	2.50	310
01-11/2021	**233,283**	301,010	2.50	310

PROJECT EMISSIONS

Project emissions are calculated as below:

$$PE_n = PE_{N2O,n} + PE_{CO2,tertiary,n}$$

Year	PE_n	$PE_{N2O,n}$	$PE_{CO2,tertiary,n}$
	tCO_2e	tCO_2e	tCO_2
12/2011	**6,282**	6,282	0
2012	**75,388**	75,388	0
2013	**75,388**	75,388	0
2014	**75,388**	75,388	0
2015	**75,388**	75,388	0
2016	**75,388**	75,388	0
2017	**75,388**	75,388	0
2018	**75,388**	75,388	0

2019	**75,388**	75,388	0
2020	**75,388**	75,388	0
01-11/2021	**69,105**	69,105	0

$$PE_{N2O,n} = (Q_{N2O,tailgas,n} + Q_{N2O,by-pass,n}) * GWP_{N2O}$$

Year	$PE_{N2O,n}$	$Q_{N2O,tail\ gas,n}$	$Q_{N2O,by-pass,n}$	GWP_{N2O}
	tCO_2e	tN_2O	tN_2O	
12/2011	**6,282**	20.27	0	310
2012	**75,388**	243.19	0	310
2013	**75,388**	243.19	0	310
2014	**75,388**	243.19	0	310
2015	**75,388**	243.19	0	310
2016	**75,388**	243.19	0	310
2017	**75,388**	243.19	0	310
2018	**75,388**	243.19	0	310
2019	**75,388**	243.19	0	310
2020	**75,388**	243.19	0	310
01-11/2021	**69,105**	222.92	0	310

$$Q_{N2O,tailgas,n} = \sum_{h=1}^{h=h_n} F_{N2O,tailgas,h} * 10^{-3}$$

Year	$Q_{N2O,tail\ gas,n}$	$F_{N2O,tail\ gas,h}$	h_n
	tN_2O	kgN_2O/h	h
12/2011	**20.27**	28.54	710
2012	**243.19**	28.54	8,520
2013	**243.19**	28.54	8,520
2014	**243.19**	28.54	8,520
2015	**243.19**	28.54	8,520
2016	**243.19**	28.54	8,520
2017	**243.19**	28.54	8,520
2018	**243.19**	28.54	8,520
2019	**243.19**	28.54	8,520
2020	**243.19**	28.54	8,520
01-11/2021	**222.92**	28.54	7,810

According to currently available information $F_{N2O,tail\ gas,h}$ was determined to 28.54 kgN_2O/h and was used for ex-ante determination.

LEAKAGE

Any leakage emissions sources are deemed to be negligible.

EMISSION REDUCTIONS

Project emissions are calculated as below:

$$ER_n = BE_n - PE_n$$

Year	ER_n	BE_n	PE_n
	tCO_2e	**tCO_2e**	**tCO_2e**
12/2011	**28,498**	34,780	6,282
2012	**321,618**	397,005	75,388
2013	**301,258**	376,646	75,388
2014	**280,899**	356,287	75,388
2015	**270,719**	346,107	75,388
2016	**250,360**	325,748	75,388
2017	**230,001**	305,389	75,388
2018	**209,642**	285,030	75,388
2019	**199,462**	274,850	75,388
2020	**179,103**	254,491	75,388
01-11/2021	**164,178**	233,283	69,105

B.6.4 Summary of the ex-ante estimation of emission reductions:

The anthropogenic emissions of the proposed project activity within the project boundary consist of the emissions of non-destroyed N_2O only. Estimation is for reference purposes only, actual project and baseline emissions will be determined on measurement results on an ex-post basis.

Expected starting date of the crediting period: 01/12/2011

The table below summarizes the project's emissions by sources.

Year	Estimation of Project Activity Emissions (tonnes of CO_2e)	Estimation of Baseline Emissions (tonnes of CO_2 e)	Estimation of Leakage (tonnes of CO2e)	Estimation of overall Emission Reductions (tonnes of CO_2 e)
12/2011	6,282	34,780	0	28,498
2012	75,388	397,005	0	321,618
2013	75,388	376,646	0	301,258
2014	75,388	356,287	0	280,899

2015	75,388	346,107	0	270,719
2016	75,388	325,748	0	250,360
2017	75,388	305,389	0	230,001
2018	75,388	285,030	0	209,642
2019	75,388	274,850	0	199,462
2020	75,388	254,491	0	179,103
01-11/2021	69,105	233,283	0	164,178
Total (tonnes of CO_2e)	**753,878**	**3,189,616**	**0**	**2,435,738**

Over the crediting period, the project activity is expected to generate 2,435,738 tCO_2e of emission reductions.

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

B.7.1 Data and parameters monitored:

Data / Parameter:	$P_{NA,n}$
Data unit:	$tHNO_3$
Description:	Nitric acid produced in the monitoring period n
Source of data to be used:	Production log
Value of data applied for the purpose of calculating expected emission reductions in section B.5	No measurements available at this stage of the project. The assumptions for Emission Reductions calculations can be found in respective section B.6.1 and B.6.3.
Description of measurement methods and procedures to be applied:	Automatically monitored.
QA/QC procedures to be applied:	Measurement devices such as weight scales shall follow QA/QC supplier recommendations
Any comment:	NA

Data / Parameter:	h_n
Data unit:	NA
Description:	Number of hours of operation in a monitoring period n
Source of data to be used:	Measured
Value of data applied for the purpose of calculating expected emission reductions in section B.5	No measurements available at this stage of the project. The assumptions for Emission Reductions calculations can be found in respective section B.6.1 and B.6.3.

Description of measurement methods and procedures to be applied:	Plant manager records the hours of full operation of the plant during each monitoring period. The information will be stored in electronic records and paper during whole project´s lifetime.
QA/QC procedures to be applied:	Included in evaluation by third party validator
Any comment:	Records to be maintained during project´s lifetime

Data / Parameter:	$T_{open,n}$
Data unit:	%
Description:	% of time the valve on the line feeding the decomposition facility is open during monitoring period n
Source of data to be used:	NA
Value of data applied for the purpose of calculating expected emission reductions in section B.5	NA
Description of measurement methods and procedures to be applied:	NA
QA/QC procedures to be applied:	NA
Any comment:	Since a secondary technology is used, $T_{open,n}$ is not applicable and parameter will not be monitored.

Data / Parameter:	$V_{t,db}$
Data unit:	m^3 dry gas/h
Description:	Volumetric flow of the gaseous stream in time interval t on a dry basis
Source of data to be used:	Measured
Value of data applied for the purpose of calculating expected emission reductions in section B.5	No measurements available at this stage of the project. The assumptions for Emission Reductions calculations can be found in respective section B.6.1 and B.6.3.
Description of measurement methods and procedures to be applied:	Volumetric flow measurement will refer to the actual pressure and temperature. Calculated based on the wet basis flow measurement plus water concentration measurement. Continuous monitoring.
QA/QC procedures to be applied:	Periodic calibration against a primary device provided by an independent accredited laboratory. Calibration and frequency of calibration is according to manufacturer´s specifications.
Any comment:	NA

Data / Parameter:	$v_{i,t,db}$

Data unit:	m^3 gas i/m^3 dry gas
Description:	Volumetric fraction of greenhouse gas i in a time interval t on a dry basis
Source of data to be used:	Measured
Value of data applied for the purpose of calculating expected emission reductions in section B.5	No measurements available at this stage of the project. The assumptions for Emission Reductions calculations can be found in respective section B.6.1 and B.6.3.
Description of measurement methods and procedures to be applied:	Continuous gas analyser operating in dry-basis. Volumetric flow measurement refers to the actual pressure and temperature. Continuous monitoring.
QA/QC procedures to be applied:	According to European Norm 14181
Any comment:	NA

Data / Parameter:	T_t
Data unit:	K
Description:	Temperature of the gaseous stream in time interval t
Source of data to be used:	Measured
Value of data applied for the purpose of calculating expected emission reductions in section B.5	No measurements available at this stage of the project. The assumptions for Emission Reductions calculations can be found in respective section B.6.1 and B.6.3.
Description of measurement methods and procedures to be applied:	Instruments with recordable electronic signal
QA/QC procedures to be applied:	Periodic calibration against a primary device provided by an independent accredited laboratory. Calibration and frequency of calibration is according to manufacturer´s specifications.
Any comment:	NA

Data / Parameter:	P_t
Data unit:	Pa
Description:	Pressure of the gaseous stream in time interval t
Source of data to be used:	Measured
Value of data applied for the purpose of calculating expected emission reductions in section B.5	No measurements available at this stage of the project. The assumptions for Emission Reductions calculations can be found in respective section B.6.1 and B.6.3.
Description of measurement methods	Instruments with recordable electronic signal

and procedures to be applied:	
QA/QC procedures to be applied:	Periodic calibration against a primary device will be performed and records of calibration procedures will be kept available as well as the primary device and its calibration certificate. Pressure transducers (either capacitive or resistive) will be calibrated regularly.
Any comment:	NA

B.7.2. Description of the monitoring plan:

The emission reductions achieved by the project activity will be monitored using the requirements of the approved consolidated baseline and monitoring methodology ACM0019 “N_2O abatement from nitric acid production” (Version 01.0.0).

Enaex has been operating chemical complex’ incl. nitric acid plants since the commissioning of the plants 1-3 and has sufficient and well-experienced staffs. Enaex has been in production of the nitric acid for more than 90 years and measurement of various production parameters including operation of analysers, which are managed by the production team.

Measurement of the N_2O concentration and the total gas volume flow
The project will employ the latest state of the art monitoring and control equipment that measures, records and reports all key parameters to determine the GHG emission reductions. The plant will be equipped with an Automated Monitoring System (AMS) in order to allow continuous real-time measurements of the N_2O concentration and the total gas volume flow, which is required by the methodology.

The amount of N_2O emissions from the tail gas stream of the project plant shall be determined using the “Tool to determine the mass flow of a greenhouse gas in a gaseous stream”. In applying the tool, the following provisions apply:

- Throughout the crediting periods of the project activity, the N_2O concentration and volume or mass flow of the tail gas are to be monitored continuously. The monitoring system is to be installed and maintained throughout the crediting period based on the European Norm 14181 (2004), or any more recent update of that standard;
- The monitoring system should provide separate hourly average values for the N_2O concentration and the volume or mass flow of the tail gas based on 2 seconds (or shorter) interval readings that are recorded and stored electronically. These N_2O data sets shall be identified by means of a unique time / date key indicating when exactly the values were observed;
- The correction factors derived from the calibration curve of the QAL2 audit for the monitoring components as determined during the QAL2-test in accordance with EN14181 must be applied to both the N_2O concentration and the volume or mass flow of the tail gas. This can either be applied automatically to the raw data recorded by the data storage system at the plant or it can be applied to the calculated hourly averages as part of the calculation of project emissions;
- If data for either the N_2O concentration or the volume or mass flow of the tail gas are not available for more than 1/3 of any hour while the plant was in operation, the value for that hour shall be replaced with the maximum value of N_2O concentration or volume or mass flow of the tail gas observed during the monitoring period. If data for neither the N_2O concentration nor the volume or mass flow of the tail gas are available for more than 1/3 of any hour while the plant was in operation, the maximum value of mass flow of N_2O calculated during the monitoring period shall be applied to any such hour. Values observed during five operating hours before and

after a plant start-up and shut-down shall not be used for the determination of the maximum values;

The European Norm EN 14181 stipulates three levels of quality assurance tests and one annual functional test for AMS, which are recommended to be used as guidance regarding the selection, installation and operation of the AMS under the applied monitoring methodology. The three quality assurance levels (QAL) are as follows:

1. Quality assurance of tested AMS. AMS will have performance certificate with calculation of uncertainty before installation. The specific performance characteristics of the monitoring system chosen by the project will be listed in the Monitoring Reports.
2. Quality assurance of installation and calibration of the Automated Measuring System according to the Standard Reference Measurement Method (SRM) for concentration measurements, determination of the measurement uncertainty/variability of the AMS and inspection of the compliance with the prescribed measurement uncertainties. Such tests will be carried out by organisations that have an accredited quality assurance system.
3. Continuous quality assurance through the local operator/manager (drift and accuracy of the AMS, verification management and documentation).
    a) Permanent quality assurance during the plant operation by the operating staff;
    b) Assurance of reliable and correct operation of the monitoring equipment (maintenance evidence);
    c) Regular controls as scheduled by the manufacturer (maintenance intervals);

In addition, annual functionality tests including SRM measurements to check for uncertainties in the data measured by the AMS are planned. Such tests will be carried out by organisations that have an accredited quality assurance system.

Quality Management
The monitoring procedures will be integrated in Enaex quality management system. All monitoring equipment will be serviced, calibrated and maintained according to the manufacturers' instructions and international standards. Parameters to be monitored are described above.

It is the responsibility of the Project Operator to ensure that required and experienced capacity is available and that their operational staffs participate in training to be able to operate the monitoring system properly. Initial training will be provided to the staff before the project activity starts operation. It is also the responsibility of the Project Operator to organize and implement a quality management system that ensures the integrity of the data.

The data measured by the installed monitoring system is sent directly to the Delta V System. This system has a historian that will archive the data without the need of human intervention. This will ensure data integrity. Malfunction of system components will be indicated on the operator console in the control room as an alarm. The occurrence of such an alarm requires the operator to immediately take measures to remedy the problem. This is normally done by informing the instrument department, which then decides whether the problem can be fixed immediately by themselves, or whether external support from manufacturer is required. In such a case it is important to act immediately in order to avoid loss of valuable data. Detailed instructions on how to proceed in such cases are given in the manufacturer's documentation.

Enaex will perform a visual inspection of system on a regular basis by the operating staff. Such an inspection can give indications on oncoming problems and allow to be prepared for them. Internal review of project performance and calculation of emission reductions will be executed by Enaex and CARBON on a regular basis.

The operation and maintenance of the N_2O monitoring system will be incorporated to the ISO 9001:2008 quality management system. The production team will be appointed to be responsible for the operation of the N_2O monitoring system. The production team will follow the monitoring plan and report the data on regular intervals to the management team and Plant Manager in ascending order.

Find below a list of persons responsible for monitoring the CDM Project.

Activity	**Person nominated (expected)**
CDM Project Manager	Jorge Saffie
Project Administration	Jorge Saffie
Project Communication DOE	Jorge Saffie
Project Operation	Alex Illge Redlich
Project Maintenance	German Lamas
Project Construction	German Lamas
Project Review: Monitoring Reports	Gerald Dunkel
Project Monitoring (data collection)	Priscilla Rehren

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

Date of completion of the application of the methodology to the project activity study: 25/07/2011

Persons/entities responsible for the application of the baseline and monitoring methodology to the project activity are shown below.

Persons/entities	***Project Participant Yes / No***
Carbon Climate Protection GmbH Am Südblick 5 A-3550 Langenlois Austria tel. +43 2734 322 70 0 fax. +43 2734 322 70 99 Gerald Dunkel Andreas Rammelmüller Hans-Jürgen Salmhofer Sonja Haderer	***Yes***

Email: dunkel@carbon-austria.com Email: rammelmueller@carbon-austria.com Email: salmhofer@carbon-austria.com Email: haderer@carbon-austria.com	

SECTION C. Duration of the project activity / crediting period

C.1. Duration of the project activity:

C.1.1. Starting date of the project activity:

Starting date of the project activity: 29/04/2011

This date is the date, when the engineering of the CDM project was assigned.

C.1.2. Expected operational lifetime of the project activity:

25 years

C.2. Choice of the crediting period and related information:

C.2.1. Renewable crediting period:

C.2.1.1. Starting date of the first crediting period:

C.2.1.2. Length of the first crediting period:

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

Expected starting date of first crediting period: 01/12/2011

C.2.2.2. Length:

10 years, 0 months

SECTION D. Environmental impacts

D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

The catalytic N_2O destruction project at the PANNA 4 Nitric Acid Plant is a sustainable project that contributes to the environmental, economic and social benefits in the Republic of Chile.

Environmental Impacts
The ex-ante GHG emission reduction is estimated to be about 2.4 million tonnes of CO_2e over the ten year crediting period.

No transboundary impacts are expected.

D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

Not applicable, as no significant environmental impacts are considered.

SECTION E. Stakeholders' comments

E.1. Brief description how comments by local stakeholders have been invited and compiled:

A local stakeholder consultation was carried out by Enaex S.A. in the Antofagasta region on July 14, 2011. The stakeholder conference took place in the auditorium of the "Mutual de Seguridad C.Ch.C" in Antofagasta city and its purpose was to inform local stakeholders about the CDM project of catalytic reduction of N_2O at the nitric acid plant PANNA 4 in Mejillones, Chile.

More than 180 invitations were prepared and sent to different stakeholders. Internally, a letter to the General Managers and e-mails were sent to the staff of the entire company:

Enaex

UNFCCC

LANZAMIENTO PROYECTO
BONOS DE CARBONO-ENAEX S.A.

Juan Andrés Errázuriz Domínguez, Gerente General de Enaex S.A., invita cordialmente a Ud. a la presentación del proyecto "Bonos de Carbono PANNA 4" desarrollado en la Planta Prillex América de Mejillones.

La conferencia abordará el fenómeno del cambio climático, las medidas que se están implementando a nivel mundial, las consecuencias para Chile y los proyectos que la Empresa desarrolla actualmente como parte de su compromiso con la comunidad y el cuidado del medio ambiente.

El evento se realizará el jueves 14 de julio a las 10 hrs., en el Auditorio de la Mutual de Seguridad C.Ch.C. ubicado en Washington 2701, tercer piso, Antofagasta.

Para la comunidad de Mejillones se dispondrá de movilización especial. La salida será desde el Municipio de la ciudad a las 08:30 hrs y el regreso una vez finalizado el cóctel.

Atentamente,

R.S.V.P
jdiaz@enaex.cl o al teléfono (562) 8377648

Gerente General

COMUNICÁNDONOS
En confianza

N°54-2011

Enaex

LANZAMIENTO PROYECTO
BONOS DE CARBONO-ENAEX S.A.

UNFCCC

Comunicamos que el **jueves 14 de julio** se realizará en la ciudad de Antofagasta el Lanzamiento del proyecto **"Bonos de Carbono PANNA 4"** desarrollado en la Planta Prillex® América de Mejillones.

Para Enaex este es un proyecto trascendente, ya que a través de su implementación se podrá reducir más de 300,000 TM CO2 eq. al año que sumado a las 800.000 TM reducidas en PANNA 3, transforma a Enaex en uno de los complejos de producción de Ácido Nítrico más eficientes a nivel global en la lucha contra el cambio climático.

El programa será el siguiente:

El evento comienza a las 10:00 hrs., en el Auditorio de la Mutual de Seguridad C.Ch.C, ubicado en calle Jorge Washington 2701, tercer piso. Para los trabajadores de la planta Prillex se dispondrá de bus para el regreso una vez finalizada la actividad.

Moderador: Sr. Jorge Saffie

Horario	Presenta	Tema
10:00 - 10:15	**Sr. Marcelino Carvajal** **Alcalde de Mejillones**	**Bienvenida**
10:15 - 10:45	**Sr. Alex Illge** Gerente Planta Prillex	Enaex S.A. - Planta Prillex América: 90 años de Crecimiento y Comprometidos con el Futuro
10:45 - 11:15	**Sr. Rafael Visedo** Gerente RSE Enaex S.A.	Responsabilidad Social Empresarial Un Compromiso de Todos
11:15 - 11:45	**Srta. Úrsula Bustamante** Ingeniero de Proyectos	Huella de Carbono Enaex S.A. Proyecto Bonos de Carbono en Panna 4
11:45- 12:15	**Sr. Jorge Saffie** Subgerente Innovación	Cambio Climático: Perspectivas a Futuro
cóctel		

Cordialmente,

Juan Andrés Errázuriz Domínguez

07 de Julio de 2011

In addition, an announcement was published in the regional newspaper in Antofagasta, El Mercurio (http://edicionimpresa.soychile.cl/antofagasta/?c).

The meeting covered three main subjects:
1. Enaex and its role with Social Responsibility
2. Global Warming with its current and future impacts and
3. PANNA4 CDM Project with an insight on the carbon market and the future perspectives of the Kyoto Protocol

A total of 86 people from different sectors attended the meeting. A variety of sectors were represented among the attendants, as shown on the following table:

Organization/Company	Number
General Public	40
Local Companies	19
Enaex S.A.	16
Goverment	7
Comunication Media	3
Army	1
Total	**86**

E.2. Summary of the comments received:

A questionnaire containing the following 10 questions was handed out to the attendees:

1. Has the presentation improved your understanding of Global Warming?
2. Has the presentation improved your understanding of this CDM Project?
3. Do you have a positive attitude to this CDM Project?
4. Do you believe that this CDM Project has environmental benefits for the local surrounding?
5. Do you believe that this CDM Project has environmental benefits for the global climate?
6. Do you believe that local people will benefit from this CDM Project (i.e. job opportunities, air quality improvement etc.)?
7. Do you believe that the image of the region will benefit from this environmental friendly CDM Project?
8. Do you believe that this CDM Project contributes to sustainable development in the region?
9. Do you believe that this CDM Project has economic benefits for the local surrounding?
10. Do you believe that the Government of Chile should support this CDM Project?

A total of 71 attendees answered the questionnaire with the following results:

	Answer			
Question Number	**Yes**	**No**	**No Answer**	**Total**
1	64	6	1	**71**
2	68	2	1	**71**
3	69	2		**71**
4	67	4		**71**
5	68	3		**71**
6	59	12		**71**
7	64	7		**71**
8	65	6		**71**
9	59	12		**71**
10	67	4		**71**

E.3. Report on how due account was taken of any comments received:

The survey shows that the project has strong support amongst local people. According to the response received from questionnaires, almost all local stakeholders support the CDM Project Activity and believe that the Government of Chile should support the CDM Project. Therefore there has been no need to modify the plans due to comments received.

Nevertheless, the project participants will consider potential input which could arise during the national approval process, besides following CDM Rules & Procedures. No direct action is necessary according to the comments received. However, in order to further address additional questions from local stakeholders, the project participants intend to provide a reasonable level on transparency on the CDM Project Activity development.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Enaex S.A.
Street/P.O.Box:	Renato Sánchez # 3859, Las Condes
Building:	
City:	Santiago
State/Region:	Región Metropolitana
Postfix/ZIP:	Correo Central 6760505
Country:	Chile
Telephone:	+56-2-2069351
FAX:	+56-2-2285527
E-Mail:	
URL:	www.enaex.cl
Represented by:	Mr. Jorge Saffie
Title:	Project Manager
Salutation:	
Last Name:	Saffie
Middle Name:	
First Name:	Jorge
Department:	
Mobile:	+56-9-6-8487768
Direct FAX:	+56-2-2285527
Direct tel:	+56-2-8377656
Personal E-Mail:	jsaffie@enaex.cl

Organization:	Carbon Climate Protection GmbH
Street/P.O.Box:	Am Südblick 5
Building:	
City:	Langenlois
State/Region:	
Postfix/ZIP:	A-3550
Country:	Austria
Telephone:	+43 2734 322 70 0
FAX:	+43 2734 322 70 99
E-Mail:	office@carbon-austria.com
URL:	www.carbon-austria.com
Represented by:	Mr. Ferdinand Heilig
Title:	Managing Director
Salutation:	
Last Name:	Heilig
Middle Name:	
First Name:	Ferdinand
Department:	
Mobile:	
Direct FAX:	+43 2734 322 70 99
Direct tel:	+43 2734 322 70 0
Personal E-Mail:	heilig@carbon-austria.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funds are available for the financing of the project activity.

Annex 3

BASELINE INFORMATION

No additional baseline information is to be mentioned.

Annex 4

MONITORING INFORMATION (subject to changes)[2]

The project activity will apply an Automated Monitoring System (AMS), which is in line with the requirements of the approved consolidated baseline and monitoring methodology ACM0019 "N_2O abatement from nitric acid production" to monitor the N_2O concentration as well as the tail gas flow volume. Therefore continuous real-time measurements of the N_2O concentration and the total gas volume flow can be carried out in the tail gas stream after the abatement of N_2O emissions throughout the crediting period of the project activity. Further details on the monitoring plan are provided in section B.7.2 of the PDD.

The monitoring parameters are the amount of nitric acid produced and the number of hours of operation in the respective monitoring period. The monitoring plan for this project activity foresees to ensure that the quality assurance and quality control of these recorded data meet CDM quality criteria. Therefore the Panna 4 nitric acid plant will be equipped with a state-of-the-art AMS consisting of a tail gas analyser and a flow meter as well as a temperature and a pressure sensor. Associated equipment has QAL1-certificates according to the norm EN 14181 and is new. The installation, quality assurance and quality control measures require therefore a training package for the site staff that has to check, operate and calibrate the stack equipment.

The measuring points were chosen in accordance with the AMS requirements and the plant design specifications to allow an optimum of data collecting quality. The locations of the measuring points were selected according to the norm EN15259:2005.

According to the approved consolidated baseline and monitoring methodology ACM0019 "N_2O abatement from nitric acid production", the monitoring system will cover the baseline emissions and project emissions. The monitoring plan details the actions necessary to record all the variables and factors required by the methodology, as provided in section B.7.1 of the PDD. All data will be archived

[2] The monitoring of the baseline and project emissions will be verified by the DOE. Therefore, the monitoring information stated in Annex 4 of this PDD might change when the project proceeds.

electronically and in hard copy in line with the methodology, and data will be kept for the full crediting period and two years after.

In order to maintain high quality on the monitored data, quality assurance and quality control measures are to be operated. This will ensure that the generated data are complete, transparent and accurate. The equipment to be used in order to carry out the monitoring of N_2O concentration and tail gas flow volume measurement will comply with European Norm EN14181:2004. It stipulates three levels of quality assurance tests and one annual functional test for AMS, which are recommended to be used as guidance regarding the selection, installation and operation of the AMS under the applied monitoring methodology. The three quality assurance levels (QAL) are as follows:

1. Quality assurance of tested AMS. AMS will have performance certificate with calculation of uncertainty before installation. The specific performance characteristics of the monitoring system chosen by the project will be listed in the Monitoring Reports.
2. Quality assurance of installation and calibration of the Automated Measuring System according to the Standard Reference Measurement Method (SRM) for concentration measurements, determination of the measurement uncertainty/variability of the AMS and inspection of the compliance with the prescribed measurement uncertainties. Such tests will be carried out by organisations that have an accredited quality assurance system.
3. Continuous quality assurance through the local operator/manager (drift and accuracy of the AMS, verification management and documentation).
    a) Permanent quality assurance during the plant operation by the operating staff;
    b) Assurance of reliable and correct operation of the monitoring equipment (maintenance evidence);
    c) Regular controls as scheduled by the manufacturer (maintenance intervals);

In addition, annual functionality tests including SRM measurements to check for uncertainties in the data measured by the AMS are planned. Such tests will be carried out by organisations that have an accredited quality assurance system.

The operation and maintenance of the N_2O monitoring system will be incorporated to the ISO 9001:2008 quality management system. Certification documents will be available onsite during validation for their review.

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