DETERMINATION REPORT

E.ON CARBON SOURCING GMBH

DETERMINATION OF THE
"Installation of CCGT-400 at Shaturskaya TPP, OGK-4, Moscow area, Russia"

BUREAU VERITAS CERTIFICATION

REPORT NO. RUSSIA/0039/2010, V.1

Determination Report on JI project "Installation of CCGT-400 at Shaturskaya TPP, OGK-4, Moscow area, Russia"

Date of first issue:	Organizational unit:
17/08/2010	Bureau Veritas Certification Holding SAS
Client:	Client ref.:
E.ON Carbon Sourcing GmbH	Ms Maryna Odeska

Summary:

Bureau Veritas Certification was commissioned by E.ON Carbon Sourcing GmbH to make the determination of the project "Installation of CCGT-400 at Shaturskaya TPP, OGK-4, Moscow area, Russia" 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 guidelines 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, monitoring plan and other relevant documents, and consists of the following three phases: i) desk review of the project design document and particularly 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 Actions Requests (CL and CAR), presented in Appendix A, Table 5. Taking into account this output, the project proponent has revised its project design document.

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

Report No.:	Subject Group:
RUSSIA/0039-2/2009	JI

Project title:
"Installation of CCGT-400 at Shaturskaya TPP, OGK-4, Moscow area, Russia"

Work carried out by:
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Vera Skitina - Team member, Lead verifier
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Work verified by:
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Work approved by:
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Indexing terms:

Climate Change, Kyoto Protocol, JI, Emission Reductions, Verification,

Abbreviations

AIE	Accredited Independent Entity
BVC	Bureau Veritas Certification
CAR	Corrective Action Request
CCGT	Combined Cycle Gas Turbine
CL	Clarification Request
CO_2	Carbon Dioxide
DDR	Draft Determination Report
DR	Document Review
EIA	Environmental Impact Assessment
E.ON	E.ON Carbon Sourcing GmbH
ERU	Emission Reduction Unit
GC	Global Carbon BV
GHG	Greenhouse House Gas(es)
I	Interview
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
JI	Joint Implementation
JISC	Joint Implementation Supervisory Committee
LoA	Letter of Approval
MoV	Means of Verification
NPV	Net Present Value
OGK-4	OJSC "Fourth Generation Company of the Wholesale Electricity Market"
PDD	Project Design Document
PP	Project Participant
RF	Russian Federation
tCO2e	Tonnes CO2 equivalent
UNFCCC	United Nations Framework Convention for Climate Change
URES	United Regional Energy System

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1 Introduction

E.ON Carbon Sourcing GmbH (hereafter called E.ON) has commissioned Bureau Veritas Certification to determine its JI project "Installation of CCGT-400 at Shaturskaya TPP, OGK-4, Moscow area, Russia" (hereafter called "the project") located in the city of Shatura, Moscow Region, Russian Federation. Global Carbon BV (hereafter called GC) being PDD developer coordinated the project and the determination process on behalf of the project participants OJSC "Fourth Generation Company of the Wholesale Electricity Market" (hereafter called OGK-4) and E.ON.

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 purpose of the determination is to provide an independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan, 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 (PDD), the project's baseline study (BLS) and monitoring plan (MP) and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements for Joint Implementation (JI) projects, JI guidelines, in particular the verification procedure under the JI Supervisory Committee, JISC Guidance on criteria for baseline setting and monitoring, Guidelines for users of JI PDD Form, and associated interpretations. Bureau Veritas Certification has, based on the recommendations in the Validation and Verification Manual (IETA/PCF), employed a risk based approach in the determination process, focusing on the identification of significant risks for project implementation and generation of ERUs.

The determination is not meant to provide any consulting towards OGK-4, E.ON and GC. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

1.3 GHG Project Description (quoted by PDD v.3.4 Section A.2)

OJSC "Fourth Generation Company of the Wholesale Electricity Market" (further in the text - OGK-4 in line with the Russian abbreviation) is one of the six thermal OGKs established during the Russian electricity sector reform. OGK-4 was incorporated in 2005 and com-

pleted the process of its corporate reorganization in 2006. E.ON Russia Power became owner of around 69% stock at the end of 2007. E.ON Russia Power owned 76% of stock by the end of 2008.

The OGK-4 Company core business is generation and wholesale of electricity. Generation, transmission and sale of heat are not crucial as it constitutes only around 2% of sales revenues.

The Company operates five thermal power plants (TPP) throughout Russia: Berezovskaya TPP (1,500 MW, Sharypovo, Krasnoyarsk territory), Surgutskaya TPP-2 (4,800 MW, Surgut, Tyumen area), Yajvinskaya TPP (600 MW, Yajva, Perm area), Shaturskaya TPP (1,100 MW, Shatura, Moscow area) and Smolenskaya TPP (630 MW, Ozerny, Smolensk area) each being a branch of the Company since 1 July 2006.

Total installed generation capacity of OGK-4 is 8,630 MW (that accounts for about 4% Russia's total installed power capacity) and total installed thermal generation capacity is 2,179 Gcal/h. OGK-4 produced 56,676 MWh of electricity and 2,261 Gcal of heat in 2008. Gas accounted for 79% of the energy balance.

Shaturskaya TPP started operation in 1925 with installed capacity of 48 MW, based on peat and coal and was one of the thirty TPPs included in the First Plan of Energy System Development in the Soviet Union (GOELRO in Russian). In the 1970-s and 1980-s the capacity was increased and modernized and the fuel was gradually switched to natural gas in the 1980-s.

Currently Shaturskaya TPP is the third biggest branch of OGK-4. The installed electricity capacity is 1,100 MW and the heat capacity is 343.4 Gcal/h. The Company produced 9% of energy generated by OGK-4 in 2008 and operates mostly (95%) on natural gas. The Company produces 20% of the energy in Moscow area and 100% of heat in the town Shatura. The main technical data of the existing energy units is presented in the Table A.2.1 below.

Table A.2.1: Main technical data of existing energy units at Shaturskaya TPP

N	Type of energy unit	Amount	Unit capacity, MW	Commissioning year	Turbine type	Boiler type	Fuel
1-3	Two-boiler single-turbine units	3	200	1971-1972	2 K-200-130	3 TP (ТП)-108	Peat, coal, gas, heavy fuel oil
4-5	One-boiler single turbine unit	2	210	1977-1986	4 K-210-130	5 TM-104A	Gas, heavy fuel oil
6	Cogeneration unit	1	80	1986	6 PT (ПТ)-80-130	7 BKZ (БКЗ)-320-140	Gas, heavy fuel oil

-	Hot-water boiler	2		1990	-	8 KVGM (КВГМ)-50	Gas, heavy fuel oil

Source: OGK-4

The project is to be implemented at Shaturskaya Thermal Power Plant. It is planned to build an additional electricity generating unit using the Combined Cycle Gas Turbine (CCGT) which is the most energy efficient and environmentally sound way of energy generation as of today. The purpose of this project is to demonstrate the utilisation of a Best Available Technology (BAT) and to decrease the specific CO2 emissions per MWh generated and other negative anthropogenic impact.

Project scenario
A combined cycle gas turbine unit with electricity capacity of 400 MW will be installed at Shaturskaya TPP and commissioned in September 2010. The efficiency of new energy unit is expected to be approximately 56%. Natural gas will be used as fuel. OJSC "OGK-4" concluded the new contract of additional natural gas delivery with OJSC "NOVATEK" (www.novatek.ru). After project implementation the new energy unit will supply electricity to the United Regional Energy System (URES) "Centre" grid (description of URES is provided in Annex 2). Electricity produced by the new generating unit, based on more efficient technology of energy generation, will replace electricity that would be generated using less efficient technology in case of the absence of the unit.

Baseline scenario
The baseline scenario is based on the assumption that if the project is not implemented (i.e. additional electricity will not be supplied to the grid) third parties will cover the energy demand. The energy companies within the same regional energy system (URES "Centre") can increase electricity generation at the existing capacities by delaying decommissioning of outdated capacity and/or installing new energy units.

According to paragraph 20 (b) of the "Guidance on criteria for the baseline setting and monitoring" the project participants: "…may establish a baseline in accordance with appendix B of the JI guidelines. In doing so, selected elements or combinations of approved CDM baseline and monitoring methodologies or approved CDM methodological tools may be used, as appropriate."

In the proposed project a JI specific approach to set the baseline scenario and the monitoring plan is used. The specific approach will be based on elements of CDM methodologies and the CDM Tool "Tool to calculate the emission factor for an electricity system". The justification of JI specific approach is presented more in detail in Section B.1 and Annex 2.

Brief history of the project
The Russian United Energy Company (in Russian- RAO "UES") paid a lot of attention to the cooperation within Kyoto Protocol to UNFCCC. The GHG inventory has been performed in all regional branches. Company seriously considered introduction of internal emission trading system (ETS). It created special entity for PIN and PDD development –

Energy Carbon Fund (ECF). When investment programs or interventions were planned and approved by its Board the potential implications of this cooperation were taken into account. This was reflected in the titles of investment projects. Most of the projects with CCGT installation were entitled as "Creating the Replacing Capacity by CCGT installation at…". It was expected that some old generating capacities would be replaced after 2020 or earlier. When OGK-4 was created in 2005 it inherited the old investment programs adjusting their scope and funding but not the titles of interventions and projects.

The decommissioning activities of some installations are not planned at Shaturskaya TPP as it is located in one of the most energy deficient areas and then OGK-4 is one of the wholesale generating companies having the modern recently installed (in comparison with the average age of this type of equipment in Russia) energy generating installations. The decision on funding and implementing the project under the title "Creating the Replacing Capacity by CCGT-400 Installation at Shaturskaya TPP, OGK-4" was taken by OGK-4 Management Board (approval of project feasibility study) in June 2007. The PIN for this project was developed by ECF in February 2007. After approval of project feasibility study OGK-4 made a contract with consortium of "General Electric International" and "Gama Guc Sistemleri Muhendislik Ve Taahut A.S." for project implementation. OGK-4 waited for JI National Approval Procedure to be in place in Russia. After its launch in February 2008 OGK – 4 and its new owner – E.ON Russia Power decided to update the PINs and to prepare pre-feasibility study for those PINs in three OGK-4 affiliates inclusive Shaturskaya TPP.

As a result of this study OGK-4 decided to start the full JI cycle but having the project under the title "Installation of CCGT-400 at Shaturskaya TPP, OGK-4, Moscow area, Russia" that more precisely reflects the project scope and follows the rules of titling the JI projects. In all JI cycle related documents it will be under this title while supporting documents provided upon the request to Determiner, National authorities and international organizations will have the original title presented above.

1.4 Determination team

The determination team consists of the following personnel:

Leonid Yaskin
Bureau Veritas Certification – Team member, Lead verifier

Vera Skitina
Bureau Veritas Certification – Team member, Lead verifier

George Klenov
Bureau Veritas Certification – Team member, verifier

Ivan Sokolov
Bureau Veritas Certification – Internal Technical Reviewer

2. Methodology

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

The determination consisted of the following three phases:

i) desk review of the project design document and the baseline and monitoring plan;
ii) on-site assessment on 28/10/2009 and on-line interactions with PDD developer throughout the determination process;
iii) resolution of outstanding issues (ref. to Appendix A Table 5 with CAR's and CL's) and the issuance of the final determination report and opinion.

In order to ensure transparency, a determination protocol was customized for the project, according to the Determination and Verification Manual (IETA/PCF).

The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating 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 independent entity will document how a particular requirement has been validated and the result of the determination.

The original determination protocol consists of five tables. The different columns in these tables are described in Figure 1.

The completed determination protocol is enclosed in Appendix A to this report. It consists of four tables. Table 3 for "Baseline and Monitoring Methodologies" is omitted because the project participants established their own baseline and monitoring approach that is in accordance with appendix B of the JI Guidelines and because the questions regarding the used approach are presented in Table 2.

Determination Protocol Table 1: Mandatory Requirements			
Requirement	**Reference**	**Conclusion**	**Cross reference**
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided (**OK**), a **Corrective Action Request (CAR)** or a **Clarification Request (CL)** of risk or non-compliance with stated requirements. The CAR's and CL's are numbered and presented to the client in the Determination Report.	Used to refer to the relevant protocol questions in Tables 2, 3 and 4 to show how the specific requirement is validated. This is to ensure a transparent determination process.

Determination Protocol Table 2: Requirements checklist				
Checklist Question	**Reference**	**Means of verification (MoV)**	**Comment**	**Draft and/or Final Conclusion**
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organized in several sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question. (See below). **Clarification Request (CL)** is used when the determination team has identified a need for further clarification.

Determination Protocol Table 3: Baseline and Monitoring Methodologies				
Checklist Question	**Reference**	**Means of verification (MoV)**	**Comment**	**Draft and/or Final Conclusion**
The various requirements of baseline and monitoring methodologies should be met. The checklist is organized in several sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question. (See below). **Clarification Request (CL)** is used when the determination team has identified a need for further clarification.

Determination Protocol Table 4: Legal requirements				
Checklist Question	**Reference**	**Means of verification (MoV)**	**Comment**	**Draft and/or Final Conclusion**
The national legal requirements the project must meet.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question. (See below). **Clarification Request (CL)** is used when the determination team has identified a need for further clarification.

Determination Protocol Table 5: Resolution of Corrective Action and Clarification Requests			
Report corrective action and clarifications requests	**Ref. to checklist question in tables 1/2/3/4**	**Summary of project owner response**	**Determination conclusion**
If the conclusions from the Determination are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	Reference to the checklist question number in Tables 1-4 where the Corrective Action Request or Clarification Request is explained.	The responses given by the Client or other project participants during the communications with the determination team should be summarized in this section.	This section should summarize the determination team's responses and final conclusions. The conclusions should also be included in Tables 1-4 under "Final Conclusion".

Figure 1 Determination protocol tables

2.1 Review of Documents

Bureau Veritas Certification (BVC) signed the contract with E.ON on 08/10/2009 and on the next day received from GC the Project Design Document (PDD) Version 3.0 dated 09/10/2009 with supporting documentation including spreadsheets with investment analysis, calculation of GHG emission, and calculation of grid emission factor.

The completeness check made by BVC revealed some deviations of the PDD from the JISC format. Therefore, GC was requested to remake the PDD in conformity to JI PPD Form. On 13/10/2009, BVC received the finally remade PDD Version 3.1 dated 09/10/2009. The PDD was published on UNFCCC JI site on 14/10/2009 available for public comments from 15 October 2009 to 13 November 2009.

The PDD and supporting documentation as well as additional background documents related to the project design, baseline, and monitoring plan, such as Kyoto Protocol, host Country laws and regulations, JI guidelines, JISC Guidance on criteria for baseline setting and monitoring, and Guidelines for users of the JI PDD Form were reviewed.

The first deliverable of the document review was the Determination Protocol Version 1 dated 21/10//2009 followed by Version 2 dated 23/10/2009 and Version 3 dated 02/11/2009 with 19 CAR's and 4 CL's.

On 06/11/2009, GC submitted the amended version of PDD Version 3.2 together with summaries of responses to the BVC requests. Having reviewed this feedback, Bureau Veritas Certification issued Determination Protocol version 4 dated 10/11/2009 with clarifications as to why some of GC responses can not be accepted.

The amended PDD Version 3.3 dated 11/11/2009 was issued followed by their determination reported in Determination Protocol Version 4 update. Draft Determination Report v.1 was issued on 14/11/2009.

After receipt of the Russian Letter of Approval, PDD Version 4/0 was issued on 16/08/2010 followed by the (final) Determination Report (DR) v.1 dated 17/08/2010.

The chronology of issuance of PDD, Determination Protocols, DDR and DR is shown in Table 6.

The determination findings presented in this Determination Report Version 1 relate to the project as described in the published PDD version 3.1 dated 31/03/2009 and the final PDD version 4.0 dated 17/16/2009.

Table 6. Chronology of issued PDD and DDR

PDD version	PDD date	Received on	DDR version	DDR date
3.0	09/10/2009	09/10/2009	-	-
3.1 published 14/10	09/19/2009 not updated	13/10/2009	-	-
			Protocol v1	21/10/2009
			Protocol v2	23/10/2009
			Protocol v3	02/11/2009
3.2	06/11/2009	06/11/2009		
			Protocol v4	10/11/2009
3.3	11/11/2009	11/11/2009		
			v.4 update	13/11/2009
3.4	13/11/2009	13/11/2009		
			DDR v1	14/11/2009
4.0	16/07/2010	16/08/2010	DR v1	17/08/2010

2.2 Follow-up Interviews

Bureau Veritas Certification verifier Leonid Yaskin conducted a visit to the project site on 28/11/2009. On-site interviews with the project participants OGK-4 and E.ON and the PDD Developer GC were conducted to confirm the selected information and to clarify some issues identified in the document review. The constructed CCGT was visited. The interview topics are listed in Table 7. The interviewees are listed in Section 6 References. Following the submission of the DDR Version 1, on-line interactions between GC and BVC took place to resolve pending CAR's and CL's.

Table 7 Interview topics

Date / Interviewed organization	Interview topics
28/11/2009 E.ON OGK-4 GC	➢ Project design documentation ➢ Project management organisation ➢ CCGT Implementation schedule ➢ Gas availability ➢ Project history ➢ Capacity replacement issues ➢ Investment analysis ➢ Environmental impact during construction ➢ Employee training programme

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 followed on by the project participants for Bureau Veritas Certification positive conclusion on the project design.

Corrective Actions Requests (CAR) are issued, where:

i) there is a clear deviation concerning the implementation of the project as defined the PDD;
ii) requirements set by the Methodological Procedure or qualifications in a verification opinion have not been met; or
iii) there is a risk that the project would not be able to deliver high quality ERUs.

Clarification Requests (CL) are issued where

iv) additional information is needed to fully clarify an issue.

Determination Protocol Version 2 summarising Bureau Veritas Certification's findings of the desk document review was submitted to GC on 23/10/2009. The findings identified have been 19 Corrective Action Requests and 4 Clarification Requests.

Following the site visit on 28/10/2009, Determination Protocol Version 3 was issued which included the new CAR 08 regarding the investment analysis and the new CL 03 regarding the available capacities of URES "Center". The overall number of CAR's and CL's did not change since removed were one CAR (regarding the absence of formulae in Section B.1[2]) and one CL (regarding training provisions).

The amendments made by GC to the PDD and reported in PDD version 3.4 dated 13/11/2009 satisfactorily addressed the verifiers' responses. As a result, the Draft Deter-

mination Report Version 1 was issued on 14/11/2009 and sent, together with the final PDD Version 3.4, to BVC Internal Technical Reviewer (ITR) for review.

Following receipt of the Russian Letter of Approval, PDD Version 4.0 was issued on 16/08/2010. This PDD was determined and the (final) Determination Report (DR) v.1 dated 17/08/2010 was issued.

To guarantee the transparency of the determination process, the CAR's raised are summarized in Appendix A, Table 5.

3 Determination Findings

In the following sections, the findings of the determination are presented for each determination subject as follows:

i) the findings from the desk review of the original project design document and the findings from interviews during the site visit are summarized. A more detailed record of these findings can be found in the Appendix A Determination Protocol.
ii) where Bureau Veritas Certification had identified issues that needed clarification or that represented a risk to the fulfillment of the determination protocol criteria or the project objectives, a Clarification or Corrective Action Request, respectively, has been issued. The Clarification and Corrective Action Requests are stated in the in Appendix A Determination Protocol.
iii) where Clarification and Corrective Action Requests have been issued, the response by the project participants to resolve these requests is summarized in Appendix A Table 5.
iv) the conclusions of the determination are presented consecutively.

3.1 Project Design

The proposed project uses General Electric STAG™ (Steam and Gas) combine-cycle power system (F class) with installed capacity 400 MW. The system includes one gas turbine with installed capacity 270 MW, one steam turbine with installed capacity 130 MW, one generator, one three-pressure heat recovery steam generator, and auxiliary equipments.

CCGT-400 is being constructed at the site of Shaturskaya TPP and is scheduled to be commissioned in September 2010. The design efficiency of the new power unit is 56%. Natural gas will be used as the fuel, availability of which is confirmed by the contract with the gas supplier. The new energy unit will supply electricity to the grid of URES "Centre".

CCGT-400 is the present-day, unique for Russia, single-shaft configuration offering compactness, simplicity of control, and high reliability.

The project is expected to provide the reduction of GHG emissions by 1,128,924 tCO2e over the crediting period 2010-2012.

The identified areas of concern as to Project Design, PP's response and BV Certification's conclusion are described in Appendix A Table 5 (refer to CAR 01, CL 01).

The project has no approvals by the Parties involved, therefore CAR 01 remains pending [as reported in DDR v1].

CAR 1 was closed following determination of the PDD version 4.0.

3.2 Baseline and Additionality

A JI specific approach regarding baseline setting has been developed in accordance with Appendix B of the JI Guidelines and with the JISC Guidance on criteria for baseline setting and monitoring/Version 01 [3]. This specific approach uses elements of CDM methodologies AM0029, ACM0013 and the CDM Methodological Tool "Tool to calculate the emission factor for an electricity system" [5].

The proposed approach is applied through the three steps as follows.

Step 1: Identification of a baseline in accordance with paragraphs 21-26 of the JISC Guidance [3]. The baseline was identified through listing and screening of several alternatives. The alternative "The electricity to be generated by project is provided by the other existing plants and the other new energy units" was qualified as the most plausible scenario thus representing the baseline. It is clearly explained in the response to CAR 04 that though the project Shaturskaya CCGT is included in the "General Scheme" [4], approved by the RF Government, this approval cannot be considered as mandatory legislation and regulation since the project was originated autonomously by a corporate company "RAO UES" and its affiliate OGK-4.

Step 2: Additionality demonstration in accordance with the most recent version (version 05.2) of the "Tool for the demonstration and assessment of additionality" [6]. The benchmark cash flow analysis and sensitivity analysis were conducted with constant as well as variable key parameters as the response to CAR 08. It was demonstrated that in all analyzed cases the benchmark (IRR) was less than the established threshold thus demonstrating that the project is not economically and financially attractive. The common practice analysis unequivocally showed that in Russia CCGTs are not common. In 2007 when the decision on funding and implementing of Shaturskaya CCGT-400 was taken there were no operating CCGT in the URES "Center" geographical area.

Step 3: Calculation of the electricity grid emission factor in accordance with paragraphs 18-20 of the JISC Guidance [3] using the CDM Tool [5]. As a response to CAR 05, the deviations from the Tool were indicated and analysed in PDD Annex 2. The deviations result in underestimation of electricity grid emission factor thus making the established baseline conservative.

The identified areas of concern as to Baseline and Additionality, PP's responses and BV Certification's conclusions are described in Appendix A Table 5 (refer to CAR 02, CAR 03, CAR 04, CAR 05, CAR 06, CAR 07, CAR 08, CAR 09, CAR 10, CAR 11, CL 02, CL 03).

Identified areas of concern as to Project Duration / Crediting Period, PP's responses and BV Certification's conclusions are described in Appendix A Table 5 (refer to CAR 12, CAR 13).

3.3 Monitoring Plan

A JI specific approach regarding monitoring has been developed in accordance with Appendix B of the JI Guidelines and with the JISC Guidance on criteria for baseline setting and monitoring/Version 01 [3].

All categories of data to be collected in order to monitor GHG emissions from the project and determine the baseline of GHG emissions are described in required details. The parameters which are monitored throughout the crediting period include natural gas consumption, electricity generation, own needs (at CCGT) and net caloric value of natural gas. The baseline grid emission factor is calculated ex ante (Annex 2). Natural gas emission factor is taken from 2006 IPCC v2 ch1. Formulae for estimation of GHG emissions and calculation of grid emission factor are clearly described.

Allocation of responsibilities for Monitoring Plan implementation and Monitoring Report preparation and an operational and management structure that OGK-4 and Shaturskaya CCGT will implement to monitor emission reduction are clearly described in the PDD. Monitoring related quality control and quality assurance procedures are outlined subject to checking at the verification phase.

The identified areas of concern as to Monitoring Plan, PP's response and BV Certification's conclusion are described in Appendix A Table 5 (refer to CAR 14, CAR 15, CAR 16, CAR 17, CAR 18).

3.4 Calculation of GHG Emissions

Formulae used for calculation of project are presented in PDD Section D and Annex 2. Input data for calculations and the calculations per se are presented on the spreadsheet made available to the verifiers by GC. The verifiers observe the final calculations as accurate. The results are summarised in Section E.

The calculated amount of project emission reduction over the crediting period 2010 - 2012 is 1,128,924 tCO_2e. The annual average emission reduction is 490,837 tCO_2e.

The identified area of concern as to Calculation of GHG Emissions, PP's response and BV Certification's conclusion is described in Appendix A Table 5 (refer to CAR 19).

3.5 Environmental Impacts

Main conclusions of the Section "Environment Protection" of the "Project Design" for this project and Expert opinion by FGU "Glavgosexpertiza" (both are in possession of the verifiers) are presented in PDD Section F.1. All environmental effects are within admissible concentration limits.

No areas of concern as to Environmental Impacts are identified.

3.6 Comments by Local Stakeholders

No comments from local stakeholders were received.

The identified area of concern as to Comments by Local Stakeholders, PP's response and BV Certification's conclusion is described in Appendix A Table 5 (refer to CL 04).

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

In accordance with the Section E "Verification procedure under the Article 6 Supervisory Committee" of the JI guidelines, Bureau Veritas Certification published the PDD Version 3.1 on UNFCCC JI site on 14/10/2009 and invited comments within 13/11/2009 by Parties, stakeholders and UNFCCC accredited observers. No comments have been received.

5 DETERMINATION OPINION

Bureau Veritas Certification has been engaged by E.ON Carbon Sourcing GmbH to perform a determination of the JI project "Installation of CCGT-400 at Shaturskaya TPP, OGK-4, Moscow area, Russia". The determination was performed on the basis of UNFCCC criteria for JI projects, in particular the verification procedures under the JI Supervisory Committee, as well as host country criteria and the criteria given to provide for consistent project operations, monitoring and reporting.

The determination is based on the information made available to us and on the engagement conditions detailed in this report. The determination has been performed using a risk-based approach as described above. The only purpose of the report is its use for the formal approval of the project under JI mechanism. Hence, Bureau Veritas Certification cannot be held liable by any party for decisions made or not made based on the determination opinion, which will go beyond that purpose.

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 on-line interviews on the project site with the project participants and PDD developer; iii) the issuance of the determination report and opinion.

The review of the project design documentation, the subsequent follow-up interviews, and the resolution of the Corrective Action Requests have provided Bureau Veritas Certification with the sufficient evidences to determine the fulfilment of the above stated criteria and to demonstrate that the project is additional.

The investment analysis and common practice analysis demonstrate that the proposed project activity is not a likely 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 it is implemented and maintained as designed, the project is likely to achieve the estimated amount of emission reductions.

It is our opinion that the project as described in the Project Design Document, Version 4.0 dated 16/08/2010 meets all the relevant UNFCCC requirements for the determination stage and the relevant host Party criteria.

Bureau Veritas Certification Holding SAS
17 August 2010

Flavio Gomes – Operational Manager

Leonid Yaskin - Team leader , Lead Verifier

Vera Skitina - Team member, Lead verifier

George Klenov - Team member, Lead verifier

6 REFERENCES

Reviewed document or type of information available before the site visit

1	PDD "Installation of CCGT-400 at Shaturskaya TPP, OGK-4, Moscow area, Russia", Version 3.1, dated 13/10/2009. With supporting documentation: investment analysis, ER calculation, calculation of grid emission factor.
2	Guidelines for Users of the Joint Implementation Project Design Document Form/Version 04, JISC.
3	JISC Guidance on criteria for baseline setting and monitoring. Version 01.
4	General scheme for allocation of power objects up to 2020, approved by the RF government order # 215-p dated 22/02/2008.
5	"Tool to calculate the emission factor for an electricity system" (Version 01.1) Methodological tool, CDM - Executive Board.
6	"Tool for the demonstration and assessment of additionally" (Version 05.2), CDM – Executive Board.
7	RF Urban Development Code N 190-ФЗ (Federal Law).
8	"Regulation of realization of Article 6 of Kyoto Protocol to United Nation Framework Convention on Climate Change". Approved by the RF Government Decree # 843 of 28/10/2009 "About measures on realization of Article 6 of Kyoto Protocol to United Nation Framework Convention on Climate Change".

Reviewed document or type of information obtained at the site visit

9	"Investment Efficiency". Volume 15 of Project Design "Creation of replacement capacity CCGR-400 at JSC OGC-4 affiliate Shaturskaya GRES-5". 2008. Teploelectroproject (affiliate of JSC "Engineering Center" of Russian JSC "United Energy Systems").
10	Annex 2 to Business Plan "Creation of replacement capacity CCGR-400 at JSC OGC-4 affiliate Shaturskaya GRES-5". 2007.
11	Environmental permissions and limits issued for Shaturskaya GRES by Interregional Department of Rostekhnadzor for Central Federal Okrug. All valid on the date of the site visit.
12	Payments by contractor GAMA for negative environmental impact at construction of CCGT-400.
13	Letter from GAMA to OGC-4 # GEC-OKP-2009-0098 dated 03/08/2009 "On corrected dates of training programme" with attachment.
14	Training certificates awarded by Rostekhnadzor in 2009 to CCGT-400 operational staff.
15	Contents of typical GE training courses.
16	Schedule of training for operational staff (in the process of approval).
17	Opinion of FGU "Glavgosexpertiza" on the project №763-08/ГТЭ-5761/02 dated 26/11/2008.

Reviewed document or type of information available after the receipt of LoA

18	PDD "Installation of CCGT-400 at Shaturskaya TPP, OGK-4, Moscow area, Russia", Version 4.0, dated 17/11/2010.
19	Russia's Letter of Approval, dated 30/07/2010.
20	Germany's Letter of Approval, dated 23/03/2010

Persons interviewed:

1	Maryna Odeska - E.ON Climate & Renewables GmbH / JI/CDM Processes Carbon Sourcing Country Manager Russia/Ukraine.
2	Moritz Frahm - E.ON Climate & Renewables GmbH / JI/CDM Processes Carbon Sourcing Project Manager.
3	Egor Vasilkov – OJSC "OGC-4" Specialist of Production and Technical Department.
4	Yury Skobtsov - OJSC "OGC-4" Shaturskaya GRES Deputy Chief Engineer for new construction.
5	Alexander Evstigneev – OJSC "OGC-4" Shaturskaya GRES Head of Production and Technical Department..
6	Alexey Varfolomeev, Senior Consultant, Global Carbon Rus LLC.

APPENDIX A: COMPANY JI PROJECT DETERMINATION PROTOCOL

Table 1 Mandatory Requirements for Joint Implementation (JI) Project Activities

1. REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
1. The project shall have the approval of the Parties involved.	Kyoto Protocol Article 6.1 (a)	CAR 01. The project has no approval of the Host Party. CAR 01 is closed based on determination of PDD version 4.0. Verifiers' Note: JISC Glossary of JI terms/Version 01 defines the following: a) At least the written project approval(s) by the host Party(ies) should be provided to the AIE and made available to the secretariat by the AIE when submitting the determination report regarding the PDD for publication in accordance with	Table 2, Section A.5.

1. REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
		paragraph 34 of the JI guidelines; (b) At least one written project approval by a Party involved in the JI project, other than the host Party(ies), should be provided to the AIE and made available to the secretariat by the AIE when submitting the first verification report for publication in accordance with paragraph 38 of the JI guidelines, at the latest.	
2. Emission reductions, or an enhancement of removal by sinks, shall be additional to any that would otherwise occur.	Kyoto Protocol Article 6.1 (b)	OK	Table 2, Section B.2
3. The sponsor Party shall not acquire emission reduction units if it is not in compliance with its obligations under Articles 5 & 7.	Kyoto Protocol Article 6.1 (c)	OK	N/A
4. The acquisition of emission reduction units shall be supplemental to domestic actions for the purpose of meeting commitments under Article 3.	Kyoto Protocol Article 6.1 (d)	OK	N/A
5. Parties participating in JI shall designate national focal points for approving JI projects and have in place national	Marrakech Accords,	OK	The Russian national focal point is

1. REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
guidelines and procedures for the approval of JI projects.	JI Modalities, §20		the Ministry of Economic Development. "Regulation of realization of Article 6 of Kyoto Protocol to United Nation Framework Convention on Climate Change". Approved by the RF Government Decree # 843 of 28/10/2009 "About measures on realization of Article 6 of Kyoto Protocol to United Nation Framework Convention on Climate Change". The German national focal point is the Federal Environment Agency German Emissions Trading Authority german.dna.dfp@uba.de

1. REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
			National guidelines and procedures for approving JI projects: Act on project-based mechanisms in accordance with the Kyoto Protocol to the United Nations Framework Convention on Climate Change of 11 December 1997(Project Mechanisms Act - ProMechG) German manual for JI investor Country approval - guidance for applicants Project Idea Note (PIN) for JI Investor Country Approval by Germany German manual for JI host country approval - guidance for applicants Project Idea Note (PIN) for JI host country Approval by Germany
6. The host Party shall be a Party to the Kyoto Protocol.	Marrakech Accords,	OK	Russia has ratified the Kyoto Protocol

1. REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
	JI Modalities, §21(a)/24		by Federal Law # 128-ФЗ dated 04/11/04.
7. The host Party's assigned amount shall have been calculated and recorded in accordance with the modalities for the accounting of assigned amounts.	Marrakech Accords, JI Modalities, §21(b)/24	OK	The Russian Federation's assigned amount has been calculated and recorded In the 4th National Communication dated 12/10/06.
8. The host Party shall have in place a national registry in accordance with Article 7, paragraph 4.	Marrakech Accords, JI Modalities, §21(d)/24	OK	Russian Federation has established the GHG Registry by the RF Government Decree N 215-p dated 20/02/06.
9. Project participants shall submit to the independent entity a project design document that contains all information needed for the determination.	Marrakech Accords, JI Modalities, §31	OK	Global Carbon BV (PDD developer) has submitted a PDD to Bureau Veritas Certification, which contains all information needed for determination.

1. REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
10. The project design document shall be made publicly available and Parties, stakeholders and UNFCCC accredited observers shall be invited to, within 30 days, provide comments.	Marrakech Accords, JI Modalities, §32	OK	The PDD was made publicly available for comments on UNFCCC JI site from 15 October 2009 till 13 November 2009.
11. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, in accordance with procedures as determined by the host Party shall be submitted, and, if those impacts are considered significant by the project participants or the host Party, an environmental impact assessment in accordance with procedures as required by the host Party shall be carried out.	Marrakech Accords, JI Modalities, §33(d)	OK	Table 2, Section F
12. The baseline for a JI project shall be the scenario that reasonably represents the GHG emissions or removal by sources that would occur in absence of the proposed project.	Marrakech Accords, JI Modalities, Appendix B	OK	Table 2, Section B.2
13. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	Marrakech Accords, JI Modalities, Appendix B	OK	Table 2, Section B.2
14. The baseline methodology shall exclude to earn ERUs for	Marrakech Ac-	OK	Table 2, Section B.2

1. REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
decreases in activity levels outside the project activity or due to force majeure.	cords, JI Modalities, Appendix B		
15. The project shall have an appropriate monitoring plan.	Marrakech Accords, JI Modalities, §33(c)	OK	Table 2, Section D
16. A project participant may be: (a) A Party involved in the JI project; or (b) A legal entity authorized by a Party involved to participate in the JI project.	JISC "Modalities of communication of Project Participants with the JISC" Version 01, Clause A.3	The Russian project participant will be authorised by the Host Party through the issuance of the approval for the project. Conclusion is pending a response to CAR 01. Refer to Verifiers' Note in 1 above. Closed. The Russian project participant OGK-4 was authorized by the issued Russian LoA.	Table 2, Section A

Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
A. General Description of the project					
A.1 Title of the project					
A.1.1. Is the title of the project presented?	1,2	DR	The title of the project is: "Installation of CCGT-400 at Shaturskaya TPP, OGK-4, Moscow area, Russia". The indicated Sectoral Scope is (1) Energy industries.		OK
A.1.2. Is the current version number of the document presented?	1,2	DR	The PDD Version 3.1 was published on UNFCCC site and is reviewed as a part of determination.		OK
A.1.3. Is the date when the document was completed presented?	1,2	DR	PDD Version 3.1 dated 13/10/2009.		OK

A.2. Description of the project					
A.2.1. Is the purpose of the project included?	1,2	DR	The project envisages the construction at the site of Shaturskaya Thermal Power Plant (TPP) of an additional electricity generating unit using the Combined Cycle Gas Turbine (CCGT), which is the most energy efficient and environmentally sound way of energy generation on fossil fuel as of today. The purpose of this project is to demonstrate the utilisation of the Best Available Technology (BAT) and to decrease the specific CO2 emissions per MWh generated and other negative anthropogenic impact. The baseline scenario is based on the assumption that if the project is not implemented (i.e. additional electricity will not be supplied to the grid) third parties of the same United Regional Energy System (URES) will cover the energy demand by delaying decommissioning of outdated capacity and/or installing new energy units. The history of the project and the situation existing prior to the starting day of the project is summarized as required in [2].		OK
A.2.2. Is it explained how the proposed project reduces greenhouse gas emissions?	1,2	DR	The explanation given in PDD Section A.2 reads: "Electricity produced by the new generating unit, based on more efficient technol-		OK

			ogy of energy generation, will replace electricity that would be generated using less efficient technology in case of the absence of the unit" . Refer also to PDD Section A.4.1.		
A.3. Project participants					
A.3.1. Are project participants and Party(ies) involved in t project listed?	1,2	DR	Party A is the Russian Federation. Project participant for the Party A is OJSC "Fourth Generation Company of the Wholesale Electricity Market" (OGC-4). Party B is Germany. Project participant from the Party B is E.ON Carbon Sourcing GmbH..		OK
A.3.2. The data of the project participants are presented in tabular format?	1,2	DR	The data is presented in the tabular format as per [2].		OK
A.3.3. Is contact information provided in Annex 1 of the PDD?	1,2	DR	The contact information about the project participants is provided in PDD Annex 1.		OK
A.3.4. Is it indicated, if it is the case, if the Party involved is a host Party?	1,2	DR	It is indicated that the Russian Federation is the host Party.		OK
A.4. Technical description of the project					
A.4.1. Location of the project activity					
A.4.1.1. Host Party(ies)	1,2	DR	The Russian Federation is indicated as the host Party in PDD Section A.4.1.1.		OK
A.4.1.2. Region/State/Province etc.	1,2	DR	The project is located in Shatura town (55°34' longitude, 39°32' latitude) in the east of Mos-		OK

			cow area (about 125 km from Moscow) in the European part of Russia.		
A.4.1.3. City/Town/Community etc.	1,2	DR	Shatura town. Refer to A.4.1.2, A.4.1.4		OK
A.4.1.4. Detail of the physical location, including information allowing the unique identification of the project. (This section should not exceed one page)	1,2	DR	Shaturskaya TPP is located within the Shatura town boundaries in its north-western part (about 2 km from the Centre). Its location is presented on the Figure A.4.1.3 below. The coordinates of TPP are 55°45'N, 39°44'E.		OK
A.4.2. Technology(ies) to be employed, or measures, operations or actions to be implemented by the project					
A.4.2.1. Does the project design engineering reflect current good practices?	1,2	DR	The proposed project uses General Electric STAG™ (Steam and Gas) combine-cycle power system (F class) with installed capacity 400 MW. The system includes one gas turbine with installed capacity 270 MW, one steam turbine with installed capacity 130 MW, one generator, one three-pressure heat recovery steam generator, and auxiliary equipments. CCGT-400 will be installed at Shaturskaya TPP and commissioned in September 2010 as per the implementation schedule presented in Table A.4.2.2. The design efficiency of the new power unit is 56%. Natural gas will be used as the fuel. The new energy unit will	CL 01	OK

			supply electricity to the grid of URES "Centre". CCGT-400 is the present-day, unique for Russia, single-shaft configuration offering, reportedly, compactness, simplicity of control, and high reliability. **CL 01.** Please clarify if the additional amount of natural gas is available from the national gas transportation system.		
A.4.2.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	1,2	DR	Due to the high thermal efficiency (50-60%) the Combined Cycle Gas Turbine is recognized as the Best Available Technology of power generation on natural gas.		OK
A.4.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	1,2	DR	The project technology is unlikely to be substituted by other or more efficient technologies within the project period.		OK
A.4.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	1,2, 13-16	DR	The project envisages extensive initial training and maintenance efforts with regard to the use of the uncommon Combined Cycle Gas Turbine technology [12-15].		OK
A.4.2.5. Does the project make provisions for meeting training and maintenance needs?	1,2	DR	Refer to A.4.2.4.		OK
A.4.3. 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 ab-					

sence of the proposed project, taking into account national and/or sectoral policies and circumstances					
A.4.3.1. Is it stated how anthropogenic GHG emission reductions are to be achieved? (This section should not exceed one page)	1,2	DR	It is reasonably stated in PDD Section A.4.3 that the project uses the best available technology of electricity generation: combined cycle gas turbine system. Its efficiency is η=56% and the relevant emission factor is 0.361 tCO_2/MWh. After the project implementation, electricity generated by the new energy unit will be supplied to the grid of URES "Centre". It will replace electricity which otherwise would have been generated by the existing power plants and/or other new energy units to be constructed by the third parties. The calculated Combined Margin (CM) emission factor for URES "Centre" (existing power plants and new energy units) is reported in PDD to be 0.540 tCO_2/MWh. To confirm how GHG emissions are to be achieved in the project the verifiers made own simple calculations. CO_2 emission factor for natural gas = 56,1 tCO_2 /TJ (IPCC value). 1 TJ = 0,278 GWh x η. This gives 56,1/(0,278 x η) = 202/η tCO_2 /GWh. For η = 56% (CCGT) and η = 40% (best value for grid condensing steam turbine) the grid emission factor will be 361 and 505 tCO_2/GWh respectively.		OK

A.4.3.2. Is it provided the estimation of emission reductions over the crediting period?	1,2	DR	The estimated GHG emission reduction at the above value of CM emission factor is 1,128,924 tCO2e over the crediting period 2010 - 2012. Refer to PDD Section A.4.3.1.		OK
A.4.3.3. Is it provided the estimated annual reduction for the chosen credit period in tCO2e?	1,2	DR	The estimated annual emission reduction at the above value of CM emission factor is 490,837 tCO2e. Refer to PDD Section A.4.3.1.		OK
A.4.3.4. Are the data from questions A.4.3.2 and A.4.3.3 above presented in tabular format?	1,2	DR	The data is presented in the required tabular format. Refer to the Table in PDD Section A.4.3.1.		OK
A.5. Project approval by the Parties involved					
A.5.1. Are written project approvals by the Parties involved attached?	1,2	DR	Conclusion is pending a response to CAR 01.	Pending	OK
B. **Baseline**					
B.1. Description and justification of the baseline chosen					
B.1.1. Is the chosen baseline described?	1,2	DR	The baseline is identified as "The electricity to be generated by project is provided by the other existing plants and the other new energy units". **CAR 02.** The baseline definition is not project-specific as to "the other existing plants and the other new energy units". **CAR 03.** Section B.1 does not contain all key	CAR 02 CAR 03	OK OK

			elements of the baseline and Annex 2 (baseline information) does not contain a summary of the key elements in tabular form though this is required in [2].		
B.1.2. Is it justified the choice of the applicable baseline for the project category?	1,2, 3,4, 5	DR	A JI specific approach regarding baseline setting and monitoring has been developed in accordance with Appendix B of the JI Guidelines and with the JISC Guidance on criteria for baseline setting and monitoring [3] (further Guidance). This specific approach uses selected elements of CDM methodologies (AM0029 "Baseline Methodology for Grid Connected Electricity Generation Plants using Natural Gas" and ACM0013 "Consolidated baseline and monitoring methodology for new grid connected fossil fuel fired power plants using a less GHG intensive technology") and the CDM Methodological Tool "Tool to calculate the emission factor for an electricity system" [5]. The proposed approach is being applied through the following three steps: - Step 1. Identification of a baseline in accordance with paragraphs 21-26 of the Guidance; - Step 2. Additionality demonstration in accordance with the most recent version (version 05.2) of the "Tool for the demonstration and	CAR 04	OK

			assessment of additionality"; - Step 3. Calculation of a multi-project emission factor in accordance with paragraphs 18-20 of the Guidance using the CDM Tool "Tool to calculate project emissions from electricity consumption" [5]. Under Step 1, seven possible alternatives (A) for baseline scenario were identified, described, and assessed: - A1: The proposed project not developed as a JI project; - A2: Construction of steam turbines of 400 MW in total with gas fired boiler(s); - A3: Construction of steam turbines of 400 MW in total with coal fired boiler(s); - A4: Construction of steam turbines of 400 MW in total with peat fired boiler(s); - A5: The electricity to be generated by project is provided by the other existing plants; - A6: The electricity to be generated by project is provided by the other new energy units, - A7: The electricity to be generated by project is provided by the other existing plants and the other new energy units. After the assessment of the Alternatives, only Alternative 7 was left as reasonable and feasible. Alternative 1 was excluded as financially		

			not attractive based on the investment analysis in Section B.2. Alternatives 2-6 were excluded as not plausible or not reasonable. In was concluded that only Alternative 7 is realistic and credible and therefore it was selected as the baseline scenario. **CAR 04.** Establishment of the baseline is carried out without due taking into account of the "General Scheme of Allocation of Energy Objects up to 2020" [4], which refers to construction of Shaturskaya CCGT-400 in 2008-2010 (General Scheme Annex 6 Table 2). The references made in PDD to the "General Scheme" at the assessment of Alternatives 1 and 2 distort the essence of this governmental instruction (rasporyazheniye in Russian) which reads: "when using natural gas on thermal power plants at modernization and new construction, combined cycle and gas turbine technologies shall be exclusively applied with gradual increase of thermal efficiency from 50% at present to 55-60% after 2010".		
B.1.3. Is it described how the methodology is applied in the context of the project?	1,2, 5	DR	Baseline emissions are defined as the product of the baseline emission factor and the net electric energy generated by the project CCGT (see Formula (3) in Section D.1.1.4. The baseline emission factor is defined in ac-	CAR 05 CL 02	OK OK

			cordance with the CDM Methodological tool "Tool to calculate the emission factor for an electricity system" [5] as the combined margin (CM) emission factor for the displacement of electric energy generated by power plants within the selected URES "Centre". Calculation of the CM emission factor is described in PDD Annex 2. Under the Tool [5], CM emission factor is the composition of the operational margin (OM) emission factor and build margin (BM) emission factor. **CAR 05.** The applicability of the Tool [5] to the energy system that includes not only power plants for generation electric energy (are envisaged in the Tool) but also cogeneration heat and power plants (TEZ in Russian, not envisaged in the Tool) is not justified. TEZ cannot be used as replacement power capacity since they produce electricity predominantly in the prescribed heat supply mode. Implications of this for the baseline are not analysed. The OM and BM emission factors are calculated by a method which split the amount of fuel consumed by TEZ in two parts: the one used for electricity generation and another one for heat production; Formula (1) in Annex 2 does not address this specifics. Calculation of BM emission factor in Annex 2 does not take into ac-		

			count two CCGT-450: Severo-Zapadnaya TEZ-1 and Kaliningradskaya TEZ-2. **CL 02.** Please make more understandable the reasoning for changing the weight coefficients for OM and BM in Formula (7) for calculation of CM emission factor.		
B.1.4. Are the basic assumptions of the baseline methodology in the context of the project activity presented (See Annex 2)?	1,2, 5	DR	Basic assumption of the baseline methodology are as follows: - The values of annual electricity output from the grid in 2010-2012 are presented in PDD section E.4.1; - the electricity is provided by the power plants of URES "Centre"; - combined margin emission factor is set ex-ante for the length of the crediting period; - baseline emissions are calculated by net quantity of electricity generated at the new CCGT making in this respect the establishment of the baseline conservative. **CL 03.** Please clarify if the selected ORES "Center" has enough capacities to replace the electric energy generated by CCGT-400 under the baseline.	CL 03	OK
B.1.5. Is all literature and sources clearly referenced?	1,2	DR	Relevant literature and sources are referenced through the text of PDD. **CAR 06.** A nonexistent CDM Tool "Tool to calculate project emissions from electricity con-	CAR 06	OK

			sumption" is referred to on p. 13 .The version of the used methodology ACM0013 is not indicated. The incorrect title of 2006 IPCC Guidelines is referenced on p. 27. The reference to Rossstat in Annex 2 lacks the transparency.		
B.2. Description of how the anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the JI project					
B.2.1. Is the proposed project activity additional?	1,2, 4,6, 9,10	DR	To substantiate the additionality of the Project, the PDD developer used the most recent "Tool for the demonstration and assessment of additionally" (version 05.2) [6]. At step 1, the same 7 Alternatives (refer to B.1.2) were listed out of each Alternatives 1 and 7 were left as realistic and credible. **CAR 07.** It is stated on p. 18 that all the seven Alternatives are in compliance with mandatory legislation and regulations. In view of the "General Scheme" [4] with Shaturskaya CCGT-400 in it, the Alternatives 2-4 (steam turbine on gas, coal, and peat) are not in compliance with this governmental instruction. At Step 2, the investment analysis of Alternative 7 was carried out with the use of the benchmark analysis method as per [5]. The list of assumptions used in investment analysis	CAR 07 CAR 08 CAR 09	OK OK OK

			provides the input data, which is sufficient to reproduce the analysis and make the same conclusion about the project financial and economical attractiveness (refer to [5], Sub-step 2c, para 8). The internal financial IRR = 12% equal to the Central Bank RF discount rate was applied as a conservative benchmark. The calculations show in PDD that IRR is well below the established threshold. Hence, the project is not financially and economically attractive (without revenue from ERU sale). **CAR 08.** The analysis of Investment Efficiency made in the frame of Project Design [9] and Business Plan [10] shows that the project is financially attractive with IRR > threshold. This contradicts the above conclusion of Step 2. A sensitivity analysis was conducted to check the above conclusion. 8 scenarios were considered with 10% increase and 10% reduction of investment cost, electricity tariff, gas tariff, and maintenance cost. The results show that the IRR of Alternative 7 could improve but any way remained below the given IRR benchmark. Hence, the sensitivity analysis supports the conclusion that Alternative 7 (project) is unlikely to be financially and economically attractive (without ERU sale).		

			At Step 4, the common practice analysis was conducted. The verifiers observe that in Russia, CCGTs are not common. In spring 2006, when the Management Board of JSC "OGK-4" and the Board of Directors of JSC "Shaturskaya GRES" recommended the investment project Shaturskaya CCGT-400 to realization, there were in Russia only 3 large present-day CCGT (Tyumenskaya 220 MW, Severo-Zapadnaya 450 MW, and Kaliningradskaya 450 MW). Their capacity is within 1% of the total installed capacity of all thermal power plants. In 2007 when the decision on funding and implementing of Shaturskaya CCGT-400 was taken there were no operating CCGT in the URES "Center" geographical area. **CAR 09**. The data in PDD Table B.2.3 on CCGT installed in Russia during the last 16 years is incomplete. The power plant "Lutch" is not CCGT. Moscow CHP-27 and Ivanovo CCGT-325 were commissioned in 2008 rather than in 2007. With the unresolved CAR 08, the additionality of the project activity is not demonstrated.		
B.2.2. Is the baseline scenario described?	1,2	DR	The baseline scenario is described in PDD Section B.1		OK

B.2.3. Is the project scenario described?	1,2	DR	The project scenario is described in PDD Sections A.4.2. A.4.3, B.1.		OK
B.2.4. Is an analysis showing why the emissions in the baseline scenario would likely exceed the emissions in the project scenario included?	1,2	DR	Such analysis is presented in PDD Section A.4.3.		OK
B.2.5. Is it demonstrated that the project activity itself is not a likely baseline scenario?	1,2	DR	Conclusion is pending a response to CAR 04.	Pending	OK
B.2.6. Are national policies and circumstances relevant to the baseline of the proposed project activity summarized?	1,2	DR	Conclusion is pending a response to CAR 04.	Pending	OK
B.3. Description of how the definition of the project boundary is applied to the project activity					
B.3.1. Are the project's spatial (geographical) boundaries clearly defined?	1,2,3	DR	The baseline boundary is in line with the provisions of paragraph 11 of the JISC Guidance on criteria for baseline setting and monitoring. Refer to PDD Section B3, Table B.3. Emissions sources included or excluded from the project boundary and Fig. B.3.1 Project Boundary.		OK
B.4. Further baseline information, including the date of baseline setting and the name(s) of the person(s)/entity(ies) setting the baseline					
B.4.1. Is the date of the baseline setting presented (in DD/MM/YYYY)?	1,2	DR	The date of the baseline setting is 09 October 2009.	CAR 10	OK

			CAR 10. The date of the baseline setting is not presented in DD/MM/YYYY format.		
B.4.2. Is the contact information provided?	1,2	DR	Alexey Varfolomeev. E-mail: varfolomeev@global-carbon.com.		OK
B.4.3. Is the person/entity also a project participant listed in Annex 1 of PDD?	1,2	DR	**CAR 11.** It is not indicated if the person/entity referred to in PDD Section B.4 is a project participant.	CAR 11	OK
C. **Duration of the project and crediting period**					
C.1. Starting date of the project					
C.1.1. Is the project's starting date clearly defined?	1,2	DR	**CAR 12**. The project starting date defined as 15/09/2010 cannot coincide with the starting date of the crediting period.	CAR 12	OK
C.2. Expected operational lifetime of the project					
C.2.1. Is the project's operational lifetime clearly defined in years and months?	1,2	DR	The operational lifetime of the proposed JI project is 30 years or 360 months.		OK
C.3. Length of the crediting period					
C.3.1. Is the length of the crediting period specified in years and months?	1,2	DR	Length of crediting period within Kyoto commitment period: two years and 3.5 months or 27.5 months. **CAR 13**. Starting date of crediting period cannot be 15/09/2009 (refer to the implementation schedule).	CAR 13	OK
D. **Monitoring Plan**					

D.1. Description of monitoring plan chosen					
D.1.1. Is the monitoring plan defined?	1,2	DR	In this project, a JI specific approach regarding monitoring is used. Option 1 – Monitoring of the emissions in the project scenario and baseline scenario – is chosen. Data to be collected is defined in PDD Sections D.1.1.1 and D.1.1.3.		OK
D.1.2. Option 1 – Monitoring of the emissions in the project scenario and the baseline scenario.	1,2	DR	Please refer to D.1.1.		OK
D.1.3. Data to be collected in order to monitor emissions from the project, and how these data will be archived.	1,2	DR	Data to be collected in order to monitor emissions from the project are defined in PDD Section D.1.1.1. Data to be collected are: P2 - Annual quantity of natural gas consumed in project activity (measured); P3- CO2 emission coefficient (calculated); P3 - Net Calorific Value (NCV) of natural gas (estimated); P4 - Emission factor for natural gas (fixed IPCC value). It is defined that the data will be archived electronically. **CAR 14.** Please describe under which conditions is the natural gas quantity (parameter P2) measured: working, normal or standard.	CAR 14 CAR 15	OK OK

			CAR 15. Please describe what value of NCV will be used in calculations of project emissions having in mind that, according to Section D.1.1.1, NCV (parameter P4) will be estimated with frequency "Continuously/daily/monthly".		
D.1.4. Description of the Formulae used to estimate project emissions (for each gas, source etc.; emissions in units of CO2 equivalent).	1,2	DR	These are formulae (1) and (2) presented in PDD Section D.1.1.2. The formulae were checked and found correct.		OK
D.1.5. Relevant data necessary for determining the baseline of anthropogenic emissions of greenhouse gases by sources within the project boundary, and how such data will be collected and archived.	1,2	DR	Data to be collected in order to monitor baseline emissions are defined in PDD Section D.1.1.3. Data to be collected are: B2 - Net quantity of electricity generated at the new CCGT unit (calculated); B3- Baseline emission factor (calculated in Annex 2; ex-ante fixed value); B3 - Quantity of electricity generated at the new CCGT unit (measured); B4 - Quantity of electricity for the new CCGT unit internal needs (measured). It is defined that the data will be archived electronically.		OK
D.1.6. Description of the Formulae used to estimate baseline emissions (for each gas, source etc, emissions in units of CO2 equivalent).	1,2	DR	These are Formulae (3) and (4) presented in PDD Section D.1.1.4. The formulae were checked and found correct.		OK

D.1.7. Option 2 – Direct monitoring of emissions reductions from the project (values should be consistent with those in section E)	1,2	DR	Not applicable.		OK
D.1.8. Data to be collected in order to monitor emission reductions from the project, and how these data will be archived.	1,2	DR	Not applicable.		OK
D.1.9. Description of the Formulae used to calculate emission reductions from the project (for each gas, source etc; emissions/emission reductions in units of CO2 equivalent).	1,2	DR	Not applicable.		OK
D.1.10. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project.	1,2	DR	The leakages are reasonably considered negligible.		OK
D.1.11.Description of the Formulae used to estimate leakage (for each gas, source etc,; emissions in units of CO2 equivalent).	1,2	DR	Not applicable.		OK
D.1.12. Description of the Formulae used to estimate emission reductions for the project (for each gas, source etc.; emissions in units of CO2 equivalent).	1,2	DR	This is the straightforward Formula (5) ER = BE – PE. Refer to PDD Section D.1.4.		OK
D.1.13. Is information on the collection and archiving of information on the environmental impacts of the project provided?	1,2	DR	Information on the collection of information on the environmental impacts of the project is provided in PDD Section D.1.5. **CAR 16.** Information on the archiving of information on the environmental impacts of the project is not provided.	CAR 16	OK

D.1.14. Is reference to the relevant host Party regulation(s) provided?	1,2	DR	**CAR 17.** Reference to relevant Russian regulations is not provided.	CAR 17	OK
D.1.15. If not applicable, is it stated so?	1,2	DR	Conclusion is pending a response to CAR 17.	Pending	OK
D.2. Qualitative control (QC) and quality assurance (QA) procedures undertaken for data monitored					
D.2.1. Are there quality control and quality assurance procedures to be used in the monitoring of the measured data established?	1,2	DR	QC and QA procedures are established and encompass requirements to accuracy of measuring devices, licensing of analytical laboratory, transfer of collected data to server, processing and archiving of collected data, checking, calibration, and substitution of measuring devises. Refer to PDD Section D.2		OK

D.3. Please describe of the operational and management structure that the project operator will apply in implementing the monitoring plan					
D.3.1. Is it described briefly the operational and management structure that the project participants(s) will implement in order to monitor emission reduction and any leakage effects generated by the project	1,2	DR	Allocation of responsibilities for Monitoring Plan implementation and Monitoring Report preparation is presented in PDD Section D.3 Table D.3.1. The scheme of the operational and management structure in implementing the monitoring plan is presented in PDD Section D.3 Figure D.3.1.		OK
D.4. Name of person(s)/entity(ies) establishing the monitoring plan					
D.4.1. Is the contact information provided?	1,2	DR	OJSC "OGK-4", Mr Egor Vasilkonov, specialist of production and technical department E-mail: vec@ogk-4.ru Global Carbon BV, Mr Alexey Varfolomeev, Engineer E-mail: varfolomeev@global-carbon.com		OK

D.4.2. Is the person/entity also a project participant listed in Annex 1 of PDD?	1,2	DR	**CAR 18.** It is not indicated if the persons/ entities referred to in PDD Section B.4 are project participants.	CAR 18	OK
E. **Estimation of greenhouse gases emission reductions**					
E.1. Estimated project emissions					
E.1.1. Are described the formulae used to estimate anthropogenic emissions by source of GHGs due to the project?	1,2	DR	These are Formulae (1) and (2) presented in PDD Section D.1.1.2.		OK
E.1.2. Is there a description of calculation of GHG project emissions in accordance with the Formula specified in for the applicable project category?	1,2	DR	The estimated project emissions within the crediting period are presented in PDD Section E.1 Table E.1.1. The calculations were checked and found correct at the given input data. **CAR 19.** The used value of the emission factor for natural gas 0,056 tCO_2/GJ differs from the value in 2006 IPCC where three meaning digits are used.	CAR 19	OK
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	1,2	DR	No conservative assumptions were made.		OK
E.2. Estimated leakage					
E.2.1. Are described the Formulae used to estimate leakage due to the project activity where required?	1,2	DR	Not applicable (refer to D.1.4).		OK

E.2.2. Is there a description of calculation of leakage in accordance with the Formula specified in for the applicable project category?	1,2	DR	Not applicable		OK
E.2.3. Have conservative assumptions been used to calculate leakage?	1,2	DR	Not applicable.		OK
E.3. The sum of E.1 and E.2.					
E.3.1. Does the sum of E.1. and E.2. represent the project activity emissions?	1,2	DR	As no leakage is expected, E1+E2=E1.		OK
E.4. Estimated baseline emissions					
E.4.1. Are described the Formulae used to estimate the anthropogenic emissions by source of GHGs in the baseline using the baseline methodology for the applicable project category?	1,2	DR	These are Formulae (3) and (4) presented in PDD Section D.1.1.4.		OK
E.4.2. Is there a description of calculation of GHG baseline emissions in accordance with the Formula specified for the applicable project category?	1,2	DR	The estimated baseline emissions are presented in PDD Section E.4 Table E.4.1. The calculations were checked and found correct at the given data.		OK
E.4.3. Have conservative assumptions been used to calculate baseline GHG emissions?	1,2	DR	This issue is not explicitly addressed in the PDD.		OK
E.5. Difference between E.4. and E.3. representing the emission reductions of the project					
E.5.1. Does the difference between E.4. and E.3. represent the emission reductions due to the project during a given period?	1,2	DR	Yes, it does. Refer to Formula ER = BE – PE in PDD Section D.1.4.		OK

E.6. Table providing values obtained when applying Formulae above					
E.6.1. Is there a table providing values of total CO2 abated?	1,2	DR	PDD Section E.6 Table E.6 provides the total values of project emissions, leakage, baseline emissions, and emission reductions.		OK
***F.* Environmental Impacts**					
F.1. Documentation on the analysis of the environmental impacts of the project, including transboundary impacts, in accordance with procedures as determined by the host Party					
F.1.1. Has an analysis of the environmental impacts of the project been sufficiently described?	1,2	DR	All relevant documentation is listed in PDD Section. Refer also to footnote [19] in PDD Section D.1.5.		OK
F.1.2. Are there any host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	1,2, 7,12. 17	DR	Under the RF Urban Development Code N 190-ФЗ [7], the capital construction cannot start without an authority's permission. The latter is granted if there is a positive conclusion of the State Expertise on the project documentation; the latter shall contain the results of EIA. It is stated in PDD Section F.1 that a positive opinion of FGU "Glavgosexpertiza" was received in November 2008 [17]. This document (№763-08/ГТЭ-5761/02 dated 26/11/2008) is in possession of the verifiers. It has no items of concern related to the EIA.		OK

			Construction of CCGT-400 is carried out on turn-key basis the general contractor GE/GAMA, which bears the sole responsibility for compliance with environmental legislation at the construction stage. Evidence of such compliance – Rostekhnadzor receipts for environmental payments by the contractor - was made available to the verifiers [12].		
F.1.3. Are the requirements of the National Focal Point being met?	1,2,8	DR	To meet the requirements of Regulation [8], the application for the project approval shall include, inter alia, the substantiation of environmental effectiveness of the project. The application will be submitted following the determination of the project.		OK
F.1.4. Will the project create any adverse environmental effects?	1,2	DR	Main conclusions of the Section "Environment Protection" of the "Project Design" for this project and Expert conclusion by FGU "Glavgosexpertiza" (both are in possession of the verifiers) are presented in PDD Section F.1. All environmental effects are within admissible concentration limits.		OK
F.1.5. Are transboundary environmental impacts considered in the analysis?	1,2	DR	Not applicable for this project.		OK
F.1.6. Have identified environmental impacts been addressed in the project design?	1,2	DR	Environmental impacts were addressed in the section "Environment Protection" of the "Project Design" entitled "Creating the Replacing		OK

			Capacity by CCGT-400 Installation at Shaturskaya TPP, OGK-4" Project Design, Volume 12: Environment Protection, OJSC "Engineer Centre of UES", 2008. Refer to D.1.5.		
***G.* Stakeholders' comments**					
G.1. Information on stakeholders' comments on the project, as appropriate					
G.1.1. Is there a list of stakeholders from whom comments on the project have been received?	1,2	DR	Information about the project is published in OGK-4 Social Reports for 2004, 2005, 2006 which passed public hearings. **CL 04.** Please clarify if any comments were received on the project during the public hearings.	CL 04	OK
G.1.2. The nature of comments is provided?	1,2	DR	Conclusion is pending a response to CL 04.	Pending	OK
G.1.3. Has due account been taken of any stakeholder comments received?	1,2	DR	Conclusion is pending a response to CL 04.	Pending	OK

Table 3 Legal requirements

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
1. Legal requirements					
1.1. Is the project activity environmentally licensed by the competent authority?	1,2	DR	Refer to F.1.2 and F.1.4.		OK
1.2. Are there conditions of the environmental permit? In case of yes, are they already being met?	1,2	DR	Environmental permits and limits will be received before the commissioning of CCGT-400 according to the approved corporate management programme which was showed to the verifier during the site visit.		OK
1.3. Is the project in line with relevant legislation and plans in the host country?	1,2	DR	Yes, the project is in line with relevant legislation and plans in the host country.		OK

Table 5 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 1, 2, 3	Summary of project owner response	Determination team conclusion
CAR 01. The project has no approval of the Host Party.	1 Table1	PDD version 4.0 was issued on 16/08/2010 which refers in Section A.5 to the received Russian LoA and German LoA. Project participants OGK-4 (Russian Federation) and E.ON Carbon Sourcing (Germany) were authorized by the LoA issued.	The CAR is closed based on the evidence that the LoA were issued
CAR 02. The baseline definition is not project-specific as to "the other existing plants and the other new energy units".	B.1.1	The baseline definition was adjusted as to "the other existing plants and the other new energy units of URES "Centre" in Section B.1 on p.14-15 and in Section B.2 on p.18-19.	The CAR is closed based on the appropriate amendment made to the PDD.
CAR 03. Section B.1 does not contain all key elements of the baseline and Annex 2 (baseline information) does not contain a summary of the key elements in tabular form though this is required in [2].	B.1.1	The key data and information used to establish the baseline are presented in tabular form in Section B.1	The CAR is closed based on the appropriate amendment made to the PDD.
CAR 04. Establishment of the baseline is carried out without due taking into account of	B.1.2	"General Scheme" (GS) is not a legislative act. It is research work which was implemented on a	The verifier observes that "General Scheme" was indeed cre-

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 1, 2, 3	Summary of project owner response	Determination team conclusion
the "General Scheme of Allocation of Energy Objects up to 2020" [3], which refers to construction of Shaturskaya CCGT-400 in 2008-2010 (General Scheme Annex 6 Table 2). The references made in PDD to the "General Scheme" at the assessment of Alternatives 1 and 2 distort the essence of this governmental instruction (rasporyazheniye in Russian), which reads: "when using natural gas on thermal power plants at modernization and new construction, combined cycle and gas turbine technologies shall be exclusively applied with gradual increase of thermal efficiency from 50% at present to 55-60% after 2010".		commission from the Government of the Russian Federation. OJSC "RAO UES of Russia" and some research institute prepared the draft of "General Scheme" in 2007. It was based on the electricity consumption forecast and the inquiry of energy companies about their investment plans (some tables are in annexes of GS). GS is compilation of such information and doesn't contain any recommendations and is not responsible for where, when, what and who will construct energy units etc. Main aim of "General Scheme" is definition of the sufficiency of consumers power supply. In case of insufficiency of consumers power supply the Government of RF will prepare the arrangements on stimulation of the new energy project implementation. The Government of RF approved this document in 2008 (Order of February 22 2008 # 215p). It is signified that this work was done according to the commission.	ated by the OJSC "RAO UES of Russia" and its affiliated institutes based on corporate business plans and investment programmes. The RF Government by its instruction just confirmed the appropriateness of these plans and programmes for the Russian federation and established a mechanism of monitoring thereof. The CAR is closed based on the appropriate amendment made to the PDD.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 1, 2, 3	Summary of project owner response	Determination team conclusion
		Also this Order entrusted to organize the monitoring of the GS implementation to Ministry of Energy. Currently CJSC "Agency of Energy Balances in the power industry" is preparing corrected version of GS (http://www.e-apbe.ru/scheme/). The new power consumption forecast and the corrected investment plans of energy companies are taken into account. In comparison with the previous version of GS some supposed power projects are delayed and some supposed power projects are stopped. GS is not an obligatory document for private energy companies but it can be used as recommended document. The similar information was added in Annex 2 (on p.43). Therefore: 1) Alternative 1 was enounced in following version: "Projects using gas turbine technologies shall be exclusively applied during modernization	

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 1, 2, 3	Summary of project owner response	Determination team conclusion
		and new construction at thermal power plants running on natural gas as indicated in "General Scheme of Power Facilities' Allocation by 2020" (General Scheme further in the text) approved by the Government of the Russian Federation (Order of February 22 2008 # 215p). The project has no technical barriers as natural gas is available, the technology as such has been implemented in many industrialized countries and electricity produced by the new energy unit can be supplied to the grid. As is shown in Section B2 this project is not economically attractive. Therefore this alternative is a not the most plausible scenario. (Please see Section B.1 on p. 14); 2) Alternative 2-4 (Section B.1 on p. 13-15) was excluded from the list of alternatives as less credible baseline scenario.	
CAR 05. The applicability of the Tool [4] to the energy system that includes not only power plants for generation electric energy	B.1.3	TEZ (CHP) can operate as cogeneration and as simple (only electricity generation) cycles and some TPPs have cogeneration energy units.	The verifiers observe that the deviations from the Tool were duly indicated in the amended

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 1, 2, 3	Summary of project owner response	Determination team conclusion
(are envisaged in the Tool) but also cogeneration heat and power plants (TEZ in Russian, not envisaged in the Tool) is not justified. TEZ cannot be used as replacement power capacity since they produce electricity predominantly in the prescribed heat supply mode. Implications of this for the baseline are not analysed. The OM and BM emission factors are calculated by a method which split the amount of fuel consumed by TEZ in two parts: the one used for electricity generation and another one for heat production; Formula (1) in Annex 2 does not address this specifics. Calculation of BM emission factor in Annex 2 does not take into account two CCGT-450: Severo-Zapadnaya TEZ-1 and Kaliningradskaya TEZ-2.		Each power plant submits the electricity and heat generation and fuel consumption data in Federal Service of State Statistics (RosStat) according to the annually statistic report (6-TP). These reports contain information about the total fired fuel amount (for each fuel type), fired amount fuel for electricity and heat generation (separately) and do not contain any information about fired fuel amount for cogeneration or simple cycles. Only part of the fired amount fuel for electricity generation was used in the OM and BM emission factors calculation. Proposed project is used combine cycle (only electricity generation). The cogeneration cycle is more efficient than simple (or combine) ones. But it is impossible to exclude from calculation the fired fuel amount and electricity generation with cogeneration cycle. Therefore, the parameters of cogeneration energy units were taken into account in OM and BM calculation. It is deviation from the Tool [4] but it is conserva-	PDD. These deviations indeed provide conservativeness of the baseline since the actual grid emission factor is higher than that calculated by the Tool. The CAR is closed based on the appropriate amendment made to the PDD.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 1, 2, 3	Summary of project owner response	Determination team conclusion
		tive because the cogeneration cycles is more efficient than a simple (or combine) cycle. The similar information was added in Annex 2 on p. 42-43. URES "Centre" is selected as a relevant electric power system (please see Annex 2 of PDD). Severo-Zapadnaya TEZ-1 (or CHP-1) and Kaliningradskaya TEZ-2 are located in URES "North-Western". Therefore they were not taken into account in the BM calculation.	
CAR 06. A nonexistent CDM Tool "Tool to calculate project emissions from electricity consumption" is referred to on p. 13 .The version of the used methodology ACM0013 is not indicated. The incorrect title of 2006 IPCC Guidelines is referenced on p. 27. The reference to Rossstat in Annex 2 lacks the transparency.	B.1.5	The correct title of CDM Tool "Tool to calculate the emission factor for an electricity system" was used (through the PDD). Version 2.1 of the used methodology ACM0013 was indicated on p.13 of the new version of PDD. The correct title of 2006 IPCC Guidelines is used on p.29 of the new version of PDD.	The CAR is closed based on the appropriate amendment made to the PDD.
CAR 07. It is stated on p. 18 that all the seven Alternatives are in compliance with mandatory legislation and regulations. In view	B.2.1	"General Scheme" is not an obligatory document for private energy companies. Also please see the response on CAR 4.	The verifiers observe that the inclusion of coal and peat power plants in the list of plausible al-

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 1, 2, 3	Summary of project owner response	Determination team conclusion
of the "General Scheme" with Shaturskaya CCGT-400 in it, the Alternatives 2-4 (steam turbine on gas, coal, and peat) are not in compliance with this governmental instruction.		But OGK-4 did not consider these alternatives of the project before project implementation. Therefore the Alternatives 2-4 (new power units with steam turbine on gas, coal, and peat) were excluded from the list of alternatives in Section B.2 on p.18-19.	ternatives would not eventually change the PDD choice of the most plausible scenario. But methodologically it was incorrect consider these two options as plausible since these are not such for the project participant. The CAR is closed based on the appropriate amendment made to the PDD.
CAR 08. The analysis of Investment Efficiency made in the frame of Project Design [8] and Business Plan [9] shows that the project is financially attractive with IRR > threshold. This contradicts the above conclusion of Step 2.	B.2.1	Some investment analysis methods assume the using of the key parameters forecast (in this case they are: electricity tariff and a natural gas price) in the IRR calculation. Such forecast was used in the frame of Project Design (PD) and Business Plan (BP). But the result reliability depends on forecast quality strongly for these methods. The PD and BP were prepared in 2007-2008 and used very optimistic forecasts (especially, an electricity tariff). Therefore the big IRR was given (more than 15% in the basic scenario).	The verifiers checked the discounted cash flow analysis of two variants: with fixed values of key parameters and with variation thereof in accordance with the official forecast of social and economical development of the RF for the period up to 2020. Both variants show that the project without JI registration is not financially and economically attractive.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 1, 2, 3	Summary of project owner response	Determination team conclusion
		Another method assumes the using of constant key parameters. Using of this method excludes to take into account some risks, for example, the fluctuation of tariffs and prices. This method was used for investment analysis in Section 2 PDD. The IRR is approximately 2%. And there is forecast for electricity and natural gas tariffs in the "Concept of social-economical development of RF for the period up to 2020" approved by the Russian Federation Government Decree #1662-p dated 17/11/2008. The IRR based on this forecast is approximately 2.5% in the base scenario. It is the similar result in comparison with the calculations based on constant prices. Therefore approach with constant prices can be used for financial analysis. (This information is added in Section B.2 on p.20). IRR in the frame of BP is more than threshold and project is financially attractive but it is not realistic situation. The method used in PDD gives more realistic re-	The CAR is closed based on the appropriate amendment made to the PDD.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 1, 2, 3	Summary of project owner response	Determination team conclusion
		sult and it should be used for investment analysis.	
CAR 09. The data in PDD Table B.2.3 on CCGT installed in Russia during the last 16 years is incomplete. The power plant "Lutch" is not CCGT. Moscow CHP-27 and Ivanovo CCGT-325 were commissioned in 2008 rather than in 2007.	B.2.1	The type of power plant "Lutch" was changed from CCGT to GT. And the years of commissioning of Moscow CHP-27 and Ivanovo CCGT-325 were changed from 2007 to 2008. Table B.2.3 was renamed.	The CAR is closed based on the appropriate amendment made to the PDD.
CAR 10. The date of the baseline setting is not presented in DD/MM/YYYY format.	B.4.1	The date format is changed in DD/MM/YYYY format.	The CAR is closed based on the appropriate amendment made to the PDD.
CAR 11. It is not indicated if the person/entity referred to in PDD Section B.4 is a project participant.	B.4.3	The contact information of person/entity setting the baseline was specified: Alexey Varfolomeev Global Carbon BV E-mail: varfolomeev@global-carbon.com Global Carbon BV is not a project participant. (This information is added in Section B.4 on p.24).	The CAR is closed based on the appropriate amendment made to the PDD.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 1, 2, 3	Summary of project owner response	Determination team conclusion
CAR 12. The project starting date defined as 15/09/2010 cannot coincide with the starting date of the crediting period.	C.1.1	OGK-4 Management Board decision about the approval of the project implementation schedule and financing is dated on 06 June 2007. The project starting date defined as 06/06/2007. The project starting date is changed on 06/06/2007 in the Section C.1.	The CAR is closed based on the appropriate amendment made to the PDD.
CAR 13. Starting date of crediting period cannot be 15/09/2009 (refer to the implementation schedule).	C.3.1	The starting date of crediting period is changed on 15/09/2010 in the Section C.3 in accordance with the implementation schedule.	The CAR is closed based on the appropriate amendment made to the PDD.
CAR 14. Please describe under which conditions is the natural gas quantity (parameter P2) measured: working, normal or standard.	D.1.3	The natural gas volume unit is the volume under normal conditions (temperature is 273^0K and pressure is 101325 Pa). Data unit (m^3) is changed on (Nm^3) for the some parameters (volume of natural gas, emission coefficient, net calorific value) in Section D.1.1.1 and D.1.1.2. Also the footnote 18 is added into Section D.1.1.2: "Data unit (Nm^3) means the volume of gas under normal conditions (temperature is 273^0K and	The CAR is closed based on the appropriate amendment made to the PDD.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 1, 2, 3	Summary of project owner response	Determination team conclusion
		pressure is 101325 Pa)".	
CAR 15. Please describe what value of NCV will be used in calculations of project emissions having in mind that, according to Section D.1.1.1, NCV (parameter P4) will be estimated with frequency "Continuously/daily/monthly".	D.1.3	The value of NCV will be used in calculations of project emissions monthly. The frequency is changed in Section D.1.1.1.	The CAR is closed based on the appropriate amendment made to the PDD.
CAR 16. Information on the archiving of information on the environmental impacts of the project is not provided.	D.1.13	The following information about the archiving of information on the environmental impacts is added in Section D.1.5: The Ecology Division of the Production and Technical Department collects and archives the data of pollutant emissions. Annually it prepares the report of pollutant emissions at Shaturskaya TPP.	The CAR is closed based on the appropriate amendment made to the PDD.
CAR 17. Reference to relevant Russian regulations is not provided.	D.1.14	The following information about relevant Russian regulations is added in Section D.1.5: The main relevant Russian Federation environmental regulations: • Federal law of Russian Federation "On Environment Protection" (10 January 2002, N 7-	The CAR is closed based on the appropriate amendment made to the PDD.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 1, 2, 3	Summary of project owner response	Determination team conclusion
		FZ); • Federal law of Russian Federation "On Air Protection" (04 May 1999, N 96-FZ). These laws and other national decrees establish the order and the frequency of the pollution sources inventory, standards of the pollutant emissions and the monitoring.	
CAR 18. It is not indicated if the persons/ entities referred to in PDD Section B.4 are project participants.	D.4.2	The contact information of person/entity establishing the monitoring plan was specified: • OJSC "OGK-4", Mr Egor Vasilkonov, specialist of production and technical department E-mail: vec@ogk-4.ru OJSC "OGK-4" is a project participant. The contact information is presented in Annex 1. • Global Carbon BV, Mr Alexey Varfolomeev, Engineer E-mail: varfolomeev@global-carbon.com	The CAR is closed based on the appropriate amendment made to the PDD.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 1, 2, 3	Summary of project owner response	Determination team conclusion
		Global Carbon BV is not a project participant. (This information is added in Section D.4 on p.35).	
CAR 19. The used value of the emission factor for natural gas 0,056 tCO_2/GJ differs from the value in 2006 IPCC where three meaning digits are always used.	E.1.2	The value of the emission factor for natural gas was changed from 0.056 to 0.0561 tCO_2/GJ in PDD. However the value of the emission factor for natural gas 0.0561 tCO_2/GJ was used in calculations. Therefore the result of the emission calculation was not changed.	The CAR is closed based on the appropriate amendment made to the PDD.
CL 01. Please clarify if the additional amount of natural gas s available from the national gas transportation system.	A.4.2.1	OJSC "OGK-4" concluded the new contract of additional natural gas delivery with OJSC "NOVATEK" (www.novatek.ru). This information is included in Section A.2 on p.3 ("project scenario"). The contract copy was submitted to AIE..	The CL is closed based on the appropriate clarification made to the PDD.
CL 02. Please make more understandable the reasoning under the change of Formula (7) from the Tool for estimation of combined	B.1.3	The operating margin is emission factor that refers to the group of existing power plants. The build margin is emission factor that refers to	The CL is closed based on the appropriate clarification made

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 1, 2, 3	Summary of project owner response	Determination team conclusion
margin emission factor.		the group of prospective power plants. OM/BM = 0.5/0.5. In Annex 2 the analysis of "General Scheme" implementation showed that BM refers not only to the group of prospective power plants but to the group of dismantling of existing capacities. And the proportion of these groups is 0.5/0.5. It means that 0.25 of BM refers to the group of prospective power plants and another 0.25 of BM refers to the dismantling of existing capacities and can be related to OM. Therefore effective W_{OM} = 0.50 + 0.25 = 0.75 and W_{BM} = 0.25.	
CL 03. Please clarify if the selected ORES "Center" has enough capacities to replace the electric energy generated by CCGT-400 under the baseline.	B.1.4	According to "The expected balance of the power industry development during 2009-2015 and till 2020"* by CJSC "Agency of Energy Balances the rate electrical capacity reserve will be from 8,000 to 11,000 MW in URES "Centre". It is enough for	The CL is closed based on the appropriate amendment made to the PDD.

* http://www.e-apbe.ru/5years/detail.php?ID=19193

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 1, 2, 3	Summary of project owner response	Determination team conclusion
		replacement of the electric energy generated by CCGT-400 under the baseline. This information was added in Annex 2 on p.45.	
CL 04. Please clarify if any comments were received on the project during the public hearings.	G.1.1	Project information was presented into the reports "Corporative Stability and Social Responsibility" in 2005, 2006 and 2007. The public hearings were carried out on each of reports. No comments were received on the project during the public hearings. This information was added in Section G on p.39.	The CL is closed based on the appropriate amendment made to the PDD.

Appendix B: Determination Team's CV

Mr. Leonid Yaskin, PhD (thermal engineering)
Lead Verifier.
Bureau Veritas Certification Rus General Director- Lead Auditor, Lead Tutor, Lead Verifier

He has over 30 years of experience in heat and power R&D, engineering, and management, environmental science and investment analysis of projects. He worked in Krrzhizhanovsky Power Engineering Institute, All-Russian Teploelectroproject Institute, JSC Energoperspectiva. He worked for 8 years on behalf of European Commission as a monitor of Technical Assistance Projects. He is a Lead auditor of Bureau Veritas Certification for Quality Management Systems (IRCA registered), Environmental Management System (IRCA registered), Occupational Health and Safety Management System (IRCA registered). He performed over 250 audits since 2002. Also he is a Lead Tutor of the IRCA registered ISO 14000 EMS Lead Auditor Training Course, and a Lead Tutor of the IRCA registered OHSAS 18001 Lead Auditor Training Course. He is an Assuror of Social Reports. He has undergone intensive training on Clean Development Mechanism /Joint Implementation and was/is involved in the verification of over 60 JI projects.

Vera Skitina, PhD (metallurgy)
Lead Verifier
Bureau Veritas Certification Russia Technical Director - Lead Auditor, Lead Tutor, Lead Verifier

She has over 15 years of experience in powder metallurgy, aluminium metallurgy, plastic metal working, physical-chemistry processes, gas production at power plant, environmental science. She worked in Irkutsk Aluminium Plant, SUAL powder metallurgy plant, Nadvoitzky aluminium plant, Central Scientific Institute of Metals. She is a Lead auditor of Bureau Veritas Certification for Quality Management Systems (IRCA registered), Environmental Management System (IRCA registered), Occupational Health and Safety Management System (IRCA registered). She performed over 200 audits since 2004. Also she is a Lead Tutor of the IRCA registered ISO 14000 EMS Lead Auditor Training Course, and a Lead Tutor of the IRCA registered ISO 9001 Lead Auditor Training Course. She is an Assuror of Social Reports. She has undergone intensive training on Clean Development Mechanism /Joint Implementation and was/is involved in determination and verification of over 15 JI projects.

George Klenov, Professor, Doctor of Science (engineer electromechanic, phisicist)
Lead Verifier.
Bureau Veritas Certification Rus - Lead Auditor, IRCA Lead Tutor, Lead Verifier

He has over 30 years of experience in Low Frequency Electromagnetic Fields of ocean, atmosphere and ships R&D, engineering, and management, environmental science. He worked in Krylov's Research Centre, Saint-Petersburg. At the same time he worked for 15 years as professor of physics at the Marine Technical University. He has published two books, more then one hundred papers in the different scientific journals. Now he is a Lead auditor of Bureau Veritas Certification for Quality Management Systems, Environmental Management System, Occupational Health and Safety Management System. He performed over 400 audits since 1998. Also he is a Lead Tutor of the IRCA registered ISO 9001 QMS Lead Auditor Training Course. He is an Assuror of Social Reports. He has undergone intensive training on Clean Development Mechanism /Joint Implementation in September 2008, Istanbul and March 2009, Moscow and was/is involved in in determination and verification of over 15 JI projects.

Ivan G. Sokolov, Dr. Sci. (biology, microbiology)
Internal Technical Reviewer
Bureau Veritas Ukraine General Manager, Climate Change Manager for Ukraine, Lead Auditor, IRCA Lead Tutor, Lead Verifier

He has over 25 years of experience in Research Institute in the field of biochemistry, biotechnology, and microbiology. He is a Lead auditor of Bureau Veritas Certification for Environment Management System (IRCA registered), Quality Management System (IRCA registered), Occupational Health and Safety Management System, and Food Safety Management System. He performed over 140 audits since 1999. Also he is Lead Tutor of the IRCA registered ISO 14000 EMS Lead Auditor Training Course, and Lead Tutor of the IRCA registered ISO 9000 QMS Lead Auditor Training Course. He has undergone intensive training on Clean Development Mechanism /Joint Implementation and he is involved in the determination/verification of over 50 JI projects.