



RINA

GOLD STANDARD VALIDATION REPORT

Final

“Methane Gas Capture and Electricity Production at
Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria”
in
Bulgaria

Report N° 2015-BG-MD-02

Revision N° 1.3 Aa



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Project Title: Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria	Country: Bulgaria	Estimated VERs (tCO₂e): 70,276 annual average
Client: Sofiyska Voda AD	Client contact: Stanislav Stanev	
Report No.: 2015-BG-MD-02	Revision: 1.3 Aa	Date of this report: 27/05/2016
Approved by (Final Report – Authorized officer signing for the DOE):  Laura Severino		Date of approval: 31/05/2016

Methodology

Number:	Version:	Title:	Scale	SS(s):
AMS-I.C	20.0 of 01/06/2014	Thermal Energy Production with or without electricity	Small	01
AMS-III.H	17 of 28/11/2014	Methane recovery in wastewater treatment		13
SSM AMS-I.D	18 of 28/11/2014	"Grid connected renewable electricity generation"		01

RINA Services S.p.A. (RINA), commissioned by Sofiyska Voda AD, has performed the validation of the project activity "Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria" in Bulgaria, with regard to the relevant requirements for GS activities.

In conclusion, it is RINA's opinion that the project activity "Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant", in "Bulgaria", as described in the PDD version 03 of 10/11/2015, meets all relevant requirements for GS activities and all relevant host Party criteria and correctly applies the baseline and monitoring methodology "AMS-I.C", "Thermal Energy Production with or without electricity", version 20 of 01/06/2014 and AMS-III.H, Methane recovery in wastewater treatment, version 17 of 28/11/2014.

Work carried out by:

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Stefan MANEV – Technical expert / Local Expert
Stefan MANEV – Financial Expert



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Rita Valoroso



Keywords:

Climate Change, Kyoto Protocol, Validation, Gold Standard



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Abbreviations

BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM M&P	Modalities and Procedures CDM
CDM-PCP	Clean Development Mechanism Project Cycle Procedure
CDM-PS	Clean Development Mechanism Project Standard
CDM-VVS	Clean Development Mechanism Validation and Verification Standard
CH ₄	Methane
CR	Clarification Request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CRT	Coordination and Technical Control Staff
DCI	Certification Division of RINA Services Spa
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG(s)	Greenhouse gas(es)
GS	Gold Standard
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
LSC	Local Stakeholder Consultation
MoV	Means of Verification
MP	Monitoring Plan
MR	Monitoring Report
NGO	Non-governmental Organization
ODA	Official Development Assistance
PDD	Project Design Document
PE	Project Emission
PP(s)	Project Participant(s)
Ref.	Document Reference
RINA	RINA Services Spa
SD	Sustainability Development
SMP	Sustainability Monitoring Plan
SS(s)	Sectoral Scope(s)
UNFCCC	United Nations Framework Convention on Climate Change
VER	Voluntary Emission Reduction
MOEW	Ministry of Environment and Water
WWTP	Waste Water Treatment Plant

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1 INTRODUCTION

Sofiyska Voda AD has commissioned RINA to carry out the validation of the “Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria” project in Bulgaria.

This report summarizes the findings of the validation of the project, performed on the basis of GS VER requirements, which refer to CDM rules, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

The objective of the Validation is to have an independent evaluation of a project activity by a designated operational entity against the requirements of the GS VER as set out in decision 3/CMP.1, its annex and relevant decisions of the COP/MOP, on the basis of the project design document. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC, GS requirements and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all GS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of verified emission reductions (VERs).

1.2 Scope

The validation scope is to review the PDD against the UNFCCC criteria for GS VER, which refer to CDM rules.

UNFCCC criteria for GS VER refer to Article 12 of the Kyoto Protocol, the GS VER modalities and procedures, and the subsequent decisions by the Gold Standard Foundation.

Validation is not meant to provide any consultancy towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

2 METHODOLOGY

Validation consisted of the following three phases:

- Document review;
- Follow-up actions;
- The resolution of outstanding issues and the issuance of the final validation report.

The following sections outline each step in more detail.

2.1 Document Review

The PDD /01/, in particular the applicability of the methodology, the baseline determination, the additionality of the project activity, the starting date of the project, the monitoring plan, the emission reduction calculations provided in the form of a spreadsheet, Svilosa Biomass Project LSC Report /21/, Svilosa Biomass Project IRR excel sheet /22/ and Svilosa Biomass Project GS Passport /23/ were assessed as part of the validation.

The following table lists the documentation that was reviewed during the validation.



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/01/	Sofiyska Voda AD: GS-PDD for project activity "Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria" in Bulgaria, version 02 of 07/07/2015, version 03 of 10/11/2015, version 04 of 02/02/2016 and ver. 05 of 30/03/2016
/02/	The Gold Standard: Requirements, version 2.2 of 1 June 2012
/03/	The Gold Standard: Toolkit and related Annexes (A – S), version 2.2 of 1 June 2012
/04/	CDM Executive Board: Baseline and monitoring methodology AMS-III.H "Methane recovery in wastewater treatment", version 17 of 28/11/2014
/05/	CDM Executive Board: Clean Development Mechanism Project Cycle Procedure, version 09 of 20/02/2015
/06/	CDM Executive Board: Clean Development Mechanism Project Standard, version 09 of 20/02/2015
/07/	CDM Executive Board: Validation and Verification Standard, version 09 of 20/02/2015
/08/	CDM Executive Board: Baseline and monitoring methodology "AMS-I.C", "Thermal Energy Production with or without electricity", version 20.0 of 01/06/2014
/09/	CDM Executive Board: Tool for the demonstration and assessment of additionality, version 07.0 of 23/11/2012
/10/	CDM Executive Board: Methodological Tool "Tool to calculate project or leakage CO ₂ emissions from fossil combustion", version 02 of 02/08/2008
/11/	CDM Executive Board: Methodological Tool "Tool to calculate baseline, project and/or leakage emissions from electricity consumption", version 01 of 16/05/2008
/12/	CDM Executive Board: Methodological Tool "Tool to determine the remaining lifetime of equipment", version 01 of 16/10/2009
/13/	CDM Executive Board: Indicative simplified Baseline and Monitoring Methodologies for selected Small-Scale CDM Project activity categories, version 03 of 28/05/2009
/14/	CDM Executive Board: Guidelines on the demonstration of additionality of small-scale project activities, version 09.0 of 20/07/2012
/15/	CDM Executive Board: General Guidelines for SSC CDM Methodologies, version 21.0 of 28/11/2014
/16/	CDM Executive Board: Guidelines on the assessment of investment analysis, version 05 of 15/07/2011
/17/	CDM Executive Board: Methodological Tool "Emissions from solid waste disposal sites", version 07 of 16/04/2015
/18/	CDM Executive Board: Methodological Tool "Project emissions from flaring", version 02 of 20/07/2012
/19/	CDM Executive Board: Methodological Tool "Project and leakage emissions from anaerobic digesters", version 01 of 02/03/2012
/20/	CDM Executive Board: Project Design Document Form for Small – Scale CDM project activities, version 05.0 of 25/06/2014
/21/	Sofiyska Voda AD: Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria Project LSC Report version 2 of 28/07/2015
/22/	Sofiyska Voda AD: Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria Project IRR excel sheet, version 01 of 07/07/2015 and version 02 of 10/11/2015
/23/	Sofiyska Voda AD: Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria Project GS Passport version 02 of 29/07/2015, version 03 of 16/11/2015, version 04 of 02/02/2016, ver. 05 of 31/03/2016 and ver. 06 of 26/05/2016
/24/	Sofiyska Voda AD: Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria Project EF calculation excel sheet, version 01 of 07/07/2015 and version 02 of 10/11/2015
/25/	Sofiyska Voda AD: Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria Project VER calculation excel sheet, version 01 of 30/04/2015, version 02 of 30/09/2015 and ver. 03 of 30/03/2016
/26/	Rational Energy Utilisation and Financing Plan for Sofiyska Voda Jsc Energy Efficiency Project: Annexes - Project Cost Breakdown; Monthly Cash Flow and Long-Term Debt; Risk

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	and Sensitivity Analyses; Audited Financial Statements, Offers and Contracts for Project Implementation; Calculation Models of April 2008
/27/	EBRD Energy Efficiency and Renewable Energy Credit Line Support and Rational Energy Utilisation Plan No. 129 for Sofiyska Voda Renewable Energy Project: Construction of CHP for biogas utilization of April 2008
/28/	Sofiyska Voda AD and European Bank for reconstruction and development, for the account of the Netherlands: Netherland emission reduction co – operation fund emission reduction purchase agreement of 21/09/2007
/29/	Sofiyska Voda AD: Flow diagram – WWTP Kubratovo
/30/	Sofiyska Voda AD: Technical data and schemes of WWTP Kubratovo
/31/	Bulgarian Accreditation Agency: Sofiyska Voda AD Laboratory reaccreditation Order 110 of 06/03/2014 and Certificate for Accreditation valid up to 06/03/2018
/32/	Sofiyska Voda AD: monthly measuring data of wastewater in the outlet of the WWTP for April, June and May 2015
/33/	Sofiyska Voda AD: Waste Water Measuring Protocol of 07/07/2015
/34/	Sofiyska Voda AD: Internal Monitoring Plan
/35/	SGS Laboratory: Sludge measuring Protocols numbers 488 – 490 of 22/05/2014; 1030 – 1032 of 29/07/2014; 1675 – 1677 of 30/09/2014 and 2318 – 2320 of 19/11/2014
/36/	Ministry of Environment and Water of Bulgaria: Letter of Support 26-00-1543 of 27/05/2014 for the project activity: Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria
/37/	Ministry of Environment and Water of Bulgaria: Letter of Approval of JI Project “Methane gas capture and electricity production at Kubratovo WWTP” of 01/08/2007
/38/	Ministry of Environment and Water of Bulgaria: Permission for wastewater discharge into surface water N 1295 of 14/04/2014
/39/	“HESPA” Laboratory: Protocols NN 51-53 of 21/11/2014 for own air emission measurement covering the three co - generators and additional two power generators available on-site
/40/	The State of Netherlands: Declaration of Approval of JI Project “Methane gas capture and electricity production at Kubratovo WWTP” of 10/07/2007
/41/	Website: http://cdm.unfccc.int/ Argument: Rules and References, Methodologies, etc. Language: English Retrieved on: 10/09/2015
/42/	Website: http://www.goldstandard.org/ Argument: Rules and References, Methodologies, etc. Language: English Retrieved on: 10/09/2015
/43/	Website: http://www.oecd.org/ Argument: DAC List of ODA Recipients Language: English Retrieved on: 10/09/2015
/44/	Website: http://www.moew.government.bg/?&lang=en Argument: Environmental laws and requirements Language: English Retrieved on: 10/09/2015
/45/	RINA: contract with company Sofiyska Voda AD of 16/07/2015
/46/	Ministry of Environment and Water of Bulgaria: Letter that an EIA is not needed for the project N 49-11 of 12/01/2000
/47/	Ministry of Environment and Water of Bulgaria: Letter of approval of JI Project “Methane gas capture and electricity production at Kubratovo WWTP” issued on 03 August 2007
/48/	TUV SUD: Determination Report N 743691 of 25/01/2006
/49/	Sofiyska Voda AD: Project List of employees (names, work position, town of living and type of contract) version 1 of 10/09/2015 (total of 27 employees)
/50/	Sofiyska Voda AD: Collective Labour Agreement version 1 of 10/06/2015 and Internal Labour Agreement
/51/	Sofiyska Voda AD: Contract 5825 of 30/04/2013 with company “AB Consult” for H&S risk



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	assessment and H&S consultation
/52/	Sofiyska Voda AD: Risk Assessment on working places covering the project activity documented in May 2014
/53/	TUV NORD Certificate covering BS OHSAS 18001:2007 (Occupation Health and Safety Management system), issued on 16/01/2015
/54/	TUV NORD Certificate covering EN ISO 14001:2004 (Environmental Management system), issued on 16/01/2015
/55/	Sofiyska Voda AD and Municipality of Sofia Concession Agreement, dated on 29/03/2002
/56/	EPC Contract between companies Sofiyska Voda AD and Pazel Finance and Leasing for Co – generators of 09/04/2008
/57/	Sofiyska Voda AD: Health and Safety Instruction for working in WWTP of 20/12/2013
/58/	CDM Executive Board: Tool to calculate the Emission Factor for an electricity system, ver. 04 of 04/10/2013
/59/	CDM Executive Board: SSM AMS-I.D “Grid connected renewable electricity generation”, ver. 18 of 28/11/2014
/60/	Website: http://www.sofiyskavoda.bg/CustomPages.aspx?PageID=41 Argument: Grievance Mechanism of Sofiyska Voda Language: English Retrieved on: 10/09/2015
/61/	Website: http://www.tso.bg/ Argument: Electricity System Operator (ESO) - EF of the GRID / GRID data Language: English Retrieved on: 10/09/2015
/62/	The Gold Standard: Revision in the rules and requirements for Prior Consideration of Carbon Revenues for GS-VER projects of 22 January 2015
/62/	CDM Methodological Tool “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period”, Version 03.0.1 of 02/03/2012
/63/	Website: http://www.ilo.org/gateway/faces/home/ctryHome?locale=EN&countryCode=BGR&regionId=5&_adf.ctrl-state=v5fmbpgay_23 Argument: International Labour Organization Language: English Retrieved on: 06/01/2015
/64/	Website: http://www.mlsp.government.bg/bg/index.asp Argument: Ministry of Labour and Social Policy of Republic of Bulgaria Language: Bulgarian Retrieved on: 06/01/2015
/65/	Website: http://oecd.org/ Argument: Better Policies for better Lives Language: English Retrieved on: 06/01/2015
/66/	EBRD Energy Efficiency and Renewable Energy credit line support: Rational Energy Utilisation Plan N 129 for construction of CHP for Biogas Utilisation of April 2008
/67/	Website: http://en.wikipedia.org/wiki/Capital_asset_pricing_model Argument: CAPM formula Language: English Retrieved on: 06/01/2015
/68/	Website: http://www.bnb.bg/bnbweb/groups/public/documents/bnb_publication/public_bnb_p_gssm_200806_en Argument: BG government bonds Issue number BG 20 400 08 216 Language: English Retrieved on: 06/01/2015
/69/	Website: https://www.google.bg/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CB4QFjAAahUKEwjR1vW_AzNDIAhXMCCwKHZv1A8c&url=http%3A%2F%2Fwww.stern.nyu.edu%2F~adamodar%2Fpc%2Farchi-ves%2Fbetas08.xls&usq=AFQjCNG7SmjG5Jo3gRXA0GE2zTvEo0cG6w



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	Argument: Average Beta value Argument: GHG data Language: English Retrieved on: 06/01/2015
/70/	Website: http://data.worldbank.org/indicator/FR.INR.RISK?page=1 Argument: Market risk premium for Bulgaria Language: English Retrieved on: 06/01/2015
/71/	Sofiyska Voda AD: Accounting records for the period 2007-2008
/72/	Website: http://www.bnb.bg/Statistics/StExternalSector/StExchangeRates/StERForeignCurrencies/?toLang= EN Argument: Bulgarian National Bank, exchange rate BGN/EUR Language: English Retrieved on: 06/01/2015
/73/	Nuclear Power Station in Bulgaria "AEC KOZLODUJ": Report January – February 2009 (available in Bulgarian) and annual Report covering 2009
/74/	Website: http://www.nsi.bg/en/content/5062/electricity-generated-renewable-sources Argument: Bulgarian National Statistical Institute – Electricity generated from renewable sources and production and delivery of electricity 2007-2015 Language: English Retrieved on: 06/01/2015
75	Sofiyska Voda AD: Four verification Reports during JI Phase: period from 2007 to 2009 – made by Bureau Veritas and the period of years: 2010, 2011 and 2012 made by RINA
/76/	Website: http://www.ipcc-nggip.iges.or.jp/public/2006gl/ Argument: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Language: English Retrieved on: 06/01/2015
/77/	E-mail from GS (Mrs. Neha Rao dated 14/04/2015)
/78/	Website: http://www.sofiyskavoda.bg/SVDocuments/2007_IAS_Bg_Consolidated.pdf and http://www.sofiyskavoda.bg/SVDocuments/Konsolidiran%20finansov%20otchet%20za%202008.pdf Argument: Independent financial auditing reports (2007 & 2008) for Sofiyska voda AD prepared by KPMG/ Language: Bulgarian Retrieved on 06/01/2015
/79/	Sofiyska voda-plant operational records for 2012.

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2.2 Follow-up actions

On 10/09/2015, RINA visited Village of Kubratovo to resolve questions and issues identified during the document review and to perform interviews with relevant stakeholders in the host country.

The key personnel interviewed and the main topics of the interviews are summarized in the table below.

	Date	Name and Role	Organization	Topic
/a/	10/09/2015	Alexandar Petrov – stakeholder	Village Benkovski citizen	Local citizens attitude; Contribution of the project to the local citizens; Complains;
/b/	10/09/2015	Ivailo Donchev – stakeholder	Village Benkovski citizen	Local citizens attitude; Contribution of the project to the local citizens; Complains;
/c/	10/09/2015	Eng. Boris Preslavski – Chief Engineer	Sofiyska Voda AD	Organization scheme and responsibilities; Data collecting and archiving; Technical specification of digesters and co - generators; Construction process and technical site details; Implementation schedule, Environmental responsibilities and fulfilment of legal requirements; Social Responsibilities and communication with local citizens; Calibration and maintenance of the used monitoring equipment; data collecting and archiving.
/d/	10/09/2015	Milena Bankova – Environmental specialist	Municipality of Sofia – Region of Novi Iskar	Local citizens attitude; Contribution of the project to the local citizens; Complains; Environmental responsibilities and fulfilment of legal requirements; Social Responsibilities and communication with local citizens;
/e/	10/09/2015	Tanya Petrova – Environmental specialist	Municipality of Sofia – Region of Serdika	Local citizens attitude; Contribution of the project to the local citizens; Complains; Environmental responsibilities and fulfilment of legal requirements; Social Responsibilities and communication with local citizens;
/f/	10/09/2015	Ulia Markova – OH&S	Sofiyska Voda AD	Roles, responsibilities, training and legal health and safety requirements; Risk assessments and safety instructions, complains

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/g/	10/09/2015	Rosen Tashev – digester Installation	Sofiyska Voda AD	Calibration and maintenance of the used monitoring equipment; data collecting and archiving; technical details
/h/	10/09/2015	Nadia Atanasova – digester Installation	Sofiyska Voda AD	Calibration and maintenance of the used monitoring equipment; data collecting and archiving; technical details
/i/	10/09/2015	Alexandar Manolov – Co-generation Installation	Sofiyska Voda AD	Calibration and maintenance of the used monitoring equipment; data collecting and archiving; technical details
/k/	10/09/2015	Veselin Vinim – el. Station	Sofiyska Voda AD	Calibration and maintenance of the used monitoring equipment; data collecting and archiving; technical details
/l/	10/09/2015	Viktor Milkov – consultant	Green Carbon Bulgaria	PDD detailed sections discussion; Monitoring data; GHG Emission reduction estimation and calculations; Baseline and Project emission estimations; Investment Analysis data and estimations. GS Passport and GS LSC Report detailed sections discussion; Safeguarding principles; SD indicators and Sustainability MP

2.3 Resolution of outstanding issues

The objective of this phase of the validation is to resolve any outstanding issues which need to be clarified for RINA's positive conclusion on the project design.

To guarantee transparency a validation protocol has been customized for the project. The protocol shows in a transparent manner the requirements, means of validation and the results from validating the identified criteria. The validation protocol consists of three tables; the different columns in these tables are described in the figure below (see Figure 1). The completed validation protocol is enclosed in Appendix A to this report.

A corrective action request (CAR) is raised if one of the following occurs:

- The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions.
- The GS VER requirements have not been met.
- There is a risk that the emission reductions cannot be monitored or calculated.

A clarification request (CR) is raised if information is insufficient or not clear enough to determine whether the applicable GS VER requirements have been met.

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Figure 1 Gold Standard Validation protocol tables

Validation Protocol, Table 1 - Requirement checklist				
Checklist Question	Ref.	MoV	Comments	Conclusion
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organized in five different sections.	Makes reference to documents where the answer to the checklist question or item is found.	Explain how conformance with the checklist question is investigated. Examples are document review (DR), interview or any other follow-up actions (I), cross checking (CC) with available information relating to projects, (N/A) means not applicable.	The discussion on how the conclusion is arrived at and the conclusion on the compliance with checklist question so far.	For CAR, CL and FAR see the definitions above. OK is used if the information and evidence provided is adequate to demonstrate compliance with CDM/GS requirements.

Validation Protocol, Table 2 - Resolution of Corrective Action Requests and Clarification			
Corrective action requests and/or clarification requests	Reference to Table 1	Response by project participants	Validation Conclusion
The CAR and/or CLs raised in table 1 are repeated here.	Reference to the checklist question number in Table 1 where the CAR or CL is explained.	The responses given by the project participants to address the CARs and/or CLs.	The validation team's assessment and final conclusion of the CARs and/or CLs.

Validation Protocol, Table 3 - Forward Action Requests (if no FAR the table 3 is deleted)		
Forward action request	Reference to Table 1	Response by project participants Validation Conclusion
The FAR raised in table 1 is repeated here.	Reference to the checklist question number in Table 1 where the FAR is explained.	Response by the project participants on how forward action request will be addressed prior to first verification.

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2.4 Internal quality control

The final draft validation report before being submitted to the client were subjected to an independent internal technical review to confirm that all validation activities had been completed according to the pertinent RINA instructions.

The technical review was performed by a technical reviewer(s) qualified in accordance with RINA's qualification scheme GS VER validation and verification.

2.5 Validation team and the technical reviewer(s)

The validation team and the technical reviewers consist of the following personnel:

Role/Qualification	Last Name	First Name	Country
Team Leader GS	RACHEV	Konstantin	Bulgaria
GS Validator	RACHEV	Konstantin	Bulgaria
Technical Expert GS (SS 01)	MANEV	Stefan	Bulgaria
Technical Expert GS (SS 13)	RACHEV	Konstantin	Bulgaria
Financial Expert	MANEV	Stefan	Bulgaria
Technical Reviewer	Menon	Rekha	India

3 VALIDATION FINDINGS

The findings of the validation related to the project, as described in the PDD /01/, are stated in the following sections.

The validation requirements, the means of validation and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

3.1 Participation

The project's host Party and Annex I country is Republic of Bulgaria. Host Country and Annex I country fulfil the requirements to participate in the GS VER. Republic of Bulgaria ratified the Kyoto protocol and established a DNA as the participating requirements for GS VER under the Kyoto Protocol. Host Country ratified the Kyoto Protocol on 12/05/1995 and established as DNA Ministry of Environment and Water (MOEW) as per the UNFCCC website /41, 44/.

The project participant is a private company (Sofiyska Voda AD - Project owner) from Republic of Bulgaria. The project participant is correctly listed in table A.4 of the PDD and the information is consistent with the contact details provided in Appendix 1 of the PDD /01/. Sofiyska Voda AD possesses a Concession Agreement for the operation and maintenance of Sofia's sewerage system and WWTP /55/.

3.2 Project design document and Gold Standard Passport

The PDD for the project activity "Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria", in "Bulgaria" /01/ and the Gold Standard Passport /23/ submitted by the Sofiyska Voda AD have been the basis for the validation process.

RINA confirms that the above PDD is based on the currently valid PDD template and is completed in accordance with the applicable guidance document /20/ and the Gold Standard Passport /23/ is in accordance with the latest version of the Gold Standard Requirements, version 2.2 /02 - 03/.

The main changes between the PDD version 02 of 07/07/2015 published for GSC and the PDD version 05 of 30/03/2016 submitted for registration are the following:

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Section of the PDD	Description and reason for changing the information in that section
Section A	Wrong information concerning major dates of the project implementation and operational life time of the project
Section B	Wrong information from the applied Tools and GS requirements; not usage of the latest information OM EF calculation; missing and wrong data for Investment Analysis calculations; common practise analysis evidences; missing and presented wrong information for GS indicators; wrong information for EF and ER calculations; missing data for the implemented project responsibilities, etc. Closing of GS feedback round comments

3.3 Project Design

Purpose and general description of the project activity

The host country is Republic of Bulgaria, which is Annex I country. Gold Standard VER project activities may be located in any host country or state. However, where host countries or states have caps on GHG emissions, projects shall only be eligible if the Project Representatives have provided satisfactory assurances that an equivalent amount of allowances are retired to back up the GS VERs issued. For that reason the PP presents to the DOE the issued Letter of Support /36/ and the required GS documentation as per the GS requirements ver. 2.2 /02 - 03/. The project activity is a retroactive GS VER validation activity. The project activity is a fast track project validation.

The project was initially developed and registered as a Joint Implementation (JI) project with the support of the European Bank for Reconstruction & Development (EBRD) and started operation in 2007. The project was determined positively by TUV SUD /48/ and received a Letter of Approval by the MOEW of Bulgaria /47/. Since 01 Jan 2007 the plant that was built under the project has been in regular operation. For the period until the end of the first Kyoto period (31 Dec 2012) the project has undertaken 4 successful verifications. During this GS Validation phase it can be stated that the baseline scenario is still valid and correspond to the applicable legal requirements. The project is both a methane emissions reduction and energy production project.

The purpose of the project is to utilise the available renewable energy sources in the form of biomass received as a result from sludge treatment by the town of Sofia Municipality wastewater treatment plant, located in the Kubratovo (Kubratovo WWTP). Methane produced in Kubratovo WWTP is captured in common methane tanks (four digesters for anaerobic sludge treatment) serving as a buffer and then supplied to the newly installed CHP gas engines (three co-generations sets) for electricity and heat production, which in turn will substitute both the plant's electricity purchases from the grid and diesel fuel usage. Excess electricity is supplied to the grid.

The main purpose of the project is to transform the existing low tech sludge treatment process at Kubratovo WWTP that existed before implementation of the project into an advanced treatment process matching the best sludge treatment practice available. The project replaces the baseline sludge drying beds and landfill sludge options disposal with mesophilic digestion of all primary and secondary sludge followed by mechanical dewatering in order to reduce GHG emissions.

Project location

The project activity is situated in the Sofia region, near the village of Kubratovo, Bulgaria. The village of Kubratovo is located some 20 km outside the centre of Sofia, the capital of Bulgaria. The designations of geographical coordinates are correctly stated in the PDD /01/ and Passport /23/, which are verified through Google Earth.

The geographical coordinates of the project are: Latitude - 42°45'10.70"N and Longitude - 23°22'11.56"E

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Scenario existing prior to the implementation of the project activity

Initially the sludge resulted from the wastewater treatment plant system has been dewatered and deposited in special sludge drying beds to stabilise for 15 to 18 months period and after that has been deposited to a landfill. The main purpose of the project was to transform the existing low tech sludge treatment process at Kubratovo WWTP into a modern advanced treatment process matching the best sludge treatment practice available in Western Europe. This transformation has a major effect on the environment through dramatically reducing the existing methane gas emissions at the plant while also reducing the volume of sludge that needs to be transported, hence reducing GHG emissions from transportation as well (not included in GHG abatement calculations). The project activity replaced the traditional sludge drying beds and landfill options with mesophilic digestion of all primary and secondary sludge followed by mechanical dewatering in order to reduce GHG emissions. This effectively mitigates odour problems from the existed treatment of sludge and sludge liquors through introduction of digestion installation.

The project also covered production of electricity and heat from utilisation of the biogas in CHP gas engines thereby reducing GHG emissions from electricity production by the grid. Prior to the implementation of the project activity the thermal energy has been generated by on-site fossil fuel (natural gas for the new crediting period) boilers and the electric energy has been imported from the National grid. Prior to the implementation of the project activity Kubratovo WWTP did not possess any systems for generation and recovery of biogas.

Technology(ies) employed

The four digesters are fed with a mixed sludge from the primary settlement tanks and the secondary sludge (surplus sludge) from the biological treatment unit of the Kubratovo WWTP. Mixing of the two types of sludge is realised in the sludge mixing chamber where the mixing produce a homogenised mixed sludge, which then is pumped into the digesters. The project activity has been erected new anaerobic digester system consisting of 4 digesters, 7,000 m³ each, designed, supplied and erected by PASSAVANT ROEDIGER Anlagenbau /30/. The used CHP comprises of 3 new co-generation sets GE JMS 320 GS-B.LC with 1,063 kW electric capacity and 1,088 kW thermal capacity each, for generation of electric and thermal energy by combusting biogas from the digesters /56/.

The electric energy generated is used to cover the plant's need of electricity and replaces the energy supplied from the grid in the baseline. The thermal energy generated by the CHP is also used for internal needs and replaces the thermal energy that would have been generated by the on-site fossil fuelled hot water boilers. An emergency flaring system has been implemented, consisting of 2 x DN150 flares, type Passavant - Roediger FAVAE (enclosed) /30/.

Project implementation

The project had been implemented in two stages: First face has covered erection of a new digester system consisting of 4 digesters and the second has covered erection of 3 new co-generation sets GE for generation of electric and thermal energy by combusting biogas from digesters. The digesters have been commissioned and entered into operation in May, 2008 and the CHP installation has been commissioned and started generating electricity and thermal energy for plant's needs in November, 2009. /27, 56, 66/

The project was initially developed and registered as a Joint Implementation (JI) project with the support of the European Bank for Reconstruction & Development (EBRD) and started operation in 2007 /27-28/. The project was determined positively by TUEV SUD with Determination Report No 743691, dated 25 January 2006 /48/ and received a Letter of Approval by the Ministry of Environment and Water of Bulgaria dated 03 August 2007 /47/.

After the successfully registration as JI Project all verifications in Kyoto Protocol period have been conducted. After the end of the KP, the PP started searching new possibilities for the project registration in voluntary market. A consultant for project evaluation and registration was chosen /01/. The project was also supported from the MOEW for further development into the voluntary scheme and issued a Letter of Support /36/.

Crediting period and estimated Emission Reductions

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The chosen crediting period is 7 years (renewable). The estimated annual average emission reduction is 70,276 tCO₂ and the total ER for the crediting period is estimates as 491,932 tCO₂ /01 and 25/

The start date of the project activity is the date of the opening of the construction site, which was on 07/09/2004 as per the Appendix 7 of the PDD (01) and Determination Report /48/. The expected operational life time of the project is 25 years, as per the Determination Report /48/. The start date of this crediting period as per the GS requirements is two years prior the date of the registration by the Gold Standard Foundation.

Contribution to sustainable development

The project uses non carbon technology and is helping to reduce greenhouse gas emissions (CH₄ and CO₂) in compared to business-as-usual scenario, created local employment (27 employees) /49/ and reduce other pollutants resulting from fossil fuel dependent power generation industry in host country. Methane emissions are also captured and destroyed. The sludge that comes after the project is measured for hazardous elements /35/ and is transported as fertilizers used in agriculture purpose. In the project total of 27 people are employed /49/ and the necessary permission is issued /34, 38/. The attitude of the local competent authorities and local people are positive /a/, /b/, /d/, /e/.

RINA was able to verify all the documented evidence listed above during the validation process and can confirm that data and considerations are complete and accurate. Moreover RINA confirms that the description of the proposed GS project activity, as contained in the PDD sufficiently covers all relevant elements, is accurate and complete and that it provides the reader with a clear understanding of the nature of the proposed GS project activity.

3.4 GS criteria – project type eligibility screen

The project activity (Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria) is a small scale renewable energy project (GS-VER) as per definition in the GS Requirements. The project gases eligible for credits is Carbon Dioxide (CO₂) and Methane (CH₄).

- Scale of project activity:

The project is a small-scale project activity – The CHP comprises of 3 new co-generation sets GE JMS 320 GS-B.LC with 1,063 kW electric capacity and 1,088 kW thermal capacity each /01, 56/. The capacity was also verified on the unit nameplates.

- Host country or state:

The host country is Republic of Bulgaria /01/. Bulgaria has ratified the KP in 2002 /41, 44/. The Republic of Bulgaria is also used a Letter of support for this project GS registration approval /36/.

- Type of project activity

The project is Renewable Energy Supply (Waste handling and disposal project (biogas)) category, which is defined as the generation and delivery of energy services (electric and thermal) from non-fossil and non-depletable energy sources. /01/.

- Greenhouse Gases

The project gases eligible for credits is Carbon Dioxide (CO₂) and Methane (CH₄) /01/

- Official Development Assistance (ODA)

The ODA declaration (Appendix 2 of the PDD) is signed and presented to the DOE, dated on 30/10/2015 /01/

- Project timeframe

The project activity is a retroactive project registration type /01/; /21, 23/

- Other Certification Schemes

The project activity does not benefit from other Certification Schemes

The project activity is a Fast Track project

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3.5 GS Criteria - Pre-feasibility assessment

The project is a Fast Track Project Activity. The GS has reviewed the applied project activity and some additional information is required from the selected DOE, as follows:

GS Comment / Request 1

The DOE shall check all the reference sources used in the calculation of grid emission factor.

DOE answer:

The most recent available data at the time of GS submission is used to calculate the grid emission factor and all the reference sources used in the calculation of grid emission factor is being applied /01/, /24/, /58/, /59/, /61/, /73/, /74/.

GS Comment / Request 2

The **PP** shall share all the evidences and reference sources for investment analysis with the DOE. The **DOE** shall validate the same and include it in the GS validation report.

DOE answer:

All evidences and reference sources concerning investment analysis during the validation phase is being validated and crosschecked /01/, /22/, /26/, /27/, /28/, /56/, /62/, /66/, /67/, /68/, /69/, /70/, /71/, /72/.

GS Comment / Request 3

The **PP** shall demonstrate that carbon revenues were seriously considered at the time of project decision making by following the latest available CDM guidelines on demonstration of carbon revenues. The **DOE** shall validate all the reference sources and provide their opinion in the GS validation report.

DOE answer:

All the references sources and all applicable CDM guidelines and data have been validated and assessed through this Validation Report.

GS Comment / Request 4

The **DOE** shall interview employees working at the project site to validate the low risk level identified for Safeguarding Principle No. 4, 5, 6 and 7.

DOE answer:

The request was conducted during the on – site visit of the project and the findings are presented in Table 1, point B.4.7.1. In conclusion it can be stated that the risk level is assessed by the competent authority from insignificant to acceptable.

3.6 Application of selected baseline and monitoring methodology

The project applies approved CDM Methodologies AMS-III.H “Methane recovery in wastewater treatment”, version 17 of 28/11/2014, AMS-I.C”, “Thermal Energy Production with or without electricity”, version 20.0 of 01/06/2014 /04, 08/ and SSM AMS-I.D “Grid connected renewable electricity generation”, ver. 18 of 28/11/2014 /59/. The applicability conditions of the selected methodology are detailed assessed in Section B.1.3 in Appendix A. The project is both a methane emissions reduction and energy production project.

The purpose of the project is to utilise the available renewable energy sources in the form of biomass received as a result from the wastewater treatment in the Kubratovo WWTP. Methane produced in

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Kubratovo WWTP is captured in common methane tanks (four digesters for anaerobic sludge treatment) serving as a buffer and then supplied to the newly installed CHP gas engines (three co-generations sets) for electricity and heat production, which in turn will substitute both the plant's electricity purchases from the grid and diesel fuel usage. Excess electricity is supplied to the grid.

The greenhouse gasses and emission sources are defined for the project activity and the baseline scenario. According to the applied methodologies AMS-I.C /08/, SSM AMS-I.D /59/ and AMS – III.H /04/ the CO₂ and CH₄ gases are applicable for this project activity.

The project correctly applies the approved baseline and monitoring methodologies /04 and 08/.

The project activity also applies the following methodological tools:

- CDM Executive Board: Tool for the demonstration and assessment of additionality, version 07.0 of 23/11/2012 /09/
- CDM Executive Board: Methodological Tool “Tool to calculate project or leakage CO₂ emissions from fossil combustion”, version 02 of 02/08/2008 /10/
- CDM Executive Board: Methodological Tool “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”, version 01 of 16/05/2008 /11/
- CDM Executive Board: Methodological Tool “Tool to determine the remaining lifetime of equipment”, version 01 of 16/10/2009 /12/
- CDM Executive Board: Indicative simplified Baseline and Monitoring Methodologies for selected Small-Scale CDM Project activity categories, version 03 of 28/05/2009 /13/
- CDM Executive Board: Guidelines on the demonstration of additionality of small-scale project activities, version 09.0 of 20/07/2012 /14/
- CDM Executive Board: General Guidelines for SSC CDM Methodologies, version 21.0 of 28/11/2014 /15/
- CDM Executive Board: Guidelines on the assessment of investment analysis, version 05 of 15/07/2011 /16/
- CDM Executive Board: Methodological Tool “Emissions from solid waste disposal sites”, version 07 of 16/04/2015 /17/
- CDM Executive Board: Methodological Tool “Project emissions from flaring”, version 02 of 20/07/2012 /18/
- CDM Executive Board: Methodological Tool “Project and leakage emissions from anaerobic digesters”, version 01 of 02/03/2012 /19/
- CDM Executive Board: Tool to calculate the Emission Factor for an electricity system, ver. 04 of 04/10/2013 /58/
- CDM Methodological Tool “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period”, Version 03.0.1 of 02/03/2012 /62/

RINA hereby confirms that the selected baseline and monitoring methodologies have been previously approved by the CDM Executive Board/GS Board, and is applicable to the Project, which complies with all the applicability conditions therein and the selected version is valid at the time of submission of the proposed project activity for registration. It is also confirmed that the methodologies are correctly applied by comparing it with the actual text of the applicable version of the methodology.

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3.7 Project boundary and baseline identification

3.7.1 Project boundary

According to the approved baseline and monitoring methodologies approved CDM Methodologies AMS-III.H “Methane recovery in wastewater treatment”, version 17 of 28/11/2014, AMS-I.C”, “Thermal Energy Production with or without electricity”, version 20.0 of 01/06/2014 /04, 08/ and SSM AMS-I.D “Grid connected renewable electricity generation”, ver. 18 of 28/11/2014 /59/ the project boundary includes methane gas capture and electricity and thermal production used for own needs. Only excess electricity will be distributed to the National Grid.

Emissions sources included in the project boundary are shown in the table below:

	GHGs involved	Description
Baseline emissions	CO ₂ and CH ₄	Methane is a major source of emissions in the baseline from sludge pits and landfill (decay of organic matter in anaerobic conditions). The project activity involves the installation of a new grid-connected renewable power unit, whereas the baseline scenario is the electricity delivered to / consumed from the grid that, in the absence of the project, would have been generated by the operation of grid-connected power plants and by the addition of new generation sources. The thermal energy would have been generated by using light oil in the thermal boiler in the baseline scenario in the absence of a cogeneration plant and using biogas as a fuel.
Project emissions	CO ₂ and CH ₄	Fugitive emissions due to inefficiencies in capture systems and Methane emissions from incomplete flaring. Use of light oil as fuel in case of emergency cases when biogas is not generated
Leakage	n/a	All leakage emissions are regarded as project emissions

Emission sources which are not addressed by the applied methodologies and which are expected to contribute more than 1% of the overall expected average annual emissions reduction have not been identified.

By checking the information and evidences available /01/ and by the physical site, RINA can confirm that all the emission sources and gases have been included in the project boundary and the description in the PDD is accurate and complete, and also that the selected sources and gases are justified for the proposed project activity.

3.7.2 Baseline identification

According to the approved baseline and monitoring methodologies approved CDM Methodologies AMS-III.H “Methane recovery in wastewater treatment”, version 17 of 28/11/2014, AMS-I.C”, “Thermal Energy Production with or without electricity”, version 20.0 of 01/06/2014 /04, 08/ and SSM AMS-I.D “Grid connected renewable electricity generation”, ver. 18 of 28/11/2014 /59/, the baseline is:

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The raw sludge is pumped for chemical conditioning followed by belt pressing with the resulting sludge cake being transported to the on-site drying beds and left for a period of 15 to 18 months to dry. The dry sludge cake is then transported some 18 km. to the landfill site, Kremikovtzi. The main source of baseline CH₄ emissions is the sludge deposited in the sludge drying beds and the landfill to decompose in anaerobic conditions. The baseline of the type I component of the initial project has also been described as “business as usual”, i.e. generation of thermal energy in the on-site boilers using light oil as a fuel and import of electric energy from the grid. The project activity displaces thermal energy from the boilers and electric energy from the grid by using the biogas for combustion in co-generating modules.

The project facility did not exist prior the implementation of the project. The prescribed baseline scenario is applicable to the project activity whether is in compliance with the national and/or sectoral policies as Energy from Renewable sources Law and Energy Law.

According to the approved baseline methodologies /04/, /08/, /59/ the following alternative scenarios to the proposed project activity have been considered and discussed for the baseline scenario:

The project activity is shifting from JI to GS registration and applies for retroactive registration under the requirements of The Gold Standard Foundation so the Methodological Tool “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period”, Version 03.0.1 is applied to demonstrate that the baseline of the project is still valid and updated.

RINA was able to verify all the documented evidence listed above during the validation process and can confirm that:

- All the assumptions and data used by the project participants are listed in the PDD /01/, including their references and sources;
- All documentation used /01/, /04/, /08/ /62/ as well as GS and CDM requirements is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
- Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- Relevant national and/or sectoral policies and circumstances /01/, /41/, /42/, /44/, /61/ are considered and listed in the PDD;

The approved baseline methodologies /04, 08, 59/ and the Toll /62/ have been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed GS project activity

3.8 Additionality

In accordance with the “Guidelines on the Demonstration of Additionality of Small-scale Project Activities”, Ver.09.0 /14/ and the GS rules and references /42/, project participants provided an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:

- (a) Investment barrier: a financially more viable alternative to the project activity would have led to higher emissions;
- (b) Technological barrier: a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions;
- (c) Barrier due to prevailing practice: prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;
- (d) Other barriers: without the project activity, for another specific reason identified by the project participant, such as institutional barriers or limited information, managerial resources, organizational capacity, financial resources, or capacity to absorb new technologies, emissions would have been higher.

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The PDD /01/ chooses to use Investment barrier to demonstrate the additionality of the project activity (a financially more viable alternative to the project activity would have led to higher emissions, has been selected and investment analysis has been carried out) and “Tool for the demonstration and assessment of additionality”- Version 07.0.0. /09/ is also applied.

The above opinion of RINA to the additionality of the proposed project is further explicitly explained in the following steps.

3.8.1 Prior consideration of the clean development mechanism

The new GS rules are followed for validation of Prior consideration of the project /62/. The project is shifting / upgrading from JI to GS voluntary scheme. For this project migrating from other voluntary standards the prior consideration for carbon revenues is checking as part of the gap analysis during validation. The project activity is existing project that apply for retroactive registration. This project is also fast track project activity.

Initially the project was developed into two phases. First face has covered erection of a new digester system consisting of 4 digesters and the second has covered erection of 3 new co-generation sets GE for generation of electric and thermal energy by combusting biogas from digesters. The digesters have been commissioned and entered into operation in May, 2008 and the CHP installation has been commissioned and started generating electricity and thermal energy for plant's needs in November, 2009.

The project was successfully registered as JI Project and all verifications (four numbers) in Kyoto Protocol period have been conducted. After the end of the KP, the PP started searching new possibilities for the project registration in voluntary market. The project was also supported from the MOEW as per official Letter of Support /36/.

The following timeline of key milestones was elaborated based on the verifiable evidence collected during the validation process. The information is consistent with the timeline provided in the PDD and all events show a logic sequence, which is in line with the GS/CDM requirements and rules.

	Date	Milestone activities verified
1	29/03/2002	Sofiyska Voda AD and Municipality of Sofia Concession Agreement
2	07/09/2004	Starting date of the project (JI period) – Protocol of opening of the construction site (Appendix 7 of the PDD) /01, 48/
3	21/02/2005	Ministry of Environment and Water of Bulgaria: Letter of Endorsement of JI Project “Methane gas capture and electricity production at Kubratovo WWTP”
4	25/01/2006	TUV SUD: Determination Report N 743691
5	21/09/2007	Sofiyska Voda AD and European Bank for reconstruction and development, for the account of the Netherlands: Netherland emission reduction co – operation fund emission reduction purchase agreement
6	10/07/2007	The State of Netherlands: Declaration of Approval of JI Project “Methane gas capture and electricity production at Kubratovo WWTP”
7	03/08/2007	Ministry of Environment and Water of Bulgaria: Letter of approval of JI Project “Methane gas capture and electricity production at Kubratovo WWTP”
8	2007-2012	Verification Reports: 2007 to 2009 – made by Bureau Veritas; years: 2010, 2011 and 2012 made by RINA /75/
9	09/04/2008	EPC Contract between companies Sofiyska Voda AD and Pazel Finance and Leasing for Co – generators
10	April 2008	Rational Energy Utilisation and Financing Plan for Sofiyska Voda Jsc Energy Efficiency Project: Annexes - Project Cost Breakdown;

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		Monthly Cash Flow and Long-Term Debt; Risk and Sensitivity Analyses; Audited Financial Statements, Offers and Contracts for Project Implementation; Calculation Models
11	27/05/2014	Ministry of Environment and Water of Bulgaria: Letter of Support 26-00-1543 for the project activity: Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria

3.8.2 Identification of alternatives

The project applies for a renewal of the crediting period under the requirements of The Gold Standard Foundation so the Methodological Tool “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period”, Version 03.0.1 is applied to demonstrate that the baseline of the project is still valid after some up-dating. The PPD /01/ follows the required two steps of the Tool /62/.

RINA can confirm that the alternatives identified in the PDD are credible and complete.

3.8.3 Investment analysis

- Choice of approach

Project Proponent has chosen Option III-Benchmark analysis.

At first is necessary to underline that the PP proposed for the investment analysis the same presented an demonstrated under Joint Implementation (JI) by an Accredited Independent Entity in 2006 (Report No 743 691 /48/ repeated with the same parameters but following the requirements of the latest version of the “Tool for the demonstration and assessment of additionality”, ver.07.0./09/ and the “Guidelines on the assessment of investment analysis”, ver.05 /16/.

- Benchmark selection
- The benchmark rate was calculated in line with the Capital Asset Pricing Model (CAPM) /67/ which represents the expected return after taxes too. The CAPM suggests below formula to calculate the discount rate (in other words benchmark rate):

$$E(R_i) = R_f + \beta_i (E(R_m) - R_f)$$

Where

$E(R_i)$ is the expected return on the capital asset;
 R_f is the risk-free free rate of interest such as interest arising from government bonds;
 β_i (the beta coefficient is the sensitivity of the asset returns to market returns
 $E(R_m) - R_f$ is known as the market premium or risk premium (the difference between the expected market rate of return and the risk-free rate of return).

Risk Free Rate (R_f)

The Risk free rate is derived from the Bulgarian government treasury bonds with longest maturity at the time of the investment decision taking to recommence the project development which is defined as May,2008.

The government bonds Issue number BG 20 400 08 216 (in BGN) with the longest maturity of 10 years (11.10.2018) have been issued on the primary market in January,2008 /68/ and reached 5.18% in its third opening on 21.05.2008 which can be considered as the value of the risk free rate.

The Beta Coefficient (β_i)

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In 2008 the companies trading on the Sofia stock exchange have been quite a few and it is not quite possible to calculate the beta coefficient properly. That is why this coefficient is taken from the studies of prof Aswath Damodaran for power industry. The study gives an average value for Beta of 1.65 /69/.

Market risk premium ($E(R_m) - R_f$)

To estimate the “Market risk premium” of Bulgaria, the data of the World Bank for 2008 / 70/ was used. The World Bank document quotes a Risk premium on lending (lending rate minus treasury bill rate) of 6.8% for 2008.

The benchmark is defined as taxes excluded and the financial parameter used for comparison is the equity IRR of the project before taxes.

- Input parameters
- RINA has validated the input parameters used in the investment analysis and the following steps have been followed to assess the investment analysis:
- Assessment of the sources used for input parameters. All input parameters used in the financial analysis are taken from the BG1000166 “Methane gas Capture and Electricity Production at Kubratovo Wastewater Treatment, Sofia Bulgaria” dated July,2005 /and specifically from the Sofiyska voda accounting records and the Feasibility Report REUP prepared for EBRD by DAI, London and ENCON Services /26/,/27/. The project was determined positively by TUEV SUD with Determination Report No 743 691 dated 25 Jan 2006 /48/ and received a Letter of Approval by the Ministry of Environment and Water of Bulgaria dated 01 Aug 2007 /37/ and a Declaration of Approval by the State of Netherlands from 10/07/2007 /40/.
- Assessment of the period between the time of the investment decision and the starting date of the proposed project activity. The first phase of the project was completed at the end of 2006 and the installation started operation on 01/01/2007. However the realisation of the second phase which envisaged provision of a co-generation plant depended on the generation of biogas from the digesters and a loan from the United Bulgarian Bank so the Project Proponent stopped the project until the capacity of the digesters to generate biogas were clear and the future benefits from the project could be estimated properly.

The project was determined (validated) under JI with a determination report dated 25/01/2006 /48/. In its initial JI PDD dated July, 2005 the project envisaged both implementation phases – construction of the biogas recovery and installation of the CHP plant. However after starting of the project it became clear that financing for the 2nd phase was not available at that time and the implementation of the project as a whole stopped. The project now applies for registration under Gold Standard and in this case it is recommended to repeat the investment analysis following the requirements of the latest version of the “Tool for the demonstration and assessment of additionality” /09/ and the “Guidelines on the assessment of investment analysis” /16/ and as per (Mrs. Neha Rao’s mail of 14/04/2015) /77/). Changes in the project have been verified during the periodic verifications for the period 01/01/2007 – 31/10/2012 /75/.

The decision to proceed with the JI project and recommence the implementation has been taken in April, 2008 after receiving a special Report named Rational Energy Utilisation Plan No. 129, Sofiyska Voda Renewable Energy Project, Construction of CHP for Biogas Utilization, prepared by DAI and EnCon, dated April, 2008 /26/, /27/ which is defined as the investment decision taking date for the current analysis as per the “Guidelines on the assessment of investment analysis”, ver.05, paragraph 7 /16/. All the data used for the investment analysis were available at the time of the investment decision.

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- Cross check the input parameters used in the investment analysis. The input parameters used in the financial analysis were cross-checked and all the data sources used for cross-checking were checked during the validation process. The following is carried out:

Input value	Assessment
Installed capacity of the CHP: 3.189 MWe	Valid: data coming from Feasibility Report REUP /26/, /27/
Availability (plant load factor) : 0.55	Valid: data coming from Feasibility Report REUP /26/, /27/
Annual energy generation (saved) : 15,348 MWhe (net to plant) and 15,249 MWhth (net to plant) per year	Valid: data coming from Feasibility Report REUP /26/, /27/
Total investment : 1 st phase – 7,020,432 Eur 2 nd phase – 2,270,810 Eur	Valid: data coming from Feasibility Report REUP /26/, /27/ and Sofiyska Voda accounting records /71/, audited by KPMG /78/. The parameters of the 1 st phase are based on real expenses as per the recommendation of the “Guide on the assessment of investment analysis”, ver.05, paragraph 7. /16/.
Quantity of light fuel saved by the project : 1,112 t/year	Valid: data coming from Feasibility Report REUP /26/, /27/
Unit price of electric energy and light fuel oil : 33.65 Eur/MWh and 798.00 Eur/t	Valid: data coming from Feasibility Report REUP /26/, /27/
O&M costs: 89,935 Eur/year	Valid: data coming from Feasibility Report REUP /26/, /27/ and Sofiyska Voda accounting records /71/, audited by KPMG /78/. The parameters of the 1 st phase are based on real expenses as per the recommendation of the “Guide on the assessment of investment analysis”, ver.05, paragraph 7. /16/.
Depreciation rate : 30% per year	Valid: Depreciation rates in Bulgaria /26/, /27/
Financial Analysis Duration : 17 (year)	Valid: As allowed in the Guidance on the Assessment of Investment Analysis ,version 05 /16/
BGN/Eur exchange ratio 1.95583	Valid: Bulgarian National Bank /72/. The rate is fixed.
Grant KIDFS: 200,000 Eur	Valid: data coming from Feasibility Report REUP /26-27/ and Sofiyska Voda accounting records /71/ audited by KPMG /78/. The parameters of the 1 st phase are based on real expenses as per the recommendation of the “Guide on the assessment of investment analysis”, ver.05, paragraph 7. /16/.
Equity: 8,291,242 Eur	Valid: data coming from Feasibility Report REUP /26/, /27/ and Sofiyska Voda accounting records /71/, audited by KPMG /78/. The parameters of the 1 st phase are based on real expenses as per the recommendation of the “Guide on the assessment of investment analysis”, ver.05, paragraph 7. /16/.
Loan amount: 1,000,000 Eur	Valid: data coming from Feasibility Report REUP /26-27/ and Sofiyska Voda accounting records /71/, audited by KPMG /78/. The parameters of the 1 st phase are based on real expenses as per the recommendation of the “Guide on the assessment of investment analysis”, ver.05, paragraph 7. /16/.
Equity IRR before taxes: 12.354 %	Valid. Data calculated

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Benchmark rate (%) : 16.40%	Valid. Data calculated
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Based on the information verified, RINA was able to confirm that the input parameters used in the investment analysis are reasonable and adequately represent the economic situation of the project activity at the time of the investment decision.

- Calculation and conclusion
- The IRR calculations were provide in a spreadsheet IRR_Kubratovo_ver.02_10112015.xlsx /22/. The calculations were verified and found to be correct by RINA as well as the assumptions used in the calculation were deemed to be correct. The equity IRR without VER revenues is 12.354% before taxes which confirms that the proposed project activity in absence of the VER benefits and compared to the benchmark IRR 16.40 % is not financially attractive.
- Sensitivity analysis

A sensitivity analysis has been carried out for parameters contributing more than 20% revenues and costs, to demonstrate the robustness of the financial analysis. The parameters are varied in the range of +/- 10% as advised by "Tool for the demonstration and assessment of additionality (Version 07.0.0)." /09/. Reasonable variations of the input values have been considered by calculating the variation necessary to reach the benchmark.

The sensitivity shows a situation where the reasonable variation of the parameters:

- Investment Cost
- Operation Cost
- Energy Savings

generate a fluctuation of IRR in a range 10.32 %-14.31 %, below the benchmark.

The results of the analysis are given in the following tables:

Equity IRR sensitivity to Investment costs

Parameter	Investment Cost		
Variance	-10%	0%	10%
Equity IRR before tax (for 17 years)	14.03%	12.35%	10.76%

A 10% decrease of the investment costs leave the equity IRR still below the benchmark of 16.40%.

In order to hit the benchmark the Investment costs have to be decreased by more than 25% to reach an equity IRR of 16.40%. This is highly improbable because at the beginning of 2008 the equipment for phase 1 had already been contracted and mostly paid. It is also highly impossible to expect at that time that the price of the CHP could decrease with more than 25% to reach the benchmark.

Equity IRR sensitivity to Operating expenses

Parameter	Operating expenses		
Variance	-10%	0%	10%
Equity IRR before tax (for 17 years)	12.48%	12.35%	12.22%

The table demonstrates that the operating expenses have a very little influence on the IRR. Even if O&M expenses are estimated at 0 the IRR will still be 13.61% which is lower than the benchmark.

Equity IRR sensitivity to Energy savings

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Parameter	Energy savings		
Variance	-10%	0%	10%
Equity IRR before tax (for 17 years)	10.32%	12.35%	14.31%

The energy savings envisage both savings due to thermal energy generation and electricity generation and have the strongest effect on the IRR. The electricity generation is estimated as net and includes both electricity for own needs and excess electricity sold to grid (which cannot be estimated ex-ante exactly due to the fact that the consumption of the plant is usually higher than the generation of the CHP and the common case is to import additional electric energy from the grid). However even a 10% increase in the generation of electricity and thermal energy still leaves the IRR below the benchmark of 16.40%. In order to hit the benchmark the energy generation has to increase with more than 25%. This is highly improbable due to the fact that the savings depend on several parameters like:

- Price of electricity – it is defined by the state committee for energy and water and the general tendency, as the past years show is to keep price unchanged or lower;
- Price of Light Fuel Oil (LFO) – it defines in general the thermal energy savings and represents about 50% as a share from the savings. In this respect the price of LFO has to increase with about 40% to compensate the constant price of electric energy which is quite unrealistic though the oil prices tend to increase after 2008.
- Energy generation – this parameter depends only on the generation of bio-gas by the digesters which, from its side depend on the quantity of waste water and sludge. The latter are quite constant throughout the years as demonstrated in Section B.4 of PDD /01/.

3.8.4 Barrier analysis.

Barrier analysis is not applied /01/, because this step is optional as per the applied Tool /09/. The project additionality has been based on investment analysis.

3.8.5 Common practice analysis

The proposed project activity is defined as a Small Scale Project Activity and according to Gold Standard guidance (mail for this confirmation of 26/09/2015), performing a common practice analysis is not required.

3.8.6 Conclusion

RINA can confirm that all data, rationales, assumptions, justifications and documentation provided by the project participants to support demonstration of additionality are credible and reliable. By assessing the evidences presented and cross-checking the information contained in, RINA considers the reasoning for the proposed project additionality demonstration is credible and reasonable i.e. the proposed project has the ability to reduce anthropogenic emissions of greenhouse gases by sources below those that would have occurred in the absence of the registered GS project activity.

3.9 GS Criteria - Sustainability assessment

The Project utilizes the available renewable energy sources in the form of biomass received as a result from the wastewater treatment in the Kubratovo WWTP and then supplied to the newly installed CHP gas engines (three co-generations sets) for electricity and heat production. The GS indicators of sustainable development are identified according to the Annex I of the GS Toolkit. The identified

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indicators are: Air quality; Water quality and quantity; Soil condition; Other pollutants; Biodiversity; Quality of employment; Livelihood of the poor; Access to affordable and clean energy services; Human and institutional capacity; Quantitative employment and income generation; Balance of payments and investment and Technology transfer and technological self-reliance. Justification choices as well as data sources and provision of references are provided for sustainable development indicators. The data sources that have been provided for references are monitoring records /31-35/ and /39/ Ministry of Environment and Water website /44/; Environmental permissions /34, 38, 46/.

It is RINA's opinion that the project complies with the requirements defined in the GS Toolkit version 2.2.

3.9.1 Do no harm assessment

The Do no harm assessment provided in GS Passport /23/ is based on the UNDP safeguarding 11 principles. All the safeguarding 11 principles are assessed in terms of risk, and the explanations and references are provided for each principle to justify the evaluation of the degree of risk.

The “Do not harm” assessment correctly identifies the risk level for the violation of the safeguarding principles. The validation team confirmed that Bulgaria is a signatory to the following conventions:

- European Convention on Human Rights, crosschecked with site /63, 64, 65/
- ILO Convention 87 (freedom of association) and 98 (right to collective bargaining), crosschecked with site /63, 64, 65/.
- ILO Convention 29 and 105 on elimination of forced and compulsory labor, crosschecked with site /63, 64, 65/.
- Convention 138 (minimum age) and Convention 182 (worst form of child labor) under the ILO Declaration on Fundamental Principles and Rights at Work, crosschecked with site /63, 64, 65/.
- Convention 100 (equal remuneration) and Convention 111 (Discrimination in employment/occupation) under the ILO Declaration on Fundamental Principles and Rights at Work, crosschecked with site /63, 64, 65/.
- UN Convention against Corruption and the OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions, crosschecked with site /63, 64, 65/.

The project provides workers with a safe and healthy work environment and is not complicit in exposing workers to unsafe or unhealthy work environments, confirmed during the on-site assessment and crosschecked with website /63/, /64/, /

65/. This issue is also included in the SM Plan as the following parameters “Number of employees receiving vocational training” and “Number of jobs created by the project”. The project is also certified against ISO 14001:2004 and OHSAS 18001:2007 /53,54/.

The project takes a precautionary approach in regard to environmental challenges and is not complicit in practices contrary to the precautionary principle. This issue was crosschecked with the next documents: /34/, /38/. This issue is also included in the SM Plan as the following parameters:

“Air Quality”; Waste oil disposal; Soil condition – heavy metal content and quantity of sludge transported to agricultural application.

The project does not involve and is not complicit in significant conversion or degradation of critical natural habitats, including those that are (a) legally protected, (b) officially proposed for protection, (c) identified by authoritative sources for their high conservation value, or (d) recognized as protected by traditional local communities, crosschecked with the official documents: /63, 64, 65/.

The project respects internationally proclaimed human rights including dignity, cultural property and uniqueness of indigenous people as well as due to the project activity there is no complicit in Human

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Rights abuses. Total of 27 Local people are employed by the PP for the biomass project as per List of employees /49/. During the on-site visit of the project was verified the signed collective Labour Agreement covered 2015 and 2016 /50/. For all working places are available risk assessment /52/ and there is a competent assigned company helping for solving all Health and Safety issues of the employees /51/. Sofiyska Voda AD is also certification against OHSAS 18001 /53/.

3.9.2 Sustainable development matrix

The next indicators are involved in the Sustainability Monitoring Matrix and Sustainability Monitoring Plan:

Indicator: Air quality – the chosen parameters are: emissions of CH₄, SO₂, NO_x, CO and dust. They will be measured annually as per SD Monitoring Plan (SMP 001) in the stack flew gas. They are correctly listed as per checked air measurement protocol /39/ and Internal Monitoring Plan /34/.

Indicator: Water quality and quantity – the chosen parameters are: COD and BOD₅. The PP measures inlet and outlet quantity and quality of the wastewater as per the issued Permission /38/. The PP also used internal accredited Laboratory for the required measurements /31/. SD Monitoring Plan (SMP 002)

Indicator: Other pollutants – the chosen parameter is: waste oil disposal and /SMP 003/. The waste oil is separately collected and sent to the competent company as per common contract.

Indicator: Quality of employment – the chosen parameter is: number of employees receiving vocational training. It will be measured annually as per SD Monitoring Plan (SMP 004). For all working places are available risk assessment and there is a competent assigned company helping for solving all Health and Safety issues of the employees and conducting labour trainings. The PP is also certified against OHSAS 18001.

Indicator: Quantitative employment and income generation – the chosen parameter is: number of jobs created. It will be measured annually as per SD Monitoring Plan (SMP 005). The PP is a big company that provides employee to the local villagers. During the on-site visit of the project was verified the signed collective Labour Agreement covered 2015 and 2016. There is also checked the Project List of employees. The list of employments can be verified each year.

Indicator: Soil condition – the chosen parameter is: Soil condition /SMP 006/ - heavy metals content and Quantity of sludge transported to agricultural application. There are also available Sludge measuring Protocols numbers 488 – 490 of 22/05/2014; 1030 – 1032 of 29/07/2014; 1675 – 1677 of 30/09/2014 and 2318 – 2320 of 19/11/2014 /35/.

Indicator: Livelihood of the poor – the chosen parameter is: Number of population who can access to effective waste management system. The PP does not influence directly to this indicator that is why it is neutralized. .

Indicator: Human and institutional capacity – the chosen parameter is: Number of male and female employees engaged by the project. Number of trainings related to the environmental awareness carried out annually /SMP 008/. The PP is a big company that provides employee to the local villagers. During the on-site visit of the project was verified the signed collective Labour Agreement covered 2015 and 2016. There is also checked the Project List of employees.

Indicator: Biodiversity – the chosen parameter is: Number of affected and/or threatened plants, mammals, birds, fishes and other species and habitats. This indicator does not influence as per the issued Permission /34/.

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Indicator: Access to affordable and clean energy services – the chosen parameter is: Change in energy use, traditional fuel consumption and/or electricity consumption per capita. All permissions are available in the company: /34, 38/

Indicator: Balance of payments and investment – the chosen parameter is: Amount of domestic and foreign investment. The PP is a big company that provides employee to the local villagers. During the on-site visit of the project was verified the signed collective Labour Agreement covered 2015 and 2016. There is also checked the Project List of employees.

Indicator: Technology transfer and technological self-reliance – the chosen parameter is: Number of workshops, seminars and training related opportunities for audience who would be directly involved in the replication of the technologies. The PP is a big company that provides employee to the local villagers. During the on-site visit of the project was verified the signed collective Labour Agreement covered 2015 and 2016. There is also checked the Project List of employees.

All non-neutral indicators are listed and monitored. They are listed correctly in the GS Passport /23/.

3.10 Monitoring Plan

According to the approved baseline and monitoring methodologies approved CDM Methodologies AMS-III.H “Methane recovery in wastewater treatment”, version 17 of 28/11/2014, AMS-I.C”, “Thermal Energy Production with or without electricity”, version 20.0 of 01/06/2014 /04, 08/ and SSM AMS-I.D “Grid connected renewable electricity generation”, ver. 18 of 28/11/2014 /59/, the applied monitoring plan is in accordance with those monitoring methodologies and the monitoring plan gives opportunity for real measurement of achieved emission reductions.

RINA has checked all the parameters presented in the monitoring plan against the requirements of the methodology; no deviations relevant to the project activity have been found in the plan.

RINA confirms that the monitoring arrangements described in the monitoring plan are feasible within the project design, and the means of implementation of the monitoring plan are sufficient to ensure the emission reductions achieved by/resulting from the proposed GS project activity can be reported ex post and verified

Parameters determined ex-ante

The ex-ante parameters that are mentioned in the methodology are included in the PDD and are provided in compliance with the methodology:

	Data/parameter	Unit	Value applied	Assessment
1	EF _{EL,Y}	tCO ₂ /MWh	1.0190	Default EF: “Tool to calculate baseline, project and/or leakage emission from electricity consumption” /11/
2	MCFs,BL,final		0.4	CDM Tool “Emissions from solid waste disposal sites”, /17/
3	DOCs		0.5	Default value from AMS-III.H /04/
4	DOCF		0.5	Default value from AMS-III.H /04/
5	F		0.5	Default value from AMS-III.H /04/
6	UFBL		0.89	Default value from AMS-III.H /04/
7	GWPOCH4		21	Default value from IPCC /76/
8	hflare	%	80	Methodological Tool “Project emissions from flaring”, /18/
9	hBL,thermal	%	92	The value is presented in the specifications provided by the

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				manufacturer of the boilers – company “Kotlostroene” /56/.
10	EEEE,CO2	tCO2/TJ	54.30	Default value from IPCC /76/
11	NCVi,y	GJ/t	46.50	Default value from IPCC /76/
12	EFCO2,i,y	tCO2/GJ	76.30	Default value from IPCC /76/
13	PEfugitive,s,y	Nm3 leaked/Nm3 produced	0.05	Default value from AMS-III.H /04/
14	DCH4	Kg/m3	0.670	Default value from AMS-I.D /59/

Parameters monitored ex-post

The ex-post parameters that are mentioned in the methodology are included in the PDD and are provided in compliance with the methodologies, and they will be monitored during the crediting period

	Parameter	Description/Assessment
1	Sfinal,PJ,y	Amount of dry matter in the sludge in the year y - Measure the total quantity of sludge entering the digesters on a wet basis.
2	EGthermal,y	The net quantity of heat supplied by the project activity during the year y - Steam thermal energy meter would be used to measure the quantity of heat generated by the boiler
3	EGgrid,y	Electricity generated by the CHP in the year y – it will be measured ex-post and recorded monthly.
4	BGburnt,y	Quantity of biogas generated by the anaerobic digesters - The biogas flow is monitored by integrated digital gas-flow meter taking into account the temperature and pressure of the gas. The final result is normalised.
5	Q_DGs_inlet	Quantity of sludge entering the anaerobic digesters - Measured by liquid flowmeter.
6	Rsludge	Dry substance content in the sludge - Laboratory samples and the results are recorded hourly, monthly and yearly
7	wCH4,y	Methane content in biogas in the year y - The fraction of methane in the gas should be measured with a continuous analyser using equipment that can directly measure methane content in the biogas.
8	FCy	Quantity of fossil fuel (naphta) used for emergency needs in the year y. - The yearly quantity is calculated using accounting documents for the purchased quantity of fuel during the reported period the initial and the residual content of the reservoirs.
9	Vt,db	Volumetric flow of the gaseous stream - The quantity of biogas is measured continuously
10	FCH4	Mass flow of methane in the residual biogas flared - The quantity and quality of biogas is measured continuously and normalized.

Sustainability monitoring plan

	Parameter	Description/Assessment
1	Emission measurements of CH ₄ , SO ₂ , NO _x , CO and dust.	The PP will conduct annual measurements of these indicators /23/
2	Water quality and quantity	PP will measures continuously the COD and BOD5 parameters inlet and outlet of the WWTP as per the issued permissions and internal procedures /23, 34, 38/
3	Waste oil disposal	The PP will conduct annual measurements of these indicator /23/

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4	Number of employees receiving vocational training	The PP will conduct it annually /23/
5	Number of jobs created by the project	The PP will conduct it annually /23/
6	Heavy metals content and Quantity of sludge shipped for agricultural application	The PP will conduct it annually /23/
7	Number of male and female employees engaged by the project. Number of trainings related to the environmental awareness carried out annually.	The PP will conduct it annually /23/

Management system and quality assurance

The project manager of Sofiyska Voda AD Project is responsible with final monitoring and reporting issues. The project manager or his/her assistant (in the absence of the manager) will be responsible to control all the monitoring data and measurements and to store them in the monthly measurement records on the site for the calculation of emission reductions at the end of each monitoring period. Each monitoring period is planned to be at least on annual basis. The operators of the project also used IT "Scada" software for continuing measuring and recording of the main data and parameters. The operator is also ISO 9001:2008 certified and follows the applicable procedures and records as well as periodically maintenances and calibration requirements.

All the meters attached to the installations for measurement of the generated streams are appointed in Section B.7.3. All of them are properly listed and explained in the PDD /01/, verified during the on-site visit. The calibration of these meters will be done in line with the equipment requirements and through the period defined by State Agency for Metrological and Technical Surveillance /01/.

It is RINA's opinion on the PP ability to implement the monitoring plan is sufficient.

3.11 Estimation of GHG emissions

For determination of the baseline and monitoring and therefore as base of GHG emissions estimation, the present project activity follows mainly two approved small scale project methodologies:

- The AMS-III.H small scale methodology for Methane Recovery in Wastewater Treatment, Version 17 /04/;
- The AMS-I.C small scale methodology for Thermal energy production with or without electricity, Version 20 /08/ using conservative options and data as presented in the following section .
- AMS-I.D/Version 18 "Grid connected renewable electricity generation", dated 28/11/2014

In addition, the following methodological tools are applied in this PDD:

- "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" Version 02 /10/;

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- “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”, version 01/11/;
- “Tool to determine the remaining lifetime of equipment”, version 01/12/;
- “Emissions from solid waste disposal sites”, version 07 /17/;
- “Project emissions from flaring”, version 02 /18/;
- “Project and leakage emissions from anaerobic digesters”, version 01 /19/;
- Tool to calculate the Emission Factor for an electricity system, ver. 04 /58/;
- “

The emission reduction ER_y by the proposed project activity during the crediting period is the difference between baseline emissions (BE_y), project emission (PE_y) and emissions due to leakage (L_y) as follows.

Baseline emissions

The project proponent correctly uses AMS-IIIH/Version 17, para 27& 37 /04/ and AMS-I.C /Version 20, para. 28(a),33,34,39 & 40 /08/ for baseline emissions calculations with the formulae below:

According to the methodology the baseline emissions may consist of:

$$BE_y = \{BE_{power,y} + BE_{ww,treatment,y} + BE_{s,treatment,y} + BE_{ww,discharge,y} + BE_{s,final,y}\} \quad (1)$$

Where:

BE_y	Baseline emissions in year y (tCO ₂ e)
$BE_{power,y}$	Baseline emissions from electricity or fuel consumption in year y (tCO ₂ e) Will be calculated following the requirements of AMS-I.C, version 20.
$BE_{ww,treatment,y}$	Baseline emissions of the wastewater treatment systems affected by the project activity in year y (tCO ₂ e) These emissions will not be taken into account because the project activity does not concern the wastewater treatment system.
$BE_{s,treatment,y}$	Baseline emissions of the sludge treatment systems affected by the project activity in year y (tCO ₂ e) These emissions will not be taken into account because the project activity does not concern this part of the sludge treatment system. The baseline
$BE_{ww,discharge,y}$	Baseline methane emissions from degradable organic carbon in treated wastewater discharged into sea/river/lake in year y (tCO ₂ e). The value of this term is zero for the case 1 (b) These source of baseline emissions will not be accounted for simplicity and conservativeness
$BE_{s,final,y}$	Baseline methane emissions from anaerobic decay of the final sludge produced in year y (tCO ₂ e). If the sludge is controlled combusted, disposed in a landfill with biogas recovery, or used for soil application in the baseline scenario, this term shall be neglected This emission source is the main in the baseline. The dewatered sludge is stored for 15 to 18 months in drying beds and then transported to a landfill without biogas recovery. The emissions from the landfill are not taken into account for simplicity and conservativeness.

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Applied to the baseline defined formula (1) is reduced to the following:

$$BE_y = \{BE_{power,y} + BE_{s,final,y}\}$$

Where:

BE_y	Baseline emissions in year y (tCO ₂ e)
$BE_{power,y}$	Baseline emissions from electricity or fuel consumption in year y (tCO ₂ e)
$BE_{s,final,y}$	Baseline methane emissions from anaerobic decay of the final sludge produced in year y (tCO ₂ e). If the sludge is controlled combusted, disposed in a landfill with biogas recovery, or used for soil application in the baseline scenario, this term shall be neglected
$BE_{power,y}$	is calculated as per AMS-I.C.

According to AMS-III.H, version 17, para.37:

Methane emissions from anaerobic decay of the final sludge produced are determined as follows:

$$BE_{s,final,y} = S_{final,BL,y} * DOC_s * UF_{BL} * MCF_{s,BL,final} * DOC_F * F * 16 / 12 * GWP_{CH4}$$

Where:

$S_{final,BL,y}$	Amount of dry matter in the final sludge generated by the baseline wastewater treatment systems in the year y (t). The baseline wastewater treating system is not different from the project system so no correction of the monitored amount of dry matter in the final sludge generated is required.
$MCF_{s,BL,final}$	Methane correction factor of the disposal site that receives the final sludge in the baseline situation, estimated as per the procedures described in the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site"
DOC_s	Degradable organic content of the untreated sludge generated in the year y (fraction, dry basis). Default values of 0.5 for domestic sludge and 0.257 for industrial sludge shall be used
DOC_F	Fraction of DOC dissimilated to biogas (IPCC default value of 0.5)
F	Fraction of CH ₄ in biogas (IPCC default of 0.5)
UF_{BL}	Model correction factor to account for model uncertainties (0.89)
GWP_{CH4}	Global Warming Potential for methane (value of 21)

Baseline emissions for supply of electricity to and/or displacement of electricity from a grid are calculated as follows:

$$BE_{grid,y} = EG_{grid,y} \times EF_{grid,y}$$

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Where:

$BE_{grid,y}$	Baseline emissions for the grid electricity displaced by the project in year y (t CO ₂ e)
$EG_{grid,y}$	Amount of grid electricity displaced by project in year y (MWh)
$EF_{grid,y}$	Emission factor of the grid (t CO ₂ e/MWh)

For thermal energy produced using fossil fuels and/or grid electricity the baseline emissions are calculated as follows:

$$BE_{thermal,CO_2,y} = \left(\frac{EG_{thermal,y}}{\eta_{BL,thermal}} \right) \times EF_{FF,CO_2}$$

Where:

$BE_{thermal,CO_2,y}$	=	Baseline emissions from thermal energy displaced by the project activity during the year y (t CO ₂)
$EG_{thermal,y}$	=	Net quantity of thermal energy supplied by the project activity during the year y (TJ)
EF_{FF,CO_2}	=	CO ₂ emission factor of the fossil fuel that would have been used in the baseline plant obtained from reliable local or national data if available, alternatively, IPCC default emission factors can be used (t CO ₂ /TJ)
$\eta_{BL,thermal}$	=	Efficiency of the plant using fossil fuel that would have been used in the absence of the project activity determined as per paragraph 39 or 40

The formula is for renewable energy technologies that displace technologies using fossil fuels, that is the case with this project.

The fossil fuel replaced by the project biogas fuel is the natural gas annually combusted in the baseline boiler as per the updated baseline.

The thermal efficiency of baseline boiler is determined as per the technical specifications of existing new natural gas boilers of the same type.

The efficiency value is defined once for the period of GS project operation.

The parameters for the ex-ante calculations of the methane emissions are the default values given in the applied methodology /04/. The correct values have been confirmed by studying the methodology AMS-III.H /04/.

The amount of dry matter in the final sludge ($MCF_{s,BL,final}$) generated by the baseline wastewater treatment system used for the ex-ante calculations is taken from the plant records for 2012 which is the last year of the Kyoto period and is the year before the estimated start of the GS crediting period. The applied data have been verified during the on-site visit by the auditing team by studying the plant records /79/.

The methane correction factor of the disposal site (in this case the drying beds and the landfill) is determined as per the latest version of the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site", Version 07 /17/. The correct value have been confirmed by the auditing team by studying the tool.

The amount of electric and thermal energy generated and used for the ex-ante calculations is taken from the plant records as average annual generation for the period 2010-2012 as per the requirements of the methodology AMS-I.C applied /08/. The applied data have been verified by the auditing team by studying the plant records./79/

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The grid emission factor is calculated as per the requirements of the applied methodology “Tool to calculate the Emission Factor for an electricity system”, ver. 04 /58/. The audit team checked the calculations presented in the PDD /01/ and EF calculation sheet /24/.

The emission factor of the fossil fuel displaced and the efficiency of the baseline boiler are defined as per the requirements of the applied “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion” Version 02 /10/. The audit team checked and approved the correctness of the applied values.

The ex-ante calculations of baseline emissions in the project are executed in accordance with considerations and formulas above.

Project emissions

The project proponent correctly uses AMS-III.H, Version 17 for project emissions calculations with the formulae below: As per paragraph 41, project emissions include:

- (a) CO₂ emissions from electricity and fuel used by the project facilities ($PE_{power,y}$);
- (b) Methane emissions from wastewater treatment systems affected by the project activity, and not equipped with biogas recovery in the project scenario ($PE_{ww,treatment,y}$);
- (c) Methane emissions from sludge treatment systems affected by the project activity, and not equipped with biogas recovery in the project situation ($PE_{s,treatment,y}$);
- (d) Methane emissions on account of inefficiency of the project activity wastewater treatment systems and presence of degradable organic carbon in treated wastewater ($PE_{ww,discharge,y}$);
- (e) Methane emissions from the decay of the final sludge generated by the project activity treatment systems ($PE_{s,final,y}$);
- (f) Methane fugitive emissions due to inefficiencies in capture systems ($PE_{fugitive,y}$);
- (g) Methane emissions due to incomplete flaring ($PE_{flaring,y}$);
- (h) Methane emissions from biomass stored under anaerobic conditions which would not have occurred in the baseline situation ($PE_{biomass,y}$).

$$PE_y = \left\{ \begin{array}{l} PE_{power,y} + PE_{ww,treatment,y} + PE_{s,treatment,y} + PE_{ww,discharge,y} + PE_{s,final,y} + \\ PE_{fugitive,y} + PE_{biomass,y} + PE_{flaring,y} \end{array} \right\}$$

Where

PE_y Project activity emissions in the year y , (tCO₂e)

$PE_{power,y}$ Emissions from electricity or fuel consumption in the year y , (tCO₂e).

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$PE_{ww,treatment,y}$	Methane emissions from wastewater treatment systems affected by the project activity, and not equipped with biogas recovery, in year y , (tCO ₂ e).
$PE_{s,treatment,y}$	Methane emissions from sludge treatment systems affected by the project activity, and not equipped with biogas recovery, in year y , (tCO ₂ e).
$PE_{ww,discharge,y}$	Methane emissions from degradable organic carbon in treated wastewater in year y , (tCO ₂ e).
$PE_{s,final,y}$	Methane emissions from anaerobic decay of the final sludge produced in year y , (tCO ₂ e).
$PE_{fugitive,y}$	Methane emissions from biogas release in capture systems in year y , calculated as per paragraph 42 of the AMS-III.H, version 17 (tCO ₂ e)
$PE_{flaring,y}$	Methane emissions due to incomplete flaring in year y , (tCO ₂ e).
$PE_{biomass,y}$	Methane emissions from biomass stored under anaerobic conditions.

The project activity involves some project emissions as below:

$PE_{power,y}$	Project emissions from combustion of fossil fuel (naphta) in case of emergency will be accounted ex- post for the calculation of the project emissions. According to the methodology «Tool to calculate baseline, project and/or leakage emissions from electricity consumption», version 01, page 2 which is applied for calculation of project emissions ¹ : «This tool is not applicable in cases where captive renewable power generation technologies are installed to provide electricity in the project activity, in the baseline scenario or to sources of leakage.». As this is the case with the discussed project no project emissions from eventual consumption of grid electricity are accounted.
$PE_{fugitive,y}$	Methane emissions from the capturing systems will be accounted for in the proposed project as the project activity involves capture of biogas for power generation.
$PE_{flaring,y}$	Methane emissions due to incomplete flaring will be accounted for in the proposed project as flaring will occur in case of emergency.

The project activity does not involve in the project emissions as below:

$PE_{s,treatment,y}$	Methane emissions from sludge treatment systems will not be accounted for the project because the project activity involves methane recovery for energy generation. The escape methane emissions from the system will be treated as fugitive emissions.
$PE_{ww,treatment,y}$	Methane emissions from wastewater treatment systems will not be accounted for in the proposed project as the project activity does not involve the wastewater treatment system.
$PE_{ww, discharge,y}$	Methane emissions from degradable organic carbon in treated wastewater will not be accounted for the project because the treated wastewater in the project activity is the same as in the baseline.
$PE_{s,final,y}$	Methane emissions from anaerobic decay of the final sludge will not be accounted for the project because the final sludge from sludge treatment system will be used as fertilizer.
$PE_{biomass,y}$	Methane emissions from biomass stored will not be accounted for the project because the project activity does not involves the storing of biomass.

The values of the parameters used for the ex-ante calculations of the project emissions are defined according to the applied methodologies and tools. The audit team checked and confirmed the choice and correctness of the applied values.

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The ex-ante calculations of Project emissions in the project are performed in accordance with considerations and formulas above.

Leakage

There is no leakage from the project activity. There is no equipment transferred from another activity.

Leakages correctly are not considered in the project, i.e. $LE_y = 0$.

Other leakage emissions are considered as project emissions and calculated correspondingly.

Emission Reductions.

. Emission reductions are be estimated *ex ante* as follows:

$$ER_{y,ex\,ante} = BE_{y,ex\,ante} - (PE_{y,ex\,ante} + LE_{y,ex\,ante})$$

Where:

$ER_{y,ex\,ante}$ Ex ante emission reduction in year y (tCO₂e)

$LE_{y,ex\,ante}$ Ex ante leakage emission in year y (tCO₂e)

$PE_{y,ex\,ante}$ Ex ante project emission in year y (tCO₂e)

$BE_{y,ex\,ante}$ Ex ante baseline emission in year y (tCO₂e)

The project activity is classified under paragraph 2(a) of AMS-III.H so the ex post calculation of the emission reductions is performed as per paragraph 48 of the methodology.

The ex-ante calculations of Emission Reduction by the project are performed in accordance with formulae above. The final figures and estimations are presented in Sofiyska_voda_VER_Calculation_ver.03 /25/.

The total annual ER is estimated as 70,276 t CO₂ and the total amount for the crediting period is 491,932 t CO₂

All assumptions, documentation and data used by the project participants are correctly listed in the PDD and additional provided documents. All values used in the PDD including GWPs are considered reasonable in the context of the proposed GS requirements. All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD and additional provided records /01, 24, 25/. The GWP for Carbon Dioxide and Methane is also taken into consideration /25/.

3.12 Environmental Impacts

During the time of investment decision of the project, the competent authority had taken decision that there is no need of EIA, as per decision of 12/01/2000 /46/. The sludge from the project is controlled for hazardous elements from external laboratory (SGS) and just after positive results the sludge is sold as fertilizers as per signed contracts /35/. The wastewater is discharged is a river "Iskar" as per the issued Permission /34/ and /38/. All measurements inlet and outlet the WWTP is strictly conducted, monitored (online) and verified /32, 33/. An accredited laboratory is used for all wastewater measuring activities /31/. The air emissions (CHP) are also measured and protocols are collected /39/. Dangerous waste is separately collected and disposed from licensed companies are per signed contracts.

3.13 Local stakeholder consultation

A local Stakeholder Consultation Meeting was held on 15/04/2015. Stakeholders were invited to the meeting through different means including: E-mail correspondence; faxes, Newspaper advertisements;

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NGOs and local people and local municipality. During the consultation meeting, stakeholders had some comments about the project and asked for some contributions from the project owner. The questions were: Would the employees working on the project have been hired in the absence of project? What is the produces heat used for?; How is the remaining sludge after the process managed? Is there any information about the effect of the sludge/soil fertilizer on the soils?

The Passport, PDD and LSC Report as well as additional information was made publicly available through the webpage of Sofiyska Voda /60/on 05/05/2015 and the stakeholders were informed. The PDD and the GS Passport were also available at the office of Sofiyska Voda and the Municipality of Sofia. For the period until 30 Oct. 2015 no comments had been received. The documents were also uploaded to the at the GS registry website /42/.

During the on-site visit held on 10/09/15 the verification team invited local stakeholders to take part and to give their opinion for the project. Two Villagers of Benkovski participated and gave their opinion to the project /point 2.2 of this Report/. During the meeting two Environmental specialists of nearby Municipalities were also participated /point 2.2 of this Report/. Contract details is requested and collected as names, signatures and positions, documented in the participation list (10 people). The environmental expert said that the project fulfil all the applicable requirements and possesses all applicable permits and no complaints were received. As a result the local people and the Municipality are satisfied form the development of this project. During the official SFR no comments are received.

RINA can confirm that the process is adequate and credible for local stakeholder consultation.

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4 VALIDATION OPINION

RINA Services Spa (RINA) has performed validation of the project activity “Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria” in Bulgaria, with regard to the relevant requirements for GS VER activities.

The review of the project design document and the subsequent follow-up interviews have provided RINA with sufficient evidence to determine the fulfilment of the stated criteria.

The host Party is Republic of Bulgaria. The DNA from Republic of Bulgaria confirmed that the project assists in achieving sustainable development.

The project correctly applies the approved baseline and monitoring methodologies: “AMS-I.C”, “Thermal Energy Production with or without electricity”, version 20.0 of 01/06/2014; AMS-III.H Methane recovery in wastewater treatment, version 17 of 28/11/2014 and SSM AMS-I.D “Grid connected renewable electricity generation”, version 18 of 28/11/2014.

By description of the project activity the project results in reduction of CO₂ and CH₄ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the “Svilosa Biomass Project” are estimated to be on average 70,276 tCO_{2e} per year over the selected 7 years renewable crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

The monitoring plan provides for the monitoring of the project’s emission reductions and of the sustainable development indicators. The monitoring arrangements described in the monitoring plan are feasible within the project design and it is RINA’s opinion that the project participants are able to implement the monitoring plan.

In conclusion, it is RINA’s opinion that the project activity “Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria” in Bulgaria, as described in the PDD, version 5 of 30/03/2016, Gold Standard Passport version 05 of 31/03/2016 meets all relevant UNFCCC requirements for the GS VER and all relevant host Party criteria and correctly applies the baseline and monitoring methodologies: “AMS-I.C”, “Thermal Energy Production with or without electricity”, version 20.0 of 01/06/2014; AMS-III.H Methane recovery in wastewater treatment, version 17 of 28/11/2014 and SSM AMS-I.D “Grid connected renewable electricity generation”, version 18 of 28/11/2014.

APPENDIX A

GOLD STANDARD VALIDATION PROTOCOL

TABLE 1 REQUIREMENTS CHECKLIST

Checklist Question		Reference	MoV ²	Comments	Conclusion
A Description of Project Activity					
A.1 Title of the project activity					
A.1.1.	Does the used project title clearly enable the reader to identify the unique GS activity? Is there an indication of a revision number and the date of the revision.	01	DR	The Project Activity is “Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria” Project and the PDD is version 02 of 07/07/2015	OK
A.1.2	Does the project comply with the applicable requirements for completing the PDDs (latest version available)?	01 – 20	DR	RINA confirms that the above PDD is based on the currently valid PDD template on the time of submission to the DOE.	OK
A.1.3	Does the PDD comply with the template available (latest version)?	01, 20	DR, CC	Yes, the PDD complies with the latest available template during the time of submission to the DOE.	OK
A.2 Description of the proposed project activity					
A.2.1	Does the PDD contain an accurate description of the project activity and provide the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation? How was the design of the project assessed?	01, 29, 30,36 ,37,4 0,474 8,55	DR, CC	Yes, the PDD contain an accurate description of the project activity and provide the reader with a clear understanding. The project is both a methane emissions reduction and energy production project. The purpose of the project is to utilise the available renewable energy sources in the form of biomass received as a result from the waste water treatment in the Kubratovo WWTP. Methane produced in Kubratovo WWTP is captured in common methane tanks (four digesters for anaerobic sludge treatment) serving as a buffer and then supplied to the newly installed CHP gas engines (three co-generations sets) for electricity and heat production, which in turn will substitute both the plant's electricity purchases from the grid and diesel fuel usage. Excess electricity is supplied to the grid. The project was successfully registered as JI Project and all verifications in Kyoto Protocol period have been successfully conducted	OK

² MoV: DR document review, I interview, CC cross checking

Checklist Question	Reference	MoV ²	Comments	Conclusion
			The project is retroactive GS VER registration.	
A.2.2	Does the project activity involve alteration of existing installations? If yes, have the differences between pre-project and post-project activity been clearly described in the PDD?	01, 55, 56	DR, CC The project does not involve alteration of existing installations. The project was implemented in two phases. The project had been implemented in two stages: First face has covered erection of a new digester system consisting of 4 digesters and the second has covered erection of 3 new co-generation sets GE for generation of electric and thermal energy by combusting biogas from digesters. The digesters have been commissioned and entered into operation in May, 2008 and the CHP installation has been commissioned and started generating electricity and thermal energy for plant's needs in November, 2009.	OK
A.2.3	Is all information provided consistent and in compliance with the actual situation or planning?	01	DR, CC The information provided is consistent and in compliance with the actual situation. The next deviation is been found and documented: Major dates of project implementation are not presented	~~CAR-1~~ OK
A.2.4	Does the project qualify as a small-scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM? (If not SSC, delete the section)	01, 13, 15	DR, CC The project activity is qualified as a small scale project /01/. The capacity of the biomass boiler is 1,063 kW electric capacity and 1,088 kW (thermal), which is bellows the 45 MW (thermal) /06/.	OK
A.2.5	Is the small-scale project activity a debundled component of a larger project activity in accordance with the Guidelines on assessment of debundling for SSC project activities? (If not SSC, delete the section)	01	DR, CC The project activity is not a debundled component of a larger project activity in accordance with the Guidelines on assessment of debundling for SSC project activities /01/. This was also verified during the on-site visit of the project.	OK
A.2.8	Have the results of the sustainable development matrix been presented in the PDD?	01	DR, CC Yes, the results of the sustainable development matrix been presented in the PDD /01/.	OK
A.2.9	To which GS category(ies) does the project activity belong to? Is the category correctly identified and indicated? (GS Toolkit Annex C)	01, 02, 03	DR, CC The project activity is classified as retroactive small scale waste handling and disposal project activity. The gases that will be taking into consideration is CH ₄ and CO ₂ .	OK
A.2.10	In case of hydro projects, do the items provided in Table C-2 of the GS Toolkit Annex C have been discussed? (<i>please make transparent the items discussed in the GS PDD</i>).		DR, CC N/A	

Checklist Question		Reference	MoV ²	Comments	Conclusion
A.3 Project participants					
A.3.1	Have the Parties and project participants participating in the project been listed in tabular form in Section A.4 and are they consistent with the information detailed in Annex 1 of the PDD?	01	DR, I, CC	Yes, the Party and project participant participating in the project are been listed in tabular form in Section A.4. The project participant is a private company Sofiyska Voda AD. This information is also provided in Annex 1 of the PDD.	OK
A.3.5	Have all private/public project participants been authorized by a Party to the Kyoto Protocol?	01, 36	DR, I, CC	Yes, the private company Sofiyska Voda AD is been authorized /36/. The Republic of Bulgaria has been ratified the KP.	OK
A.4 Technical description of the project					
A.4.1	Does the information provided on the location of the project activity allow for a clear identification of the site(s)? Are the latitude and longitude of the site indicated (decimal points)?	01	DR, I, CC	Yes, the information provided on the location of the project activity and the geographical coordinates are provided in the PDD. The project activity location is in Village of Kubratovo, 20 km. from the centre of Sofia Town. The designations of geographical coordinates are: Latitude – 42:45:10.70 N and Longitude - 23:22:11.56 E, which was cross checked during the on-site visit as per Google Maps and GPS equipment /01/.	OK
A.4.2	Is the category(ies) of the project activity correctly identified?	01, 23	DR, I, CC	Yes, the category of the project activity correctly identified in the PDD. The project is small scale waste handling and disposal project under SS 01 and 13 /01/.	OK
A.4.3	Does the project design engineering reflect current good practices? Would the technology result in a significantly better performance than any commonly used technologies in the host Country? Is any transfer of technology from any Annex I Party involved?	01	DR, I, CC	The main purpose of the project was to transform the existing low tech sludge treatment process at Kubratovo WWTP into a modern advanced treatment process matching the best sludge treatment practice available in Western Europe. This transformation has a major effect on the environment through dramatically reducing the existing methane gas emissions at the plant while also reducing the volume of sludge that needs to be transported, hence reducing GHG emissions from transportation as well (not included in GHG abatement calculations). The project activity replaced the traditional sludge drying beds and landfill options with mesophilic digestion of all primary and secondary sludge followed by mechanical dewatering in order to reduce GHG emissions. This effectively mitigates odour problems from the existing treatment of sludge and sludge liquors through introduction of digestion installation. The project also covered production of electricity and heat from utilisation of the biogas in CHP gas engines thereby	OK

Checklist Question		Reference	MoV ²	Comments	Conclusion
				reducing GHG emissions from electricity production by the grid. Prior to the implementation of the project activity the thermal energy has been generated by on-site fossil fuel (natural gas for the new crediting period) boilers and the electric energy has been imported from the National grid.	
A.4.4	What is the expected operational lifetime of the project activity? Is it reasonable?	01	DR	The expected operational lifetime of the project activity is not correctly presented in the PDD.	CAR 2 OK
A.5 Public funding					
A.5.1	Does the information on public funding provided conform to the actual situation or planning as presente by the PPs?	01	DR, I, CC	There has been no public funding used for the financing of the project. ODA Declaration is not being presented.	CAR 3 OK
A.5.2	If public funding from Parties included in Annex I is used for the project activity, have these Parties provided an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties?	01	DR, I, CC	There has been no public funding used for the financing of the project. ODA Declaration is not being presented (CAR3).	OK
A.5.3	Is the ODA Declaration available and submitted to the GS Board as per the Annex D of the GS Toolkit?	01	DR, I, CC	There has been no public funding used for the financing of the project. ODA Declaration is not being presented (CAR3).	OK
B. Application of a baseline and monitoring methodology					
B.1 Methodology applied					
B.1.1	Does the project activity apply an approved methodology and the correct version thereof?	01, 04, 08, 09, 10, 11, 12, 17, 18, 19 and 41	DR, I, CC	The project activity apply three approved methodologies: - AMS-I.C “Thermal Energy Production with or without electricity”, ver. 20.0 of 01/06/2014 is used for this project activity /08/, which is the latest version of the methodology available on UNFCCC website; - AMS-III.H “Methane recovery in wastewater treatment”, ver. 17 of 28/11/2014 which is also used for this project activity /04/ is the latest version of the methodology available on UNFCCC website; - CDM Executive Board: Small Scale Methodology AMS-I.D “Grid connected renewable electricity generation”, ver. 18 of 28/11/2014, which is also used for this project activity /04/ is the latest version of the methodology available on UNFCCC website. Several CDM Tools are also used: 09, 10, 11, 12, 17, 18,	CAR 4 OK

Checklist Question		Reference	MoV ²	Comments	Conclusion									
				19 The latest version on Tool for “Emissions from solid waste disposal sites” in not used in the PDD										
B.1.2	Is there any specific guidance, including the methodological tools provided by EB and has these guidance been applied?	/01/, /14,15,16/	DR, I, CC	Yes, specific guidance are included in the presented PDD /01/, as: /14, 15, 16/	OK									
B.1.3	How was it validated that the project activity complies with the applicability criteria?	01, 04, 08	DR, I, CC	<table><tr><td>Applicability criteria</td><td>Project activity</td><td>Criteria is met?</td></tr><tr><td colspan="3">AMS-III.H “Methane recovery in wastewater treatment” /04/</td></tr><tr><td>This methodology comprises measures that recover biogas from biogenic organic matter in wastewater by means of one, or a combination, of the following options: a)Substitution of aerobic wastewater or sludge treatment systems with anaerobic systems with biogas recovery and combustion; b)Introduction of anaerobic sludge treatment system with biogas recovery and combustion to a wastewater treatment plant without sludge treatment; c)Introduction of biogas recovery and combustion to a</td><td>The project activity satisfies the applicability condition (a). The project is designed to replace the traditional sludge drying beds (aerobic) and landfill options with mesophilic digestion of all primary and secondary sludge in order to reduce GHG emissions (anaerobic). The project also effectively mitigated odour problems and stabilized the sludge. The used biogas is combusted in the</td><td>YES</td></tr></table>	Applicability criteria	Project activity	Criteria is met?	AMS-III.H “Methane recovery in wastewater treatment” /04/			This methodology comprises measures that recover biogas from biogenic organic matter in wastewater by means of one, or a combination, of the following options: a)Substitution of aerobic wastewater or sludge treatment systems with anaerobic systems with biogas recovery and combustion; b)Introduction of anaerobic sludge treatment system with biogas recovery and combustion to a wastewater treatment plant without sludge treatment; c)Introduction of biogas recovery and combustion to a	The project activity satisfies the applicability condition (a). The project is designed to replace the traditional sludge drying beds (aerobic) and landfill options with mesophilic digestion of all primary and secondary sludge in order to reduce GHG emissions (anaerobic). The project also effectively mitigated odour problems and stabilized the sludge. The used biogas is combusted in the	YES	CL1 CAR 5 OK
Applicability criteria	Project activity	Criteria is met?												
AMS-III.H “Methane recovery in wastewater treatment” /04/														
This methodology comprises measures that recover biogas from biogenic organic matter in wastewater by means of one, or a combination, of the following options: a)Substitution of aerobic wastewater or sludge treatment systems with anaerobic systems with biogas recovery and combustion; b)Introduction of anaerobic sludge treatment system with biogas recovery and combustion to a wastewater treatment plant without sludge treatment; c)Introduction of biogas recovery and combustion to a	The project activity satisfies the applicability condition (a). The project is designed to replace the traditional sludge drying beds (aerobic) and landfill options with mesophilic digestion of all primary and secondary sludge in order to reduce GHG emissions (anaerobic). The project also effectively mitigated odour problems and stabilized the sludge. The used biogas is combusted in the	YES												

Checklist Question		Reference	MoV ²	Comments			Conclusion
				sludge treatment system; d)Introduction of biogas recovery and combustion to an anaerobic wastewater treatment system such as anaerobic reactor, lagoon, septic tank or an on-site industrial plant; ³ e)Introduction of anaerobic wastewater treatment with biogas recovery and combustion, with or without anaerobic sludge treatment, to an untreated wastewater stream; f)Introduction of a sequential stage of wastewater treatment with biogas recovery and combustion, with or without sludge treatment, to an anaerobic wastewater treatment system without biogas recovery (e.g. introduction of treatment in an anaerobic reactor with biogas recovery	co-generation usnit.		

³ Other technologies in Table 6.3 of Chapter 6: Wastewater Treatment and Discharge of 2006 IPCC Guidelines for National Greenhouse Gas Inventories are included.

Checklist Question	Reference	MoV ²	Comments	Conclusion
			as a sequential treatment step for the wastewater that is presently being treated in an anaerobic lagoon without methane recovery).	
			In cases where baseline system is anaerobic lagoon the methodology is applicable if: a)The lagoons are ponds with a depth greater than two meters, without aeration. The value for depth is obtained from engineering design documents, or through direct measurement, or by dividing the surface area by the total volume. If the lagoon filling level varies seasonally, the average of the highest and lowest levels may be taken; b)Ambient temperature above 15°C, at least during part of the year, on a monthly average basis; c)The minimum interval between two	The baseline system does not apply anaerobic lagoons. The sludge in the baseline is stored in pits and after 1 year is transferred to a landfill. YES

Checklist Question	Reference	MoV ²	Comments	Conclusion
			consecutive sludge removal events shall be 30 days.	
			The recovered biogas from the above measures may also be utilised for the following applications instead of combustion / flaring: a) Thermal or mechanical, electrical energy generation directly; b) Thermal or mechanical, electrical energy generation after bottling of upgraded biogas, in this case additional guidance provided in Annex 1 shall be followed; or c) Thermal or mechanical, electrical energy generation after upgrading and distribution, in this case additional guidance provided in Annex 1 shall be followed; d) Upgrading and injection of biogas into a natural gas distribution grid with no significant transmission constraints;	YES

Checklist Question	Reference	MoV ²	Comments	Conclusion
			e)Upgrading and transportation of biogas via a dedicated piped network to a group of end users; or f)Upgrading and transportation of biogas (e.g. by trucks) to distribution points for end users. g)Hydrogen production; h)Use as fuel in transportation applications after upgrading.	
			If the recovered biogas is used for project activities covered under paragraph 4 (a) of AMS-III.H, that component of the project activity can use a corresponding methodology under Type I.	The project activity satisfies condition 4(a) above. The component of the project that accounts for the activities under paragraph 4(a) of the methodology uses SSC methodology AMS- I.C. "Thermal energy production with or without electricity", Version 20. YES
			For project activities covered under paragraph 4 (b) of AMS-III.H, if bottles with upgraded biogas	Not Applicable The project activity satisfies condition 4(a) YES

Checklist Question	Reference	MoV ²	Comments	Conclusion
			are sold outside the project boundary, the end-use of the biogas shall be ensured via a contract between the bottled biogas vendor and the end-user. No emission reductions may be claimed from the displacement of fuels from the end use of bottled biogas in such situations. If however the end use of the bottled biogas is included in the project boundary and is monitored during the crediting period CO₂ emissions avoided by the displacement of fossil fuel can be claimed under the corresponding Type I methodology, e.g. AMS-I.C “Thermal energy production with or without electricity”.	
			For project activities covered under paragraph 4 (c) (i) of AMS-III.H, emission reductions from the displacement of the use of natural gas are eligible under this	Not Applicable The project activity satisfies condition 4(a) YES

Checklist Question		Reference	MoV ²	Comments			Conclusion
				methodology, provided the geographical extent of the natural gas distribution grid is within the host country boundaries.			
				For project activities covered under paragraph 4 (c) (ii) of AMS-III.H, emission reductions for the displacement of the use of fuels can be claimed following the provision in the corresponding Type I methodology, e.g. AMS-I.C	Not Applicable The project activity satisfies condition 4(a)	YES	
				In particular, for the case of 4 (b) and (c) (iii) of AMS-III.H, the physical leakage during storage and transportation of upgraded biogas, as well as the emissions from fossil fuel consumed by vehicles for transporting biogas shall be considered. Relevant procedures in paragraph 11 of Annex 1 of AMS-III.H "Methane recovery in wastewater treatment" shall be	Not Applicable The project activity satisfies condition 4(a)	YES	

Checklist Question	Reference	MoV ²	Comments	Conclusion
			followed in this regard. For project activities covered under paragraph 4 (b) and (c) of AMS-III.H, this methodology is applicable if the upgraded methane content of the biogas is in accordance with relevant national regulations (where these exist) or, in the absence of national regulations, a minimum of 96% (by volume). If the recovered biogas is utilized for the production of hydrogen (project activities covered under paragraph 4 (d)) of AMS-III.H, that component of the project activity shall use the corresponding methodology AMS-III.O "Hydrogen production using methane extracted from biogas". If the recovered biogas is used for project activities covered under	Not Applicable The project activity satisfies condition 4(a) Not Applicable The project activity satisfies condition 4(a) Not Applicable The project activity satisfies condition 4(a)

Checklist Question	Reference	MoV ²	Comments	Conclusion
			paragraph 4 (e) of AMS-III.H, that component of the project activity shall use corresponding methodology AMS-III.AQ "Introduction of Bio-CNG in road transportation". New facilities (Greenfield projects) and project activities involving a change of equipment resulting in a capacity addition of the wastewater or sludge treatment system compared to the designed capacity of the baseline treatment system are only eligible to apply this methodology if they comply with the relevant requirements in the "General guidelines to SSC CDM methodologies". In addition the requirements for demonstrating the remaining lifetime of the equipment replaced, as described in the general guidelines shall be followed The project activity is a new facility and is implemented in an existing facility for treatment of municipal wastewaters and affects the sludge treatment system only. The project replaces the baseline sludge drying beds and landfill options with mesophilic digestion of all primary and secondary sludge followed by mechanical dewatering in order to reduce GHG emissions. The waste-water treatment system is not affected hence the capacity of the primary	YES

Checklist Question	Reference	MoV ²	Comments	Conclusion
			waste-water treatment system remains the same as in the baseline and there is no capacity addition. The project also uses CDM Executive Board: Methodological Tool “Tool to determine the remaining lifetime of equipment”, version 01 of 16/10/2009 /12/. Please also refer to CAR 2	
			The location of the wastewater treatment plant as well as the source generating the wastewater shall be uniquely defined and described in the PDD	YES
			Measures are limited to those that result in aggregate emissions reductions of less than or equal to 60 kt CO₂ equivalent annually from all Type III components of the project activity.	YES
			The emission reductions from the Type III component of the project activity are less than 60 kt CO₂ as demonstrated further in the PDD and ER excel sheet. The annual amount with the ER for electricity is	

Checklist Question	Reference	MoV ²	Comments	Conclusion
			56,747 tCO ₂ e	
			AMS-I.C “Thermal Energy Production with or without electricity”, version 20.0 of 01/06/2014	
			This methodology comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel. The project activity supplies the WWTP with electric energy that would be imported in the baseline from the National grid and with thermal energy that would be generated by local boilers using fossil fuel. The project utilises as fuel the bio-gas generated in anaerobic digesters.	YES
			Biomass-based cogeneration and trigeneration systems are included in this category. The proposed project is a biomass-based co-generation system.	YES
			Emission reductions from a biomass cogeneration system can accrue from one of the following activities: (a) Electricity supply to a grid; (b) Electricity and/or thermal energy (steam or heat) production for on-site consumption or for The proposed project is a biomass-based co-generation system because it generates thermal and electric energy for own use. The exceed electricity is supply to the Grid. The project follows the c)	CL1

Checklist Question	Reference	MoV ²	Comments			Conclusion
			consumption by other facilities; (c) Combination of (a) and (b).	requirement. However the PDD does not mention the correct answer.		
			Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category.	N/A	YES	
			In the case of new facilities (Greenfield projects) and project activities involving capacity additions the relevant requirements related to determination of baseline scenario provided in the "General guidelines for SSC CDM methodologies" for Type-II and Type-III Greenfield/capacity expansion project activities also apply.	The presented project activity falls under CDM Executive Board: Indicative simplified Baseline and Monitoring Methodologies for selected Small-Scale CDM Project activity categories, version 03 of 28/05/2009 and CDM Executive Board: Baseline and monitoring methodology "AMS-I.C", "Thermal Energy Production with or without electricity", version 20.0 of 01/06/2014	YES	
			The total installed/rated thermal energy generation capacity of the project	The project activity utilises 3 new co-generation sets with 1,063 kW electric capacity	YES	

Checklist Question	Reference	MoV ²	Comments	Conclusion
			equipment is equal to or less than 45 MW thermal (see paragraph 9 for the applicable limits for cogeneration and trigeneration project activities).	each (total 3,189 kW _e) and 1,088 kW thermal capacity each (total 3,264 kW _{th}).
			For co-fired systems, the total installed thermal energy generation capacity of the project equipment, when using both fossil and renewable fuel, shall not exceed 45 MW thermal (see paragraph 9 for the applicable limits for cogeneration project activities).	Not Applicable. The project is not a co-fired system. YES
			The following capacity limits apply for biomass cogeneration and trigeneration units: (a) If the project activity includes emission reductions from both the thermal and electrical energy components, the total installed energy generation capacity (thermal and electrical) of the	The total installed energy generation capacity (thermal and electrical) of the project activity is 6,453 kW which is below the limit of 45 MW (thermal) and 15MW(e). YES

Checklist Question	Reference	MoV ²	Comments	Conclusion
			project equipment shall not exceed 45 MW thermal. For the purpose of calculating this capacity limit the conversion factor of 1:3 shall be used for converting electrical energy to thermal energy (i.e. for renewable energy project activities, the maximal limit of 15 MW(e) is equivalent to 45 MW thermal output of the equipment or the plant); (b) If the emission reductions of the cogeneration project activity are solely on account of thermal energy production (i.e. no emission reductions accrue from the electricity component), the total installed thermal energy production capacity of the project equipment of the cogeneration unit shall not exceed 45 MW thermal; (c) If the emission reductions of the cogeneration project	

Checklist Question	Reference	MoV ²	Comments	Conclusion
			activity are solely on account of electrical energy production (i.e. no emission reductions accrue from the thermal energy component), the total installed electrical energy generation capacity of the project equipment of the cogeneration unit shall not exceed 15 MW.	
			The capacity limits specified in paragraphs 7 to 9 above paragraphs apply to both new facilities and retrofit projects. In the case of project activities that involve the addition of renewable energy units at an existing renewable energy facility, the total capacity of the units added by the project should comply with capacity limits in paragraphs 7 to 9, and should be physically distinct from the existing units.	YES
			If solid biomass fuel (e.g. briquette) is	Not applicable. The project uses YES

Checklist Question	Reference	MoV ²	Comments	Conclusion
			used, it shall be demonstrated that it has been produced using solely renewable biomass and all project or leakage emissions associated with its production shall be taken into account in the emissions reduction calculation.	biogas.
			Where the project participant is not the producer of the processed solid biomass fuel, the project participant and the producer are bound by a contract that shall enable the project participant to monitor the source of the renewable biomass to account for any emissions associated with solid biomass fuel production. Such a contract shall also ensure that there is no double-counting of emission reductions.	N/A YES
			If electricity and/or steam/heat produced by the project activity is delivered to a third party i.e. another facility or facilities	The energy generated (electric and thermal) by the project activity is used to supply its own needs. The YES

Checklist Question	Reference	MoV ²	Comments	Conclusion
			within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into that ensures there is no double-counting of emission reductions.	excess electric energy is delivered to the National grid.
			If the project activity recovers and utilizes biogas for power/heat production and applies this methodology on a stand-alone basis i.e. without using a Type III component of a SSC methodology, any incremental emissions occurring due to the implementation of the project activity (e.g. physical leakage of the anaerobic digester, emissions due to inefficiency of the flaring), shall be taken into account either as project or leakage emissions.	Not Applicable. The project activity uses AMS-III.H methodology.
			If project equipment contains refrigerants, then the refrigerant used in the project case shall have no ozone depleting	YES
				YES

Checklist Question	Reference	MoV ²	Comments	Conclusion
			potential (ODP). Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources provided: (a) Charcoal is produced in kilns equipped with methane recovery and destruction facility; or (b) If charcoal is produced in kilns not equipped with a methane recovery and destruction facility, methane emissions from the production of charcoal shall be considered. These emissions shall be calculated as per the procedures defined in the approved methodology AMS-III.K. Alternatively, conservative emission factor values from peer reviewed literature or from a registered CDM project activity	Not Applicable. YES

Checklist Question	Reference	MoV ²	Comments	Conclusion
			can be used, provided that it can be demonstrated that the parameters from these are comparable e.g. source of biomass, characteristics of biomass such as moisture, carbon content, type of kiln, operating conditions such as ambient temperature.	
			In cases where the project activity utilizes biomass, sourced from dedicated plantations, applicability conditions prescribed in the tool "Project emissions from cultivation of biomass" shall apply.	Not applicable. YES
			The applicability of the project against the requirements of Gold Standard V.2.2- Annex C is demonstrated below: Project type: Biogas	
			The following types of projects are eligible for registration by Gold Standard: -Renewable energy supply -End-use energy efficiency -Waste handling and disposal	The proposed project activity falls under the definition of "Waste handling and disposal". The project uses biogas recovered from the sludge digesters to generate electric YES

Checklist Question		Reference	MoV ²	Comments			Conclusion
					and thermal energy in CHP.		
				Methane recovery activities shall be eligible for emission reductions from both methane avoidance (including from the flared biogas fraction) and non-renewable fuel substitution as long as evidence is provided on time for validation to demonstrate that the system was designed in a way to at least make use of some of the biogas recovered for the delivery of energy services (e.g. electricity, heat)	The project uses biogas recovered from the sludge digesters to substitute the fossil fuel in the generation of thermal and electric energy. The electricity is produced in CHP units.	YES	
				Methane recovery activities at wastewater treatment plants related to Palm Oil production shall comply with all rules provided for palm oil related activities in the section @Electricity and/or heat, and liquid biofuels from biomass resources	Not Applicable. However the presented answer in the PDD is not related to this project.	CL1	
				The applicability of the project against the requirements of Gold Standard V.2.2- Annex C in the GS Passport is not documented.			

Checklist Question	Reference	MoV ²	Comments	Conclusion
B.1.4	Is the selected baseline one of the baseline(s) described in the methodology and this hence confirms the applicability of the methodology?	01, 04, 08	DR, I, CC According to the methodology AMS-I.C, ver. 20 /08/ which is used by the project for renewable energy technologies that displace technologies using fossil fuels, the simplified baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity, times an emission factor for the fossil fuel displaced. The project facility did not exist prior the implementation of the project. According to the methodology AMS-III.H, ver.17 which is used by the project: Prior to the implementation of the project activity Kubratovo WWTP did not possess any systems for generation and recovery of biogas. The sludge resulting from the wastewater treatment system has been dewatered and deposited in special sludge drying beds to stabilise for 15 to 18 months period and after that has been deposited to a landfill. The baseline will take into consideration as per paragraph 27 “baseline emissions from electricity or fuel consumption” and “baseline emissions from anaerobic decay of the final sludge”.	OK
B.2 Project boundary				
B.2.1	Is the project boundary are clearly defined and in accordance with the applied methodology?	01, 04, 08	DR, I, CC The project boundary /01/ are clearly defined and in accordance with the applied methodologies /04, 08/.	OK
B.2.2	What are the project's system boundaries (components and facilities used to mitigate GHGs)?	01, 04, 08	DR, I, CC During the on site visit in the WWTP it is confirmed that the boundary includes Digesters and Co-generation Installations as well as hot boilers and National Grid.	OK
B.2.3	Which sources are identified for the project? Does the identified project boundary cover all possible sources linked to the project activity?	01, 04, 08	DR, I, CC The gases which are included in the boundary are CO ₂ and CH ₄ emission from the baseline and project activity. It can be confirmed that all sources have been identified /01/.	OK
B.2.4	In case of grid connected electricity project: is the relevant grid correctly identified in accordance with the latest version of tool to calculate emission factor of electricity system and the underlying methodology?	01, 58, 59	DR, I, CC The project is grid connected electricity supply project that apply Tool to calculate the Emission Factor for an electricity system /58/ and SSM AMS-I.D “Grid connected renewable electricity generation” /59/. The latest version of SSM AMS-I.D “Grid connected renewable electricity generation” is not used in the PDD.	CAR 6 OK
B.2.5	Does the project involve other emissions sources not	01, 04, 08	DR, I, CC Project does not involve other emissions sources not	OK

Checklist Question		Reference	MoV ²	Comments	Conclusion
	foreseen by the methodologies that may question the applicability of the methodology? Do these sources contribute by more than 1% to the estimated emission reductions of the project?		CC	foreseen by the methodologies that may question the applicability of the methodology and nor there are any sources that contribute by more than 1% to the estimated emission reductions of the project. This is also confirmed during the site visit based on the implementation status of the project.	
B.3 Identification of the Baseline Scenario					
B.3.1	Which baseline scenarios have been identified? Is the list of the baseline scenarios complete? Does the PDD follow the steps to determine the baseline scenario required by the methodology/tool?	01, 04, 08	DR, I, CC	As per the used Methodology IMS-I.C /08/ the next scenario is used in the PDD (01): for renewable energy technologies that displace technologies using fossil fuels, the simplified baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity, times an emission factor for the fossil fuel displaced. The PDD /01/ follows the steps to determine the baseline scenario required by the methodology /08/. According to the methodology AMS-III.H, ver.17 which is used by the project, wastewater and treatment systems equipped with a biogas recovery facility in the baseline shall be excluded from the baseline emission calculations. Prior to the implementation of the project activity Kubratovo Wastewater Treatment Plant did not possess any systems for generation and recovery of biogas. The sludge resulting from the wastewater treatment system has been dewatered and deposited in special sludge drying beds to stabilise for 15 to 18 months period and after that has been deposited to a landfill. The project activity is designed to replace the traditional sludge drying beds and landfill options with mesophilic digestion of all primary and secondary sludge followed by mechanical dewatering, in order to reduce GHG emissions that have been generated by the anaerobic decomposition of the organic components of the sludge in the drying beds. The biogas produced and recovered by the project activity is used to generate thermal and electric energy and to replace the electricity imported from the grid and the combustion of fossil fuel (light oil) to generate thermal energy. The project activity affects only the treatment of the sludge while the wastewater treatment system remains the	OK

Checklist Question		Reference	MoV ²	Comments	Conclusion
				same as in the baseline. According to paragraph 1 of methodology AMS-III.H, version 17: The project activity is related to the aerobic sludge treatment system which existed in the plant prior to the implementation of the project, hence it falls under the definition of paragraph 1 (a): Substitution of aerobic wastewater or sludge treatment systems with anaerobic systems with biogas recovery and combustion.	
B.3.2	How have the other baseline scenarios been eliminated in order to determine the baseline?	01, 04, 08	DR, I, CC	Please refer to B.3.1	OK
B.3.3	What is the baseline scenario? Is the determination of the baseline scenario in accordance with the guidance in the methodology?	01, 04, 08	DR, I, CC	Please refer to B.3.1	OK
B.3.4	Has the baseline scenario been determined using conservative assumptions? Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies (E+ / E-), macro-economic trends and political aspirations?	01, 38, 44	DR, I, CC	The main applicable laws and regulations as well as Bulgarian electricity sector have been identified and justified in the PDD /01/. It is mention that all applicable legal requirements have been taken into account. All applicable legal permissions are issued and verified /38, 44/.	OK
B.4 Additionality					
B.4.1	What tool does the project use to assess additionality? Is this in line with the methodology?	01, 04, 08, 09	DR, I, CC	The Methodological tool “Tool for the demonstration and assessment of additionality”, ver. 07.0 of 23/11/12 /09/ is used to demonstrate the additionality of the project activity which is in line with the approved methodologies applied /04, 08/.	OK
B.4.2	What is the project additionality mainly based on?	01, 04, 08, 09	DR, I, CC	The project additionality has been based on the investment analysis.	OK
B.4.3 Prior consideration					
B.4.3.1	What is the starting date of the proposed project activity? Is it in accordance with the CDM Glossary of Terms?	01, 62	DR, I, CC	The new GS rules are followed for validation of Prior consideration of the project /62/. The project is shifting / upgrading from JI to GS voluntary scheme. For this project migrating from other voluntary standards the prior consideration for carbon revenues is checking as part of the gap analysis during validation. Please refer to the documented CARs in Table 2 of this Report.	OK
B.4.3.2	Is the project activity a new project activity or existing project?	01, 02, 03	DR, I, CC	The project activity is existing project that apply for retroactive registration. This project is also fast track project activity.	OK

Checklist Question		Reference	MoV ²	Comments	Conclusion
B.4.3.3	Does the timeline of the project confirm that continuous actions in parallel with the implementation were taken to secure project status? Please specify the gap between the documented evidences.	01, 36, 45	DR, I, CC	The project was successfully registered as JI Project and all verifications in Kyoto Protocol period have been conducted After the end of the KP, the PP started searching new possibilities for the project registration in voluntary market. The project was also supported from the MOEW as per official Letter of Support /36/. Major dates of project implementation are not presented, which was documented as CAR in Table 2 of this Report. RINA was chosen as a DOE as per signed contract with company Svilocell EAD of 16/07/2015 /45/.	OK
B.4.4 Investment analysis					
B.4.4.1	What is the analysis method used to determine whether the proposed project activity is not (a) the most economically or financially attractive; or (b) economically or financially feasible, without the revenue from the sale of certified emission reductions?	01, 04, 08, 16	DR, I, CC	Investment analysis according to the latest methodologies document and it is used from PP to prove that the project is not the most economically or financially attractive; or economically or financially feasible, without the revenue from the sale of emission reductions. The PP apply Option III - Benchmark analysis, which is a correct method of analysis.	OK
B.4.4.2	What the financial indicator is used?	01, 04, 08, 16	DR, I, CC	The financial indicator chosen in the project is estimation of equity Internal Rate of Return as the most appropriate parameter that show enough clear the profitability of the project and can be compared with the project benchmark.	OK
B.4.4.3	If a benchmark is used, is it ensured that it is selected in accordance with the requirements of the EB guidelines and it represents standard returns in the market? Is the benchmark suitable for the type of financial indicator presented? Is it ensured the any risk premiums applied in determining the benchmark reflect the risks associated with the project type or activity?	01, 04, 08, 16	DR, I, CC	Yes in principle the benchmark is selected in accordance with the requirements of EB. The benchmark rate is calculated in line with the Capital Asset Pricing Model (CAPM) that is correctly.	CAR 7 OK
B.4.4.4	Is the investment analysis carried out in accordance with specific guidance from EB? Is the investment analysis complete and accurate? Is the investment analysis provided in a spreadsheet version? Are all the formulas used readable and all relevant cell be viewable and unprotected?	01, 04, 08, 16, 22	DR, I, CC	Yes, the investment analysis carried out in accordance with specific guidance from EB. The investment analysis is complete and in principle accurate. The investment analysis provided in a spreadsheet version. The formulas are readable and all relevant cells be viewable and unprotected.	OK

Checklist Question		Reference	MoV ²	Comments	Conclusion
B.4.4.5	Cross-check the parameters used in the financial analysis against third party or publicly available sources (all parameters used as input values shall be cross-checked and assessed).	01, 04, 08, 16, 22	DR, I, CC	The information is not correctly presented in the PDD, documented as CARs. Please refer to Table 2. The next deviations are documented.	CAR 8 CAR 9 CAR 10 OK
B.4.4.6	Are the input values used in the investment analysis valid and applicable at the time of the investment decision taken by the PP?	01, 04, 08, 16, 22	DR, I, CC	The input values used in the investment analysis valid and applicable at the time of the investment decision taken by the PP, but there are discrepancies about operation maintenance costs, the price of electricity look very small, equipment depreciations time. Please refer to the documented CARs in Table 2. The next deviations are documented.	CAR 11 CAR 12 CAR 13 CAR 14 CAR 15 OK
B.4.4.7	Where applicable, the PFL has been defined ex-ante according to the applicable EB guideline?			N/A	OK
B.4.4.8	Does the time period of the investment analysis reflect the expected operation of the underlying project activity (technical lifetime)?	01, 04, 08, 16, 22	DR, I, CC	The information is not correctly presented in the PDD, documented as CARs. Please refer to Table 2.	OK
B.4.4.9	Does the fair value of the project activity assets is included at the end of the assessment period as a cashflow in the final year? Is the fair value calculated in accordance with local accounting regulations where available or international best practice?	01, 04, 08, 16, 22	DR, I, CC	Yes, the fair value of the project activity assets is included at the end of the assessment period as a cashflow in the final year. The fair value calculated in accordance with local accounting regulations where available or international best practice.	OK
B.4.4.10	Does the income tax calculation take depreciation into account? Is the depreciation year in accordance with normal accounting practice in the Host Country	01, 04, 08, 16, 22	DR, I, CC	The depreciation is in accordance with the Bulgarian legislation, but here there is a deviation with depreciation time in analysis and in factory accounting that is not motivated from PP. Please refer to Table. 2.	OK
B.4.4.11	Sensitivity analysis: have the key parameters contributing to more than 20% of the revenue/costs during operating or implementation been identified?	01, 04, 08, 16, 22	DR, I, CC	The key parameters are correctly stated in sensitivity analysis.	OK
B.4.4.12	Sensitivity analysis: is the range of variations is reasonable in the project activity? The main parameters can be changed for the different project category.	01, 04, 08, 16, 22	DR, I, CC	The range of variations is in accordance with the requirements of $\pm 10\%$, but in Excel file there is no calculations in the range of values. Please refer to Table 2.	OK
B.4.4.13	Have the key parameters been varied to reach the benchmark and the likelihood of this happening been justified to be small?	01, 04, 08, 16, 22	DR, I, CC	Yes the key parameters been varied to reach the benchmark and remain smaller. Please refer to the documented CARs in Table 2.	OK
B.4.5 Barrier analysis					

Checklist Question		Reference	MoV ²	Comments	Conclusion
B.4.5.1	Are the barriers identified complimentary to a potential investment analysis?	01, 04, 08-09	DR, I, CC	The barrier analysis is not applied /01/. The project additionality has been based on investment analysis.	OK
B.4.5.2	How were the investment barriers assessed to be real?			Please refer to B.4.5.1	OK
	How were the technological barriers assessed to be real?			Please refer to B.4.5.1	OK
B.4.5.3	How were the other barriers assessed to be real?			Please refer to B.4.5.1	OK
B.4.5.4	Barriers due to prevailing practice (First of its kind): does the project apply measures currently covered in the framework (fuel and feedstock switch, switch of technology with or without change of energy source, methane destruction, methane formation avoidance)?			Please refer to B.4.5.1	OK
B.4.5.5	Barriers due to prevailing practice (First of its kind): do the technologies deliver the same output and differ by at least of energy source/fuel, feed stock, size of installation?			Please refer to B.4.5.1	OK
B.4.5.6	Barriers due to prevailing practice (First of its kind): does the applicable geographical area is in compliance with the definition as per the EB guideline?			Please refer to B.4.5.1	OK
B.4.5.7	Is the project activity prevented by the identified barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?			Please refer to B.4.5.1	OK
B.4.5.8	How the GS can alleviate the identified barriers?			Please refer to B.4.5.1	OK
B.4.6 Common practice analysis					
B.4.6.1	Does the project apply measures currently covered in the framework (fuel and feedstock switch, switch of technology with or without change of energy source, methane destruction, methane formation avoidance)?	01, 09, 14	DR, I, CC	The PDD, ver. 02 of 07/07/2015 /01/ does not implement a Common Practice analysis as per the latest version of the "Tool for the demonstration and assessment of additionality" /09/.	CAR 16 OK
B.4.6.2	Do the technologies deliver the same output and differ by at least of energy source/fuel, feed stock, size of installation, investment climate in the date of the investment decision, other features?			Please refer to B.4.6.1	OK
B.4.6.3	Does the applicable geographical area is in compliance with the definition as per the EB guideline?			Please refer to B.4.6.1	OK

Checklist Question		Reference	MoV ²	Comments	Conclusion
B.4.6.4	How many similar non-CDM-projects exist in the region within the scope? (describe how the steps of the additionality tool have been applied)			Please refer to B.4.6.1	OK
B.4.6.5	What is the data source(s) used for the common practice analysis?			Please refer to B.4.6.1	OK
B.4.7 Do No Harm Assessment					
B.4.7.1	Does the project respects internationally proclaimed human rights including dignity, cultural property and uniqueness of indigenous people? Does the project is not complicit in Human Rights abuses? (<i>Annex H of GS Toolkit – § 1</i>).	01, 02, 03, 49, 50-53, 57	DR, I, CC	The project respects internationally proclaimed human rights including dignity, cultural property and uniqueness of indigenous people as well as due to the project activity there is no complicit in Human Rights abuses. Total of 27 Local people are employed by the PP for the project as per List of employees /49/. During the on-site visit of the project was verified the signed collective Labour Agreement covered 2015 /50/. For all working places are available risk assessment /51,52/ and there is a competent assigned company helping for solving all Health and Safety issues of the employees /51/. The company is also certified against OHSAS 18001 /53/. Health and Safety Instruction for all working places in WWTP are also available /57/. During the on-site visit of the project the used personnel protective equipment for all working places have been verified. The next equipment is allocated and used by the staff: protective working clothes, respiratory equipment, protective shoes, as analyzers, helmets, breathing equipment, protective glasses, torches. For all working places safety instruction are conducted and documented. This was demonstrated through the official letters and documents during the on-site visit.	OK
B.4.7.2	Does not the project involve and is not complicit in involuntary resettlement? (<i>Annex H of GS Toolkit – § 2</i>).	01	DR, I, CC	There are no resettlement activities due to the project activity, because the project is located outside village's area.	OK
B.4.7.3	Does not the project involve and is not complicit in the alteration damage or removal of any critical cultural heritage? (<i>Annex H of GS Toolkit – § 3</i>).	01	DR, I, CC	The project activity is not constructed on any critical cultural heritages and archaeological area. Please also refer to Section B.4.7.2	OK
B.4.7.4	Does the project respects the employees' freedom of association and their right to collective bargaining and is not complicit in restrictions of these freedoms and	01, 50	DR, I, CC	The project activity respects the employees' freedom. Bulgaria has ratified ILO (International Labour Organization)	OK

Checklist Question	Reference	MoV ²	Comments	Conclusion
rights? (<i>Annex H of GS Toolkit – § 4</i>).			convention. Please also refer to Section B.4.7.1	
B.4.7.5 Does not the project involve and is not complicit in any form of forced compulsory labour? (<i>Annex H of GS Toolkit – § 5</i>).	01, 50-53, 57	DR, I, CC	The project activity respects the employees and there is no compulsory labour. Please also refer to above Sections.	OK
B.4.7.6 Does not the project employ and is not complicit in any form of child labour? (<i>Annex H of GS Toolkit – § 7</i>).	01, 50-53, 57	DR, I, CC	The project activity does not employ children. Please also refer to above Sections.	OK
B.4.7.7 Does not the project involve and is not complicit in any form of discrimination based on gender, race, religion, sexual orientation or any other basis? (<i>Annex H of GS Toolkit – § 7</i>).	01, 50-53, 57	DR, I, CC	The project activity does not involve and is not complicit in any form of discrimination based on gender, race, religion, sexual orientation or any other basis. Bulgaria has ratified ILO (International Labour Organization) convention. Please also refer to Section B.4.7.1	OK
B.4.7.8 Does the project provide workers with a safe and healthy work environment and is not complicit in exposing workers to unsafe or unhealthy work environments? (<i>Annex H of GS Toolkit – § 8</i>).	01, 50-53, 57	DR, I, CC	The project activity does not involve and is not complicit in any form of discrimination based on gender, race, religion, sexual orientation or any other basis. Bulgaria has ratified ILO (International Labour Organization) convention. Please also refer to Section B.4.7.1	OK
B.4.7.9 Does the project take a precautionary approach in regard to environmental challenges and is not complicit in practices contrary to the precautionary principle? (<i>Annex H of GS Toolkit – § 9</i>).	01, 31, 32, 33, 34, 35, 38, 39, 46, 54	DR, I, CC	All the conducted assessments of environmental and social impact show that from this project activity there is no significant negative influence into environment and social area /31, 32, 33, 34, 35, 38, 39, 46/. The required Environmental Permissions are issued. The company is also certified against ISO 14001:2004 /54/.	OK
B.4.7.10 Does not the project involve and is not complicit in significant conversion or degradation of critical natural habitats, including those that are legally protected, officially proposed for protection, identified by authoritative sources for their high conservation value, or recognized as protected by traditional local communities? (<i>Annex H of GS Toolkit – § 10</i>).	01	DR, I, CC	The project activity is not constructed on any critical cultural heritages and archaeological area. Please also refer to Section B.4.7.2	OK
B.4.7.11 Does not the project involve and is not in complicit in corruption? (<i>Annex H of GS Toolkit – § 11</i>).	01	DR, I, CC	Bulgaria has ratified ILO (International Labour Organization) convention. Please also refer to Section B.4.7.1	OK
B.4.8 Sustainability Assessment				
B.4.8.1 Are the GS indicators of sustainable development identified according to the Annex I of the GS Toolkit? (<i>list the identified indicators</i>)	01, 02, 03, 23, 60	DR, I, CC	Yes, the GS indicators of sustainable development are identified according to the Annex I of the GS Toolkit. The identified indicators are: Air quality; Water quality and quantity; Soil condition; Other pollutants; Biodiversity; Quality of employment; Livelihood	

Checklist Question		Reference	MoV ²	Comments	Conclusion
				of the poor; Access to affordable and clean energy services; Human and institutional capacity; Quantitative employment and income generation; Balance of payments and investment and Technology transfer and technological self-reliance. However the next discrepancies are also documented: Numbered of employed women is not added in SD MP There is no information about the used oil and other hazardous waste generated from the periodical technical maintenance of the project. GS Passport: SFR is still not finalized. The exact dates of the SFR are not presented. GS Passport: Assessment of stakeholder comments in Section E.1 is not presented. GS Passport: In the Passport (Section E.3) and in the presented link http://www.sofiyskavoda.bg/CustomPages.aspx?PageID=41 concerning the grievance mechanism the mail of GS (info@goldstandard.org) is not presented.	CAR 17 CAR 18 CAR 19 CAR 20 CAR 21 OK
B.4.8.2	Are the justification choices documented? Which data sources have been provided for references?	01, 31, 32, 33, 34, 35, 38, 44	DR, I, CC	Yes, justification choices as well as data sources and provision of references are provided for sustainable development indicators. The data sources that have been provided for references are monitoring records /31, 32, 33, 34, 35/, Ministry of Environment and Water website /44/, Project Environmental permissions /38/ as well as corresponded environmental laws and regulations documented in the PDD. Please also refer to Section B.4.8.1	OK
B.4.8.3	Which parameters have been identified for the selected indicators?	01, 31, 32, 33, 34, 35, 38, 44	DR, I, CC	Indicator: Air quality – emissions of SO_x, NO_x, CO and dust Indicator: Water quality and quantity – consumed and	

Checklist Question	Reference	MoV ²	Comments	Conclusion
			discharged wastewater	
			Indicator: Soil condition – monitoring of the sludge	
			Indicator: Other pollutants – no other pollutant is added	
			Indicator: Biodiversity – number of effected and / or threatened plants, mammals, birds, fishes and other species and habitats	
			Indicator: Quality of employment – number of employees receiving vocational training (Occupation health and safety and Environmental training)	
			Indicator: Livelihood of the poor – Parameter: employment	
			Indicator: Access to affordable and clean energy services – change in energy use, traditional fuel consumption and / or electricity consumption per capita	
			Indicator: Human and institutional capacity – number of employees (women employees)	
			Indicator: Quantitative employment and income generation – Parameter: number of jobs created	
			Indicator: Balance of payments and investment – Parameter: amount of domestic and foreign investment	
			Indicator: Technology transfer and technological self-reliance – Parameter: number of workshops, seminars and training	
			The Indicator Air Quality is not scored as positive. Emission of CH ₄ is included in the SD MP but not in Section F.2	CAR 22
			Noise measurement in GS Passport s not included	CAR 23
			Measurement of the quantity of the sludge in GS Passport	CAR 24

Checklist Question		Reference	MoV ²	Comments	Conclusion
				is not included	OK
B.4.9 Conclusion					
B.4.9.1	What is the conclusion with regard to the additionality of the project activity?	01	DR, I, CC	The final conclusion with regard to the additionality of the project activity will be presented in the final report only after closing of all documented CARs and CR in Table 2 of this Report.	OK
B.5 Algorithms and/or formulae used to determine emission reductions					
B.5.1 Baseline emissions					
B.5.1.1	Are the steps and equations applied to calculate the baseline emissions in compliance with the requirements of selected baseline and monitoring methodology?	01, 04, 08, 10, 11, 12, 17, 18, 19, 24, 25	DR, I, CC	The steps and equations applied to calculate the baseline emissions are in compliance with the requirements of selected baseline and monitoring methodology. The methodology AMS-III.H: Methane recovery in wastewater treatment (Version 17) is used for the part of baseline emissions calculation rise of methane pollutions and “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site”, Version 06.0.1. The methodology AMS-I.C, “Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories – I.C. Thermal energy production with or without electricity”, Version 20 , is used for the part of baseline emissions calculations due of thermal energy and electricity plant’s consumption. The methodologies: “Guidelines on the Demonstration of Additionality of Small-scale Project Activities”, Ver.09.0 is used for demonstration of project additionality. The Methodological Tool “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period”, Version 03.0.1 is applied to demonstrate that the baseline of the project is still valid. The methodology “AMS-I.D: Grid connected renewable electricity generation” ver.17 is used, but shall be ver. 18 together with “Tool to calculate the emission factor for an electricity system”, version 04 is used for grid electricity emission factor estimation. All methodologies and tools applied, are approved by the CDM Executive Board. The steps and equations applied to calculate baseline	OK

Checklist Question	Reference	MoV ²	Comments	Conclusion
			emissions and the monitoring plan determination are in accordance with these methodologies, tools and guidelines, using conservative options and data.	
B.5.1.2	Have conservative assumptions been used when calculating the baseline emissions and are the uncertainty estimates properly addressed? Are all the values used in the PDD considered reasonable in the context of the proposed project activity?	01, 04, 08, 10, 11, 12, 17, 18, 19, 24, 25	DR, I, CC The Baseline emissions from wastewater treatment are estimated in accordance of methodology AMS-III.H,para.27. Applied to the baseline defined formula is reduced to two components: - Baseline emissions from electricity and fuels consumption in year y (tCO₂e); - Baseline methane emissions from anaerobic decay of the final sludge produced in year y (tCO₂e). It is enough conservative approach of PP. The project activity falls under paragraph 28(a) of the methodology AMS-I.C, version 20. Baseline emissions for supply of electricity to the plant is calculated as multiplication of electricity consumed and the emission factor of the grid. The grid EF is estimated in accordance with “AMS-I.D and “Tool to calculate the emission factor for an electricity system”, version 04. The grid EF is calculated as CM emission factor equal of the sum of OM EF and BM EF in weighted proportion 50 : 50 %, that is correctly. In the calculations there are some discrepancies as it is described in CAR 7 and CAR 8 of table 2. The thermal energy baseline emissions are calculated as per paragraph 33 of AMS-I.C, version 20. The value of boilers efficiency is taken from the operation documentation of the boiler that is enough conservative. Methane emissions from anaerobic decay of the final sludge produced are estimated as According to AMS-III.H, version 17, para.37 that is correctly. The methane correction factor MCF of the disposal site (in this case the drying beds and the landfill) is determined as per the latest version of the “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site”	OK

Checklist Question		Reference	MoV ²	Comments	Conclusion
				For conservativeness the lowest default value of MCF of 0.4 for unmanaged shallow solid waste disposal sites (SWDP) with depth less than 5 m. is used.	
B.5.1.3	Baseline Emissions estimated (in case of different components applied please make them transparent).	01, 04, 08, 10, 11, 12, 17, 18, 19, 24, 25	DR, I, CC	Baseline emissions are calculated in accordance with the documents in B.5.1.1 and B.5.1.2 and with the necessary conservativeness.	OK
B.5.2 Project emissions					
B.5.2.1	Are the steps and equations applied to calculate the project emissions in compliance with the requirements of selected baseline and monitoring methodology? Are all the values used in the PDD considered reasonable in the context of the proposed project activity?	01, 04, 08, 10, 11, 12, 17, 18, 19, 24, 25	DR, I, CC	The steps and equations applied to calculate the project emissions are in compliance with the requirements of the selected in B.5.1.1 baseline and monitoring methodologies and the tools. Also in compliance with the tools pointed below: "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" Version 02 ; "Emissions from solid waste disposal site", Version 6.0.1 "Project emissions from flaring", Version 2.0.0; "Project and leakage emissions from anaerobic digesters", Version 1 "Tool to determine the mass flow of a greenhouse gas in a gaseous stream", version 02.0.0 The values used in the PDD can be considered reasonable in the context of the proposed project.	OK
B.5.2.2	Have conservative assumptions been used when calculating the project emissions and are the uncertainty estimates properly addressed?	01, 04, 08, 10, 11, 12, 17, 18, 19, 24, 25	DR, I, CC	Yes in principle the PP use conservative assumptions but there is a discrepancies, documented as CARs in Table 2.	OK
B.5.2.3	Project emissions estimated	01, 04, 08, 10, 11, 12, 17, 18, 19, 24, 25	DR, I, CC	Please refer to the documented CARs in Section B.5.4.2	OK
B.5.3 Leakage					
B.5.3.1	Are the steps and equations applied to calculate the leakage in compliance with the requirements of selected baseline and monitoring methodology? Are all the values used in the PDD considered reasonable in the context of the proposed project activity?	01, 04, 08, 10, 11, 12, 17, 18, 19, 24, 25	DR, I, CC	There are three tools concern to leakage calculation in PDD. "Tool to calculate baseline, project and/or leakage emissions from electricity consumption; "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" and "Project and leakage emissions from	OK

Checklist Question		Reference	MoV ²	Comments	Conclusion
				anaerobic digesters". There is no equipment transferred from another activity and in accordance with AMS-III.H . paragraph 43 it is not necessary leakages to be calculated. The PP considers that the leakages of project activities are negligible small, and no leakage emissions are considered in the project.	
B.5.3.2	Have conservative assumptions been used when calculating the leakage and are the uncertainty estimates properly addressed?		DR, I, CC	No leakages applied to project activities.	OK
B.5.3.3	Leakage estimated		DR, I, CC	No leakages applied to project activities.	OK
B.5.4 Emission reductions					
B.5.4.1	Has the methodology been correctly applied to calculate the emission reductions and can this be replicated by the data provided in the PDD and supporting files to be submitted for registration?	01, 04, 08, 10, 11, 12, 17, 18, 19, 24, 25	DR, I, CC	Yes, the calculations of emission reductions are performance in accordance with par.80 of AMS I.C./Version 20 /08/ and in accordance with paragraph 44 of AMS-III.H.	OK
B.5.4.2	Are all the assumptions and data used by the project participants listed in the PDD including their references and sources?	01, 04, 08, 10, 11, 12, 17, 18, 19, 24, 25	DR, I, CC	Yes, all the assumptions and data used by the project participants are listed in the PDD including their references and sources. The next deviations are documented as CARs.	~~CAR-25~~ ~~CAR-26~~ ~~CAR-27~~ ~~CAR-28~~ OK
B.5.4.3	Is all the documentation used by the project participants as the basis for assumptions and source of data quoted and interpreted in the PDD?	01, 04, 08, 10, 11, 12, 17, 18, 19, 24, 25	DR, I, CC	Yes, in principle all documentation of data interpreted in PDD is used.	OK
B.5.4.4	Emission Reductions estimated	01, 04, 08, 10, 11, 12, 17, 18, 19, 24, 25	DR, I, CC	The ex-ante emission reduction are calculated in accordance with par.80 of AMS I.C./Version 20 /11/ and in accordance with paragraph 44 of AMS-III.H. The results are shown in table of B.6.8. Summary of ex-ante estimates of emission reductions in accordance with the requirements. The data are extracted from Excel calculation file "Kubratovo_biogas_project_VER_calculation_v.01.xls"but no link to this document.	OK
B.6 Monitoring plan					
B.6.1 Parameters ex-ante					
B.6.1.1	Does the monitoring plan contain the list of all parameters required by the approved methodology	01, 04, 08	DR, I, CC	The MP described in the PDD refers to the requirements of the used Methodologies /04, 08/.	

Checklist Question		Reference	MoV ²	Comments	Conclusion
	and by the applicable methodological tool?			The next parameters fixed ex ante are used: EF of the Grid of Bulgaria; Methane correction factor; degradable organic content of the untreated sludge; fraction of DOC dissimilated to biogas; fraction of CH₄ in biogas; model correction factor to account for model uncertainties; GWP of methane; flare efficiency; efficiency of the plant using fossil fuel; CO₂ EF of the fossil fuel; NCV of the light oil (naphta) used in emergency cases; CO₂ EF of the light oil (naphta); Project activity emissions from methane release in capture systems and density of CH₄. Reference of the used efficiency of the plant using fossil fuel in the PDD, section B.6.6 in not presented Data and parameters to be monitored are as follows: Amount of dry matter in the sludge; the net quantity of the heat supplied by the project activity; electricity generated by the CHP; quantity of the biogas generated by the anaerobic digesters; quantity of the sludge entering the anaerobic digesters; dry substance content in the sludge; methane content in biogas; quantity of fossil fuel (naphta) used for emergency needs and mass flow of methane in the residual biogas flared	CAR-29 OK
B.6.1.2	How were the parameters available at validation verified?	01, 04, 08,10, 11, 17, 18, 19, 44, 58, 59	DR, I, CC	Yes, the parameters were available at validation and verified. The official site of the MOEW is used /44/ as well as approved CDM Methodologies and Tools /04, 08,10, 11, 17, 18, 19, 58 and 59/. IPPC 2006 default values are also used.	OK
B.6.1.3	Which default data have been selected and applied?	01, 04, 08	DR, I, CC	They are listed in B.6.1.1	OK
B.6.1.4	Are all the values used in the PDD considered reasonable in the context of the proposed project activity?	01, 04, 08	DR, I, CC	Yes, all the values used in the PDD are considered reasonable in the context of the proposed project activity /01/.	OK
B.6.2 Parameters ex-post					
B.6.2.1	Does the monitoring plan described in the PDD comply with the requirements of the methodology and the applicable methodological tool?	01, 04, 08,	DR, I, CC	The MP described in the PDD refers to the requirements of the used Methodologies /04, 08/. Data and parameters to be monitored are as follows:	OK

Checklist Question		Reference	MoV ²	Comments	Conclusion
				Amount of dry matter in the sludge; the net quantity of the heat supplied by the project activity; electricity generated by the CHP; quantity of the biogas generated by the anaerobic digesters; quantity of the sludge entering the anaerobic digesters; dry substance content in the sludge; methane content in biogas; quantity of fossil fuel (naphta) used for emergency needs and mass flow of methane in the residual biogas flared.	
B.6.2.2	Does the monitoring plan contain all necessary parameters and are they clearly described?	01, 04, 08	DR, I, CC	The monitoring plan contains all necessary parameters and are they clearly described in the MP. Please refer to the above section.	OK
B.6.2.3	Is the measurement equipment described? Is the accuracy of the measurement equipment addressed and deemed appropriate? Are the requirements for maintenance and calibration of measurement equipment described and deemed appropriate?	01	DR, I, CC	The used measuring equipment as well as their periodic calibration is mention in the PDD /01/, checked during the on-site visit of the project. The required calibration files are also available on-site. Flowchart of the stream and measurement equipment is also provided in the PDD. The real measurement points, measurement equipment and measurement method of parameters in the PDD are not presented.	~~CAR-30~~ OK
B.6.2.4	Is the monitoring and recording frequency adequate for all monitoring parameters? Is it in line with the monitoring methodology?	01, 04, 08	DR, I, CC	The monitoring and recording frequency as described in the PDD /01/ are adequate for all monitoring parameters as per the used monitoring Skada software, verified during the on-site visit of the project. The data are on-line monitoring and recording in the installed software. The proposed monitoring is in line with the monitoring methodology /, 04, 08/. Please refer to the above documented CAR.	OK
B.6.2.6	How has it been assessed that the monitoring arrangements described in the monitoring plan are feasible within the project design? Please confirm the ability of the project participants to implement the described monitoring plant.	01, 04, 08	DR, I, CC	The monitoring data is continuously measured by the meters attached to the installations. This continuous measurement is recorded in a daily monthly basis. The project also uses IT “Scada” software for continuing measuring and recording. As a result, monthly figures are used for ER estimations.	OK
B.6.3 Monitoring of the GS indicators of sustainable development					
B.6.3.1	Does the monitoring plan include the GS indicators of sustainable development?	01, 02, 03, 23	DR, I, CC	Yes, the GS Passport includes monitoring of GS indicators, except those indicated in CAR of Section B.4.8. They are assed and listed in Section B.4.8	OK
B.6.3.2	Does the monitoring plan give the way (how, when,	01, 02, 03,	DR, I,	Yes, the monitoring plan gives the information about the	OK

Checklist Question		Reference	MoV ²	Comments	Conclusion
	by who) of monitoring of each GS indicator?	23	CC	way (how, when, by who) of monitoring of each GS indicator. The main responsibility for conducting the monitoring is on the project manager and competent authority (third party). Please also refer to Section B.4.8.	
B.6.3.3	Does the monitoring plan give the future project target for the parameter?	01, 02, 03, 23	DR, I, CC	Yes, the monitoring plan gives the future project target for the used parameters in the Sustainability Monitoring Plan. Please also refer to Section B.4.8.1.	OK
B.6.4 Management/Quality Assurance/Quality Control					
B.6.4.1	Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?	01	DR, I, CC	The management and operators have the responsibilities to input the required data feeds on a monthly and annual basis as required in the monitoring methodology and input data templates in the electronic workbook. The workbook should be saved after each update. Back-up copies of the workbook should be saved and stored on a secure system on a monthly basis to avoid loss of information. The responsibilities are clearly pointed in the PDD. Project management diagram (management data flow) in Section B.7.3 of the PDD is not provided.	~~CAR-31~~ OK
B.6.4.2	Are the data management and quality assurance and quality control procedures sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified?	01	DR, I, CC	Yes, the data management and quality assurance and quality control procedures are sufficient to ensure that the emission reductions achieved by the project can be reported ex post and verified during the verification phase. All measuring meters and equipment are installed in the project installations and their periodic calibration files are also available and. Please also refer to Section B.6.2.3.	OK
B.6.4.3	Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	01	DR, I, CC	All monitored data required for verification and issuance will be kept for two years after the end of the crediting period, documented in the PDD.	OK
C.1 Crediting period					
C.1.1	What is the expected crediting starting date of the proposed project activity? Does the crediting period start eight week after the request for registration?	01	DR	Evidence for selected start date of the project activity is not presented. Please also refer to Section A.2.3	~~CAR-32~~ OK
C.1.2	What is the length of the crediting period? Is it clearly defined and reasonable?	01	DR, I, CC	The length of the crediting period is defined as 7 years and 0 months that is clearly defined and reasonable.	OK

Checklist Question		Reference	MoV ²	Comments	Conclusion
D.1 Environmental impacts					
D.1.1	Has an analysis of the environment impacts of the project activity been undertaken? Is it clearly and sufficiently described in the PDD?	01, 31-35, 38, 46,	DR, I, CC	During the time of investment decision of the project, the competent authority had taken decision that there is no need of EIA, as per decision of 12/01/2000 /46/. The sludge from the project is controlled for hazardous elements from external laboratory (SGS) and just after positive results the sludge is sold as fertilizers as per signed contracts /35/. The wastewater is discharged in a river "Iskar" as per the issued Permission /34/ and /38/. All measurements inlet and outlet the WWTP is strictly conducted, monitored (online) and verified /32, 33/. An accredited laboratory is used for all wastewater measuring activities /31/. The air emissions (CHP) are also measured and protocols are collected /39/. Dangerous waste is separately collected and disposed from licensed companies as per signed contracts.	OK
D.1.2	Will the project create any adverse environmental effects? Are transboundary environmental impacts considered in the analysis? <i>(If not SSC, delete the section)</i>	01	DR, I, CC	No adverse environmental effects and transboundary environmental impacts are considered. Please refer the above explanation.	OK
D.1.3	Is the analysis of the environmental impacts required by the legislation of the host Country? If yes, has the EIA has been approved by local Government? Does the approval contain any conditions that need monitoring?	01	DR, I, CC	Please refer the above explanation.	OK
D.1.4	Is it the project in line with the current environmental legislation in the host Country?	01	DR, I, CC	Yes, the project is in line with the current environmental legislation in the Republic of Bulgaria as per the PPD and verified permissions and protocols. All applicable laws and regulations are available in the Ministry of Environmental and Water website /44/. Please also refer the above explanation.	OK
D.1.5	Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	01, 44	DR, I, CC	Yes, the monitoring of sustainable development indicators/ environmental impacts is warranted by legislation in the host country.	OK
D.1.6	Are the sustainable development indicators in line with stated national priorities in the host country?	01, 44	DR, I, CC	Yes, the sustainable development indicators are in line with stated national priorities in the host country.	OK

TABLE 2 RESOLUTION OF CORRECTIVE ACTION REQUESTS AND CLARIFICATION REQUESTS

Corrective action and/ or clarification requests	Reference to Table 1	Response by project participants	Validation conclusion
CAR 1 Major dates of project implementation are not presented	A.2.3	A relevant table has been amended to the PDD in Section B.5, paragraph «Prior consideration».	Major dates of project implementation in PDD ver. 3 of 10/11/2015 are presented. This CAR 1 is closed.
CAR 2 The expected operational lifetime of the project activity is not correctly presented in the PDD	A.4.4	The operational lifetime of the project is stated in Section C.1.2 of the revised PDD, ver.03.	The expected operational lifetime of the project activity is now correctly presented in the PDD ver. 3 of 10/11/2015. This CAR 2 is closed.
CAR 3 ODA Declaration is not being presented.	A.5.1	ODA declaration is uploaded at the GS Register and presented to the DOE – Appendix 2 of the Revised PDD.	ODA Declaration is being attached to the revised PDD ver 3 of 10/11/2015 This CAR 3 is closed.
CAR 4 The latest version on Tool for “Emissions from solid waste disposal sites” in not used in the PDD	B.1.1	The latest version 07 of “Emissions from solid waste disposal sites” is presented in the PDD.	The latest version on Tool for “Emissions from solid waste disposal sites” in the revised PDD ver 3 of 10/11/2015 is used. This CAR 4 is closed.
CAR 5 The applicability of the project against the requirements of Gold Standard V.2.2- Annex C in the GS Passport, Section C.3 is not documented.	B.1.3	The applicability conditions are amended in the Passport against the requirements of GS V.2.2 – Annex C.	The applicability of the project against the requirements of Gold Standard V.2.2- Annex C in the GS Passport, ver. 3 of 16/11/2015 is now added and documented. This CAR 5 is closed.

CAR 6 The latest version of SSM AMS-I.D “Grid connected renewable electricity generation” is not used in the PDD	B.2.4	The latest version 18 of AMS-I.D “Grid connected renewable electricity generation” is presented in the PDD.	The latest version of SSM AMS-I.D “Grid connected renewable electricity generation” in the revised PDD ver. 3 of 10/11/2015 is used. This CAR 6 is closed.
CAR 7 The Annual Reports on ESO site are for 2010, 2011, 2012 but not for 2013. It is valid and for all quoted data in Table 11 on page 35 of PDD.	B.4.4.3	The grid OM EF is re-calculated using data from ESO annual Reports for 2010, 2011 & 2012. The PDD and the corresponding data Tables have been corrected.	The requested information is been corrected. At OM EF recalculations the net electricity generated annually as difference between gross electricity production of fossil TPP extracted auxiliary needs calculated, as the auxiliary needs consumption of every TPP is calculated with average percent of parasitic loads received with relation between system auxiliary needs and (Lignite +Hard coals+Gas) TPP + Nuclear TPP gross production. It is conservative approach and can be used. The OM and BM emission factors are calculated conservatively in accordance with the existing official authorities data and in good order in Excel special program. There is a correlation between MOEW calculation in 2014 of grid EF and the calculated in PDD . This CAR 7 is closed .

CAR 8 For Market risk premium ($E(R_m) - R_f$) is taken Total risk premium that is 8.9 % instead Country risk premium that is 3.9 % but in other side $R_f +$ country premium risk will give $E(R_m)$ market rate of return i.e. loan interest. If country premium is 3.9 it makes in our case $6.55 + 3.9 = 9.45$ % it can be the average loan's interest. In other case if we take total premium risk $8.9 \% + 6.55 = 15.45$ % that is quite big value of interest. Please clarify.	B.4.4.5	To estimate the "Market risk premium" of Bulgaria, the data of the World Bank for 2008 was used. The World Bank document quotes a Risk premium on lending (lending rate minus treasury bill rate) of 6.8% for 2008. The Benchmark has been re-calculated correspondingly in the PPP, ver.03.	The calculation of risk premium is corrected with data of World bank of credits lending rate with extraction of risk free rate. This CAR 8 is closed .
CAR 9 "The equity IRR before taxes is calculated as 12.37%" but in the same time in calculation Excel file "IRR_Kubratovo_v.01.xls" the IRR is calculated for 17 years after corporative tax and the value is 10.6 %. What is the valid value? Please correct and make the values and the conditions of calculation equal.	B.4.4.5	The equity IRR is calculated before taxes and it matches the type of the Benchmark, which is also defined before taxes. The Benchmark is calculated using the CAPM method which by definition gives the IRR without taxes. The Equity IRR is stated in the excel spreadsheet filename: IRR_Kubratovo_v.02.xls. The correct value of the equity IRR before taxes is 12.35 %.	Yes, the Excel file "IRR_Kubratovo_v.01.xls" is corrected and the equity IRR before taxes is 12.35 % on the two places in PDD and in Excel file. This CAR 9 is closed
CAR 10 The chosen Risk Free Rate (R_f) (emission BG 20 40 40) is indeed for EUR but from date of the bid 12.11.2003 and 15 years maturity. Please explain why this choice is used instead of BGN.	B.4.4.5	The Risk Free rate is corrected as per emission BG 20 400 08 216 /16.01.2008 third opening from 21.05.2008 and 10 years maturity. The PDD is corrected correspondingly and the benchmark is recalculated.	The Risk free rate is accordingly corrected to bid open from 21.05.2008. This CAR 10 is closed .
CAR 11 It is not clear why the IRR is calculated for 17 years, if the first part of project is with life time 25 years and CHP life time 16 years. Why the calculations are not for 15 years?	B.4.4.6	The equity IRR is calculated for 17 years which is the technical lifetime of the CHP of 16 years + 1 year construction period. According to the Guidelines on the Assessment, of the Investment Analysis, ver.05, Paragraph 3, a period of 10 to 20 years is appropriate for the investment analysis period in general.	The team does accept the explanation. In our case the direction is conservative. This CAR 11 is closed.

CAR 12 Table of input parameters – The next information is not clear: - O&M is not clear the period and units. The values look quite small, is not clear what they consist; - The price of electricity (33.65 EUR) looks very low; - The depreciation time is very short. In the presented accounting document the annual norm of depreciation is 7.5 % or 13 years for all; - The table has no number. In the table is written that the equity IRR is calculated before corporative taxes but the benchmark is calculated after taxes or before? Please clarify?	B.4.4.6	-The table is amended to make the O&M period clear. -The amount of the O&M is taken from the real accounting records of the plant for the first period and from the Feasibility study REUP for the second period, as stated in the PDD and the IRR calculation spreadsheet. This approach corresponds to the requirements of the Guidelines for the assessment of the investment analysis, ver.05. The cost of biogas produced is defined by the general O&M expenses and adding it to the O&M expenses will lead to double counting which is not appropriate. -The price of electricity is taken from the Feasibility report REUP which is in line with the Guidelines and was available at the time of the investment decision taking as required by the Guidelines on the assessment of the investment analysis, ver.05. - For the needs of the project a general rate 30% per year (~3.3 years) as per the Bulgarian accounting law is estimated and is stated in the excel sheet Investment&Financials, row 40. However the depreciation is not taken into account in the calculation of the equity IRR before taxes because as per the Guidelines on the assessment of the investment analysis, ver.05, paragraph 5 it is a non-cash item and if deducted in estimating gross profits on which tax is calculated, should be added back to net profits for the purpose of calculating the financial indicator (e.g. IRR, NPV). The PDD is amended with additional explanation in that respect. -The benchmark is calculated before taxes so correspondingly the IRR is calculated before taxes too. The revised IRR calculated sheet, ver.02 is presented to the audit team. The benchmark is calculated using the CAPM model which in general calculates the rate of return without taxes (by definition).	The team does accept the explanation. This CAR 12 is closed.
CAR 13 In calculation IRR file "IRR_Kubratovo_v.01.xls" the Debt Interest is not identified and there are no calculations for Debt Interest Payment. The values shall be result from a formula.	B.4.4.6	The debt interest is taken into account in the revised IRR calculations – see. Sheet Loan repayment. The data on the loan is taken from the REUP Report, which is , in fact, a Feasibility Study Report, valid at the date of the investment decision taking.	The IRR is recalculated and debt is included in the calculations This CAR 13 is closed.

CAR 14 In calculation IRR file "IRR_Kubratovo_v.01.xls" the Debt Interest no calculations of project sensitivity in the limits of $\pm 10\%$. Please explain.	B.4.4.6	The Debt interest is not assessed in the Sensitivity analysis. According to the requirements of the Guidelines for the assessment of the investment analysis, ver.05. the Sensitivity analysis is performed over parameters that contribute to more than 20% of the revenues and/or expenses of the project. The Sensitivity Analysis includes the parameters "Investment cost", "Energy savings" and "Operating cost" varied in the range of +/-10%.	In accordance with CAR13, the debt interest is included in calculations and it is part from operation costs, that automatically answer of this CAR. This CAR 14 is closed
CAR 15 The beta coefficient is the sensitivity of the asset returns (equity) to market risk and it is reflect to the risk of different kinds of industries. There is investigation of this parameter by industries of Aswath Damodaran, can be suitable "betas08.xls" where the value of β for power industry is 1,65. Please clarify.	B.4.4.6	The Beta coefficient is taken from the studies of prof Aswath Damodaran for power industry as recommended. The Benchmark has been re-calculated correspondingly in the PDD, ver.03. Reference to the source is added in the revised PDD.	The correction is correctly done. Benchmark is recalculated accordingly. This CAR 15 is closed
CAR 16 The PDD, ver. 03 of 14/10/2014 /01/ does not implement a Common Practice analysis as per the latest version of the "Tool for the demonstration and assessment of additionality" /09/.	B.4.6.1	As per the instructions of GS no Common Practice analysis is required for Small Scale projects as evident from the attached e-mail fro GS.  Re GS 4238 (Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant Sofia Bulgaria).msg	The validation tem does accept the GS confirmation and closed this CAR. This CAR 16 is closed.
CAR 17 Numbered of employed women is not added in SD MP	B.4.8.1	Added number of women employed in the project.	The number of employed women in SD MP is now added. Please see the GS Passport ver. 3 of 16/11/2015. This CAR 17 is closed.
CAR 18 There is no information about the used oil and other hazardous waste generated from the periodical technical maintenance of the project.	B.4.8.1	Waste oil disposal is added as an Indicator for monitoring.	Additional information concerning the waste oil collection and disposal as well as the measurement requirements in the amended GS Passport is added. This CAR 18 is closed.

CAR 19 GS Passport: SFR is still not finalized. The exact dates of the SFR are not presented.	B.4.8.1	The SFR is finalised and exact dates are presented.	The SFR is now finalized and the exact dates of the SFR are presented. This CAR 19 is closed.
CAR 20 GS Passport: Assessment of stakeholder comments in Section E.1 is not presented.	B.4.8.1	The Assessment of stakeholders comments is presented in the GS Passport.	Assessment of stakeholder comments in Section E.1 of the GS Passport ver. 3 of 16/11/2015 is now presented. This CAR 20 is closed.
CAR 21 GS Passport: In the Passport (Section E.3) and in the presented link http://www.sofiyskavoda.bg/CustomPages.aspx?PageID=40 concerning the grievance mechanism the mail of GS (info@goldstandard.org) is not presented. The mail shown in the official link is not documented in the Passport.	B.4.8.1	The e-mail on the official link and in the Passport Grievance mechanism is corrected to: goldstandard@sofiyskavoda.bg	For the process the next information is presented: - An email address is available for any feedback: goldstandard@sofiyskavoda.bg - A web link provides more background on the project: http://www.sofiyskavoda.bg/CustomPages.aspx?PageID=41 - A weblink of gold standard is also available This CAR 21 is closed.
CAR 22 The Indicator Air Quality is not scored as positive. Emission of CH ₄ is included in the SD MP but not in Section F.2	B.4.8.3	The Indicator Air Quality is now scored as positive. According to GS the emissions of CH ₄ should not be included in Air Quality.	The validation team accept the provided information and closed this CAR. This CAR 22 is closed.
CAR 23 Noise measurement in GS Passport is not included	B.4.8.3	Noise measurement is excluded from the GS Passport as not obligatory for the current project. Noise levels are measured once at the starting of the project as part of the working environment assessment and before issuing of the Permit for Operation.	The validation team accept the provided information and closed this CAR. This CAR 23 is closed.

CAR 24 Measurement of the quantity of the sludge in GS Passport is not included	B.4.8.3	Measurement of the quantity of the final sludge is included in the Monitoring Plan as indicator.	Measurement of the quantity of the sludge in GS Passport is now included in parameter "Soil condition", chosen parameter number 2. This CAR 24 is closed.
CAR 25 In EFgrid calculation Excel file "EF_calculation_table_Kubratovo_v.01" spreadsheet "Average_OM_option_B_data" table " Fuels ", next deviations are found: - NCVi – the value for NG of 0.00337 GJ is wrong stated. - Is not indicated from where the EF for fossil fuels are taken (0.0909, 0.0895, 0.0543); - Is not chosen the method of calculation "Ex-ante"; - NG calculation is not correctly presented	B.5.4.2	- The NCV value of the natural gas is corrected. The EF is re-calculated correspondingly. - The sources of the fossil fuel EF values are added in the calculation table. - "Ex ante" option is chosen in the exell table. - The EF is automatically re-calculated with the proper value of NCV for NG.	The calculation of grid EF is changed from Average to Simple method (Option B) and here the value of NCV of NG is right, and the source of EFs for fossil fuels is indicated, the Ex-ante method is chosen. This CAR 25 is closed
CAR 26 In the calculation of PE is considered emergency situation with consumption of fossil fuels for thermal energy producing, but is not foreseen the consumption of electricity from grid in emergency situation. No PE from grid electricity consumption. Please also explain the motives for this in PDD.	B.5.4.2	According to the methodology «Tool to calculate baseline, project and/or leakage emissions from electricity consumption», version 01, page 2: «This tool is not applicable in cases where captive renewable power generation technologies are installed to provide electricity in the project activity, in the baseline scenario or to sources of leakage.». As this is the case with the discussed project no project emissions from eventual consumption of grid electricity are accounted. An explanation in this respect is added to the PDD.	The team does accept the provided explanation of the used Tool. This CAR 26 is closed.
CAR 27 The project activity is classified under <u>paragraph 4(a)</u> of AMS-III.H so the ex post calculation of the emission reductions will, be performed as per <u>paragraph 44</u> of the methodology", but the paragraph is 2(a) and the other paragraph is 48. Table "- Data and parameters fixed ex ante"- EFEL,y - value 0.6952 is not correctly presented.	B.5.4.2	-The paragraph is corrected -The Emission factor of the grid is corrected according to the revised calculations.	All data in text and in the ex-ante parameters table are corrected accordingly. This CAR 27 is closed

CAR 28 Page 64 of PDD- - The table for WCH_{4,y} practically this is parameter $V_{CH_4,t,db}$ from formulae (11) for ex-post calculations the difference is only that one is % the other is (m³CH₄/m³ dry gas). - All parameters of ex-ante and ex-post calculations (PE calculations) and monitoring tables are not with identical names; The table for ρ_{sludge} - Please clarify the value of 0.0596 for which year is?	B.5.4.2	- The designations/names of the parameters used are changed to match for different methodologies used to avoid confusion and to match the specifics of the project. - The value in the table for ρ_{sludge} is amended to specify the year (2012) it is valid for.	The required information are corrected accordingly. This CAR 28 is closed
CAR 29 Reference of the used efficiency of the plant using fossil fuel in the PDD, section B.6.6 in not presented	B.6.1.1	A reference for the efficiency used for new N. gas fired boilers is presented in the PDD.	The required information are corrected accordingly. This CAR 29 is closed
CAR 30 The real measurement points, measurement equipment and measurement method of parameters in the PDD are not presented.	B.6.2.3	A new detailed diagramme was included in the PDD with all measuring points listed. The table of the measuring equipment is amended with the missing devices.	Streams and measurement points flowchart as well as a list of measurement equipment in the revised PDD ver 3 of 10/11/2015 are presented. This CAR 30 is closed.
CAR 31 Project management diagram (management data flow) in Section B.7.3 of the PDD is not provided.	B.6.4.1	A diagramme with the management structure and data flows is added in the PDD.	Project management diagram (management data flow) in Section B.7.3 of the PDD ver. 3 of 10/11/2015 is now provided. This CAR 31 is closed.
CAR 32 Evidence for selected start date of the project activity is not presented.	C.1.1	The start date of the project is stated as 07/09/2004 as per the Protocol for opening of the construction site – attached in Appendix 7 of the PDD.	The start date of the project activity is 07/09/2004, as per the presented Protocol for construction site opening. The PDD ver. 3 of 10/11/2015 is amended accordingly. This CAR 32 is closed.

CR1 The answer of applicability condition number 3 of IMS-I.C is not correctly documented (Section B.2 of the PDD). Also the answer of applicability condition number 3 of GS V.2.2 Annex C is not related to this project activity (Section B.2 of the PDD).	B.1.3	The applicability conditions table is amended and corrected to follow the requirements of AMS-I.C and Annex C of GS V.2.2.	Both answers in the amended PDD ver 3 of 10/11/2015 now correspond to the requirements. This CR 1 is closed.
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TABLE 3 FORWARD ACTION REQUEST

Forward action request	Reference to Table 1	Response by project participants Validation conclusion



RINA

CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE FOR VOLUNTARY SCHEMES

Si attesta che il sig./sig.ra:

Konstantin Dimitrov Rachev

We declare that Mr/Mrs/Ms:

è qualificato come¹:
is qualified as:

TL - VAL - VER - TE

per le seguenti aree tecniche:
for the following technical areas:

1.2, 5.1, 13.1

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
1.2	Renewables	1
5.1	Chemical industry	5
13.1	Solid waste and wastewater	13

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	17-03-2011	-
8	05-03-2015	-

Il Resp. QPT
Head of QPT

¹ Legend:

VAL: Validator
VER: Verifier
TEC: Technical Expert
TL: Team Leader
FIN-EXP: Financial Expert
DET: Determiner

CDM: Clean Development Mechanism
VCS: Verified Carbon Standard
GS: Gold Standard
SCS: SocialCarbon Standard
JI: Joint Implementation

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports



RINA

CERTIFICATO DI QUALIFICA QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra:

Stefan Manev

We declare that Mr/Mrs/Ms:

è qualificato come¹:
is qualified as:

CDM - TEC

per le seguenti aree tecniche:
for the following technical areas:

1.1, 2.1, 3.1

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
1.1	Thermal energy generation	1
2.1	Electricity Distribution	2
3.1	Energy Demand	3

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	04/11/2014	First Issue
1	22-12-2014	Update qualification according to AS 6.0

Il Resp. QPT
Head of QPT

¹ Legend:

VAL: Validator
VER: Verifier
TEC: Technical Expert
TL: Team Leader
FIN-EXP: Financial Expert
DET: Determiner

CDM: Clean Development Mechanism
VCS : Verified Carbon Standard:
GS: Gold Standard
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RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports



RINA

CERTIFICATO DI QUALIFICA QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra:
We declare that Mr/Mrs/Ms:

Rekha Menon

è qualificato come¹:
is qualified as:

CDM-TEC, -VAL, -VER, -TL

per le seguenti aree tecniche:
for the following technical areas:

1.2, 2.1, 13.1, 13.2, 14.1

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
1.2	Renewables	1
2.1	Energy Demand	2
13.1	Solid Waste and wastewater	13
13.2	Manure	13
14.1	Afforestation and reforestation	14

in accordo alle istruzioni della Divisione Certificazione.
in accordance with the instructions of the Certification Division.

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	06-03-2008	-
10	22-12-2014	Update qualification according to AS ver.6.0

Il Resp. QPT
Head of QPT

¹ Legend:

VAL: Validator
VER: Verifier
TEC: Technical Expert
TL: Team Leader
FIN-EXP: Financial Expert
DET: Determiner

CDM: Clean Development Mechanism
VCS : Verified Carbon Standard:
GS: Gold Standard
SCS: SocialCarbon Standard
JI: Joint Implementation

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports