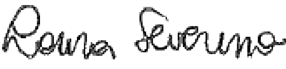




Validation report form for GS project activities

VALIDATION REPORT FOR DESIGN CHANGE

Title of the project activity	Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria
Version number of the validation report	5.0Aa
Completion date of the validation report	22/04/2026
Version number of PDD to which this report applies	05 of 21/04/2026
Version number of GS Passport to which this report applied	Not applicable
Project participant(s)	Sofiyska Voda AD (project owner, private entity)
Host Party	Bulgaria
Estimated annual average GHG emission reductions or net removals in the crediting period (tCO₂e)	71,120 tCO ₂ – after design change 68,545 tCO ₂ - annual average over the crediting period, after design change
Sectoral scope(s) and selected methodology(ies)	Sectoral scope 1: Energy Industries (Renewable-/non-renewable sources) and Sectoral scope 13: Waste handling and disposal AMS-I.C./Version 22.0: Thermal energy production with or without electricity AMS-III.H./Version 19.0: Methane recovery in wastewater treatment AMS-I.F./Version 05.0: Renewable electricity generation for captive use and mini-grid
Name of VVB	RINA Services S.p.A. (RINA)
Name, position and signature of the approver of the validation report	 Laura Severino (Authorized officer signing for the VVB) Decarb & Chain of Custody Product Management

SECTION A. Executive summary

Purpose and general description of the 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 (five digesters for anaerobic sludge treatment, each of 7,000m³) serving as a buffer and then supplied to the newly installed CHP gas engines (three co-generations sets with 1,063 kW electric capacity and 1,088 kW thermal capacity each) 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. In addition, an implementation of CHP exhaust gasses heat recovery system in 2017 was involved.

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.

The proposed permanent design change includes:

The installation implemented in the process of treatment of wastewater sludge in "Kubratovo" WTP and regarded as a permanent design change of the validated project is an experimental one and applied for the first time in any of Bulgaria's waste-water treatment plants. The design change related to the project does not influence the quantity of the sludge entering the bio-reactors and the biological content in it (Biological Oxygen Demand – BOD). The purpose of the implemented process is to atomize the particles of the inlet waste-water sludge and to improve the process of sludge stabilization in order to decrease the quantity of ammonia and nitrogen in the effluent water. In general, the design-change objectives are the following:

1. Reducing the high ammonia content in the sludge water from sludge dewatering, through anaerobic ammonium oxidation (Anammox). The main objective is to lower the final ammonia content in the treated water and then reduce eutrophication. The goal is to achieve ammonia removal up to 80-90% and total nitrogen removal up to 75-85%. This is conducted in Anaerobic Ammonia Oxidation Plant – Anammox.
2. Reducing the amount of sludge generated by upgrading the capacity of the sludge management - construction of a thermal hydrolysis of sludge (THS) installation in addition to the currently existing anaerobic stabilization. This is conducted in Thermal Hydrolysis Plant (THP).
3. Steam boilers for THP – 2 units (replacing the existing hot water boiler)

The implementation of the design change makes obsolete and replaces the following equipment included in the project's validated PDD:

1. Raw Sludge Pumping Station
2. Sludge Circulation System
3. Hot water boiler (replaced by steam boilers)

The general purpose of the permanent design change is to improve the quality of the effluent water after the wastewater treatment plant by decreasing the content of ammonia and nitrogen in it. The quantity of the sludge entering the bio-reactors is not affected and remains the same as in the validated PDD. The quantity of the biogas generated by the project is expected to increase by about 10% but the generation of electric energy by the co-generation plant will remain the same. The number of co-generating units will remain the same as in the validated PDD and the additional quantity of biogas will be destroyed by combusting in the steam boilers to generate process steam

The project was successfully validated for previous CP 1 (starting from 01/04/2014) and current CP 2 (starting from 01/04/2021) /1,3/. The new installation, regarded as a design change of project, was put in full operation on 15/11/2024 /35,37/.

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 geographical coordinates of the project are: Latitude - 42°45'13.25"N and Longitude - 23°22'11.15"E

Scope of validation

The scope of the design change Validation is to have an independent evaluation of a project activity by a VVB against the GS4GG requirements and principles /18-29/, on the basis of the PDD /1/. Validation is a requirement, and it is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of VERs and sustainability development.

Validation of the design change is a necessary to provide assurance about:

- (a) the impact of new relevant national and/or sectoral policies as well as GS4GG requirements and circumstances on the baseline;
- (b) the correctness of the application of an approved baseline methodology for the determination of the continued validity of the baseline or its update, and the estimation of emission reductions and monitoring data for the applicable crediting period;
- (c) the description of changes in revised PDD accurately reflects the implementation, operation and monitoring of the modified project by review of the submitted revised PDD and by means of an on-site visit.

Validation process

Validation is conducted using RINA procedures in line with the GS requirements and principles and applying standard auditing techniques. The validation assessment involved a document review of relevant documentation, the interview and/or on-site visit and the reporting. Validation is not meant to provide any consultancy towards the project participants. However, stated request for clarifications and/or corrective actions may have provided input for improvement of the project design.

Design change requirements /29/ has been followed to validate the design change of an already registered project activity.

Conclusion

RINA commissioned by Sofiyska Voda AD has performed the design change validation of the project activity "Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria", regarding the relevant GS4GG requirements and principles for project activities.

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 21/04/2026 /1/ meets all relevant requirements for GS activities and all relevant host Party criteria and correctly applies the baseline and monitoring methodologies /7,8,9/.

SECTION B. Validation team, technical reviewer and approver

B.1. Validation team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of VVB or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader, GS approved Validator and verifier, Technical Expert TA 1 and 13	IR	R	Konstantin	RINA Bulgaria	✓	✓	✓	✓

B.2. Technical reviewer and approver of the validation report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of VVB or outsourced entity)
1.	Technical reviewer Approved GS auditor and technical expert in SS 01 and 13.	IR	A	Cyril	RINA India
2	Approver	IR	S	Laura	RINA HO

Validation team member (Previous Audit-Revalidation)

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader, GS approved Validator and verifier, Technical Expert TA 1.2&13	IR	K	Tugce	RINA Turkey	✓	✓	✓	✓
2	Technical reviewer Approved GS auditor and technical expert in SS 01 and 13.	IR	E	Fulya	RINA Turkey				✓

SECTION C. Means of validation**C.1. Desk review**

The PDD version 05 of 21/04/2026 and previous versions /1/, in particular the applicability of the methodologies, the baseline determination, the additionality of the project activity, the starting date, the project eligibility, the monitoring plan, the sustainability indicators, the stakeholder consultation, the emission reductions calculation /1-3/ were assessed as part of the validation. All documents reviewed or referenced during the validation are listed in Appendix 3.

C.2. On-site inspection

Duration of on-site inspection: 08/05/2025				
No.	Activity performed on-site	Site location	Date	Team member
1	- Implementation and operation of the proposed design change project activity. - Emission reductions calculations. - Monitoring data and used measuring equipment. - Interview key personnel to confirm the operational and data collection. - Procedures - QA QC - GS Sustainable Indicators. - Local stakeholder consultation. - Implementation and maintaining the grievance mechanism. - Company Registration Certificates, Permissions and evidences.	Village of Kubratovo	08/05/2025	Konstantin R

C.3. Interviews

N o	Interview			Date	Subject	Team member
	Last name	First name	Affiliation			
1	L	Teodor	Sofiyska Voda – Manager Waste Water Treatment	08/05/2025	Implementation and operation of the proposed project activity. - Baseline and Additionality - Emission reductions calculations - Interviewed key personnel of the plant to confirm the operational and data collection procedures, QA QC procedures - GS Sustainable Indicators - Local stakeholder consultation - Monitoring data - Measuring equipment	Konstantin R
2	V	Mariana	Sofiyska Voda – Technologist, Technical Department			
3	M	Viktor	Green Carbon Bulgaria – project consultant			
4	D	Hristo	Sofiyska Voda – Technical Department Supervisor			
5	P	Vilhelm	Sofiyska Voda – Technical Department Supervisor			
6	M	Rumen	Sofiyska Voda – Senior manager “Sustainable management”	Contacted on phone on 08/05/2025		
7	K	Konstantin	Benkovski citizen			
8	S	Nasko	Benkovski citizen			
9	V	Petar	Mayor of Village Kubratovo			

Although the on-site visit is not required by the Core Document “Site-Visit-and-Remote-Audit-Requirements” /24/, the Team Leader decided to go on-site to visit to verify already installed facilities, speak with company representatives.

During on site visit, project responsible and carbon consultant were interviewed about the updated project activity and calculation of emission reduction; Mechanical & Electrician were interviewed about monitoring plan, monitoring arrangements, monitoring equipment and operation of the project activity; Environmental responsible person was interviewed about the environmental and social impacts of the project activity. In addition, 3 stakeholders were interviewed about the benefits or complaints about the project. They all defined that they have no complaints about the project activity.

During interview, it is asked to the stakeholders and project employees if any legal contests or disputes have arisen during the construction and validation phase, and they confirmed that there is no legal contest or disputes have arisen.

C.4. Sampling approach

There is no sampling approach applied.

C.5. Clarification requests, corrective action requests and forward action requests raised

Areas of validation findings	No. of CR	No. of CAR	No. of FAR
Project design document		1	
Description of project activity			
Application of selected baseline and monitoring methodology and selected standardized baseline			
- Applicability of methodology and standardized baseline		1	
- Deviation from methodology			
- Clarification on applicability of methodology, tool and/or standardized baseline			
- Project boundary		1	
- Establishment and description of baseline scenario			
- Project eligibility			
- Demonstration of additionality			
- Sustainability assessment			
- Emission reductions	1		
- Monitoring plan		1	1
- Sustainability Monitoring plan			
Duration and crediting period			
Environmental impacts			
Local stakeholder consultation			
Pre-feasibility assessment			
Others (please specify)			
Total	1	4	1

SECTION D. Validation findings

D.1. Project design document

Means of validation	The title of the project activity is defined as "Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria" in the PDD /1/ which is in line with the GS Registry (GS 4238). The version and the completion date of the report are available on the cover page of the PDD. "GS4GG Project Design Document Template /19/, version 1.5, which is the latest versions when project documentation was provided to VVB.
Findings	N/A
Conclusion	RINA confirms that the PDD is based on the currently valid GS4GG Templates /1,19/.

D.2. GS Passport

Means of validation	No GS Passport is available under GS4GG.
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Findings	NA
Conclusion	No GS Passport is available under GS4GG.

D.3. Description of project activity

Means of validation	The design change related to the project does not influence the quantity of the sludge entering the digesters and the biological content in it (Biological Oxygen Demand – BOD). The purpose of the implemented process is to atomize the particles of the inlet wastewater sludge and to improve the process of sludge stabilisation in order to decrease the quantity of ammonia and nitrogen in the effluent water. In general, the design-change objectives are the following: 1. Reducing the high ammonia content in the sludge water from sludge dewatering, through anaerobic ammonium oxidation (Anammox). The main objective is to lower the final ammonia content in the treated water and then reduce eutrophication. The goal is to achieve ammonia removal up to 80-90% and total nitrogen removal up to 75-85%. 2. Reducing the amount of sludge generated, by upgrading the capacity of the sludge management - construction of a thermal hydrolysis of sludge (THS) installation in addition to the currently existing anaerobic stabilization. Additionality: The quantity of the sludge entering the bio-reactors is not affected and remains the same as in the validated PDD. The quantity of the biogas generated by the project is expected to increase with about 10% but the generation of electric energy by the co-generation plant is expected to remain at nominal level of CHP operation. The number of co-generating units will remain the same as in the validated PDD and the eventual additional quantity of biogas will be destroyed by combusting in the steam boilers to generate process steam. The project does not benefit from the sale of electricity, but from conditional savings from the purchase of electricity and fuels. The generated electricity and heat are used entirely for own needs, and if there is a shortage, it is purchased. The relevant parameters have been changed in the financial analysis, and they are reflected in the new PDD and IRR file, corresponding to the increased savings. The term of the investment analysis has also been increased until the end of the credit period. /41/. The installation related to the project is a part of greater rehabilitation of the wastewater treatment plant and is financed by a European Union grant and does not affect and change the project investment analysis parameters. The power of the generators is 3x1.088 MW, which at 100% load gives an annual 28,593 MWh (theoretically), and at 80% availability the annual production is 22,874 MWh. The verified electricity generated over the last 3 years is an average of 22,217 MWh, which is close to 80%, which is proof that there is little opportunity to produce more electricity. Any additional amount of methane will be used to power the steam generators, which have a greater capacity than the dismantled boiler. The residual amount, as it has been until now, will be flared. The main goal of the project is not electricity production, but the deepest possible processing and safety of the wastewater sludge and the elimination of nitrogen and phosphorus in the water treatment process. Therefore, from a technical point of view, a reasonable increase in electricity generation from the project cannot be foreseen. Used Methodologies and Tools: The design change does not influence the applicability of the methodologies and tools applied and validated in the initial PDD. There is no change in the baseline and the project line as the project boundary and the sources of GHG emissions are the same as in the certified project activity. Monitoring Plan: No changes in the monitoring plan validated in the initial PDD are required. Level of accuracy: There will be no difference in the level of accuracy and completeness in the monitoring of the activity compared to the validated and registered monitoring plant. Project scale: The total installed energy generation capacity (thermal and electrical) of the project activity will remain 6.453 MW which is far below the limit of
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	15 MW (e) and 45 MW (th) for small scale project. The estimated annual emission reductions related to AMS-III.H are calculated at 53,214 tCO₂e which is below the limit of 60,000 tCO₂e for a small-scale project. Stakeholder consultation process: There is no need of organising a new stakeholder's consultation due to the following circumstances: - The design change does not lead to an increase of the installed electric capacity of the project involving the same co-generation engines as in the certified project; - The new installation has been built on the same project site, inside the Wastewater Treatment Plant and did not require selecting different sites from those originally envisioned during stakeholder consultations; - The purpose of the design change is to improve the quality of the effluent waters delivered to the local river system compared to the conditions originally envisioned during stakeholder consultations; - The design change provides a better quality of the stabilised and dewatered sludge exiting the digesters compared to the conditions originally envisioned during stakeholder consultations and improves its application as a fertiliser. SD criteria: There are no changes as in the already validated PDD for the Second crediting period. Compliance with applicable legislation: There are no changes or additional legislative requirements concerning the project activity as in the already validated PDD for the Second crediting period. The plant possesses a Permission for deposition of the effluent outlet water into the Iskar River No 1295/14.04.2014, issued by the Ministry of Environment and Water /31/. The Permission defines the quantity of inlet and outlet water and the quality of the effluent water. The quality of the effluent water and heavy metals content is monitored and measured according to the plan and frequency part of the Permission.
Findings	N/A
Conclusion	RINA confirms that the given explanation of project activity provided in PDD is in accordance with what was checked during the audit and based on the above referred documents.

D.4. Application of selected baseline and monitoring methodology

D.4.1. Applicability of methodology

Means of validation	The project correctly applies the approved baseline and monitoring methodologies AMS-I.C. "Thermal energy production with or without electricity" /7/, AMS-III.H. "Methane recovery in wastewater treatment" /8/, AMS-I.F. "Renewable electricity generation for captive use and mini-grid" /9/. The applied methodologies are approved by CDM and the applied versions are the latest version at the time of the updated PDD submission. In addition, the following methodological tools are applied in this PDD: TOOL 1 /10/ TOOL /11/ TOOL 3 /12/ TOOL 4 /13/ TOOL 5 /14/ TOOL 6 /15/ TOOL 10 /16/ TOOL 14 /17/
Findings	CAR 1 – Please refer to Appendix 3 of this Report.
Conclusion	RINA confirms that the selected baseline and monitoring methodologies have been previously approved by the CDM Executive Board and are applicable to the project, which complies with all the applicability conditions therein the selected versions are valid at the time of submission. It is also confirmed that the methodologies and Tools are correctly applied by comparing them with the actual text of the applicable versions.

D.4.2. Deviation from methodology

Means of validation	There is no deviation from the selected methodologies.
Findings	NA
Conclusion	RINA verified that no deviation from methodologies are available.

D.4.3. Clarification on applicability of methodology, tool and/or standardized baseline

Means of validation	The project correctly applies the approved baseline and monitoring methodologies AMS-I.C. “Thermal energy production with or without electricity” /7/, AMS-III.H. “Methane recovery in wastewater treatment” /8/, AMS-I.F. “Renewable electricity generation for captive use and mini-grid” /9/. The applied methodologies are approved by CDM and the applied versions are the latest version at the time of the updated PDD submission. In addition, the following methodological tools are applied in this PDD: TOOL 1 /10/ TOOL /11/ TOOL 3 /12/ TOOL 4 /13/ TOOL 5 /14/ TOOL 6 /15/ TOOL 10 /16/ TOOL 14 /17/ Used Methodologies and Tools: The design change does not influence the applicability of the methodologies and tools applied and validated in the initial PDD. There is no change in the baseline and the project line as the project boundary and the sources of GHG emissions are the same as in the certified project activity.
Findings	N/A
Conclusion	RINA verified that the baseline was assessed according to the next requirements /7-17/.

D.4.4. Project boundary

Means of validation	The project boundary is the physical, geographical site where the wastewater and sludge treatment take place, in the baseline and project situations. It covers all facilities affected by the project activity including sites where processing, transportation and application or disposal of waste products as well as biogas takes place. The project activity affects only the sludge-treatment system of the plant. The wastewater system is not affected by the project activity and operates in the project scenario under the same operational conditions as in the baseline scenario (e.g. wastewater inflow and COD content, temperature, retention time, etc.). The design change does not influence the applicability of the methodologies and tools applied and validated in the initial PDD. There is no change in the baseline and the project line as the project boundary and the sources of GHG emissions are the same as in the certified project activity.
Findings	CAR 4 – Please refer to Appendix 3 of this Report
Conclusion	RINA confirmed that the project boundary is clearly defined and in accordance with the applied methodologies /7,8,9/. RINA confirms that the selected baseline and monitoring methodologies have been previously approved by the CDM Executive Board and are applicable to the project, which complies with all the applicability conditions therein the selected versions are valid at the time of submission of crediting period. It is also confirmed that the methodologies and Tools are correctly applied by comparing them with the actual text of the applicable versions.

D.4.5. Establishment and description of baseline scenario

Means of validation	The project correctly applies the approved baseline and monitoring methodologies AMS-I.C. “Thermal energy production with or without electricity” /7/, AMS-III.H. “Methane recovery in wastewater treatment” /8/ and AMS-I.F.
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	"Renewable electricity generation for captive use and mini-grid" /9/. The applied methodologies are approved by CDM and the applied versions are the latest version at the time of PDD submission. In addition, the following methodological tools are applied in this PDD: TOOL 1 /10/ TOOL /11/ TOOL 3 /12/ TOOL 4 /13/ TOOL 5 /14/ TOOL 6 /15/ TOOL 10 /16/ TOOL 14 /17/ Since the baseline is defined by the approved methodologies, no further analysis is requested. Used Methodologies and Tools: The design change does not influence the applicability of the methodologies and tools applied and validated in the initial PDD. There is no change in the baseline and the project line as the project boundary and the sources of GHG emissions are the same as in the certified project activity.
Findings	N/A
Conclusion	RINA confirmed that the baseline scenario is clearly defined and in accordance with the applied methodologies and Tools /7-17/. RINA confirms that the selected baseline and monitoring methodologies have been previously approved by the CDM Executive Board and are applicable to the project, which complies with all the applicability conditions therein the selected versions are valid at the time of submission of crediting period. It is also confirmed that the methodologies and Tools are correctly applied by comparing them with the actual text of the applicable versions.

D.4.6. Proof of project eligibility

Means of validation	GENERAL ELIGIBILITY CRITERIA: Eligibility project type: The project aims 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. Therefore, the project activity meets the eligibility criteria as per 3.1.1 G4SGG Principles & Requirements document /20/, Renewable Energy Activity Requirements /26/ and Community Services activity Requirements /25/. Scale of the project activity: Project activity falls under small scale project activity. Host country or State: The project's host Party is Bulgaria and eligible as per Gold Standard. Greenhouse Gases: CH₄ and CO₂ are considered in the project activity and the same is eligible under Gold Standard. Legal Ownership: Legal ownership of the GS carbon credit generated from the project activity is Sofiyska Voda AD. Official Development Assistance (ODA) Declaration: The project does not involve any ODA. Therefore, the proposed project activity is deemed to be eligible under gold standard GS4GG. The design change does not influence of the applicability conditions of the already validated project activity and methodologies and tools applied. There is no change in the baseline and the project line as the project boundary and the sources of GHG emissions are the same as in the certified project activity.
Findings	N/A
Conclusion	RINA hereby confirms that the selected baseline and monitoring methodologies have been previously approved by the CDM Executive Board and allowed the use of GS Board, and is applicable to the Project, which complies with all the applicability conditions, therein and the selected versions are valid at the time of submission of the proposed project activity. It is also confirmed that the

	methodologies and Tools are correctly applied by comparing it with the actual text of the applicable version of the methodology.
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D.4.7. Demonstration of additionality and conservativeness

Means of validation	The additionality of the Project was demonstrated using the latest versions of CDM Methodological Tool 01 applicable to all types of CDM projects: “Tool for the demonstration and assessment of additionality” /10/. The tool provides a stepwise approach to demonstrate and assess the additionality. The project was successfully validated for previous CP 1 (starting from 01/04/2014) and current CP 2 (starting from 01/04/2021) /1,3/. Additionality: The quantity of the sludge entering the bio-reactors is not affected and remains the same as in the validated PDD. The quantity of the biogas generated by the project is expected to increase with about 10% but the generation of electric energy by the co-generation plant is expected to remain at nominal level of CHP operation. The number of co-generating units will remain the same as in the validated PDD and the eventual additional quantity of biogas will be destroyed by combusting in the steam boilers to generate process steam. The installation related to the project is a part of greater rehabilitation of the wastewater treatment plant and is financed by a European Union grant and does not affect and change the project investment analysis parameters. Used Methodologies and Tools: The design change does not influence the applicability of the methodologies and tools applied and validated in the initial PDD. There is no change in the baseline and the project line as the project boundary and the sources of GHG emissions are the same as in the certified project activity. Hence, the proposed project meets the criteria for deemed additionality. Project design change starting date: 15/11/2024, as per Protocol for a 72-hour test conducted under operational conditions /35/. Before that date there was an official commissioning of the installations, as per Commissioning file N CT-05-186/17.04.2024 /37/.
Findings	N/A
Conclusion	RINA confirmed that the additionality of the project had been established applying the “Tool for the demonstration and assessment of additionality” /10/. The changes in design (increase in capacity) does not affect the additionality of the project /1/.

D.4.8. Sustainability assessment

Means of validation	As per GS4GG all projects shall conform to the Gold Standard for the Global Goals Safeguarding Principles & Requirements /20/. The assessment is as follows: <u>Principle 1- Human Rights:</u> The project does respect internationally proclaimed human rights and is not complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights. Bulgaria has ratified European Convention on Human Right in 1992. Therefore, the project is not expected to violate the rules regarding human rights. The project activity respects the Labour Codex (in force of 01/01/1987) /40/ since the activity is developed in Bulgaria - The Labour Code includes regulations on non-discrimination in the workplace, equal treatment, maternity and paternity protection, and working conditions. It is important for ensuring a safe and healthy working environment. This law requires employers to ensure appropriate conditions for the professional integration of persons with disabilities, including access to adapted workplaces /39/. <u>Principle 2 – Gender Equality and Women’s Rights:</u> Bulgaria has ratified ILO (since 1932) 103 Conventions and 1 Protocol, which provides gender equality and promotes women’s employment. The project outputs serve everyone without regarding gender. In total Bulgaria has ratified 103 ILO Conventions and 1 Protocol /39/. <u>Principle 3 – Community Health and Safety:</u> In total Bulgaria has ratified 103 ILO Conventions and 1 Protocol. As approved during the on-site assessment, all employees have the right to participate freely in Labor associations. All staff also possess the required PPEs. The company is also certified against next ISO standards: ISO 9001 (Quality Management System); ISO 14001 (Environmental Management System); ISO 45001 (Occupational Health and Safety Management System); ISO 37001 (Anti – Bribery Management System) and ISO 50001 (Energy management System) /36/. <u>Principle 4 – Cultural Heritage, Indigenous Peoples, Displacement and Resettlement:</u> According to the investigations performed within the Project Area, project sites are not located within the boundaries of any determined landscape protection areas (NATURA 2000), subject to prohibition of construction as specified in the issued Permission /31,32/. <u>Principle 5 – Corruption:</u> Bulgaria has adopted several conventions on bribery and corruption including OECD /39/ and UN conventions /39/. <u>Principle 6 – Economic Impacts:</u> The project activity does not have any restrictions on employees’ freedom. Bulgaria has ratified ILO conventions. All staff recruited are employed according to the national legislation. Sofiyska voda, as Project Developer, has ensured that all employment is in compliance with national labour occupational health and safety laws and with the principles and standards embodied in the ILO fundamental conventions. All workers are able to establish and join labour organisations as per the Labour Code of Bulgaria /40/. Working agreements with all individual workers are documented and implemented and include working hours. Duties and tasks, Remuneration (include provision for payment of overtime), Modalities on health insurance,
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	Modalities on termination of the contract with provision. Children labour is not allowed in Bulgaria as per the Labour Code. Bulgaria has also ratified Convention on the Rights of the Child. During the design change phase total of 34 employees are working on-site. <u>Principle 7 – Climate & Energy:</u> The project helps to reduce GHG emissions by producing green energy. The methane produced by the WWTP is captured in methane tanks and utilized as a fuel for energy production. This leads to the reduction of high amounts of CH₄ (powerful greenhouse gas). In addition, the production of electricity and heat from biogas replaces the use of fossil fuels thus reducing greenhouse gases such as CO₂. <u>Principle 8 – Water:</u> The project possesses and respects the issued Environmental permissions /31,32/. Project does not affect the natural or pre-existing pattern of watercourses, groundwater and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity. The plant possesses Permission for deposition of the effluent outlet water into the Iskar River /31/. The Permission defines the quantity of inlet and outlet water and the quality of the effluent water. The quality of the effluent water and heavy metals content is monitored and measured according to the plan and frequency part of the Permission. The quality of the water is monitored by the accredited laboratory, that is a part of Kubratovo Wastewater Treatment Plant. The project does not result in soil erosion and does not contribute to soil contamination by pollutants. The deactivated sludge coming out of the digesters is dewatered, dried, and used as fertilizer. <u>Principle 9 – Environment, Ecology and Land use:</u> The project respects the Environmental permissions issued /31,32/. All waste from the construction and operational phase are treated as per the legal requirements: send to the license companies as per contracts and in line with the associated legislative framework. The project does not involve the use of any land and soil for production of crops or other production. The equipment needed for the project is situated on the land of the WWTP. The project is a municipal wastewater treatment and has no direct relation to vulnerability to natural disaster. The project has major positive effect on the air quality 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. The project area is not physically related to any intact or High Conservation Value ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified. There are no endangered species identified in the Project area.
Findings	N/A
Conclusion	RINA confirms that conservative approach has been applied by PP to demonstrate sustainable development of the project activity which is in line with GS4GG requirements. According to EIA report it is expected that project's effect is limited /32/.

D.4.9. Emission reductions

Means of validation	During the permanent design change of the project, there is no amendments from the already validated emission reduction estimations, approved in monitoring methodologies AMS-I.C. "Thermal energy production with or without
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electricity" /7/, AMS-III.H. "Methane recovery in wastewater treatment" /8/, AMS-I.F. "Renewable electricity generation for captive use and mini-grid" /9/.

The calculation data for this phase are presented in the PDD /1/ and in excel sheet /2/. All monitoring data is available in the used software: SCADA Energy and SCADA Technological.

The calculations correspond to the applicable and approved methodologies, are as follows:

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

Applied to the baseline defined, above formula is reduced to the following: $BE_y = BE_{power,y} + BE_{s,treatment,y}$

According to AMS-III.H

$$BE_{final,s,y} = \sum_j S_{j,BL,y} \times MCF_{s,final,BL,j} \times DOC_s \times UFBL \times DOCF \times F \times 16/12 \times GW_{PCH4}$$

Baseline emissions for supply of electricity to and/or displacement of electricity from a grid shall be calculated as follows: $BE_{grid,y} = EG_{grid,y} \times EF_{grid}$,

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

$$BE_{thermal,CO2,y} = \left(\frac{EG_{thermal,y}}{h_{BL,thermal}} \right) \times EF_{FF,CO2}$$

Project emissions

As per the applied methodology AMS-III.H, project emissions are calculated with the formulae below:

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

Project Emission from power (thermal energy) consumption

As per the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion", CO2 emissions from fossil fuel combustion in process j are calculated based on the quantity of fuels combusted and the CO2 emission coefficient of those fuels, as follows:

$$PE_{FC,j,y} = \sum FC_{i,j,y} \times COEF_{i,y}$$

Methane emissions from biogas release in capture system

As per paragraph 39 of the AMS-III.H, version 19 fugitive emissions from the capture system are estimated in this component.

$$PE_{fugitive,y} = PE_{fugitive,ww,y} + PE_{fugitive,s,y}$$

Leakage emissions

There is no leakage from the project activity. There is no equipment transferred from another activity. Leakages are neglected. $LE_y = 0$.

Emission Reduction

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

$$ER_{y,exante} = BE_{y,exante} - (PE_{y,exante} + LE_{y,exante})$$

All the assumptions and data used by the project participants are listed in the PDD including their references and sources.

	All the documentation used by the project participants as the basis for assumptions and source of data are quoted and interpreted in the PDD and the Emission Reduction Calculation Spread Sheet /2/. Before design change $ER_y = BE_y - PE_y = 74,808 - 8,384 = 66,424 \text{ tCO}_2/\text{year}$ After design change $ER_y = BE_y - PE_y = 80,248 - 9,128 = 71,120 \text{ tCO}_2/\text{year}$
Findings	N/A
Conclusion	It is RINA's opinion: (a) All assumptions and data used by the PP are listed in the PDD; (b) All documentation used by the PP as the basis for assumption and source of data is correctly quoted and interpreted in the PDD (c) All values used in the PDD and CERs spreadsheet including GWPs are considered reasonable in the context of the proposed project activity (d) The baseline methodology and methodological tools have been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions; All estimates of the baseline and project emissions can be replicated using the data and parameters values provided in the PDD and ER spreadsheet.

D.4.10. Monitoring plan

Means of validation	During the design change no amendments in the monitoring plan validated in the initial PDD are introduced. The monitoring plan (data and parameters fixed ex ante) includes all data and parameters monitoring, required by the applied methodologies /19/, are: Parameters ex-ante:			
		Data/ parameter	Unit	Value applied
	1	$E/F_{EL,y}$	tCO ₂ /MWh	0.400
	2	$MCF_{s,BL,final}$		0.4
	3	DOCs		0.5
				Assessment According to "Tool to calculate baseline, project and/or leakage emissions from electricity consumption", this project falls under the requirements of (a) Scenario A because before implementation of the project electric energy was purchased from the grid only. For the purpose of this project the emission factor of the electricity grid is defined according to para.20, Option A2 (b): A value of 0.4 t CO₂e/MWh for electricity grids where hydro power plants constitute less than 50% of total grid generation in 1) average of the five most recent years. Methane correction factor of the disposal site that receives the treated sludge in the baseline situation: A default value of 0.4 has been used as recommended by IPCC 2006 Guidelines for National Greenhouse Gas Inventories /30/. Degradable organic content of the untreated sludge generated in the year y (fraction, dry basis): A default value of 0.5

				has been used as recommended by IPCC 2006 Guidelines for National Greenhouse Gas Inventories /30/.
4	DOC _F		0.5	Fraction of DOC dissimilated to biogas: A default value of 0.5 has been used as recommended by IPCC 2006 Guidelines for National Greenhouse Gas Inventories /30/.
5	F		0.5	Fraction of CH ₄ in biogas: A default value of 0.5 has been used as recommended by IPCC 2006 Guidelines for National Greenhouse Gas Inventories /30/.
6	UF _{BL}		0.89	Model correction factor to account for model uncertainties: A default value of 0.89 has been used as recommended by AMS-III.H. /8/.
7	GWP _{CH₄}		28	Global Warming Potential for methane: A default value of 28 has been used as recommended by IPCC Fifth Climate Change Synthesis Report of 2014 (page 87) /30/.
8	η _{flare} -	%	80	Flare efficiency: A default value of 80% has been used as recommended by Tool for Project emissions from flaring /15/.
9	η _{BL,thermal}	%	100	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: A default value of 100% has been used as recommended by AMS-I.C. /7/.
10	EF _{FF,CO₂}	tCO ₂ /TJ	54.30	CO ₂ emission factor of the fossil fuel: A default value of 54.30 tCO ₂ e/TJ has been used as recommended by IPCC 2006 Guidelines for National Greenhouse Gas Inventories /30/.
11	EF _{CO₂,i,y}	tCO ₂ /GJ	76.30	CO ₂ emission factor of the light oil (naphta) used for emergency cases in year y: A default value of 76.30 tCO ₂ e/GJ has been used as recommended by IPCC 2006 Guidelines for National Greenhouse Gas Inventories /30/.
12	PE _{fugitive,s,y}		0.05	Portion of methane leaked from the system: A default value of 0.05 Nm ³ has been used as recommended by AMS-III.H. /8/.
13	D _{CH₄}	kg/m ³	0.00067	Density of methane: A default value of 0.05 Nm ³ has been used as recommended by ACM0010.
Parameters ex-post:				
	Parameter	Description/Assessment		

	1	Amount of dry matter in the sludge in the year y (SDG 13)	Measure the total quantity of sludge entering the digesters – $S_{final,PJ,y}$ (t/y) Value applied: 36,794.64 /1.2/
	2	The net quantity of heat supplied by the project activity during the year y (SDG 7,13)	Steam thermal energy meter would be used to measure the quantity of heat generated by the boiler – $EG_{thermal,y}$ (TJ/y) Value applied: 188.473 /1.2/
	3	Electricity generated by the CHP in the year y (SDG 7,13)	it will be measured ex-post and recorded monthly – $EG_{grid,y}$ (MWh/y) Value applied: 22,217.27 /1.2/
	4	Quantity of biogas generated by the anaerobic digesters (SDG 13)	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 - $BG_{burnt,y}$ (Nm ³ /y) Value applied: 11,734,470.97 /1.2/
	5	Quantity of methane generated by the anaerobic digesters in the year y (SDG 13)	Calculated based on the quantity of bio-gas generated and specific content of methane in the bio-gas $WCH_4 - CH_4$, burnt,y (m ³ /y) Value applied: 7,403,747.11 /1.2/
	6	Quantity of methane generated by the anaerobic digesters in the year y (SDG 13)	Calculated based on the quantity of bio-gas generated and specific content of methane in the bio-gas WCH_4 and density of methane – CH_4 , burnt,y (t/y) Value applied: 4,960.51 /1.2/
	7	Quantity of sludge entering the anaerobic digesters (SDG 13)	Measured by liquid flowmeter – Q_{DGs_inlet} (m ³ /y) Value applied: 699,770.67 /1.2/
	8	Dry substance content in the sludge (SDG 13)	Laboratory samples and the results are recorded hourly, monthly and yearly - ρ_{sludge} (t/m ³) Value applied: 0.05281 /1.2/
	9	Methane content in biogas in the year y (SDG 13)	The fraction of methane in the gas is being measuring with a continuous analyser using equipment that can directly measure methane content in the biogas – $WCH_{4,y}$ /%/ Value applied: 63.094 /1.2/
	10	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 – FC_y (t/y) Value applied: 0 /1.2/
	11	Volumetric flow of the gaseous stream (SDG 13)	The quantity of biogas is measured continuously – $V_{t,db}$ (m ³ CH ₄ /h) Value applied: formula 3 from PDD is used /1.2/
	12	Mass flow of methane in the residual biogas flared (SDG 13)	The quantity and quality of biogas is measured continuously and normalized – F_{CH_4} (kgCH ₄ /y) Methane in the residual biogas flared. Value applied: formula 3 from PDD is used /1.2/

Annual estimated ER after design change is estimated as 71,120 tCO₂/year /1.2/.

The average annual quantity of emission reductions (VER) certified in the validated PDD for the second GS4GG period is 66,424 tCO₂e and the estimated annual quantity of VERs generated by the project after the design change is calculated ex-ante as 71,120 tCO₂e or with a 7.1 % increase compared to the validated PDD for the second crediting period. This is within the limit of increase of emission reductions after a design change as per GS4GG Design Change Requirements /29/. For the total approved second CP the increase is 3.3 %.

The used measuring equipment will be calibrated as per the applicable legal requirements – calibration frequency issued by the State Agency for Metrological and Technical Surveillance. The next measuring equipment is used:

	- Automatic gas analysers, flow meter system "Awite" (serial number 564_09 and serial number 2764_19) - calibrated every six months - Automatic gas analyser, flow-meter system „Binder, Combimass eco basic“ (Model 022218-0620J1 S/N 642404) – Biogas flowmeter for Digester 5 (normalised), used for reference and control/crosschecking - Digital Electric meter (measured electricity exported / imported (combined) to the grid) The new meter is ZQM 202C.8 with serial number 95591212, calibrated every 4 year. - Digital Electric meter (measured electricity exported / imported (combined) to the grid). The new meter is ZQM 202C.8 with serial number 95591181, calibrated every 4 year. - Digital Electric meter (electricity generated by the CHP, only for internal use) – Schneider Electric PM 5560, with ser. N 600008706 - Four inlet sludge flow to digesters (serial numbers: 000015791/X001, 000015791/X003, 000015791/X004, 000015791/X002) – there is not requirements for external calibration. The information is continuously recorder in SCADA Technological. - Five Automatic gas analyser flow meter system (serial numbers: S.No.C080650, S.No.C080647, S.No.C080649, S.No.C080648, S.No.C120564) – there is not requirements for external calibration, used only for crosschecking. The information is continuously recorder in SCADA Technological. - Turbine gas meter (serial number 450345/2011) – the meter is using for cross – checking purpose - Digital thermal energy meters "Kamstrup" – measured thermal energy generated by the CHPs exhaust gasses (serial number: 69303430) – EG_{thermal} – installed on 30/12/2013 with factory calibration and recalibrated in October 2020. The period of calibration is 5 years.
Findings	CAR 2,3 – Please refer to Appendix 3 of this Report CR – 1 FAR - 1
Conclusion	It is RINA's opinion that the monitoring plan is in accordance with the monitoring methodology; the monitoring plan will give 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 and methodological tools. RINA confirms that the monitoring arrangements described in the monitoring plan, including the data management and quality assurance and quality control procedures, are feasible within the project design, and do not change with design change and the means of implementation of the monitoring plan are sufficient to ensure the emission reductions achieved by/resulting from the proposed GS4GG project activity can be reported ex post and verified. Level of accuracy and completeness in the monitoring of the project activity does not change with the design change.

D.4.11. Sustainability Monitoring plan

Means of validation	The Sustainability Monitoring Plan includes a way of monitoring for each GS indicator.		
		Parameter	Description/Assessment
	1	ER (tCO _{2e})	SDG 13: Climate action: 13.2 Integrate climate change measures into national policies, strategies and planning: GHG emission reductions will be monitored yearly. The value of the parameter is given as 71,120 tCO _{2e} .
	3	Effluent water quantity treated	SDG 6.3.1 Proportion of wastewater safely treated
Findings	N/A		

Conclusion	RINA confirms that sustainability monitoring plan and indicators included in the PDD confirm to the sustainable development requirements of GS4GG. The increase in design change complies with the Sustainability Monitoring Plan.
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D.5. Duration and crediting period

Means of validation	The total crediting period of the project activity is 21 years for the period 01/01/2007 - 31/12/2028. This was confirmed by GS when transition of the project to GS4GG took place. The overall crediting period includes the following schemes: 01/01/2007 – 31/12/2007 – Green Investment Scheme 01/01/2008 – 31/12/2012 – Joint Implementation Scheme 01/04/2014 – 31/03/2021 – 1st 7-years GS crediting period 01/04/2021 – 31/03/2028 – 2nd 7-years GS crediting period (approved by GS4GG) Design change start date – 15/11/2024
Findings	N/A
Conclusion	RINA confirmed that this is the second crediting period of the registered GS4GG project activity. No amendment to the crediting period applied.

D.6. Environmental impacts

Means of validation	For the design change there is an official Decision N CO – 75 – PR/2021 to assess the need to carry out an environmental impact assessment, with decision that an EIA is not needed as per the lack of environmental impact /32/. It could be confirmed that the proposed project activity is in line with the current environmental legislation in Bulgaria. Compliance with applicable legislation: There are no changes or additional legislative requirements concerning the project activity as in the already validated PDD for the Second crediting period. The plant possesses a Permission for deposition of the effluent outlet water into the Iskar River No 1295/14.04.2014, issued by the Ministry of Environment and Water /31/. The Permission defines the quantity of inlet and outlet water and the quality of the effluent water. The quality of the effluent water and heavy metals content is monitored and measured according to the plan and frequency part of the Permission.
Findings	N/A
Conclusion	RINA confirms that environmental impact and requirements included in the PDD confirm to the requirements of GS4GG, as well as applicable local environmental legislations.

D.7. Local stakeholder consultation

Means of validation	There is no need of organising a new stakeholders consultation due to the following circumstances: - The design change does not lead to an increase of the installed electric capacity of the project involving the same co-generation engines as in the certified project; - The new installation has been built on the same project site, inside the Wastewater Treatment Plant and did not require selecting different sites from those originally envisioned during stakeholder consultations; - The purpose of the design change is to improve the quality of the effluent waters delivered to the local river system compared to the conditions originally envisioned during stakeholder consultations; - The design change provides a better quality of the stabilised and dewatered sludge exiting the digesters compared to the conditions originally envisioned during stakeholder consultations and improves its application as a fertiliser. SD criteria: There are no changes as in the already validated PDD for the Second crediting period. No negative comment or grievance found recorded during the stakeholder meeting. VVB also noted during site visit that there are no negative comments from stakeholders from the project activity. It is also noted that a continuous grievance mechanism as detailed during stakeholder meeting is found in practice at site //. Everyone can contact the project representatives by phone and on place and report any complaints or suggestions. The logbook was seen and confirmed that no feedback is received.
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Findings	N/A
Conclusion	RINA verified that no negative feedback is being received up to the time of this on-site visit audit.

D.8. Pre-feasibility assessment

Means of validation	N/A
Findings	
Conclusion	

SECTION E. Internal quality control

The draft final validation report before being submitted to the client is subjected to an independent technical review to confirm that all validation activities has been completed according to the pertinent RINA's procedures. The technical review is performed by a technical reviewer(s) qualified in accordance with the RINA's qualification procedure.

SECTION F. Validation opinion

RINA Services Spa (RINA) has performed validation of the design change of project activity Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria, with regard to the relevant GS requirements and principles. 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.

After design change as per design change requirements, the total annual emission reductions from the "Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria" are estimated to be on average 71,120 tCO₂ per year. Annual baseline emissions are estimated to be 80,248 tCO₂ and project emissions to be 9,128 tCO₂. 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", as described in the PDD, ver. 05 of 21/04/2026 /1/ meets all relevant GS requirements and principles and correctly applies the baseline and monitoring methodologies AMS-I.C./Version 22.0 "Thermal energy production with or without electricity", AMS-III.H./Version 19.0 "Methane recovery in wastewater treatment" and AMS-I.F./Version 05.0 "Renewable electricity generation for captive use and mini-grid".

Abbreviations

Abbreviations	Full texts
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
DCI	Certification Division of RINA Services Spa
VVB	Validation and Verification Body
EB	Executive Board
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG(s)	Greenhouse gas(es)
GS	Gold Standard
GS4GG	Gold Standard for Global Goals
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LSC	Local Stakeholder Consultation
MoV	Means of Verification
MP	Monitoring Plan
MR	Monitoring Report
NGO	Non-governmental Organization
ODA	Official Development Assistance
PD	Project Design
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
WWTP	Waste Water Treatment Plant

Appendix 1. Competence of team members and technical reviewers



CERTIFICATO DI QUALIFICA QUALIFICATION CERTIFICATE

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

Konstantin Dimitrov RACHEV

è qualificato come¹:
is qualified as:

TL – VAL – VER – TEC – ITR

nello schema²:
for the scheme:

GS4GG – VCS – SCS – UER – CCB - ISO14064-2

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

1.2 – 3.1 – 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
3.1	Energy demand	3

in accordo alle istruzioni dell'Unità responsabile (OU) per sostenibilità & cambiamenti climatici.
in accordance with the instructions of the responsible unit (OU) for the sustainability & climate change.

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	19/07/2016	-
1	20/03/2022	Update qualification as ITR
2	31/01/2024	Update to TA 3.1

Il Responsabile di schema
Scheme Manager

¹ Legend:

VAL: Validator
VER: Verifier
TEC: Technical Expert
TL: Team Leader
FIN-EXP: Financial Expert
REG-EXP: Regional Expert
ITR: Independent Reviewer
DET: Determiner

² Legend:

CDM: Clean Development Mechanism
VCS: Verified Carbon Standard
GS4GG: Gold Standard for Global Goals
SCS: SocialCarbon Standard
JI: Joint Implementation
ISO14064-2: International standard 14064 part 2
UER: Upstream Emission Reduction
CCB: The Climate, Community & Biodiversity Alliance

RNA Services S.p.A. è accreditata 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.

RNA 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 GS4GG Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports.

GHG_QUAL_CERT_EN(06-2021)

Page 1 of 1



CERTIFICATO DI QUALIFICA PER GLI SCHEMI VOLONTARI*
QUALIFICATION CERTIFICATE FOR VOLUNTARY SCHEMES*

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

Cyril Augustus Arokiasamy Amalorpavanathan

è qualificato come:
 is qualified as:

TEC, VAL, VER, TL, Local Expert, ITRP, REG¹

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

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
1.1	Thermal energy generation	1
1.2	Renewables	1
4.1	Cement and Lime Production	4
3.1	Energy Demand	3
5.1	Chemical industry	5
13.1	Solid Waste and wastewater	13

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	19/07/2016	First issue with new template (this certificate is linked to CDM qualification)
2	09/10/2017	Qualification update as ITRP

Responsabile di schema
 Scheme Leader
 Laura Severino

*SCHEMI VOLONTARI/ VOLUNTARY SCHEMES: ACR American Carbon Registry, CCB The Climate, Community & Biodiversity Alliance, GS Gold Standard, JI Joint Implementation, SCS Social Carbon Standard, VCS Verified Carbon Standard.

¹ Ghana, Azerbaijan, China, Sri Lanka, Bangladesh, Nepal, Thailand, Indonesia, Singapore, Malaysia, Cambodia, Vietnam, Philippines, UAE and Iraq
 Brazil, Japan.

TEC: Technical expert; VAL: Validator; VER: Verifier; TL: Team leader; FIN EXP: Financial Expert; ITRP: Independent technical reviewer

RINA Services S.p.A. è accreditato/ricosciuto da

RINA Services S.p.A. is accredited /recognized by

UNFCCC	quali Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects
VCSA	per condurre la Validazione e la Verifica di Progetti VCS to carry out Validation and Verification of VCS Projects
GS Foundation	per condurre la Validazione e la Verifica di Progetti GS to carry out Validation and Verification of GS Projects
Ecologica Institute	per condurre la Validazione e la Verifica di rapporti SCS to carry out Validation and Verification of SCS Reports
American Carbon Registry ACR	per condurre la Validazione e la Verifica di Progetti ACR to carry out Validation and Verification of ACR projects
The Climate, Community & Biodiversity Alliance CCB	per condurre la Validazione e la Verifica di Progetti co-benefit CCB to carry out Validation and Verification of co-benefit CCB projects

GHG_QUAL_CERT_EN_07_16 Voluntary(Certificate)

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Appendix 2. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1.	Sofiyska Voda AD	Design change PDD for “Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria”	version 01 of 20/01/2025 version 02 of 14/05/2025 version 03 of 10/10/2025 version 04 of 11/03/2026 version 05 of 21/04/2026	Project Participant
2.	Sofiyska Voda AD	Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria Project – Sofiyska Voda VER calculation excel sheet “Sofiyska_voda_VER_Calculation_ver.01_20.01.2025_GS_design_change Sofiyska_voda_VER_Calculation_ver.02_21.04.2026_GS_design_change	version 01 of 20/01/2025 version 02 of 21/04/2026	Project participant
3.	Sofiyska Voda AD	Approved PDD for “Methane Gas Capture and Electricity Production at Kubratovo Wastewater Treatment Plant, Sofia, Bulgaria”, for the 2 nd CP 01/04/2021 to 31/03/2028	01/04/2021 to 31/03/2028	Project participant
4.	Sofiyska Voda AD	Flow diagram – WWTP Kubratovo	Up to date	Project participant
5.	Sofiyska Voda AD	Technical data and schemes of WWTP Kubratovo	Up to date	Project participant
6.	Sofiyska Voda AD	Grievance book	Retrieved on 08/05/2025	Project Participant
7.	CDM Executive Board	“AMS-I.C.”, “Thermal energy production with or without electricity”	version 22.0 of 11/03/2022	Publicly Available
8.	CDM Executive Board	“AMS-III.H.”, “Methane recovery in wastewater treatment”	version 19.0 of 14/06/2019	Publicly Available
9.	CDM Executive Board	“AMS-I.F.”, Renewable electricity generation for captive use and mini-grid”	version 05.0 of 08/09/2022	Publicly Available
10.	CDM Executive Board	TOOL 01 Methodological tool “Tool for the demonstration and assessment of additionality”	version 07.0. of 23/11/2012	Publicly Available
11.	CDM Executive Board	TOOL 02 Methodological tool “Combined tool to identify the baseline scenario and demonstrate additionality”	version 07.0.0 of 22/09/2017	Publicly Available
12.	CDM Executive Board	TOOL 3 Methodological Tool “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion”	Version 03.0 of 27/09/2017	Publicly Available
13.	CDM Executive Board	TOOL 04 Methodological tool “Emissions from solid waste disposal sites”	Version 08.1 of 24/03/2023	Publicly Available
14.	CDM Executive Board	TOOL 05 Methodological tool “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation”	Version 03.0 of 27/09/2017	Publicly Available

15.	CDM Executive Board	TOOL 06 Methodological tool "Project emissions from flaring"	Version 04.0 of 11/03/2022	Publicly Available
16.	CDM Executive Board	TOOL 10 Tool to determine the remaining lifetime of equipment	Version 01 of 16/10/2009	Publicly Available
17.	CDM Executive Board	TOOL 14 Project and leakage emissions from anaerobic digesters	Version 03.0 of 07/11/2024	Publicly Available
18.	GS4GG	Validation & Verification Body Requirements	version 3.0 of 12/11/2024	Publicly Available
19.	GS4GG	Project Design Document Template	version 1.5	Publicly Available
20.	GS4GG	Principles & requirements	version 2.1 of 31/01/2025	Publicly available
21.	GS4GG	Validation and verification standard	version 2.0 of 12/11/2024	Publicly available
22.	GS4GG	GHG emissions reduction & sequestration product requirements	version 2.4 of 20/08/2024	Publicly available
23.	GS4GG	Audit techniques	version 1.0 of 16/11/2021	Publicly available
24.	GS4GG	Site Visit and Remote Audit Requirements	version 2.0 of 30/05/2023	Publicly available
25.	GS4GG	Community Services Activity Requirements	version 1.2 of 24/10/2019	Publicly available
26.	GS4GG	Renewable Energy Activity Requirements	version 1.4 of 16/08/2021	Publicly available
27.	GS4GG	SDG Impact Tool Manual	version 1.3 of 05/10/2023	Publicly available
28.	GS4GG	Stakeholder Consultation and Engagement Requirements	version 2.1 of 14/06/2024	Publicly available
29.	GS4GG	Design Change Request Requirements and Procedures	version 2.0 of 12/11/2024	Publicly available
30.	IPCC	IPCC Fifth Climate Change 2014 Synthesis Report IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2, Chapter 1, Table 1.4 "Default CO ₂ Emission Factors for Combustion"	Retrieved on 08/05/2025	Other
31.	Ministry of Environment and Water of Bulgaria	Permission for wastewater discharge into surface water N 1295 of 14/04/2014, amended as per Decision 3021 of 14/07/2020, Decision 3264 of 10/05/2021 and Decision 4417 of 30/12/2024	14/04/2014 14/07/2020 30/12/2024	Others
32.	Ministry of Environment and Water of Bulgaria, Regional Inspection of Environment and Water	Decision N CO – 75 – PR/2021 to assess the need to carry out an environmental impact assessment.	10/08/2021	Others
33.	Sofiyska Voda AD	Internal Air Emission Monitoring Plan of 2019	2019	Project participant
34.	Sofiyska Voda AD	https://www.sofiyskavoda.bg/en/about-us/gold-standard Available in Bulgarian and English	Retrieve on 08/05/2025	Project participant
35.	Sofiyska Voda AD	Protocol for a test conducted under operational conditions	14/11/2024	Project participant
36.	Sofiyska Voda AD	TUV NORD Certificates: ISO 9001; ISO 14001; ISO 45001; ISO 37001 and ISO 50001	Retrieve on 08/05/2025	Project participant

37.	Ministry of Regional Development and Public Works, Directorate for National Construction Control	Commissioning file N CT-05-186/17.04.2024	17.04.2024	Project participant
38.	RINA	Final Validation Report for the 2 nd CP 01/04/2021 to 31/03/2028	Ver. 2.0 of 29/06/2021	Others
39.	The European Convention of Human right ILO OECD UN Conventions	chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.echr.coe.int/documents/d/echr/CP_Bulgaria_ENG https://normlex.ilo.org/dyn/nrmlx_en/f?p=1000:11200:0:0::NO:11200:P11200_COUNTRY_ID:102576 https://www.oecd.org/en/countries/bulgaria.html https://www.un.org/en/about-us/member-states#gotoB	Retrieve on 08/05/2025	Others
40.	Legal Portal	https://lex.bg/	Retrieve on 08/05/2025	Others
41.	Sofiyska Voda AD	IRR_Kubratovo_ver.03_10102025_design_change sheet IRR_Kubratovo_ver.02_10112015 sheet	Ver.3/10.10.25 Ver,2/10,11,2015	Project Participant
42.	Sofiyska Voda AD	Sofyiska_voda_SDG-Impact-tool Sofiyska_voda_project_SDG-Impact-tool_v.02	10/10/2025 Version 2 of 21/04/2026	Project Participant

Appendix 3. Clarification requests, corrective action requests and forward action requests

Table 1. Remaining FAR from GS Review and/or last periodic verification

FAR ID	1	Section no.		Date:
Description of FAR				
None				
Project participant response				Date:
Documentation provided by project participant				
VVB assessment				Date:

Table 2. CR from this validation (Design Change)

CR ID	1	Section no.	D.4.10	Date: 13/05/2025
Description of CR				
Please clarify the usage of naphtha in emergency situation, under PE section.				
Project participant response				Date: 14/05/2025
An option to use naphtha (light oil) as an emergency (or back-up) fuel for the steam boilers is provided in the project design change. The new steam boilers are equipped with dual-fuel burners that allow the use of liquid fuel. Monitoring of the eventual application of such fuel is included in the monitoring plan in Table 32 of the revised PDD and will be used for the calculation of the project emissions.				
Documentation provided by project participant				
Revised PDD, v. 02 of 14/05/2025				
VVB assessment				Date: 09/06/2025
Revised PDD, v. 02 of 14/05/2025, is being correctly updated.				

Table 3. CAR from this validation (Design Change)

CAR ID	1	Section no.	D.4.1	Date: 13/05/2025
Description of CAR				
Latest versions of used CDM Methodologies and Tools, as well as GS4GG documents are not correctly pointed in the PDD.				
Project participant response				Date: 14/05/2025
The PDD is revised to state the latest versions of the applied methodologies and Tools.				
Documentation provided by project participant				
Revised PDD, v. 02 of 14/05/2025				
VVB assessment				Date: 09/06/2025
Revised PDD, v. 02 of 14/05/2025, is being correctly updated.				

CAR ID	2	Section no.	D.4.10	Date: 13/05/2025
Description of CAR				
Project Participant address is not correctly pointed in the PDD, Appendix 2.				
Project participant response				Date: 14/05/2025
Appendix 2 of the PDD is revised to state the present address of the Project Participant Sofiyska voda AD.				
Documentation provided by project participant				
Revised PDD, v. 02 of 14/05/2025				
VVB assessment				Date: 09/06/2025
Revised PDD, v. 02 of 14/05/2025, is being correctly updated.				

CAR ID	3	Section no.	D.4.10	Date: 13/05/2025
Description of CAR				
The new measuring devices of the steam boilers are not presented in the design project.				
Project participant response				Date: 14/05/2025
Measuring devices for thermal energy generated by the steam boilers are included in the technical project of the new installation but are still not mounted. An option for these devices is included in the monitoring plan (Table 35, position 19). A provision for monitoring the quantity of thermal energy generated by the steam boilers is included in the Monitoring Plan in Section B.7, Table 22.				
Documentation provided by project participant				
Revised PDD, v. 02 of 14/05/2025				
VVB assessment				Date: 09/06/2025
Revised PDD, v. 02 of 14/05/2025, is being correctly updated.				

CAR ID	4	Section no.	D.4.4	Date: 13/05/2025
Description of CAR				
Project boundary is not being updated in the PDD (fig. 11).				
Project participant response				Date: 14/05/2025
The PDD is revised to show the correct project boundary (fig.11), corresponding to the project after the design change.				
Documentation provided by project participant				
Revised PDD, v. 02 of 14/05/2025				
VVB assessment				Date: 09/06/2025
Revised PDD, v. 02 of 14/05/2025, is being correctly updated.				

Table 4. FAR from this validation (Design Change)

FAR ID		Section no.	D.4.10	Date: 09/06/2025
Description of FAR				
During the verification process after design change phase, installation of thermal energy meters of the steam boilers should be verified.				
Project participant response				Date:
Documentation provided by project participant				
VVB assessment				Date:

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
01.0	10/06/2016	Initial publication.