VERIFICATION REPORT
VEMA S.A.

VERIFICATION OF THE JI PROJECT

IMPLEMENTATION OF ENERGY SAVING MEASURES AT PJSC «LYSYCHANSKIY GLASS FACTORY «PROLETARY»

2nd periodic
for the period of 01/07/2011-31/05/2012

REPORT NO. UKRAINE-ver/0544/2012

REVISION NO. 01

BUREAU VERITAS CERTIFICATION

Report No: UKRAINE-ver/0544/2012

VERIFICATION REPORT

Date of first issue: 05/07/2012	Organizational unit: Bureau Veritas Certification Holding SAS
Client: VEMA S.A.	Client ref.: Fabian Knodel

Summary:

Bureau Veritas Certification has made the 2nd periodic verification for the period of 01/07/2011 – 31/05/2012 of the JI project "Implementation of energy saving measures at PJSC «Lysychanskiy glass factory "Proletary", project of VEMA S.A. located in Lysychansk city, Luhansk Region, Ukraine, and applying the JI specific approach, 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 (but for the crediting period) 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 verification scope is defined as a periodic independent review and ex post determination by the Accredited Entity of the monitored reductions in GHG emissions during defined verification period, and consisted of the following three phases: i) desk review of the monitoring report against 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 verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the verification process is a list of Clarification, Corrective Actions Requests and Forward Actions Requests (CL, CAR and FAR), presented in Appendix A.

In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in approved project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions. The GHG emission reduction is calculated accurately and without material errors, omissions, or misstatements, and the ERUs issued totalize 90 767 tonnes of CO_2 equivalent for the monitoring period from 01/07/2011 to 31/05/2012.

Our opinion relates to the project's GHG emissions and resulting GHG emission reductions reported and related to the approved project baseline and monitoring, and its associated documents.

Report No.: UKRAINE-ver/0544/2012	Subject Group: JI	
Project title: "Implementation of energy saving measures at PJSC «Lysychanskiy glass factory «Proletary»		
Work carried out by: Oleg Skoblyk – Team Leader, Lead verifier Viacheslav Yeriomin – Team Member, Verifier		
Work reviewed by: Ivan Sokolov – Internal technical reviewer		
Work approved by: Ivan Sokolov – Operational Manager		
Date of this revision: 05/07/2012	Rev. No.: 01	Number of pages: 35

Bureau Veritas Certification Holding SAS

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1 INTRODUCTION

VEMA S.A. has commissioned Bureau Veritas Certification to verify the emissions reductions of its JI project “Implementation of energy saving measures at PJSC «Lysychanskiy glass factory «Proletary» (hereafter called “the project”) in Lysychansk city, Ukraine.

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

The verification covers the period from July 1, 2011 to May 31, 2012.

1.1 Objective

Verification is the periodic independent review and ex post determination by the Accredited Independent Entity (AIE) of the monitored reductions in GHG emissions during defined verification period.

The objective of verification can be divided in Initial Verification and Periodic Verification.

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

The verification is not meant to provide any consulting towards the Client. However, stated requests for clarifications, corrective and/or forward actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

1.3 Verification Team

The verification team consists of the following personnel:

Oleg Skoblyk

Bureau Veritas Certification Team Leader, Climate Change Lead Verifier

Viacheslav Yeriomin

Bureau Veritas Certification Team Member, Climate Change Verifier

This verification report was reviewed by:

Ivan Sokolov
Bureau Veritas Certification Internal Technical Reviewer

2 METHODOLOGY

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

In order to ensure transparency, a verification 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 verification and the results from verifying the identified criteria. The verification protocol serves the following purposes:

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

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

2.1 Review of Documents

The Monitoring Report (MR) submitted by VEMA S.A. and additional background documents related to the project design and baseline, i.e. country Law, Project Design Document (PDD), Approved CDM methodology, Determination Report of the project prepared by Bureau Veritas Certification Holding SAS No. UKRAINE-DET/0292/2011 rev.01 dated 05/08/2011, Guidance on criteria for baseline setting and monitoring, Host party criteria, the Kyoto Protocol, Clarifications on Verification Requirements to be Checked by an Accredited Independent Entity were reviewed.

The verification findings presented in this report relate to the Monitoring Report for the period from 01/07/2011 to 31/05/2012, version 01 as of June 6, 2012 and version 02 as of June 28, 2012 and the project as described in the determined PDD.

2.2 Follow-up Interviews

On 29/06/2012 Bureau Veritas Certification verification team visited the project implementation site (PJSC «Lysychanskiy glass factory «Proletary») and performed on-site interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of PJSC «Lysychanskiy glass factory «Proletary» and VEMA S.A. were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
PJSC «Lysychanskiy glass factory «Proletary»	➢ Organizational structure ➢ Responsibilities and authorities ➢ Roles and responsibilities for data collection and processing ➢ Implementation Schedule ➢ Installation of equipment ➢ Data logging, archiving and reporting ➢ Metering equipment control ➢ Metering record keeping system, database ➢ IT management ➢ Training of personnel ➢ Quality management procedures and technology ➢ Internal audits and check-ups
Consultant: VEMA S.A.	➢ Baseline methodology ➢ Monitoring plan ➢ Monitoring report

2.3 Resolution of Clarification, Corrective and Forward Action Requests

The objective of this phase of the verification 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 GHG emission reduction calculation.

If the Verification Team, in assessing the monitoring report and supporting documents, identifies issues that need to be corrected, clarified or improved with regard to the monitoring requirements, it should 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 that is not in accordance with the monitoring plan;

(b) Clarification request (CL), requesting the project participants to provide additional information for the Verification Team to assess compliance with the monitoring plan;

(c) Forward action request (FAR), informing the project participants of an issue, relating to the monitoring that needs to be reviewed during the next verification period.

The Verification 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 verification.

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

3 VERIFICATION CONCLUSIONS

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

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

The Clarification, Corrective and Forward Action Requests are stated, where applicable, and are further documented in the Verification Protocol in Appendix A. The verification of the Project resulted in 10 Corrective Action Requests, and 2 Clarification Requests.

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

3.1 Remaining issues and FARs from previous verifications

There are no any remaining CRs and FARs from previous verifications.

3.2 Project approval by Parties involved (90-91)

The project obtained approval by the Host party (Ukraine) (Letter of Approval #2572/23/7 issued by the State Environmental Investment Agency of Ukraine as of 15/09/2011).
Written project approval by Switzerland (the party – buyer of emission reduction units) was issued by the NFP of this Party (Letter of Approval # J294-0485 issued by the Federal Office for the Environment (FOEN) of Switzerland dated 25/07/2011).

The abovementioned written approvals are unconditional.
The identified areas of concern as to project approval by the parties involved, project participants response and BV Certification's conclusion are described in Appendix A to this report (refer to CAR 01).

3.3 Project implementation (92-93)

The main purpose of the project that is implemented at PJSC «Lysychanskiy glass factory «Proletary» is greenhouse gass emission reductions due to the use of alternative energy resources in the course of company's production activity and its modernization by using modern technologies. Alternative energy resources include effluent furnace gases of glass-melting furnaces that are used for additional generation of heat, which would be generated by old boilers in steam boiler-houses in case of absence of the project. In addition the project's purpose is greenhouse gas emission reductions due to company modernization that provides for introduction of modern technologies in production of float glass and leads to decrease in consumption of energy sources by decrease of specific fuel and electric energy consumption for product unit manufacturing. The reduction of consumption of the electric energy, which is produced in power system of Ukraine, lead to the decrease of fossil fuel combustion for electricity production, and as a result to the greenhouse gas emission reduction.

The reconstruction measures under the project include three sub-projects.

A project activity is divided into the following subprojects:

Subproject No.1. Utilization of furnace effluent gases. Due to furnace gas utilization the heat is generated, for production of which fossil fuel (natural gas) would be applied in case of absence of the project activities. According to the implementation schedule 2 water-heating HRSGs of KUV-EM-2,1-0,6 type with capacity of one water-heating HRSG equal to 2.1 MW (fume gases after glass furnace are used) were installed in the workshop № 2-2 (production 2). Temperature of heat carrier in the heating system and hot water supply is 85-90 °C and 55-65 °C correspondingly. Gas with the temperature of 420°C and in the quantity of 20000 m^3/h is extracted to the common retention gas pipe. In HRSGs the water is heated up to the temperature of 105°C for own needs of production. Then the fume gases are extracted by smoke exhauster to the chimney with the height of 80 m. Height of the pipe is calculated based on conditions of harmful emissions dispersion in atmospheric air. The HRSGs are the heat exchangers of pipe-in-pipe type. The HRSGs utilize heat of combustion products of glass furnaces. Quantity of utilized furnace gases depends on production volume. Quantity of generated steam (for production 2 – heat) is measured by the meters.

Subproject No.2. Implementation of modern line of float-glass production (production 2). The activities provide for decrease of electric energy and natural gas consumption due to implementation of the modern production line that consumes less energy resources. Decrease in consumption of electric energy that is needed in the course of production process will lead to decrease of fossil fuel consumption for electric energy generation for the grid, as well as decrease of natural gas consumption will also result in GHG emission reductions.

According to the implementation schedule the modern workshop (line) for production of large-size float-glass was installed and commissioned. This workshop contains the following sections:
- tunnel for mixture and cullet supply;
- melting area;
- formation area;
- fritting and cutting area;

Technological equipment:
- Glass furnace with capacity of 350 tons / day;
- Molten pool with the capacity of 350 tons / day;
- Annealing lehr with the capacity of 350 tons / day;
- Air cooling of furnace and molten glass;
- Protective atmosphere station;

- Internal gas supply;
- External gas supply.

Components of the modern line of float glass production are presented in Section A.6. of the MR.

Subproject No. 3. Modernization of existing float – glass production (production 1). Subproject provides for decrease of specific electricity and natural gas consumption due to rehabilitation of functioning capacities: use of modern models of burners, change of furnace geometry, application of frequency regulators at electrical equipment of the workshops and introduction of electrical heating of glass melts. Decrease in specific consumption resulted in decrease in electric power consumption and natural gas utilization resulting in reduction of GHG emissions. In addition the project ensured additional benefits, for example, economic efficiency, labor protection, and stimulus for introduction of similar projects at other industrial companies of Ukraine.

In the process of workshop No. 3 reconstruction the following activities were performed:

1. The changes in the design of the furnace; this lead to reduction in heat losses in the manufacturing process.
2. Replacement of gas burners with modern ones, manufactured by «FlammaTec». «FlammaTec» burners allow of fine-tuning of natural gas consumption, have a torch of the exact geometric shape that allows of optimum heating of molten glass surface, adjusting the feed rate of gas and controlling the parameters of mixing gas with air.

The major project implementations were carried out prior to the current monitoring period. Refer to the table below:

Table 2. Project implementation status

	Name of stage	Starting Date	End Date
1.	**Subproject No.1. Utilization of furnace effluent gases.**		
	The installation of HRSG after glass furnace in the workshop №2-2	01/01/2008	04/12/2008
2.	**Subproject No.2. Implementation of modern line of float-glass production (production 2).**		
	Installation and commissioning of the	01/01/2008	04/12/2008

	modern workshop (line) for production of large-size float-glass		
3.	**Subproject No. 3. Modernization of existing float – glass production (production 1).**		
	Installation of the wall furnace using high-fireproof materials	01/02/2009	01/11/2010
	Increase of the volumes of regenerator filling	01/02/2009	01/11/2010
	Installation of the new construction of burners with expansion of the port route	01/02/2009	01/11/2010
	Improvement of the insulation of bottom and walls, decrease of the pool depth	01/02/2009	01/11/2010
	Implementation of the ASECCA (automated system of electricity consumption commercial accounting) and commercial accounting of electricity	01/02/2009	01/11/2010
	Installation of the frequency converters in blow fans of glass furnace No. 3	01/02/2009	01/11/2010

The project measures are implemented according to the implementation schedule presented in the determined PDD ver.02.

The starting date of the crediting period did not change and remains the date of the first generated emission reduction units, namely: January 01, 2009.

The Monitoring System is in place and operational.

The monitoring equipment such as electricity meters, gas meters, generated heat meters and others are in place and comply with the industrial standards of Ukraine. All monitoring equipment is covered by the detailed verification (calibration) plan and is verified with periodicity, established by its manufacturer.

The project implementation doesn't provide for any negative impacts on environment. The only impact on environment is dismantled equipment, which will be further used as secondary material.

PJSC «Lysychanskiy glass factory «Proletary» has all necessary reports, permissions, limits and licenses required by the Ukrainian legislation.

Implementation of this project allows of improvement of quality level of produced glass and reduction of specific consumption for its production. Experience of PJSC «Lysychanskiy glass factory «Proletary» employees allows of minimization of occurrence of emergency situations in the course of this project implementation.

The identified areas of concern as to project implementation, project participants response and BV Certification's conclusion are described in Appendix A to this report (refer to CAR 02 and CAR 03).

3.4 Compliance of the monitoring plan with the monitoring methodology (94-98)

The monitoring occurred in accordance with the monitoring plan included in the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website.

For calculating the emission reductions, key factors such as electricity consumption, fuel consumption, heat generation, volume of output, quality of produced goods, operation mode of furnaces, experience in implementation of measures provided for by the project, existing practice in Ukraine in this sphere, financial costs and experience in the sphere, the activity level of the project and the emissions as well as risks associated with the project were taken into account, as appropriate.

Data sources used for calculating emission reductions such as appropriately calibrated metering equipment, the study of standardized emission factors for the Ukrainian electricity grid are clearly identified, reliable and transparent.

Emission factors used for emission reduction calculations were selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice. Carbon dioxide emission factors for electricity consumption by electricity consumers (EF) were set in accordance with the Order # 62 of the National Environmental Investment Agency of Ukraine "On approval of carbon dioxide emission factors in 2008" dated 15/04/2011, Order # 63 of the National Environmental Investment Agency of Ukraine "On approval of carbon dioxide emission factors in 2009" dated 15/04/2011, Order # 43 of the National Environmental Investment Agency of Ukraine "On approval of carbon dioxide emission factors in 2010" dated 28/03/2011 and Order # 75 of the National Environmental Investment

Agency of Ukraine" On approval of carbon dioxide emission factors in 2011" dated 12/05/2011.

The calculation of emission reductions is based on conservative assumptions and the most plausible scenarios in a transparent manner.

The identified areas of concern as to the compliance of the monitoring plan with the monitoring methodology, project participants response and BV Certification's conclusion are described in Appendix A to this report (refer to CAR 04 – CAR 09, CL 01 and CL 02).

3.5 Revision of monitoring plan (99-100)

Not applicable.

3.6 Data management (101)

The data and their sources, provided in monitoring reports, are clearly identified, reliable and transparent.

The implementation of data collection procedures is in accordance with the PDD and the monitoring plan, including the quality control and quality assurance procedures.

The function of the monitoring equipment, including its calibration status, is in order.

According to the existing legislation "On metrology and metrological activity" all metering equipment in Ukraine shall conform to stated requirements of corresponding standards and be calibrated periodically. Electricity meters and heat energy meters were calibrated by SE "Lysychanskstandardmetrology". Natural gas meters were calibrated by SE "Kharkivstandartheolohiia" and SPE "Ukrhazueoavtomatyka" LLC.

The project complies with legal requirements to the calibration and verification.

The actual data and records used for the monitoring are maintained in a traceable manner.
The data collection and management system for the project is in accordance with the PDD and the monitoring plan.

The project and baseline emissions subject to monitoring relate to the electricity and fuel (gas) consumption by the production #1 and production #2, additional heat generation from alternative energy resources by the HRSG. The baseline emissions are determined based on historical values

of specific electricity and natural gas consumption per unit of output in the period before the reconstruction (considered as a baseline year) and actual monitored value of electricity and natural gas consumption, heat generation and amount of output in the reporting period.

The monitoring procedure provides for:

1) Metering of electricity consumption by PJSC «Lysychanskiy glass factory «Proletary»;
2) Metering of natural gas consumption by PJSC «Lysychanskiy glass factory «Proletary»;
3) Metering of heat generation from alternative energy resources by the HRSGs of PJSC «Lysychanskiy glass factory «Proletary»;
4) Metering of output by PJSC «Lysychanskiy glass factory «Proletary».

Parameters which are monitored throughout the crediting period are metered for each separate production that is production 1 for the subproject #3 and production #2 for the subprojects #1 and #2.

Based on the obtained data that are subject to accounting and control PJSC «Lysychanskiy glass factory «Proletary» prepares the following documents:

- Electricity and fuel consumption report under the form 11-MTP that is signed by PJSC «Lysychanskiy glass factory «Proletary» director and submitted to Lysychansk regional state administration.

PJSC «Lysychanskiy glass factory «Proletary» collects and keeps the data relating to electricity consumption, gas consumption, output and heat generation in the forms of production reports.
Structure of monitoring data collection at PJSC «Lysychanskiy glass factory «Proletary» is the following:

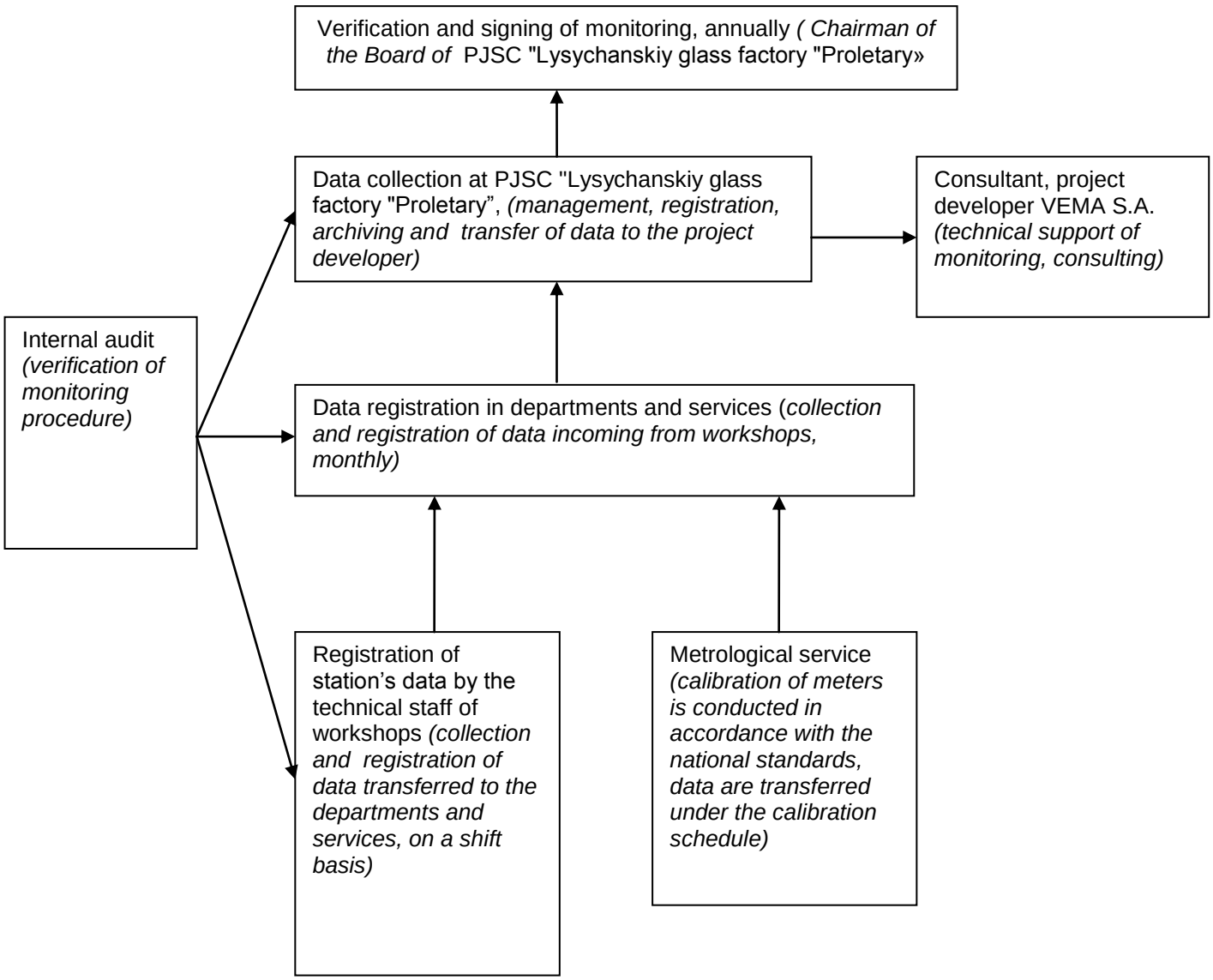

Figure 1 Structure of monitoring data collection

All necessary information for monitoring of GHG emission reductions is stored in paper or/and electronic formats and will be saved till the end of the crediting period and for two years after the last operation with ERUs from the project.

The Monitoring Report rev.02 provides sufficient information on the assigning roles, responsibilities and authorities for implementation and maintenance of monitoring procedures including control of data. The

verification team confirms effectiveness of the existing management and operational systems and found them eligible for reliable project monitoring.

The identified areas of concern as to data management, project participants response and BV Certification's conclusion are described in Appendix A to this report (refer to CAR 10).

3.7 Verification regarding programmes of activities (102-110)

Not applicable.

4 VERIFICATION OPINION

Bureau Veritas Certification has performed the 2nd periodic verification for the period of 01/07/2011 – 31/05/2012 of the "Implementation of energy saving measures at PJSC «Lysychanskiy glass factory «Proletary» project in Ukraine, which applies JI specific approach. The verification 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 verification consisted of the following three phases: i) desk review of the monitoring report against 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 verification report and opinion.

The management of VEMA S.A. is responsible for the preparation of the GHG emissions data and the reported GHG emission reductions of the project on the basis set out within the project Monitoring Plan indicated in the final PDD version 02 and the revised monitoring plan. The development and maintenance of records and reporting procedures are in accordance with that plan, including the calculation and determination of GHG emission reductions from the project, is the responsibility of the management of the project.

Bureau Veritas Certification verified the Project Monitoring Report, version 02, for the reporting period of 01/07/2011 – 31/05/2012 as indicated below. Bureau Veritas Certification confirms that the project is implemented according to the determined PDD. Installed equipment being essential for generating emission reduction runs reliably and is calibrated

appropriately. The monitoring system is in place and the project is generating GHG emission reductions.

The emission reductions achieved under the project for the period from 01/07/2011 to 31/05/2012 differ from the amount of emission reductions provided for the same period in the determined PDD. This is because at the time of PDD development it was impossible to obtain accurate data necessary for calculating GHG emission reductions. The date when the determined PDD version 02 was written is 14/07/2011, and this monitoring report covers the period from 01/07/2011 to 31/05/2012. So during the process of PDD writing it was impossible to accurately predict all the factors that influenced the reduction of GHG emissions. In the determined PDD GHG emission reductions were calculated by dividing the total emission reductions by 12 (12 months) and multiplying by the number of months (6 months on 2011, 5 months of 2012) covering the monitoring period.

Emission reductions estimated in the determined PDD version 02 and the MR version 02 are provided in Table 3 of this Report.

Table 3 Emission reductions estimated in the determined PDD version 02 and the MR version 02

Period	Estimated GHG emission reductions stated in the determined PDD in tonnes of CO_2eq	Ex-post GHG emission reductions stated in the Monitoring report in tonnes of CO_2eq
01/07/2011-31/05/2012	54 761	90 767

Bureau Veritas Certification confirms that the GHG emission reduction is calculated without material misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the approved project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated, we confirm the following statement:

Reporting period: From 01/07/2011 to 31/05/2012

Baseline emissions : 229 293 tonnes of CO_2 equivalent.
Project emissions : 138 526 tonnes of CO_2 equivalent.
Emission Reductions : 90 767 tonnes of CO_2 equivalent.

5 REFERENCES

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

/1/	Monitoring Report of the project “Implementation of energy saving measures at PJSC «Lysychanskiy glass factory “Proletary” for the period from 01/07/2011 to 31/05/2012, version 01, dated June 6, 2012
/2/	Monitoring Report of the project “Implementation of energy saving measures at PJSC «Lysychanskiy glass factory “Proletary” for the period from 01/07/2011 to 31/05/2012, version 02, dated June 28, 2012
/3/	Annex 1. Supporting document 1 “Calculation of GHG emission reductions due to implementation of electric energy saving activities at the PJSC «Lysychanskiy glass factory «Proletary» (Excel file)
/4/	Annex 2. Supporting document 2 "Determination of carbon dioxide emission factor (CEF) for reduction of electricity consumption from the national power grid"
/5/	Annex 3. Supporting document 3 “Measuring equipment”
/6/	PDD “Implementation of energy saving measures at PJSC «Lysychanskiy glass factory «Proletary», version 02 dated 14/07/2011
/7/	Determination Report issued by Bureau Veritas Certification Holding SAS No. UKRAINE-DET/0292/2011 “Implementation of energy saving measures at PJSC «Lysychanskiy glass factory «Proletary», rev.01 dated 05/08/2011
/8/	Letter of Approval of the Joint Implementation project “Implementation of energy saving measures at PJSC «Lysychanskiy glass factory «Proletary» #2572/23/7 issued by the State Environmental Investment Agency of Ukraine as of 15/09/2011
/9/	Letter of Approval of the JI project “Implementation of energy saving measures at PJSC «Lysychanskiy glass factory «Proletary»# J294-0485 issued by the Federal Office for the Environment (FOEN) of Switzerland dated 25/07/2011
/10/	ACM0012 «Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects» version 3.2.

Category 2 Documents:

Background documents related to the design and/or methodologies employed in the design or other reference documents.

/1/	Report on fuel, heat and electricity energy consumption results in 2011 (form 11-MTP)
/2/	Permission No. 4411800000-25a on amendment to Permission No. 4411800000-25 for emissions of pulluting substances into the atmospheric air by stationary sources dated 27/01/2012
/3/	Permission No. 4411800000-25b on amendment to Permission No. 4411800000-25 for emissions of pulluting substances into the atmospheric air by stationary sources dated 27/01/2012
/4/	Permission No. 4411800000-25v on amendment to Permission No. 4411800000-25 for emissions of pulluting substances into the atmospheric air by stationary sources dated 30/12/2011
/5/	Permission No. 4411800000-25 for emissions of pulluting substances into the atmospheric air by stationary sources dated 27/01/2012
/6/	Total emissions of pollutants and greenhouse gases from the company (form 2-TP air)
/7/	Report on protection of atmospheric air in the 3rd quarter 2011 (form 2-TP air) – for 2 production departments
/8/	Report on protection of atmospheric air for 1t 20 Pr., (form 2-TP air) – for 2 production departments
/9/	Total emissions of pollutants and greenhouse gases from the company (form 2-TP air)
/10/	Report on protection of atmospheric air in the 3rd quarter 2011 (form 2-TP air) – for 2 production departments l-s.
/11/	Report on protection of atmospheric air in 2012, (form 2-TP air) – for 2 production departments
/12/	Information on energy consumption and glass production for the period from 01/07/2011 to 31/05/2012
/13/	Calibration certificate on the mean of metering device No. 899 dated 22/11/2011 (electronic recorders MTM-RE-160 SPE "Mikroterm")
/14/	Technological log of glass furnace in the work shop 2-2

/15/	Log of pressure registration, gas density and consumption for GDP-15, the gas pressure in the plant gas network control points.
/16/	Report on water consumption in the 3rd quarter of 2011
/17/	Report on water consumption in the 4th quarter of 2011
/18/	Report on water consumption in the 1st quarter of 2012
/19/	Report on fuel, heat and electricity consumption in January 2012
/20/	Report on industrial output in 2011
/21/	Report on industrial output in January-May 2012
/22/	Report on balances and use of energy materials and oil refinery products in January – December 2011
/23/	Report on balances and use of energy materials and oil refinery products in January-May 2012

Persons interviewed:

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

	Name	Company	Position
/1/	Dmytro Drozhzhyn	PJSC «Lysychanskiy glass factory «Proletary»	Deputy Head of Executive board
/2/	Yurii Baranovskyi	PJSC «Lysychanskiy glass factory «Proletary»	Lead Engineer
/3/	Vasyl Voinichenko	PJSC «Lysychanskiy glass factory «Proletary»	Head of Energy Department
/4/	Halyna Kartamysheva	PJSC «Lysychanskiy glass factory «Proletary»	Lead Technologist
/5/	Iekateryna	PJSC «Lysychanskiy	Lead Ecologist at

	Zimskaia	glass factory «Proletary»	PJSC
/6/	Vasyl Babich	PJSC «Lysychanskiy glass factory «Proletary»	Head of Metrology department
/7/	Anatolii Chumak	PJSC «Lysychanskiy glass factory «Proletary»	Head of production line 2-2
/8/	Oleksandr Zinchenko	PJSC «Lysychanskiy glass factory	Head of production line 3
/9/	Mykola Yaytskyi	PJSC «Lysychanskiy glass factory «Proletary»	Head of production line 4
/10/	Serhii Apostolaka	“CEP” LLC	Consultant of VEMA S.A.
/11/	Oleksandr Pohosov	“CEP” LLC	Consultant of VEMA S.A.

APPENDIX A: JI PROJECT VERIFICATION PROTOCOL

BUREAU VERITAS CERTIFICATION HOLDING SAS

VERIFICATION PROTOCOL

Check list for verification, according to the JOINT IMPLEMENTATION DETERMINATION AND VERIFICATION MANUAL (Version 01)

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
Project approvals by Parties involved				
90	Has the NFPs of at least one Party involved, other than the host Party, issued a written project approval when submitting the first verification report to the secretariat for publication in accordance with paragraph 38 of the JI guidelines, at the latest?	The project has been approved by both the Host Party (Ukraine) and the Party – buyer of emission reductions (Switzerland). The Letter of Approval #2572/23/7 issued by the State Environmental Investment Agency as of 15/09/2011 and the Letter of Approval J294-0485 issued by Federal Office for the Environment (FOEN) of Switzerland as of 25/07/2011 were presented to the verification team. **CAR 01**. The name of authority that issued the Letter of Approval from Switzerland is stated incorrectly.	**CAR 01**	OK
91	Are all the written project approvals by Parties involved unconditional?	Yes, all the written project approvals by Parties involved are unconditional.	OK	OK
Project implementation				
92	Has the project been implemented in	Implementation of the project activity was	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	accordance with the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website?	realized according to the project implementation schedule described in the project design document. There are no deviations from or revisions of the determined PDD		
93	What is the status of operation of the project during the monitoring period?	The project measures are implemented according to the implementation schedule presented in the determined PDD ver.02. as of 14/07/2011. The first implementation measures under the project started at the end of 2008. During the monitoring period from July 1, 2011 to May 31, 2012 the project was operational and generated emission reduction units, although full completion of installation of all project measures is planned for the end of 2012. **CAR 02**. Please, in Section A.6. of the MR provide information on how the reduction of GHG emissions were achieved by sub-project No. 2. **CAR 03**. Please provide information on measures planned according to activities under sub-project No. 3.	**CAR 02** **CAR 03**	OK OK
Compliance with monitoring plan				

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
94	Did the monitoring occur in accordance with the monitoring plan included in the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website?	The monitoring process was carried out in accordance with the monitoring plan included in the registered PDD, regarding which the determination has been deemed final and is so listed on the UNFCCC JI website. Data used for calculation of emission reductions are based on information that is confirmed by documents provided by PJSC «Lysychanskiy glass factory «Proletary».	OK	OK
95 (a)	For calculating the emission reductions or enhancements of net removals, were key factors, e.g. those listed in 23 (b) (i)-(vii) above, influencing the baseline emissions or net removals and the activity level of the project and the emissions or removals as well as risks associated with the project taken into account, as appropriate?	For calculating the emission reductions, key factors such as electricity consumption, fuel consumption, heat generation, volume of output, quality of produced goods, operation mode of furnaces, experience in implementation of measures provided for by the project, existing practice in Ukraine in this sphere, financial costs and experience in the sphere, the activity level of the project and the emissions as well as risks associated with the project were taken into account, as appropriate. **CAR 04**. Most of the parameters described in Section B of the MR don't correspond to the parameters listed in Section D. Please correct the discrepancy.	**CAR 04** **CAR 05** **CAR 06** **CAR 07**	OK OK OK OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		CAR 05. Data units of kWh parameter are incorrect. Please correct the discrepancy. **CAR 06**. Please, provide a description of the net calorific value of natural gas in Section B.2.2. of the MR. **CAR 07**. Please, provide an explanation of indexes for the parameters in Section D of the MR.		
95 (b)	Are data sources used for calculating emission reductions or enhancements of net removals clearly identified, reliable and transparent?	Yes, data sources used for calculating emission reductions are clearly identified, reliable and transparent.	OK	OK
95 (c)	Are emission factors, including default emission factors, if used for calculating the emission reductions or enhancements of net removals, selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice?	Yes, emission factors, including default emission factors, that are used for calculating the emission reductions are selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice. For calculations carbon dioxide emission factors for electricity consumption by electricity consumers (EF) set in accordance with the Order # 62 of the National Environmental Investment Agency of Ukraine "On approval of carbon dioxide emission factors in 2008" dated 15/04/2011, Order # 63 of the National Environmental Investment Agency of Ukraine "On approval of carbon dioxide emission factors in 2009" dated 15/04/2011, Order # 43	**CAR 08** **CL 01** **CL 02**	OK OK OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		of the National Environmental Investment Agency of Ukraine "On approval of carbon dioxide emission factors in 2010" dated 28/03/2011 and Order # 75 of the National Environmental Investment Agency of Ukraine" On approval of carbon dioxide emission factors in 2011" dated 12/05/2011 were used. **CAR 08**. Name of carbon dioxide emission factors for electricity consumption by electricity consumers is stated incorrectly. Please provide the name of the factor according to NEIA orders. **CL 01**. Please provide a link to NEIA orders. **CL 02**. Please provide a link to the "National inventory of anthropogenic greenhouse gas emissions by sources and removals by sinks in Ukraine in 1990 - 2006" in Section B of the MR.		
95 (d)	Is the calculation of emission reductions or enhancements of net removals based on conservative assumptions and the most plausible scenarios in a transparent manner?	Calculation of emission reductions is based on conservative assumptions and the most plausible scenarios in a transparent manner. **CAR 09**. The amount of GHG emission reductions by sub-project No. 3 stated in Table 4 of the MR does not coincide with the amount of GHG emission reductions stated in the Supporting document 1.	**CAR 09**	OK
Applicable to JI SSC projects only				
96	Is the relevant threshold to be classified	N/a	N/a	N/a

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	as JI SSC project not exceeded during the monitoring period on an annual average basis? If the threshold is exceeded, is the maximum emission reduction level estimated in the PDD for the JI SSC project or the bundle for the monitoring period determined?			
Applicable to bundled JI SSC projects only				
97 (a)	Has the composition of the bundle not changed from that is stated in F-JI-SSCBUNDLE?	N/a	N/a	N/a
97 (b)	If the determination was conducted on the basis of an overall monitoring plan, have the project participants submitted a common monitoring report?	N/a	N/a	N/a
98	If the monitoring is based on a monitoring plan that provides for overlapping monitoring periods, are the monitoring periods per component of the project clearly specified in the monitoring report? Do the monitoring periods not overlap with those for which verifications were already deemed final in the past?	N/a	N/a	N/a
Revision of monitoring plan				
Applicable only if monitoring plan is revised by project participant				

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
99 (a)	Did the project participants provide an appropriate justification for the proposed revision?	N/a	N/a	OK
99 (b)	Does the proposed revision improve the accuracy and/or applicability of information collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans?	N/a	N/a	OK
Data management				
101 (a)	Is the implementation of data collection procedures in accordance with the monitoring plan, including the quality control and quality assurance procedures?	The implementation of data collection procedures is in accordance with the monitoring plan, including the quality control and quality assurance procedures. The information regarding education, training, internal audit and control is insufficient. **CAR 10**. In Section C.1. of the MR it is stated that during the monitoring period a modern float glass production line was installed at PJSC “Lysychankiy glass factory “Proletary”; however no innovations were introduced in the current monitoring period (01/07/2011-31/05/2012).	**CAR 10**	OK
101 (b)	Is the function of the monitoring equipment, including its calibration status in order?	Yes, the function of the monitoring equipment, including its calibration status, is in order. According to the existing legislation "On	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		metrology and metrological activity" all metering devices in Ukraine shall conform to stated requirements of corresponding standards and be calibrated periodically. Electricity meters and heat energy meters were calibrated by SE "Lysychanskstandardmetrology". Natural gas meters were calibrated by SE "Kharkivstandartheolohiia" and SPE "Ukrhazueoavtomatyka" LLC.		
101 (c)	Are the evidence and records used for the monitoring maintained in a traceable manner?	The evidence and records used for the monitoring are maintained in a traceable manner. PJSC «Lysychanskiy glass factory «Proletary» collects and keeps the data relating to electricity consumption, gas consumption, heat generation, volume of output in the forms of production reports and bills. All necessary information for monitoring of GHG emission reductions is stored in paper and/or electronic formats and will be saved till the end of the crediting period and for two years after the last operation with ERUs generated by the project.	OK	OK
101 (d)	Is the data collection and management system for the project in accordance with the monitoring plan?	The data collection and management system for the project is in accordance with the monitoring plan. The verification team confirms effectiveness of the existing management and operational systems and finds them eligible for	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		reliable project monitoring.		
Verification regarding programs of activities (additional elements for assessment)				
102	Is any JPA that has not been added to the JI PoA not verified?	N/a	N/a	N/a
103	Is the verification based on the monitoring reports of all JPAs to be verified?	N/a	N/a	N/a
103	Does the verification ensure the accuracy and conservativeness of the emission reductions or enhancements of removals generated by each JPA?	N/a	N/a	N/a
104	Does the monitoring period not overlap with previous monitoring periods?	N/a	N/a	N/a
105	If the AIE learns of an erroneously included JPA, has the AIE informed the JISC of its findings in writing?	N/a	N/a	N/a
Applicable to sample-based approach only				
106	Does the sampling plan prepared by the AIE: (a) Describe its sample selection, taking into account that: (i) For each verification that uses a sample-based approach, the sample selection shall be sufficiently representative of the JPAs in the JI PoA such extrapolation to all JPAs identified for that verification is reasonable, taking into account differences among the characteristics of JPAs, such as:	N/a	N/a	N/a

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	− The types of JPAs; − The complexity of the applicable technologies and/or measures used; − The geographical location of each JPA; − The amounts of expected emission reductions of the JPAs being verified; − The number of JPAs for which emission reductions are being verified; − The length of monitoring periods of the JPAs being verified; and − The samples selected for prior verifications, if any?			
107	Is the sampling plan ready for publication through the secretariat along with the verification report and supporting documentation?	N/a	N/a	N/a
108	Has the AIE made site inspections of at least the square root of the number of total JPAs, rounded to the upper whole number? If the AIE makes no site inspections or fewer site inspections than the square root of the number of total JPAs, rounded to the upper whole number, then does the AIE provide a reasonable explanation and justification?	N/a	N/a	N/a
109	Is the sampling plan available for submission to the secretariat for the	N/a	N/a	N/a

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	JISC's ex ante assessment? (Optional)			
110	If the AIE learns of a fraudulently included JPA, a fraudulently monitored JPA or an inflated number of emission reductions claimed in a JI PoA, has the AIE informed the JISC of the fraud in writing?	N/a	N/a	N/a

TABLE 2 RESOLUTION OF CLARIFICATION AND CORRECTIVE ACTION REQUESTS

Clarification and corrective action requests issued by the verification team	Ref to checklist question in Table 1	Summary of project participant's response	Verification team conclusion
CAR 01. The name of authority that issued the Letter of Approval from Switzerland is stated incorrectly.	90	Letter of Approval # J294-0485 issued by the Federal Office for the Environment (FOEN) of Switzerland dated 25/07/2011	Appropriate corrections were made in the latest version of the MR. The issue is closed.
CAR 02. Please, in Section A.6. of the MR provide information on how the reduction of GHG emissions were achieved by sub-project No. 2.	93	The activities provide for decrease of electric energy and natural gas consumption due to implementation of the modern production line that consumes less energy resources. Decrease in consumption of electric energy that is needed in the course of production process lead to decrease of fossil fuel consumption for electric energy generation for the grid, as well as decrease of natural gas consumption will also result in GHG emission reductions.	CAR 02 is closed based on the provided information in the MR ver.02.

CAR 03. Please provide information on measures planned according to activities under sub-project No. 3.	93	Subproject provides for decrease of specific electricity and natural gas consumption due to rehabilitation of functioning capacities: use of modern models of burners, change of furnace geometry, application of frequency regulators at electrical equipment of the workshops and introduction of electrical heating of glass melts. Refer to Section A.6. of the MR.	The issue is closed based on provision of relevant information in the MR.
CAR 04. Most of the parameters described in Section B of the MR don't correspond to the parameters listed in Section D. Please correct the discrepancy.	95 (b)	The description of parameters and their values are verified, relevant correction are made in the Monitoring report, version 02.	Corrections were made, the issue is closed.
CAR 05. Data units of kWh parameter are incorrect. Please correct the discrepancy.	95 (b)	kWh – Total amount of electric energy, necessary for production of glass at production department No. 2 according to sub-project No.2 in period y, MWh	Corrections were made, the issue is closed.
CAR 06. Please, provide a description of the net calorific value of natural gas in Section B.2.2. of the MR.	95 (b)	Description of the parameter is provided in Section B.2.2 in the MR version 02.	The issue is closed based on the provision of relevant information.
CAR 07. Please, provide an explanation of indexes for the parameters in Section D of the MR.	95 (b)	The explanation of indexes for the parameters is provided in the MR version 02.	The issue is closed based on provision of relevant explanation relating to the indexes.

CAR 08. Name of carbon dioxide emission factors for electricity consumption by electricity consumers is stated incorrectly. Please provide the name of the factor according to NEIA orders.	95 (c)	EFy - carbon dioxide emission factors for electricity consumption by electricity consumers in period y.	Relevant corrections were made, the issue is closed.
CAR 09. The amount of GHG emission reductions by sub-project No. 3 stated in Table 4 of the MR does not coincide with the amount of GHG emission reductions stated in the Supporting document 1.	95 (d)	The amount of GHG emission reductions by sub-project No. 3 is 52 400 t CO2eq.	Relevant corrections were made, the issue is closed.
CAR 10. In Section C.1. of the MR it is stated that during the monitoring period a modern float glass production line was installed at PJSC “Lysychankiy glass factory “Proletary”; however no innovations were introduced in the current monitoring period (01/07/2011-31/05/2012).	101 (a)	Relevant corrections were made in the latest version of the MR.	The issue is closed based on relevant corrections made.
CL 01. Please provide a link to NEIA orders.	95 (c)	Relevant links are provided in the MR version 02.	Relevant links are provided, the issue is closed.
CL 02. Please provide a link to the "National inventory of anthropogenic greenhouse gas emissions by sources and removals by sinks in Ukraine in 1990 - 2006" in Section B of the MR.	95 (c)	Relevant links are provided in the MR version 02.	Relevant links are provided, the issue is closed.