Sustainability programme

30 September 2023

JOENSUU BIOCOAL

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Basic information about the document

Purpose	The purpose of the document is to describe the organisation's corporate responsibility and operations
Update frequency	As needed (assessed annually)
Approved	30 September 2023 / Joensuu Biohiili Oy Board of Directors and Executive Management Team
Applied	30 September 2023
Responsible organisation	Joensuu Biohiili Oy
Contact person	Tero Saarno, Iiro Tiilikainen, Essi Heikkinen firstname.lastname@taaleri.com

Version control

Approved	Applied	Changes made
30 September 2023	30 September 2023	30 September 2023 / Document created and approved
		15th of November 2023 / Minor updates on estimated employment impact

Basic information about the company

The company's highest decision-making body approved the sustainability programme on 30 September 2023. This is the first version of the sustainability programme. The programme will be assessed annually and updated as necessary.

Name and company form: Joensuu Biocoal Oy

Executive Management Team and Board of Directors:

- Iiro Tiilikainen (CEO)
- Tero Saarno (Chair of the Board of Directors)
- Pyry Lipiäinen (Member of the Board of Directors)
- Jorma Alanne (Member of the Board of Directors)

Organisation size and employees: At the initial stage, the organisation will directly employ approximately 1–2 people. The daily operation and maintenance of the plant has been outsourced to Savon Voima's electric and thermal power plant. In addition, Joensuu Biocoal will employ several dozen people indirectly, first during the construction phase of the plant and then during the operation. During the operation phase the indirect employment impact is derived through e.g., the maintenance, logistics, and sourcing operations. The plant's estimated employment impact during the construction phase is approximately 60 full-time equivalents. Once the plant is up and running, it is expected that the plant will employ around 10 people directly, and the indirect employment impact will be about 120 people.

Operations: Joensuu Biocoal Oy will build Europe's largest, industrial-scale production plant of torrefied biomass in Iiksenvaara, Joensuu, on the plot of Savon Voima's electric and thermal power plant. Initially, the plant will produce torrefied biomass primarily to replace coal as a raw material and energy source for industrial processes such as steel and cement production. In the future, however, other applications will include carbon sequestration via various biocoal uses, such as soil improvement and storm water filtration.

Stakeholders and value chain: The organisation's own direct operations are concentrated in Finland and Sweden. The value chain of the organisation consists of licensing and the procurement, preparation, torrefaction, cooling, processing, quality controlling, storiage, packaging and distribution of the biomass used by the plant, involving the partners used, the users of the final product, the processors of waste, the process development partners and the project sponsors. The plant's direct cooperation partners are identified as part of the description of the value chain and mainly operate in Europe, but they also have global operations. The customers targeted by the company operate in the cement-, lime-, and metal industries as well as in agriculture. Other key stakeholders include local and part-time residents, as well as the media.

Sustainability

Our vision is to empower a greener future and to be a pioneer in the sustainable biocoal production in Finland, and to drive the transition towards a circular and sustainable economy, reducing our reliance on finite fossil resources while minimizing the environmental impact.

Our mission is to revolutionize industrial processes by providing a renewable, sustainable, and eco-friendly substitute for hard-to-replace fossil raw materials. With a commitment to environmental sustainability, we harness sustainably sourced biomass resources to produce biocoal that serves as a low-carbon alternative for heavy process industries. Through innovation, collaboration, and responsible production, we strive to be a catalyst for positive change in industrial practices, promoting a more sustainable future for all.

Below, we describe our sustainability principles in our production and sourcing of raw material, as well as our impact on the environment and society.

Sustainability in production

Biocoal is torrefied forest biomass, which is a renewable energy and carbon source. Responsibility and sustainability are critical aspects of biomass processing and biocoal production. Biocoal enables the replacement of fossil coal in industrial processes where coal plays a critical role in the production of the final product. Biocoal is treated as a low-emission alternative to fossil fuel, as the amount of carbon released when burning biocoal is almost equal to the amount of carbon fixed by the biomass during its growth phase. Torrefied biomass is a potential solution for achieving industrial carbon neutrality. It can be used, for example, for energy production with existing equipment, without large investments. In the future, it will also open up new opportunities for fixing carbon from the atmosphere through the production of soil enhancers.

The biocoal production process uses electricity, small amounts of fuel oil (to start the process), water, and biomass (Figure 1). In its production, the plant will use renewable energy and, where possible, biofuels to minimise its climate impact. The side streams generated during the production process, such as combustible gases, dusts, raw material residues and heat can be reused in the production of biocoal, as well as in the electricity and heat production of the electric power plant of Savon Voima, which is the company operating the plant.

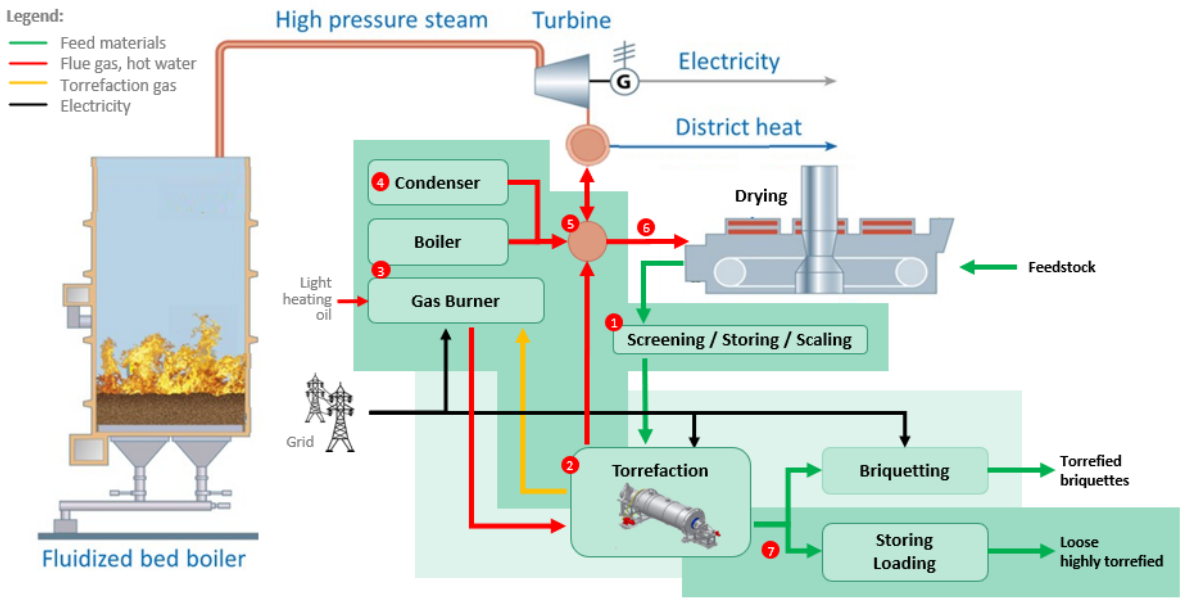

Figure 1. Biocoal production process

Joensuu Biocoal Oy produces torrefied biomass from domestic, certified biomass and aims to utilise in its production processes forest biomass side streams, such as bark and trees felled during the first thinning. The torrefaction process can be used to process raw material from material previously only used in energy production, and this processed raw material can then be used by energy-intensive industries. When utilising biomass, optimisation and efficiency of materials and production are of paramount importance. The aim is to maximise the energy content of biocoal and minimise the generation of side streams and waste, as well as the energy consumption of the process. This is ensured by the careful design and high-quality technology of the plant.

Sustainability in the sourcing of raw materials

Only biomass that meets the applicable sustainability criteria and has been certified with a sustainability scheme approved by the Energy Authority will be used in the production. The biomass used will be Finnish certified wood biomass. Biomass will not be imported from Russia, and wood biomass from biodiversity-sensitive areas will not be used in the production. We strive to maximise in the production the utilisation of side streams, such as bark and trees felled during first thinning. Itä-Suomen Biomassa Oy is responsible for the sourcing of biomass for the project. In addition, we are constantly exploring other possible uses for side streams and biomass sources as raw material for production, in order to reduce our impacts on nature caused by land use.

Environmental impacts

The planning and construction of the plant will follow the environmental permit method, which includes the assessment of sustainability risks related to the operations as well as the assessment of the environmental impacts of the operations. Implementing the operations does not require an environmental impact assessment. The identified significant risks will be taken into account in the development of operations through precautionary plans.

According to an assessment carried out by a third party, the operations of Joensuu Biocoal will not, during their lifecycle, cause significant harm to the environmental objectives of the EU Taxonomy. Based on this assessment and the calculations it contains, the company's climate impact is positive and thus contributes to the EU's climate change mitigation objective. In addition, Joensuu Biocoal is committed to the Net Zero Asset Managers (NZAM) initiative through Taaleri's ownership, which means that the company will align its emission reduction targets with the goals of the Paris Agreement, which in turn means that the company will seek to achieve net zero emissions in its direct and indirect greenhouse gas emissions by 2050 at the latest. In addition, the company will explore opportunities to reduce emissions from its logistics chain.

According to the assessment carried out, the plant's water use and wastewater management will have no impact on the water quality of the local water bodies. Once the wastewater has been filtrated at the plant, the wastewater will be directed to the existing Savon Voima water treatment infrastructure. In addition, no significant amounts of waste will be generated in the production, as the majority of side streams can be utilised either directly as part of the plant's own production processes or as part of Savon Voima's operations. The insignificant amount of process waste created will be processed and recycled appropriately, utilising Savon Voima's existing waste management procedures. Management plans will be made to manage wastewater and waste, as well as to manage accidents or exceptional situations.

According to the assessment made by the Centre for Economic Development, Transport and the Environment, the plant will not significantly increase pollution to air, water or soil. Air pollution is estimated to be low in the area and is not expected to have an impact on air quality. Under normal conditions, the operations of the plant will not cause emissions that affect the groundwater or soil.

The operations are not expected to have a significant negative impact on the restoration or protection of ecosystems. The operations are also not expected to have any significant direct negative impacts on biodiversity. The plant will be built in an existing production area, so its construction phase will not have any direct adverse impacts on the surrounding environment. However, the plant will in its production processes use forest biomass, which is linked to land use and forest management. The procurement of raw material, however, will comply with sustainability criteria aimed at minimising the impact on nature. The biomass used must be domestic and come from certified commercial forests. The origin of the biomass must be verifiable. In addition, the aim is to utilise forestry side streams that do not have other competing uses. The use of non-forest biomass side streams as raw material will also be actively investigated even before the start of operations.

Social responsibility

Initially, the organisation will directly employ approximately 1–2 people. The operation and maintenance of the plant has been outsourced to Savon Voima's electric and thermal power plant. According to Savon Voima's estimate, the Joensuu Biocoal plant can be successfully maintained with its current staff but, if this is not enough, only a small increase in the workforce will be needed. However, the plant will indirectly employ several dozen people during both the construction phase and the operational phase. During the latter, the employment impact comes mainly from the logistics and sourcing processes. The plant's estimated employment impact during construction is approximately 60 full-time equivalents. In the operational phase, the plant is expected to employ around 10 Savon Voima employees, and the indirect employment impact is expected to be approximately 120 people.

Our cooperation partner Savon Voima will be responsible for the operational activities of the plant as well as the daily environmental, health and safety issues. Thus, they will also be responsible for the training of employees. Savon Voima's existing processes, such as the introduction programme and on-the-job learning, will be utilised when training staff to operate the plant. The training will include both theoretical and practical training by the technology supplier. The know-how that Savon Voima's employees have concerning the pyrolysis process previously used in the area, will be utilised in the maintenance of the plant. In addition to relevant experience, Savon Voima has existing operating models, guidelines and occupational safety methods for carrying out comprehensive process risk assessments. These operating models will be integrated into Joensuu Biocoal's operations, and comprehensive risk assessments will be carried out before the start of operations to ensure occupational safety. The implementation of the operating models will be monitored through random audits.

Joensuu Biocoal is committed to complying with the minimum safeguards mentioned in the EU regulation (2019/2088 and 2020/852) in its operations. These include ensuring good governance, preventing bribery and corruption, adhering to competition laws and fair practices, complying with tax obligations and respecting human and labour rights. The company follows the UN Guiding Principles, the UN Global Compact, the

International Labour Organisation's Declaration on Fundamental Principles and Rights at Work (ILO's eight Core Conventions), and the OECD Guidelines for Multinational Enterprises. The company also strives to engage its key partners to commit to these principles. Joensuu Biocoal will examine the risks concerning human and labour rights related to its operations and value chain, and will actively cooperate with local actors and stakeholders to ensure that the plant is well received locally.

Compliance and regulation

The operating methods and values of Joensuu Biocoal Oy are guided by Taaleri's Code of Conduct and the sustainability principles of Taaleri Group and Taaleri Bioindustry. Joensuu Biocoal complies with good governance practices as well as applicable national, local and EU-level laws and regulations. Good governance practices are considered to include elements such as well-functioning administrative structures, the fostering of good relations with employees, rewarding of staff, compliance with tax regulations, compliance with competition law, and prevention of corruption and bribery.

Joensuu Biocoal has engaged and will engage its most significant partners in complying with its Code of Conduct. Alternatively, Joensuu Biocoal will at least ensure that its partners' own codes of conduct are in line with the company's own guidelines and ethical values. We select our partners carefully and do not collaborate or establish cooperative relationships with bodies that violate legislation or good governance practices.

We undertake to report financial and non-financial information and to develop appropriate processes to manage and document sustainability, good governance and minimum safeguards.

Key identified sustainability-related opportunities, strengths, challenges and weaknesses

Joensuu Biocoal was established to produce a bio-based solution to replace fossil raw materials and, where possible, virgin raw materials. This solution will then be used to replace coal and make industrial operations greening heavy process industries where this is challenging. The company's strength lies in its ability to utilise the side streams from its processes almost completely and in its access to existing infrastructure and its partnership with Savon Voima. The electrification of heat production is seen as a key opportunity for the company, as this will increase the opportunities to utilise sustainably produced biomass. In addition, the change in the sustainability of the construction industry and the increase in timber construction can provide new raw material side streams for biocoal production. Furthermore, the greening of polluting industries will increase the demand for biocoal and ensure a market for the product.

On the other hand, the company's key sustainability challenges and threats will initially be the need to utilise clean biomass and the possible regulatory restrictions on the use of forest biomass, the challenges in reducing the emissions from the logistics chain, the limited variation of the products produced by the plant, the fast development of alternative technologies, and the risks of the EU environmental policies failing.

The aim is to promote the opportunities and strengths included in the operations: by finding alternative biomass side streams and exploring the possibilities of utilising waste biomass as a raw material for production; by ensuring price competitiveness through

resource efficiency and optimisation of the company's own processes; and by exploring the possibility of closed-loop production processes and the commercialisation possibilities of the side streams generated therein. In addition, good governance, the alignment of values and rules, and consistent actions will contribute to responsible business operations and the successful maintenance of partnerships.

Measures to promote sustainability

Joensuu Biocoal is committed to promoting its sustainability through measures such as exploring alternative raw material flows to reduce the use of pure forest biomass. Alternative raw material flows will be explored by, for example, seeking strategic partnerships in various industries with the aim of accessing side streams and sourcing agreements. This will help reduce the environmental impact of the operations by reducing dependence on virgin raw materials, cutting links to deforestation and preventing risks related to the restrictions on the use of forest biomass.

In addition, Joensuu Biocoal will implement a sustainability scheme approved by the EU for its raw material procurement, and the company will agree on sustainability criteria for raw material sourcing with its partners. The company undertakes to explore ways to reduce emissions from its logistics chain by surveying lower-emission modes of transport in cooperation with logistics partners.

The company's production plant and the technology it uses have been designed so that the plant will operate as energy- and resource-efficiently as possible and, in the process itself, as much of the energy contained in the raw material as possible will be transferred to the final product. Effort will also be made to obtain from renewable sources the inputs used in the production process, such as electricity and fuel oil.

The company will actively cooperate with Savon Voima, which is responsible for operational activities, to ensure that the processes are controlled appropriately. In addition, Joensuu Biocoal is committed to implementing processes to measure and report the environmental impacts of its production (such as emissions) and steering its operations to reduce these impacts.

Joensuu Biocoal will regularly assess sustainability risks and environmental and social impacts and take the results into account in the development of its operations. The company will cooperate with its stakeholders as needed and strive to observe and promote the best practices of the industry, as well as maintain transparent governance to reduce risks and improve business sustainability. Through its own actions, the company will aim to boost the local economy and its corporate field and support local employment.

The company will promote the sustainability aspects related to the use of the final product by identifying critical customers and ensuring supply agreements so that the final product produced is primarily supplied to processes and to operators that have trouble replacing fossil coal in their processes. That way, the carbon handprint of biocoal production can also be maximised.

In order to ensure good governance practices, an environmental management system will be used in the operation of the plant and a sustainability scheme will be used in the procurement of raw materials. In addition, establishing clear processes and a distribution of responsibility with cooperation partners for the purpose of maintaining successful

relationships is important to the company. Employees and key partners will be engaged in the operating principles that steer the operations. Appropriate supplier and customer identification processes (KYC/KYS) will be implemented before concluding any procurement and supply agreements. In addition, the company will strive to reserve the right to audit/verify the contractual operations of its key cooperation partners.

Managing and measuring sustainability

The main responsibility for managing the sustainability work of Joensuu Biocoal lies with the company's CEO and Board of Directors. Third parties and the sustainability experts from Taaleri and other cooperation partners can be used as strategic support for the development of sustainability work.

Sustainability work will be managed as part of the company's daily operations and will be monitored with, for example, the predefined indicators described below. The indicators will be monitored regularly, and key indicators and the implementation of new possible indicators will be assessed annually. Data collection and reporting will be developed continuously as part of other operations.

Table 1. Sustainability Targets and KPIs

Objective	**Indicator / quantitative target**	**Timetable**
Minimising the carbon footprint	• Emission level and its reference value • Net zero objective	• Measuring emissions, continuous • Ensuring of data collection processes H1/2024 • Determining the baseline emission level Q4/2024 • Designing the 2026 net zero roadmap
Maximising the carbon handprint	• Emission reduction produced, tCO_2e • Use of the final product by sector, % • Greenhouse gas emissions	• 2025 • 2025 • 2025
Utilisation of side streams as raw material	• The share of side streams and so-called waste biomass from the total raw material used, % (baseline determination before quantitative targets)	• 2025

Sustainability of raw material	• Share of certified wood biomass, 100% • Biomass origin, % (trunk vs. bark and trees felled in the first thinning) (baseline determination before quantitative targets)	• Continuous • H2/2024
Ensuring the quality and responsibility of operations	• Audits performed, 100% • Violations reported, 0	• 2025 • 2025
ESG data and monitoring	• Processes for monitoring ESG data: yes • Setting of KPIs: yes	• H1/2024 • H1/2024
Environmental management system implemented	• Yes	• H1/2024
Sustainability system implemented	• Yes	• H1/2024
REACH certificate	• Yes	• H1/2024