DETERMINATION REPORT
LITASCO S.A.

DETERMINATION OF THE
GREENHOUSE GASES EMISSIONS REDUCTION DUE TO MODERNIZATION OF PRODUCTION FACILITIES AT LLC "KARPATNAFTOHIM"

REPORT NO. UKRAINE-DET/0581/2012
REVISION NO. 02

BUREAU VERITAS CERTIFICATION

Report No: UKRAINE-det/0581/2012

DETERMINATION REPORT

Date of first issue:	Organizational unit:
30/11/2012	Bureau Veritas Certification Holding SAS
Client:	**Client ref.:**
LITASCO S.A.	Nelson da Silva

Summary:

Bureau Veritas Certification has made the determination of the "Greenhouse gases emissions reduction due to modernization of production facilities at LLC "Karpatnaftohim" project of LITASCO S.A. located in Kalush, Ivano-Frankivsk region, Ukraine on the basis of UNFCCC criteria for the JI, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Supervisory Committee, as well as the host country criteria.

The determination scope is defined as an independent and objective review of the project design document, the project's baseline study, monitoring plan and other relevant documents, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final determination report and opinion. The overall determination, from Contract Review to Determination Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the determination process is a list of Clarification and Corrective Action Requests (CL and CAR), presented in Appendix A. Taking into account this output, the project proponent revised its project design document.

In summary, it is Bureau Veritas Certification's opinion that the project correctly applies Guidance on criteria for baseline setting and monitoring and meets the relevant UNFCCC requirements for the JI and the relevant host country criteria.

Report No.:	Subject Group:
UKRAINE-det/0581/2012	JI
Project title:	
Greenhouse gases emissions reduction due to modernization of production facilities at LLC "Karpatnaftohim"	
Work carried out by:	
Vyacheslav Yeriomin – Team Leader, Lead Verifier Sergiy Kustovskyy – Team Member, Verifier Denis Pishchalov – Financial Specialist	
Work reviewed by:	
Ivan Sokolov - Internal Technical Reviewer Iuliia Pylnova – Technical specialist	
Work approved by:	
Ivan Sokolov – Operational Manager	

Date of this revision:	Rev. No.:	Number of pages:
03/12/2012	02	48

Indexing terms

☒ No distribution without permission from the Client or responsible organizational unit

☐ Limited distribution

☐ Unrestricted distribution

Bureau Veritas Certification Holding SAS

Table of Contents *Page*

1 INTRODUCTION

LITASCO S.A. has commissioned Bureau Veritas Certification to determine its JI project “Greenhouse gases emissions reduction due to modernization of production facilities at LLC “Karpatnaftohim” (hereafter called “the project”) at Kalush, Ivano-Frankivsk region, Ukraine.

This report summarizes the findings of the determination of the project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

The determination serves as project design verification and is a requirement of all projects. The determination is an independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan (MP), and the project’s compliance with relevant UNFCCC and host country criteria are determined in order to confirm that the project design, as documented, is sound and reasonable, and meets the stated requirements and identified criteria. Determination is a requirement for all JI projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of emission reduction units (ERUs).

UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Supervisory Committee, as well as the host country criteria.

1.2 Scope

The determination scope is defined as an independent and objective review of the project design document, the project’s baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

The determination 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.

1.3 Determination team

The determination team consists of the following personnel:

Vyacheslav Yeriomin
Bureau Veritas Certification Team Leader, Climate Change Lead Verifier

Sergiy Kustovskyy

Bureau Veritas Certification Climate Change Verifier

Denis Pishchalov

Bureau Veritas Certification Financial Specialist

This determination report was reviewed by:

Ivan Sokolov
Bureau Veritas Certification, Internal reviewer

Iuliia Pylnova
Bureau Veritas Certification Technical Specialist

2 METHODOLOGY

The overall determination, from Contract Review to Determination Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

In order to ensure transparency, a determination protocol was customized for the project, according to the version 01 of the Joint Implementation Determination and Verification Manual, issued by the Joint Implementation Supervisory Committee at its 19 meeting on 04/12/2009. The protocol shows, in a transparent manner, criteria (requirements), means of determination and the results from determining the identified criteria. The determination protocol serves the following purposes:

- It organizes, details and clarifies the requirements a JI project is expected to meet;
- It ensures a transparent determination process where the determiner will document how a particular requirement has been determined and the result of the determination.

The completed determination protocol is enclosed in Appendix A to this report.

2.1 Review of Documents

The Project Design Document (PDD) submitted by LLC “KT-Energy” and additional background documents related to the project design and baseline, i.e. country Law, Guidelines for users of the joint implementation project design document form, Approved CDM methodology and/or Guidance on criteria for baseline setting and monitoring, Kyoto Protocol, Clarifications on Determination Requirements to be Checked by an Accredited Independent Entity were reviewed.

To address Bureau Veritas Certification corrective action and clarification requests, LLC “KT-Energy” revised the PDD and resubmitted it on 29/11/2012.

The determination findings presented in this report relate to the project as described in the PDD version(s) 2.2.

2.2 Follow-up Interviews

On 31/10/2012 Bureau Veritas Certification performed on-site interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of LLC "KT-Energy" and LLC "Karpatnaftohim" were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
LLC "Karpatnaftohim"	➢ Implementation schedule ➢ Project management organisation ➢ Evidence and records on reconstruction and new equipment and its operation ➢ Environmental Impact Assessment ➢ Project monitoring responsibilities ➢ Monitoring equipment ➢ Quality control and quality assurance procedures ➢ Environmental impacts affected ➢ Local authorities and public opinion
CONSULTANT LLC "KT-Energy"	➢ Applicability of methodology ➢ Baseline and Project scenarios ➢ Barriers analysis ➢ Additionality justification ➢ Common practice analysis ➢ Monitoring plan ➢ Conformity of PDD to JI requirements

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the determination is to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the project design.

If the determination team, in assessing the PDD and supporting documents, identifies issues that need to be corrected, clarified or improved with regard to JI project requirements, it will raise these issues and inform the project participants of these issues in the form of:

(a) Corrective action request (CAR), requesting the project participants to correct a mistake in the published PDD that is not in accordance with the

(technical) process used for the project or relevant JI project requirement or that shows any other logical flaw;

(b) Clarification request (CL), requesting the project participants to provide additional information for the determination team to assess compliance with the JI project requirement in question;

(c) Forward action request (FAR), informing the project participants of an issue, relating to project implementation but not project design, that needs to be reviewed during the first verification of the project.

The determination team will make an objective assessment as to whether the actions taken by the project participants, if any, satisfactorily resolve the issues raised, if any, and should conclude its findings of the determination.

To guarantee the transparency of the determination process, the concerns raised are documented in more detail in the determination protocol in Appendix A.

3 PROJECT DESCRIPTION

Project activity foresees the replacement of diaphragm cell technology with more energy efficient membrane cell technology for caustic soda production by construction membrane electrolysis unit with the capacity of 200 thousand tonnes per annum (new membrane electrolysis plant). The project is initiated in order to optimize energy resource consumption by the enterprise and to reduce greenhouse gases emissions.

Caustic soda (sodium hydroxide, NaOH) is a reagent used in the chemical industry, petrochemical industry, paper manufacturing, textile manufacturing and other industries as well as in the color metallurgical sector.

Before proposed project implementation caustic soda at LLC “Karpatnaftohim” was produced using diaphragm cell technology. Within this process saturated brine (sodium chloride solution) enters the anode compartment of the cell, where chlorine gas is liberated. The function of the diaphragm is to separate the brine from the caustic solution at the cathode side, which is also where hydrogen gas is released. Diaphragm cell technology supposes consumption of relatively high amounts of heat energy and electricity and thus causes relatively high emissions of greenhouse gases into the atmosphere.

The decision about project implementation has been made on 14th of November, 2005 taking into account the possibility of attracting additional investment using Kyoto Protocol’s flexible mechanisms. Project

implementation lasted during 2005-2010 and the new chlorine and caustic soda production facilities (membrane electrolysis unit or membrane electrolysis plant) have been put into operation at 11th of November, 2010.

Within the framework of proposed project implementation the existed chlorine and caustic soda production unit #2 with the capacity of 125 000 tonnes per annum has been taken out from operation at the 1st of August 2006 and the chlorine and caustic soda production unit #1 with the capacity of 66 000 tonnes per annum has been taken out from operation at 1st of June 2008 (both units were using diaphragm cell technology).

4 DETERMINATION CONCLUSIONS

In the following sections, the conclusions of the determination are stated.

The findings from the desk review of the original project design documents and the findings from interviews during the follow up visit are described in the Determination Protocol in Appendix A.

The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Determination Protocol in Appendix A. The determination of the Project resulted in 20 Corrective Action Requests and 3 Clarification Requests.

The number between brackets at the end of each section corresponds to the DVM paragraph

4.1 Project approvals by Parties involved (19-20)

Letter of Endorsement for the project #3412/23/7 dated 13/11/2012 has issued State Environmental Investments Agency of Ukraine.

According to the national Ukrainian procedure, the LoAs by Ukraine is expected after the project determination (See CAR 20).

4.2 Authorization of project participants by Parties involved (21)

The participation of each project participant listed in the PDD will be authorized by Letter of Approval from appropriate party explicitly stating the name of the legal entity. See CAR 20.

4.3 Baseline setting (22-26)

The PDD explicitly indicates that using a methodology for baseline setting and monitoring developed in accordance with appendix B of the JI guidelines (hereinafter referred to as JI specific approach) was the selected approach for identifying the baseline.

The PDD provides a detailed theoretical description in a complete and transparent manner, as well as justification, that the baseline is established:

(a) By listing and describing the following plausible future scenarios on the basis of conservative assumptions and selecting the most plausible one:

a. Continuation of previously existed practice of caustic soda production using diaphragm cell technology
b. Implementation of the project activity without being registered as a JI project
c. Introduction of mercury technology for caustic soda production

(b) Taking into account relevant national and/or sectoral policies and circumstances, such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector. In this context, the following key factors that affect a baseline are taken into account:

- Complexity of production process
- Permanent change in price of electricity and natural gas in Ukraine
- Long payback period
- Implementation of proposed poject requires significant annual capital investments and human resources.
- Ukraine has one of the lowest electricity tariffs in Europe. Therefore, it is really hard to invest the cost for the reconstruction or the rehabilitation of the equipment.

All explanations, descriptions and analyses pertaining to the baseline in the PDD are made in accordance with the approach chosen and the baseline is identified appropriately.

4.4 Additionality (27-31)

Traceable and transparent information showing that the baseline was identified on the basis of conservative assumptions, that the project scenario is not part of the identified baseline scenario and that the project will lead to reductions of anthropogenic emissions by sources or enhancements of net anthropogenic removals by sinks of GHGs was provided.

The PDD provides a justification of the applicability of the approach. Due to the fact that there is no approved CDM baseline and monitoring methodology which is applicable to the project type, the JI specific approach was used.

The PDD provides a justification of the applicability of the approach with a clear and transparent description, as per item 4.3 above.

Additionality proofs are provided.

Additionality is demonstrated appropriately as a result of the analysis using the approach chosen.

4.5 Project boundary (32-33)

The project boundary defined in the PDD encompasses all anthropogenic emissions by sources of greenhouse gases (GHGs) that are:

(i) Under the control of the project participants;

(ii) Reasonably attributable to the project; and

(iii) Significant, i.e., as a rule of thumb, would by each source account on average per year over the crediting period for more than 1 per cent of the annual average anthropogenic emissions by sources of GHGs, or exceed an amount of 2,000 tonnes of CO2 equivalent, whichever is lower.

The delineation of the project boundary and the gases and sources included are appropriately described and justified in the PDD

4.6 Crediting period (34)

The PDD states the starting date of the project as the date on which the implementation or construction or real action of the project will begin or began, and the starting date is 16/12/2005, which is after the beginning of 2000.

The PDD states the expected operational lifetime of the project in years and months, which is 15 years and 0 months.

The PDD states the length of the crediting period in years and months, which is 2 years and 2 months, and its starting date as 11/11/2010, which is on the date the first emission reductions or enhancements of net removals are generated by the project.

The PDD states that the crediting period for the issuance of ERUs starts only after the beginning of 2008 and does not extend beyond the operational lifetime of the project.

The PDD states that the extension of its crediting period beyond 2012 is subject to the host Party approval, and the estimates of emission reductions or enhancements of net removals are presented separately for those until 2012 and those after 2012 in all relevant sections of the PDD.

4.7 Monitoring plan (35-39)

The PDD, in its monitoring plan section, explicitly indicates that JI specific approach was the selected.

The monitoring plan describes all relevant factors and key characteristics that will be monitored, and the period in which they will be monitored, in particular also all decisive factors for the control and reporting of project performance.

The monitoring plan specifies the indicators, constants and variables that are reliable (i.e. provide consistent and accurate values), valid (i.e. be clearly connected with the effect to be measured), and that provide a transparent picture of the emission reductions or enhancements of net removals to be monitored.

The monitoring plan draws on the list of standard variables contained in appendix B of "Guidance on criteria for baseline setting and monitoring" developed by the JISC.

The monitoring plan explicitly and clearly distinguishes:

(i) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), and that are available already at the stage of determination.

(ii) Data and parameters that are monitored throughout the crediting period.

The monitoring plan describes the methods employed for data monitoring (including its frequency) and recording depending on its kind. It is provided in comprehensive manner in Tables for the key-parameters in Section B.1 of the PDD.

The monitoring plan elaborates all algorithms and formulae used for the estimation/calculation of baseline emissions and project emissions/removals or direct monitoring of emission reductions from the project, leakage, as appropriate, such as:

Project scenario emissions

Calculation of anthropogenic greenhouse gases emissions in metric tonnes of carbon dioxide equivalent will be made according to the following formula:

$$PE = PE_{electricity} + PE_{heat}$$

where:

PE – total project greenhouse gases emissions, tonnes of CO_2e;

$PE_{electricity}$ – non-direct greenhouse gases emissions due to consumption of electricity, generated by power stations of united energy system of Ukraine under the project scenario, tonnes of CO_2e;

PE_{heat} – non-direct greenhouse gases emissions due to consumption of heat energy generated by Kalush TPP using natural gas under the project scenario, tonnes CO_{2e}.

Non-direct greenhouse gases emissions due to consumption of electricity, generated by power stations of united energy system of Ukraine are calculated according to the following formula:

$$PE_{electricity} = EC_{project} \cdot EF_{grid}$$

where:

$EC_{project}$ – electricity consumption for caustic soda production under the project scenario, MWh; parameter is monitored during the crediting period;

EF_{grid} – specific carbon dioxide non direct emissions factor for consumption of electricity generated by power stations of united energy system of Ukraine, tonnes of CO_2e/ MWh; parameter is monitored during the crediting period;

Non-direct greenhouse gases emissions due to consumption of heat energy generated by Kalush TPP using natural gas under the project scenario are calculated according to the following formula:

$$PE_{heat} = HC_{project} \cdot 4.1868 \cdot EF_{NG} \cdot OXID_{NG} \cdot 10^{-3} / \eta_{NG},$$

where:

$HC_{project}$ – heat energy consumption for caustic soda production under the project scenario, Gkal; parameter is monitored during the crediting period;

EF_{NG} - CO_2 emission factor for natural gas combustion, kg of CO_2e/GJ; parameter is monitored during the crediting period;

$OXID_{NG}$ – carbon oxidation factor for combustion of natural gas; parameter is monitored during the crediting period;

η_{NG} – efficiency factor for natural gas fired boilers used for heat energy generation – 90%; parameter is not monitored during the crediting period.

Baseline scenario emissions

Baseline greenhouse gases emissions would have been generated due to electricity consumption, heat energy consumption and natural gas combustion for heat energy generation. Calculation of anthropogenic greenhouse gases emissions that would have taken place without joint implementation project realization (baseline emissions) will be made according to the following formula:

$$BE = BE_{electricity} + BE_{heat} + BE_{NG}$$

where:

BE – total baseline greenhouse gases emissions, tonnes of CO_2e;

$BE_{electricity}$ – non-direct greenhouse gases emissions due to consumption of electricity, generated by power stations of united energy system of Ukraine under the baseline scenario, tonnes of CO_2e;

BE_{heat} – non-direct greenhouse gases emissions due to consumption of heat energy generated by Kalush TPP by combusting of natural gas under the baseline scenario, tonnes CO_{2e};

BE_{NG} – greenhouse gases emissions due to combustion of natural gas for heat energy generation under the baseline scenario in the amount that would be equal to the amount of heat energy generated due to hydrogen combustion under the project scenario, tonnes CO_{2e}.

Non-direct greenhouse gases emissions due to consumption of electricity, generated by power stations of united energy system of Ukraine will be calculated according to the following formula:

$$BE_{electricity} = SEC_{baseline} \cdot P_{caustic} \cdot EF_{grid}$$

where:

$SEC_{baseline}$ – specific electricity consumption for caustic soda production under the baseline, MWh/tonne; parameter is not monitored during the crediting period and is estimated based on historic data on electricity consumption for caustic soda production as an average value for last 5 years of using diaphragm technology at the enterprise (years 2004-2008) – 3.157 MWh/tonne;

$P_{caustic}$ – caustic soda production, tonnes; parameter is monitored during the crediting period;

EF_{grid} – specific carbon dioxide non direct emissions factor for consumption of electricity generated by power stations of united energy system of Ukraine, tonnes CO_{2e}/ MWh; parameter is monitored during the crediting period.

Non-direct greenhouse gases emissions due to consumption of heat energy generated by Kalush TPP by combusting of natural gas under the baseline scenario are calculated according to the following formula:

$$BE_{heat} = SHC_{baseline} \cdot 4.1868 \cdot P_{caustic} \cdot EF_{NG} \cdot OXID_{NG} \cdot 10^{-3} / \eta_{NG}$$

where:

$SHC_{baseline}$ – specific heat energy consumption for caustic soda production under the baseline, GJ/tonne; parameter is not monitored during the crediting period and estimated based on historic data on heat energy consumption for caustic soda production as an average value for last 5 years of using diaphragm technology at the enterprise (years 2004-2008) – 3.374 Gkal/tonne;

$P_{caustic}$ – caustic soda production, tonnes; parameter is not monitored during the crediting period and assumed to be equal both in project and baseline scenario;

EF_{NG} - CO_2 emission factor for natural gas combustion, kg CO_{2e}/GJ; value of the carbon content in natural gas according to National inventory of anthropogenic emissions from sources and removals by sinks of GHG in Ukraine in 1990-2010 (Table П2.41 on page 470) converted to carbon dioxide emissions factor based on

molar mass ratio (according to the step 6 on page 1.8 of the Workbook, Module "Energy" of 1996 IPCC Guidelines for national greenhouse gas inventories) and presented in kg CO_{2e}/GJ has been used for preliminary calculations – 55.62 kg CO_{2e}/GJ;

$OXID_{NG}$ – carbon oxidation factor for combustion of natural gas; value according to National inventory of anthropogenic emissions from sources and removals by sinks of GHG in Ukraine in 1990-2010 (Table П2.42 on page 471) has been used for preliminary calculations – 0,995;

η_{NG} – efficiency factor for natural gas fired boilers used for heat energy generation – 90%; parameter is not monitored during the crediting period (See also section B).

Greenhouse gases emissions due to combustion of natural gas for heat energy generation under the baseline scenario in the amount that would be equal to the amount of heat energy generated due to hydrogen combustion under the project scenario are calculated according to the following formula:

$$BE_{NG} = HG_{hydrogen} \cdot EF_{NG} \cdot OXID_{NG} \cdot 10^{-3} / \eta_{hydrogen}$$

where:

EF_{NG} - CO_2 emission factor for natural gas combustion, kg CO_{2e}/GJ; value of the carbon content in natural gas according to National inventory of anthropogenic emissions from sources and removals by sinks of GHG in Ukraine in 1990-2010 (Table П2.41 on page 470) converted to carbon dioxide emissions factor based on molar mass ratio (according to the step 6 on page 1.8 of the Workbook, Module "Energy" of 1996 IPCC Guidelines for national greenhouse gas inventories) and presented in kg CO_{2e}/GJ has been used for preliminary calculations – 55.62 kg CO_{2e}/GJ;

$OXID_{NG}$ – carbon oxidation factor for combustion of natural gas; value according to National inventory of anthropogenic emissions from sources and removals by sinks of GHG in Ukraine in 1990-2010 (Table П2.42 on page 471) has been used for preliminary calculations – 0,995;

$HG_{hydrogen}$ – amount of heat energy generation due to hydrogen combustion under the project scenario, GJ. Calculated according to the following formula:

$$HG_{hydrogen} = FC_{hydrogen} \cdot NCV_{hydrogen} \cdot \eta_{hydrogen}$$

where:

$FC_{hydrogen}$ – amount of hydrogen combusted for heat energy generation under the project scenario, 1000 m^3; parameter is monitored during the crediting period;

$NCV_{hydrogen}$ – net calorific value of hydrogen, GJ/1000m^3; the value according to GOST 3022-80 "Hydrogen technical. Technical specifications" (28 670 kcal/kg), converted to GJ/1000m^3 is used – 10.8 GJ/1000m^3; parameter is not monitored during the crediting period;

$\eta_{hydrogen}$ – efficiency of the equipment used for hydrogen combustion for heat energy generation – 90%; parameter is not monitored during the crediting period (See also section B).

The monitoring plan presents the quality assurance and control procedures for the monitoring process. This includes, as appropriate, information on calibration and on how records on data and/or method validity and accuracy are kept and made available on request.

The monitoring plan clearly identifies the responsibilities and the authority regarding the monitoring activities.

On the whole, the monitoring plan reflects good monitoring practices appropriate to the project type.

The monitoring plan provides, in tabular form, a complete compilation of the data that need to be collected for its application, including data that are measured or sampled and data that are collected from other sources (e.g. official statistics, expert judgment, proprietary data, IPCC, commercial and scientific literature etc.) but not including data that are calculated with equations.

The monitoring plan indicates that the data monitored and required for verification are to be kept for two years after the last transfer of ERUs for the project.

4.8 Leakage (40-41)

The PDD appropriately describes an assessment of the potential indirect external leakage of CO2, CH4, N2O generated by fuel production and its transportation and appropriately explains that they are neglected.

4.9 Estimation of emission reductions or enhancements of net removals (42-47)

The PDD indicates assessment of emissions or net removals in the baseline scenario and in the project scenario as the approach chosen to estimate the emission reductions or enhancement of net removals generated by the project.

The PDD provides the ex ante estimates of:

(a) Emissions or net removals for the project scenario (within the project boundary), which are:

Year	Greenhouse gases project emission (tonnes of CO2equivalent)
2010	68 559
2011	302 147
2012	504 205

Total 2010-2012:	874 911
2013	504 205
2014	504 205
2015	504 205
2016	504 205
2017	504 205
2018	504 205
2019	504 205
2020	504 205
2021	504 205
2022	504 205
2023	504 205
2024	504 205
2025	504 205
Total 2013-2025:	6 554 665
Total 2010-2025:	7 429 576

(b) Leakage, as applicable, which are 0 tonnes of CO2eq;

(c) Emissions or net removals for the baseline scenario (within the project boundary), which are:

Year	**Greenhouse gases baseline emission (tonnes of CO2equivalent)**
2010	103 930
2011	474 330
2012	798 580
Total 2010-2012:	1 376 840
2013	798 580
2014	798 580
2015	798 580
2016	798 580
2017	798 580
2018	798 580
2019	798 580
2020	798 580
2021	798 580
2022	798 580
2023	798 580
2024	798 580
2025	798 580
Total 2013-2025:	10 381 540
Total 2010-2025:	11 758 380

(d) Emission reductions or enhancements of net removals adjusted by leakage (based on (a)-(c) above), which:

Year	Greenhouse gases emissions reduction (tonnes of CO2equivalent)
2010	35 371
2011	172 183
2012	294 375
Total 2010-2012:	501 929
2013	294 375
2014	294 375
2015	294 375
2016	294 375
2017	294 375
2018	294 375
2019	294 375
2020	294 375
2021	294 375
2022	294 375
2023	294 375
2024	294 375
2025	294 375
Total 2013-2025:	3 826 875
Total 2010-2025:	4 328 804

The estimates referred to above are given:

(a) On a periodic basis;

(b) From 11/11/2010 to 11/11/2025, covering the whole crediting period;

(c) On a source-by-source/sink-by-sink basis;

(d) For each applicable GHG gas;

(e) In tonnes of CO2 equivalent, using global warming potentials defined by decision 2/CP.3 or as subsequently revised in accordance with Article 5 of the Kyoto Protocol;

The formula used for calculating the estimates referred above, which is

$$ER = BE - PE$$

where:

ER – total greenhouse gases emissions reduction, tonnes CO_{2e};
BE – total baseline greenhouse gases emissions, tonnes CO_{2e};
PE – total project greenhouse gases emissions, tonnes CO_{2e}.,

is consistent throughout the PDD.

For calculating the estimates referred to above, key factors influencing the baseline emissions or removals and the activity level of the project and the emissions or net removals as well as risks associated with the project were taken into account, as appropriate.

Data sources used for calculating the estimates referred to above are clearly identified, reliable and transparent.

Emission factors were selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice.

The estimation referred to above is based on conservative assumptions and the most plausible scenarios in a transparent manner.

The estimates referred to above are consistent throughout the PDD.

The annual average of estimated emission reductions or enhancements of net removals over the crediting period is calculated by dividing the total estimated emission reductions or enhancements of net removals over the crediting period by the total months of the crediting period, and multiplying by twelve.

4.10 Environmental impacts (48)

The PDD lists and attaches documentation on the analysis of the environmental impacts of the project, including transboundary impacts, in accordance with procedures as determined by the host Party.

The PDD provides conclusion and all references to supporting documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party, if the analysis referred to above indicates that the environmental impacts are considered significant by the project participants or the host Party.

4.11 Stakeholder consultation (49)

Stakeholder consultation was not undertaken as it is not required by the host party.

4.12 Determination regarding small scale projects (50-57)

Not applicable

4.13 Determination regarding land use, land-use change and forestry (LULUCF) projects (58-64)

Not applicable

4.14 Determination regarding programmes of activities (65-73)

Not applicable

5 SUMMARY AND REPORT OF HOW DUE ACCOUNT WAS TAKEN OF COMMENTS RECEIVED PURSUANT TO PARAGRAPH 32 OF THE JI GUIDELINES

No comments, pursuant to paragraph 32 of the JI Guidelines, were received.

6 DETERMINATION OPINION

Bureau Veritas Certification has performed a determination of the "Greenhouse gases emissions reduction due to modernization of production facilities at LLC "Karpatnaftohim" Project in Ukraine. The determination was performed on the basis of UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The determination consisted of the following three phases: i) a desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) the resolution of outstanding issues and the issuance of the final determination report and opinion.

Project participant/s used investment analysis and common practice analysis to determine that the project activity itself is not the baseline scenario.

Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented and maintained as designed, the project is likely to achieve the estimated amount of emission reductions.

The determination revealed one pending issue related to the current determination stage of the project: the issue of the written approval of the project and the authorization of the project participant by the host Party. If the written approval and the authorization by the host Party are awarded, it is our opinion that the project as described in the Project Design Document, Version 2.2 meets all the relevant UNFCCC requirements for the determination stage and the relevant host Party criteria.

The review of the project design documentation (2.2) and the subsequent follow-up interviews have provided Bureau Veritas Certification with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project correctly applies and meets the relevant UNFCCC requirements for the JI and the relevant host country criteria.

The determination is based on the information made available to us and the engagement conditions detailed in this report.

7 REFERENCES

Category 1 Documents:
Documents provided by LITASCO S.A. that relate directly to the GHG components of the project.

/1/ PDD “Greenhouse gases emissions reduction due to modernization of production facilities at LLC “Karpatnaftohim” project of LITASCO S.A. version 1.0 dated 12/10/2012
/2/ PDD “Greenhouse gases emissions reduction due to modernization of production facilities at LLC “Karpatnaftohim” project of LITASCO S.A. version 2.0 dated 20/11/2012
/3/ PDD “Greenhouse gases emissions reduction due to modernization of production facilities at LLC “Karpatnaftohim” project of LITASCO S.A. version 2.2 dated 29/11/2012
/4/ Emission reduction calculation for LLC “Karpatnaftohim”, excel file
/5/ Letter of Endorsement №3412/23/7 issued by State ecological investment agency of Ukraine dated 13.11.2012

Category 2 Documents:
Background documents related to the design and/or methodologies employed in the design or other reference documents.

/1/ Certificate of compliance N IФ000544 issued 16/09/2010
/2/ Statement of the operating readiness of object N 544 dated 09/09/2010
/3/ Environmental impacts assessment for the working project “Chlorine and caustic soda production by membrane method”. 2006
/4/ Statement of the operating readiness of object N 544.1 dated 09/09/2010
/5/ Statement of the operating readiness of object N 544.14 dated 09/09/2010
/6/ Statement of the operating readiness of object N 544.15 dated 09/09/2010
/7/ Statement of the commission on acceptance of equipment after individual examination. 2010
/8/ Statement of the commission on acceptance of equipment after complex examination. 2010
/9/ Electromembrane facility with the capacity of 200 ths t/year of caustic soda. Working project. 05-3065-205-ПЗ. Kalush 2006
/10/ Electromembrane facility with the capacity of 200 ths t/year of caustic soda. Approval part. Explanatory note. 05-3065-205-ПЗ. Kalush 2006
/11/ License АБ №219938 of State department of fire safety dated 01/07/2005.
/12/ Register №3 of project documentation of electromembrane facility. Buildings 534, 530. Started on 23.01.07.
/13/ Register №1 of project documentation of electromembrane facility. Started on 14.02.06.
/14/ Automated system of commercial accounting of CJSC “Lukor”. Technical project. 2006
/15/ Passport of electronic multifunctional electric power meter Landis&Gyr of the type ZFB reg.№72884186

/16/ Passport of electronic multifunctional electric power meter Landis&Gyr of the type ZFB reg.№73113337
/17/ Passport of electronic multifunctional electric power meter Landis&Gyr of the type ZFB reg.№72738581
/18/ Passport of electronic multifunctional electric power meter Landis&Gyr of the type ZFB reg.№72738575
/19/ Certificate №47 dated 31/05/2011 about state metrological attestation of Automated system of commercial accounting of CJSC “Lukor”
/20/ Certificate №CB.228-2009 dated 28/07/2009 about state metrological attestation of Automated system of commercial accounting of CJSC “Lukor”
/21/ Certificate №CB.386-2006 dated 31/08/2006 about state metrological attestation of Automated system of commercial accounting of CJSC “Lukor”
/22/ Note on execution of production program on production of caustic soda by diaphragm method for December 2004
/23/ Note on quality of produced caustic soda by diaphragm method for November 2004
/24/ Technical report of workshop of caustic soda production by diaphragm method for December 2007
/25/ Note on execution of production program on production of caustic soda by membrane method for December 2010
/26/ Note on quality of produced caustic soda by membrane method for November 2010
/27/ Report on atmospheric air protection (form 2-TP) for 3 quarter of 2012
/28/ Report on atmospheric air protection (form 2-TP) for 2011
/29/ Report on atmospheric air protection (form 2-TP) for 2010
/30/ Report on wastes handling (form №1-wastes) for 2011
/31/ Report on wastes handling (form №1-wastes) for 2010
/32/ Certificate of compliance. ISO 14001:2004 dated 02/09/2010 issued to LLC “Karpatnaftohim”
/33/ Permission №2622882400-1 dated 28/04/2011.
/34/ Permission №260992 on pollutants emission into the atmospheric air dated 14/12/2007
/35/ Schedule of education of employees of caustic soda and chlorine workshop dated 13/04/2009
/36/ Service note №34/309 dated 15/05/2012 about personnel education
/37/ Protocol of examination N 33 dated 16/06/2012
/38/ Passport N 0-9 of rate meter reg. number 8/348990
/39/ Passport N 0-8 of rate meter reg. number 8/848989
/40/ Passport N 0-18 of rate meter reg. number 8/348995
/41/ Schedule of verification, calibration and technical maintenance of measurement devices of caustic soda and chlorine production workshop for 2012
/42/ Photo. Electronic database.
/43/ Photo. Hydrogen supply pipe.
/44/ Photo. Electrolysis facility
/45/ Photo. Chlorine supply pipe.
/46/ Business plan “Installation of electromembrane facility at LLC “Karpatnaftohim”. Moscow 2010

/47/ Report on results of using of fuel, heat power and electric power (form 11-MTP) for January – December 2009
/48/ Report on results of using of fuel, heat power and electric power (form 11-MTP) for January – December 2006
/49/ Report on results of using of fuel, heat power and electric power (form 11-MTP) for January – December 2007
/50/ Report on results of using of fuel, heat power and electric power (form 11-MTP) for January – December 2008
/51/ Report on results of using of fuel, heat power and electric power (form 11-MTP) for January – December 2010
/52/ Report on results of using of fuel, heat power and electric power (form 11-MTP) for January – December 2011

Persons interviewed:

List persons interviewed during the determination or persons that contributed with other information that are not included in the documents listed above.

/1/ V.Kysylchak – chief engineer of LLC “Karpatnaftohim”
/2/ E.Maslov – Head of technical department of LLC “Karpatnaftohim”
/3/ A.Andriiv – Deputy head of technical department of LLC “Karpatnaftohim”
/4/ O.Izdryk – Acting head of project department of LLC “Karpatnaftohim”
/5/ O.Pukish – Senior foreman of LLC “Karpatnaftohim”
/6/ O.Yamnych – Lead engineer technologist of LLC “Karpatnaftohim”
/7/ I.Ivanova – Head of personnel preparation department of LLC “Karpatnaftohim”
/8/ Y.Bumbu – Head engineer of ecological calculations of of LLC “Karpatnaftohim”
/9/ M.Shlapak – JI consultant, LLC “KT-Energy”

APPENDIX A: DETERMINATION PROTOCOL

DETERMINATION PROTOCOL

Check list for determination, according JOINT IMPLEMENTATION DETERMINATION AND VERIFICATION MANUAL (Version 01)

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
General description of the project				
Title of the project				
-	Is the title of the project presented?	"Greenhouse gases emissions reduction due to modernization of production facilities at LLC "Karpatnaftohim"	OK	OK
-	Is the sectoral scope to which the project pertains presented?	Corrective Action Request (CAR) 01. Please specify that the proposed project pertains to sectoral scope 3.	CAR 01	OK
-	Is the current version number of the document presented?	2.2	OK	OK
-	Is the date when the document was completed presented?	The date is presented	OK	OK
Description of the project				
-	Is the purpose of the project included with a concise, summarizing explanation (max. 1-2 pages) of the: a) Situation existing prior to the starting date of the project; b) Baseline scenario; and c) Project scenario (expected outcome,	Corrective Action Request (CAR) 03. Please add information about project scenario and technical description of the project to section A.2 of the PDD.	CAR 03	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	including a technical description)?			
-	Is the history of the project (incl. its JI component) briefly summarized?	Corrective Action Request (CAR) 02. Section A.2 should contain information on brief project history. Please make the proper amendments in the PDD.	CAR 02	OK
Project participants				
-	Are project participants and Party(ies) involved in the project listed?	Yes, the information is listed in section A.3	OK	OK
-	Is the data of the project participants presented in tabular format?	The data is presented in tabular format	OK	OK
-	Is contact information provided in Annex 1 of the PDD?	Yes.	OK	OK
-	Is it indicated, if it is the case, if the Party involved is a host Party?	Ukraine is Host Party	OK	OK
Technical description of the project				
Location of the project				
-	Host Party(ies)	Ukraine	OK	OK
-	Region/State/Province etc.	Ivano-Frankivsk region	OK	OK
-	City/Town/Community etc.	Kalush	OK	OK
-	Detail of the physical location, including information allowing the unique identification of the project. (This section should not exceed one page)	Data is provided in section A.4.1.4 of the PDD.	OK	OK
Technologies to be employed, or measures, operations or actions to be implemented by the project				
-	Are the technology(ies) to be employed, or measures, operations or actions to be implemented by the project, including all relevant technical data and the	Corrective Action Request (CAR) 04. Please specify the source of data provided in Table A.4-2 of the PDD. Corrective Action Request (CAR) 05.	CAR 04 CAR 05	OK OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	implementation schedule described?	Please add the implementation schedule to section A.4.2.		
Brief explanation of how the anthropogenic emissions of greenhouse gases by sources are to be reduced by the proposed JI project, including why the emission reductions would not occur in the absence of the proposed project, taking into account national and/or sectoral policies and circumstances				
-	Is it stated how anthropogenic GHG emission reductions are to be achieved? (This section should not exceed one page)	Corrective Action Request (CAR) 06. Please provide in section A.4.3 explanation on how emission reductions are to be achieved.	CAR 06	OK
-	Is it provided the estimation of emission reductions over the crediting period?	The estimation of emission reductions over the crediting period is provided	OK	OK
-	Is it provided the estimated annual reduction for the chosen credit period in tCO2e?	Estimated annual reduction for the chosen credit period in tCO2e is provided.	OK	OK
-	Are the data from questions above presented in tabular format?	Yes.	OK	OK
Estimated amount of emission reductions over the crediting period				
-	Is the length of the crediting period Indicated?	16 years	OK	OK
-	Are estimates of total as well as annual and average annual emission reductions in tonnes of CO2 equivalent provided?	Yes.	OK	OK
Project approvals by Parties				
19	Have the DFPs of all Parties listed as “Parties involved” in the PDD provided written project approvals?	Corrective Action Request (CAR) 20. The Letter of Approval issued by the DFP of Ukraine was not provided to the determination team.	CAR 20	Pending
19	Does the PDD identify at least the host Party as a “Party involved”?	Ukraine is indicated as Host party	OK	OK
19	Has the DFP of the host Party issued a	See CAR 20	Pending	Pending

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	written project approval?			
20	Are all the written project approvals by Parties involved unconditional?	See CAR 20	Pending	Pending
Authorization of project participants by Parties involved				
21	Is each of the legal entities listed as project participants in the PDD authorized by a Party involved, which is also listed in the PDD, through: − A written project approval by a Party involved, explicitly indicating the name of the legal entity? or − Any other form of project participant authorization in writing, explicitly indicating the name of the legal entity?	See CAR 20	Pending	Pending
Baseline setting				
22	Does the PDD explicitly indicate which of the following approaches is used for identifying the baseline? − JI specific approach − Approved CDM methodology approach	PDD explicitly indicates JI specific approach or identifying the baseline	OK	OK
JI specific approach only				
23	Does the PDD provide a detailed theoretical description in a complete and transparent manner?	Corrective Action Request (CAR) 07. Where applicable, please provide the version number and reference on Guidance on criteria for baseline setting and monitoring.	CAR 07	OK
23	Does the PDD provide justification that the baseline is established:	Corrective Action Request (CAR) 08. In section B.1 of the PDD please consider the	CAR 08 CAR 10	OK OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	(a) By listing and describing plausible future scenarios on the basis of conservative assumptions and selecting the most plausible one? (b) Taking into account relevant national and/or sectoral policies and circumstance? − Are key factors that affect a baseline taken into account? (c) In a transparent manner with regard to the choice of approaches, assumptions, methodologies, parameters, date sources and key factors? (d) Taking into account of uncertainties and using conservative assumptions? (e) In such a way that ERUs cannot be earned for decreases in activity levels outside the project or due to force majeure? (f) By drawing on the list of standard variables contained in appendix B to "Guidance on criteria for baseline setting and monitoring", as appropriate?	application of mercury technology for caustic soda production as an alternative for the project activity. Corrective Action Request (CAR) 10. Formulas used for baseline emissions calculation should be added to section B.1 of the PDD. Please make the amendments and check numbering of formulas throughout the PDD. Corrective Action Request (CAR) 11. For tables in section B.1 where applicable please provide frequency of monitoring, names of sources of data applied, values of data applied. Corrective Action Request (CAR) 12. Please correct the data unit for specific heat energy consumption (see page 16 of the PDD). Corrective Action Request (CAR) 13. For emission and oxidation factors for natural gas (pages 17 and 18) please specify quality assurance and quality control procedures to be applied.	CAR 11 CAR 12 CAR 13	OK OK OK
24	If selected elements or combinations of approved CDM methodologies or methodological tools for baseline setting are used, are the selected elements or combinations together with the elements supplementary developed by the project	No elements or combinations of approved CDM methodologies or methodological tools for baseline setting are used	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	participants in line with 23 above?			
25	If a multi-project emission factor is used, does the PDD provide appropriate justification?	N/A	OK	OK
Approved CDM methodology approach only_Paragraphs 26(a) – 26(d)_Not applicable				
Additionality				
JI specific approach only				
28	Does the PDD indicate which of the following approaches for demonstrating additionality is used? (a) Provision of traceable and transparent information showing the baseline was identified on the basis of conservative assumptions, that the project scenario is not part of the identified baseline scenario and that the project will lead to emission reductions or enhancements of removals; (b) Provision of traceable and transparent information that an AIE has already positively determined that a comparable project (to be) implemented under comparable circumstances has additionality; (c) Application of the most recent version of the "Tool for the demonstration and assessment of additionality. (allowing for a two-month grace period) or any other method for proving additionality approved	PDD indicates approach (a) for additionality demonstration. Corrective Action Request (CAR) 09. In section there is the reference on Annex 2. However, Annex 2 does not contain the referred information. Please make the proper corrections.	CAR 09	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	by the CDM Executive Board".			
29 (a)	Does the PDD provide a justification of the applicability of the approach with a clear and transparent description?	Corrective Action Request (CAR) 14. References 5, 10 do not contain the referred information. Please make the corrections.	CAR 14	OK
29 (b)	Are additionality proofs provided?	See CAR 14 above	OK	OK
29 (c)	Is the additionality demonstrated appropriately as a result?	See CAR 14 above	OK	OK
30	If the approach 28 (c) is chosen, are all explanations, descriptions and analyses made in accordance with the selected tool or method?	N/A	OK	OK
Approved CDM methodology approach only_ Paragraphs 31(a) – 31(e)_Not applicable				
Project boundary (applicable except for JI LULUCF projects				
JI specific approach only				
32 (a)	Does the project boundary defined in the PDD encompass all anthropogenic emissions by sources of GHGs that are: (i) Under the control of the project participants? (ii) Reasonably attributable to the project? (iii) Significant?	The project boundary defined in the PDD encompasses all necessary anthropogenic emissions by sources of GHGs.	OK	OK
32 (b)	Is the project boundary defined on the basis of a case-by-case assessment with regard to the criteria referred to in 32 (a) above?	Project boundary is defined appropriately	OK	OK
32 (c)	Are the delineation of the project boundary and the gases and sources included	Yes.	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	appropriately described and justified in the PDD by using a figure or flow chart as appropriate?			
32 (d)	Are all gases and sources included explicitly stated, and the exclusions of any sources related to the baseline or the project are appropriately justified?	All GHGs and sources included are explicitly stated, and the exclusions of any sources related to the baseline or the project are appropriately justified.	OK	OK
Approved CDM methodology approach only_Paragraph 33_ Not applicable				
Crediting period				
34 (a)	Does the PDD state the starting date of the project as the date on which the implementation or construction or real action of the project will begin or began?	Yes, starting date of the project is 16/12/2005	OK	OK
34 (a)	Is the starting date after the beginning of 2000?	16/12/2005 is after the beginning of 2000.	OK	OK
34 (b)	Does the PDD state the expected operational lifetime of the project in years and months?	Yes.	OK	OK
34 (c)	Does the PDD state the length of the crediting period in years and months?	2 years and 2 months (26 months)	OK	OK
34 (c)	Is the starting date of the crediting period on or after the date of the first emission reductions or enhancements of net removals generated by the project?	Starting date is on the date of first emission reductions generated by the project.	OK	OK
34 (d)	Does the PDD state that the crediting period for issuance of ERUs starts only after the beginning of 2008 and does not extend beyond the operational lifetime of	Yes, the crediting period starts in 2010. Corrective Action Request (CAR) 15. Please specify start and end dates of second commitment period and it's length in section C.3 of the	CAR 15	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	the project?	PDD.		
34 (d)	If the crediting period extends beyond 2012, does the PDD state that the extension is subject to the host Party approval? Are the estimates of emission reductions or enhancements of net removals presented separately for those until 2012 and those after 2012?	Yes, the relevant information is stated in the PDD.	OK	OK
Monitoring plan				
35	Does the PDD explicitly indicate which of the following approaches is used? − JI specific approach − Approved CDM methodology approach	JI specific approach	OK	OK
JI specific approach only				
36 (a)	Does the monitoring plan describe: − All relevant factors and key characteristics that will be monitored? − The period in which they will be monitored? − All decisive factors for the control and reporting of project performance?	Corrective Action Request (CAR) 16. For section D.1 of the PDD please apply step-by-step approach as it is foreseen by the Guidance for users of JI PDD form.	CAR 16	OK
36 (b)	Does the monitoring plan specify the indicators, constants and variables used that are reliable, valid and provide transparent picture of the emission reductions or enhancements of net removals to be monitored?	Clarification Request (CL) 01. Please justify that the enterprise is the 1st class electricity consumer.	CL 01	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
36 (b)	If default values are used: − Are accuracy and reasonableness carefully balanced in their selection? − Do the default values originate from recognized sources? − Are the default values supported by statistical analyses providing reasonable confidence levels? − Are the default values presented in a transparent manner?	Clarification Request (CL) 02. For formulae D.3 and further similar ones please clarify the meaning of 10^{-3}	CL 02	OK
36 (b) (i)	For those values that are to be provided by the project participants, does the monitoring plan clearly indicate how the values are to be selected and justified?	See CL 02 above.	OK	OK
36 (b) (ii)	For other values, − Does the monitoring plan clearly indicate the precise references from which these values are taken? − Is the conservativeness of the values provided justified?	Monitoring plan clearly indicates the precise references from which these values are taken. The conservativeness of the values provided is justified.	OK	OK
36 (b) (iii)	For all data sources, does the monitoring plan specify the procedures to be followed if expected data are unavailable?	Yes.	OK	OK
36 (b) (iv)	Are International System Unit (SI units) used?	International System Units are used partly	OK	OK
36 (b) (v)	Does the monitoring plan note any parameters, coefficients, variables, etc. that are used to calculate baseline	Some parameters (e.g. electricity consumption, heat power consumption, caustic soda production) are obtained through the monitoring.	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	emissions or net removals but are obtained through monitoring?			
36 (b) (v)	Is the use of parameters, coefficients, variables, etc. consistent between the baseline and monitoring plan?	The relevant parameters are consistent throughout the PDD,	OK	OK
36 (c)	Does the monitoring plan draw on the list of standard variables contained in appendix B of "Guidance on criteria for baseline setting and monitoring"?	Some variables contained in appendix B of "Guidance on criteria for baseline setting and monitoring" were included in the monitoring plan.	OK	OK
36 (d)	Does the monitoring plan explicitly and clearly distinguish: (i) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), and that are available already at the stage of determination? (ii) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), but that are not already available at the stage of determination? (iii) Data and parameters that are monitored throughout the crediting period?	The monitoring plan explicitly distinguishes: (i) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), and that are available already at the stage of determination? (ii) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), but that are not already available at the stage of determination? (iii) Data and parameters that are monitored throughout the crediting period	OK	OK
36 (e)	Does the monitoring plan describe the methods employed for data monitoring (including its frequency) and recording?	Yes. This information is included in the monitoring plan.	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
36 (f)	Does the monitoring plan elaborate all algorithms and formulae used for the estimation/calculation of baseline emissions/removals and project emissions/removals or direct monitoring of emission reductions from the project, leakage, as appropriate?	Yes.	OK	OK
36 (f) (i)	Is the underlying rationale for the algorithms/formulae explained?	See CL 02 above.	OK	OK
36 (f) (ii)	Are consistent variables, equation formats, subscripts etc. used?	Yes.	OK	OK
36 (f) (iii)	Are all equations numbered?	All equations are numbered.	OK	OK
36 (f) (iv)	Are all variables, with units indicated defined?	See CL 02 above	OK	OK
36 (f) (v)	Is the conservativeness of the algorithms/procedures justified?	Yes, algorithms/procedures used are in line with the state norms and used in conservative manner.	OK	OK
36 (f) (v)	To the extent possible, are methods to quantitatively account for uncertainty in key parameters included?	Yes	OK	OK
36 (f) (vi)	Is consistency between the elaboration of the baseline scenario and the procedure for calculating the emissions or net removals of the baseline ensured?	Yes	OK	OK
36 (f) (vii)	Are any parts of the algorithms or formulae that are not self-evident explained?	See CL 02 above	OK	OK
36 (f) (vii)	Is it justified that the procedure is consistent with standard technical	The procedure is consistent with standard technical procedures in the relevant sector and is well justified.	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	procedures in the relevant sector?			
36 (f) (vii)	Are references provided as necessary?	See CARs above.	OK	OK
36 (f) (vii)	Are implicit and explicit key assumptions explained in a transparent manner?	All implicit and explicit assumptions are explained in a transparent manner.	OK	OK
36 (f) (vii)	Is it clearly stated which assumptions and procedures have significant uncertainty associated with them, and how such uncertainty is to be addressed?	It is clearly stated which assumptions and procedures have significant uncertainty associated with them, and how such uncertainty is to be addressed. The level of all uncertainties is low.	OK	OK
36 (f) (vii)	Is the uncertainty of key parameters described and, where possible, is an uncertainty range at 95% confidence level for key parameters for the calculation of emission reductions or enhancements of net removals provided?	The level of all uncertainties is low.	OK	OK
36 (g)	Does the monitoring plan identify a national or international monitoring standard if such standard has to be and/or is applied to certain aspects of the project? Does the monitoring plan provide a reference as to where a detailed description of the standard can be found?	The monitoring plan is in line with the relevant national standards.	OK	OK
36 (h)	Does the monitoring plan document statistical techniques, if used for monitoring, and that they are used in a conservative manner?	N/A	OK	OK
36 (i)	Does the monitoring plan present the quality assurance and control procedures for the monitoring process, including, as	Corrective Action Request (CAR) 17. The documentation concerning JI project should be collected and kept for the period until the last ERUs	CAR 17	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	appropriate, information on calibration and on how records on data and/or method validity and accuracy are kept and made available upon request?	transaction plus two years. Please provide the documental evidence that this procedure is followed at the enterprise. Please also correct section D.3 considering all the mentioned above.		
36 (j)	Does the monitoring plan clearly identify the responsibilities and the authority regarding the monitoring activities?	The responsibilities and the authority are clearly identified.	OK	OK
36 (k)	Does the monitoring plan, on the whole, reflect good monitoring practices appropriate to the project type? If it is a JI LULUCF project, is the good practice guidance developed by IPCC applied?	The monitoring plan reflects good monitoring practices appropriate to the project type.	OK	OK
36 (l)	Does the monitoring plan provide, in tabular form, a complete compilation of the data that need to be collected for its application, including data that are measured or sampled and data that are collected from other sources but not including data that are calculated with equations?	Yes. The appropriate information is indicated in the section D of the PDD.	OK	OK
36 (m)	Does the monitoring plan indicate that the data monitored and required for verification are to be kept for two years after the last transfer of ERUs for the project?	Monitoring plan indicates that the data monitored and required for verification are to be kept for two years after the last transfer of ERUs	OK	OK
37	If selected elements or combinations of approved CDM methodologies or methodological tools are used for	No any selected elements or combinations of approved CDM methodologies or methodological tools are used for establishing the monitoring plan.	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	establishing the monitoring plan, are the selected elements or combination, together with elements supplementary developed by the project participants in line with 36 above?			
Approved CDM methodology approach only_Paragraphs 38(a) – 38(d)_Not applicable				
Applicable to both JI specific approach and approved CDM methodology approach_Paragraph 39_Not applicable				
Leakage				
JI specific approach only				
40 (a)	Does the PDD appropriately describe an assessment of the potential leakage of the project and appropriately explain which sources of leakage are to be calculated and which can be neglected?	No leakages are foreseen as a result of project implementation	OK	OK
40 (b)	Does the PDD provide a procedure for an ex ante estimate of leakage?	Leakages are neglected. The approach's applicability is justified in the PDD.	OK	OK
Approved CDM methodology approach only_Paragraph 41_Not applicable				
Estimation of emission reductions or enhancements of net removals				
42	Does the PDD indicate which of the following approaches it chooses? (a) Assessment of emissions or net removals in the baseline scenario and in the project scenario (b) Direct assessment of emission reductions	Yes. The predicted assessment and the detailed calculations are provided in the supporting Excel file. The assessment of emissions in the baseline scenario and in the project scenario was used.	OK	OK
43	If the approach (a) in 42 is chosen, does the PDD provide ex ante estimates of: (a) Emissions or net removals for the	The estimation of GHG emissions for the project, baseline scenario and emission reductions ex ante is provided in the section E of the PDD.	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	project scenario (within the project boundary)? (b) Leakage, as applicable? (c) Emissions or net removals for the baseline scenario (within the project boundary)? (d) Emission reductions or enhancements of net removals adjusted by leakage?			
44	If the approach (b) in 42 is chosen, does the PDD provide ex ante estimates of: (a) Emission reductions or enhancements of net removals (within the project boundary)? (b) Leakage, as applicable? (c) Emission reductions or enhancements of net removals adjusted by leakage?	N/A	OK	OK
45	For both approaches in 42 (a) Are the estimates in 43 or 44 given: (i) On a periodic basis? (ii) At least from the beginning until the end of the crediting period? (iii) On a source-by-source/sink-by-sink basis? (iv) For each GHG? (v) In tones of CO2 equivalent, using global warming potentials defined by decision 2/CP.3 or as subsequently revised in accordance with Article 5 of the	Corrective Action Request (CAR) 18. Specific consumption of energy resources for 5 years (2004-2008) should be calculated as the amount of resources consumed per amount of product produced (as total for 5 years). Please make the corresponding corrections in the excel calculation file and in the PDD. Corrective Action Request (CAR) 19. The values of electric power and heat energy consumption in excel calculation file for 2010 and 2011 do not correspond with the values provided in forms 11-MTP. Please make the corrections.	CAR 18 CAR 19	OK OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	Kyoto Protocol? (b) Are the formula used for calculating the estimates in 43 or 44 consistent throughout the PDD? (c) For calculating estimates in 43 or 44, are key factors influencing the baseline emissions or removals and the activity level of the project and the emissions or net removals as well as risks associated with the project taken into account, as appropriate? (d) Are data sources used for calculating the estimates in 43 or 44 clearly identified, reliable and transparent? (e) Are emission factors (including default emission factors) if used for calculating the estimates in 43 or 44 selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice? (f) Is the estimation in 43 or 44 based on conservative assumptions and the most plausible scenarios in a transparent manner? (g) Are the estimates in 43 or 44 consistent throughout the PDD? (h) Is the annual average of estimated emission reductions or enhancements of net removals calculated by dividing the total estimated emission reductions or			

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	enhancements of net removals over the crediting period by the total months of the crediting period and multiplying by twelve?			
46	If the calculation of the baseline emissions or net removals is to be performed ex post, does the PDD include an illustrative ex ante emissions or net removals calculation?	Yes, the illustrative ex ante emission calculations are presented in the PDD.	OK	OK
Approved CDM methodology approach only_Paragraphs 47(a) – 47(b)_Not applicable				
Environmental impacts				
48 (a)	Does the PDD list and attach documentation on the analysis of the environmental impacts of the project, including transboundary impacts, in accordance with procedures as determined by the host Party?	Clarification Request (CL) 03. In section F.1 of the PDD it is stated that specific water consumption was reduced from 202 to 97 m3 and technological air from 52 to 20 nm3. Please clarify the origin of these data.	OK	OK
48 (b)	If the analysis in 48 (a) indicates that the environmental impacts are considered significant by the project participants or the host Party, does the PDD provide conclusion and all references to supporting documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party?	The information on environmental impact is sufficiently described in the section F.2. of the PDD.	OK	OK
Stakeholder consultation				
49	If stakeholder consultation was undertaken	N/A	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	in accordance with the procedure as required by the host Party, does the PDD provide: (a) A list of stakeholders from whom comments on the projects have been received, if any? (b) The nature of the comments? (c) A description on whether and how the comments have been addressed?			
Determination regarding small-scale projects (additional elements for assessment)_Paragraphs 50 - 57_Not applicable				
Determination regarding land use, land-use change and forestry projects _Paragraphs 58 – 64(d)_Not applicable				
Determination regarding programmes of activities_Paragraphs 66 – 73_Not applicable				

Table 2 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1	Summary of project participant response	Determination team conclusion
Corrective Action Request (CAR) 01. Please specify that the proposed project pertains to sectoral scope 3.	-	Corrected in the PDD (see p. 2).	Issue is closed due to corrections made in the PDD.
Corrective Action Request (CAR) 02. Section A.2 should contain information on brief project history. Please make the proper amendments in the PDD.	-	Brief project history has been described in Section A.2 of the PDD (see p. 3).	CAR is closed

Corrective Action Request (CAR) 03. Please add information about project scenario and technical description of the project to section A.2 of the PDD.	-	Information about project scenario and technical description of the project has been added to Section A.2 of the PDD (see p. 2).	CAR is closed
Corrective Action Request (CAR) 04. Please specify the source of data provided in Table A.4-2 of the PDD.	-	The source of data is indicated in the PDD (see p. 10). Response of 26/11/2012 Documented evidences have been provided to determination team	*Verifier's note of 21/11/2012* Issue is not closed. Please provide the Act mentioned on p.10 of the PDD to the determination team. *Verifier's note of 29/11/2012* Issue is closed
Corrective Action Request (CAR) 05. Please add the implementation schedule to section A.4.2.	-	Implementation schedule is described in Section A.4.2 (see p. 3). Response of 26/11/2012 Implementation schedule has been provided in tabular format in the manner "year – measure" in section A.4.2. of the PDD (see p. 3). Response of 29/11/2012 Corrected.	*Verifier's note of 21/11/2012* There is no referred information on p.3. Please provide implementation schedule in tabular format in the manner "year – measure" in section A.4.2. All measures implemented in the framework of the project should be mentioned in this schedule. *Verifier's note of 29/11/2012* Implementation schedule should be provided in section A.4.2.

Corrective Action Request (CAR) 06. Please provide in section A.4.3 explanation on how emission reductions are to be achieved.	-	Explanations of how emission reductions are to be achieved is added to Section A.4.3 (see p. 11). Response of 26/11/2012 Clarification has been added to Section A.4.3 of the PDD (see p. 11).	*Verifier's note of 21/11/2012* Required information should include explanation why the emission reductions would not occur in the absence of the proposed project, taking into account national and/or sectoral policies and circumstances (as per Guidance for users of JI PDD form). *Verifier's note of 29/11/2012* Issue is closed
Corrective Action Request (CAR) 07. Where applicable, please provide the version number and reference on Guidance on criteria for baseline setting and monitoring.	23	Version number and reference to Guidance on criteria for baseline setting and monitoring have been indicated in the PDD, where applicable.	CAR is closed.
Corrective Action Request (CAR) 08. In section B.1 of the PDD please consider the application of mercury technology for caustic soda production as an alternative for the project activity.	23	Application of mercury technology for caustic soda production as an alternative for the project activity has been considered in Section B.1 of the PDD (see p.15). Response of 26/11/2012 Corrected.	*Verifier's note of 21/11/2012* On p.15 it is stated that "Overall energy consumption during mercury process is only less than 1% lower than in mercury process". Please correct to make the sense clear. *Verifier's note of 29/11/2012* CAR is closed

Corrective Action Request (CAR) 09. In section there is the reference on Annex 2. However, Annex 2 does not contain the referred information. Please make the proper corrections.	28	Corrected (see p. 16).	CAR is closed
Corrective Action Request (CAR) 10. Formulas used for baseline emissions calculation should be added to section B.1 of the PDD. Please make the amendments and check numbering of formulas throughout the PDD.	23	Formulas used for baseline emissions calculation have been added to section B.1 of the PDD (see p. 17).	CAR is closed
Corrective Action Request (CAR) 11. For tables in section B.1 where applicable please provide frequency of monitoring, names of sources of data applied, values of data applied.	23	The frequency of monitoring, names of sources of data applied and values of data applied have been indicated in tables of section B.1 of the PDD.	CAR is closed
Corrective Action Request (CAR) 12. Please correct the data unit for specific heat energy consumption (see page 16 of the PDD).	23	Corrected (see page 19 of the PDD).	CAR is closed
Corrective Action Request (CAR) 13. For emission and oxidation factors for natural gas (pages 17 and 18) please specify quality assurance and quality control procedures to be applied.	23	Quality assurance and quality control procedures to be applied for emission and oxidation factors for natural gas have been indicated in tables of section B.1 of the PDD.	Issue is closed based on the amendments in the PDD.

Corrective Action Request (CAR) 14. References 5, 10 do not contain the referred information. Please make the corrections.	29 (a)	As for reference 5, please, see the "Overview of the caustic soda market of CIS", p.15 (table with the list of Ukrainian producers and used technology) http://megaresearch.ru/files/demo_file/4496.pdf. The copy of this report has been also provided to determination team. As for reference 10, it has been corrected. The copy of the article has been also provided to determination team. Please, note that the numeration of the references in the version 2.0 has been changed in comparison to version 1.1 (former reference 5 now has number 9 and reference 10 – number 14).	CAR is closed based on the appropriate explanation
Corrective Action Request (CAR) 15. Please specify start and end dates of second commitment period and it's length in section C.3 of the PDD.	34 (d)	Start and end dates of second commitment period and its length have been specified in Section C.3.	CAR is closed
Corrective Action Request (CAR) 16. For section D.1 of the PDD please apply step-by-step approach as it is foreseen by the Guidance for users of JI PDD form.	36 (a)	Step-by-step approach as it is foreseen by the Guidance for users of JI PDD form has been applied in section D.1.	CAR is closed

Corrective Action Request (CAR) 17. The documentation concerning JI project should be collected and kept for the period until the last ERUs transaction plus two years. Please provide the documental evidence that this procedure is followed at the enterprise. Please also correct section D.3 considering all the mentioned above.	36 (i)	According to the monitoring procedure established at the enterprise documentation concerning JI project will be collected and kept for the period until the last ERUs transaction plus two years. Relevant documental evidence has been provided to the determination team.	CAR is closed.
Corrective Action Request (CAR) 18. Specific consumption of energy resources for 5 years (2004-2008) should be calculated as the amount of resources consumed per amount of product produced (as total for 5 years). Please make the corresponding corrections in the excel calculation file and in the PDD.	45	Calculations have been adjusted as requested.	Issue is closed
Corrective Action Request (CAR) 19. The values of electric power and heat energy consumption in excel calculation file for 2010 and 2011 do not correspond with the values provided in forms 11-MTP. Please make the corrections.	45	The values have been updated.	Issue is closed
Corrective Action Request (CAR) 20. The Letter of Approval issued by the DFP of Ukraine was not provided to the determination team.	19	Due to the national procedure, the LoA from Ukraine will be issued after the successful passing of determination process.	CAR is not closed. LoA from Ukraine was not provided.
Clarification Request (CL) 01. Please justify that the enterprise is the 1st class electricity consumer.	36 (b)	Documented evidences have been provided to the determination team.	Documental evidence was provided. Issue is closed.

Clarification Request (CL) 02. For formulae D.3 and further similar ones please clarify the meaning of 10^{-3}	36 (b)	To multiply by 10^{-3} means the mathematical action, which is identical to division by 1000. This action is used in formulae D.3 and others to ensure the consistency of data units as the value of emission factor for natural gas combustion is used in kg of CO2e per GJ while calculated emissions are presented in tonnes of CO2e.	CL is closed.
Clarification Request (CL) 03. In section F.1 of the PDD it is stated that specific water consumption was reduced from 202 to 97 m3 and technological air from 52 to 20 nm3. Please clarify the origin of these data.	48 (a)	The evidences were provided to the determination team.	CL is closed