

Bureau Veritas Certification  
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# DETERMINATION REPORT

## LLC "LUKOIL- ASTRAKHANENERGO"

DETERMINATION OF THE  
"RECONSTRUCTION OF ASTRAKHAN TPP  
THROUGH CONSTRUCTION OF CCP-110,  
LLC "LUKOIL-ASTRAKHANENERGO",  
RUSSIAN FEDERATION"

REPORT No. RUSSIA-DET/0156/2011

REVISION No. 02

BUREAU VERITAS CERTIFICATION



Determination Protocol on JI project

“Reconstruction of Astrakhan TPP through construction of CCP-110, LLC “LUKOIL-Astrakhanenergo”, Russian Federation”

Date of first issue: 26/08/2011	Organizational unit: Bureau Veritas Certification Holding SAS
Client: CCGS Limited	Client ref.: M. Yulkin
<p>Summary:</p> <p>Bureau Veritas Certification has made the determination of “Reconstruction of Astrakhan TPP through construction of CCP-110, LLC “LUKOIL-Astrakhanenergo”, Russian Federation” project of the LLC “LUKOIL-Astrakhanenergo” located in city of Astrakhan, Astrakhan oblast, Russian Federation on the basis of UNFCCC criteria for the JI, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Supervisory Committee, as well as the host country criteria.</p> <p>The determination scope is defined as an independent and objective review of the project design document, the project’s baseline study, monitoring plan and other relevant documents, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up on-site 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 &amp; Opinion, was conducted using Bureau Veritas Certification internal procedures.</p> <p>The first output of the determination process is a list of Corrective Actions Requests (CAR) and Clarification Requests (CL), presented in Appendix A. Taking into account this output, the project proponent revised its project design document.</p> <p>In summary, it is Bureau Veritas Certification’s opinion that the project correctly applies Guidance on criteria for baseline setting and monitoring and meets the relevant UNFCCC requirements for the JI and the relevant host country criteria.</p>	

Report No.: RUSSIA-det/0156/2011	Subject Group: JI	<input checked="" type="checkbox"/> No distribution without permission from the Client or responsible organizational unit
Project title: “Reconstruction of Astrakhan TPP through construction of CCP-110, LLC “LUKOIL-Astrakhanenergo”, Russian Federation”		<input type="checkbox"/> Limited distribution
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Work verified by: George Klenov – Internal Technical Reviewer		
Work approved by: Leonid Yaskin – Operational Manager		
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## Abbreviations

AIE	Accredited Independent Entity
ATPP	Astrakhan Thermal Power Plant
ACHPP-2	Astrakhan Combined Heat and Power Plant - 2
BVC	Bureau Veritas Certification
CAR	Corrective Action Request
CL	Clarification Request
CO <sub>2</sub>	Carbon Dioxide
DDR	Draft Determination Report
EIA	Environmental Impact Assessment
ERU	Emission Reduction Unit
GHG	Greenhouse House Gas(es)
JI	Joint Implementation
JISC	Joint Implementation Supervisory Committee
NCSF	National Carbon Sequestration Foundation JSC
PDD	Project Design Document
RAO EES	Russian Joint Stock Company “United Energy System of Russia”
JSC	Joint Stock Company
PP	Project Participant
RF	Russian Federation
tCO <sub>2</sub> e	Tonnes CO <sub>2</sub> equivalent
UNFCCC	United Nations Framework Convention for Climate Change

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## 1 INTRODUCTION

CCGS Limited (hereafter referred ‘CCGS’) has commissioned Bureau Veritas Certification to determine “Reconstruction of Astrakhan TPP through construction of CCP-110, LLC “LUKOIL-Astrakhanenergo”, Russian Federation” project of the LLC “LUKOIL-Astrakhanenergo” (hereafter referred ‘the project’) located in city of Astrakhan, Astrakhanskaya oblast, Russian Federation.

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

### 1.1 Objective

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

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

### 1.2 Scope

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

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

### 1.3 Determination team

The determination team consists of the following personnel:

Leonid Yaskin

Bureau Veritas Certification Team Leader, Climate Change Lead Verifier



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This determination report was reviewed by:

George Klenov  
Bureau Veritas Certification, Internal reviewer

## 2 METHODOLOGY

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

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

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

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

### 2.1 Review of Documents

The original Project Design Document (PDD) v.1.0 dated 29/07/2011 submitted by the CCGS for determination and additional background documents related to the project design and baseline, i.e. country Law, Guidelines for users of the joint implementation project design document form, Guidance on criteria for baseline setting and monitoring, Kyoto Protocol to be checked by an Accredited Independent Entity were reviewed and corrective action requests were reported.

To address Bureau Veritas Certification corrective action requests, CCGS revised the original PDD and resubmitted it as v.1.1 dated 24/08/2011, v.1.2 dated 25/08/2011.

The determination findings presented in this report relate to the project as described in the above mentioned versions of the PDD.



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## 2.2 Follow-up Interviews

On 25/08/2011 Bureau Veritas Certification conducted interviews with the project participant LLC “LUKOIL-Astrakhanenergo” and the consultant CCGS were performed to confirm selected information about the technical and economic characteristics and parameters of the project and to clarify issues identified in the review of the PDD v.1.0 and v.1.1. Interviewees are listed in References. The main topics of the interviews are summarized in Table 1.

**Table 1 Interview topics**

Interviewed organization	Interview topics
Project participant LLC “LUKOIL-Astrakhanenergo”	<ul style="list-style-type: none"> <li>• The project history; status of the projects as on today.</li> <li>• Confirmation of the starting date of the crediting period.</li> <li>• Equipment for monitoring of emission reduction.</li> <li>• EIA and conclusion of Glavgosexpertiza.</li> <li>• Operational and managerial structure of monitoring.</li> </ul>
Consultant CCGS	<ul style="list-style-type: none"> <li>• Calculation of the grid emission factor.</li> <li>• Investments analysis in the PDD.</li> <li>• Calculations of Emission Reduction in the PDD</li> </ul>

## 2.3 Resolution of Clarification and Corrective Action Requests

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

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

- (a) Corrective action request (CAR), requesting the project participants to correct a mistake in the published PDD that is not in accordance with the (technical) process used for the project or relevant JI project requirement or that shows any other logical flaw;
- (b) Clarification request (CL), requesting the project participants to provide additional information for Bureau Veritas Certification to assess compliance with the JI project requirement in question;
- (c) Forward action request (FAR), informing the project participants of an issue, relating to project implementation but not project design, that needs to be reviewed during the first verification of the project.



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

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

### **3 PROJECT DESCRIPTION** (quoted by PDD v.1.2)

#### Objective of the project

The project is aimed at reconstruction of Astrakhan TPP (ATPP) of LLC “LUKOIL-Astrakhanenergo” with a view to enhancing efficiency and increasing electricity generation, as well as reducing greenhouse gas (GHG) emissions through introduction of modern energy generation technologies based on a combined-cycle plant (CCP).

The project replaces a corresponding amount of electricity generated at the existing inefficient power generating capacities of ATPP and some electricity supplied by other grid power plants of the Integrated Energy System of the South of Russia (IES South). Besides the project also increases the proportion of heating cycle based electricity generation at the neighboring Astrakhan CHPP-2 (ACHPP-2) also owned by LLC “LUKOIL-Astrakhanenergo”.

#### Situation prior to the project

The first equipment at ATPP was put into operation in 1947. The existing equipment of ATPP has been in operation since 1962. Today the installed electrical capacity of Astrakhan TPP is 100MW, and the installed thermal capacity is 244 Gcal/h.

Most of electricity at ATPP is generated in condensation cycle, but the proportion of heating cycle based generation is also considerable, because ATPP supplies steam to industrial enterprises to cover their process needs and also ensures heat supply of the housing and utilities sector and industrial facilities.

Astrakhan CHPP-2 was commissioned in 1985. Its installed electrical capacity is 380 MW, the installed thermal capacity is 910 Gcal/h. The generating capacities of ACHPP-2 have a large thermal capacity margin.

The main fuel of ATPP and ACHPP-2 is natural gas, the backup fuel being heavy fuel oil (mazut).

Astrakhan Region has a deficit power system; there are considerable power flows from the neighboring regions.





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### Baseline scenario

The baseline scenario assumes that the existing steam-turbine based energy generation practice will be continued without any serious obstacles at least till late 2012.

Technical condition of ATPP’s boilers and turbines makes it possible to keep their performance at the existing level for another number of years with the help of relatively inexpensive routine maintenance.

The project implies boosting electricity generation which would be unachievable under the baseline scenario with the existing equipment. Therefore the lacking amount (compared with the project) of electricity would be provided by third parties. Energy generating companies within the IES South could increase electricity generation with the help of their existing capacities and through construction of new energy generating units.

### Project scenario

ATPP is reconstructed by building a combined-cycle plant of CCP-110 type with the installed electrical capacity of 110 MW and with thermal capacity of heat extraction from steam turbine being 66 Gcal/h.

CCP-110 generating unit is a double-unit double-pressure combined-cycled gas turbine power plant designed for heat and electricity generation under base-mode operation.

Main equipment of CCP-110 features:

- two LM6000PF-Sprint gas-turbine units, 46.64 MW of nominal electrical capacity each, manufactured by General Electric, USA;
- two double-pressure heat recovery steam boilers of KGT-44/4.6-435-13/0.5-210 type, manufactured by CJSC “Belenergomash”, Russia;
- one T-14/23-4.5/0.18 steam turbine manufactured by OJSC “Kaluzhsky Turbine Manufacturing Plant”, Russia.

The main and backup fuel of the CCP is natural gas. The estimated electrical efficiency of the CCP when running in condensation mode is 55.1%. The project technologies comply with the up-to-date environmental standards.

After implementation of the project the old inefficient equipment of ATPP is planned to be decommissioned. However the thermal capacity of the CCP will not be sufficient to ensure the former level of heat supply from the plant. On the other hand, it is not feasible to install a higher capacity CCP because of the conditions of electrical output from ATPP (the electric network throughput is constrained).

Therefore the heat loads will be met with the help of a connecting heating main to be built between Astrakhan TPP and Astrakhan CHPP-2. Thus a full-fledged common heat circuit is created making it possible to cover all heat

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loads from Astrakhan CHPP-2 with additional loading of heat extraction turbines of ACHPP-2.

The expected results of the project are as follows:

- Re-equipment of the ATPP with installation of new and more efficient units which meet up-to-date environmental and technical requirements;
- Enhancement of electricity generation efficiency at ACHPP-2 due to additional loading of heating steam extraction turbines;
- Increased electricity generation in the power system of Astrakhan Region;
- Optimization of heat supply system of Astrakhan City;
- Mitigation of negative environmental impact, including reduction in greenhouse gas emission by 318 ktCO<sub>2</sub>e per year.

#### Project history

RAO “UES of Russia” (Unified Energy Systems of Russia) had started gearing up for implementation of the Kyoto mechanisms long before the Protocol was ratified by the Russian Federation. To this end a Non-Commercial Investment and Environmental Organization “Energy Carbon Fund” was set up in 2000.

The main results of the Fund’s operation are as follows:

- Together with RAO “UESR” it took a comprehensive survey of greenhouse gas emissions from energy sector covering the period from 1990 in accordance with the world standards, an emission inventory was created;
- A greenhouse gas emission monitoring system, including an accounting and reporting system, is up and running; emission inventories are developed;
- A number of joint implementation (JI) projects were prepared for approval by government authorities, some of these projects already have positive determination by international auditors; foreign investments were attracted for these projects;
- Together with regional energy generators, the Fund participated in international tenders for purchase of GHG emissions;
- “Greenhouse Gases”, an information analysis system, was developed and introduced at a number of regional energy companies;
- Projections of emission reductions of the Unified Energy System of Russia have been made;

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- Several regulatory and methodological guidelines were issued and are in effect in the energy sector, including the method for calculation of GHG emissions from thermal power plants.

In 2006-2007 the Fund evaluated several projects in terms of their potential for JI. The Astrakhan TPP reconstruction project was put on the list of the investment projects of S&A of OJSC RAO “UES of Russia” that are implemented jointly in accordance with Article 6 of the Kyoto Protocol to the UNFCCC as of 25.06.2007.

In 2007 a preliminary estimation of the GHG emission reduction potential of “Reconstruction of Astrakhan TPP through construction of CCP-110MW” Project was made and an inventory of GHG emissions originating from OJSC “SGC TGC-8” from 1990 through 2005 was taken [R6].

Open Joint Stock Company “Southern Generating Company – TGC-8” was established on March 22, 2005. The sole founder of the Company was OJSC RAO “UES of Russia”. After completion of the restructuring of OJSC RAO “UES of Russia”, LUKOIL Group consolidated the controlling interest in OJSC “SGC – TGC-8” and became the company’s strategic investor. Since May 4, 2008 OJSC “SGC TGC-8” is a part of LUKOIL Group. LLC “LUKOIL-Astrakhanenergo” was established in 2009 in the course of restructuring of TGC-8.

On February 22, 2008 (considered to be the starting date of the project) the company management signed a turnkey contract with CJSC “Energokaskad” No.589 [R7] for works on “Reconstruction of Astrakhan TPP through construction of CCP-110MW”.

Turning and start-up of the CCP with test generation of electricity started in May 2011. On June 16, 2011 Astrakhan City Administration issued an authorization for putting the CCP in operation [R11].

At the time of decision making the planned cost of the project implementation was estimated at RUR 4 212.61 million. The actual cost of construction totaled RUR 4 625.82 million.

As shown above, when taking the decision to implement the project, the company management from the very start considered a possibility to develop it as a carbon project in order to attract required financial resources and to ensure acceptable return on investments. The issues related to preparation of the JI project documentation were discussed with many companies and eventually a contract was signed in 2011 with CCGS.

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## 4 DETERMINATION CONCLUSIONS

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

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

The Clarification and Corrective Action Requests are stated, where appropriate, in the following sections and are further documented in the Determination Protocol in Appendix A. The determination of the Project resulted in 2 Corrective Action Requests and 2 Clarification Requests. 6 Requests for Information were issued as well.

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

### 4.1 Project approvals by Parties involved (19-20)

The project has no approvals by the parties involved. This was reported in CAR 01 which remains pending.

### 4.2 Authorization of project participants by Parties involved (21)

The participation of LLC “LUKOIL-Astrakhanenergo” listed as project participant in the PDD is not authorized by the Parties involved.

The authorization is deemed to be carried out through the issuance of the project approval.

### 4.3 Baseline setting (22-26)

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

#### JI specific approach

Section B.1 provides a detailed theoretical description of the baseline in complete and transparent manner as required by Guidelines for users of JI PDD Form Version 04.

The baseline is established:

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/a/ By listing and describing future baseline scenarios available for the project participant and selecting the most likely scenario. Five alternative scenarios were listed as regards generation of electricity (E1-E5) and two as regards production of heat (H1, H2) as follows:

E1. Generation of electricity by other existing power plants within the IES South;

E2. Generation of electricity by other new energy generating units within the IES South;

E3. Continuation of the existing electricity generation practice at ATPP;

E4 Continuation of the existing electricity generation practice at ATPP and production of lacking amount of electricity (lacking, that is, compared with the project) by other existing power plants and new energy units within the IES South;

E5. The project activity without the joint implementation mechanism;

H1 Continuation of the existing heat production practice at ATPP;

H2. The project activity without the joint implementation mechanism.

Based on alternatives analysis with taking into account the key factors in (b) below a conclusion is made in Section B.1 that the most likely baseline scenario is the following combination of Alternatives: Alternative E4 which assumes electricity generation and supply to the grid by the existing and new energy generating units within the IES South, and Alternative H1 which assumes heat production by the existing equipment of ATPP.

/b/ By taking into account key factors that affect a baseline, such as (i) energy sector reform policies and legislation – forecasting by CJSC “Energy Forecasting Energy”; (ii) growth of electricity demand in the Southern Federal District; (iii) availability of capital including investment barriers; (iv) local availability of technologies/techniques, skills and know-how – the project is not common practice; gas turbine and boiler are the imported equipment; (v) natural gas price and availability for Astrakhan TPP; (vi) national and sub-national expansion plans for the energy sector in South of Russia.

/c/ Basically in a transparent manner with regard to the choice of approaches, assumptions (traced by a finder), methodologies, parameters, data sources and key factors.

/d/ Taking into account of uncertainties and using conservative assumptions (neglect of oil fuel consumption; estimate for the value of ATPP electricity generation under the baseline scenario till the end of the crediting period; priority of electricity generation in the combined cycle; on heat consumption for ATPP; heat supply from ATPP under the baseline scenario is based on heating cycle; the decision to set the baseline value of annual electricity generation by ATPP at the actual level recorded in 2008; neglect of leakage; neglect of CH<sub>4</sub> and N<sub>2</sub>O emission in the baseline).

/e/ In such a way that ERUs cannot be earned for decreases in activity levels outside the project or due to force majeure.

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/f/ By drawing of the list of standard variables contained in appendix B to Guidance on criteria for baseline and monitoring.

Outstanding issues related to Baseline setting (22-26), PP’s response and the AIE conclusion are summarized in Appendix A (refer to CAR 02 and CL 02).

The issued CAR and CL concern:

- Refusal of the use of the available company’s data of specific fuel consumption per MWh and GJ for theoretical description of ATPP under the baseline. (CAR 02);
- Explanation of conservativeness of some assumptions used for setting the baseline (CL 02).

#### **4.4 Additionality (27-31)**

The additionality is demonstrated by using the following approach: Provision of traceable and transparent information showing the baseline was identified on the basis of conservative assumptions, that the project scenario is not part of the identified baseline scenario and that the project will lead to emission reductions or enhancements of removals.

Additionality proofs are provided through project alternatives analysis, investment analysis and common practice analysis.

Alternative analysis refers to baseline setting made in Section B.1. This analysis is not self-sufficient since the baseline is chosen with the use of the investment analysis of the project made in Section B.2.

Investment analysis considers calculation of project IRR and NPV at the discount rate 18% which was estimated with the use of the official “Guidelines on estimation of investment project efficiency”. Calculations were made using the general inflation rate, rate of growth of heat and electricity tariffs and rate of increase in natural gas prices for the IES South. The tariff growths were taken in accordance with the “Development Scenarios for the Russian Electric Power Sector for the years 2009-2020”. The AIE observes, that the use of tariffs dynamic forecast from “Concept of long-term social and economic development of Russian Federation for the period up to 2020“(approved by RF Government Resolution N 1662-p dated 17/10/2008) results in lower IRR and NPV. Hence, the results of the investment analysis can be considered conservative. These results demonstrate that the project IRR is less than the discount rate and NPV is accordingly negative. This implies that the project without JI registration is unprofitable. The sensitivity analysis with variation of main parameters by  $\pm 10\%$  also confirms this conclusion.





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Common practice analysis has pointed out that projects to install CCP are not widely observed and commonly carried out in Russia. Thus the considered project is not common practice.

### **4.5 Project boundary (32-33)**

#### **JI specific approach**

The project boundary encompasses all anthropogenic emissions by sources of greenhouse gases as listed in Table B.3-1 which are:(i) under the control of the project participants; (ii) reasonably attributable to the project; and (iii) significant.

The project boundary is defined on the basis of case-by-case assessment of different emission sources. All gases and sources included and excluded are explicitly stated.

The identified sources of the accountable emissions are:

- gas consumption at CCP, equipment of the old section of ATPP (if not dismantled), and ACHPP-2 (project);
- fossil fuel consumption at ATPP and power plants of the IES South (baseline).

Delineation of the project boundary and the sources is described and justified in the PDD by using the Fig B.3.1 and B.3.2 and Table B.3.1.

Based on the assessment of the project documentation, the AIE hereby confirms that the identified boundary and the selected sources and gases are justified for the project activity.

### **4.6 Crediting period (34)**

The PDD reports the starting date of the project as 22/02/2008 being the date of signing the contract with a subcontractor for works on “Reconstruction of Astrakhan TPP through construction of CCP-110”.

The PDD states the expected operational lifetime is 20 years or 240 months.

The PDD defines the length of the crediting period as 1,58 years and the starting date as 01/06/2011, which is on the date the first emission reductions or enhancements of net removals are generated by the project.

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#### 4.7 Monitoring plan (35-39)

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

##### Jl specific approach

The monitoring plan adequately specifies the indicators, constants and variables used that are reliable, valid and provide transparent picture of the emission reductions to be monitored. The monitoring is in line with current operational routines.

The monitoring plan explicitly and clearly distinguishes:

- (i) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), and that are available already at the stage of determination, such as emission factors, boilers efficiency, and specific fuel;
- (ii) N/A (refer to para 36 (d));
- (iii) Data and parameters that are monitored throughout the crediting period (please see above).

Sections D.1.1.1 and D.1.1.3 provide compilation of all data needed to monitor project and baseline emissions.

The monitoring plan describes:

- data to be monitored:

- ID 1 – Volumetric consumption of natural gas by the old section of ATPP under the project;
- ID 2 – Volumetric consumption of natural gas by the CCP under the project;
- ID 3 – Average net caloric value of natural gas consumed at ATPP;
- ID 4 – Heat supply from the old section of ATPP under the project;
- ID 5 – Heat supply from the CPP;
- ID 6 – Supply of electricity from the old section of ATPP under the baseline;
- ID 7 – Supply electricity from CPP.

- the period in which these parameters will be monitored - monthly (3) or continuously (1, 2, 4-6).

- all decisive factors for the control and reporting of project performance: 2tp statistics forms; quality control (QC) and quality assurance (QA) procedures; the operational and management structure that will be applied in implementing the monitoring plan.

Constants used are the default values of the parameters as follows:

- emission factor of natural gas (2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Chapter 2, Table 2.2)
- efficiency of old gas-fired boilers (Tool to determine the baseline efficiency of thermal or electric energy generation systems. Version 01. CDM Executive Board. P.7, Table 1);

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- IES South grid emission factor (estimated with the use of own specific approach based on ORGRES data for power plants in the condensing mode);
- Values of electromechanical efficiency (0,98), heat transportation factor (0,98), factor of heat losses in heat exchangers (0,99), specific electricity generation based on heat supply at ACHPP-2 (0,1366 MW/GJ), specific electricity generation based on heat supply at ATPP (0,0895 MW/GJ), internal efficiency of turbine units at ATPP in condensation mode (0,324), specific electricity consumption for auxiliary needs of ATPP and ACHPP-2 (0,1).

Accuracy and reasonableness are carefully balanced in their selection. Uncertainty level of data is defined in Section D.2 as low. The default values originate from the recognized sources and are presented in a transparent manner.

The monitoring plan draws on the list of standard variables contained in appendix B of “Guidance on criteria for baseline setting and monitoring”.

The monitoring plan elaborates all algorithms and formulae used for the estimation/calculation of baseline emissions and project emissions. The underlying rationale for the algorithms/formulae is well explained. Consistent variables, equation formats, subscripts etc. are used. There is basic consistency between the elaboration of the baseline scenario and the procedure for calculating the baseline emissions.

Implicit and explicit assumptions are explained in a transparent manner. Most assumptions in the monitoring plan are specified and explained in Section B.1.

Monitoring plan refers to state statistic environmental forms 2-tp listed in the Section D.1.5.

QC/QA procedures are specified in sufficient detail in PDD Section D.2. These are routine enterprise procedures.

The monitoring plan outlines the responsibilities and the authority regarding the monitoring activities. The person responsible for monitoring is the Head of Planning and Technical Department (PTD) who is reporting to Deputy Chief Engineer for Operations. Monitoring techniques are in line with current operation routines at Russian power sector.

It is indicated in the Section D.3 that data will be kept for two years after the last ERU transfer under the project.



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

#### **4.8 Leakage (40-41)**

##### **JI specific approach**

Leakage is reasonably neglected.

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

##### **JI specific approach**

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

The PDD provides the ex-ante estimate of emission reduction from the project (within the project boundary), which is 503 367 tCO<sub>2</sub>e for the crediting period.

The estimate referred to above is given:

- (a) On an annual basis;
- (b) From 01/06/2011 to 31/12/2012;
- (c) On a source-by-source basis;
- (d) For CO<sub>2</sub> as GHG emitted.
- (e) In tonnes of CO<sub>2</sub> equivalent.

The formulae used for calculating the estimates referred above, which are Formulae in Sections D.1.1.2 and D.1.1.4 are consistent throughout the PDD.

For calculating the estimates referred to above, key factors defined in the monitoring plan influencing the project and baseline emissions were taken into account, as appropriate.

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

The PDD Section E includes an illustrative ex ante emissions calculation.



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#### **4.10 Environmental impacts (48)**

Environmental impact assessment (EIA) is made in the designed documentation listed in the PDD. Information about impact upon atmospheric air, surface and ground waters, environmental monitoring and environmental consequences of the project implementation is summarized in Section F.1. The project documentation has received a positive conclusion by Glavgosexpertiza.

#### **4.11 Stakeholder consultation (49)**

Russian legislation does not require local stakeholder consultation. No negative responses to publications about the project in the mass media were received.

#### **4.12 Determination regarding small scale projects (50-57) (Not applicable)**

#### **4.13 Determination regarding land use, land-use change and forestry (LULUCF) projects (58-64) (Not applicable)**

#### **4.14 Determination regarding programmes of activities (65-73) (Not applicable)**

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

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

### **6 DETERMINATION OPINION**

Bureau Veritas Certification has performed a determination of the “Reconstruction of Astrakhan TPP through construction of CCP-110, LLC “LUKOIL-Astrakhanenergo”, Russian Federation” project. The determination was performed on the basis of UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

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



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Using investment analysis and common practice analysis the project participants proved that the project activity itself is not the baseline scenario.

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

The review of the project design documentation and the subsequent follow-up interviews have provided Bureau Veritas Certification with sufficient evidence to determine the fulfillment of stated criteria.

The determination revealed two pending issues related to the current determination stage of the project: the issue of the written approval of the project and the authorization of the project participant by the host Party. If the written approval and the authorization by the host Party are awarded, it is our opinion that the project as described in the Project Design Document, Version 1.2 dated 25/08/2011 meets all the relevant UNFCCC requirements for the determination stage and the relevant host Party criteria.

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

## 7 REFERENCES

### Category 1 Documents:

Documents provided by CCGS that relate directly to the GHG components of the project.

/1/ “Reconstruction of Astrakhan TPP through construction of CCP-110, LLC “LUKOIL-Astrakhanenergo”, Russian Federation”, PDD Versions 1.0, 1.1 and 1.2.

Supporting documentation:

- Model\_Astrakhan\_24 08 2011.

### Category 2 Documents:

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

/1/ JI Guidelines;

/2/ Guidelines for Users of the JI PDD Form (Version 04), JISC;

/3/ Guidance on criteria for baseline setting and monitoring (Version 02), JISC;





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- /4/ List of Investment Projects of Subsidiaries of OJSC RAO “UES of Russia” implemented jointly in accordance with Article 6 of the Kyoto protocol to UNFCCC dated 25.06.2007;
- /5/ Project Idea Note. JSC South Generation Company TGC-8. Affiliate Astrakhan Generation.
- /6/ Timetable of construction the connecting heat pipeline between ATPP and ACHPP-2.
- /7/ Project documentation. Volume 8. Effectiveness of investments. Energokaskad. 2008.
- /8/ Project documentation. Volume 1. Section 1. Explanatory Note. Energokaskad. 2008.
- /9/ Project documentation. Volume 3. Section 8. Environment protection measures. Energokaskad. 2008.
- /10/ Turn-on key contract for construction of the CCP-110. Dated 22/02/2008.
- /11/ Act of commissioning of CCP-110. Dated 16/06/2011.
- /12/ Act of pre-commissioning of CCP-110. Dated 08/06/2011.
- /13/ Conclusion of Glavgosexpertiza. Dated 18/12/2009.
- /14/ Test models Astrakhan 18/07/2011.
- /15/ Calculations of IES South grid emission factor.

**Persons interviewed:**

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

- /1/ I. Grigoryev – LLC “LUKOIL-Astrakhanenergo” Deputy Chief Engineer for Operation.
- /2/ E. Stepanitscheva – LLC “LUKOIL-Astrakhanenergo” Lead engineer of HSE Department.
- /3/ A. Samorodov – CCGS Director of Project Development Department.
- /4/ D. Potashev – CCGS Chief Specialist of Project Development Department.

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## DETERMINATION PROTOCOL

Table 1

## Check list for determination, according JOINT IMPLEMENTATION DETERMINATION AND VERIFICATION MANUAL (REVISION 02)

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
<b>General description of the project</b>				
<b>Title of the project</b>				
-	Is the title of the project presented?	The indicated title of the project is “Reconstruction of Astrakhan TPP through construction of CCP-110, LLC “LUKOIL-Astrakhanenergo”, Russian Federation”.		OK
-	Is the sectoral scope to which the project pertains presented?	The indicated sectoral scope of the project is: (1) Energy industries (renewable/non-renewable sources),		OK
-	Is the current version number of the document presented?	The indicated Version is 1.0		OK
-	Is the date when the document was completed presented?	The indicated PDD date is July 29, 2011.		OK
<b>Description of the project</b>				
-	Is the purpose of the project included with a concise, summarizing explanation (max. 1-2 pages) of the: a) Situation existing prior to the starting date of the project; b) Baseline scenario; and c) Project scenario (expected outcome, includ-	The PDD formulates the purpose of the project as follows:  “The project is aimed at reconstruction of Astrakhan TPP (ATPP) of LLC “LUKOIL-Astrakhanenergo” with a view to enhancing efficiency and increasing electricity generation, as well as reducing greenhouse gas (GHG) emissions through introduction of modern energy generation technologies		OK

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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	ing a technical description)?	<p>based on a combined-cycle plant (CCP). The project replaces a corresponding amount of electricity generated at the existing inefficient power generating capacities of ATPP and some electricity supplied by other grid power plants of the Integrated Energy System of the South of Russia (IES South). Besides the project also increases the proportion of heating cycle based electricity generation at the neighbouring Astrakhan CHPP-2 (ACHPP-2) also owned by LLC “LUKOIL-Astrakhanenergo” (end of quotation).</p> <p>Requirements a), b), c) to the content of Section A.2 are met.</p>		
-	Is the history of the project (incl. its JI component) briefly summarized?	<p>The history of the project (incl. its JI component) is summarized in sufficient detail on pages 3-4.</p> <p>The Astrakhan TPP reconstruction project of OJSC “TGC-8” was put on 25.06.2007 on the list of the investment projects of RAO UES of Russia to be implemented as JI. In 2007 a preliminary estimation of the GHG emission reduction potential of the project was made. A turnkey contract for works on “Reconstruction of Astrakhan TPP through construction of CCP-110 MW” was signed on February 22, 2008. Since May 4, 2008 TGC-8 is a part of LUKOIL Group. LLC “LUKOIL-Astrakhanenergo” being the project participant was established in 2009 in the course of restructuring of TGC-8.</p> <p><b>RFI 01.</b> Please provide the AIE a documented evidence of the above mentioned facts.</p>	Pending	
<b>Project participants</b>				



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
-	Are project participants and Party(ies) involved in the project listed?	The Party and project participant involved in the project are listed as follows: - Party A the Russian Federation and its legal entity Limited Liability Company “LUKOIL-Astrakhanenergo”; - Party B is not defined.		OK
-	Is the data of the project participants presented in tabular format?	The data of the project participant are presented in due tabular format.		OK
-	Is contact information provided in Annex 1 of the PDD?	Contact information is provided in Annex 1 of the PDD.		OK
-	Is it indicated, if it is the case, if the Party involved is a host Party?	Russian Federation is indicated as Host Party.		OK
<b>Technical description of the project</b>				
<b>Location of the project</b>				
-	Host Party	Russian Federation.		OK
-	Region/State/Province etc.	Location of the project: Russian Federation, Astrakhan Region, Astrakhan City, LLC “LUKOIL-Astrakhanenergo”, territory of Astrakhan TPP.		OK
-	City/Town/Community etc.	Astrakhan City.		OK
-	Detail of the physical location, including information allowing the unique identification of the project. (This section should not exceed one page)	Astrakhan City provides the unique identification of the project.		OK
<b>Technologies to be employed, or measures, operations or actions to be implemented by the project</b>				
-	Are the technology(ies) to be employed, or measures, operations or actions to be implemented by the project, including all relevant technical data and the implementation schedule described?	Section A.4.2 outlines main technologies to be employed including relevant technical data and the implementation period.  <b>CL 01.</b> Please clarify if the building of the connecting heating	CL 01	

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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		main between Astrakhan TPP and Astrakhan CHPP-2 is the part of the main contract and that the heating main will be commissioned together with the CPP. Please take note that if this is not the case, the sections of the old ATPP will have to partly cover the heat load and this will have to be reflected in the theoretical description of the project activity.		
<b>Brief explanation of how the anthropogenic emissions of greenhouse gases by sources are to be reduced by the proposed JI project, including why the emission reductions would not occur in the absence of the proposed project, taking into account national and/or sectoral policies and circumstances</b>				
-	Is it stated how anthropogenic GHG emission reductions are to be achieved? (This section should not exceed one page)	It is explained in Section A.4.3 on page 14 that the project GHG emission reductions will be mainly due to using state-of-the-art combined-cycle technology for substitution of grid electricity that is generated within the IES South mainly using less efficient steam-turbine technology. Also, the project will result in re-distribution of the volumes of heat supply to the city between ATPP and ACHPP-2. Astrakhan CHPP-2 is enabled to increase its heat supply and therefore to increase its electricity generation based on heating cycle. This leads to reduction in fuel consumption per unit of electricity output at ACHPP-2. Hence the project emission reductions will be also due to enhancement of operating efficiency of ACHPP-2.		OK
-	Is it provided the estimation of emission reductions over the crediting period?	The estimation of emission reductions over the crediting period is provided.		OK
-	Is it provided the estimated annual reduction for the chosen credit period in tCO <sub>2</sub> e?	The estimated annual reduction for the chosen credit period is provided in tCO <sub>2</sub> e.		OK
-	Are the data from questions above presented in tabular format?	The data from questions above are presented in tabular format. Refer to Table A.4.3.1.		OK

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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
-	Is the length of the crediting period Indicated?	The length of the crediting period is indicated as 1,58 years (19 months).		OK
-	Are estimates of total as well as annual and average annual emission reductions in tonnes of CO2 equivalent provided?	Total as well as annual and average annual emission reductions in tonnes of CO2 equivalent are provided.		OK
<b>Project approvals by Parties</b>				
19	Have the DFPs of all Parties listed as “Parties involved” in the PDD provided written project approvals?	<b>CAR 01.</b> The project has no written approvals by the Parties involved. The project approval by Parties will be provided later.	CAR 01	
19	Does the PDD identify at least the host Party as a “Party involved”?	Host Party involved is the Russian Federation.		OK
19	Has the DFP of the host Party issued a written project approval?	Conclusion is pending a response to CAR 01.	Pending	
20	Are all the written project approvals by Parties involved unconditional?	Yes, the written project approvals by Parties involved are unconditional.		OK
<b>Authorization of project participants by Parties involved</b>				
21	Is each of the legal entities listed as project participants in the PDD authorized by a Party involved, which is also listed in the PDD, through: – A written project approval by a Party involved, explicitly indicating the name of the legal entity? or – Any other form of project participant authorization in writing, explicitly indicating the name of the legal entity?	The project participant LLC “LUKOIL-Astrakhanenergo” will likely be authorized with the issue of the project approval by the Host Party. Conclusion is pending a response to CAR 01.	Pending	
<b>Baseline setting</b>				



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
22	Does the PDD explicitly indicate which of the following approaches is used for identifying the baseline? – JI specific approach – Approved CDM methodology approach	It is explicitly indicated in the PDD Section B.1 that a JI specific approach is applied according to the Guidance on criteria for baseline setting and monitoring, version 02 (hereafter referred Guidance).		OK
<b>JI specific approach only</b>				
23	Does the PDD provide a detailed theoretical description in a complete and transparent manner?	<p>Section B.1 provides a detailed theoretical description of the baseline in complete and transparent manner as required by Guidelines for users of JI PDD Form Version 04.</p> <p>The key information and data used to establish the baseline are provided in the required tabular forms.</p> <p><b>CAR 02.</b> Under the JI specific approach, PDD does not apply the values of specific fuel consumption per MWh and GJ for theoretical description of ATPP under the baseline. These data are available from 6-tp statistical forms. Please justify conservativeness of the used JI specific approach. To do so please provide calculations of the baseline based on the available values of specific fuel consumption and compare the results with those received under the project approach. The same points of concern pertain to the description of ACHPP-2 in the project conditions.</p> <p><b>CL 02.</b> Please clarify why /a/ “it is important not to overestimate the value f ATPP electricity generation under the baseline” (PDD page 21); /b/ “it is a soundly conservative decision to set the baseline</p>	CAR 02 CL 02	

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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>of annual electricity generation by ATPP at the actual level recorded in 2008” (PDD page 21);            /c/ “the specific electricity generation based on heat supply at ATPP is assumed to be equal to the maximum average annual value recorded over 2008-2010” (PDD page 23);            /d/ “the specific electricity generation based on heat supply at ACHPP-2 is assumed to be equal to the minimal average annual value recorded over 2008-2010” (PDD page 26);            /e/ heat losses at the heating main between ACHPP-2 and ATPP were not taken into account.</p>		
23	<p>Does the PDD provide justification that the baseline is established:            (a) By listing and describing plausible future scenarios on the basis of conservative assumptions and selecting the most plausible one?            (b) Taking into account relevant national and/or sectoral policies and circumstance?            – Are key factors that affect a baseline taken into account?            (c) In a transparent manner with regard to the choice of approaches, assumptions, methodologies, parameters, data sources and key factors?            (d) Taking into account of uncertainties and using conservative assumptions?            (e) In such a way that ERUs cannot be earned for decreases in activity levels outside the project or due to force majeure?</p>	<p>The baseline is established basically:            /g/ By listing and describing future baseline scenarios available for the project participant and selecting the most likely scenario. Five alternative scenarios were listed as regards generation of electricity (E1-E5) and two as regards production of heat (H1, H2) as follows:            E1. Generation of electricity by other existing power plants within the IES South;            E2. Generation of electricity by other new energy generating units within the IES South;            E3. Continuation of the existing electricity generation practice at ATPP;            E4 Continuation of the existing electricity generation practice at ATPP and production of lacking amount of electricity (lacking, that is, compared with the project) by other existing power plants and new energy units within the IES South;            E5. The project activity without the joint implementation mechanism;</p>		OK



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	<p>(f) By drawing on the list of standard variables contained in appendix B to “Guidance on criteria for baseline setting and monitoring”, as appropriate?</p>	<p>H1 Continuation of the existing heat production practice at ATPP;                      H2. The project activity without the joint implementation mechanism.                      Based on alternatives analysis with taking into account the key factors in (b) below a conclusion is made in Section B.1 that the most likely baseline scenario is the following combination of Alternatives: Alternative E4 which assumes electricity generation and supply to the grid by the existing and new energy generating units within the IES South, and Alternative H1 which assumes heat production by the existing equipment of ATPP.                      /h/ By taking into account key factors that affect a baseline, such as (i) energy sector reform policies and legislation – forecasting by CJSC “Energy Forecasting Energy”; (ii) growth of electricity demand in the Southern Federal District; (iii) availability of capital including investment barriers; (iv) local availability of technologies/techniques, skills and know-how – the project is not common practice; gas turbine and boiler are the imported equipment; (v) natural gas price and availability for Astrakhan TPP; (vi) national and sub-national expansion plans for the energy sector in South of Russia.                      /i/ Basically in a transparent manner with regard to the choice of approaches, assumptions (traced by a finder), methodologies, parameters, data sources and key factors.                      /j/ Taking into account of uncertainties and using conservative assumptions (neglect of oil fuel consumption; estimate</p>		



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>for the value of ATPP electricity generation under the baseline scenario till the end of the crediting period; priority of electricity generation in the combined cycle; on heat consumption for ATPP; heat supply from ATPP under the baseline scenario is based on heating cycle; the decision to set the baseline value of annual electricity generation by ATPP at the actual level recorded in 2008; neglect of leakage; neglect of CH4 and N2O emission in the baseline).</p> <p>/k/ In such a way that ERUs cannot be earned for decreases in activity levels outside the project or due to force majeure.</p> <p>// By drawing of the list of standard variables contained in appendix B to Guidance on criteria for baseline and monitoring.</p>		
24	If selected elements or combinations of approved CDM methodologies or methodological tools for baseline setting are used, are the selected elements or combinations together with the elements supplementary developed by the project participants in line with 23 above?	N/A		OK
25	If a multi-project emission factor is used, does the PDD provide appropriate justification?	The grid emission factor for IES South is estimated with the use of own specific approach based on ORGRES data for power plants in condensing mode. AIE considers this approach as the most accurate among different ones used by PDD developers.		OK
<b>Approved CDM methodology approach only_Paragraphs 26(a) – 26(d)_Not applicable</b>				
<b>Additionality</b>				
<b>JI specific approach only</b>				



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
28	<p>Does the PDD indicate which of the following approaches for demonstrating additionality is used?</p> <p>(a) Provision of traceable and transparent information showing the baseline was identified on the basis of conservative assumptions, that the project scenario is not part of the identified baseline scenario and that the project will lead to emission reductions or enhancements of removals;</p> <p>(b) Provision of traceable and transparent information that an AIE has already positively determined that a comparable project (to be) implemented under comparable circumstances has additionality;</p> <p>(c) Application of the most recent version of the “Tool for the demonstration and assessment of additionality (allowing for a two-month grace period) or any other method for proving additionality approved by the CDM Executive Board”.</p>	The PDD indicates that approach (a) is used.		OK
29 (a)	Does the PDD provide a justification of the applicability of the approach with a clear and transparent description?	The PDD reads: “Within the framework of the chosen approach the additionality of the project is proven using the project alternatives analysis, investment analysis and common practice analysis”.		OK



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
29 (b)	Are additionality proofs provided?	<p>Additionality proofs are provided through project alternatives analysis, investment analysis and common practice analysis.</p> <p>Alternative analysis refers to baseline setting made in Section B.1. This analysis is not self-sufficient since the baseline is chosen with the use of the investment analysis of the project made in Section B.2.</p> <p>Investment analysis considers calculation of project IRR and NPV at the discount rate 18% which was estimated with the use of the official “Guidelines on estimation of investment project efficiency”. Calculations were made using the general inflation rate, rate of growth of heat and electricity tariffs and rate of increase in natural gas prices for the IES South. The tariff growths were taken in accordance with the “Development Scenarios for the Russian Electric Power Sector for the years 2009-2020”. The AIE observes, that the use of tariffs dynamic forecast from “Concept of long-term social and economic development of Russian Federation for the period up to 2020”(approved by RF Government Resolution N 1662-p dated 17/10/2008) results in lower IRR and NPV. Hence, the results of the investment analysis can be considered conservative. These results demonstrate that the project IRR is less than the discount rate and NPV is accordingly negative. This implies that the project without JI registration is unprofitable. The sensitivity analysis with variation of main parameters by <math>\pm 10\%</math> also confirms this conclusion.</p>	Pending	



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		Common practice analysis has pointed out that projects to install CCP are not widely observed and commonly carried out in Russia. Thus the considered project is not common practice.  <b>RFI 02.</b> Please provide the AIE a documented evidence of the input data (investment cost by years, tariffs for 2011, other process costs) used in the investment analysis.		
29 (c)	Is the additionality demonstrated appropriately as a result?	With pending RFI 02 the additionality is not demonstrated.	Pending	
30	If the approach 28 (c) is chosen, are all explanations, descriptions and analyses made in accordance with the selected tool or method?	N/A		OK
<b>Approved CDM methodology approach only _ Paragraphs 31(a) – 31(e)_ Not applicable</b>				
<b>Project boundary (applicable except for JI LULUCF projects)</b>				
<b>JI specific approach only</b>				
32 (a)	Does the project boundary defined in the PDD encompass all anthropogenic emissions by sources of GHGs that are: (i) Under the control of the project participants? (ii) Reasonably attributable to the project? (iii) Significant?	The project boundary defined in the PDD encompasses main anthropogenic emissions by sources of GHGs that are (i) under the control of the project participants, (ii) reasonably attributable to the project, and (iii) significant.  The identified sources of the accountable emissions are: - gas consumption at CCP, equipment of the old section of ATPP (if not dismantled), and ACHPP-2 (project); - fossil fuel consumption at ATPP and power plants of the IES South (baseline).		OK
32 (b)	Is the project boundary defined on the basis of a case-by-case assessment with regard to the	Project boundary is defined on the basis of case-by-case assessment of different emission sources.		OK

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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	criteria referred to in 32 (a) above?			
32 (c)	Are the delineation of the project boundary and the gases and sources included appropriately described and justified in the PDD by using a figure or flow chart as appropriate?	Delineation of the project boundary and the sources is described and justified in the PDD by using the Fig B.3.1 and B.3.2 and Table B.3.1.		OK
32 (d)	Are all gases and sources included explicitly stated, and the exclusions of any sources related to the baseline or the project are appropriately justified?	All gases and sources included are explicitly stated; refer to 32 (a) above.  All exclusions made are appropriate as conservative assumptions or logic assumptions based on data from IPCC V.2.Ch2.		OK
<b>Approved CDM methodology approach only Paragraph 33 Not applicable</b>				
<b>Crediting period</b>				
34 (a)	Does the PDD state the starting date of the project as the date on which the implementation or construction or real action of the project will begin or began?	The project's starting date is indicated as February 22, 2008 being the date of signing the contract with CJSC “Energokaskad” for implementation of the project “Reconstruction of Astrakhan TPP through construction of CCP-410”.  <b>RFI 03.</b> Please provide the AIE a documented evidence of the date.	Pending	
34 (a)	Is the starting date after the beginning of 2000?	Yes.		OK
34 (b)	Does the PDD state the expected operational lifetime of the project in years and months?	Operational lifetime is defined as 20 years or 240 months.		OK
34 (c)	Does the PDD state the length of the crediting period in years and months?	The length of crediting period is defined as 1,58 years (19 months).		OK
34 (c)	Is the starting date of the crediting period on or after the date of the first emission reductions or enhancements of net removals generated by	Starting day is June 1, 2011 – being the date of the first emission reductions generated by the project.		OK

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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	the project?			
34 (d)	Does the PDD state that the crediting period for issuance of ERUs starts only after the beginning of 2008 and does not extend beyond the operational lifetime of the project?	The crediting period is defined as from 01/06/2011 to 31/12/2012.		OK
34 (d)	If the crediting period extends beyond 2012, does the PDD state that the extension is subject to the host Party approval? Are the estimates of emission reductions or enhancements of net removals presented separately for those until 2012 and those after 2012?	N/A		OK
<b>Monitoring plan</b>				
35	Does the PDD explicitly indicate which of the following approaches is used? – JI specific approach – Approved CDM methodology approach	It is explicitly indicated that a JI specific approach is chosen.		OK
<b>JI specific approach only</b>				
36 (a)	Does the monitoring plan describe: – All relevant factors and key characteristics that will be monitored? – The period in which they will be monitored? – All decisive factors for the control and reporting of project performance?	The monitoring plan describes: - data to be monitored: ID 1 – Volumetric consumption of natural gas by the old section of ATPP under the project; ID 2 – Volumetric consumption of natural gas by the CCP under the project; ID 3 – Average net caloric value of natural gas consumed at ATPP; ID 4 – Heat supply from the old section of ATPP under the project;		OK



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		ID 5 – Heat supply from the CPP; ID 6 – Supply of electricity from the old section of ATPP under the baseline; ID 7 – Supply electricity from CPP. - the period in which these parameters will be monitored - monthly (3) or continuously (1, 2, 4-6). - all decisive factors for the control and reporting of project performance: 2tp statistics forms; quality control (QC) and quality assurance (QA) procedures; the operational and management structure that will be applied in implementing the monitoring plan.		
36 (b)	Does the monitoring plan specify the indicators, constants and variables used that are reliable, valid and provide transparent picture of the emission reductions or enhancements of net removals to be monitored?	The monitoring plan generally specifies indicators, constants and variables used that are basically reliable, valid and provide transparent picture of the emission reductions to be monitored.  For data to be monitored, please refer to 36(a) above.  For constants please refer to the next paragraph.		OK

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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
36 (b)	If default values are used: <ul style="list-style-type: none"> <li>– Are accuracy and reasonableness carefully balanced in their selection?</li> <li>– Do the default values originate from recognized sources?</li> <li>– Are the default values supported by statistical analyses providing reasonable confidence levels?</li> <li>– Are the default values presented in a transparent manner?</li> </ul>	Constants used are the default values of the parameters as follows: <ul style="list-style-type: none"> <li>- emission factor of natural gas (2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Chapter 2, Table 2.2)</li> <li>- efficiency of old gas-fired boilers (Tool to determine the baseline efficiency of thermal or electric energy generation systems. Version 01. CDM Executive Board. P.7, Table 1);</li> <li>- IES South grid emission factor (taken from JI-0206 Nevinnomysskaya CCP);</li> <li>- Values of electromechanical efficiency (0,98), heat transportation factor (0,98), factor of heat losses in heat exchangers (0,99), specific electricity generation based on heat supply at ACHPP-2 (0,1366 MW/GJ), specific electricity generation based on heat supply at ATPP (0,0895 MW/GJ), internal efficiency of turbine units at ATPP in condensation mode (0,324), specific electricity consumption for auxiliary needs of ATPP and ACHPP-2 (0,1). All these values originate from recognised sources.</li> </ul> Accuracy and reasonableness are carefully balanced in their selection. The default values originate from the recognized sources (see above) and are presented in a transparent manner.		OK
36 (b) (i)	For those values that are to be provided by the project participants, does the monitoring plan clearly indicate how the values are to be se-	N/A		OK

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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	lected and justified?			
36 (b) (ii)	For other values, – Does the monitoring plan clearly indicate the precise references from which these values are taken? – Is the conservativeness of the values provided justified?	The monitoring plan provides clearly indicates the precise references from which these default values are taken. Please refer to 36 (b) above.		OK
36 (b) (iii)	For all data sources, does the monitoring plan specify the procedures to be followed if expected data are unavailable?	Please refer to PDD Section D.2 paragraph “Monitoring procedure in case of emergency”.		OK
36 (b) (iv)	Are International System Unit (SI units) used?	International System Units (SI units) are used.		OK
36 (b) (v)	Does the monitoring plan note any parameters, coefficients, variables, etc. that are used to calculate baseline emissions or net removals but are obtained through monitoring?	N/A		OK
36 (b) (v)	Is the use of parameters, coefficients, variables, etc. consistent between the baseline and monitoring plan?	There is consistency between parameters, coefficients, variables, etc. used in baseline and monitoring plan.		OK
36 (c)	Does the monitoring plan draw on the list of standard variables contained in appendix B of “Guidance on criteria for baseline setting and monitoring”?	The monitoring plan draws on the list of standard variables contained in appendix B of “Guidance on criteria for baseline setting and monitoring”.		OK
36 (d)	Does the monitoring plan explicitly and clearly distinguish: (i) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), and that are	Description of the monitoring plan in Section D.1 explicitly and clearly distinguishes: (i) Refer to 36 (b). (ii) N/A. (iii) Refer to 36 (a).		OK

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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	available already at the stage of determination? (ii) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), but that are not already available at the stage of determination? (iii) Data and parameters that are monitored throughout the crediting period?			
36 (e)	Does the monitoring plan describe the methods employed for data monitoring (including its frequency) and recording?	Most of methods employed for data monitoring are described appropriately in the monitoring plan, including recording frequency, proportion of data to be monitored, and how will the data be archived.		OK
36 (f)	Does the monitoring plan elaborate all algorithms and formulae used for the estimation/calculation of baseline emissions/removals and project emissions/removals or direct monitoring of emission reductions from the project, leakage, as appropriate?	The monitoring plan elaborates all algorithms and formulae used for the estimation/calculation of baseline emissions and project emissions. Please refer to Sections D.1.1.4 and D.1.1.2 respectively.		OK
36 (f) (i)	Is the underlying rationale for the algorithms/formulae explained?	The underlying rationale for the algorithms/formulae is well explained.		OK
36 (f) (ii)	Are consistent variables, equation formats, subscripts etc. used?	Consistent variables, equation formats, subscripts etc. are used.		OK
36 (f) (iii)	Are all equations numbered?	Yes.		OK
36 (f) (iv)	Are all variables, with units indicated defined?	Yes.		OK
36 (f) (v)	Is the conservativeness of the algorithms/procedures justified?	N/A		OK
36 (f) (v)	To the extent possible, are methods to quanti-	N/A		OK



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	tatively account for uncertainty in key parameters included?			
36 (f) (vi)	Is consistency between the elaboration of the baseline scenario and the procedure for calculating the emissions or net removals of the baseline ensured?	There is basic consistency between the elaboration of the baseline scenario and the procedure for calculating the baseline emissions.  Conclusion is pending a response to CAR 02 and CL 01.	Pending	
36 (f) (vii)	Are any parts of the algorithms or formulae that are not self-evident explained?	N/A.		OK
36 (f) (vii)	Is it justified that the procedure is consistent with standard technical procedures in the relevant sector?	Yes, the monitoring is in line with current operational routines.		OK
36 (f) (vii)	Are references provided as necessary?	Yes.		OK
36 (f) (vii)	Are implicit and explicit key assumptions explained in a transparent manner?	Implicit and explicit assumptions are explained in a transparent manner. Most assumptions in the monitoring plan are specified and explained in Section B.1.  Conclusion is pending a response to CL 02.	Pending	
36 (f) (vii)	Is it clearly stated which assumptions and procedures have significant uncertainty associated with them, and how such uncertainty is to be addressed?	N/A		OK
36 (f) (vii)	Is the uncertainty of key parameters described and, where possible, is an uncertainty range at 95% confidence level for key parameters for the calculation of emission reductions or enhancements of net removals provided?	Uncertainty level of data is defined in Section D.2 as low.		OK
36 (g)	Does the monitoring plan identify a national or	Monitoring plan refers to state statistic forms 2-tp listed in the		OK

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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	international monitoring standard if such standard has to be and/or is applied to certain aspects of the project? Does the monitoring plan provide a reference as to where a detailed description of the standard can be found?	Section D.1.5.		
36 (h)	Does the monitoring plan document statistical techniques, if used for monitoring, and that they are used in a conservative manner?	Please refer to 36 (g).		OK
36 (i)	Does the monitoring plan present the quality assurance and control procedures for the monitoring process, including, as appropriate, information on calibration and on how records on data and/or method validity and accuracy are kept and made available upon request?	QC/QA procedures are specified in sufficient detail in PDD Section D.2. These are routine enterprise procedures.		OK
36 (j)	Does the monitoring plan clearly identify the responsibilities and the authority regarding the monitoring activities?	The monitoring plan outlines the responsibilities and the authority regarding the monitoring activities. The person responsible for monitoring is the Head of Planning and Technical Department (PTD) who is reporting to Deputy Chief Engineer for Operations.		OK
36 (k)	Does the monitoring plan, on the whole, reflect good monitoring practices appropriate to the project type? If it is a JI LULUCF project, is the good practice guidance developed by IPCC applied?	Monitoring techniques are in line with current operation routines at Russian power sector.		OK
36 (l)	Does the monitoring plan provide, in tabular form, a complete compilation of the data that need to be collected for its application, includ-	Sections D.1.1.1 and D.1.1.3 provide compilation of all data needed to monitor project and baseline emissions.		OK

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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	ing data that are measured or sampled and data that are collected from other sources but not including data that are calculated with equations?			
36 (m)	Does the monitoring plan indicate that the data monitored and required for verification are to be kept for two years after the last transfer of ERUs for the project?	It is indicated in the Section D.3 that data will be kept for two years after the last ERU transfer under the project.		OK
37	If selected elements or combinations of approved CDM methodologies or methodological tools are used for establishing the monitoring plan, are the selected elements or combination, together with elements supplementary developed by the project participants in line with 36 above?	N/A		OK
<b>Approved CDM methodology approach only Paragraphs 38(a) – 38(d) Not applicable</b>				
<b>Applicable to both JI specific approach and approved CDM methodology approach Paragraph 39 Not applicable</b>				
<b>Leakage</b>				
<b>JI specific approach only</b>				
40 (a)	Does the PDD appropriately describe an assessment of the potential leakage of the project and appropriately explain which sources of leakage are to be calculated and which can be neglected?	Leakage is conservatively neglected (refer to Section B.1).		OK
40 (b)	Does the PDD provide a procedure for an ex ante estimate of leakage?	N/A.		OK
<b>Approved CDM methodology approach only Paragraph 41 Not applicable</b>				

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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
<b>Estimation of emission reductions or enhancements of net removals</b>				
42	Does the PDD indicate which of the following approaches it chooses? (a) Assessment of emissions or net removals in the baseline scenario and in the project scenario (b) Direct assessment of emission reductions	Approach (a) is clearly indicated by the scope of Section 6.		OK
43	If the approach (a) in 42 is chosen, does the PDD provide ex ante estimates of: (a) Emissions or net removals for the project scenario (within the project boundary)? (b) Leakage, as applicable? (c) Emissions or net removals for the baseline scenario (within the project boundary)? (d) Emission reductions or enhancements of net removals adjusted by leakage?	Yes, ex ante estimates of project emissions, baseline emissions and emission reduction are provided in Section E. Calculations are made on the excel spreadsheet.		OK
44	If the approach (b) in 42 is chosen, does the PDD provide ex ante estimates of: (a) Emission reductions or enhancements of net removals (within the project boundary)? (b) Leakage, as applicable? (c) Emission reductions or enhancements of net removals adjusted by leakage?	N/A		OK

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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
45	<p>For both approaches in 42</p> <p>(a) Are the estimates in 43 or 44 given:</p> <p>(i) On a periodic basis?</p> <p>(ii) At least from the beginning until the end of the crediting period?</p> <p>(iii) On a source-by-source/sink-by-sink basis?</p> <p>(iv) For each GHG?</p> <p>(v) In tones of CO2 equivalent, using global warming potentials defined by decision 2/CP.3 or as subsequently revised in accordance with Article 5 of the Kyoto Protocol?</p> <p>(b) Are the formula used for calculating the estimates in 43 or 44 consistent throughout the PDD?</p> <p>(c) For calculating estimates in 43 or 44, are key factors influencing the baseline emissions or removals and the activity level of the project and the emissions or net removals as well as risks associated with the project taken into account, as appropriate?</p> <p>(d) Are data sources used for calculating the estimates in 43 or 44 clearly identified, reliable and transparent?</p> <p>(e) Are emission factors (including default emission factors) if used for calculating the estimates in 43 or 44 selected by carefully balancing accuracy and reasonableness, and ap-</p>	<p>(a) Estimates in 42 are given:</p> <p>(i) for 2011 (H2) and 2012 only;</p> <p>(ii) Yes;</p> <p>(iii) On a source-by-source basis;</p> <p>(iv) For the only GHG CO2;</p> <p>(v) In tones of CO2 equivalent;</p> <p>(b) The formulae used for calculating the estimates in 43 are consistent throughout the PDD;</p> <p>(c) For calculating estimates in 43, key factors influencing the baseline emissions and the activity level of the project and the emissions associated with the project are taken into account, as appropriate;</p> <p>(d) Data sources used for calculating the estimates in 43 are clearly identified, reliable and transparent;</p> <p>(e) Yes as regards natural gas emission factor and grid emission factor.</p> <p>(f) Yes;</p> <p><b>(g)</b> The estimates in 43 are consistent throughout the PDD;</p> <p><b>(h)</b> Yes.</p>		OK

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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	<p>appropriately justified of the choice?</p> <p>(f) Is the estimation in 43 or 44 based on conservative assumptions and the most plausible scenarios in a transparent manner?</p> <p>(g) Are the estimates in 43 or 44 consistent throughout the PDD?</p> <p>(h) Is the annual average of estimated emission reductions or enhancements of net removals calculated by dividing the total estimated emission reductions or enhancements of net removals over the crediting period by the total months of the crediting period and multiplying by twelve?</p>			
46	If the calculation of the baseline emissions or net removals is to be performed ex post, does the PDD include an illustrative ex ante emissions or net removals calculation?	Illustrative ex-ante estimation of emission reduction is made on the excel spreadsheet made available to AIE.		OK
<b>Approved CDM methodology approach only Paragraphs 47(a) – 47(b) Not applicable</b>				
<b>Environmental impacts</b>				
48 (a)	Does the PDD list and attach documentation on the analysis of the environmental impacts of the project, including transboundary impacts, in accordance with procedures as determined by the host Party?	<p>Environmental impact assessment (EIA) is made in the designed documentation listed in the PDD. Information about impact upon atmospheric air, surface and ground waters, environmental monitoring and environmental consequences of the project implementation is summarised in Section F.1.</p> <p><b>RFI 04.</b> Please provide the Environmental impact assessment to the AIE.</p>	Pending	



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
48 (b)	If the analysis in 48 (a) indicates that the environmental impacts are considered significant by the project participants or the host Party, does the PDD provide conclusion and all references to supporting documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party?	The project received a positive conclusion of Glavgosexpertiza Rossii.  <b>RFI 05.</b> Please provide the Glavgosexpertiza conclusion to the AIE.	Pending	
<b>Stakeholder consultation</b>				
49	If stakeholder consultation was undertaken in accordance with the procedure as required by the host Party, does the PDD provide: (a) A list of stakeholders from whom comments on the projects have been received, if any? (b) The nature of the comments? (c) A description on whether and how the comments have been addressed?	The stakeholder consultation was not undertaken since it is not required by the local legal requirements.		OK
<b>Determination regarding small-scale projects (additional elements for assessment) Paragraphs 50 - 57 Not applicable</b>				
<b>Determination regarding land use, land-use change and forestry projects Paragraphs 58 – 64(d) Not applicable</b>				
<b>Determination regarding programmes of activities Paragraphs 66 – 73 Not applicable</b>				





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**Table 2 Resolution of Requests for Corrective Action (CAR), Forward Action (FAR), Clarification (CL) and Information (RFI)**

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1	Summary of project participant response	Determination team conclusion
<p><b>CAR 01.</b> The project has no written approvals by the Parties involved.</p>	19	N/A	Pending.
<p><b>CAR 02.</b> Under the JI specific approach, PDD does not apply the values of specific fuel consumption per MWh and GJ for theoretical description of ATPP under the baseline. These data are available from 6-tp statistical forms. Please justify conservativeness of the used JI specific approach. To do so please provide calculations of the baseline based on the available values of specific fuel consumption and compare the results with those received under the project approach. The same points of concern pertain to the description of ACHPP-2 in the project conditions.</p>	23	<p>In order to demonstrate the conservative nature of the JI specific approach to the baseline setting, let us take the minimum values of specific fuel consumption at ATPP over the past three years (2008) and use them to calculate the baseline consumption of natural gas at ATPP (See file #8). Then let us compare it with the results obtained using the JI specific approach. The calculations show that the results differ by as little as 0.1%, which demonstrates high accuracy and conservative nature of the calculation method chosen by the PDD developers.</p> <p>As for the calculation of the project emissions at ACHPP-2, here only heating mode of operation is considered, therefore it would be wrongful to use specific fuel consumption in general for the ACHPP-2, where the proportion of condensation-based generation is significant.</p> <p>However, even if we assume that the error of the method of fuel consumption calculation that we chose is 5% (let us increase additional consumption of natural gas by ATPP under the project by 5%), the reductions shall decrease by as little as 0.8% (See file #8).</p>	CAR is closed based on the argumentation in the response and the additional data provided to the AIE.

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		<p>It follows from the above that the approach that was applied by the PDD-developers is sufficiently accurate and conservative.</p> <p>It should be noted that a justification of the new emission factor for the IES South was added to the PDD (See Annex 4) and corresponding amendments were made. The Excel file with calculations of the new emission factor has been provided to the AIE (file #10).</p>	
<p><b>CL 01.</b> Please clarify if the building of the connecting heating main between Astrakhan TPP and Astrakhan CHPP-2 is the part of the main contract and that the heating main will be commissioned together with the CPP. Please take note that if this is not the case, the sections of the old ATPP will have to partly cover the heat load and this will have to be reflected in the theoretical description of the project activity.</p>	-	<p><u>Response 1 dated 24/08/2011</u></p> <p>Building of the connecting heating main was financed out of the funds and on the commission of LUKOIL company division in view of the CCP construction project. Operational costs for this connecting main were laid upon ATPP.</p> <p>However investment costs were not included in the main project, because the construction of the CCP is carried out by E4 group, whereas the works related to building of the connecting main were carried out by a different company.</p> <p>It should be noted that the costs not being included in the calculation of the economic attractiveness of the project means that the approach to demonstrating the additionality is more conservative.</p> <p><u>Response 2 dated 25/08/2011</u></p> <p>Commissioning of the connecting main between ACHPP-2 and ATPP is scheduled for 30.09.2011, that is before the start of the heating period in Astrakhan (file #13).</p>	<p>Response 1 is not accepted</p> <p>The gist of the CL was to get confirmation that the heating main will be operational when CCP is commissioned. Please clarify this issue by providing relevant evidence.</p> <p>Response 2 is accepted.</p> <p>CL is closed based on provided information and documented evidence.</p>
<p><b>CL 02.</b> Please clarify why /a/ “it is important not to overestimate the value of ATPP electricity generation under the baseline” (PDD page 21);</p>	23	<p><u>Response 1 dated 24/08/2011</u></p> <p>/a/ As can be easily checked in the model that has been provided to the AIE, increase in this parameter will lead to increase in GHG emission reductions, therefore the PDD-developers in this</p>	<p><u>Response 1 is accepted</u></p> <p>CL will be closed when the clarification s of /a/-</p>



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<p>/b/ “it is a soundly conservative decision to set the baseline of annual electricity generation by ATPP at the actual level recorded in 2008” (PDD page 21);                  /c/ “the specific electricity generation based on heat supply at ATPP is assumed to be equal to the maximum average annual value recorded over 2008-2010” (PDD page 23);                  /d/ “the specific electricity generation based on heat supply at ACHPP-2 is assumed to be equal to the minimal average annual value recorded over 2008-2010” (PDD page 26);                  /e/ heat losses at the heating main between ACHPP-2 and ATPP were not taken into account.</p>	<p>case were proceeding from conservative considerations;                  /b/ As is indicated in the PDD, on page 21: “Annual electricity generation at ATPP over several years before 2008 (the year of the project start) was around 650 thousand MWh, and in some years exceeded 700 thousand MWh. However after the start of the project implementation and after it was decided to decommission the existing equipment after commissioning of the CCP (due to the existing constraints on the throughput of electric networks), the company management reduced the current expenses on repairs of old boiler and turbine equipment, paying special attention to the CCP construction project. Therefore from 2008 through 2010 annual electricity generation at ATPP had been gradually reducing from 574 to 429 thousand MWh (See Annex 2). However there is good reason to believe that in the absence of the project ATPP would continue to generate electricity in the amount approximately equal to the production level before the start of the project implementation”.                  Which means that the PDD-developers could have assumed the value of annual electricity generation at ATPP at the level of 650 thousand MWh, but chose to assume it at the level of 2008 (574 227 MWh), which is a more conservative decision.                  /c/ Decrease in this parameter leads to increase in GHG emission reductions, therefore the PDD- developers in this case were proceeding from conservative considerations.                  /d/ Increase in this parameter will lead to increase in GHG emission reductions, therefore the PDD-developers in this case were proceeding from conservative considerations.                  /e/ According to [E.Y.Sokolov. Cogeneration-based district heating and heating networks. - MEI, 2001, p.33] the coefficient of</p>	<p>/e/ are included in the PDD.                  Response 2 is accepted.                  CL is closed based on amendments made to the PDD.</p>
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	<p>losses during heat transportation via heating networks that were built earlier than 1990, may be 0.9-0.95. Considering that the project connecting main is built much later than 1990 using up-to-date thermal insulation it is fair to assume that this coefficient will be 0.95. Considering that using this coefficient in calculations causes changes in GHG emission reductions of less than 1% (See file #9), and considering that the heat losses in the connecting main are well offset by project-induced reduction in heat losses during supply of heat from ATPP in summer period, there is a good reason to neglect this parameter in our calculations.</p> <p><u>Response 2 dated 25/08/2011</u></p> <p>Corresponding clarifications for each of the items have been included in the PDD.</p>	
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<p><b>RFI 01.</b> Please provide the AIE a documented evidence of the above mentioned facts.</p>	-	<p><u>Response 1 dated 24/08/2011</u> All data on parameters and operation modes of the CCP as used in the PDD were assumed on the basis of the design documentation: "Reconstruction of Astrakhan TPP through construction of CCP-110MW". Section 1. Executive Summary. Volume 1. CJSC "Energokaskad", Moscow 2008. (Executive Summary has been provided to the AIE – file #7).</p> <p><u>Response 2 dated 25/08/2011</u> The list of the investment projects of RAO UES of Russia to be implemented as JI have been provided to the AIE (file #11). It is also available at: <a href="http://www.carbonfund.ru/projects/ps/">http://www.carbonfund.ru/projects/ps/</a></p> <p>A preliminary estimation of the GHG emission reduction potential of the project has been provided to the AIE (file #12).</p>	<p><u>Response 1 is not accepted</u></p> <p>No documented evidence was provided as regards the facts as follows (refer to the Determination Protocol):</p> <p>The Astrakhan TPP reconstruction project of OJSC "TGC-8" was put on 25.06.2007 on the list of the investment projects of RAO UES of Russia to be implemented as JI. In 2007 a preliminary estimation of the GHG emission reduction potential of the project was made.</p> <p>RFI is closed</p>
<p><b>RFI 02.</b> Please provide the AIE a documented evidence of the input data (investment cost by years, tariffs for 2011, other process costs) used in the investment analysis.</p>	29 (b)	<p>Data for the investment analysis were assumed on the basis of the design documentation: "Reconstruction of Astrakhan TPP through construction of CCP-110MW". Volume 8. Feasibility study. CJSC "Energokaskad", Moscow 2008. (File #1)</p>	RFI is closed.
<p><b>RFI 03.</b> Please provide the AIE a documented evidence of the date.</p>	34 (a)	<p>Turnkey contract for works on the project "Reconstruction of Astrakhan TPP with installation of CCP-110MW", No.589 dated Feb-</p>	RFI is closed.



## Determination Protocol on JI project

“Reconstruction of Astrakhan TPP through construction of CCP-110, LLC “LUKOIL-Astrakhanenergo”, Russian Federation”

		<p>ruary 22, 2008;          Commissioning Permit for the CCP issued by Astrakhan City Administration, No. RU3030100-27 dated June 16, 2011, and Certificate of compliance for the constructed site. Construction and Housing Supervision Service of Astrakhan Region. Approved by the resolution of the Head of the Service, No. 46/11-R dated June 10, 2011 have been provided to the AIE.          (Files #2, 3 and 4 respectively).</p>	
<b>RFI 04.</b> Please provide the Environmental impact assessment to the AIE	48 (a)	Environmental impact assessment has been provided to the AIE (file #5).	RFI is closed.
<b>RFI 05.</b> Please provide the Glavgosexpertiza conclusion to the AIE.	48 (b)	Glavgosexpertiza conclusion has been provided to the AIE (file #6).	RFI is closed.
<b>Additional RFI 06.</b> To determine the value of IES South grid emission factor please provide the used OGRGES data.	N/A	<p><u>Response 1 dated 25/08/2011</u>          Data of ORGRES used for IES South grid emission factor calculation have been provided to the AIE.</p>	Data is received and verified. RFI is closed.