Gold Standard for the Global Goals
Key Project Information & Project Design Document (PDD)

Version 1.1 – August 2017

KEY PROJECT INFORMATION

Title of Project:	VINCA Landfill Gas and Energy from Waste facilities
Brief description of Project:	The Vinca landfill site has been operated for more than 40 years at the Vinča locality, located approximately 12 km east of Belgrade city center. This existing landfill does not meet Serbian or EU standards for Sanitary Landfills and poses a source of pollution for groundwaters and surrounding soils. The City of Belgrade through the Local Waste Management Plan 2011-2020, adopted by the City Assembly of Belgrade in 2011, envisaged the improvement of waste collection and transport practices, an increase in waste re-use and recycling, the construction of waste treatment (including energy from waste) facilities, the remediation of the existing landfill and the creation of a new sanitary landfill at Vinča. On 21st August 2015, as part of its Waste Management System, the City of Belgrade decided to improve the current solid waste disposal practice through a Private Public Partnership. The estimated Quantity of urban solid waste collected and to be treated at the Vinca site is circa 510,000 t/yr. The Project includes the following main features: • The remdiation of the Existing Landfill and the construction of a new sanitary landfill both associated with a Landfill Gas (LFG) facility • The construction of a state-of-the-art Energy from Waste (EfW) facility. Biogas will be collected from both the existing and the new landfills and the LFG facility with an installed capacity of 3.2 MW will generate an Estimated Quantity of 26,574 MWh /yr of net electricity fed into the grid. An Energy from Waste facility, with the nominal combustion capacity of about 340,000 t/year of municipal waste, will generate a combination of electricity and heat The Energy from Waste facility will feature a 103 MW steam boiler and a cogeneration turbine with an installed capacity of 32 MW electrical and up to 56 MW thermal. The EfW facility will generate an Estimated Quantity of 189,652 MWh /yr of net electricity fed into the grid and allow in addition

	(173,611 MWh/y) of heat distribution into the distric heating network; Estimated Quantity of heat supplied by the project activity displacing baseline heat generation by a fossil fuel cogeneration plant: 625 TJ/yr (or 173,611 MWh/y) Estimated quantity of renewable electricity produced by valorization of residual biogenic waste in the Energy from Waste Facility: 140,342 MWh /yr Estimated quantity of renewable heat produced by valorization of residual biogenic waste in the Energy from Waste Facility: 411 TJ/yr The start date of the Project is 30/09/2019. Annual average emission reduction over the crediting period will be 244,073 tCO2/yr. The project operational lifetime is 25 years.
Expected Implementation Date: Expected duration of Project:	Beginning 2020 25 years
Project Developer:	BEO ČISTA ENERGIJA D.O.O. BEOGRAD
Project Representative:	Malik Kerkar, Suez
Project Participants and any communities involved:	BEO ČISTA ENERGIJA D.O.O. BEOGRAD (BCE)
Version of PDD: Date of Version:	Version 1.3 23/12/2020
Host Country / Location:	Serbia
Certification Pathway (Project Certificatin/Impact Statements & Products	Impact Statements & Products The project aim is to issue VERs
Activity Requirements applied: (mark GS4GG if none relevant)	Renewable Activities Requirements (+ Annex A, Point 6 Waste incineration)
Methodologies applied:	CDM Methodologies: Landfills : ACM001 V19.0 - Large-scale Consolidated Methodology: Flaring or use of landfill gas EfW : ACM022 V2.0 - Large-scale Consolidated Methodology: Alternative waste treatment processes
Product Requirements applied:	GHG Emission reduction and sequestration
Regular/Retroactive:	Regular
SDG Impacts:	**SDG 13: Climate Action.** • Estimated quantity of GHG emission reductions thanks to the development of the new landfill and the coverage of the old landfill (reduction of biogas fugitive emissions and avoided emissions thanks to the electricity generated by the project) • Estimated quantity of GHG emission reductions thanks to the EfW (reduction of biogas fugitive emissions and avoided emissions thanks to the electricity and heat generated by the project)

	SDG 7: Affordable and Clean Energy • Estimated quantity of renewable electricity produced by valorization of residual biodegradable waste in the Energy from Waste Facility: 124,720 MWh /yr • Estimated quantity of renewable heat produced by valorization of residual biogenic waste in the Eenegry from Waste Facility: 411 TJ/yr • Estimated quantity of renewable electricity produced by valorization of residual biodegradable waste in the Landfill Gas Facility: 26,574 MWh /yr
	SDG 11: Sustainable Cities and Communities • Estimated Quantity of urban solid waste regularly collected and with adequate final discharge: 510,000 t/yr
	SDG 6: Clean Water and Sanitation • Estimated Leachate flow treated annually or used for APCR stabilization 25,976 m3/y • Estimated quantity of dirty water re-used for the quenching of the EfW IBA: 9,165 m3/y
Estimated amount of SDG Impact Certified	**244,073 tCO2/yr (Annual Average)** **2 440,727 tCO2 (Total GHG emission reductions for the crediting period)**

Annex A2-a	ODA Declaration
Annex A2-b	Required permits and consents
Annex A2-c	Regulatory comparison
Annex A2-d	Statement of non-inclusion of the Project in other voluntary or compliance standards programs
Annex A3-a	Deed of appointment
Annex A4-a	Coordinates Site Plan
Annex A8-a	List of participants of the report on public consultation
Annex A8-b	Consultation Presentation Support
Annex D-a	Sanitary Water Protection Zones
Annex D-b	Records archaeological sites

SECTION A. Description of project

A.1. Purpose and general description of project

>> (Provide a brief description of the project including the description of scenario existing prior to the implementation of the project.)

- Context Overview

The urban area of Belgrade is 3,223 square km and the city area is 360 square km. The city proper has a population of 1.23 million, while over 1.65 million people live within the administrative limits.

The population growth has shown a constant trend within the last decade (4% in the period between 2002 and 2011) – 100% through newcomers.

The City of Belgrade's objective is to be at the fore-front among capital cities in the region for maximizing its waste recycling and recovery rates thanks to state-of-art waste treatment infrastructure facilities.

The existing scenario prior to the implementation of the project:

- Collection

The City has delegated the collection of MSW and transportation to public utility companies ("PUCs") and the largest of them is Gradska Cistoca ("GC"), which collects and transports Municipal Solid Waste ("MSW") from eleven Belgrade municipalities, representing 85% of the MSW generated on the territory of Belgrade.

The other six municipalities are serviced by their own PUCs.

The residential MSW collection system consists of a combination of on-street containers of different sizes and underground containers located in the most densely populated areas of the City.

- Separation and recycling

At the moment, there is limited formal waste separation at source. Therefore, the waste collected curb-side is generally mixed.

The City has initiated the introduction of a two-bin waste collection system, to be initially implemented in the three most central municipalities in 2015, with planned expansion into other areas of the City in the second phase.

- The Existing Landfill

At the Vinča landfill, located just east of Belgrade approximately 12 km from the city center and adjacent to the Danube, a typical non-hygienic landfill has been formed during more than 40 years of works. The consequence of this landfill creation and operation has been pollution of the waters of Ošljanski potok (Ošljan stream) and further Ošljanska bara (Ošljan pond), contamination of the surrounding agricultural land and air.

This landfill does not meet Serbian or EU standards for sanitary landfills and keeps remaining a source of pollution for groundwaters and surrounding soil.

i) 2017

Figure C-2. Satellite imagery of the Vinča landfill development 2008 – 2017 (a-i).

The site is currently operated by PUC Gradska čistoća, Beograd (GC), the waste management company owned by the City.

The Vinča landfill is currently used for the disposal of waste collected on the territory of thirteen municipalities (the eleven municipalities served by GC, plus Barajevo and Grocka), together representing 90% of the waste generated on the entire territory of Belgrade. In addition to MSW, the following types of waste are being disposed here:

- Green waste collected by PUC Gradsko Zelenilo, fruit and vegetable markets waste collected by GC and the relevant PUCs serving municipalities of Grocka and Barajevo;
- A portion of commercial waste and non-hazardous and inert industrial waste brought to the landfill by third parties and paid for separately at the disposal as per the official price list of the GC;
- CDW collected either by GC or by third parties (in which case charged for separately for disposal as per the official price list of GC);
- Sterilized medical waste.

The incoming waste is spread out and compressed by compactors. There is neither collection nor recovery of landfill gas at the landfill at present. The leachate is released without treatment together with the surface water through a canal into a natural swamp connected to the Danube river and is a source of environmental contamination.

Conclusion: The current condition imposes a need for a planned solution of rehabilitation, as well as for expanding the Vinča existing landfill in line with good international practice.

- Description of the baseline scenario

In the baseline scenario, the old landfill is covered with a minimal layer to respect the Serbian regulation. The waste continues to be dumped in a landfill, which has a minimal coverage, and where the biogas is partially captured and flared. The baseline scenario will be detailed in section B.4.

- Description of the project

Construction of the project**:**

The City of Belgrade through the Local Waste Management Plan 2011-2020, adopted by the City Assembly of Belgrade in 2011, envisaged the improvement of waste collection and transport practices, an increase in waste re-use and recycling, the construction of waste treatment (including energy from waste) facilities, the remediation of the existing landfill and the creation of a new sanitary landfill at Vinča. On 21st of August 2015, as part of its Waste Management System, the City of Belgrade decided to improve the current solid waste disposal practice through a Private Public Partnership**.**

- Structure of the project:

The Project includes:

- Closing the existing landfill site after remediation and stabilization (introducing leachate treatment and landfill gas extraction and use), with final capping;
- Introducing a management system for municipal waste on a site of approximately 60 ha, located at the Vinča site. This system will be composed of:

  - An Energy from Waste facility with the nominal combustion capacity of about 340,000 t/year of municipal waste, which will generate a combination of electricity (~216 GWh/y) and heat (~174 GWh/y);
  - As 74% of waste are biogenic, 160 GWh/y will be renewable electricity and 128 GWh/y will be renewable heat.
  - A sanitary landfill for the portion of municipal waste not processed at the EfW Facility;
  - A landfill for the disposal of EfW residues;
  - A treatment facility for Construction & Demolition Waste (CDW) to produce recoverable inert CDW, recovery and storage of recoverable inert CDW, and landfill of the respective treatment residues;
  - A Leachate treatment facility and a landfill gas energy recovery facility ;
  - Construction of a dam (supporting structure) downstream of the existing landfill ;
  - Construction of an electrical infrastructure consisting of 35KV (cable) and 110 KV (overhead) Transmission Lines for connection of electrical energy produced in EfW and BEP to the transmission grid and provision of the electricity supply for the Vinca complex.
  - Construction of the hot water pipeline for heat offtake with connection to the heating plant TO “Konjarnik”

The following mapp presents the different infrastructures planed in the Project.

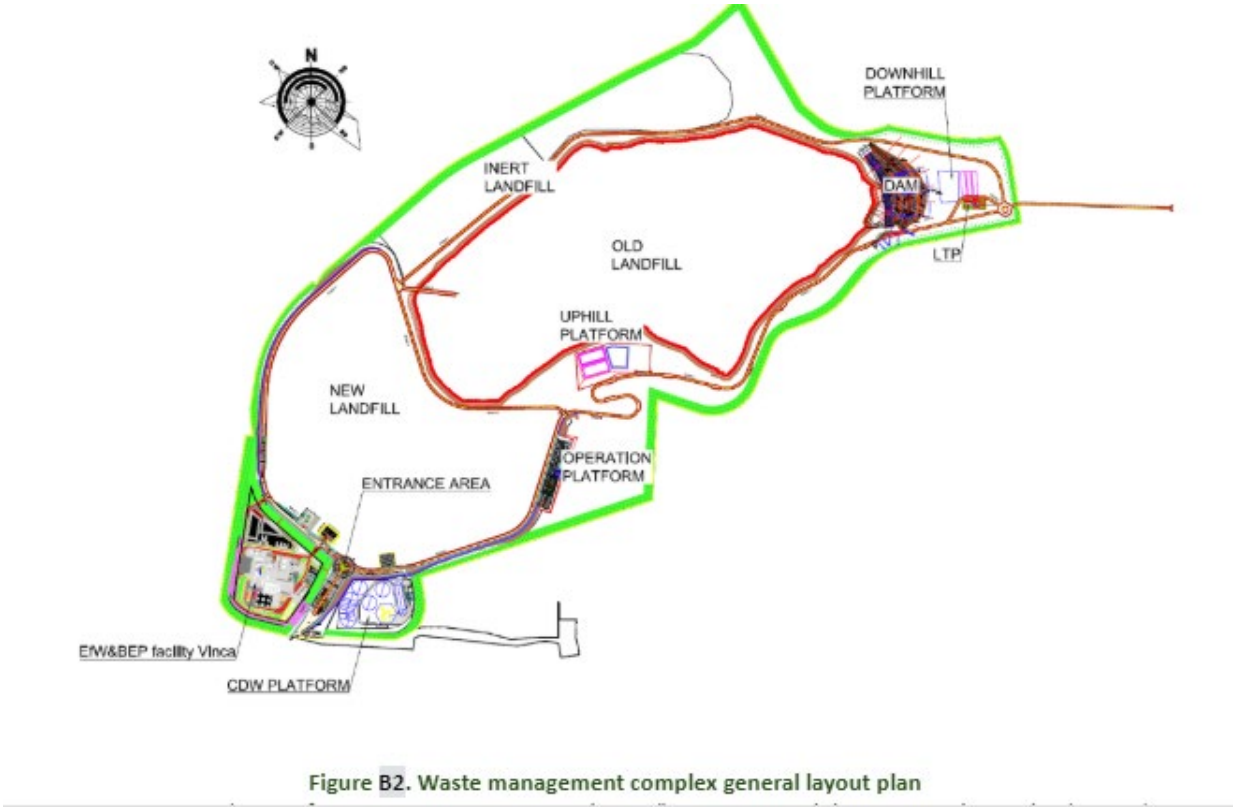

Figure 1: Figure B2, ESIA-Report 2019

All parts of projects are designed in accordance with EU regulations, International Finance Institutions (EBRD, EIB, IFC) requirements and Serbian and EU standards.

- **Costs of the project:**

Total project costs are estimated at 333 million Euros.

- **Temporality of the project:**

Event	Date
PPP Contract signature	30/09/2017
Amended Detailed Plan of Regulation (DPR) for the complex adopted by the City Assembly	25/09/2018
Adoption of the RAP	25/09/2018
Environmental and Social Impact Assessment (ESIA) publicly disclosed on EBRD website	12/10/2018
Public consultation meeting in Municipality of Grocka targeting Local Community	20/12/2018
Public consultation meeting in City Office in Belgrade targeting NGOs	21/12/2018

Issuance of Location Conditions - Energy from Waste plant by the Ministry of Construction Transport and Infrastructure	25/04/2019
Issuance of Location Conditions – Landfill by the Ministry of Construction Transport and Infrastructure	12/04/2019
Issuance of Report on IDP (Basic design) by Rev. Committee - BEP	08/07/2019
Issuance of Report on IDP (Basic design) by Rev. Committee - EfW	22/07/2019
Issuance of Report on IDP (Basic design) by Rev. Committee - LND	22/07/2019
Issuance of Report on IDP (Basic design) by Rev. Committee - LTP	22/07/2019
Certification of PGD (Detailed Design) by Technical Control	08/08/2019
Issuance of Preliminary Priviledge Power Producer status (4P)	18/09/2019
Detailed Plan of Regulations for Heat Connection adopted by the City Assembly	16/05/2019
Detailed Plan of Regulation (DPR) for ETI 3 – 110 kV Connection adopted bythe City Assembly	29/08/2019
Detailed Plan of Regulation (DPR) for ETI 2 – 35 kV Connection adopted bythe City Assembly	29/08/2019
Detailed Plan of Regulations for Distric Heating	16/05/2019
Acquisition of property rights	30/09/2019
Environmental Impact Assessment (Serbian procedure) submitted for approval	20/06/2019
EIA Public Consultations	23/07/2019
Revision of ESIA	23/09/2019
Signing of Heat off-take Agreement	15/07/2019
Approval of Rehabilitation and Recultivation Plan for the Existing Landfill	24/07/2019
Construction Permit for Energy from Waste Facility, 110 kV Switchgear	16/08/2019
Construction Permit for Landfill Gas Facility	16/08/2019
Construction Permit for New Landfill, Existing Landfill, ancillary facilities	23/08/2019
Construction Permit for Flare	23/08/2019
Construction Permit for Leachate Treatment Plant	23/08/2019
Consent on Environmental Impact Assessment Study New Landfill and ancillary facilities	30/09/2019
Consent on Environmental Impact Assessment Study Energy from Waste Facility, Landfill Gas Facility, 110 kV Switchgear	30/09/2019
PPP Effective Date	30/09/2019

- **Estimation of annual average and total GHG emission reductions for the chosen crediting period**

The ex-ante calculations evaluate the emission reduced and avoided by the project at an annual average of 244,0730 tCO2/yr. and 2,440,727 tCO2 for the first crediting period

- **Description of how the project activity contributes to the sustainable development of Serbia**

Economic Development
Depending on the business savy and capabilities of the local population, but also depending on their interest and cooperation, local companies will likely have an opportunity to offer their services or goods to the beneficiary and/or selected contractor, which could have a positive impact on the local economy and in general on the resident's perception of the project.

This preconstruction activities will generate additional job opportunities and activities in the surrounding region (the cumulative effect)" :

- permanent employment both in the EfW and Landfill facilities itself and also for the services outsourced ; employees will be fully employed in the plant and receive social security.
- part-time employment during the construction phase for construction workers,

Social Development
The VINCA project includes technological and social development for Serbia and the local population.
Technical development : Local workers will be integrated and trained by Suez engineers and this will result in know-how transfer to local workers.
Furthermore, the workers will have health security and working conditions in compliance with the EU regulation. It will have a strong impact on the health of the local population (workers and their families).
The Roma's family's settlement located at the northern part of the Landfill complex have been resettled, which improved their living conditions (water supply, electricity and heating at home). Finally, the environmental impacts of the Project will have a positive impact of the inhabitants quality of live ; reduction of noise pollution and olfactive nuisances, less transmitted diseases, etc.

Environmental Development
The Project will help to:

- Modernize energy infrastructure in Serbia and increase sustainability of the share of renewable energy in the global energy mix (increase of renewable energy share in gross final consumption of energy to 27% by 2020[1]), reducing fossil fuel combustion at the national level.
- Improve efficiency in energy generation and avoid fossil fuel combustion (EfW and LGF)
- Reduce the volume of non-treated waste in the region and so avoid water pollution and waste dump in open areas

In fact, the **Energy from Waste facility (EfW)** with the nominal combustion capacity of about 340,000 t/year of municipal waste, which will generate a combination of electricity (~190 GWh/y) and heat (~174 GWh/y).
Moreover, the construction and operation of a **Landfill Gas Facility (LGF)** for relevant landfills at the site (i.e. Existing Landfill and New Landfill for Unprocessed RMW) will enable :

- The extraction and capture of landfill gas (methane wich is an extremely potent GHG gas)
- When sufficient landfill gas is available, the energy recovery through electricity production

[1] National Renewable Energy Action Plan: https://www.mre.gov.rs/doc/efikasnost-izvori/NREAP%20OF%20REPUBLIC%20OF%20SERBIA%2028_June_2013.pdf?uri=CELEX:32009L0028

A.2. Eligibility of the project under Gold Standard

>> (Describe how the project meets the eligibility criteria as per section 3.1.1 of GS4GG Principles & Requirements document and the relevant activity requirements document)

Concerning this section, the VINCA Project has to respond to the eligibility criteria of the following sections of Gold Standard Methodologies :

The Principles and Requirements Documentation	
(a) Type of the project	The Project, as asked in this criteria (a), includes physical actions and implementations on the ground. In fact, the project includes : ⇨ Remediation and capping of the Vinča Existing Landfill body (40 hectares), including landfill gas capture ; ⇨ The new landfill facilities including the Construction and Demolition Waste (CDW) treatment plant, the inert waste landfill, a final disposal landfill for unprocessed Residual Municipal Waste, and a landfill for Municipal Waste Processed Residues ; ⇨ The construction of a Leachate Treatment Facility for all relavant landfills at the site (existing / unprocessed RMW, processed residues); ⇨ The construction and operation of a Landfill Gas Facility (LGF) for relevant landfills at the site (existing and unprocessed RMW). The Project includes as well the construction of a new one and of EfW facility.
(b) Location of the Project	The project is located in Vinca, Serbia.

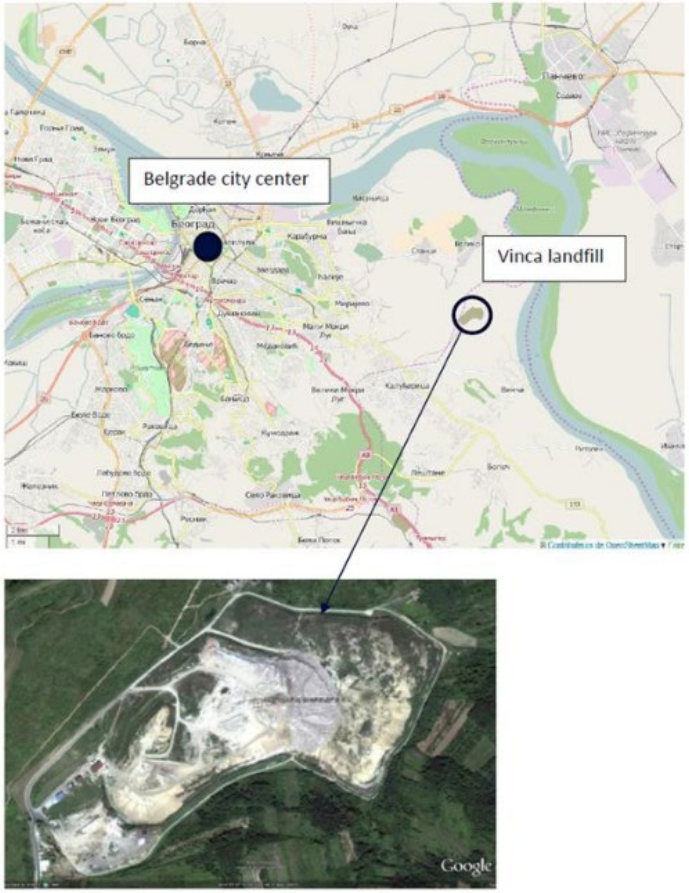

Figure C-1. Localization of the Vinča landfill project site.

Figure 2: Figure C-1, Esia Report 2019

The Annex A4-a proposes a detailed plan of the project, including the GPS coordonates.

(c) Project Area, Project Boundary and Scale	Project Area and Boundary : The project does not overlap with an other Gold Standard or other voluntary or compliance standards programme of a similar nature. *For confidential reasons, the lease agreements are not available*[2]. **Project Boundaries** (which activities are take into account) : See in Section B3. **Scale of the Project :** The project is considered by Gold Standard Methodology as a large scale project[3]. Indeed Gold Standard small scale project refere to the CDM and UNFCCC rules: • Renewable energy Project capacity < = 15 MW • End-use energy efficiency project improvement < = 180 GWhth • Waste handling & disposal project GHG reduction < = 60,000 tCO2eq per annum All Project exceeding the small scale thresholds are defined as large scale. Concerning Belgrade, the project includes: - Energy from Waste : The renewable energy project capacity is 32MW > 15MW ; - Landfill gas : The annual GHG reduction for the landfill is : between 150,000 and 180,000 tCO2eq/y >= 60,000 tCO2eq/y. Furthermore, as requested in article 3.1.1. of the Project is not included in any other voluntary or compliance standards programme (see. Annex A2-d).
(d) Host Country Requirements	The environmental protection is implemented in different and complementary ways in the Serbian law. The main document is the Constitution which guarantees protection and sustainable development as an inalienable Human right. In Article 74 of the Constitution it is established that everyone shall have the right to healthy environment and the right to timely and full information. **The Law on Environmental Protection** (Official Gazette of RS, Nos. 135/04, 36/09, 43/11 and 14/16) gives the framework of the environmental protection, it contains basic principles of legal order that comprehensively and completely regulate protection of the environment. It emphasis on the integration of environment policy in economic policies, the harmonization of local charges for environment,

[2] Because of juridical implications the names and faces of participants have to be covered (see Serbian Personal Data Protection Law, which is modelled under GDPR and applicable in Serbia as of 21/08/2019).

[3] GHG emissions reduction & sequestration product requirements' Version 1.2, March 2018.

	for the obligation of polluters to pay for all environmental costs linked to their activities including prevention and reduction of pollution. This law also regulates issues such as monitoring the state of environment or public participation. Then, several laws are related to environmental protection but dedicated to more specific issues. In keeping with the **Law on Environmental Impact Assessment** (Official Gazette of RS, Nos. 135/04 and 36/09) which regulates the assessment process regarding the effects of the projects that may have significant environmental consequences, several environmental laws have been studied to demonstrate that the project is compatible with the Serbian legislation and the protection of the environment. The most relevant laws for this project are: • **Law on Waste Management** (Official Gazette of RS, No. 36/09, 88/10 and 14/16): regulates types and classification of waste, responsibilities in waste management organization, waste management funding, etc. Regulation on types of waste subject to thermal treatment, the conditions and criteria for determining the location, technical and technological requirements for the design, construction, equipping and operation of waste thermal treatment plant. • **Law on Nature Protection** (Official Gazette of RS, Nos. 36/09, 88/10, 91/10 and 14/16): this law regulates protection and conservation of nature, biological, geological and landscape diversity as an integral part of the environment. • **Law on Air Protection** (Official Gazette of RS, No. 36/09 and 10/13): This law regulates air quality management and establishment of environmental protection measures, their organization and control of their implementation. The performed measurement of emissions from the combustion plant are prescribed by Regulation on measurement of air pollutant emissions from stationary sources of pollution (Official Gazette of RS, Nos. 5/16). • **Law on Waters** (Official Gazette of RS, No. 30/10, 93/12 and 101/16): regulates legal status of waters, integrated water management. The emission limit values for different pollutants in technological wastewaters before their discharge into the public sewage system or the recipient are prescribed by Regulation on emission limit values for pollutants in waters and the deadlines for their reaching (Official Gazette of RS, No. 67/11, 1/16 and 48/12) • **Law Integrated Prevention and Control of the Environment Pollution** (Official Gazette of RS, No. 135/04 and 25/15): regulates the requirements and the procedure for issuing integrated permit for the installations and activities that may have negative effect on human health, environment or material goods. Rulebook on the list of hazardous substances and their quantities and the criteria for determining the type of documents produced by the operator of the Seveso establishment or complex (Official Gazette of RS, No. 41/10) prescribes the list of dangerous substances and their quantities and criteria for determining the type of documents created by the operator of the Seveso plant. Except for environmental issues, there are laws regulating social issues. Issues in relation to provision of assistance for Roma are not regulated by a specific law, but through the implementation of other mentioned laws in relation to social welfare, housing, employment, health care, etc. • **Expropriation Law** (Official Gazette of the RS 53/95, Official Gazette SRJ 16/01 – Federal Constitutional Court decision, 20/09, 55/13 – Constitutional Court decision and 106/2016 – authentic interpretation): focuses on properties and assets which may be expropriated and restrictions which may be placed on property rights, in the public interest.

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Freedom of Information Law (Official Gazette no. 120/04, 54/07, 104/09, 36/10): regulates the freedom of information in respect to information of public interest. This act applies to all information in possession of public authorities for the purpose of protection and achievement of public interest, as well as the democratic environment.

The VINCA Project is framed by the legal structures and respect the texts and obligations deriving.
As a matter of fact, it is required under the PPP Contract, that the Project Developer (BEO ČISTA ENERGIJA D.O.O. BEOGRAD acting as PPP Contractor) and its Construction Sub-Contractor to carry out the design and the construction, completion, commissioning and testing of the works so that it fully comply with and meet all the requirements of International Environmental and Social Standards, Good Industry Practice, all Applicable Law and all Consents.
The “ENVIRONMENTAL AND SOCIAL REQUIREMENTS” for the project are extensively detailed in a specific schedule of the PPP Contract where in particular the following obligations are set: The Contractor and its Sub-Contractors shall develop maintain and implement an environmental and social management system ("ESMS") in accordance with Applicable Law, International Environmental and Social Standards and Good Industry Practice.
The above contractual obligations have been flown down into respectively the EfW and the Landfill EPC Contracts and passed down respectively to CNIM (EPC Contractor for the EfW Facility) and Enerprojekt Niskogradnja (EPC Contractor for the Landfill Facilities).
In addition, the Vinca Project was granted all necessary permits and consents shortly prior the Project Start Date. In particular, the Vinca Project obtained all necessary Location Conditions, Construction Permit and Consent on Environmental Impact Assessment Study as shown in the table in the Annex A2-b.
The granting of the above permits and consents prior the Project Start Date therefore guarantees that the project planned facilities and related detailed designs are in compliance with the applicable local Serbian regulations in particular the Law on Planning and Construction, Law on Fire Protection and applicable environmental Laws.
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<tr><td>(e) Contact Details</td><td>
<table>
<tr><th>Name of the Project Participant</th><th>Contact Details of the Project Participants</th></tr>
<tr><td>SAFEGE/ SUEZ CONSULTING</td><td>Parc de l’Ile – 15/27 rue du Port 920022 Nanterre
01 46 14 71 88
Contact Person ; Camille-Léa Passerin
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<tr><td>SUEZ VINCA OPERATOR D.O.O. BEOGRAD</td><td>Tošin bunar 272v
Buikding v – 2nd Floor 11000 Belgrade
Contact Person:</td></tr>
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		Philippe Thiel + 33 (0)6 78 09 81 34 philippe.thiel@suez.com
	BEO ČISTA ENERGIJA D.O.O. BEOGRAD	Tošin bunar 272v Buikding v – 2nd Floor 11000 Belgrade + 381 11 715 48 86 Contact Persons: Philippe Thiel + 33 (0)6 78 09 81 34 philippe.thiel@suez.com Mitsuaki Harada +381 65 805 00 52 haradam@ieilt.co.uk
(f) Legal Ownership	The Ownership of Product Units are held by the BEO ČISTA ENERGIJA D.O.O. BEOGRAD. The Annex A3-a is a transparent proof of it. The entity BEO ČISTA ENERGIJA D.O.O. BEOGRAD owns the credit.	
(g) Other rights	The Project Developer owns the ground on which the Project will be constructed. *For confidential reasons the Lease Agreements can be published in this PDD.*	
(h) Official Development Assistance (ODA) Declaration	Serbia is present in the 2020 list of ODA recipients (cf. DAC list of ODA Recipients for reporting 2020 flows)[4]. Therefore, the Project Developer signed the mandatory ODA Declaration (AnnexA2-a).	
Points 4.1.1. to 4.1.56.	The Project respects as well the Principles issued from the Principles and Requirements Documentation. 1. Contribution to Climate Security & Sustainable Development (*see. SDG part*) ; 2. Safeguarding Principles (see. Safeguarding Principles Part) ;	

[4] https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/DAC-List-of-ODA-Recipients-for-reporting-2020-flows.pdf

	3. Stakeholder Inclusivity (see. Stakeholder Consultation Part) ; 4. Demonstration of Real Outcomes (*no eligibility criteria*) ; 5. Financial Additionality & Ongoing Financial Need (*see. Additionality part*).
The Activity Requirements Eligibility Criteria	
(a) The project shall involve energy generation (electricity and/or heat) from MSW incineration *(2.1.2.)*	The Project generates and delivers energy services from non-fossil and renewable energy sources ; The Project includes an Energy from Waste (EfW) Facility with CHP recovery with the following main features: - Minimum plant annual availability time ratio of 89%, equivalent to around 7,800 hours per year ; - single independent waste incineration line, with a nominal capacity of 43.6 t/h equivalent to a total annual capacity of 340,000 tons/year of RMW at a calorific value of 8.5 MJ/kg ; - Capacity to produce a minimum heat off -take volume of 174 GWh and power delivery of 190 GWh per year.
(b) Projects shall comprise of renewable energy generation units that are supplying energy to a national or a regional grid; *(2.1.2.)*	The Project comprises a renewable energy generation unit such as waste to energy and gas recovery, that is suppling energy to a regional grid, the one of Belgrade's region. - the EfW facility will be connected to transmission system of EMS in order to export electricity generated to Belgrade 20 substations. - the LGF facility will be connected to distribution system of EPS Distribucija.
Points c and d don't concern the VINCA Project (*2.1.2.)*	The Project is not supplying electricty to a mini-grid, neither (d) generating one-site energy for captive consumption at an industrial facility.
2.1.3. Eligibility Clause	The PDD is submitted to SustainCert for the Preliminary Review before the *24th. January 2020*, which assures the eligibility of the project.
Points 2.1.4. to 2.1.6 don't concern the VINCA project	x
Specific eligibility criteria prescribed in Annex A, point 6, « Waste incineration and gasification » (to be applied to the Project).	
(a) The Stakeholder Consultaion	The criteria has already been completed in the *section E of the PDD and the Stakeholder Consultation*.
(b) Project Eligibility	*6.1.3.* The Project involves a renewable energy generation :

	1. The Project includes one operation of a Landfill Gas Facility (LGF) for relevant landfills at the site (i.e. Existing Landfill and New Landfill for Unprocessed RMW) comprising: - Extraction of landfill gas, - when sufficient landfill gas is available, energy recovery through electricity production. 2. The Project includes Energy from Waste (EfW) Facility with CHP, comprising: - Minimum plant annual availability time ratio of 89%, equivalent to around 7,800 hours per year ; - Single independent waste incineration line, with a nominal capacity of 43.6 t/h equivalent to a total annual capacity of 340,000 tons/year of RMW at a calorific value of 8.5 MJ/kg ; - Capacity to produce a minimum heat off -take volume of 174 GWh and power delivery of 190 GWh per year. Both facilities are suppling energy to a regional grid, the ones of Belgrade's regions (*see. PPD, A.2.*) : EfW will be connected to the electricity transmission network wheras LGF will be connected to the electricity distribution network. - The EfW facility will be connected to the **transmission system of EMS in order to export electricity generated** at 110 kV voltage level, via a step-up transformer 110/11 kV, a 110 kV switchgear and a 110 kV line (OHL/cable). The 110 kV line will be connected to the 110 kV switchgear at the **Belgrade 20 substation**. - The LGF facility will be connected to the **distribution system of EPS Distribucija** via a 10 kV cable connected to the 10 kV switchgear at the new 35/10 kV substation and further to the 35 kV network via a 35 kV line. *6.1.4*. The Project do not make use of waste material already used in the pre-project. There is no valorization of waste in the actual scenario. Indeed, at the Vinča landfill a typical non-hygienic landfill has been formed during more than 40 years of works in this area **without waste treatment**. The new VINCA project of Belgrade City will achieve to treat the maximum volumes of biodegradable municipal solid waste and restrict the use of landfills to dispose treatment residues and inert waste. *6.1.5*. The Project is included in the The Local Waste Management Plan 2011-2020, adopted by the City Assembly of Belgrade in 2011, involving the improvement of waste collection and transport practices, an increase in waste re-use and recycling.
(c) Emissions and operational requirements	As mentioned in the section « Host Country Requirements », the following permits and consents were issued for the Vinca Project prior the Project Start date: • the Construction Permit for the Energy from Waste (EfW) Facility (including the 110 kV Switchgear) was issued on 16.08.2019 by the Ministry of Construction, Traffic and Infrastructure (Ref. 351-02-00239/2019-07 - ROP-MSGI-3997-CPI-3/2019) • the Consent on Environmental Impact Assessment Study for the EfW Facility was issued on 30.09.2019 by the Ministry of Environmental Protection (Ref. 353-02-1299/2019-03)

Timeline : Permits and consents issued

At the time of the above permits and consents were issued, the corresponding permitting documentation and detailed design of the Vinca EfW Facility were complying with the Industrial Emissions Directive (IED) 2010/75/EU emission limits / official BREF for Waste Incineration from August 2006 which were the applicable and enforceable EU regulations / reference document.
As required by the Lenders (IFC and EBRD), the Environmental and Social Impact Assessment (ESIA) was prepared during the summer 2018 and published on their website in October 2018 while the related Public Consultation was held in December 2018. Similarly, both the ESIA Report and the ESIA Public Consultation presented the EfW Facility project and design as complying with 2014, the IED (Directive on Industrial Emissions) and 2006 Waste Incineration BREF document.

Timeline: Permits and consents granted, Project Start outdated

In the following period, after those permits and consents being granted and after the Project Start Date (29/09/2019), revised Best Available Techniques (BAT) Conclusions for Waste Incineration were published in the Official Journal of the European Union on **Tuesday December 3rd 2019.**
The BAT Associated Emission Levels (**BATAELs**) for air emissions at stack are provided in the newly adopted BAT conclusion 25 to 31 and are summarised in the table in Annex A2-c.
In this context, the project will take necessary steps to comply with the new BAT Conclusion independently of the Government of Serbia deciding to transpose and enforce into the Serbian regulation.

Gold Standard Requirements

⇨ Comparaison

Gold Standard requires a comparison between the host country regulatory requirements with the most recent version of European Union Regulations for Waste Incineration Plants & Waste Co-incineration Plants.
Therefore, a comparison between the BATAELs from WI BREF December 2019 and the requirements from the IED Annex VI daily and periodic ELVs is provided in the Annex A2-c.
In addition, as required under *RENEWABLE ENERGY ACTIVITY REQUIREMENTS - Version 1.2 - Published October 2019 section 6.1.7*, the Annex A2-c also provided a comparison between the Serbian regulatory requirements with the BATAELs from WI BREF December 2019 which is the latest version of European Union Regulations for Waste Incineration Plants.

⇨ Mitigation measures:

1. On the technological level:

	The planned energy from waste facility incorporates technological solutions and design choices that have been made in order to allow the necessary adaptations to comply with the next possible new BREF requirements as it may be transposed by the Government of Serbia within the limits set into the new BAT conclusions adopted at EU level. It shall be noted that with the support of the EPC Contractor for the EfW (CNIM) a pre-assessment of the NEW BREF design and operational impact has been performed which shows that: • Most of the new BAT-AELs (BAT - Associated Emission Levels) ranges can be met by simply by increasing the reagents consumption thanks to safe design margin already embedded in the current Employer's Requirements (ERs) • Remaining Emissions Levels are met by design modification reasonably implementable technically / permitting and construction wise: - Urea injection System - Residues transport system - Mercury continuous monitoring 2. Additional contractual measures: As further elaborated below, we confirm the Project and its contractual aspects have been structured **contractually to comply with the future BREF/BAT Conclusions**: The contractual obligations and rights relating to a possible need to comply with new regulation at EU level as been foreseen under specific contractual provisions: • *PPP Output Specifications* clearly requires that the Project complies with the EU BREF/BAT as applicable at the date of any consent for any consent. • *Contract on Credit Terms Agreement (CTA*): More importantly and directly relating to the conditions set by EBRD and IFC in financing the Vinca Project, the ESAP (Environmental and Social Action Plan sets specific requirements in line with EBRD guidelines and in anticipation of the forthcoming change in regulation at EU level (see Extract of ESAP Action 3.6) : " • Review the requirements of the latest EU BREF document for waste incineration once it is finalized (final draft as of December 2018). Develop and implement a plan to ensure the project will operate in compliance with the revised BREF". • Plan to be developed within six months of the adoption of the revised BREF and implemented by the end of 2022" It shall be noted that the above actions have been added in the latest binding version of the ESAP CTA (Credit Term Agreement with the Lenders).
(d) Ongoing monitoring requirements	Not relevant yet.

A.3. Legal ownership of products generated by the project and legal rights to alter use of resources required to service the project

>> (Justify that project owner has full and uncontested legal ownership of the products that are generated under Gold Standard Certification and has legal rights concerning changes in use of resources required to service the Project for e.g water rights, where applicable.)

The City of Belgrade – City Administration of Belgrade – Secretariat for Environmental Protection ("**City**") conducted a tender for the project for the design, construction, operation and maintenance of certain waste treatment facilities and the provision of other related services in the City of Belgrade ("**PPP Project**"). As a result of that competitive process, the City selected the consortium of SUEZ GROUPE S.A.S and I-ENVIRONMENT INVESTMENTS LTD ("**Consortium**"), as the preferred bidder, which is to incorporate a special purpose vehicle in accordance with the PPP Law of the Republic of Serbia in order to enter into a PPP Contract as the contractor, with all the rights and obligations of the contactor on the PPP Project.

In that capacity, BEO ČISTA ENERGIJA D.O.O. BEOGRAD entered into the PPP Contract with the Consortium and the City of Belgrade and as such has the legal rights to deal with the benefits of the PPP Project and products or other outputs generated by or from the project facilities, under the terms of the PPP Contract and the Lenders' Direct Agreement.

In summary, the consortium SUEZ GROUPE S.A.S (SUEZ) and I-ENVIRONMENT INVESTMENTS LTD (ITOCHU) was established in order to submit their bid further to the request for proposals initiated by the City of Belgrade. Once the project has been awarded to the consortium, SUEZ and ITOCHU incorporated a Special Purpose Vehicle (SPV) - BEO ČISTA ENERGIJA D.O.O. BEOGRAD which signed the PPP Contract with the City of Belgrade. SUEZ and ITOCHU are shareholders of BEO ČISTA ENERGIJA D.O.O. BEOGRAD.

A.4. Location of project

A.4.1. **Host Country**

The project is located in Serbia.

A.4.2. **Region/State/Province etc.**

The project is located in the Syrmia region.

A.4.3. **City/Town/Community etc.**

The project is located in Vinca.

A.4.4. **Physical/Geographical location**

>> (Include information allowing the unique identification of this project.)

The Vinča municipal waste landfill covers an area of about 140 ha, located in the valley of the Ošljanski potok (Ošljan stream).

Limits of the site :

The landfill location falls to the north-east and it is surrounded by hills on the southern and western side. Below the landfill body flows the Ošljanski potok, which flows into the Ošljanska bara (Ošljan Pond).

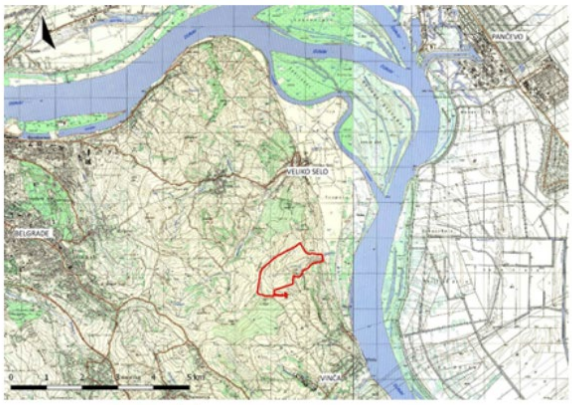
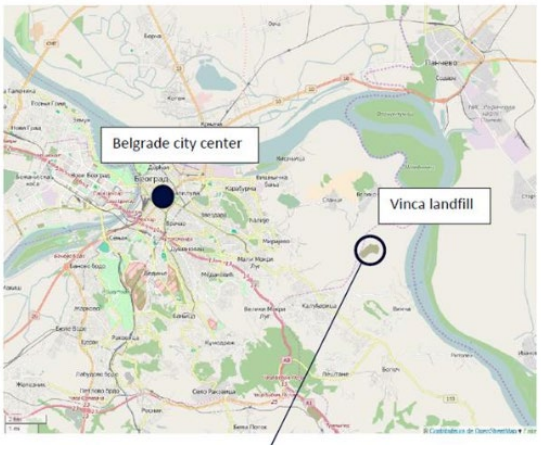


Figure B1. Site location on topographic map



The Annex A4-a inludes a detailed plan of the project, showing the site GPS coordinates

A.5. Technologies and/or measures

>> (Describe the technologies and measures to be employed and/or implemented by the project, including a list of the facilities, systems and equipment that will be installed and/or modified by the project. Include information essential to understand the purpose of the project and how it will contribute positively to three SDGs.)

The Vinča project, as part of the Waste Management System for the City of Belgrade, is a Private Public Partnership designed to improve the current solid waste disposal practice. It includes:

- A remediation of the existing landfill:

The Existing Landfill Remediation Works will comprise a full reshaping of the landfill body (40 hectares), involving the movement of approximately 800,000 m^3 of waste in order to provide the stability of the landfill slopes in both directions.

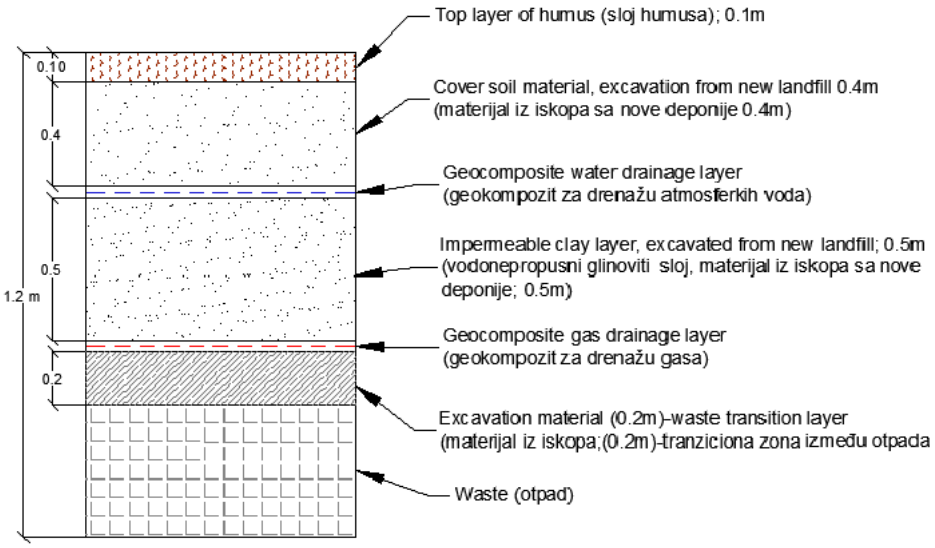
The reshaping of the landfill surface will be followed by the coverage of the entire landfill body area with a final layer (inluding the so-called “technical recultivation layer”) with a thickness of 1.20 to 1.30 m.

Based on the landfill cover specification provided below, the landfills cover shall be considered as semi-waterproof (transition layer with a low permeability) zone connected to a biogas combustion unit.

The anticipated landfill gas capture rate is anticipated to be no less than 65% unless during transition periods where the capture rate will increase in proportion of the biogas collection network implementation.

Final landfill capping layers

The total thickness of the final capping layer shall be 1.20 m to 1.30 m. The Figure below identifies the different the capping layers.



The multi-layered watertight lining shall consist of the following layers, looking downwards:

Cover Layer

In the capping system, the reclamation layer overlying the geocomposite for rainwater drainage will consist of 0.1m thick humus layer + 0.4m thick composed by material excavated from the new landfill. This layer will be similar as much as possible to a “top soil” (vegetal earth) non-compacted in order to promote the development of plant roots and evapotranspiration.

Rainwater Drainage Layer

The rainwater drainage layer is a geocomposite, with purpose of draining precipitation and reducing penetration of water into the landfill body.

Mineral Barrier

The natural material that will compose the barrier will meet the requirements of low permeability and sufficient stability. For achieving a low permeability, the material to be used will present an important proportion of clay.

Concerning the physical characteristics of a mineral barrier these are the relevant points to be considered:

- To achieve the low permeability objective of k $\leqslant$ 10-9 m/s, the material will contain a high clay content (at least 15 to 25%);

- The consistence limits will be controlled. For compacting, permeability and shrinkage/swelling issues it is proposed materials with Liquidity index LI $\geqslant$ 25 to 30% and plasticity index PI $\geqslant$ 10 to 20%.

- The mineral barrier will not contain more than 10% of coarse material (diameter > 0.5 cm) and no gravel with diameter > 2 cm;

- The organic carbon content will not exceed 5%.

Adequate compaction method will be employed to the implementation of the mineral barrier of the capping system according to good industry practices.

Gas Drainage Layer

In the capping system, the permeable material layer (Construction and Demolition Waste or excavations from new landfill) facilitates the collection and evacuation of biogas. Yet, the main device dedicated to landfill gas collection is the collection network.

The permeable material placed directly on the waste mass is also assumed to ensure a stable, homogeneous and leveled base to perform the support function for the other components of the capping system. It will allow the circulation of equipment and the load distribution arising from the differential settlement of waste landfill. The materials will have a good bearing capacity after compaction. The coarse elements provide good bearing capacity and sufficient porosity

for the evacuation of biogas towards the collection system while the fine elements will maintain the mechanical cohesion of the support. However, an excessive proportion of fine elements (clay) could compromise the suitable drainage of gases. A good compromise (support function + contribute to the collection network of gas collection) is to ensure that the material implemented will present hydraulic conductivity in a range between 10-4 and 10-6 m/s as far as possible subject to availability of material on site.

Considering the likely unavailability of permeable material with sufficient quantity and quality to perform simultaneously these two functions (support and gas drainage), a combination of a 0.1 m thickness of permeable material (out of the 0.3m initially foreseen) will be replaced with a geosynthetic gas drainage liner. It will also permit catching, extracting and recovering biogas using an adequately spaced and extended biogas wells network.

Geocomposite Gas Drainage Layer

In case the option of reducing the thickness of permeable material from 0.3 to 0.2 m is chosen, a geocomposite (synthetic material) for gas drainage will be added to the capping system.

EXISTING LANDFILL REMEDIATION WORKS	
Name of the Facility	Existing Landfill Remediation Works
Expected volumes of waste to be moved and replaced	800,000 m3
Expected volumes of additional material to be used for backfilling (excluding final capping)	Inert material from surplus excavation 5,000 m3
Expected structure of the final capping	Capping layer was designed as follows, looking from the landfill top to the bottom: ▪ Capping layer – soil 50 cm (10 cm topsoil + 40 cm excavated material); ▪ Run-off water drainage layer – geocomposite drainage layer; ▪ Impermeable mineral layer of low permeability, thickness 50 cm - excavated material; ▪ Geocomposit gas drainage layer ▪ Excavation fine material (0.2m) –waste transition layer ▪ Waste. The total thickness of the cover layer is 1.20 m.
Expected area for remediation (total area for capping)	484,000 m²
Density of Biogas Wells	5.3 wells/ha
Total number of Biogas Wells	256

- Construction of a new landfill

Including:

- the final disposal landfill of Unprocessed Residual Municipal Waste (RMW) throughout the Project period (with a capacity of 170,000 tons of RMW waste/year),
- the landfill for Municipal Waste Process Residues (i.e Incineration Bottom Ash (IBA) and stabilized Air Pollution Control Residues APCR as produced by the dedicated facilities to maturate or solidify these residues),

- the Construction and Demolition Waste (CDW) treatment plant, crusher for inert CDW targeting recovery of CDW and a temporary storage for Recovered Inert CDW (pending and subject to any off-take). The sorting capacity of the CDW facility will be 200,000 tons/year of CDW waste.
- the Inert waste landfill for CDW process residues and Inert CDW unprocessed

NEW LANDFILL FOR RMW LANDFILLED UNPROCESSED	
Name of the Facility	New Landfill for RMW Landfilled Unprocessed
Waste type/origin:	RMW collected
Annual waste delivery for the Base Case	170,000 t/a
Total void space (excluding intermediate covers and final capping)	5,200,000 tonnes
Total landfill volume (including intermediate covers and final capping)	5,500,000 m³
Percentage of intermediate covers and final capping of total landfill volume	19.2 % by weight 13.6 % by volume
Number of working shifts	2
Operating time	365 d/a 5,840 h/a
Required area for the Facility (total)	Approx 110,000 m²
Maximum height of the landfill	260 m
Slope ratio	33%
Planned area for unprocessed RMW cells	158,000 m²
Density of Biogas Wells	16.3 wells/ha
Total number of Biogas Wells	257

- Construction and operation of Leachate Treatment Facility (LTF)
    - For all relevant landfills on the site (i.e. Existing Landfill, Unprocessed Residual Municipal Waste (RMW) and Process Residues landfills).

LEACHATE TREATMENT FACILITY	
Name of the Facility	Leachate Treatment Facility in 2 steps RO treatment of leachate Evaporation of RO Brine

LEACHATE TREATMENT FACILITY	
Storage pond capacity Leachate pond New Landfills Leachate pond Existing Landfill	on the uphill platform: - 2 x 2 000 m³ on the downhill platform: - 2 x 5 100 m³ for New and Existing Landfills - 3 600 m³ for the Mix pond Total Leachate pond capacity 17 800 m³
Nominal capacity	RO 15. m³/h – 105,000 m³/y Evaporation: 7.5 m3/h – 50,000 m3/year
Peak capacity	RO 15 m³/h Evaporation: 7.5 m3/h
Number of lines	RO.: 2 lines of 7.5 m3/h Evaporation: 1 line of 7.5 m3/h
Number of working shifts	1 + remote monitoring from main facility
Operating time	292 d/a 7,000 h/a
Availability time ratio	80 %
Full load operating hours	6,000 h/a
Nominal capacity of Main Facility components:	
Reverse Osmosis treatment	15 m³/h
Evaporation of brine from RO	7.5 m³/h
Facility outputs (please specify)	Specify quantity and destination
Clean Water	83,000 t/a to environment
Concentrates	7,000 t/a for disposal
Required area for the Facility (total)	2,000 m²

- Construction and operation of a Landfill Gas Facility (LGF)
    - For relevant landfills at the site (i.e. Existing Landfill and New Landfill for Unprocessed RMW) Comprising:
    - Extraction of landfill gas,
    - When sufficient landfill gas is available, energy recovery through electricity production.

LANDFILL GAS FACILITY	
Name of the Facility	Landfill Gas Facility

Nominal capacity of main components of the Facility	
Gas extraction Existing Landfill	60 m³/h – 500,000 m³/a (min) 1,900 m³/h – 1,500,000 m³/a (max) 530 m³/h – 4,000,000 m³/a (average)
Gas extraction New Landfill(s)	110 m³/h – 880,000 m³/a (min) 1,400m³/h – 11,000,000 m³/a (max) 1,100 m³/h – 8,800,000 m³/a (average)
Gas extraction Total (Existing Landfill and New Landfill(s))	170 m³/h – 1,380,000 m³/a (min) 3,300 m³/h – 12,500,000 m³/a (max) 1,630 m³/h – 12,800,000 m³/a (average)
Flare	3,000 Nm³/h (with 2 units : 1x1000 + 1x2000)
Utilization (e.g. CHP/gas engine, please specify): 2 CHPs / gas engines	1,500 m³/h
Landfill Gas Utilization, where applicable:	
Number and size of generators for electricity production	2. generator sets x 1,500 kWel
Number of working shifts	1
Operating time	365 d/a 7,900 h/a
Availability time ratio	90%
Full load operating hours	7,900 h/a
Energy output (at design capacity)	20,000.000 kWh/a electricity 20,000.000 kWh/a heat (where used)
Required area for the Facility (total)	1,000 m²

- Site conditions and Emissions monitoring equipment
    - Covering leachate, groundwater, landfill gas, landfill body and control of EfW plant purified gas, LGF, exhaust gas
- **Energy from Waste (EfW) Facility** with CHP recovery allowing to achieve Maximal biodegradable landfill diversion and comprising:
    - a waste incinerator with a waste reception facility and a waste combustion system (air-cooled reverse acting grate technology),
    - a heat recovery boiler : CNIM boiler a vertical structure, with natural circulation, one vertical drum, top supported type, with 4 passes with water walls, integrated with the furnace:
        - furnace: radiant combustion chamber, vertical pass,
        - 2nd pass: vertical pass, with evaporator panels,
        - 3rd pass: vertical pass, with evaporator bank and superheaters,
        - 4th pass: vertical pass with economizers.

  - a condensing steam turbine, accepting the entire boiler output. The designed rated electrical power output is 32 MW. In the case of co-generation, the turbine provides 20,6 MW of electrical and 56,6 MWt of heat output.
- A generator rated power 32,4 MW, powered by a steam turbine. The generator will be connected to the 11 kV switchgear where the 110/11 kV transformer is also connected, via which generated electricity is transferred towards transmission system at 110 kV voltage level,
- a Flue Gas Treatment (FGT) system (dry, hydrated lime system) : the FGT will allow to reduce the concentration of contaminants from exhaust gases emitted to the atmosphere in accordance with the requirements of the Applicable Law; The Industrial Emissions Directive 2010/75/EU and its emission limit values.,
- a treatment facility for bottom ash (IBA),
- a treatment facility for FGT residues (also called Air Pollution Control [APCR] Residues).

The EfW facility involves a proven reverse acting grate technology and a vertical heat recovery boiler. The 60bar/400°C steam cycle coupled to a turbine and air-cooled condensers will deliver approx. 32 MW gross power and 26 MW net power to the grid. In case of connection to the district heating system, the facility will be able to deliver up to 56 MWth.

EfW plant main design features are as follow:

- Minimum plant annual availability time ratio of 89%, equivalent to around 7,800 hours per year,
- Single independent waste incineration line, with a nominal capacity of 43.6 t/h

  Equivalent to a total annual capacity of 340,000 tons/year of RMW at a calorific value of 8.5 MJ/kg,
- Capacity to produce a minimum heat off-take volume of 174 GWh and a power delivery of 190 GWh per year,
- the IBA plant will be sufficiently sized to handle 75 tons/hour of raw IBA allowing to easily manage the anticipated circa 70,000 tons/year of IBA generated by the EfW plant,
- the APCRs stabilization and solidification plant will be sufficiently sized to accommodate the FGT residues (both fly ash and APCRs) production estimated to approximately 14,000 tons/year.

The EfW facility involves a proven reverse acting grate technology and a vertical heat recovery boiler. The 60bar/400°C steam cycle coupled to a turbine and air-cooled condensers will deliver approx. 32 MW gross power and 26 MW net power to the grid. In case of connection to the district heating system, the facility will be able to deliver up to 56 MWth.

Those facilities will also include:

- the necessary networks for drainage and collection of run-off water (i.e. atmospheric rainwater), leachate and biogas
- Ponds for collection of run-off water (i.e. atmospheric rainwater) and leachate ponds
- Access and internal roads
- Operating structures and facilities

- Types and level of services in the baseline scenario

The baseline scenario consists in a strict application of the Serbian law. It has been elaborated based on the the Rulebook on the Methodology for the Development of Rehabilitation and Remediation Projects ("Official Gazette of RS", No. 74/2015[5]) and specifically *Appendix II. Rehabilitation and remediation of existing non-sanitary landfills of municipal waste – dumpsites.* This document specifies:

[5] Official Gazette of RS", No. 74/2015 - https://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/eli/rep/sgrs/ministarstva/pravilnik/2015/74/2/reg

To consider the possibility of relocating (…) all waste to a sanitary landfill, after partial separation, followed by the execution of works referred to in the item 8 given hereinafter, as well as the final closure at the site itself.

It is necessary:

1. to perform the minimum, required geological and hydrogeological investigation;

2. to perform mass distribution in the field - the formation of the body of the landfill with stable inclination slopes;

*3**. to set up a system for dumpsite degassing system - biotrn;***

4. to bring precipitation water by diversion channels;

5. to provide controlled entrance/exit - gate, fence;

*6. **to cover the body of the dumpsite with inert material – minimum thickness of the layer 30cm;***

*7**. to place pervious gravel blanket course - minimum thickness 20cm;***

*8**. to execute technical and biological reclamation (soil and topsoil layer 30 + 20 cm);***

9. to form a grassed surface;

10. to foresee monitoring: stability, gas emissions, capacity of diversion channels.

Therefore, in the baseline scenario, the waste continues to be dumped in a landfill, which has a minimal coverage, and where the biogas is partially captured and flared. The baseline scenario will be detailed in section B.4.

- Age and average lifetime of the equipment

The equipment lifetimes have been calculated using the Tool to determine the remaining lifetime of equipment (Version 01).

The following equipments are used in the project:

- Landfills Project activity:
  - Generator set (1)
  - Generator set (2)
- EfW Project activity:
  - Boiler
  - Steam Turbine Generator

The following conditions are met:

(i) The project participants can demonstrate that the equipment has been operated and maintained according to the recommendations of the equipment supplier;
(ii) There are no periodic replacement schedules or scheduled replacement practices specific to the industrial facility, that require early replacement of equipment before the expiry of the technical lifetime; and
(iii) The equipment has no design fault or defect and did not have any industrial accident due to which the equipment can not operate at rated performance levels.

Since the equipment will be new, conditions (i) and (iii) are met automatically, and there are no specific replacement schedules for waste management.

Option (c) of the tool is chosen: default values are used.

There are no historical information about the equipment that will be used in the project, because all equipment is new. We use therefore default values. The following values apply for the equiment:

	Equipment	Lifetime	Source
LFG	Generator sets	50 000 hours	am-tool-10-v1
EFW	Boiler	25 years	am-tool-10-v1

	Steam turbine	25 years	am-tool-10-v1

- **Positive contribution of the project to the Sustainable Development Goals**

Compare to the baseline scenario, the project will reduce GES emissions. The quantity of the emission to be reduced due to the project activity is detailed under section B.6.2. Therefore, the project activity will contribute positively to SDG13 Climate Action. Moreover, the project activity will generate electricity from a renewable energy source which is fed into Serbian grid system dominated through fossil fuels so that the project activity will contribute positively to SDG7 Affordable and Clean Energy, as well. In addition, since the project activity will use municipal wastes to generate electricity it will increase the proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated. Therefore, another positive contribution of the project activity will be for SDG11 Sustainable Cities and Communities. Lastly, the project, through the leachate treatment and the dirty water re-used, will contribute to increase water-use efficiency and to protect water-related ecosystems.

A.6. Scale of the project

>> (Define whether project is micro scale, small scale or others. Justify the scale referring to relevant activity requirement.)

The project is considered by Gold Standard Methodology as a large scale project[6].

Indeed Gold Standard small scale project refere to the CDM and UNFCCC rules.:

- Renewable energy Project capacity < = 15 MW
- End-use energy efficiency project improvement < = 180 GWhth
- Waste handling & disposal project GHG reduction < = 60,000 tCO2eq per annum

All Project exceeding the small scale thresholds are defined as large scale.

Concerning Belgrade, the project includes :

- Energy from Waste : The renewable energy project capacity is 32MW > 15MW
- Landfill gas : The annual GHG reduction for the landfill is : roughly between 150,000 and 180,000 tCO2eq/y >= 60,000 tCO2eq/y

*GHG emissions reduction & sequestration product requirements' Version 1.2, March 2018

A.7. Funding sources of project

>> (Provide the public and private funding sources for the project. Confidential information need not be provided.)

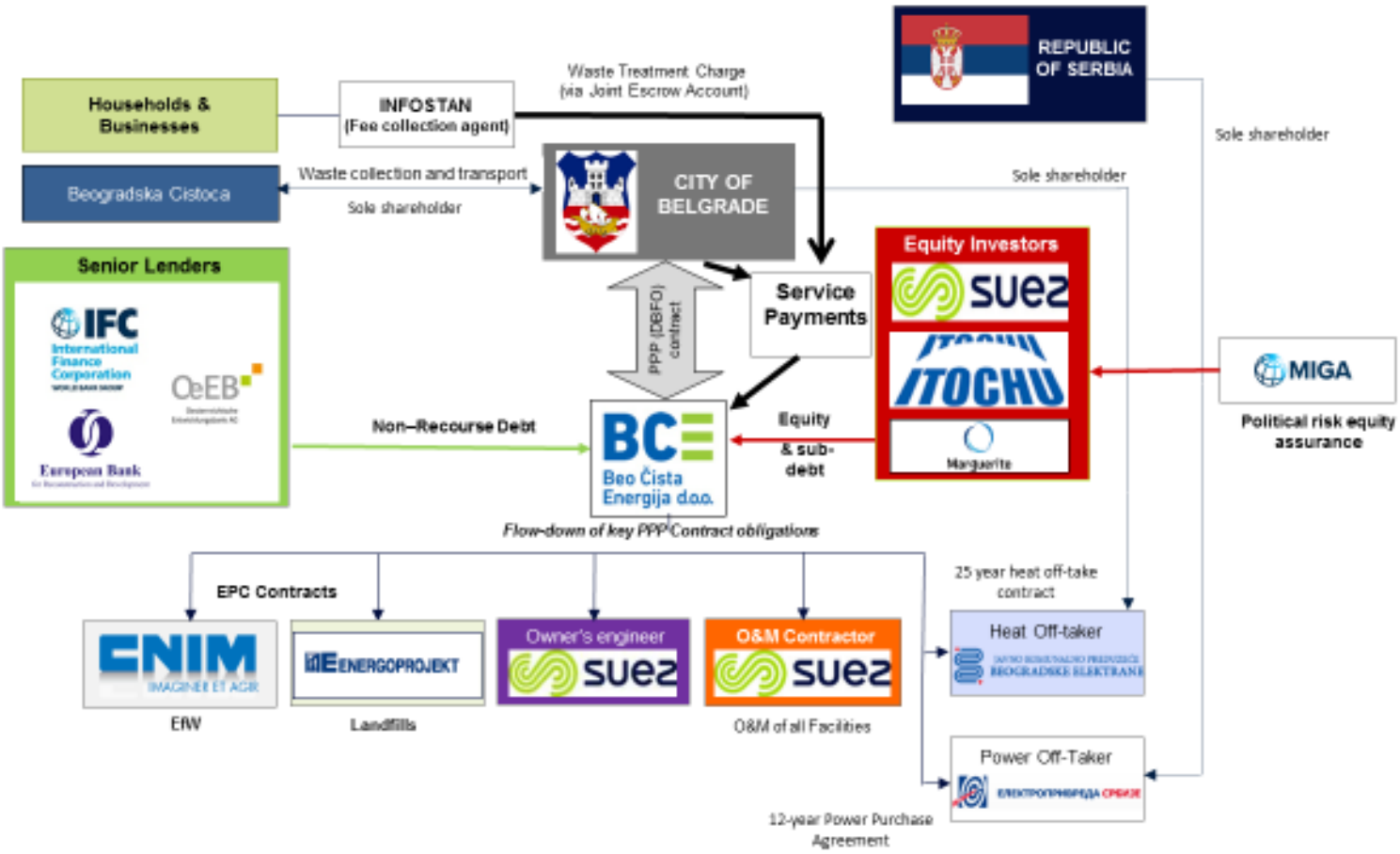
Belgrade Waste PPP Project is funded in accordance with the principles of project finance. Project financing is the usual structure used to implement infrastructure, energy and waste to energy investments. This structure allows to maximize the leverage on the asset, while optimizing the Sponsors' equity contribution. Hence, the project is planned and designed to be financed from a combination of equity (partly to be provided as subordinated debt) and senior loans received by the Contractor (the Borrower).

The Borrower BEO ČISTA ENERGIJA D.O.O. BEOGRAD, is a Special Purpose Vehicle (SPV) sponsored by SUEZ, the Japanese conglomerate Itochu and pan-European infrastructure fund Marguerite II which entered into a 25-year PPP with the City of Belgrade in 2017 for the first large-scale environmental infrastructure PPP investment in the Western Balkans region. Under the project finance scheme, the Senior Lenders will have no recourse to the Sponsors in case the Project SPV defaults on its obligations. The Sponsors will provide the Project SPV with the necessary

[6] GHG emissions reduction & sequestration product requirements' Version 1.2, March 2018.

equity financing (25% of the total project costs) in order to raise the remaining balance from senior lenders and reach financial close (expected February 2020). The EUR 290 m€ senior loan package will be provided by a group of international financial institutions, namely the International Finance Corporation (IFC), the European Bank for Reconstruction and Development (EBRD), the Austrian development bank Oesterreichische Entwicklungsbank (OeEB), UniCredit S.p.A. and Erste Group. The debt package will also include a concessional senior loan from the Canada-IFC Blended Climate Finance Program via the IFC and a concessional finance via EBRD funded by Taiwan ICDF.

The project financial structuring is summarized as follow:



A.8. Assessment that project complies with 'gender sensitive' requirements

>> (Answer the four mandatory questions included under Step 1 to 3 in "Gold Standard Gender Equality Guidelines and Requirements" available *here*.)

- ⇨ **Question 1:** Does the project reflect the key issues and requirements of **Gender Sensitive design** and implementation as outlined in the Gender Policy ?

Requirement 1: Ensure gender-sensitive approaches in stakeholder consultation; information sharing equally with women and Stakeholders

A gender-sensitive approach has been ensured in the Stakeholder Consultation. Requirements regarding the consultation process states that the consultation process should:

O **capture both men's and women's views**, if necessary, through separate forums or engagements, and

O **reflect men's and women's different concerns and priorities** about impacts, mitigation mechanisms, and benefits, where appropriate.

More detailed information is presented in the Stakeholder Consultation Report.

Furthermore, the presentation support used during the consultation allowed a equitably share of the information within women and men (see Annex A7-b).

Requirement 2: Address gender inequalities and gender related risks identified in project gender analyses

Social risks and impacts are addressed in chapter E.2.2.6 of the ESIA Study This part of the study has been developed to identify all potential risks related to gender during the conception, construction, implementation of the VINCA Project.

In this context, no gender inequalities have been noticed.

In fact, the gender issues have been assessed **as minor positive**, as the construction phase of the project is not expected to result in different impacts on men and women.

The project envisages the employment of about 120 workers, with different qualifications, to work in:

- administration
- maintenance
- laboratories
- production facilities (CDW, EfW and BEP)
- security, etc.

These positions will be primarily offered to local residents, which will have a significant positive effect on the employment rate in these communities. This may be an opportunity to increase the number of **employed women, which brings a moderate, positive and long-term effect on gender equality**.

In addition, the basic gender sensitive requirements have been addressed within technical design in Architectural Design Book 1.1 and 1.2 for all future facilities. It prescribes a number of norms, i.e. all administrative buildings that currently have separate male/female toilets and dressing rooms will be marked with appropriate signs.

Gender sensitive issues have also been addressed in:

- The Resettlement Action Plan (see Stakeholder Consultation), which provides a basic survey data, including statistical information on the gender structure of the project affected population. Under chapter 15.4 of the General remarks regarding displacement and resettlement, the following requirements are stated: “Special attention will be given to incapacitated persons and persons with disabilities, **women**, children and persons over 65 years of age. It is necessary to provide adequate transport for incapacitated persons and persons with disabilities, in line with their needs” during the resettlement process.
- The Stakeholder Engagement Plan (SEP) ; Under Chapter 10.2 of the Reporting, the following is stated: “Before and during construction, the City Secretariat for Environmental Protection and BEO ČISTA ENERGIJA D.O.O. BEOGRAD will produce quarterly Environmental Health Safety and Social (EHSS) reports, which will also include a summary of the Project’s performance on grievance management (number, type and source of complaints; number of resolved complaints and average time for resolution of complaints, **gender segregated**). These reports will be submitted to the CoB Mayor’s cabinet and relevant other CoB departments, as well as the IFIs and will be posted on the websites of the CoB and BEO ČISTA ENERGIJA D.O.O. BEOGRAD. Upon the completion of construction, i.e. during operation, these reports will be prepared and issued annually.”
- The Community health and safety management plan identified the following impacts and risks on community health, safety and security, potentially developed during the Project, especially concerning conflicts with Project Security Personnel: The lack of relevant **cultural sensitivity, gender sensitivity**, use of force and other Code of Conduct trainings for the security personnel may lead to conflict with local communities, as security personnel will be in direct contact with communities

The Project directly anticipates these gender-oriented risks and proposes the following mitigation measures:

- Provide training to all workers on Code of Conduct, local sensitivities, gender sensitivities, risks (associated with relations with local communities) ;
- Provide training on code of conduct, appropriate use of force, gender sensitivities and local cultural sensitivities to security personnel or ensure the security subcontractors provides the same level of trainings.

Finally, the PPP Contract requires the ESIA to include social diversity and gender dimension as a part of social risks and impact assessment. It also requires the Socio- economic study on project affected persons:

Focus groups to be administered in the Project Area of Influence with men and women in order to gain a good understanding of the socio-economic issues in local communities and how the project may impact on these and collect their comments and concerns. The focus groups should also include vulnerable groups such as those with disabilities and the elderly; **gender issues**, ethnic minorities issues and in particular, vulnerability of the affected Roma community.

Requirement 3: Encourage women and men to participate equitably and meaningfully in the project design

The project does not create any discriminations concerning the equitable involvement of men or women in the project. As an example, the Project SPV includes women, who hold a decision-making power.

During the consultation, women's participation and feedback was particularly encouraged, especially through the presence of the NGOs.

Requirement 4: Provide quantifiable, "easy to mesure" indicators potentially aligned with the SDG goals

The Gold Standard Certification Process encourages the Project Team to develop an "easy to measure" indicators evaluation grill in order to improve its gender-sensitive approach.

SDG's targets	Indicators
	Ratio between men and women in the project teams
5.2 Eliminate all forms of violence against all women and girls in public and private spheres, including trafficking and sexual and other types of exploitation	Women harassment complaints reported
5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life	Ratio men/women in the managerial positions
5.A Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws	Ratio between men's average wage and women's average wage
	Comparison between men and women wages at same hierarchical position
	Number of women with unstable employment situation (short contracts, part-time…)
	Transportation time for women
	Number of women below the national poverty line in the company
	Number of sexist discriminations reported
	Number of awareness measures (training…)
	Subjective feeling of equality on a 1 to 10 scale

Requirement 5: Establish a checklist of gender-sensitive processes, procedures and implementation risks

The ESIA has developed a gender oriented implementation risks checklist, which has come to the following conclusion: no important gendered issues linked with the ESIA-Project were noticed.

⇨ **Question 2**: Does the project align with existing country policies, strategies and best practices?

The VINCA Project is framed by the national gender regulations.

In this context, the following obligations are respected:

- Art 19 of the Constitution, which states that the purpose of the constitutional guarantees is "preserving human dignity and achieving full freedom and equality for every individual" ;
- Art. 15 which guarantees the equality between women and men;
- Art. 2, paragraph 3; which prohibits direct and indirect discrimination on any grounds, including discrimination based on sex.

In this context, Ban to Discrimination of any kind is prohibited:

- **Direct Discriminatory Act** ; Direct Discriminatory act is a situation, in which one person is at a disadvantageous position in relation to other people in the same or similar situation.
- **Indirect Discriminatory** ; Indirect Discriminatory Act exists when a specific, seemingly neutral provision, criterion or practice, places or would place an individual in a more disadvantageous position comparing to other people - a person seeking employment, as well as an employed person, because of a specific characteristic, status, orientation or belief.

Direct and indirect discrimination of individuals seeking employment, as well as the employees, for reasons of **sex**, birth, language, race, color of skin, age, pregnancy, health condition, i.e. disability, ethnic origin, religion, marital status, family obligations, **sexual orientation**, political or other belief, social background, financial status, membership in political organizations, trade unions, or any other personal characteristic - is prohibited (cf*. Labor Law of the Republic of Serbia ("Official Gazette of RS", Nos. 24/2005, 61/2005, 54/2009, 32/2013, 75/2014, 13/2017-Decision of the CC, 113/2017 and 95/2018*).

It is forbidden to do something wrong towards a person seeking employment, as well as an employed person; who is placed in a more disadvantageous position comparing to other persons in the same or similar situation.

Discrimination is prohibited in relation to: employment conditions and choice of candidates for performing a specific job, conditions of work and all the rights deriving from employment, education, vocational training and specialization, job promotion and termination of the employment contract.

Further, harassment and sexual harassment is prohibited. Harassment is any unwanted conduct that is aiming at the violation of dignity of a person that seeks employment, as well as of an employed person, and which causes fear or creates a hostile, degrading or offensive environment and sexual harassment is any verbal, non-verbal or physical behavior aiming at or amounting to the violation of dignity of a person seeking employment, as well as of an employed person in the sphere of sexual life, and which causes fear or creates a hostile, degrading or offensive environment.

The Project aligns with this legislation , regarding the Community health and safety management plan, The Stakeholder Consultation Plan (*see below*.)

In addition, the Project Environmental and Social Action Plan (*ESAP, see Stakeholder Consultation*) requires project to be compliant with EBRD/IFC policies which ensure gender equality.

The Project should as well be in adequacy with the EBRD requirement (PR7): "to recognize the specific needs of men, **women** and children of Indigenous Peoples by addressing gender issues **and mitigating potential disproportionate gender impacts of a project**;" (see. PPP Contract).

⇨ **Question 3:** Does the project address the questions raised in the Gold Standard **Safeguarding Principles and Requirements document?**

Requirement 1: Respect of the Principle 2 – Gender Equality and Women Right's:

The project shall not directly or indirectly contribute to adverse impacts on gender equality.

The project shall apply the principles of non-discrimination, equal treatment, and equal pay for equal work.

As part of the Environmental and Social Management Plan (ESMP) the Labor Management Plan requires the contractor involved in the VINCA Project to take into account the National requirements, Lenders Performance Standard and the International Labor Organization's (ILO). This plan will, among other, comply with the following:

Prevent discrimination in hiring, remuneration, access to training, promotion, termination, and retirement on the grounds of race, national or social origin, caste, birth, religion, disability, **gender,** sexual orientation, union

membership, political opinions and age and promote equal opportunities. This applies equally to employees and non-employees.

Furthermore, the Security personnel code of conduct "Professional attitude and skills" of the Project assure that the security personal should:

Be friendly and do not discriminate on the grounds of gender, sexual orientation, marital status, race, nationality, ethnicity, religion or beliefs, disability, or any other difference in individuals which is not relevant to the Security Guard responsibility.

The Project does not contribute to adverse impacts on gender equality. In fact, all companies within SUEZ Group share a common **focus on developing gender equality**: gender diversity in job roles, equal pay, equal access to career management and training. This policy is supported by specific programs such as mentoring and coaching.

In this context, SUEZ, was certified by the 2014 Project Management certification " by the The French Diversity Label" in order to demonstrate the conformity of diversity policy in terms of promoting equal opportunities, preventing discrimination and promoting diversity and how these policies are put into action.

SUEZ is committed to maintaining human relationships that are both demanding and harmonious at all levels. In this regard, it is everyone's responsibility to enable all employees to perform their work in physically good conditions and in conditions of good morale. Accordingly, while exercising responsibilities and line relationships, employees / individuals must always be respected. The Group favors relationships between colleagues based on courtesy, consideration, recognition and discretion.

SUEZ strongly condemns workplace sexual harassment and disapproves of any practice which involves exerting excessive pressure. As an example, the HR Policy applies zero tolerance for any proven case of gender-based sexual or physical violence and workplace harassment.

Requirement 2: The project shall refer to the country's national gender strategy or equivalent:

The VINCA Project follows the fundamental strategic document of the Republic of Serbia concerning gender equality, the National Gender Equality Strategy. The Strategy focuses on the elimination of multiple discrimination acts and improving the status of women discriminated against on multiple grounds, especially Roma Women and victims of gender -based violence. These two issues especially concern the VINCA Project, which implies Roma population settlement and displacements, as well as potential violence acts against women due to the presence of a significant male workeforce, away from its home.

In this context the Project respects the guidelines exploited by the Strategy, especially in the following strategy goals :

- ⇨ **Strategic Goal 2** "Increased equality of women and men by implementing an equal opportunities policy and measures", especially target 3 "Improved economic and labor market status of women".
    - Measures to achieve the objective are linked to this target;
- Integrate provisions in the labour legislation that will additionally strengthen gender equality of those employed.
    - In the VINCA Project, this measure is reinforced by integration protection measures and non-discrimination obligations present in the SCR, SEP, Security Code of Conduct, … *(see other questions answered in this document).*
    -
- (…) Continuously training labour inspectorate staff to enable them to recognize discrimination against women at work or in connection with work and respond adequately, also with respect to the protection of pregnant women and other vulnerable groups of women.
    - At its level, the VINCA Project is framed by this National Strategy. Indeed, as mitigation measure against violence and inequalities, the Project provides trainings to all workers on Code of Conduct, local sensitivities, gender sensitivities, risks (associated to relations with local communities). In addition, the Project provides trainings on code of conduct, appropriate use of force, gender sensitivities and local cultural sensitivities to security personnel to ensure the security subcontractors are provided with the same level of trainings.
- Secure the commitment of all (…) private employers to develop internal mechanisms for the prevention of and protection from discrimination and for the implementation of gender-balanced human resources policies for the purpose of facilitating women's and men's equal advancement.

The VINCA Project assures the implementation of a gender-balanced human resources policy, especially concerning career advancement.

- Observe the principle of equal pay for equal work or for work of equal value for all employed.
    - All companies within SUEZ organization share a common **focus on developing gender equality**: gender diversity in job roles, equal pay, equal access to career management and training.
    -

⇨ **Strategic Goal 3** "System-wide gender mainstreaming in the policy adoption, implementation and monitoring processes", especially target 2 "Gender perspective included in all strategic documents".

The associated objectives are presented in the Serbian National Gender Strategy:

- Continuously endeavour to introduce gender equality into all normative regulations, strategies, programmes and measures across all areas, securing equal participation of women and men in their planning, preparation and development process

The Project strategic documents contain goals and measures for improving the status of women and vulnerable groups. They provide gender equity in the HR regulation, the Security and the women Work Conditions. The equal participation of women and men is encouraged, especially through the consultation process.

⇨ **Question 4**: Does the project apply the Gold Standard Stakeholder Consultation & Engagement Procedure, Requirement and Guidelines?

Requirement 1: Women have been integrated in the consultation (ex: number of women present during the consultation, or representatives of a group of women)

Yes, women have been integrated in the consultation design and the consultation process. All NGOs participating in consultations related to our project have a significant number of women present and engaged.

In addition, more than 50 women were present at / during the public consultation, which represents more than 43% of the participants[7] (see participant list in the Stakeholder Consultation Report, Annex A8-a).

Requirement 3: Have several different meetings took place in order to include all fragile population (where the consultations took place, is it at affordable hours for women? Childcare, etc.)

Numerous consultations have been organized with the goal of reaching the largest public as possible, including women. The ESIA Public Consultation meetings were held on 20/12/2018 and 21/12/2018. This was announced by/in the local media but also in public places in the community and was held on 20/12/2018 in the Municipality of Grocka targeting local communities.

In addition, the first ESIA Public consultation was held at 17:00 / 5pm, which was convenient for people who were coming after work. EIA Public consultations were held at 10 am, which was convenient as at this time children are at usually in kindergarden/school in Serbia.

In this context working women as family mothers were able to attend the consultation meetings.

Finally, a web link was shared to allow the public to submit any remarks or suggestions concerning the public consultation.

[7] Because of juridical implications the photos could no be published in the public version of the PDD (see Serbian Personal Data Protection Law, which is modelled under GDPR and applicable in Serbia as of 21 August 2019).

SECTION B. Application of selected approved Gold Standard methodology

B.1. Reference of approved methodology

The used methodologies are the methodologies:

- For the landfills :
  - ACM001 v19.0: Large-scale Consolidated Methodology: Flaring or use of landfill gas
  - Tool04 v8.0: Emissions from solid waste disposal sites
  - Tool05 v3.0: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation
  - Tool07 v7.0: Tool to calculate the emission factor for an electricity system
  - Tool 32: Methodological tool Positive lists of technologies Version 02.0
- For the EfW facilities :
  - ACM022 (EfW) V2.0 - Large-scale Consolidated Methodology: Alternative waste treatment processes
  - Tool04 v8.0: Emissions from solid waste disposal sites
  - Tool02 v7.0: Combined tool to identify the baseline scenario and demonstrate additionality
  - Tool03 v03.0: Tool to calculate project or leakage CO2 emissions from fossil fuel combustion
  - Tool23: First of its kind

B.2. Applicability of methodology

>> (Justify the choice of the selected methodology(ies) by demonstrating that the project meets each applicability condition of the applied methodology(ies))

B.2.1. **ACM0001 : Capture and use of landfill gas to produce electricity and heat**

Scope

The project activity includes the **destruction of methane emissions and displacement of a more-GHG-intensive service by capturing landfill gas from the landfill site using to produce energy** (i.e. electricity exported to the grid and heat to the evaporator for leachate treatment condensate).

Applicability

The applicability conditions (a), (c)*(i)* and (d) are met :

- A new LFG capture system is installed in an existing and in a new (Greenfield) SWDS where no LFG capture system was installed prior to the implementation of the project activity;
- The LFG is to generate electricity and heat
- **The project** does not reduce the amount of organic waste that would be recycled in absence of the project activity

The most plausible baseline scenario is:

(a) Capture of LFG and destruction through flaring to comply with regulations or contractual requirements
(b) Electricity would be generated in the grid

B.2.2. **ACM0022 : Incineration of fresh waste**

Scope

The project activity includes the treatment of **fresh waste, originally intended for disposal in a solid waste disposal site (SWDS)** therefore avoids emissions of methane associated with disposing organic waste in a SWDS with a partial landfill gas (LFG) capture system that would have been installed pursuant the applicable serbianregulation. In addition, the project activity also claims emission reductions for:

(c) Displacing electricity in a grid or electricity generation by a fossil fuel fired captive power-only or cogeneration plant; and

(d) Displacing heat generation by a fossil fuel fired cogeneration plant, boiler or air heater.

Applicability:

Applicability conditions specific to the treatment option

The incineration technology is **grate type**.

The fraction of energy generated by auxiliary fossil fuels is not more than 50% of the total energy generated in the incinerator.

General applicability conditions

The following general applicability conditions apply:

(a) The project activity involves the construction of a new plant to implement one incineration of fresh waste;
(b) In the project plant, only wastes for which emission reductions are claimed (fresh waste or wastewater) are processed :
(c) Neither organic fresh waste nor products and by-products from the waste treatment plant established under the project activity are stored on-site under anaerobic conditions *On the Energy from Waste facility, municipal waste stored in the bunker is regularly mixed in order to homogenize it prior being incinerated. This regular mixing of the stored waste prevents the apparition of anaerobic conditions by avoiding too much waste compaction and letting oxygen "refills" below the waste surface. The Waste Cranes are programmed to automatically mix the Waste during periods when they are not feeding the combustion grate which ensure no waste is left to decay under anerobic condition prior being incinerated.*.All by-products from the EfW facility are non-organic in nature.
(d) Any run-off wastewater is treated within the project boundary;
(e) The project does not reduce the amount of waste that would be recycled in the absence of the project activity. The Local Waste Management Plan for the City of Belgrade 2011-2020 includes the sorting and diversion of the compostable and recyclable waste (the extract of the PPP contract and the official confirmation from the City is provided in Confidential annexed documentation[8])

The baseline scenario is the disposal of the fresh waste in a SWDS with a partial LFG capture system. Indeed, as presented in section A5, the Serbian regulation requires to cover the landfill, capture the biogas and flare it (Rulebook on the Methodology for the Development of Rehabilitation and Remediation Projects ("Official Gazette of RS", No. 74/2015)).

No minimal capture rate or destroying rate is specified under this relevant serbian regulation. Therefore, we followed the CDM methodologies to determine the baseline: the fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emissions of methane to the atmosphere is supposed equal to 0.2.

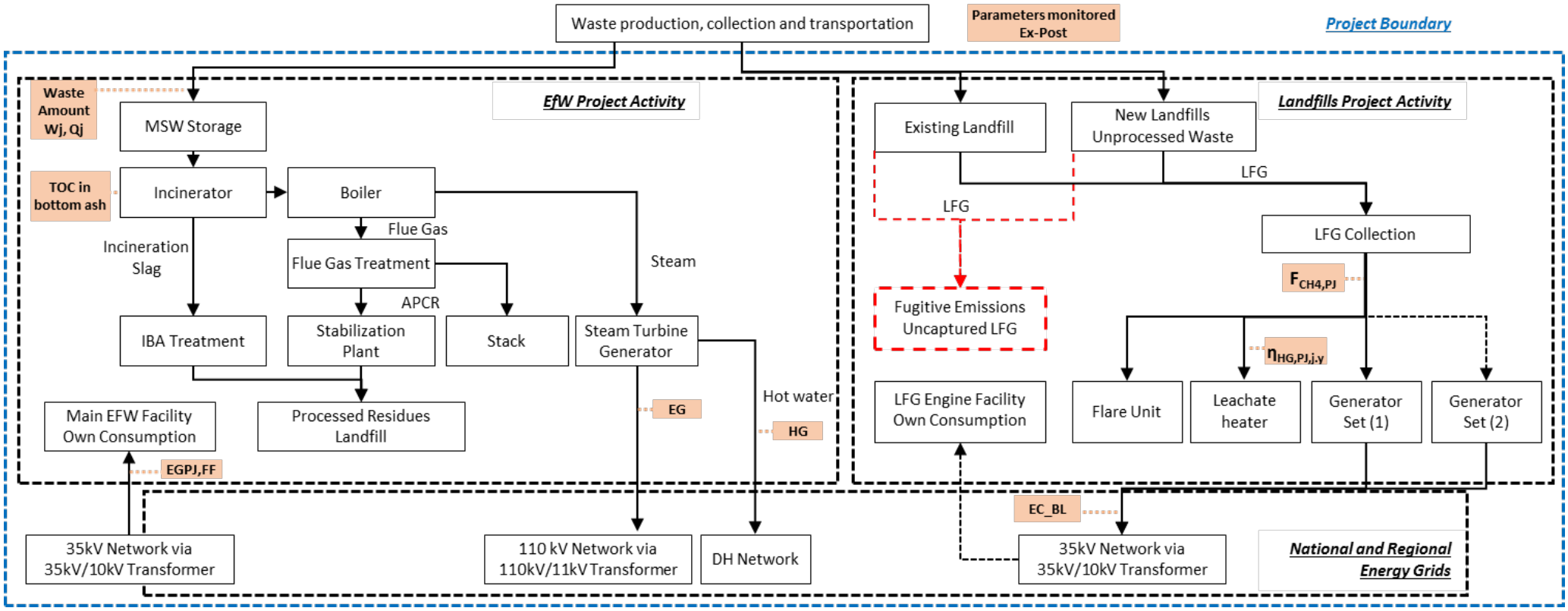
In the baseline scenario for ACM0022, it has been considered that in the absence of the project, a thermal plant would have been constructed, in order to supply the heating network. In a conserative approach, it has been considered that this thermal plant would be a cogeneration power plant, fuelled by natural gas, which is the less emissisve solution, compared with coal and fuel.

[8] PPP Contract - Schedule 2 Output Specifications / Answer of the City of Belgrade - Confidential annexed documentation

B.3. Project boundary

>> (Present a flow diagram of the project boundary, physically delineating the project, based on the description provided in section A.5 above.)

The project(s) boundary(ies) are schematically illustrated in the below:


Waste production, collection and transportation
Parameters monitored Ex-Post
Project Boundary
EfW Project Activity
Landfills Project Activity
Waste Amount Wj, Qj
MSW Storage
TOC in bottom ash
Incinerator
Boiler
Flue Gas
Incineration Slag
Flue Gas Treatment
Steam
APCR
IBA Treatment
Stabilization Plant
Stack
Steam Turbine Generator
Hot water
EG
HG
Main EFW Facility Own Consumption
Processed Residues Landfill
EGPJ,FF
35kV Network via 35kV/10kV Transformer
110 kV Network via 110kV/11kV Transformer
DH Network
Existing Landfill
New Landfills Unprocessed Waste
LFG
LFG
LFG Collection
$F_{CH4,PJ}$
Fugitive Emissions Uncaptured LFG
$\eta_{HG,PJ,j,y}$
LFG Engine Facility Own Consumption
Flare Unit
Leachate heater
Generator Set (1)
Generator Set (2)
EC_BL
35kV Network via 35kV/10kV Transformer
National and Regional Energy Grids

For the purpose of GHG mitigation/sequestration, the following parameters have been considered

ACM0001:

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	LFG Emissions from decomposition of waste at SWDS site	CO_2	No	CO_2 emissions from decomposition of organic waste are not accounted since the CO_2 is also released under the project activity
		CH_4	Yes	The major source of emissions in the baseline
		N_2O	No	N_2O emissions are small compared to CH4 emissions from SWDS. This is conservative
	Emissions from electricity generation	CO_2	Yes	Major emission source since power generation is included in the project activity
		CH_4	No	Excluded for simplification. This is conservative
		N_2O	No	Excluded for simplification. This is conservative
	Emissions from heat generation	CO_2	No	Heat generation is not included in the project activity
		CH_4	No	Heat generation is not included in the project activity
		N_2O	No	Heat generation is not included in the project activity
Project scenario	Emissions from fossil fuel consumption for purposes other than electricity generation or transportation due to the project activity	CO_2	Yes	May be an important emission source
		CH_4	No	Excluded for simplification. This emission source is assumed to be very small
		N_2O	No	Excluded for simplification. This emission source is assumed to be very small
	Emissions from electricity consumption due to the project activity	CO_2	Yes	May be an important emission source
		CH_4	No	Excluded for simplification. This emission source is assumed to be very small
		N_2O	No	Excluded for simplification. This emission source is assumed to be very small
	Emissions from flaring	CO_2	No	Emissions are considered negligible
		CH_4	Yes	May be an important emission source
		N_2O	No	Emissions are considered negligible

ACM0022:

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	Emissions from heat generation	CO_2	Yes	Major emission source if heat generation is included in the project activity and displaces more carbon intensive heat generation in the baseline
		CH_4	No	Excluded for simplification. This is conservative
		N_2O	No	Excluded for simplification. This emission source is assumed to be very small
	Emissions from	CO_2	No	CO2 emissions from the decomposition of fresh waste are not accounted for

Source		GHGs	Included?	Justification/Explanation
	decomposition of waste at the SWDS	CH_4	Yes	The major source of emissions in the baseline
		N_2O	No	N2O emissions are small compared to CH4 emissions from landfills. Exclusion of this gas is conservative
	Emission from electricity generation	CO_2	Yes	Major source if electricity generation is included in the project activity and is sent to the grid or displaces fossil fuel fired electricity generation in the baseline
		CH_4	No	Excluded for simplification. This is conservative
		N_2O	No	Excluded for simplification. This is conservative
Project scenario	Emissions from on-site fossil fuel consumption due to the project activity oher than for electricity generation	CO_2	Yes	May be an important emission source. Includes heat generation for mechanical/thermal treatment process, start up of the gasifier, auxiliary fossil fuels needed to be added into incinerator, etc. It does not include transport
		CH_4	No	Excluded for simplification. This emission source is assumed to be very small
		N_2O	No	Excluded for simplification. This emission source is assumed to be very small
	Emissions from on-site electricity use	CO_2	Yes	May be an important emission source
		CH_4	No	Excluded for simplification. This emission source is assumed to be very small
		N_2O	No	Excluded for simplification. This emission source is assumed to be very small
	Emissions from the waste treatment processes	CO_2	Yes	CO2 emissions from incineration, gasification or combustion of fossil based waste are included. CO2 emissions from the decomposition or combustion of fresh waste are not accounted
		CH_4	Yes	CH4 leakage from the anaerobic digester and incomplete combustion in the flaring process are potential sources of project emissions. CH4 may be emitted from incineration, gasification, composting and RDF/SB combustion
		N_2O	Yes	N2O may be emitted from composting, incineration, syngas produced and RDF/SB combustion
	Emissions from the waste treatment processes	CO_2	No	No waste water treatment
		CH_4	No	No waste water treatment
		N_2O	No	No waste water treatment

B.4. Establishment and description of baseline scenario

>> (Explain how the baseline scenario is established in accordance with guidelines provided in GS4GG Principles & Requirements and the selected methodology(ies). In case suppressed demand baseline is used then same should be explained and justified.)

Landfill Gas Facility

As per ACM0001 (V 19.0) project participants may either apply the simplified procedures to identify the baseline scenario and demonstrate additionality or the procedures according to the “Combined tool to identify the baseline scenario and demonstrate additionality” to select the most plausible baseline scenario and demonstrate additionality. For this project, simplified procedures to identify the baseline scenario and demonstrate additionality has been selected.

According to simplified procedures, (1) the baseline scenario for LFG is assumed to be the atmospheric release of the LFG or capture of LFG and destruction through flaring to comply with regulations or contractual requirements, to address safety and odour concerns, or for other reasons. Moreover, (2) if all or part of the electricity generated by the project activity is exported to the grid, the baseline scenario for all or the part of the electricity exported to the grid is assumed to be electricity generation in existing and/or new grid-connected power plants.

(1)Therefore, in the absence of the project activity, the organic waste would have otherwise been left to decay and the gas emitted would have been partially captured and flared, to conform with the local reglementation. This reglementatioon does not specify the amount of gas that should be captured and flared, so we supposed accordingly to the methodologies that 20% of the methane would have been destroyed (as per ACM0001 43 (b) (ii)). Thus, as per the approved methodological tool “Emissions from solid waste disposal sites”, the annual baseline emissions are calculated as the amount of methane that would otherwise have been emitted from the decay of the cumulative quantity of the waste diverted or removed from the disposal site, to date, by the project activity.

(2)Additionally , without the existence of the project activity, supplied electricity to the grid by the project would have otherwise been generated by already grid-connected mainly fossil-fuel based power plants or by addition of new generation sources.

Energy from Waste Facility :

As per ACM0022 (V 02.0) project participants may apply two available approaches to select the most plausible baseline scenario and to demonstrate additionality: (1) Approach 1 refers to the “Combined tool to identify the baseline scenario and demonstrate additionality” and (2) Approach 2 relies on a set of objective criteria which are applied individually or in combination.. For this project, the “Combined tool to identify the baseline scenario and demonstrate additionality” has been selected.

B.5. Demonstration of additionality

>> (If the proposed project is not a type of project that is deemed additional, as stated below, then follow guidelines in section 3.5.1 of GS4GG Principles & Requirements to demonstrate additionality.)

The purpose of this part is to prove the deemed additionality of the project.

Landfill Gas Facility:

Specify the methodology or activity requirement or product requirement that establish deemed additionality for the proposed project (including the version number and the specific paragraph, if applicable).	As per 21st paragraph of ACM0001 (V 19.0) and 11th papragraph of referenced "TOOL32: Positive lists of technologies V02.0"; *5.1 Waste handling and disposal* *5.1.1. Landfill gas recovery and its gainful use* *The project activities and PoAs at new or existing landfills (greenfield or brownfield) are deemed automatically additional, if it is demonstrated that prior to the implementation of the project activities and PoAs the landfill gas (LFG) was only vented and/or flared (in the case of brownfield projects) or would have been only vented and/or flared (in the case of greenfield projects) but not utilized for energy generation, and that under the project activities and PoAs any of the following conditions are met:The following types of project activities at new or existing landfills (greenfield or brownfield) are deemed automatically additional, if prior to the implementation of the project activity the LFG was or would have been only vented and/or flared but not utilized for energy generation:* *(a) The LFG is used to generate electricity in one or several power plants with a total nameplate capacity that equals or is below 10 MW;* *(b) The LFG is used to generate heat for internal or external consumption;* *(c) The LFG is flared.*
Describe how the proposed project meets the criteria for deemed additionality.	The Project is composed by a brownfield and a greenfield project which will use LFG as a renewable energy source for electricity generation and feed into the grid along with supplying heat for the evaporation of leachate treatment by-products. Therefore, prior to the implementation of the project activity the LFG was not utilized for energy generation. Additionally, the LFG will be used to generate electricity in a power plant with a total nameplate capacity that equals **3 MW** which is less than the total benchmark capacity (10 MW) defined by the applicable methodological tool 32 " Positive lists of technologies (V 02.0)" Hence, the proposed project meets the **criteria for deemed additionality**.

Energy from Waste Facility :

The following procedure purpose is selecting the most plausible baseline scenario and demonstrating deemed additionality, accoding to "Combined tool to identify the baseline scenario and demonstrate additionality" Methodological TOOL 2 Version 07.0 as per the methodology ACM0022 (Version 02.0) requirement.

Step 0. Demonstration that a proposed project activity is the First-of-its-kind

As per the 12th papragraph of referenced "TOOL23: First of its kind";

5.1. Identification of a first-of-its-kind project activity

A proposed project activity is the first of its kind in the applicable geographical area if:

(a) The project is the first in the applicable geographical area that applies a technology that is different from technologies that are implemented by any other project, which are able to deliver the same output and have started commercial operation in the applicable geographical area before the project design document (CDM-PDD) is published for global stakeholder consultation or before the start date of the proposed project activity, whichever is earlier;

(b) The project implements one or more of the measures;

(c) The project participants selected a crediting period for the project activity that is "a maximum of 10 years with no option of renewal".

Where :

9. Measure - (for emission reduction activities) is a broad class of greenhouse gas emission reduction activities possessing common features. Four types of measures are currently covered in the framework:

(a) Fuel and feedstock switch (example: switch from naphtha to natural gas for energy generation, or switch from limestone to gypsum in cement clinker production);

(b) Switch of technology with or without change of energy source including energy efficiency improvement as well as use of renewable energies (example: energy efficiency improvements, power generation based on renewable energy);

(c) Methane destruction (example: landfill gas flaring);

(d) Methane formation avoidance (example: use of biomass that would have been left to decay in a solid waste disposal site resulting in the formation and emission of methane, for energy generation).

10. Output - is goods/services produced by the project activity including, among other things, ***heat,*** *steam****, electricity,*** *methane, and biogas unless otherwise specified in the applied methodology.*

11. Different technologies - are technologies that deliver the same output and differ by at least one of the following (as appropriate in the context of the measure applied in the proposed clean development mechanism (CDM) project activity and applicable geographical area):

(a) Energy source/fuel (example: energy generation by different energy sources such as wind and hydro and different types of fuels such as biomass and natural gas);

(b) Feed stock (example: production of fuel ethanol from different feed stocks such as sugar cane and starch, production of cement with varying percentage of alternative fuels or less carbon-intensive fuels);

(c) Size of installation (power capacity)/energy savings:

(i) Micro (as defined in paragraph 24 of decision 2/CMP.5 and paragraph 39 of decision 3/CMP.6);

(ii) Small (as defined in paragraph 28 of decision 1/CMP.2);

(iii) Large.

The project activity is the first of its kind in the applicable geographical area because:

a) The project is the first of it's kind in Serbia, indeed, it is the **first incinerator project** in the country[9];
b) The project implements the measure; **Methane formation avoidance**
c) The project participants selected a crediting period for the project activity that is "a maximum of 10 years with no option of renewal".

Outcome of Step 0:
Conclusion I: The proposed project activity is the first-of-its-kind.

[9] A supporting letter of ministry will be added in the final version of the PDD

Step 1. Identification of alternative scenarios

This step serves to identify all alternative scenarios to the proposed CDM project activity(s) which can be the baseline scenario.

Step 1a. Determination of alternative scenarios to the proposed CDM project activity

Alternative scenarios for the treatment of municipal waste

M1. The project activity without being registered as a CDM project activity

M2. Disposal of the waste in a SWDS with a partial capture of the LFG and flaring of the captured LFG

M3. Disposal of the waste in a SWDS without a LFG capture system

M4. Part of the fresh waste fraction of the solid waste is recycled and not disposed in the SWDS

M5. Part of the fresh waste fraction of the solid waste is treated aerobically and not disposed in the SWDS

M6. Part of the organic waste fraction of the solid waste is incinerated and not disposed in the SWDS

M7. Part of the organic waste fraction of the solid waste is gasified and not disposed in the SWDS

M8. Part of the organic waste fraction of the solid waste is treated in an anaerobic digester and not disposed in the SWDS.

M9. Part of the organic waste fraction of the solid waste is mecanically or thermally treated to produce RDF/SB and not disposed in the SWDS.

Alternative scenarios for the electricity

P1. Electricity generated as an output of one of the waste treatment options, not undertaken as a CDM project activity

P2. Existing or new construction of an on-site or off-site fossil fuel fired cogeneration plant

P3. Existing or new construction of an on-site or off-site renewable based cogeneration plant

P4. Existing or new construction of an on-site or off-site fossil fuel fired based electricity plant

P5. Existing or new construction of an on-site or off-site renewable based electricity plant

P6. Electricity generation in existing and/or new grid-connected electricity plants

Alternative scenarios for the heat generation

H1. Heat generated as a by-product from one of the options for waste treatment, not undertaken as a CDM project activity

H2. Use of an existing or construction of a new on-site or off-site fossil fuel fired cogeneration plant

H3. Existing or new construction of an on-site or off-site renewable based cogeneration plant

H4. Existing or new construction of an on-site or off-site fossil fuel based boiler or air heater

H5. Existing or new construction of an on-site or off-site renewable energy based boiler or air heater

H6. District heat

H7.Other heat generation technologies (e.g. heat pumps or solar energy)

The Steps 1 and 2 are to identify realistic and credible alternative(s) available to the project participant that provide outputs or services comparable with the proposed CDM project activity. The core services provided by the project activity are waste treatment/disposal. According to the PPP contract requirements (ref SCHEDULE 2 - Output Specifications – Part 3: Definitions) the contractual landfill diversion ratio is 70% by weight. Additionally, the project involves clean electricity and clean heat generation, but this is an indirect service provided. The various alternative scenarios are reviewed below to determine whether they are plausible and credible according to the guidance in methodology and the tool for the demonstration and assessment of additionality. For defining the plausible and

credible alternatives, the project activity's services are defined, according to the international tender for the project, as:

- landfill diversion
- alternative environmentally sound waste disposal reducing the volume of waste to be disposed in waste disposal sites
- clean electricity generation from renawable energy source (waste)
- clean heat generation from renawable energy source (waste)

Step 1a and 1b: List of plausible alternatives and Consistency with mandatory applicable laws and regulations

The following table lists the plausible alternatives of the project.

		1 Landfill diversion	*2 Sound treatment*	*3 Clean electricity &heat*	**Justification**	**Plausible**
M1	The project activity without being registered as a CDM project activity.	*YES*	*YES*	-		YES
M2	Disposal of the fresh waste in a SWDS with a partial capture of the LFG and flaring of the captured LFG.	*NO*	*NO*	-	This technical alternative does not meet the specifications of the PPP contract in terms of landfill diversion. In addition the PPP required heat and electricity recovery from the municipal waste	NO
M3	Disposal of the fresh waste in a SWDS without a LFG capture system.	*NO*	*NO*	-	This technical alternative does not meet the specifications of the PPP in terms of landfill diversion. In addition the PPP required heat and electricity recovery from the municipal waste. In addition, the local regulation doest not allow the disposal of the fresh waste in a SWDS without a LFG capture and flaring system.	NO
M4	Part of the fresh waste fraction of the solid waste is recycled and not disposed in the SWDS.	*YES*	*YES*	-		YES
M5	Part of the fresh waste fraction of the solid waste is treated aerobically and not disposed in the SWDS.	*YES*	*YES*	-		YES
M6	Part of the organic waste fraction of the solid waste is incinerated and not disposed in the SWDS.	*YES*	*YES*	-		YES
M7	Part of the organic waste fraction of the solid waste is gasified and not disposed in the SWDS.	*YES*	*YES*	-		YES

M8	Part of the organic waste fraction of the solid waste is treated in an anaerobic digester and not disposed in the SWDS.	*YES*	*YES*	-		YES
M9	Part of the organic waste fraction of the solid waste is mecanically or thermally treated to produce RDF/SB and not disposed in the SWDS.	*YES*	*YES*	-		YES
P1	Electricity is generated as an output of one of the waste treatment options, not undertaken as a CDM project activity.	-	-	*YES*		YES
P2	Use of an existing or construction of a new on-site or off-site fossil fuel fired cogeneration plant.	-	-	*NO*	This technical alternative does not provide the core service provided by the project, namely waste disposal. Besides, this scenario involves the purchase and use of fossil fuel whereas waste is 'available' to the project owner for generating clean electricity. From an environmental perspective, combustion of fossil fuel would create additional greenhouse gas emissions. Therefore, this alternative scenario is not plausible at this stage.	NO
P3	Existing or new construction of an on-site or off-site renewable based cogeneration plant.	-	-	*YES*		YES
P4	Existing or new construction of an on-site or off-site fossil fuel fired based electricity plant.	-	-	*NO*	This technical alternative does not provide the core service provided by the project, namely waste disposal. Besides, this scenario involves the purchase and use of fossil fuel whereas waste is 'available' to the project owner for generating clean electricity. From an environmental perspective, combustion of fossil fuel would create additional greenhouse gas emissions. Therefore, this alternative scenario is not plausible at this stage.	NO
P5	Existing or new construction of an on-site or off-site renewable based electricity plant.	-	-	*YES*		YES

P6	Electricity generation in existing and/or new grid-connected electricity plants.	-	-	*NO*	This technical alternative does not provide the core service provided by the project, namely waste disposal. Besides, this scenario involves the use of electricity from the grid, and the Serbian electric mix is mostly thermal whereas waste is 'available' to the project owner for generating clean electricity. From an environmental perspective, the use of electricity from the Serbian grid would create additional greenhouse gas emissions. Therefore, this alternative scenario is not plausible at this stage.	NO
H1	Heat generated as a by-product from one of the options for waste treatment listed in Table 1, not undertaken as a CDM project activity.	-	-	*YES*		YES
H2	Use of an existing or construction of a new on-site or off-site fossil fuel fired cogeneration plant.	-	-	*NO*	This technical alternative does not provide the core service provided by the project, namely waste disposal. Besides, this scenario involves the purchase and use of fossil fuel whereas waste is 'available' to the project owner for generating clean heat. From an environmental perspective, combustion of fossil fuel would create additional greenhouse gas emissions. Therefore, this alternative scenario is not plausible at this stage.	NO
H3	Existing or new construction of an on-site or off-site renewable based cogeneration plant.	-	-	*YES*		YES
H4	Existing or new construction of an on-site or off-site fossil fuel based boiler or air heater.	-	-	*NO*	This technical alternative does not provide the core service provided by the project, namely waste disposal*. Besides, this scenario involves the purchase and use of fossil fuel whereas waste is 'available' to the project owner for generating clean heat. From an environmental perspective, combustion of fossil fuel	NO

					would create additional greenhouse gas emissions. Therefore, this alternative scenario is not plausible at this stage.	
H5	Existing or new construction of an on-site or off-site renewable energy based boiler or air heater.	-	-	*YES*		YES
H6	District heat.	-	-	*NO*	This technical alternative does not provide the core service provided by the project, namely waste disposal. Besides, this scenario involves the use of heat from the district heat which is generated mostly thermally (according to Serbian energy mix), whereas waste is 'available' to the project owner for generating clean heat. From an environmental perspective, the use of the district heat would create additional greenhouse gas emissions. Therefore, this alternative scenario is not plausible at this stage.	NO
H7	Other heat generation technologies (e.g. heat pumps or solar energy).	-	-	*YES*	This technical alternative does not provide the core service provided by the project, namely waste disposal. Besides, there is no geothermy potential on site and no surface available for solar while the landfill is operated. Therefore, this alternative scenario is not plausible at this stage.	NO

Outcome of Step 1a and 1b:

List of plausible alternative scenarios to the project activity : M1, M4, M5, M6, M7, M8 and M9 for waste treatment, P1, P3, P5 for electricity generation and H1, H3, H5 and H7 for heat generation.

Step 2: Barrier analysis

Step 2a: Identify barriers that would prevent the implementation of alternative scenarios

The alternatives identified are challenged by the realistic and credible following identified barriers that may prevent alternative scenarios to occur:

- Technological barriers - Skilled labour:

Skilled and/or properly trained labor to operate and maintain the technology is not available in the applicable geographical area, which leads to an unacceptably high risk of equipment disrepair, malfunctioning or another underperformance;

- Technological barriers – Lack of infrastructure:

Lack of infrastructure for implementation and logistics for maintenance of the technology;

- Technological barriers – Technological failure risk:

The process/technology failure risk in the local circumstances is significantly greater than for other technologies that provide services or outputs comparable to those of the proposed CDM project activity;

- Technological barriers – Local availability of technology

The particular technology used in the proposed project activity is not available in the applicable geographical area.

Technological barrier: The first-of-its-kind project feature induce logically some technological barriers to face waste management process. The local labor and partners present little technological know-how and no previous experience in implementing modern waste management measures and advanced waste treatment process such as gasification plant. This is primarily due to the fact that the common practice in the country is unmanaged landfills with high negative environmental impact while the purpose of the project is improving the ecological situation of the site (leachate treatment) and having a direct impact on climat change (clean electricity and heat generation). Due to the lack of experience and technological knowledge in Serbia, some technological process such as gasification, DRF/SB production and MBT would present either lack of infracture, skilled labour barrier or risk of technology.

Outcome of Step 2a:

The list of barriers that may prevent the alternative scenarios to occur are : skilled labour, lack of infrastructure, technological failure risk, local availability of technology

Step 2b: Eliminate alternative scenarios which are prevented by the identified barriers

The following table screens out the alternatives through the technological barriers identified:

		i Skilled labour	*ii Infrastructure*	*iii Technological failure risk*	*iv Local availability of technology*	Justification	Credible
M1	The project activity without being registered as a CDM project activity.	*OK*	*OK*	*OK*	*OK*		OK
M4	Part of the fresh waste fraction of the solid waste is recycled and not disposed in the SWDS.		*Unsatisfactory*			This alternative is not credible by lack of infrastructures for waste separate collection. Indeed, there is no separate collection of waste in Belgrade.	NO
M5	Part of the fresh waste fraction of the solid waste is treated aerobically		*Unsatisfactory*		*Unsatisfactory*	This alternative is not credible by lack of infrastructures for waste separate collection. Indeed,	NO

	and not disposed in the SWDS.					there is no separate collection of waste in Belgrade. This alternative is not credible by lack of local availability of technology. Indeed, the tender notified the MBT technology for the organic extraction but no bidder for such technology was willing to propose such technology / infrastructure for Belgrade.	
M6	Part of the organic waste fraction of the solid waste is incinerated and not disposed in the SWDS.	*OK*	*OK*	*OK*	*OK*		OK
M7	Part of the organic waste fraction of the solid waste is gasified and not disposed in the SWDS.	*Unsatisfactory*		*Unsatisfactory*	*Unsatisfactory*	This alternative is not credible by lack of skilled labour, lack of local availability of technology and by risk of technology failure. Indeed, the gasification is relevant technology for smaller amount of waste. Besides, the technology is not mature enough.	NO
M8	Part of the organic waste fraction of the solid waste is treated in an anaerobic digester and not disposed in the SWDS.		*Unsatisfactory*		*Unsatisfactory*	This alternative is not credible by lack of infrastructures for waste separate collection allowing direct and affordable treatment of the waste organic fraction in an anaerobic digester. Indeed, there is no separate collection of waste in Belgrade. This alternative is not credible by lack of local availability of technology. Indeed, the tender notified the MBT technology for the treatment of organic fraction but no bidder for such	

						technology was willing to propose such technology / infrastructure for Belgrade.	
M9	Part of the organic waste fraction of the solid waste is mecanically or thermally treated to produce RDF/SB and not disposed in the SWDS.		*Unsatisfactory*	*Unsatisfactory*	*Unsatisfactory*	This alternative is not credible by lack of infrastructures, lack of local availability of technology and by risk of technology failure.	NO
P1	Electricity is generated as an output of one of the waste treatment options, not undertaken as a CDM project activity.	*OK*	*OK*	*OK*	*OK*		OK
P3	Existing or new construction of an on-site or off-site renewable based cogeneration plant.			*Unsatisfactory*		Regarding the alternative scenarii based on renewable energy technology, new construction of hydropower plant or geothermal plant is not credible. Regarding the existing renewable assets, the generation is already valorized through the grid. Thus, using such generation is not credible. New construction of a solar asset is not credible by lack of surface area on site during the landfill operation. New construction of wind assets is not credible by lack of surface area on site during the landfill operation. In addition, construction and operation of alternative renewable assets is not in the core service provided by	NO

						the project, namely waste disposal.	
P5	Existing or new construction of an on-site or off-site renewable based electricity plant.			*Unsatisfactory*		Regarding the alternative scenarii based on renewable energy technology, new construction of hydropower plant or geothermal plant is not credible. Regarding the existing renewable assets, the generation is already valorized through the grid. Thus, using such generation is not credible. New construction of a solar asset is not credible by lack of surface area on site during the landfill operation. New construction of wind assets is not credible by lack of surface area on site during the landfill operation. In addition, construction and operation of alternative renewable assets is not in the core service provided by the project, namely waste disposal.	NO
H1	Heat generated as a by-product from one of the options for waste treatment, not undertaken as a CDM project activity.	*OK*	*OK*	*OK*	*OK*		OK

H3	Existing or new construction of an on-site or off-site renewable based cogeneration plant.			*Unsatisfactory*		Regarding the alternative scenarii based on renewable energy technology, new construction of hydropower plant or geothermal plant is not credible. Regarding the existing renewable assets, the generation is already valorized through the grid. Thus, using such generation is not credible. New construction of a solar asset is not credible by lack of surface area on site during the landfill operation. New construction of wind assets is not credible by lack of surface area on site during the landfill operation. In addition, construction and operation of alternative renewable assets is not in the core service provided by the project, namely waste disposal.	NO
H5	Existing or new construction of an on-site or off-site renewable energy based boiler or air heater.			*Unsatisfactory*		Regarding the alternative scenarii based on renewable energy technology, new construction of hydropower plant or geothermal plant is not credible. Regarding the existing renewable assets, the generation is already valorized through the grid. Thus, using such generation is not credible. New construction of a solar asset is not credible by lack of surface area on site during the landfill	NO

						operation. New construction of wind assets is not credible by lack of surface area on site during the landfill operation. In addition, construction and operation of alternative renewable assets is not in the core service provided by the project, namely waste disposal.	

Outcome of Step 2b:

The list of alternative scenarios to the project activity that are not prevented by any barrier are M1, M6, P1 and H1.

The combined alternatives are the following :

		1 Waste disposal	2 Clean electricity	3 Clean heat
M1 - H1 - P1	M1 : The project activity without being registered as a CDM project activity. - P1 : Electricity is generated as an output of one of the waste treatment options, not undertaken as a CDM project activity. - H1 : Heat generated as a by-product from one of the options for waste treatment, not undertaken as a CDM project activity.	X	X	X
M6 - H1 - P1	M6 : Part of the organic waste fraction of the solid waste is incinerated and not disposed in the SWDS. P1 : Electricity is generated as an output of one of the waste treatment options, not undertaken as a CDM project activity. - H1 : Heat generated as a by-product from one of the options for waste treatment, not undertaken as a CDM project activity.	X	X	X

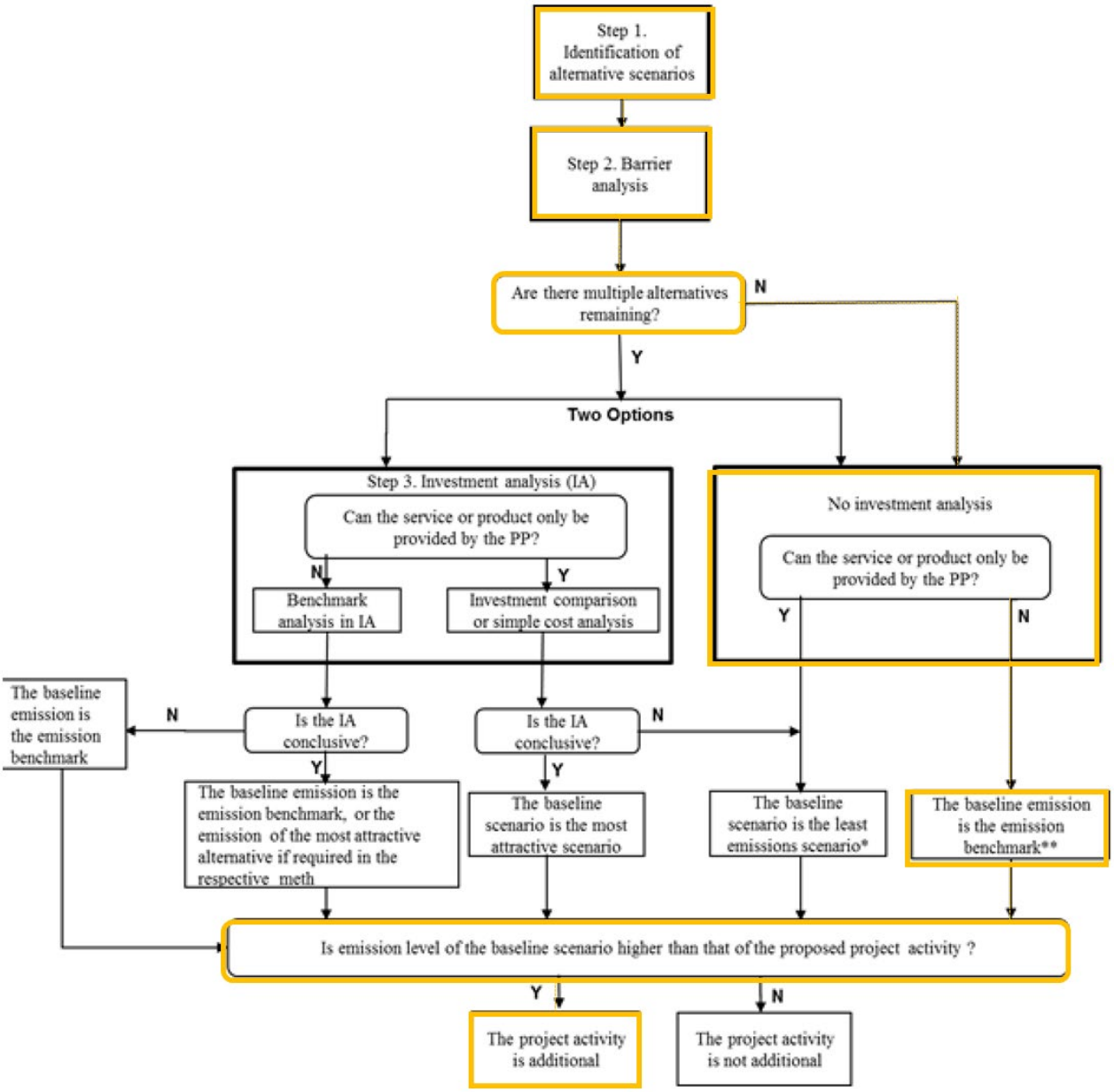
Thus there is only one alternative remaining: the combination M6 – P1 – H1.

To the question: “Can the service or produce can be only provided by the project proponent”, the answer is no. Thus the baseline emission scenario corresponds to the benchmark scenario presented in the section B.6.2.2 of the PDD:

- M: Disposal of the fresh waste in a SWDS with a partial capture of the LFG and flaring of the captured LFG;
- P: Use of an existing or construction of a new on-site or off-site fossil fuel fired cogeneration plant;
- H: Use of (an) existing or construction of (a) new on-site or off-site fossil fuel fired cogeneration plant(s)

According to the computation, the emission level of the baseline scenario is higher than the “proposed project activity undertaken without being registered as a CDM project activity”. In addition, refers to STEP 0, the project is first of its kind, thus the **project activity is deemed additional.**

The following diagram summarize the additionality demonstration:



Flowchart of the step-wise approach (Case 2: Project is a first-of-its-kind)

B.6. Sustainable Development Goals (SDG) outcomes

B.6.1. Relevant target for each of the three SDGs

>> (Specify the relevant SDG target for each of three SDGs addressed by the project. Refer most recent version of targets *here* .)

SGD	Targets
	**Goal 13. Take urgent action to combat climate change and its impacts** • Target 13.2 Integrate climate change measures into national policies, strategies and planning • Target 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
	**Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all** • Target 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix
	**Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable** • Target 11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

	**Goal 6: Ensure access to water and sanitation for all** • Target 6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally • Target 6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity • Target 6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes

B.6.2. Explanation of methodological choices/approaches for estimating the SDG outcome

>> (Explain how the methodological steps in the selected methodology(ies) or proposed approach for calculating baseline and project outcomes are applied. Clearly state which equations will be used in calculating net benefit.)

Goal 13. Take urgent action to combat climate change and its impacts

Target 13.2 Integrate climate change measures into national policies, strategies and planning

1. Vinca Complex Energy from Waste facility

The Project includes an Energy from Waste facility with the nominal combustion capacity of about 340,000 t/year of municipal waste, which will generate a combination of electricity (~190 GWh/y) and heat (~174 GWh/y);

Considering the nature of the municipal waste and the conclusion provided in this ESIA Report showing that proven technology and solution will be implemented with limited impact to the Environment, we consider that the EfW Facility contribute to the scaling up of sustainable energy solutions for Belgrade thanks to the electricity and the heat generated by the Project:

Energy Recovery preserves the value of this residual waste by turning it into electricity and/or heat thanks to efficient cogeneration under strictly controlled conditions, preventing resource losses, decreasing the need for fossil fuels, increasing energy security and contributing to the reduction of greenhouse gas emissions.

Moreover, more than 74% of this energy is renewable, as it comes from waste of biological origin, and therefore helps Member States to achieve the targets of the Renewable Energy Directive. The remaining part, although fossil, nonetheless contributes to avoided emissions in comparison to the extraction of fossil fuel.

An often-forgotten advantage of Energy Recovery plant energy (electricity / steam / hot water) is that besides the fact that it is low carbon energy, it has a constant production/baseload compared to intermittent energy generation such as solar or wind turbines.

At the end of the combustion process metals such as iron, aluminium, copper and zinc can be recycled from the bottom ash, this way contributing to recycling targets and saving the GHG emissions (more than 3 million tons of CO_2 eq.) that otherwise would have been emitted in the extraction and production process. Bottom ash is also largely used as part of road construction (in the form of granules) which also contributes to the avoidance of CO_2 eq. emissions.

Vinca Complex Existing and New Landfills Facilities

The Project includes:

- The closing the existing landfill site after remediation and stabilization with final capping;
- A leachate treatment facility;
- A landfill gas treatment and energy recovery facilities.

Several specific provisions of the Project constitute technically and financially feasible and cost-effective options to avoid or minimise project-related greenhouse gases (GHG) emissions during the operation of the project.

For instance, and to maximize the “reduction of gas flaring”, the following provisions have been foreseen which go way above Good Industry Practice (GIP):

- Biogas well density above GIP
    - The French Agency for the Environment and Energy Management (ADEME) recommends a ratio of 1 to 5 wells per hectare for vertical extraction after filling.
    - The planned density of biogas wells per hectare on both the New Landfill (16.3 wells/ha) and the Existing Landfill body (5.7 wells/ha) is in the upper limit of the value range prescribed by ADEME.
- Heat Recovery from the Landfill Gas Facility (biogas engines)
    - Instead of being flared, the landfill biogas will be used on biogas engines generating both electricity and heat. These biogas engines will be installed right at the EfW site in order to facilitate the recovery of heat produced by the engines which will be used for the EfW combustion air pre-heating.
- Additional landfill gas consumer
    - On the Leachate Treatment Plant (LTP), the evaporator process treats RO concentrate thermally instead of electrically. In order to allow this configuration, the Existing Landfill biogas network has been extended on purpose to feed this additional landfill gas consumer. This provision will limit both the need for flaring biogas and for electricity distribution network.

Target 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning

The Project developer (BEO ČISTA ENERGIJA D.O.O. BEOGRAD) will design and construct a Visitor Centre at the Site to receive and explain visitors waste management in general and the steps taken at the Site and the Facilities.

The Visitor Centre will be suitable to accommodate groups (including seating) of up to 30 persons, including school children.

The Visitor Centre will maintain didactic material for different target groups:

- school children;
- student groups;
- interested adult groups;
- expert visits; and
- visits by officials from other towns and countries.

Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all

Target 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix

As explained for target 13.2 the Project includes an **Energy from Waste facility (EfW)** with the nominal combustion capacity of about 340,000 t/year of municipal waste, which will generate a combination of electricity (~190 GWh/y) and heat (~174 GWh/y). About 74% of this energy is renewable, as it comes from waste of biological origin (Pulp, paper and cardboard; food waste, beverages and tobacco; Textiles; Garden, yard and park waste) , which correspond to the generation of about 140 GWh/y of renewable electricity and 128 GWh/y of renewable heat. Considering that serbian energetic mix rests mostly on coal and natural gaz for the production of electricity and heat, we consider that this renewable production of energy replacing fossil energy will contribute to increase the share of renewable energy in the global energy mix.

Morover, the construction and operation of a **Landfill Gas Facility (LGF)** for relevant landfills at the site (i.e. Existing Landfill and New Landfill for Unprocessed RMW) will enable :

- The extraction of landfill gas,

- When sufficient landfill gas is available, the energy recovery through electricity production.

As the gas comes from waste of biological orgirin, we consider that the electricity produced is renewable.

Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

Target 11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

The Vinča landfill is currently used for the disposal of waste collected on the territory of thirteen municipalities (the eleven municipalities served by GC, plus Barajevo and Grocka), together representing 90% of the waste generated on the entire territory of Belgrade.

The consequence of this landfill creation and operation has been pollution of the waters of Ošljanski potok (Ošljan stream) and further Ošljanska bara (Ošljan pond), contamination of the surrounding agricultural land and air. This landfill does not meet Serbian or EU standards for Sanitary Landfills and poses a source of pollution of groundwaters and surrounding soil.

The entire project will allow the City of Belgrade to reduce its waste management environmental impact and will make it more sustainable by preserving the value of the main part of its residual waste. The key environmental impact of the Vinca Project is the elimination of the currently uncontrolled leachate flow to the site downstream area. Also, the following measures have been included in the design regarding groundwaters:

- Insure protection of water from pollution at the new landfill by combining the geological barrier and the lower impermeable layer during the active phase of the landfill and combine the geological barrier and the upper impermeable layer during the passive phase after the closure of the new landfill.
- Insure protection of water at the existing landfill by setting up the upper impermeable layer after the closure of the existing landfill.
- A proper installation of geotextiles and water drainage will be installed for the design of landfill cells.
- All areas on which fluid is expected to leak will be concreted/asphalted.
- A geomembrane will be foreseen below the IBA processing and storage platform

During the development of the project, numerous environmental protection measures have already been integrated in the Design itself in order to strongly mitigate impact during operation phase. These design measures include

- a highly integrated water management system, in order to separate rainwater, “industrial” wastewater and leachates, treat them appropriately and favor water reuse in the global Vinča process;
- enhanced waste reuse between EfW facility and landfills;

As a consequence, Ošljanski potok (watercourse) and further Ošljanska bara (ponds / wetlands) will slowly recover from past pollution when the existing source of pollution will be run out thanks to the leachate treatment plant and the old landfill remediation.

The groundwater monitoring data show that the waters taken from the piezometers outside the waste mass can contain high levels of pollutants such as chlorides and sulphates, but rather variables in time and space.

For instance, the chloride concentration levels monitored remain low (below 150 mg/l) in piezometers upstream and laterally of the waste mass and. They are much more marked immediately downstream or on the edge of the waste mass with levels in the order of 1600 to 5000 mg/l.

A simplified hydrodispersive modeling was carried out to simulate the evolution of the polluted plume related to leachates contained in the waste, before and after redevelopment.

After redevelopment, a waterproof cover over the waste will limit the infiltration of runoff waters for 95%. Lateral surface waters will be diverted and collected via tight peripheral ditches. Leachate will be collected and drained on the periphery.

Finally, the waste mass will be drained of its leachate nappe decreasing the source term of the pollution.

The modeling of these arrangements shows that the simulated downstream concentration will fall rapidly below 100 mg/l, which is twice below the chloride concentration limit in drinking water.

The Vinča landfill is currently used for the disposal of waste collected on the territory of thirteen municipalities (the eleven municipalities served by GC, plus Barajevo and Grocka), together representing 90% of the waste generated on the entire territory of Belgrade. In order to generate energy, the project activity is expected to use 510 000 tons/y of municipal waste.

Thus, we know that the project will contribute to the adequate final discharge of 90% of the waste generated on the entire territory of Belgrade. This project outcome will be evaluated each year by monitoring the tons of municipal waste disposed at the new Vinca site.

Goal 6: Ensure access to water and sanitation for all

Target 6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally

The key environmental impact of the Vinca Project is the elimination of the currently uncontrolled leachate flow to the site downstream area.

Also, the following measures have been included in the design regarding groundwaters:

• Insure protection of water from pollution at the new landfill by combining the geological barrier and the lower impermeable layer during the active phase of the landfill and combine the geological barrier and the upper impermeable layer during the passive phase after the closure of the new landfill.

• Insure protection of water at the existing landfill by setting up the upper impermeable layer after the closure of the existing landfill.

• A proper installation of geotextiles and water drainage will be installed for the design of landfill cells.

• All areas on which fluid is expected to leak will be concreted/asphalted.

• A geomembrane will be foreseen below the IBA processing and storage platform

Target 6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity

During the development of the project, numerous environmental protection measures have already been integrated in the Design itself in order to strongly mitigate impact during operating phase. These design measures include

• a highly integrated water management system, in order to separate rainwater, “industrial” wastewater and leachates, treat them appropriately and favor water reuse in the global Vinča process;

• enhanced waste reuse between EfW facility and landfills;

Target 6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes

As a consequence of 6.3 above, Ošljanski potok (watercourse) and further Ošljanska bara (ponds / wetlands) will slowly recover from past pollution when the existing source of pollution will be run out thanks to the leachate treatment plant and the old landfill remediation.

The groundwater monitoring data show that the waters taken from the piezometers outside the waste mass can contain high levels of pollutants such as chlorides and sulphates, but rather variables in time and space.

For instance, the chloride concentration levels monitored remain low (below 150 mg/l) in piezometers upstream and laterally of the waste mass and. They are much more marked immediately downstream or on the edge of the waste mass with levels in the order of 1600 to 5000 mg/l.

After redevelopment, a waterproof cover over the waste will limit the infiltration of runoff waters by 95%. Lateral surface waters will be diverted and collected via tight peripheral ditches. Leachate will be collected and drained on the periphery. Finally, the waste mass will be drained of its leachate nappe decreasing the source term of the pollution.

It is anticipated that these arrangements will allo the downstream concentration to fall rapidly below satisfactory level and in the case of chloride concentration even below the limit concentation of this parameter in drinking water.

Calculations for emission reductions

As presented previously, two different methodologies were used, to evaluate both the emission reductions due to the cover of the old landfill, creation of the new landfill and use of the landfill gas to generate heat and electricity (ACM001), and the emission reductions due to the construction of the incinerator, and heat and electricity generation (ACM0022).

According to both ACM0001and ACM0022, emission reductions are calculated as follows;

$$ER_y = BE_y - PE_y \qquad \text{Equation (1)}$$

Where:

ER_y	=	Emission reductions in year *y* (t CO2e/yr)
BE_y	=	Baseline emissions in year *y* (t CO2e/yr)
PE_y	=	Project emissions in year *y* (t CO2/yr)

B.6.2.1. ACM0001

Baseline emissions

Baseline emissions are determined according to equation (2) and comprise the following sources:

(a) Methane emissions from the SWDS in the absence of the project activity;
(b) Electricity generation using fossil fuels or supplied by the grid in the absence of the project activity;
(c) Heat generation using fossil fuels in the absence of the project activity; and
(d) Natural gas used from the natural gas network in the absence of the project activity.

$$BE_y = BE_{CH4,y} + BE_{EC,y} + BE_{HG,y} + BE_{NG,y} \quad \text{Equation (2)}$$

Where:

BE_y	=	Baseline emissions in year *y* (t CO2e/yr)
$BE_{CH4,y}$	=	Baseline emissions of methane from the SWDS in year *y* (t CO2e/yr)
$BE_{EC,y}$	=	Baseline emissions associated with electricity generation in year *y* (t CO2/yr)
$BE_{HG,y}$	=	Baseline emissions associated with heat generation in year *y* (t CO2/yr)
$BE_{NG,y}$	=	Baseline emissions associated with natural gas use in year *y* (t CO2/yr)

Project activity does not include natural gas use. Therefore;

$BE_{NG,}$= 0

Thus, baseline emissions are;

a. Emissions of methane from the SWDS,
b. Emissions associated with electricity generation
c. Emissions associated with the heat generation to evaporate the leachates

B.6.2.1.1. **Emissions of methane from the SWDS**

As per the paragraph 30 of ACM0001; *Baseline emissions of methane from the SWDS are determined as follows, based on the amount of methane that is captured under the project activity and the amount that would be captured and destroyed in the baseline (such as due to regulations). In addition, the effect of methane oxidation that is present in the baseline and absent in the project is taken into account:*

$$BE_{CH4} = ((1 - OX_{top\_layer}) \times F_{CH4,PJ,y} - F_{CH,BL,y}) \times GWP_{CH4} \quad \text{Equation (3)}$$

Where:

$BE_{CH4,y}$	=	Baseline emissions of methane from the SWDS in year *y* (t CO2e/yr)
OX_{top_layer}	=	Fraction of methane in the LFG that would be oxidized in the top layer of the SWDS in the baseline (0.1)
$F_{CH4,PJ,y}$	=	Amount of methane in the LFG which is flared and/or used in the project activity in year *y* (t CH4/yr)

$F_{CH4,BL,y}$ = Amount of methane in the LFG that would be flared in the baseline in year *y* (t CH4/yr)

GWP_{CH4} = Global warming potential of CH4 (t CO2e/t CH4)

OX_{top_layer} = 0.1 (source: Appendix)

GWP_{CH4} = 28 tCO_{2e}/t CH_4 (soure: IPCC)

An ex ante estimate of $F_{CH4,PJ,y}$ is required to estimate baseline emission of methane from the SWDS (according to equation (4)) in order to estimate the emission reductions of the proposed project activity in the PDD. It is determined as follows:

$$F_{CH4,PJ,y} = \eta_{PJ,y} \times BE_{CH4,SWDS,y} / GWP_{CH4}$$ Equation (4)

Where:

$F_{CH4,PJ,y}$ = Amount of methane in the LFG which is flared and/or used in the project activity in year *y* (t CH_4/yr)

$BE_{CH4,SWDS,y}$ = Amount of methane in the LFG that is generated from the SWDS in the baseline scenario in year *y* (t CO_2e/yr)

$\eta_{PJ,y}$ = Efficiency of the LFG capture system that will be installed in the project activity for year y

GWP_{CH4} = Global warming potential of CH_4

y	2020	2021 -2045
$\eta_{PJ,y,\text{old\_landfill}}$	35%	65%
$\eta_{PJ,y,\text{new\_landfill}}$	50%	60%

The amount of methane in the LFG generated from disposal of waste at the SWDS is calculated based on a first order decay (FOD) model in line with the methodological tool 04 "*Emissions from solid waste disposal sites*", V.08.0. The model differentiates between the different types of waste j with respective constant decay rates (k_j) and fractions of degradable organic carbon (DOC_j).

Equation (5)

$$BE_{CH4,SWDS,y} = \varphi_y \times (1 - f_y) \times GWP_{CH4} \times (1 - OX) \times (16/12) \times F \times DOC_{f,y} \times MCF_y \times \sum_{x=1}^{y} \sum_{j} (W_{j,x} \times DOC_j \times e^{-k_j \times (y-x)} \times (1 - e^{-k_j}))$$

$BE_{CH4,SWDS,y}$ = Baseline, project or leakage methane emissions occurring in year y generated from waste disposal at a SWDS during a time period ending in year y (t CO2e/yr)

x = Years in the time period in which waste is disposed at the SWDS, extending from the first year in the time period (x = 1) to year y

(x = y)

y	=	Year of the crediting period for which methane emissions are calculated (y is a consecutive period of 12 months)
$DOC_{f,y}$	=	Fraction of degradable organic carbon (DOC) that decomposes under the specific conditions occurring in the SWDS for year y (weight fraction) (0.5)
$W_{j,x}$	=	Amount of solid waste type j disposed or prevented from disposal in the SWDS in the year x (t)
φ_y	=	Model correction factor to account for model uncertainties for year y (0.75)
f_y	=	Fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emissions of methane to the atmosphere in year y (0) According to ACM0001 38 a) fy in the tool shall be assigned a value of 0 because the amount of LFG that would have been captured and destroyed is already accounted for in equation (2) of this methodology;
GWP_{CH4}	=	Global Warming Potential of methane
OX	=	Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste) (0.1)
F	=	Fraction of methane in the SWDS gas (volume fraction) (0.5)
MCF_y	=	Methane correction factor for year y (0.8)
DOC_j	=	Fraction of degradable organic carbon in the waste type j (weight fraction)
K	=	Decay rate for the waste type j (1 / yr)
J	=	Type of residual waste or types of waste in the MSW

k_j and DOC_j are given in the tool 04.

An ex ante estimate of $F_{CH4,BL,y}$ is also required to estimate baseline emission of methane from the SWDS (according to equation (3)). We are in the Case 2 mentioned in the methodology: there is a requirement to destroy methane in the Serbian reglementation, and no LFG capture exists currently.

Therefore:

$$F_{CH4,BL,y} = F_{CH4,BL,R,y} \quad \text{Equation (6)}$$

And

$$F_{CH4,BL,R,y} = \rho_{reg,y} \times F_{CH4,PJ,capt,y} \quad \text{Equation (7)}$$

Where:

$F_{CH4,BL,R,y}$	=	Amount of methane in the LFG which is flared in the baseline due to a requirement in year y (t CH4/yr)

$\rho_{reg,y}$	=	Fraction of LFG that is required to be flared due to a requirement in year y
$F_{CH4,PJ,capt,y}$	=	Amount of methane in the LFG which is captured in the project activity in year y (t CH4/yr)

We can calculate $F_{CH4,PJ,capt,y}$ using option 2, as the sum of the amount of methane that is sent to the flare, electricity generating or heat generating equipment in year y. And as the requirement does not specify any amount or percentage of LFG that should be destroyed, but requires the installation of a system to capture and flare the LFG, then a typical destruction rate of 20 per cent is assumed (as per ACM0001 43 (b) (ii)):

$F_{CH4,BL,R,y} = 0.2 \times F_{CH4,PJ,capt,y}$

B.6.2.1.2. Emissions associated with electricity generation

Baseline emissions associated with electricity generation are calculated using the TOOL 05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation.

The baseline emissions are to be calculated as follows:

$$BE_{EC,y} = \sum_k EC_{BL,k,y} \times EF_{EF,k,y} \times (1 + TDL_{k,y}) \quad \text{Equation (8)}$$

Where:

$BE_{EC,y}$	= Baseline emissions associated with electricity generation in year y (t CO2/yr)
$EC_{BL,k,y}$	= Quantity of electricity that would be consumed by the baseline electricity consumer k in year y (MWh / yr)
$EF_{EF,k,y}$	= Emission factor for electricity generation for source k in year y (tCO2 / MWh)
$TDL_{k,y}$	= Average technical transmission and distribution losses for providing electricity to source k in year y

Therefore, “Tool to calculate the emission factor for an electricity system” (V 07.0) is applied to calculate combined margin. The following six steps below, provided in the Methodological Tool are applied to calculate the combined margin (CM) emission factor:

STEP 1 - Identify the relevant electricity systems

Serbia has nationwide single electricity grid and imports/exports electricity power from/to neighbour countries[10],[11]. Therefore, these are the connected electricty systems for the Project activity. According to the tool, the OM emission factor of that connected electricity system is considered zero.

STEP 2 - Choose whether to include off-grid power plants in the project electricity system (optional)

For the calculation of the operating margin and build margin emission factor, *"Option I: Only grid power plants are included in the calculation",* will be used.

STEP 3 - Select a method to determine the operating margin (OM)

According to the Methodological Tool, the calculation of the OM emission factor is based on one of the following four methods:

(a) Simple OM; or

(b) Simple adjusted OM; or

(c) Dispatch data analysis OM; or

(d) Average OM.

Table 6 illustrates the share of low-cost/must-run (LCMR) resources in electricity generation in Serbia for the two most recent years. Hydro, geothermal, wind, low-cost biomass, nuclear and solar resources are accepted as low cost/must run resources. There exists no nuclear power plant and geothermal facility in Serbia.

Table 1: Share of low-cost/must-run (LCMR) resources in electricity generation , 2017 – 2018[12,13]

	2017	**2018**
Hydro (GWh)	8,740	11,329
Wind	48	124
Solar	13	10
Biomass	72	120
Coal	23,864	22,546
Gas	351	399
Unspecified fossil	11	-3
GENERAL TOTAL	**33,100**	**34,525**
Share of LCRs (Hydro, Wind, Solar, Biomass)	26.81%	30.57%
Average	28.69%	

[10] https://www.teias.gov.tr/tr/v-ithalat-ihracat

[11] Godisnji izvestaj o nacionalnom rezidualnom miksu 2017

[12] Godisnji izvestaj o nacionalnom rezidualnom miksu 2017

[13] Godisnji izvestaj o nacionalnom rezidualnom misku 2018

Low-cost/must-run resources constitute less than 50 per cent of total grid generation average of the two most recent years; **28.7%** . Thus, in accordance with the Methodological Tool, (a) Simple adjusted OM method will be used in the calculations.

The Ex-ante option which states that *"once for each crediting period using the most recent three historical years for which data is available at the time of submission of the PDD to the DOE for validation"*, has been chosen. That is, 3 year generation-weighted average based on the most recent data available has been selected for data vintage.

STEP 4 - Calculate the operating margin emission factor according to the selected method

The simple adjusted OM emission factor (EFgrid,OM-adj,y) is a variation of the simple OM, where the power plants/units (including imports) are separated in low-cost/must-run power sources (k) and other power sources (m). As under Option A of the simple OM, it is calculated based on the net electricity generation of each power unit and an emission factor for each power unit, as follows::

$$EF_{grid,OM-adj,y} = (1-\lambda_y)\times\frac{\sum_m EG_{m,y}\times EF_{EL,m,y}}{\sum_m EG_{m,y}} + \lambda_y\times\frac{\sum_k EG_{k,y}\times EF_{EL,k,y}}{\sum_k EG_{k,y}}$$

Equation (9)

Where:

λ_y	= Factor expressing the percentage of time when low-cost/must-run power units are on the margin in year y
$EG_{m,y}$	= Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
$EG_{k,y}$	= Net quantity of electricity generated and delivered to the grid by power unit k in year y (MWh)
$EF_{EL,m,y}$	= CO2 emission factor of power unit m in year y (t CO2/MWh)
$EF_{EL,k,y}$	= CO2 emission factor of power unit k in year y (t CO2/MWh)

As the LCMR share is way below 0.5, $\lambda_y = 0$ (see Appendix 2)

$EG_{m,y}$ are given in Table 1.

$EF_{EL,m,y}$ is determined using simple OM Method option A2:

$$EF_{EL,m,y} = \frac{EF_{co2,m,i,y}\times 3.6}{\eta_{m,y}}$$

Equation (10)

Where:

$EF_{EL,m,y}$	= CO2 emission factor of power unit m in year y (t CO2/MWh)
$EF_{CO2,m,i,y}$	= Average CO2 emission factor of fuel type i used in power unit m in year y (tCO2/GJ)
$\eta_{m,y}$	= Average net energy conversion efficiency of power unit m in year y (ratio)

Average net energy conversion efficiencies are given in Appendix of tool 09 v2.0: "Determining the baseline efficiency of thermal or electric energy generation systems ":

η_{coal} = 37% (subcritical units);

η_{gas} = 46% (combinedcycle gas turbine);

η_{oil} = 8% (steam turbine)

CO2 emission factor of fuel types have been estimated by th default values of the IPCC guidelines, found in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories: (in tCO_2/GJ):

$EF_{CO2,coal,y}$ = 0.0946 tCO_2/GJ

$EF_{CO2,natural\ gas,y}$ = 0.0561 tCO_2/GJ

$EF_{CO2,fuel,y}$ = 0.0774 tCO_2/GJ

Using equation (10), the emission factor of fuel types have been estimated:

$EF_{EL,coal,y}$ = 0.920 tCO_2/MWh

$EF_{EL,natural\ gas,y}$ = 0.439 tCO_2/MWh

$EF_{EL,fuel,y}$ = 0.743 tCO_2/MWh

STEP 5 - Calculate the build margin (BM) emission factor

Missing information for this part at the moment, we chose to use the BM factor calculated for the last CDM project registered in Serbia: Wind Farm Kladovo 1 (10/10/2012).

The BM emission factor has been estimated as follows:

$EF_{grid,BM,y}$ = 0.9917 tCO_2/MWh

STEP 6 - Calculate the combined margin (CM) emission factor

For the calculation of the combined margin (CM) emission factor ($EF_{grid,CM,y}$) option *" (a) Weighted average CM"* was applied which is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM} \quad \text{Equation (11)}$$

Where:

$EF_{grid,BM,y}$ = Build margin CO2 emission factor in year y (t CO2/MWh)

$EF_{grid,OM,y}$ = Operating margin CO2 emission factor in year y (t CO2/MWh)

w_{OM} = Weighting of operating margin emissions factor (per cent)

w_{BM} = Weighting of build margin emissions factor (per cent)

According to the Methodological Tool, default weights for the operating margin and build margin emission factors for landfill gas power generation activities are defined as:

w_{OM} =0.5; w_{BM} = 0.5

As a result:

$EF_{grid,CM,y}$ = 0. 9522 tCO_2/MWh

B.6.2.1.3. Emissions associated with heat generation

LFG is also used in the project to evaporate the by-roduct (condensate) of the leachate treatment process. In the baseline, this hat would have been generated by a fuel air heater.

$$BE_{HG,y} = NCV_{CH4} \times R_{efficiency,y} \times F_{CH4HG,dest,y} \times EF_{CO2,BL,HG}$$ Equation (12)

Where:

$BE_{HG,y}$	=	Baseline emissions associated with heat generation in year y (t CO2/yr)
NCV_{CH4}	=	Net calorific value of methane at reference conditions (TJ/t CH4)
$R_{efficiency,y}$	=	Ratio of the project and baseline efficiency of the heater in year y
$F_{CH4HG,dest,y}$	=	Amount of methane in the LFG which is destroyed for heat generation by the heater in year y (t CH4/yr)
$EF_{CO2,BL,HG}$	=	CO2 emission factor of the diesel fuel used for heat generation by the heater in the baseline (t CO2/TJ)

NCV_{CH4} is fixed (0.0504 TJ:t_{CH4})

The ratio $R_{efficiency,y}$ is determined by the following equation

$$R_{efficiency,y} = min\{1; \eta_{HG,PJ,y} / \eta_{HG,BL,}\}$$ Equation (13)

Where:

$R_{efficiency,y}$	=	Ratio of the project and baseline efficiency of the heater in year y
$\eta_{HG,PJ,y}$	=	Efficiency of the heat generation equipment used in the project activity in year y
$\eta_{HG,BL,y}$	=	Efficiency of the heat generation equipment used in the baseline

$\eta_{HG,PJ,y} = 92\%$

In a conservative approach, we consider $\eta_{HG,BL,y} = 100\%$

As a result, $R_{efficiency,y} = 0.92$

$F_{CH4HG,dest,y}$ is estimated ex-ante as follows: the need of the heater is 215Nm3/h of biogas composed with 50% of methane, and will operate 80% of the time. With a value of 0.6709kg.m^{-3} for the methane,

Therefore, $F_{CH4HG,dest,y}$ = (215*(0,5*(0.6709/1000) *365*24*80%)) = 505 tCH4/y

And for the heavy fuel that would have been used in the baseline to evaporate the leachates,

$EF_{CO2,BL,HG}$= 90.4 (t CO2/TJ)

Project emissions

According to the methodology ACM0001 (V19.0) project emissions are calculated as follows:

$$PE_y = PE_{EC,y} + PE_{FC,y} + PE_{DT,y} + PE_{SP,y} \quad \text{Equation (14)}$$

Where:

PE_y	= Project emissions in year y (t CO2/yr)
$PE_{EC,y}$	= Emissions from consumption of electricity due to the project activity in year y (t CO2/yr)
$PE_{FC,y}$	= Emissions from consumption of fossil fuels due to the project activity, for purpose other than electricity generation, in year y (t CO2/yr)
$PE_{DT,y}$	= Emissions from the distribution of compressed/liquefied LFG using trucks, in year y (t CO2/yr)
$PE_{SP,y}$	= Emissions from the supply of LFG to consumers through a dedicated pipeline, in year y (t CO2/yr)

Project activity does not include consumption of fossil fuels, distribution of compressed/liquefied LFG and supply of LFG to consumers through a dedicated pipeline . Therefore the only project emission are emissions from consumption of electricity due to the project activity. ACM0001 (V19.0) refers to the methodological tool “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (V 03.0)” to calculate emissions from consumption of electricity due to the project activity and this tool directs to the methodological tool “Tool to calculate the emission factor for an electricity system (V 07.0)”. This tool is applied in the above section to calculate the combined margin emission factor of the applicable electricity system for the calculations of baseline emissions. Thus, project emissions can be considered ex post during the monitoring period by subtracting the total electricity consumed from the total electricity generation. However, since expected project emissions are quite insignificant compare to the emission reductions, it will be ignored in the ex-ante exercise.

Leakage

No leakage effects are accounted for under this methodology.

B.6.2.2. ACM0022

The following scenario has be chosen for the baseline :

M2: Disposal of the fresh waste in a SWDS with a partial capture of the LFG and flaring of the captured LFG;

P2: Use of an existing or construction of a new on-site or off-site fossil fuel fired cogeneration plant;

H2: Use of (an) existing or construction of (a) new on-site or off-site fossil fuel fired cogeneration plant(s)

Baseline emissions

Baseline emissions are determined according to equation (15) and comprise the following sources:

(a) Methane emissions from the SWDS in the absence of the project activity;

(b) Methane emissions from the treatment of organic wastewater in the absence of the project activity;
(c) Energy generated or electricity consumed by the grid in the absence of the project activity;
(d) Natural gas used from the natural gas network in the absence of the project activity.

$$BE_y = \sum_t (BE_{CH4,t,y} + BE_{WW,y} + BE_{EN,t,y} + BE_{NG,t,y}) \times DF_{RATE,t,y} \quad \text{Equation (15)}$$

With:

$$DF_{RATE,t,y} = \begin{cases} 1 - RATE_{compliance t,y}, & if\ RATE_{compliance t,y} < 0.5 \\ 0, & if\ RATE_{compliance t,y} \geq 0.5 \end{cases} \quad \text{Equation (16)}$$

Where:

BE_y	=	Baseline emissions in year *y* (t CO_2e)
$BE_{CH4,t,y}$	=	Baseline emissions of methane from the SWDS in year *y* (t CO_2e)
$BE_{WW,y}$	=	Baseline methane emissions from anaerobic treatment of the wastewater in open anaerobic lagoons or of sludge in sludge pits in the absence of the project activity in year *y* (t CO_2e)
$BE_{EN,t,y}$	=	Baseline emissions associated with energy generation in year *y* (t CO_2)
$BE_{NG,t,y}$	=	Baseline emissions associated with natural gas use in year *y* (t CO_2)

$DF_{RATE,t,y}$	=	Discount factor to account for $RATE_{Compliance,t,y}$
$RATE_{compliance,t,y}$	=	Rate of compliance of a requirement that mandates the use of alternative waste treatment option *t* in year *y*
t	=	Type of alternative waste treatment option

$BE_{WW,y}$ = 0 : no waste water is treated in open anaerobic lagoons in in the absence of the project activity

$BE_{NG,t,y}$ = 0 : no natural gas used for incineration

$RATE_{compliance,t,y}$ = 0 for the disposal of the fresh waste in a SWDS with a partial capture of the LFG and flaring of the captured LFG: no requirement to use this alternative waste treatment option

Procedure (A)

Baseline emissions of methane from the SWDS have been calculated following tool 04, with the same methodology as for the LFG in ACM0001, presented previously.

The tool instructs that f_y shall be determined based on historic data or contract or regulation requirements specifying the amount of methane that must be destroyed/used (if available). The requirement do not specify any amount or percentage of LFG that should be destroyed but require the installation of a system to capture and flare the LFG, then it is assumed f_y =0.2 as per ACM0022 43 d) (iii)).

.

Procedure (C)

In order to evaluate $BE_{EN,t,y}$, we used the Procedure C2 for cogeneration of electricity and heat. Baseline emissions from electricity and heat cogeneration are calculated by multiplying electricity generation (EGt,y) and the quantity of heat supplied (HGPJ,y) with the CO2 emission factor of the fuel used by the cogeneration plant, as follows:

$$BE_{EN,y} = \frac{EG_{t,y} \times 3.6) \times 10^{-3} + HG_{PJ,y}}{\eta_{cogen}} \times EF_{CO2,BL,CG} \qquad \text{Equation (17)}$$

Where:

$BE_{EN,y}$	=	Baseline emissions associated with energy generation in year *y* (t CO_2)
$EF_{CO2,BL,CG}$	=	CO_2 emission factor of the fossil fuel type used for energy generation by the cogeneration plant in the baseline (t CO_2/TJ)
$HG_{PJ,y}$	=	Quantity of heat supplied by the project activity displacing baseline heat generation by a fossil fuel cogeneration plant in year *y* (TJ)
$EG_{t,y}$	=	Electricity generated by the alternative waste treatment option *t* and exported to the grid or displacing fossil fuel fired power-only and/or cogeneration captive energy generation in year *y*
η_{cogen}	=	Efficiency of the cogeneration plant that would have been used in the absence of the project activity (ratio)

$HG_{PJ,y}$ and $EG_{t,y}$ have been estimated in the project design:

$HG_{PJ,y}$ = 325 TJ

$EG_{t,y}$ = 189 652 MWh

The cogneration plant used in the baseline has been supposed to be natural gas, and the emission factor comes from table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories: (in tCO2/GJ).

In a conservative approach, as described in ACM0022, the efficiency of the cogeneration plant that would have been used is 90%.

Project emissions

The project emissions in year *y* are calculated for each alternative waste treatment option implemented in the project activity as follows:

$$PE_y = PE_{COMP,y} + PE_{AD,y} + PE_{GAS,y} + PE_{RDF\_SB,y} + PE_{INC,y} \quad \text{Equation (18)}$$

Where:

PE_y = Project emissions in year *y* (t CO_2e)

$PE_{COMP,y}$ = Project emissions from composting or co-composting in year *y* (t CO_2e)

$PE_{AD,y}$ = Project emissions from anaerobic digestion and biogas combustion in year *y* (t CO_2e)

$PE_{GAS,y}$ = Project emissions from gasification in year *y* (t CO_2e)

$PE_{RDF\_SB,y}$ = Project emissions associated with RDF/SB in year *y* (t CO_2e)

$PE_{INC,y}$ = Project emissions from incineration in year *y* (t CO_2e)

In our case, the project concerns only incineration:

$$PE_y = PE_{INC,y}$$

Project emissions from incineration include emissions from combustion within the project boundary ($PE_{COM,INC,y}$). If associated with the incineration process, then project emissions shall also account for electricity consumption, fossil fuel consumption and wastewater treatment (if associated with the incineration process). Project emissions are therefore determined as follows:

$$PE_{INC,y} = PE_{COM,INC,y} + PE_{EC,INC,y} + PE_{FC,INC,y} + PE_{ww,INC,y} \quad \text{Equation (19)}$$

Where:

$PE_{INC,y}$	=	Project emissions from incineration in year *y* (t CO_2e)
$PE_{COM,INC,y}$	=	Project emissions from combustion within the project boundary of fossil waste associated with incineration in year *y* (t CO_2)
$PE_{EC,INC,y}$	=	Project emissions from electricity consumption associated with incineration year *y* (t CO_2e)
$PE_{FC,INC,y}$	=	Project emissions from fossil fuel consumption associated with incineration in year *y* (t CO_2e)
$PE_{ww,INC,y}$	=	Project emissions from the wastewater treatment associated with incineration in year *y* (t CH_4)

Electricity is generated within the project, so :

$PE_{EC,INC,y} = 0$

And no waste water is treated in the incinerator:

$PE_{\mathrm{ww},INC,y} = 0$

Finally,

$PE_{INC,y} = PE_{COM,INC,\,y} + PE_{FC,INC,y}$

Emissions from combustion

Emissions from combustion consist of carbon dioxide, and small amounts of methane and nitrous oxide, as follows:

$$PE_{COM,C,y} = PE_{COM,CO2,c,y} + PE_{COM,CH4,N2O,c,y} \qquad \text{Equation (20)}$$

Where:

$PE_{COM,C,y}$	=	Project emissions from combustion within the project boundary associated with combustor *c* in year *y* (t CO_2e)
$PE_{COM,CO2,c,y}$	=	Project emissions of CO_2 from combustion within the project boundary associated with combustor *c* in year *y* (t CO_2)
$PE_{COM,CH4,N2O,c,y}$	=	Project emissions of CH_4 and N_2O from combustion within the project boundary associated with combustor *c* in year *y* (t CO_2)
c	=	Combustor used in the project activity: gasifier or syngas burner, incinerator or RDF/SB combustor

$PE_{COM,CO2,c,y}$ is defined as follows:

$$PE_{COM,CO2,c,y} = EFF_{COM,c,y} \times \frac{44}{12} \times \sum_{j} Q_{j,c,y} \times FCC_{j,y} \times FFC_{j,y} \qquad \text{Equation (21)}$$

Where:

$PE_{COM,CO2,c,y}$	=	Project emissions of CO_2 from combustion within the project boundary associated with combustor *c* in year *y* (t CO_2)
$Q_{j,c,y}$	=	Quantity of fresh waste type *j* fed into combustor *c* the in year *y* (t)
$FCC_{j,y}$	=	Fraction of total carbon content in waste type *j* in year *y* (t C/t)
$FFC_{j,y}$	=	Fraction of fossil carbon in total carbon content of waste type *j* in year *y* (weight fraction)
$EFF_{COM,c,y}$	=	Combustion efficiency of combustor *c* in year *y* (fraction)
$\frac{44}{12}$	=	Conversion factor (t CO_2/t C)
c	=	Combustor used in the project activity: gasifier, incinerator or RDF/SB combustor
j	=	Waste type

$EFFCOM,c,y$ = 97% (calculated by the global CO2 emissions simulated on the incinerator)

Finally, $PE_{COM,CH4,N2O,c,y}$ has been calculated as follows:

$$PE_{COM\_CH4,N2O,c,y} = Q_{waste,c,y} \times (EF_{N2O,t} \times GWP_{N2O} + EF_{CH4,t} \times GWP_{CH4}) \quad \text{Equation (22)}$$

Where:

$PE_{COM\_CH4,N2O,c,y}$	=	Project emissions of CH_4 and N_2O from combustion within the project boundary associated with combustor *c* in year *y* (t CO_2)
$Q_{waste,c,y}$	=	Quantity of fresh waste or RDF/SB fed into combustor *c* in year *y* (t)
$EF_{N2O,t}$	=	Emission factor for N_2O associated with waste treatment option *t* (t N_2O/t waste)
$EF_{CH4,t}$	=	Emission factor for CH_4 associated with treatment option *t* (t CH_4/t waste)
GWP_{N2O}	=	Global Warming Potential of nitrous oxide (t CO_2e/t N_2O)
GWP_{CH4}	=	Global Warming Potential of methane valid for the commitment period (t CO_2e/t CH_4)
c	=	Combustor used in the project activity: gasifier, incinerator
t	=	Type of alternative waste treatment options: gasification, incineration

With

$EF_{N2O,t}$ = 1.21x 50x10^{-6} tN_2O/t waste net basis (factor for continuous and semi-continuous incinerators)

$EF_{CH4,t}$ = 1.21x 0.2x10^{-6} tCH$_4$/t waste net basis (factor for continuous incineraton with stoker)

Emissions from fossil fuel consumption

$PE_{FC,INC,y}$ is determined according to the procedure "Project emissions from fossil fuel use", where $PE_{FC,INC,y}$=$PE_{FC,t,y}$ and the alternative waste treatment option *t* is incineration.
This value has been calculated following the Tool 03 version 03.0 « Tool to calculate project or leakage CO2 emissions from fossil fuel combustion »

Regarding this tool, $PE_{FC,INC,y}$ is estimated as follows :

$$PE_{FC,INC,y} = FC_{fuel,INC,y} \times COEF_{fuel,y} \quad \text{Equation (23)}$$

Where:

$PE_{FC,INC,y}$	=	Project emissions from fossil fuel consumption associated with incineration in year *y* (t CO_2e)
$FC_{fuel,INC,y}$	=	Quantity of diesel fuel combusted for incineration during the year y (t/yr)
$COEF_{fuel,y}$	=	CO2 emission coefficient of diesel fuel type year y (tCO2/t)

In a conservative approach, $FC_{fuel,INC,y}$ has been estimated using the maximum consumption guaranteed by the contract:

In the EPC Contract ERS Schedule B02 it is mentioned:

"Within each year of the guarantee period, the number of 4 cold start-ups and 4 hot start-ups shall not be exceeded

…

11.5a	Maximum fuel consumption for one cold start-up (at LHV of gas oil of 42.65 MJ/kg)	40 000 kg
11.5b	Maximum fuel consumption for one normal stop (at LHV of gas oil of 42.65 MJ/kg)	24 000 kg"

Therfore, with 4 cold and 4 hot start-ups, the maximum global consumption of diesel fuel is 256 t of diesel fuel:

$FC_{fuel,INC,y}$= 256 t/yr ex-ante

$COEF_{fuel,y}$ is calculated using the following equation:

$COEF_{\text{fuel},y} = w_{C,\text{fuel},y} \times 44/12$

$$COEF_{\text{fuel},y} = w_{C,\text{fuel},y} \times 44/12 \quad \text{Equation (24)}$$

Where:

$COEF_{fuel,y}$	=	CO2 emission coefficient of diesel fuel type year y (tCO2/t)
$w_{C,\text{fuel},y}$	=	Weighted average mass fraction of carbon for diesel fuel in year y

With $w_{C,\text{fuel},y}$ = 81.3% for the gasoil (ADEME, Base Carbone), then

$COEF_{\text{fuel},y} = 3.75$ tCO2 /t

And $PE_{FC,INC,y}$ = 960tCO2/yr ex-ante

Leakage

Leakage emissions have been considered non-existent, as there is no composting or co-composting; there is no anaerobic digester; there is no RDF/SB in the project activity.

B.6.3. **Data and parameters fixed ex ante for monitoring contribution to each of the three SDGs**

(Include a compilation of information on the data and parameters that are not monitored during the crediting period but are determined before the design certification and remain fixed throughout the crediting period like IPCC defaults and other methodology defaults. Copy this table for each piece of data and parameter.)

a. For the emissions of methane from the Landfill

Data / Parameter table 1.

Relevant SDG Indicator	**SDG13 Climate Action** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	$\varphi_{default}$
Unit	-
Description	Default value for the model correction factor to account for model uncertainties
Source of data	-
Value(s) applied	0.75
Choice of data or Measurement methods and procedures	Default value for the model correction factor to account for model uncertainties for Application A
Purpose of data	To calculate baseline emissions due to methane from the SWDS
Additional comment	-

Data / Parameter table 2.

Relevant SDG Indicator	**SDG13 Climate Action** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	OX
Unit	-
Description	Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste)
Source of data	Based on an extensive review of published literature on this subject, including the IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied	0.1
Choice of data or Measurement methods and procedures	Default value
Purpose of data	To calculate baseline emissions due to methane from the SWDS
Additional comment	

Data / Parameter table 3.

Relevant SDG Indicator	**SDG13 Climate Action** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	F
Unit	-
Description	Fraction of methane in the SWDS gas (volume fraction)
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied	0.5
Choice of data or Measurement methods and procedures	Default value. As a result of biodegradation, organic material is converted to a mixture of methane and carbon dioxide
Purpose of data	To calculate baseline emissions due to methane from the SWDS
Additional comment	-

Data / Parameter table 4.

Relevant SDG Indicator	**SDG13 Climate Action** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	$DOC_{f,default}$
Unit	Weight fraction
Description	Default value for the fraction of degradable organic carbon (DOC) in MSW that decomposes in the SWDS
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied	0.5
Choice of data or Measurement methods and procedures	Default value
Purpose of data	To calculate baseline emissions due to methane from the SWDS
Additional comment	-

Data / Parameter table 5.

Relevant SDG Indicator	**SDG13 Climate Action** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	$MCF_{default}$
Unit	-
Description	Methane correction factor

Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied	0.8
Choice of data or Measurement methods and procedures	From tool 04 Emissions from solid waste disposal sites - ACM0001: Application A of tool 04: MCF default value is used - ACM0022: Application B: there is no water table above the bottom of the SWDS – therefore MCF default value is used In the baselines, the SWDS is not meeting the criteria of managed SWDS and has depths of greater than or equal to 5 meters; case (c) of MCF default value applies
Purpose of data	To calculate baseline emissions due to methane from the SWDS
Additional comment	-

Data / Parameter table 6.

Relevant SDG Indicator	**SDG13 Climate Action** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	DOC_j
Unit	-
Description	Fraction of degradable organic carbon in the waste type j (weight fraction)
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories (adapted from Volume 5, Tables 2.4 and 2.5)
Value(s) applied	For MSW, the following values for the different waste types j should be applied: **Default values for DOC_j**

Waste type j	**DOC_j (% wet waste)**
Wood and wood products	43
Pulp, paper and cardboard (other than sludge)	40
Food, food waste, beverages and tobacco (other than sludge)	15
Textiles	24
Garden, yard and park waste	20
Glass, plastic, metal other inert waste	0

Choice of data or Measurement methods and procedures	The percentages listed in table above are based on wet waste basis which are concentrations in the waste as it is delivered to the SWDS.
Purpose of data	To calculate baseline emissions due to methane from the SWDS
Additional comment	-

Data / Parameter table 7.

<table>
<tr><td>Relevant SDG Indicator</td><td>SDG13 Climate Action
Target: 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
Indicator: 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula</td></tr>
<tr><td>Data/parameter</td><td>k_j</td></tr>
<tr><td>Unit</td><td>1/yr</td></tr>
<tr><td>Description</td><td>Decay rate for the waste type j</td></tr>
<tr><td>Source of data</td><td>IPCC 2006 Guidelines for National Greenhouse Gas Inventories (adapted from Volume 5, Table 3.3)</td></tr>
<tr><td>Value(s) applied</td><td>
<table>
<tr><td colspan="2" rowspan="2">Waste type j</td><td colspan="2">Boreal and Temperate (MAT≤20°C)</td><td colspan="2">Tropical (MAT>20°C)</td></tr>
<tr><td>Dry (MAP/ PET<1)</td><td>Wet (MAP/PET >1)</td><td>Dry (MAP< 1000mm)</td><td>Wet (MAP > 1000mm)</td></tr>
<tr><td rowspan="2">Slowly degrading</td><td>Pulp, paper, cardboard (other than sludge), textiles</td><td>0.04</td><td>0.06</td><td>0.045</td><td>0.07</td></tr>
<tr><td>Wood, wood products and straw</td><td>0.02</td><td>0.03</td><td>0.025</td><td>0.035</td></tr>
<tr><td>Moderately degrading</td><td>Other (non-food) organic putrescible garden and park waste</td><td>0.05</td><td>0.10</td><td>0.065</td><td>0.17</td></tr>
<tr><td>Rapidly degrading</td><td>Food, food waste, sewage sludge, beverages and tobacco</td><td>0.06</td><td>0.185</td><td>0.085</td><td>0.40</td></tr>
</table>
</td></tr>
<tr><td>Choice of data or Measurement methods and procedures</td><td>Climatic conditions for VINCA where project site located in:

MAT – mean annual temperature: 13.4 °C
MAP – Mean annual precipitation: 719.9 mm
PET – potential evapotranspiration: 1014.6 mm (max-annual)

Therefore Boreal and Temperate (MAT≤20°C) and dry (MAP/PET <)1 conditions are observed in the project site and</td></tr>
<tr><td>Purpose of data</td><td>To calculate baseline emissions due to methane from the SWDS</td></tr>
</table>

Additional comment	-

Data / Parameter table 8.

Relevant SDG Indicator	**SDG13 Climate Action** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	GWP_{CH4}
Unit	t CO_2e/t CH_4
Description	Global Warming Potential of methane
Source of data	IPCC
Value(s) applied	28
Choice of data or Measurement methods and procedures	source: AR5 chapter 8 Appendix 8.A: Lifetimes, Radiative Efficiencies and Metric Values Table 8.A.1 https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter08_FINAL.pdf
Purpose of data	To calculate baseline emissions due to methane from the SWDS
Additional comment	-

Data / Parameter table 9.

Relevant SDG Indicator	**SDG13 Climate Action** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	$\eta_{PJ,y}$
Unit	Dimensionless
Description	Efficiency of the LFG capture system that will be installed in the project activity
Source of data	-
Value(s) applied	

y	2020	2021 -2045
$\eta_{PJ,y,\text{ old\_landfill}}$	35%	65%
$\eta_{PJ,y,\text{ new\_landfill}}$	50%	60%

<table>
<tr><td>Choice of data or Measurement methods and procedures</td><td>In order to determine the capture rate of the produced biogas, using the biogas collection network, we use this formula:

Average capture rate formula
<table>
<tr><th>Kind of captured area</th><th>Capture rate</th><th>Area</th><th>Average capture rate</th></tr>
<tr><td>Operating zone disconnected</td><td>0 %</td><td>V m²</td><td rowspan="5">= (W*0.35+X*0.65+Y*0.85 +Z*0.9)/(V+W+X+Y+Z)</td></tr>
<tr><td>Operating zone connected to a biogas combustion unit</td><td>35 %</td><td>W m²</td></tr>
<tr><td>Semi-waterproof (transition layer with a low permeability) zone connected to a biogas combustion unit</td><td>65 %</td><td>X m²</td></tr>
<tr><td>Waterproof (1m thickness layer of covering material which permeability <10^{-9} m/s) zone connected to a biogas combustion unit</td><td>85 %</td><td>Y m²</td></tr>
<tr><td>Liner covered zone connected to a biogas combustion unit</td><td>90 %</td><td>Z m²</td></tr>
</table>
The average annual capture rates of each new and old landfill are summarized above.

The new landfill (interim and unprocessed waste landfills) and the old landfill will be covererd with a drained cover (semi-waterproof), as described in section A.5</td></tr>
<tr><td>Purpose of data</td><td>To calculate baseline emissions due to methane from the SWDS</td></tr>
<tr><td>Additional comment</td><td>-</td></tr>
</table>

Data / Parameter table 10.

Relevant SDG Indicator	**SDG13 Climate Action** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	$TDL_{k,y}$
Unit	Dimensionless
Description	Average technical transmission and distribution losses for providing electricity to source k in year y
Source of data	World Bank collection of development indicators https://tradingeconomics.com/serbia/electric-power-transmission-and-distribution-losses-percent-of-output-wb-data.html
Value(s) applied	15,44%
Choice of data or Measurement methods and procedures	
Purpose of data	To calculate baseline emissions due to electricity generation in the baseline
Additional comment	-

Data / Parameter table 11.

Relevant SDG Indicator	**SDG13 Climate Action** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	NCV_{CH4}
Unit	TJ/t CH4
Description	Net calorific value of methane at reference conditions (TJ/t CH4)
Source of data	ACM0001
Value(s) applied	0.0504
Choice of data or Measurement methods and procedures	
Purpose of data	To calculate baseline emissions due heat generation in the baseline
Additional comment	-

Data / Parameter table 12.

Relevant SDG Indicator	**SDG13 Climate Action** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	$EF_{CO2,BL,HG}$
Unit	t CO2/TJ
Description	CO2 emission factor of the diesel fuel used for heat generation by the heater in the baseline (t CO2/TJ)
Source of data	Base Carbone v19.0 ADEME
Value(s) applied	90.4
Choice of data or Measurement methods and procedures	
Purpose of data	To calculate baseline emissions due heat generation in the baseline
Additional comment	-

b. For the emissions of CO_2 from the EfW

Data / Parameter table 13.

Relevant SDG Indicator	**SDG13 Climate Action** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	$RATEcompliance,t,y$
Unit	%
Description	Rate of compliance of a requirement that mandates the use of alternative waste treatment option t in year y
Source of data	
Value(s) applied	0
Choice of data or Measurement methods and procedures	for the disposal of the fresh waste in a SWDS with a partial capture of the LFG and flaring of the captured LFG: no requirement to use this alternative waste treatment option
Purpose of data	To calculate project emissions due to combustion
Additional comment	-

Data / Parameter table 14.

Relevant SDG Indicator	**SDG13 Climate Action** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	FFC_j
Unit	%
Description	Fraction of fossil carbon in total carbon content of waste type j
Source of data	Table 2.4, chapter 2, volume 5 of IPCC 2006 guidelines

Value(s) applied	<table><tr><th>Waste type *j*</th><th>Default mrm: Internal note: the methodology's default is the largest value of the range of Table 2.4/Chapter2/Vol.5/ 2006 IPCC Guidelines</th></tr><tr><td>Paper/cardboard</td><td>5</td></tr><tr><td>Textiles</td><td>50</td></tr><tr><td>Food waste</td><td>-</td></tr><tr><td>Wood</td><td>-</td></tr><tr><td>Garden and Park waste</td><td>0</td></tr><tr><td>Nappies</td><td>10</td></tr><tr><td>Rubber and Leather</td><td>20</td></tr><tr><td>Plastics</td><td>100</td></tr><tr><td>Metal*</td><td>NA</td></tr><tr><td>Glass*</td><td>NA</td></tr><tr><td>Other, inert waste</td><td>100</td></tr></table> Metal and glass contain some carbon of fossil origin. Combustion of significant amounts of glass or metal is not common. If a waste type is not comparable to a type listed in Table 4, or can not clearly be described as a combination of types in this table above, or if the project participants wish to measure FFC_j, then project participants shall measure $FFC_{j,y}$ using the following standards, or similar national or international standards: ASTM D6866: "Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis"; ASTM D7459: "Standard Practice for Collection of Integrated Samples for the Speciation of Biomass (Biogenic) and Fossil Carbon Dioxide Emitted from Stationary Emissions Sources". The frequency of measurement shall be as a minimum four times in year y with the mean value valid for year y The project participates also have the option to apply the balance method (appendix 2) to measure FFCj,y
Choice of data or Measurement methods and procedures	
Purpose of data	To calculate project emissions due to combustion
Additional comment	-

Data / Parameter table 15.

Relevant SDG Indicator	**SDG13 Climate Action** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	FCC_j
Unit	%
Description	Fraction of total carbon content in waste type j
Source of data	Koeher 2011, ADEME 2007

Value(s) applied

Waste type j	FCC_j values calculated from Koeher 2011, ADEME 2007
Paper/cardboard	25.1%
Textiles	39.6%
Food waste	16.4%
Wood	32.8%
Garden and Park waste	24.0%
Nappies	8.8%
Rubber and Leather	32.8%
Plastics	64.3%
Metal*	1.2%
Glass*	1.2%
Other, inert waste	3.8%

Choice of data or Measurement methods and procedures

Calculation from Humidity content (Koeher 2011 + expert assumptions), and from the carbon content of waste (ADEME 2007)

		Koeher 2011	Expert assumptions	ADEME 2007 (tableau 24)	Expert assumptions
	Carbon content (total)	Humidity		Carbon content	
Categories as per ACM0022	**% brut**	% brut	% brut	% dry	% dry
Paper and cardboard	**25.10%**	30%		35.85%	
Textiles	**39.60%**	25.0%		52.80%	
Food waste	**16.36%**	60%		40.90%	
Wood	**32.80%**		20%	41%	
Green Waste	**24.00%**		40%		40.00%
Nappies	**8.77%**	80.2%		44.30%	
Rubber, leather	**32.80%**		20%	41%	
Plastics	**64.26%**	15.0%		75.60%	
Metals	**1.22%**		2%	1.24%	
Glass	**1.16%**		2%	1.18%	
Inert waste	**3.80%**		5%	4%	

Purpose of data: To calculate project emissions due to combustion

Additional comment: -

Data / Parameter table 16.

Relevant SDG Indicator	**SDG13 Climate Action** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	GWP_{N2O}
Unit	t CO_{2e}/tN_2O
Description	Global Warming Potential of N2O
Source of data	IPCC
Value(s) applied	265
Choice of data or Measurement methods and procedures	source: AR5 chapter 8 Appendix 8.A: Lifetimes, Radiative Efficiencies and Metric Values Table 8.A.1 https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter08_FINAL.pdf
Purpose of data	To calculate project emissions due to combustion
Additional comment	-

Data / Parameter table 17.

Relevant SDG Indicator	**SDG13 Climate Action** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	$EF_{CH4,t}$
Unit	t CH4/t waste (wet basis)
Description	Emission factor for CH4 associated with waste treatment option t
Source of data	Table 5.3, chapter 5, volume 5 of IPCC 2006 guidelines
Value(s) applied	$1.21x0.2x10^{-6}$
Choice of data or Measurement methods and procedures	factor for continuous incineraton with stoker
Purpose of data	To calculate project emissions due to combustion
Additional comment	-

Data / Parameter table 18.

Relevant SDG Indicator	**SDG13 Climate Action** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	$EF_{N2O,t}$
Unit	t N_2O/t waste (wet basis)

Description	Emission factor for N2O associated with waste treatment option t
Source of data	Table 5.6, chapter 5, volume 5 of IPCC 2006 guidelines
Value(s) applied	$1.21x50x10^{-6}$
Choice of data or Measurement methods and procedures	factor for continuous and semi-continuous incinerators
Purpose of data	To calculate project emissions due to combustion
Additional comment	-

Data / Parameter table 19.

Relevant SDG Indicator	**SDG13 Climate Action** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	η_{cogen}
Unit	ratio
Description	Efficiency of the cogeneration plant that would have been used in the absence of the project activity
Source of data	Maximum efficiency of 90 per cent, based on net calorific values
Value(s) applied	90%
Choice of data or Measurement methods and procedures	
Purpose of data	To calculate project emissions due to combustion
Additional comment	-

Data / Parameter table 20.

Relevant SDG Indicator	**SDG13 Climate Action** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	$EF_{CO2,BL,CG}$
Unit	t CO2/MJ
Description	Emission factor of baseline fossil fuel used in the cogeneration plant, as identified in the baseline scenario identification
Source of data	IPCC default values for gas
Value(s) applied	122
Choice of data or Measurement methods and procedures	
Purpose of data	To calculate project emissions due to combustion
Additional comment	-

c. For the energy substitution electricity and heat

Data / Parameter table 21.

Relevant SDG Indicator	**SDG13 Climate Action** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	$EF_{CO2,i,y}$ and $EF_{CO2,m,i,y}$
Unit	t CO2/GJ
Description	CO2 emission factor of fuel type i used in power unit m in year y
Source of data	table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories: (in tCO2/GJ)
Value(s) applied	Please see excel file for OM Calculations
Choice of data or Measurement methods and procedures	
Purpose of data	To calculate project emissions due to combustion
Additional comment	-

B.6.4. **Ex ante estimation of outcomes linked to each of the three SDGs**

>> (Provide a transparent ex ante calculation of baseline and project outcomes (or, where applicable, direct calculation of net benefit) during the crediting period, applying all relevant equations provided in the selected methodology(ies) or as per proposed approach. For data or parameters available before design certification, use values contained in the table in section B.6.3 above. For data/parameters not available before design certification and monitored during the crediting period, use estimates contained in the table in section B.7.1 below)

The ex-ante estimation of outcomes has been conducted following the methodologies presented in section B.6.2.

Emission reductions

According to both ACM0001and ACM0022, emission reductions are calculated as follows;

$$ER_y = BE_y - PE_y \quad \text{Equation (1)}$$

Where:

ER_y = Emission reductions in year *y* (t CO2e/yr)

BE_y = Baseline emissions in year *y* (t CO2e/yr)

PE_y = Project emissions in year *y* (t CO2/yr)

1. **Baseline emissions** Emissions of methane from the SWDS in ACM0001 baseline

Methodological choices and data-parameters to be used for calculations are explained in the sections B.6.2 and B.6.3, respectively.

As per equations (3), (4), (5) and (6) ex ante estimation of baseline emissions due to methane from the SWDS are as below:

Year	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year	9th year	10th year
Baseline emissions due to methane from the SWDS (tCO2e)	144 391	143 040	141 762	140 551	139 404	138 319	137 291	136 318	135 396	134 523

Detailed calculations will be submitted to DOE in excel files.

2. Emissions of electricity and heat generation in ACM0001

Emisions for generating electricity in the baseline are calculated following equations (8), (9), (10), (11) and emissions for heat generation are camculated following equations (12) and (13). The results are shown below:

Year	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year	9th year	10th year
Baseline emissions due to electricity and heat generation (tCO2e)	31 330	31 330	31 330	31 330	31 330	31 330	31 330	31 330	31 330	31 330

3. Project emissions in ACM0001

There are no emissions linked to the project in ACM0001.

4. Emissions of methane from the SWDS in ACM0022 baseline

The emissions due to the SWDS in the baseline are calculated using the same procedure as for ACM0001. The results are shown below:

Year	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year	9th year	10th year
Baseline emissions due to methane from the SWDS (tCO2e)	0	9 773	19 083	27 953	36 406	44 461	52 138	59 456	66 432	73 083

5. Emissions due to electricity and heat generation in ACM0022 baseline

As per equations (15), (16) and (17), the emissions due to electricity generation are calculated. The results are shown below:

Year	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year	9th year	10th year
Baseline emissions due to electricity and heat generation (tCO2e)	0	176 722	177 208	177 208	177 208	177 208	177 208	177 208	177 208	177 208

6. Emissions due to the project activity in ACM0022

Emissions due to the combustion are calculated using equations (20), (21) and (22) and emissions due too the use of diesel fuel are calculated using equations (23) and (24). The results are shown below:

Year	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	8th year	9th year	10th year
Project Emissions (tCO2e)	0	138 290	138 290	138 290	138 290	138 290	138 290	138 290	138 290	138 290

B.6.5. **Summary of ex ante estimates of each SDG outcomes**

Goal 13. Take urgent action to combat climate change and its impacts

Target: 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning

ACM0001

Year	**Baseline estimate**		**Project estimate**	**Net benefit**
	Baseline emissions due to methane from the SWDS (tCO_2e)	**Baseline emissions due to electricity generation (tCO_2e)**	**Project Emissions (tCO_2e)**	**Emission Reductions (tCO_2e)**
1st Year	144 391	31 330	0	173 602
2nd Year	143 040	31 330	0	174 370
3rd Year	141 762	31 330	0	173 091
4th Year	140 551	31 330	0	171 880
5th Year	139 404	31 330	0	170 734
6th Year	138 319	31 330	0	169 648
7th Year	137 291	31 330	0	168 620
8th Year	136 318	31 330	0	167 647
9th Year	135 396	31 330	0	166 725
10th Year	134 523	31 330	0	165 852
Total	**1 390 994**	**313 295**	**0**	**1 702 171**
Total number of crediting years	10 Years			

ACM0022

Year	Baseline estimate		Project estimate	Net benefit
	Baseline emissions due to methane from the SWDS (tCO_2e)	Baseline emissions due to electricity and heat generation (tCO_2e)	Project Emissions (tCO_2e)	Emission Reductions (tCO_2e)
1st Year	0	0	0	0
2nd Year	9 773	176 722	138 290	48 204
3rd Year	19 083	177 208	138 290	58 000
4th Year	27 953	177 208	138 290	66 871
5th Year	36 406	177 208	138 290	75 323
6th Year	44 461	177 208	138 290	83 378
7th Year	52 138	177 208	138 290	91 056
8th Year	59 456	177 208	138 290	98 374
9th Year	66 432	177 208	138 290	105 350
10th Year	73 083	177 208	138 290	112 001
Total	**388 786**	**1 594 384**	**1 244 613**	**738 556**
Total number of crediting years	10 Years			

Global emission reductions

Year	Baseline estimate		Project estimate	Net benefit
	Baseline emissions due to methane from the SWDS (tCO_2e)	Baseline emissions due to electricity generation (tCO_2e)	Project Emissions (tCO_2e)	Emission Reductions (tCO_2e)
1st Year	144 391	31 330	0	173 602
2nd Year	152 813	208 052	138 290	222 574
3rd Year	160 844	208 537	138 290	231 091
4th Year	168 504	208 537	138 290	238 751
5th Year	175 810	208 537	138 290	246 057
6th Year	182 780	208 537	138 290	253 027
7th Year	189 429	208 537	138 290	259 676
8th Year	195 774	208 537	138 290	266 021

9th Year	201 828	208 537	138 290	272 075
10th Year	207 606	208 537	138 290	277 853
Total	**1 779 780**	**1 907 679**	**1 244 613**	**2 440 727**
Total number of crediting years	10 Years			

Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all

Target 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix

To estimate the production of renewable electricity on the Landfill Gas facility, we need to know how much gas will be produced on the site annualy and how much electricity it will generate from it.

The Landfill Gas facility will generate a 26.5 GWh/y of electricity while the EfW facility will generate 190 GWh/y of electricity and 174 GWh/y of heat.
As 74% of waste are biogenic, 159 GWh/y will be renewable electricity and 128 GWh/y will be renewable heat.

Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

Target 11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

From 2022 to 2031, it is anticipated that, 510 000 tons of municipal waste every year will be directed to VINCA site, 170,000 tons/y toward the landfill facility and 340,000 tons/y toward the EfW facility.

Year	Baseline estimate	Project estimate	Net benefit
	Amount of municipal waste with adequate final discharge	Amount of municipal waste with adequate final discharge	Amount of municipal waste with adequate final discharge
1st Year	0	510 000 tons	510 000 tons
2nd Year	0	510 000 tons	510 000 tons
3rd Year	0	510 000 tons	510 000 tons
4th Year	0	510 000 tons	510 000 tons
5th Year	0	510 000 tons	510 000 tons
6th Year	0	510 000 tons	510 000 tons
7th Year	0	510 000 tons	510 000 tons
8th Year	0	510 000 tons	510 000 tons
9th Year	0	510 000 tons	510 000 tons
10th Year	0	510 000 tons	510 000 tons
Total	5 100 000 tons		
Total number of crediting years	10 Years		
Year	Baseline estimate	Project estimate	Net benefit

Goal 6: Ensure access to water and sanitation for all

Target 6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally

Indicator: 6.3.1 Proportion of wastewater safely treated

Leachate Flow Treated annually

From 2022 to 2031, it is anticipated that 259 764 m3 of leachate flow will be either treated on site or used for APCR stabilization[14].

Year	Baseline estimate	Project estimate	Net benefit
	Leachate Flow annually Treated or used for APCR stabilization (m3/y)	Leachate Flow annually Treated or used for APCR stabilization (m3/y)	Leachate Flow annually Treated or used for APCR stabilization (m3/y)
1st Year	0	90 914	90 914
2nd Year	0	80 218	80 218
3rd Year	0	45 283	45 283
4th Year	0	11 101	11 101
5th Year	0	3 842	3 842
6th Year	0	1 777	1 777
7th Year	0	2 013	2 013
8th Year	0	6 069	6 069
9th Year	0	10 792	10 792
10th Year	0	7 756	7 756
Total	259 764		
Total number of crediting years	10 Years		

Quantity of dirty water re-used for the quenching of the EfW IBA (m3/y)

From 2022 to 2031, it is anticipated that 91 650 m3 of dirty water will be re-used for the quenching of the EfW IBA[15].

Year	Baseline estimate	Project estimate	Net benefit
	Quantity of dirty water re-used for the quenching of the EfW IBA (m3/y)	Quantity of dirty water re-used for the quenching of the EfW IBA (m3/y)	Quantity of dirty water re-used for the quenching of the EfW IBA (m3/y)
1st Year	0	9 165	9 165

[14] The computation for the leachate flow treated or used for APCR stabilization is detailed in the file 'CONFIDENTIAL'-'CAR-28-SDG6 Computations for leachate and re-used water'.

[15] The computation for the quantity of dirty water re-used for the quenching of the EfW IBA is detailed in the file 'CONFIDENTIAL'-'CAR-28-SDG6 Computations for leachate and re-used water'.

2nd Year	0	9 165	9 165
3rd Year	0	9 165	9 165
4th Year	0	9 165	9 165
5th Year	0	9 165	9 165
6th Year	0	9 165	9 165
7th Year	0	9 165	9 165
8th Year	0	9 165	9 165
9th Year	0	9 165	9 165
10th Year	0	9 165	9 165
Total	91 650		
Total number of crediting years	10 Years		

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

(Include specific information on how the data and parameters that need to be monitored in the selected methodology(ies) or proposed approaches or as per mitigation measures from safeguarding principles assessment or as per feedback from stakeholder consultations would actually be collected during monitoring. Copy this table for each piece of data and parameter.)

Goal 13 related Data / Parameters

Landfill Facilities

Data / Parameter table 22.

Relevant SDG Indicator	**Goal 13. Take urgent action to combat climate change and its impacts** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data / Parameter	$F_{CH4,PJ,y}$
Unit	t CH4/yr
Description	Amount of methane in the LFG which is flared or used in the generator sets
Source of data	
Value(s) applied	
Measurement methods and procedures	The methane flow rate is measured continuously before entring the flare unit and the generator sets. Pression and temperature are also measured continuously to evaluate the quantity of methane actually flared or used.
Monitoring frequency	The quantity of methane flared or used will be measured continuously and recorded at least monthly.

QA/QC procedures	Maintenance and calibration of meters will be carried out according to the instructions of the manufacturer or legal requirements.
Purpose of data	To calculate baseline and project emissions due to methane emissions
Additional comment	-

Data / Parameter table 23.

Relevant SDG Indicator	**Goal 13. Take urgent action to combat climate change and its impacts** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data / Parameter	$\eta_{HG,BL,y}$
Unit	dimensionless
Description	Efficiency of the heat generation equipment used in the project activity in year y for the leachates treatment
Source of data	
Value(s) applied	92%
Measurement methods and procedures	To be updated
Monitoring frequency	
QA/QC procedures	
Purpose of data	
Additional comment	-

Data / Parameter table 24.

Relevant SDG Indicator	**Goal 13. Take urgent action to combat climate change and its impacts** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula Electricity produced per year due to the LFG facility
Data / Parameter	$EC_{BL,y}$
Unit	MWh/yr
Description	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the LFG in year y
Source of data	Electricity meter measurement at project site
Value(s) applied	26 574

Measurement methods and procedures	The quantity of net electricity generation supplied to the grid by the project plant will be recorded and reported based on the meters at the project site.
Monitoring frequency	The quantity of net electricity generation supplied to the grid will be measured continuously and recorded at least monthly.
QA/QC procedures	Maintenance and calibration of meters will be carried out according to the instructions of the manufacturer or legal requirements.
Purpose of data	To calculate baseline and project emissions due to electricity generation
Additional comment	-

Energy from Waste Facility

Data / Parameter table 25.

Relevant SDG Indicator	**Goal 13. Take urgent action to combat climate change and its impacts** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula Electricity produced per year due to the Energy from Waste facility
Data / Parameter	$EG_{t,y}$
Unit	MWh/yr
Description	Electricity generated by the incinerator and exported to the grid in year y
Source of data	Electricity meter measurement at project site
Value(s) applied	189 652
Measurement methods and procedures	The quantity of net electricity generation supplied to the grid by the project plant will be recorded and reported based on the meters at the project site.
Monitoring frequency	The quantity of net electricity generation supplied to the grid will be measured continuously and recorded at least monthly.
QA/QC procedures	Maintenance and calibration of meters will be carried out according to the instructions of the manufacturer or legal requirements.
Purpose of data	To calculate baseline and project emissions due to electricity generation
Additional comment	-

Data / Parameter table 26.

Relevant SDG Indicator	**Goal 13. Take urgent action to combat climate change and its impacts** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula Heat produced per year due to the Energy from Waste facility
Data / Parameter	$HG_{PJ,y}$

Unit	TJ/yr
Description	Quantity of heat supplied by the project activity displacing baseline heat generation by a fossil fuel cogeneration plant in year y (TJ)
Source of data	Heat meter measurement at project site
Value(s) applied	625
Measurement methods and procedures	The quantity of net heat generation supplied to the grid by the project plant will be recorded and reported based on the meters at the project site.
Monitoring frequency	The quantity of net heat generation supplied to the grid will be measured continuously and recorded at least monthly.
QA/QC procedures	Maintenance and calibration of meters will be carried out according to the instructions of the manufacturer or legal requirements.
Purpose of data	To calculate baseline and project emissions due to heat generation
Additional comment	-

Data / Parameter table 27.

Relevant SDG Indicator	**Goal 13. Take urgent action to combat climate change and its impacts** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data / Parameter	$Q_{j,i,y}$
Unit	T
Description	Quantity of fresh waste type j fed into installation i the in year y (t)
Source of data	Measurement of the waste global tonnage and sampling of the waste each five years to analyse the repartition
Value(s) applied	Cf excel calculation
Measurement methods and procedures	
Monitoring frequency	The global amount of waste coming in will be measured continuously on site; The repartition between the waste types will be measured through sampling campaigns each five years
QA/QC procedures	
Purpose of data	To calculate project emissions
Additional comment	-

Data / Parameter table 28.

Relevant SDG Indicator	**Goal 13. Take urgent action to combat climate change and its impacts** **Target:** 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning **Indicator:** 13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula
Data/parameter	**$EFF_{COM,c,y}$**
Unit	%
Description	Combustion efficiency of combustor c in year y (fraction) Combustion efficiency of the incinerator
Source of data	project simulation by ESIA
Value(s) applied	97%
Choice of data or Measurement methods and procedures	measurement of the TOC in bottom ash (according EN 13137) $EFF_{COM,c,y}$ = 1 - TOC
Purpose of data	To calculate project emissions due to combustion
Additional comment	-

Energy from Waste and landfill Facilities

Data / Parameter table 29.

Relevant SDG Indicator	**Goal 13. Take urgent action to combat climate change and its impacts** **Target 13.3** Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
Data/parameter	Number of people participating to Vinca site visits per year
Unit	Number of people
Description	Annual number of people informed through Vinca site visits
Source of data	Measured on site
Value(s) applied	Circa 2 visits per month with 20 visitor each
Choice of data or Measurement methods and procedures	Attendance sheets
Purpose of data	
Additional comment	

Goal 11 related Data / Parameters

Energy from Waste and Landfill Facilities

Data / Parameter table 30.

Relevant SDG Indicator	**Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable** **Target 11.6** By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management **Indicator:** 11.6.1 Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities
Data/parameter	**W_x and Q_J**
Unit	Tons
Description	Evolution of the amount of waste valorized at the Vinca site Tons of waste actually disposed at the Vinca site before the project and during the project life
Source of data	Measured on site The collection truck which carry municipal waste will be weighed at the site entrance weighbridges and printed receipts will be filled in
Value(s) applied	Initital value : 510 000 tons
Choice of data or Measurement methods and procedures	Measured on site Maintenance and calibration of weighbridges will be carried out according to the instructions of the manufacturer or legal requirements.
Purpose of data	In order to know the quantity of Belgrade waste with appropriate disposal
Additional comment	

Goal 7 related Data / Parameters

Energy from Waste Facility

Data / Parameter table 31.

Relevant SDG Indicator	**Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all** **Target 7.2** By 2030, increase substantially the share of renewable energy in the global energy mix **Indicator:** 7.2.1 Renewable energy share in the total final energy consumption Renewable energy produced at Vinca site
Data/parameter	Biogenic ratio
Unit	%
Description	Correspond to the proportion of biodegradable waste among all types of waste disposed at the Vinca site.
Source of data	To be detailed
Value(s) applied	65,8%
Choice of data or Measurement methods and procedures	To be detailed
Purpose of data	Used to calculated the portion of renewable energy produced at Vinca site.
Additional comment	

Data / Parameter table 32.

Relevant SDG Indicator	**Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all** **Target 7.2** By 2030, increase substantially the share of renewable energy in the global energy mix **Indicator:** 7.2.1 Renewable energy share in the total final energy consumption Renewable energy produced at Vinca site
Data / Parameter	Renewable electricity produced
Unit	MWh/y
Description	Correspond to the renewable electricity produced by valorization of residual biodegradable waste.
Source of data	Calculated as the part of electricity generated that is biogenic:
Value(s) applied	124,720
Measurement methods and procedures	Multiplication of the biogenic part of the waste by the electricity produced by the project
Monitoring frequency	Annualy
QA/QC procedures	
Purpose of data	
Additional comment	

Data / Parameter table 33.

Relevant SDG Indicator	**Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all** **Target 7.2** By 2030, increase substantially the share of renewable energy in the global energy mix **Indicator:** 7.2.1 Renewable energy share in the total final energy consumption Renewable energy produced at Vinca site
Data / Parameter	Renewable heat produced
Unit	TJ/y
Description	Correspond to the renewable heat produced by valorization of residual biogenic waste.
Source of data	Calculated as the part of electricity generated that is biogenic
Value(s) applied	411
Measurement methods and procedures	Multiplication of the biogenic part of the waste by the heat produced by the project
Monitoring frequency	Annualy
QA/QC procedures	
Purpose of data	
Additional comment	

Landfill Facilities

Data / Parameter table 34.

Relevant SDG Indicator	**Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all** **Target 7.2** By 2030, increase substantially the share of renewable energy in the global energy mix **Indicator:** 7.2.1 Renewable energy share in the total final energy consumption Renewable energy produced at Vinca site
Data / Parameter	Renewable electricity produced
Unit	MWh/y
Description	Correspond to the renewable electricity produced by valorization of residual biodegradable waste.
Source of data	Calculated as the part of electricity generated that is biogenic:
Value(s) applied	26,574
Measurement methods and procedures	
Monitoring frequency	Annualy
QA/QC procedures	
Purpose of data	
Additional comment	

Goal 6 related Data / Parameters

Energy from Waste and Landfill Facilities

Data / Parameter table 35.

Relevant SDG Indicator	Goal 6: Ensure access to water and sanitation for all Target 6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally Indicator: 6.3.1 Proportion of wastewater safely treated
Data/parameter	Annual Leachate Flow Treated or used for APCR stabilization
Unit	m3/y
Description	
Source of data	Measured on site
Value(s) applied	An average of 25,976 m3/y
Choice of data or Measurement methods and procedures	Flow meter - Continuous measurement
Purpose of data	
Additional comment	

Data / Parameter table 36.

Relevant SDG Indicator	Goal 6: Ensure access to water and sanitation for all **Target 6.3** By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally **Indicator:** 6.3.2 Proportion of bodies of water with good ambient water quality
Data/parameter	Concentration of Chloride and Heavy metals in piezometers located downstream the site Quality of the Surface Water / pH – Redox / [Electroconductivity] discharge into the natural recipient i.e. the Osljanski Potok
Unit	As the case may be mg/l or micro g/l [or micro s/l]
Description	
Source of data	Measured on site
Value(s) applied	Treshold values as per Regulation on the Program of Systematic Monitoring of Soil Quality via Indicators for Assessment of Soil Degradation Risk and Methodology for Creation of Remediation Programs ("Official Gazette of the Republic of Serbia", No. 88/10), Annex 2: Remediation values of concentrations of hazardous and deleterious substances and values that could indicate significant groundwater contamination
Choice of data or Measurement methods and procedures	
Purpose of data	
Additional comment	

Data / Parameter table 37.

Relevant SDG Indicator	Goal 6: Ensure access to water and sanitation for all **Target 6.4** By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity **Indicator:** 6.4.1 Change in water-use efficiency over time
Data/parameter	Run-off water re-used on site (including for Landfill activities and EfW IBA quenching)
Unit	m3/year
Description	
Source of data	Measured on site
Value(s) applied	An average of 9,165 m3/y of dirty water re-used for the quenching of the EfW IBA
Choice of data or Measurement methods and procedures	
Purpose of data	
Additional comment	

Data / Parameter table 38.

Relevant SDG Indicator	Goal 6: Ensure access to water and sanitation for all **Target 6.6** By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes **Indicator:** 6.6.1 Change in the extent of water-related ecosystems over time
Data/parameter	Bird Polpulation Macroinvertebrates in water in the Osjlanski ponds: - Total number of taxa - Saprobic Index (Zelinka & Marvan) - % Oligochaeta Tubificidae
Unit	Qualitative assessment for the Bird Surveys
Description	
Source of data	The threshold concentrations for such parameters as macroinvertebrates are defined in the Rulebook on the Parameters of the Ecological and Chemical Status of Surface Waters and the Parameters of the Chemical and Quantitative Status of the Underground Water (Official Gazette of the Republic of Serbia, No. 74/2011).
Value(s) applied	
Choice of data or Measurement methods and procedures	
Purpose of data	
Additional comment	

B.7.2. **Sampling plan**

>> (If data and parameters monitored in section B.7.1 above are to be determined by a sampling approach, provide a description of the sampling plan.)

There is no sampling plan applied.

B.7.3. **Other elements of monitoring plan**

All monitoring procedures and requirements of the proposed project activity will be in accordance with the methodologies ACM0001 Flaring or use of landfill gas Version 19.0 and ACM0022 Alternative waste treatment processes Version 02.0

The VINCA Project is frameworked by the Construction Environmental and Social Management Plan (CESMP, Environmental and Social Management System (point 10, p. 60) and the Construction Environmental and Social Management Plan, which have been provided to the VVB (cf. confidential documents).

The Plan presents the monitoring process and the monitoring governance for the followings aspects:

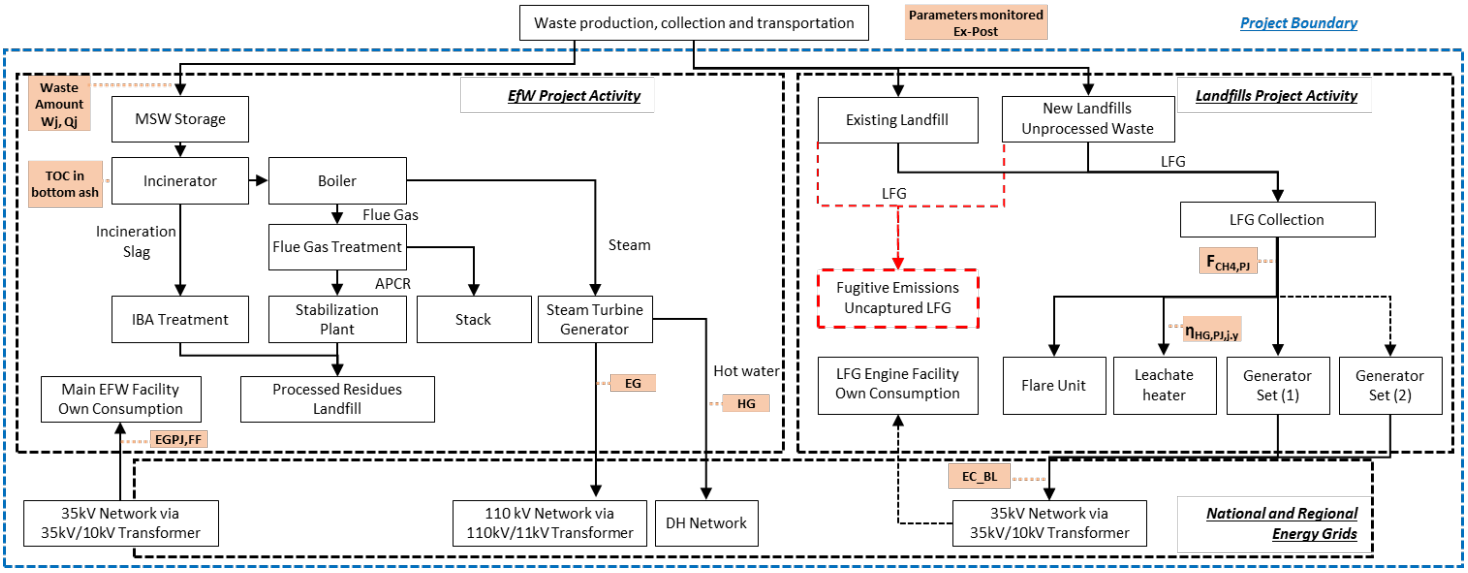
- **Pollution prevention plan** (including SO2, NOx emissions), including monitoring process (CESMP, point 9, p. 52)

- **Best Management Practices during the construction to reduce the potential dust emissions (cf.ESMS, p. 68, Point VIII, g)**: During construction, EPC Contractors will be responsible for implementing the requirements of the Plan. EPC Contractors will monitor construction activities to verify that the dust control measures are being implemented as required to control fugitive dust emissions in accordance with requirements. Compliance observations will be reported on a regular basis along with other reporting requirements as noted in the CESMP and or Monitoring program. Non-compliance events and responses to non-compliance events, as well as complaints and responses to complaints will be reported as part of regular compliance reporting.

- **Community Health and Safety Management Plan** (CESMP, p.101, point XII ESMS Annex 1): The objectives of this plan are to:
    - Avoid or limit risks to, and impacts on, the health, safety and security of the community during the construction phase from both routine and non-routine circumstances. This is achieved through implementing targeted prevention programs to reduce risks, along with the implementation of an effective monitoring and evaluation program.
    - Ensure that safeguarding of personnel and property is conducted in an appropriate manner that avoids or limits risks to the community's safety and security.
    - Maintain a monitoring and evaluation program that is community-based, participatory, transparent and covers all phases of production and decommissioning
    - Including measures related to traffic management, site access controls, removal of hazardous conditions on sites, community awareness raising measures, noise and odour control, and control of spreading of garbage and litter outside of the waste management site.

- **Monitoring of Stakeholder Engagement (point 16.4 of the CESMP)** : A set of Key Performance Indicators (KPIs) have been defined to enable monitoring and evaluation of the implementation of the SEP and guide updates and revisions of the document:
    - SEP in place, up to date and available to the public for comment;
    - SEP document integrates comments received from public as appropriate;
    - All planned actions from SEP implemented as scheduled;
    - Grievance procedure operating as planned (as evidenced by an up-to-date grievance register) including recording;
    - Subcontractor contracts include clauses obligating them to adopt SEP requirements, as appropriate
    - Report on the implementation of the SEP and grievance management made available as part of corporate reporting and the Project's environmental and social reporting.

- **Environmental And Social Monitoring Plan (Esmp, Cesmp. Point 17)**
  To properly manage the environmental and social action plan, measurements must be taken of its performance to provide data for action.
  There is no requirement for EPC Contractors to perform any regular monitoring since this is a client responsibility.
  However, EPC Contractors(Engineering, procurement, and construction (Contractor) will take arrangements to support BEO ČISTA ENERGIJA D.O.O. BEOGRAD and provide all necessary information under his scope of work for the environmental and social monitoring plan.



Parameter	Explanation	Measurement device
$F_{CH4,PJ,y}$	Amount of methane in the LFG which is flared or used in the generator sets and in the leachates heater	
$\eta_{HG,PJ,j,y}$	Efficiency of the heat generation equipment using LFG to evaporate the leachates in year y	
$EC_{BL,y}$	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the LFG in year y	Electricity metering cell as required per the Distribution Network Operator (EPS)
$EG_{t,y}$	Electricity generated by the incinerator and exported to the grid in year y	Electricity metering cell as required per the Transmission Network Operator (EMS)
$HG_{PJ,y}$	Quantity of heat supplied by the project activity displacing baseline heat generation by a fossil fuel cogeneration plant in year y (TJ)	
W_x and $Q_{j,i,y}$	Quantity of fresh waste type j fed into installation i the in year y (t)	Site entrance weighbridges
TOC	Bottom Ash (unburned matter)	Total Organic Carbon (TOC) in bottom ash to be measured according to European norm EN 13137 (periodic sampling and accredited laboratory analysis)
	Biogenic ratio	
	Leachate Flow Treated annually	Electromagnetic flowmeter (See PID - BEL-LIX-PRE-PID-001-RevD: Leachate Treatment Plant Pre-treatment / Tag AA-FIT-140)
	Concentration of Chloride and Heavy metals in piezometers located downstream the site	
	Quality of the Surface Water / pH – Redox / [Electroconductivity] discharge into the natural recipient i.e. the Osljanski Potok	
	Run-off water re-used on site (including for Landfill activities and EfW IBA quenching)	
	Leachate re-used in the APCR Stabilization Plant	

SECTION C. Duration and crediting period

C.1. Duration of project

C.1.1. Start date of project

>> (Specify start date of the project, in the format of DD/MM/YYYY. Describe how this date has been determined as per the definition of start date provided in section 4.1.39 of GS4GG Principles & Requirements document and provide evidence to support this date.)

The definition given in the section 4.1.39 of the GS4GG Principles & Requirements is definied as “the earliest date on which the Project Developer has commited to expenditures related to the implementation of the Project”.

Furthermore, the point 4.1.10 of the GS4GG Principles and Requirements documents evoques as examples the date on which contracts have been signed for equipment or construction/operations services required for the Project.

In this context, the start date of the Project is the 30/09/2019. On this date the PPP-agreement between the 3 equity stakeholders Marguerite, Itochu and Suez has been signed, launching the necessary budget to the first expenditures related to the implementation of the Project.

C.1.2. Expected operational lifetime of project

>> (Specify in years)

Under the PPP Contract provisions, the Service period is planned to last 25 years. However, the Contractor shall hand back all the facilities to the City of Belgrade in such physical shape and condition and typical wear and tear, as can be expected after such operation time and after appropriate operation and maintenance. This will allow continued operation for a significant additional period assuming, after handback, further appropriate operation and maintenance in accordance with the Operating Manual and Good Industry Practice. Typically for the Energy France Waste Facility and subject to obsolescence constraints, an additional [15] years of continuous operation after handback is possible.”

C.2. Crediting period of project

The additionality tool 32 (used for the landfill additionality) do not give any indication concerning the crediting period.

According to the requirements of the Additionality Tool 23 which is used in the Project additionality justification for the EfW Facility (see art. 5.1.12. ©), “*the project participants selected a crediting period for the project activity that is “a maximum of 10 years with no option of renewal”.*

RE Activity requirements precise: *Projects may receive Issuance of Certified Impact Statements or Products for a maximum of three Certification Renewal Cycles i.e., a total of 15 years, unless mentioned otherwise in the product Requirements* (art. 4.1.7.). In the arti. 4.1.5., the Community Services Activities Requirements presents the same condition : "*New Projects may seek Certification and receive Issuance of Gold Standard Certified Impact Statements or Products for a maximum of two Design Certification Renewal Cycles i.e., a total of 15 years issuance.”*

The EfW Facility and the landfill are part of the same Gold Standard Project (same PDD, …). Therefore the more restrictive crediting period applicable for the EfW Facility (due to the used additionality tool 23) applies as well for the landfill.

In these conditions, the crediting period is 10 years, without possibility of renewal.

C.2.1. Start date of crediting period

>> (Specify in dd/mm/yyyy. This can be start of project operation or two years prior to the date of Project Design Certification, whichever is later.)

The start date of crediting is **01/01/2022.**

C.2.2. Total length of crediting period

>> (Specify the total length of crediting period sought in line with GS4GG Principles & Requirements or relevant activity requirements.)

As upstream explained (see C.2.), the first and only crediting period will be **10 years**.

SECTION D. Safeguarding principles assessment

D.1. Analysis of social, economic and environmental impacts

>> (Refer the GS4GG Safeguarding Principles and Requirements document for detailed guidance on carrying out this assessment.)

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes/potentially/no)	Justification	Mitigation measure (if required)
1. Human Rights	**x**	No	The Project is framed by the Serbian Constitution (*Official Gazette of RS issue 98/2006*), whose fundamental prerequisite of the Constitution is based on inalienable Human Rights. Furthermore, Serbia ratified many international Human Rights Instruments: - International Convention of the Elimination of All Forms of Racial Discrimination - International Covenant on Civil and Political Rights - International Covenant on Economic, Social and Cultural Rights - Convention on the Elimination of All Forms of Discrimination against Women - Convention on the Rights of Child - Convention against Torture or Other Cruel, Inhuman or Degrading Treatment and Punishment	**x**

			- Convention on the Rights of Persons with Disabilities Moreover, the Human Rights are protected by the Ministry of Human and Minority Rights, especially migration groups and displaced persons. During the Project, the local governance will ensure that all implementations, constructions and programs will reflect human rights standards (especially concerning the reflection of the human rights in the Resettlement Plan). In addition, the General Environmental and Social Management System certifies existing policies in intern of the SPV participants concerning the Protection of the Human rights (ex: ITOCHU corporate philosophy centred on preventing human rights issues, respect and conservation of the human rights, Suez Ethic Charter and HR Suez HR Policy as well, …)	
2. Gender Equality and Women's Rights	**Is there a likelihood that the proposed Project would expose women and girls to further risks or hazards?**	**Potentially**	Gender-based violence: Construction workers are predominantly young males. Those who are away from home on the construction job and separated from their families and outside their normal sphere of social control. It cannot be excluded that in such circumstances, such factors could potentially lead to inappropriate and criminal behaviour, such as sexual harassment of women and girls, exploitative sexual relations, and illicit sexual relations with minors from the local community.	The company will refine and adopt the human resources (HR) policy and procedures of Suez to ensure the coverage of, several HR requirements: including (vi) commitment to apply zero tolerance for any proven case of gender based sexual or physical violence and workplace harassment; This issue will be addressed in particular under the "workers code of conduct"
	Is there a possibility that the Project might reduce or put at	**No**	The Project doesn't involve any obstacles to entitlements or resources. In contrary, it potentially means access to new benefits:	**x**

	risk womens's access or control of resources, entitlements and benefits?		affordable energy, jobs and growing buying power.	
	Is there a possibility that the Project can adversely affect men or women in marginalised or vulnerable communities?			Adopt a gender-sensitive approach to the management of environmental and social impacts that takes into account the rights and interests of women and girls, men and boys, including specific attention to the differentiated burden of impacts that women and girls might face.
	Is there a possibility that the project might not take into account gender roles and the abilities of women or men to participate in decisions of the project activities?	**No**	The SPV Board governing the Project include a woman, including in all project decisions	**x**
	Does the Project take into account gender roles and the abilities of women or men to benefit from the Project's activities?	**No**	The creation of employment opportunities there is an opportunity to increase the number of women who will be employed on construction phase related jobs, which means a positive impact. ⇨ Project opportunities	**x**
	Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full participation in design?	**Potentially**	The jobs proposed could be strongly categorized as "men jobs".	Encourage contractors to hire women, i.e. consider suitably qualified and experienced woman applicant. Especially in the Administration, Engineering, Supervision, or similar. Give particular attention to vulnerable groups, including women and minorities, who may require special assistance and whose participation should be vigilantly promoted.

	Does the Project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging other activities?	**No**	The Project doesn't imply any added responsibilities, especially concentred on women. The Project only mean potential new jobs for women.	x
	Would the Project potentially limit women's ability to use, develop, and protect natural resources, taking into account different roles and priorities of women and men in accessing and managing environmental goods and services?	**No**	The project doesn't imply any barriers concerning the women ability to protect natural resources. Both men and women manage the environmental issues linked with the project (SPV team, workers, …)	x
3. Community Health, Safety and Working Conditions	**x**	**Potentially**	Concerning the workers safety and health: Community health and safety issues related to the construction of the Vinča project may include emissions from the solid waste and construction site issues which are addressed in the General EHS Guidelines. Prolonged exposure to waste materials and airborne particulates represents an occupational risk hazard and could potentially have a negative impact on the health of employees. Furthermore, increase in traffic (bringing equipment and materials to the site) could lead to more accidents in the local communities and reduced quality of life. The impact is mostly expectable on the inhabitants who live in the settlements, or their parts, near to the project location.	Concerning the workers safety and health: The contractor should provide workers with a safe and healthy workplace as much as possible, considering inherent risks in its sector and specific classes of hazards that may be present. In the initial phase, prepare a design of preparatory works with a mandatory section relating to fire protection (fire protection design) and occupational health and safety measures. Furthermore, the following prevention actions must be done: -Ban the personnel under the influence of alcohol, medicines and drugs from entering the landfill, -Define transport routes and set up appropriate signs,

			Generally, the construction of the project may imply specific impacts on the workforce related to: -Occupational health and safety: falls, electrocution, injuries, exposure to high levels of noise and dust, exposure to toxic substances, collapse of trench walls, weather related risks (working under too low or too high temperatures), etc. -On and off-site conditions: waste management, hygiene, food supply, security, etc.; -Worker's rights, rules and obligations; -Employment standards Concerning the community health: The community could be displaced, new workers will work on the site, potentially bringing diseases. The presence of hazardous wastes could be a danger for the local inhabitants, whose livehoods are on the border of the landfill.	-Limit the vehicle speed on the main traffic routes to maximum 40 km/h, -Ban digging through the waste, -Properly train the employees working in the marked (active) area and provide them with the necessary protective equipment (overalls, helmet, protective gloves, traffic safety vest and safety steel, toe boots), - Conduct periodic inspections of the conditions of the working environment, work equipment and machinery, as well as medical examinations of workers. It is necessary to keep a record of the inspections, -Regularly carry out disinfection and rat extermination. Ensure an Emergency Preparedness and Response Plan + Fire Protection Project. A basic occupational training program and specialty courses should be provided, as needed, to ensure that workers are trained to the specific hazards of individual work assignments. The training should adequately cover: -Knowledge of materials, equipment, and tools (e.g. heavy machinery) -Hazard awareness (known site-specific hazards) -Potential risks to health -Safe work practices (precautions to prevent exposure, hygiene requirements (appropriate disinfectants and means for maintaining personal hygiene of workers), wearing and use of personal protective

				equipment (PPE) and clothing, working at extreme temperatures, working with chemicals, working in conditions of increased noise levels etc.) Additionally, to PPE, appropriate individual gas detectors should be deployed and specific equipment (excavator, trucks...) exposed to high levels of particulates or toxic gas should be protected with filter pressurization systems. -Appropriate response to operation extremes, incidents and accidents -Emergency procedures for fire, evacuation, and natural disaster Workers with rescue and first-aid duties should receive dedicated training so as not to inadvertently aggravate exposures and health hazards to themselves or their co-worker. Through appropriate contract specifications and monitoring, the employer should ensure that service providers, as well as contracted and subcontracted labor, are trained adequately before assignments begin. Concerning the community health: Implementation of Resettlement Plan and Livelihood Restoration Action Plan (obligation of the City of Belgrade). Also as a part of Environmental and Social management Plan, BEO ČISTA ENERGIJA D.O.O. BEOGRAD Has developed Community Health And Safety Management Plan identifying Potential Impacts and

				Risks, Mitigation measures, Monitoring, Reporting and Training. Cooperate and coordinate with local health, safety and security facilities. Develop and implement a health and safety program for workers and the public, addressing all safety issues identified in the assessment and all applicable safety standards. Disclose relevant project- related information to enable the stakeholders and local communities to understand these risks and potential impacts, as well as proposed prevention, mitigation and emergency response measures. Provide educational material and increase awareness to avoid or minimize transmission of communicable diseases that may be associated with the influx of temporary and/or permanent project workers (for community and workers).
4.1. Cultural Heritage, Indigenous Peoples, Displacement and Resettlement Sites of Cultural and Historical Heritage	**Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture?**	**Yes**	1 Site, which is part of Frontiers of the Roman Empire which is listed on the UNESCO tentative list (see Annexe D-b) The city of Belgrade, with its surroundings, is the cultural center of the Republic of Serbia. Within the administrative area of Belgrade, which includes the area of Grocka municipality, there are about 350 protected immovable cultural goods. In addition, there are numerous cultural heritage sites at lower levels of protection. The highest concentration of cultural goods is in the	During the design phase, obtain the conditions from the competent institution for cultural heritage protection. In all following phases of project development, adhere to the demands and guidelines of the competent institution for cultural heritage protection. Respect of the EBRD Performance Requirements PR8: Cultural Heritage support the protection and conservation of cultural heritage;

			central part of Belgrade and their number decreases towards the peripheral areas Presence of the archaeological site Belo Brdo in Vinča: -a cultural heritage -archaeological site that has the status of significant importance for the Republic of Serbia (Decision of the Bureau No. 653/5 from 10 November 1965, Cultural resource of extraordinary importance, Decision, "Off. Gazette of the SRS" No. 14/79) The Monastery of Holy Archbishop Stephan (Slanci Monastery) is located 1.2 km north of the existing landfill site. Within the boundaries of the plan, there is a registered archaeological site “Ošlja ne”, defined as the cultural property, enjoying preliminary protection under the Cultural Property Act.	-adopt the mitigation hierarchy approach to protect cultural heritage from adverse impacts arising from the project; -promote the equitable sharing of benefits from the use of cultural heritage in business Activities, -promote the awareness and appreciation of cultural heritage where possible. For the purpose of testing and eventual recording of potential new, hitherto unexplored archaeological remains in the exploration area, geophysical examination was carried out in the Vinča landfill zone in the period from February 9, 2017 to March 5, 2017, by the company Tehnohidrosfera d.o.o. from Beočin. The objectives of the proposed geophysical examination were the detection of potential archaeological objects at sites of planned construction works in the area of the landfill considering the closeness of the archaeological sites of Vinča and Starčevo, and the formation of a detailed orthophoto and 3D models of the wider landfill zone. In further stages of the project development, it will be necessary to comply with the provisions of the competent Ministry. Accordingly, the Ministry will prescribe the required research if it deems necessary. It is to be expected that preliminary archaeological research will be provided on the eastern part of the landfill. This will establish the scope of the archaeological site, if it exists within the project borders.

				The Chance find Procedure has been established and distributed to All Contractors. The constant supervision of Archaeologist from the Belgrade Institute for |Protection of Monuments is insured
4.2. Cultural Heritage, Indigenous Peoples, Displacement and Resettlement Forced Eviction and Displacement	**Does the Project require or cause the physical or economic relocation of peoples?**	**Yes**	Roma's families Roma's families settlement located at the northern part of the Landfill complex are residing there and working on the landfill. They are collecting, classifying and selling different waste materials from the landfill to recycling companies having their offices at the landfill. Due to the project implementation, they need to be physically displaced, to free up the space and build designed facilities i.e. utilize the land for intended purpose. General increased pressure on accommodations and rents Depending on the project worker income and the form of the accommodation provided, there may be increased demand for accommodations, which again may lead to price hikes and crowding out of local residents. Displacements 17 households living in the informal settlement Vinča on the territory of the landfill will be physically displaced.	The City of Belgrade has created a Resettlement Plan (RAP). The objective of the Resettlement Plan is to: -Ensure a comprehensive approach to the families, subjects to resettlement. -Restoration an improvement of living conditions for resettled families i.e. provision of adequate accommodation in accordance with human rights standards and Serbian laws is the main achievement foreseen by the RAP Resettlement of the families will be conducted in compliance with the national legislation, international standards and the Resettlement Plan, fully reflecting human rights standards, considering the fact that these families can't be resettled by applying provisions of the Law on Expropriation („Official Gazette of RS", no. 53/95, 23/01, (CC) and 20/09), because of the type of dwellings they have on this location (shacks, etc.) The stakeholder consultation has included all these groups, in order to discuss the whole linked issues.

4.3. Cultural Heritage, Indigenous Peoples, Displacement and Resettlement Land Tenure and other rights	Does the Project require any change to land tenure arrangements and/or other rights?	Yes	Owners of land (individuals, legal entities, local administration) acquired for the Project, in the metropolitan municipalities Grocka (Vinča cadastral municipality), Zvezdara (Mali Mokri Lug cadastral municipality) and Palilula (Slanci cadastral municipality). + Users of land acquired for the Project, under formal arrangements (rent contracts) or informal use. ⇨ These persons will be affected by land acquisition for the expansion of the Vinca landfill.	Privately owned plots of land are being acquired by the City of Belgrade through expropriation. There are two main stages of expropriation. In the first stage, (co)owners of affected plots (as well as other interested stakeholders, i.e. users of affected land) are invited to a hearing where they are asked if they agree with expropriation. In the second stage, owners of affected land plots are offered compensation for their affected land and other affected assets. In this stage, prices of land are requested from the Tax Administration (determined based on comparable registered recent sale purchase agreements in the vicinity of the affected area), while court certified valuators are sent to the field to evaluate and cost other assets (in the case of this Project, fruit trees). Affected owners may accept, after which compensation is paid to their bank account. If they do not agree with the offered compensation amount for land or other assets, they may turn to the courts, first to the basic court, then, upon appeal, to the higher court and finally the highest court of appeal, the Supreme Court of Cassation. Courts hire new certified valuators to re-evaluate the affected land and assets The BEO ČISTA ENERGIJA D.O.O. BEOGRAD has appointed Consultant to monitor: Appoint an independent external consultant to conduct periodic evaluation of the resettlement process along with a completion audit at the end of the process to verify the effectiveness of the implemented measures. Indicators for the evaluation should cover both outputs number of

				processed cases, compensation received, grievances processed and similar) and outcomes participation in the consultation process, impact of compensation on households and living arrangements, ability/success in restoring livelihood incomes following expropriation, etc.)
4.4. Cultural Heritage, Indigenous Peoples, Displacement and Resettlement Indigenous Peoples	Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous people?	No	No indigenous people are present in the project area	x
5. Corruption	x	No	Minimal risk regarding the construction of the SPV and the national level risk.	x
6.1. Economic Impacts – Labour Rights	x	Potentially	The Labour Rights are strong framed by the national Law, the Serbian Ministry and the international conventions that Serbia ratified (Labour Inspection Convention, Forced Labour Convention, International Labour Standards, Labour Clauses Convention). But the structure of the project, especially the presence of displaced population the arrival of new workers and the creation of jobs linked with waste management implies some special equipment and safety issues, working agreements issues, and migrants working conditions issues.	The contractor should provide workers with a safe and healthy workplace as much as possible, considering inherent risks in its sector and specific classes of hazards that may be present. Identify the employment of migrant workers and ensure that their treatment is not less favourable than the one of non-migrant workers undertaking similar functions. Encourage contractors to hire local workforce (or existing workforce if possible), i.e. give preference to suitably qualified and experienced applicants from the local community. Implement transparent and fair recruitment procedures
6.2. **Economic Impacts** – Negative	x	Potentially	The ESIA study demonstrates that there would be more positive impacts.	Livelihood Restoration Plan as the part of the RAP study details the measures and roles of different institutions that will be engaged to

Economic Consequences			"Depending on the business savy and capabilities of the local population, but also depending on their interest and cooperation, local companies will likely have an opportunity to offer their services or goods to the beneficiary and/or selected contractor, which could have a positive impact on the local economy and in general on the resident's perception of the project. This preconstruction activities will generate additional job opportunities and activities in the surrounding region (the cumulative effect)" But The project will also affect the livelihoods of waste pickers and their households, who will no longer be able to continue their engagement in this activity once the remediation of the existing landfill commences and new landfill starts its operation.	provide alternative jobs and facilitate livelihood restoration and wellbeing of their households The waste pickers were consulted: every waste picker was invited to attend meetings with the Secretariat where these issues were discussed. Implementation of Resettlement Plan and Livelihood Restoration Action Plan Provision of information and support to interested waste pickers to apply for other employment opportunities created as part of the project, including construction phase related opportunities. Provision of timely information to waste pickers on the expected timeline of the project phases.
7.1. Climate and Energy – Emissions	Will the Project include greenhouse gas emissions over the Baseline Scenario?	No concern	See the methodological part of the PDD The project will have a positive impact on greenhouse gas emissions thanks to the electricity and heat production and injection in the Serbian network (with a positive contribution due to the CO2 emissions of the actual mix of Serbian electricity production), and the major reduction of CO2 emissions from the old landfill. The huge continuous improvement in GHG emissions (due to the remediation of the landfill, the shift to more emission controlled processes and the generation of heat and power) will lead to more than 11.5 million of	x

			CO2 tons spared over the global period 2025- 2046.	
7.2. Climate and Energy – Energy Supply	Will the Project use energy from local grid or power supply or fuel resources that provides for other local users?	No	The project represents an additional source of energy to the local grid of Belgrade.	x
8.1. **Water** – Impact on natural Water Patterns/ Flows	Will the Project affect natural or pre-existing pattern of watercourses/ flows?	Potentially	The project area is located outside both water protection zones (water protection areas are those in which special conditions and prohibitions are in place to protect potable water from harmful influences) and flood areas which makes this location suitable for all activities that are part of the project. (Annexe D-a) Considering the location of the EfW, away from surface waters and flood zones as well as relatively low groundwater level (for the observed period from 25/10/2017 to 30/3/2018) at the EfW construction site, no adverse impacts on the surrounding surface watercourses and groundwater are likely during normal construction operations. But the emergence of groundwater was registered on the ground surface around the perimeter of the existing landfill. Construction and remediation of the landfill can have a negative impact on the waters in the eventuality of an accident involving spilling or leakage of oils and lubricants from the vehicles and construction machinery into the soil and subsoil.	On all plateaus and places where leakage of fluids is expected (diesel fuel, oil, chemicals, etc.), install suitable drains with drainage treatment in the sedimentation tank and/or separator of grease and oil, in accordance with the design solutions. Store hazardous substances needed for the operation of machinery in dedicated storage areas (hazardous waste cabinet, spillage retention tray, etc.) to prevent any leakage in accordance with the regulations. Fuel for construction machinery needs to be stored in tanks with oil bund. By the EfW; Provide buried double walled tanks for chemicals. Possible negative impacts on the water during construction will be prevented by the proper organization of the construction site and by complying with protection measures.

8.2. **Water** – Erosion or Water Body instability	Could the Project directly or indirectly cause additional erosion/ water body instability or disrupt the natural pattern of erosion?	Potentially	According to the data of the Landslide Cadaster in Belgrade, unstable slopes, including areas affected by active, stabilized and recovered landslides were found in the hill areas and hill terrains south of the Sava and Danube rivers (in the narrower city area, at the right Danube slope (Grocka) and on the valley sides of Sava and Danube right tributaries). According to the above, soil erosion is expected to the north-east and east of the existing landfill, on the erosive area.	Regular inspections of the surface water drainage system are necessary to ensure that surface water runoff is not accumulating on the site. Provide adequate adsorbents to collect spilled liquids (petroleum products, chemicals, etc.). Provide adequate daily covering of deposited waste to prevent the dispersal of light fractions from the body of the landfill (dust, paper, bags, etc.) and to reduce rainfall infiltration. Excess soil from excavation works should be reused on site All sediment and erosion control measures must be implemented. Designed methods of constructing slopes with respect to the stability calculation will be used in order to prevent from the penetration of waste out of the body of the landfill and from the erosion of the protective slopes of the landfill. During the operational phase => Regularly control protective slopes of the body of landfill to prevent from waste erosion and landslides.
	Is the Project's area of influence susceptible to excessive erosion or body instability	No	x	x

9.1. **Environment, ecology and land use** – Landscape Modification and Soil	Does the Project involve the use of land and soil for production of crops or other products?	Potentially	Deterioration of soil characteristics during excavation. Improper deposition (disposal) of excavated material and soil on the project site. Soil compacting caused by frequent passes of heavy machinery	Organize surface area for deposition of excavated material and soil within the building site. Surplus material planned to be re-used will be stored on the landfill designated by the Engineer, at the predetermined locations. Potentially contaminated soil must be stockpiled separately from the clean soil. All vehicle and machinery movements have to be organized and controlled within the construction site, with minimal use of green area.
9.2. Environment, ecology and land use – genetic resources	Could the Project be negatively impacted by the use of genetically modified organisms or GMOs?	No	No use of GMOs.	x
9.3. Environment, ecology and land use – Release of pollutants	Could the Project potentially result in the release of pollutants to the environment?	Yes	The Project implies hazardous and non-hazardous wastes, which means pollutants.	Respect of the Air Quality Standard (ARQs) established by the European Union. Monitoring on N02 and PM10 pollutants. NOx emission reduction is controlled with the Selective Non- Catalytic Reduction (SNCR) Bag filter is used for primary removal of flue gas pollutant particles. As part of ESMP The Waste Management Plan for Construction phase has been developed.

9.4. **Environment, ecology and land use** – Hazardous and non-hazardous waste	Will the Project involve the manufacture, trade, release, and/or use of hazardous and non-hazardous chemicals or materials?	Yes	The Project involves the use of non-hazardous waste disposed in the MSW landfill, but no waste generation (treatment of already produced waste). In fact, in the future waste treatment facility, only non-hazardous waste will be treated. ⇨ In the EfW plant, there will be no hazardous substances in quantities which would classify the plant as a plant of high or increased risk of a major industrial failure. But waste containing asbestos is hazardous waste from construction and demolition requiring special treatment directly on the project and have one or more hazardous properties that make it hazardous waste (Article 5 of the Serbian Law on Waste Management). Furthermore, during the construction, different types of hazardous and non-hazardous waste will be handled (bricks, wood from planking, metals, ...)	The operator will maintain hazardous substances management so as not to classify the facility as a plant of increased or high risk of a major industrial failure. According to Article 54 of the Law on Waste Management, waste containing asbestos should be separately collected, packaged, stored and disposed of on a landfill in a clearly designated place for the disposal of waste containing asbestos The remainder of non-hazardous and hazardous waste must be disposed through authorized legal entities. Store hazardous substances needed for the operation of machinery in dedicated storage areas (hazardous waste cabinet, spillage retention tray, etc.) to prevent any leakage in accordance with the regulations. Prevent or minimize the potential for community exposure to hazardous materials. All vessels that may contain substances that are hazardous as a result of chemical or toxicological properties, or temperature or pressure, should be labelled as to the contents and hazard, or appropriately color coded. As a part of ESMP the Asbestos Management Plan has been prepared
9.5. **Environment, ecology and land use** – Pesticides and Fertilizers	Will the Project involve the application of pesticides/ fertilizers?	No	No agricultural project	x

9.6. Environment, ecology and land use – Harvesting of forests	Will the Project involve the harvesting of forests?	Yes (but small risks)	Natural habitat types (shrubs, mosaics of shrubs and grasslands, oak forests) are abundantly distributed outside of the planed project area. Their loss within the planed project will not endanger their existence and favorable status in the wider area. Simply 5 ha of forests will be lost on the existing landscape structure of the project.	Use the surrounding green space as little as possible. Restore possibly damaged areas. ⇨ Part of natural succession areas is replaced by a green belt within the project boundary). The environmental fee is payed for cutting the trees. The old landfill will be covered with new grass
9.7. Environment, ecology and land use – Food	Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	No	No food included in the project.	x
9.8. Environment, ecology and land use – Animal husbandry	Will the Project involve animal husbandry?	No	x	x
9.9. **Environment, ecology and land use –** High Conservation Value Areas and Critical Habitats	Does the Project physically affect or alter largely intact or High Conservation Value ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?	Potentially	The ESIA study of the project showed that no impacts were expected on protected areas (according to Serbian and international legal frameworks). But the project implies a local and permanent conversion of currently present habitats. Furthermore, no IPA, PBA or Ramsar sites are located in the vicinity (within 5 km) of the planned project area.	Natural vegetation cover must be preserved wherever is possible, especially by using the minimal working/manipulation area. For planting grassland at old landfill site (after its closure), use a mixture of seeds of grasses, and other locally present plants.

9.10. Environment, ecology and land use – Endangered Species	Are they any endangered species identified as potentially being present within the Project Boundary?	Yes	Expected impacts on the flora: -Removal of protected plant species true comfrey and littleleaf linden. -Removal of protected plant species midland hawthorn and common hawthorn -Encountering of other protected flora and fauna species Presence of endangered species: -The mammals found, wild boar and beech marten are protected species according to the national legislation. Strictly protected insect species is the pine ladybird and also two species of butterflies that are listed as vulnerable according to the Serbian Red List: Southern frestoon and large copper. A number of protected and strictly protected species were observed within the planned project area during the bird survey.	Individuals of protected species true comfrey and littleleaf linden should be relocated to a suitable location or individuals of these species (from greeneries) can be used in area landscaping Individuals of protected species midland hawthorn and common hawthorn are to be used in greenbelt formation During execution of works, in the case of encountering strictly protected species, all necessary protective measures have to be taken. Relevant authorities (Institute for Nature Conservation of Serbia) have to be informed and actions taken according to their instructions.
	Does the Project potentially impact other areas where endangered species may be present through transboundary affects?	No	The ESIA report provides no accuracies.	x

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from stakeholders

>> (Describe how stakeholder consultation was conducted in accordance with GS4GG Stakeholder Procedure Requirements and Guidelines.)

The Environmental and Social Impact Assessment (ESIA) Consultation Process was conducted in a way as to comply with the Lenders (EBRD and IFC) requirements and guidelines on the matter and under the scrutiny of both the Lenders environmental and social expert and an Independent Environmental and Social (IES) Consultant. Such International Financial Institution requirements and guidelines are in line with the GS4GG Stakeholder Procedure Requirements and Guidelines.

Step 1- Prepare - Stakeholder Identification

The GG4G requirements concerning the Stakeholders consultation require the following elements:

(a) The Project Developer has to notify the relevant government officials/ departments

This step was followed. A map of the relevant officials was built, and the relevant were invited.

(b) The Project Developer must invite all Stakeholders who hold land tenure for any area directly affected by the implementation of the Project.

An analyse of the touched population has been developed in the ESIA Report. In this context, all identified inhabitants of the area have been invited, as well as were the Roma populations. Furthermore, ecological interests of the inhabitants were represented by NGOs and relevant representation groups (see Section C, Stakeholder Consultation Report).

(c) The Project Developer should have the relevant capacities and appropriate experience to organize the consultation.

The whole consultation process was held by the EGIS group in the context of the ESIA Consultation Process. EGIS is specialized in this kind of procedures and consultation process, which assured the professionalism of the approach.

Invitations send

In accordance with the point 4 of the GS4GG Stakeholder consultation & engagement procedure, invitations were send in prior preparation. In this context, individuals (though e-mails) and public invitations (newspaper) were send (see Stakeholder Consultation Report).

In the invitations, as required in the GS4GG Stakeholder consultation & engagement procedure, the agenda of the meetings and the objectives of the consultation were presented and transmitted.

In addition, the invitations included different types of stakeholders : University, NGOs, associations, and political representatives or organizations. All stakeholders were welcomed, and the BEO ČISTA ENERGIJA D.O.O. BEOGRAD did not deny a stakeholder access to the consultation.

It was decided to send the invitations per e-mail and newspaper in order to reach the largest public as possible.

The local population of Vinca has access to digital tools, which made e-mails the most relevant way to send the invitations. Nevertheless, to reach the largest pospulation as possible, the consultation communication was adapted and published in the newspaper.

Step 2- Hold a consultation meeting

The GS4GG Requirements are the following:

- Organize the schedule so that it does not conflict with stakeholder work arrangements and do not require them to travel so far.

Two different consultations have been organized with the goal of reaching the largest public as possible, including women. The ESIA Public Consultation meetings were held on 20/12/2018 and 21/12/2018. This was announced by/in the local media but also in public places in the community and was held on 20/12/2018 in the Municipality of Grocka targeting local communities.

In addition, the first consultation was held at 17h, which is convenient for people who were coming after work, and the second one was held at 10h, which was convenient, especcialy for women, as at this time children usually are in kindergarden/school in Serbia.

In this context working women as family mothers were able to attend the consultation meetings.

- Make sure all participants are able to understand what is said

The consultation was held in English, but translated in Serbian, which most of the participants speak, with the goal of reaching the local stakeholders,

- Explain the Project

The Annex B1-iii presents the consultation support document, including the presentation of the Project, which was presented to the public.

- Presentation and Blind test about the potential SDG impacts

According to Stakeholder Consultation Report templates updates (14/10/2020), providing the Blind Test during the Stakeholder Consultation is now non-mandatory[16].

- Gold Standard Recommendations about the Agenda Setting

The Agenda of the Consultation respects the Gold Standard recommendations, including a general presentation of the project (see Annex B1-iii), presentation of the projects participants, explanation of the project and its implications. The presented Agenda includes the following elements:

- General Project Presentation ;
- Environmental impact and mitigation measures ;
- Social impact and mitigation measures ;
- Land Acquisition Process ;
- Resettlement Action Plan (RAP) ;
- Environmental aspects having a Social Impact on the project ;
- Next Steps ;
- Stakeholder Engagement Plan
- Grievance Mechanism
- Closure of the meeting

Discussion on monitoring sustainable development is not included in the Agenda. However, according to Stakeholder Consultation Report templates updates (14/10/2020), providing the Sustainable Development Assessment during the Stakeholder Consultation is now non-mandatory.

- Arrange time for people to ask any questions to further clarify or understand the Project idea

Consultation held on the 20th of December 2018:

After the presentation, the BEO ČISTA ENERGIJA D.O.O. BEOGRAD's representant informed the concerned public that all comments or enquiries relating to Project activities can be directed to the City Secretariat for Environmental Protection and the BEO ČISTA ENERGIJA D.O.O. BEOGRAD. He also encouraged dialogue between the concerned public and the representatives of BEO ČISTA ENERGIJA D.O.O. BEOGRAD and the City of Belgrade.

Consultation held on the 21th of December 2018:

[16] https://globalgoals.goldstandard.org/rule-updates/

There were no questions posed to the presented topic after the BEO ČISTA ENERGIJA D.O.O. BEOGRAD's representant opened the discussion. He reached out once again to the present representatives of the NGOs inviting them to ask their questions and express their opinions.

Since it was established that there are no questions relating the subject presentation currently, it was mentioned that if any questions may arise later, they can be sent online and the answers to them will be provided as soon as possible

- Discussion on monitoring sustainable development

According to Stakeholder Consultation Report templates updates (14/10/2020), providing the Sustainable Development Assessment during the Stakeholder Consultation is now non-mandatory.

Step 3 -Documents

- Closure of the meeting: Invite Stakeholders to complete an evaluation form
    -).
    - The evaluation forms of the ESIA meetings are presented in the new version of the SCR (Section C.1.4.),as well as in the Annex F of the new version of the SCR.
    -
- Invite the participants to full-in the participants list
    - This list has been filled-in by the participants. The listing is in the Minutes of Meeting of the Stakeholder Consultation present in Annex A of the new version of the SCR.
    -

Step 4 – Feedback

The Feedback round started on the 12th of October 2018 and ended 11 months later, on the 18th September 2019.

The ESIA Public consultation was widely opened to all interested parties and the invitation published in the media gave clear indications on:

- Where the ESIA documentations could be consulted namely the EBRD and IFC website pages dedicated to the Vinca Project ;
- How remarks and suggestions on the project could be made directly to City of Belgrade:

"Remarks and suggestion in regard to the (ESIA) document shall be submitted in writing to Secretariat for Environmental Protection to the following internet address: beoeko@beograd.gov.rs".

During the consultation presentation, special attention was taken to remind attendees that comments or enquiries relating to Project activities should be directed to:

City Secretariat for Environmental Protection	BEO ČISTA ENERGIJA D.O.O. BEOGRAD
Contact Person: Tatjana Živković Address: Belgrade, 43-45, 27. Marta Street Telephone number: +381 11 330 9611 Email address: tatjana.zivkovic@beograd.gov.rs	Managing Director Assistant Address: Tosin bunar 272v, 11070 Belgrade, Serbia Telephone number: +381 11 715 4885 Email address: bce@bcenergy.rs

Therefore, allowing interested parties to make comments by phone or by e-mail either directly with the City of Belgrade or with the Project Developer.

Finally, the dedicated EBRD webpage was providing details on the ESIA and Resettlement Action Plan and the full availability at physical location with the Project Developer in its New Belgrade main office and with the Secretariat for communal and housing affairs located in Belgrade City centre.

The EBRD webpage was also providing full contact details, phone and e-mail, to address environmental or social enquiries directly to the Project Developer.

Nearly 150 written comments / questions from several NGOs extremely detailed were received by the EBRD. All the questions were addressed jointly by the Project developer and the City of Belgrade and the EBRD shared those answers/clarifications directly with the NGOs while in parallel a revised ESIA public consultation was made available again on their website on 10/09/2019.

E.2. Summary of comments received

>> (Provide a summary of key comments received during the consultation process.)

The ESIA report is a very detailed document (more than 900 pages long) covering a significant number of facilities, technologies, applicable regulations and environmental / social impacts.

The number of comments received was therefore quite important with an extremely wild range in the level of details entered into and the magnitude of the project social/environmental impacts in relation to those comments.

The large majority of the comments were seeking clarification on the environmental and social baseline data and compliance of the project with the applicable local Serbian regulation / EU regulation or International Standards.

More specifically several NGOs (Ne Davimo Beograd / A11 / Bankwatch) sent jointly to EBRD an extensive list of questions with comments specially focusing on the Energy From Waste Facility environmental impacts including in particular:

- Request for clarification on where the solidified filter residues and fly ash would be disposed of ;
- Clarification from the Project Developer on its commitments to monitor emissions to air apart from SO2, NOx and dust. The NGOs making the comment that all the substances limited by the draft Best Available Techniques reference document (BREF) for waste incineration 2017 ;
- Concern expressed on the fact that “Serbia does not have, as far as we are aware, any laboratory that can analyse dioxin and furan emissions”

Comment that the emissions to air do not appear to be in line with the 2017 draft BREF. The NGOs making the comment that “There is no point in building a facility which is already outdated at the time it is designed. Expected mercury emissions to air seem to be missing altogether”.

E.3. Report on consideration of comments received

All the comments on the project or the ESIA report received directly by BEO ČISTA ENERGIJA D.O.O. BEOGRAD/City of Belgrade from individual or NGOs were answered directly in writing.

The above-mentioned comments received on the ESIA report jointly from Ne Davimo Beograd / A11 / Bankwatch by EBRD were all answered in writing to EBRD and to these NGOs.

In addition, as foreseen under the PPP Contract provisions, an Independent Environmental and Social (IES) Consultant was appointed on the project by BEO ČISTA ENERGIJA D.O.O. BEOGRAD and the City and endorsed by the project Lenders (EBRD and IFC). The IES consultant reviewed the NGOs comments/ BEO ČISTA ENERGIJA D.O.O. BEOGRAD answers and followings his recommendation where deemed necessary the ESIA report was amended and the ESIA revised version published again on EBRD and IFC websites.

In the project course and in particular during the Detailed Plan of Regulation (DPR) amendment process (including the DPR Public Insight) and the ESIA Public Consultation, the design of the project or the monitoring plan of the project were amended to further mitigate the potential negative impacts of the Project. Some short illustrations are given below:

- Groundwater Monitoring
- Following review and comments on the Site Condition – Ground Water Monitoring Protocol (basis of the ESIA report groundwater monitoring plan) from the Lenders’ environmental experts, the initial number of groundwater monitoring piezometers was significantly increased and their spatial distribution improved.Green Belt
    - The green belt around the project site boundary was initially foreseen as a simple 10m wide grass area and following stakeholder comments was improved into a 20m wide protective green belt more contributive to the mitigation measure to several impacts (air quality, dust, biodiversity, landscape).

- The changes in the green belt design are derived from the consultation with Local Institutions (Serbian Institute for Nature Conservation, PE City Greenery Belgrade, City of Belgrade Secretariat for Environmental Protection) as part of the process for amending the Detailed Master Plan of Vinča Sanitary Landfill; those Local Institutions providing some general conditions regarding the green belt design.
- Based on those stakeholder comments, the ESIA elaborated more precise conditions to provide proper mitigation measures related to identified impacts which are described in section H.7. Green Belt and covers the following specific issues:

- Landscape improvement
- Dust barrier
- Additional barrier for plastic bags and similar
- Compensation for ecological species/habitats that will be destroyed due to the project
- Protection of sensitive areas

- Landfill Gas Facility (LFG)

At the time of the conceptual design stage, the design of the landfill gas facility was based on the following directive regarding measures to be implemented for reduction of air pollution:

- DIRECTIVE (EU) 2015/2193 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, of 25 November 2015, on the limitation of emissions of certain pollutants into the air from medium combustion plants.
  - Indeed, this regulation had been used in several projects in Serbia for the facilities of the same category.However, following consultation and comments from the City of Belgrade Secretariat for Environmental Protection) as part of the process for amending the Detailed Master Plan of Vinča Sanitary Landfill, more stringent requirements were adopted as prescribed under the Decree of the Republic of Serbia, the "Regulation on Limit Values of Air Pollutant from Combustion Plants" The RS Official Gazette "No. 5/2016".
  - As a consequence of such a change, and in order to achieve the much more stringent Emission Limits Values requirements, the LFG facility design was amended to include a SCR DeNOx Flue Gas Treatment at the exhaust of the Engines combined with continuous measurement of NOx concentrations for control of urea injection system.

  - Compliance with the New Waste Incineration BAT ConclusionsThe ESIA report was amended to clarify that the planned energy from waste facility incorporates technological solutions and design choices that have been made in order to allow the necessary adaptations to comply with the new BREF requirements as it may be transposed by the Government of Serbia within the limits set into the new BAT conclusions adopted at EU level."
  - In addition, the Environmental and Social Action Plan (ESAP) which is a binding document with the project Lenders has been amended to add the following addition commitments / clarifications:

- Review the requirements of the latest EU BREF document for waste incineration once it is finalized (final draft as of December 2018). Develop and implement a plan to ensure the project will operate in compliance with the revised BREF.

Plan to be developed within six months of the adoption of the revised BREF and implemented by the end of 2022.Finally, regarding the current situation that there are laboratories in Serbia that are accredited for sampling but not for determination of these compounds' concentrations into the gases:

- In line with regular practice here and in EU (representatives of cement industry in Serbia that use waste as alternative fuel also perform this practice), samples could be taken here and then sand to some accredited laboratory abroad that will perform analyses and give official report.

- This situation is not unusual in many countries and the practice within EU Member States to allow to send abroad samples for laboratory analysis is not specific to dioxin measurements but to all periodic measurements ;

- Nonetheless, the Project Developer is actively pursuing the identification of a local Serbian independent laboratory willing to obtain the necessary accreditation and we have received recently a letter of intent of such laboratory willing to:

    - “provide in the forthcoming period all the necessary steps and standards for initiating and introducing a method for testing dioxins and furans. This would entail accreditation of the method and extending the scope of the laboratory in this area. It is considered that this would be of interest for the laboratory business, as dioxins and furans are often found as environmental pollutants.”

Appendix 1. Contact information of project participants

Organization name	SAFEGE / SUEZ CONSULTING
Registration number with relevant authority	542 021 829 00107
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Country	France
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Fax	01 47 24 77 88
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Website	https://www.suez.com/fr
Contact person	Camille-Léa PASSERIN
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Salutation	Mrs
Last name	PASSERIN
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First name	Camille-Léa
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Organization name	BEO ČISTA ENERGIJA D.O.O. BEOGRAD
Registration number with relevant authority	Registration number 21319775 and Tax identification number 110224482
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Organization name	SUEZ VINCA OPERATOR D.O.O. BEOGRAD
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Appendix 2. Summary of post registration design changes

Not relevant.