

°24

graanul  
invest

Sustainability  
Report



# Graanul Invest Sustainability Report 2024

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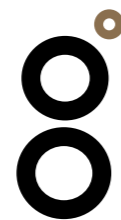


# Introduction and summary



**By Nicholas B. Dottino**

Chief Executive Officer (CEO)



**It is a pleasure to share our 2024 sustainability report. Overall, we performed and innovatively found ways to exceed prior records in some areas of the business. Graanul Invest has consistently demonstrated excellence with regard to sustainability, and related areas. As we continue to reduce our carbon footprint and enhance our overall energy efficiency, we are also happy to share that we've successfully met our multi-year sustainability-linked target.**

**With an eye towards the future and maintaining the spirit of continuous improvement we are excited to share some early stage projects that will deliver meaningful results in the years ahead. Areas of focus include but aren't limited to the overall energy efficiency (CHP related), solar power, battery storage, and wind projects (vessel related). While these are all strong projects that were launched in 2024, I'm even more excited as they are all scalable.**

**I'm proud to be part of the team that is delivering best in class sustainability results along with a view of more progress to be achieved in the coming years.**

We believe that a safe facility is the largest indicator of successful leadership, and that our people are our most valuable asset. As such, safety is of paramount importance to us as an organization. While our safety record from 2024 may be comparable or better than peers in similar manufacturing businesses, we endeavor to achieve zero work-related incidents and accidents. Our complete focus, for 2024 and beyond, must be and will be on developing a safety structure and culture that understands and subscribes to the fact that all incidents/accidents are, in fact, predictable and preventable.

We safely produce high-quality industrial and premium pellets with unquestionable levels of sustainability. We do so with levels of predictability, dependability, and reliability that the marketplace gravitates towards regularly. This is our promise and value proposition to all of our valued partners. We live by this commitment, and 2024 again confirmed to our clients and stakeholders that we really deliver on that without question.

As we reflect on 2024, we are proud to reaffirm our status as the world's leading and most reliable bioenergy producer, a testament to our unwavering commitment to excellence. We kept all our promises and fulfilled all our contracted deliveries with exemplary precision and the best carbon footprint on the market.

Graanul Invest is a world-leading biomass and bioenergy producer with almost 22 years of exceptional performance. We celebrate our tenure with humility, dignity and confidence, stronger than ever. Because, more than ever, we are ready to fuel the green transition and phase out fossil fuels beyond the "traditional" energy industries – in aviation, steel, cement, lime and many more.

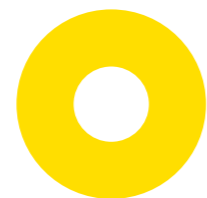
## By Mihkel Jugaste

Chief Sustainability Officer (CSO)

Reading through this report, it is evident that Graanul Invest has again demonstrated robustness and innovation in its sustainability journey. Building upon the foundations laid in recent years, we have maintained our best-in-class sustainability performance while ensuring renewable and local energy security for our partners.

The global focus has seemingly shifted away from setting new climate targets to delivering the existing ones while keeping the lights on, thus increasing the importance of already established renewable energy infrastructure. Providing local, on-demand, baseload energy at sufficient capacity, with a positive climate impact and affordability, has become a new societal priority.

The year 2024 has above else seen us continue to focus on reducing our carbon footprint and enhancing our energy efficiency. Our efforts in value chain digitalization and safety training have brought us new tools and practices that bring us closer to our ESG goals.

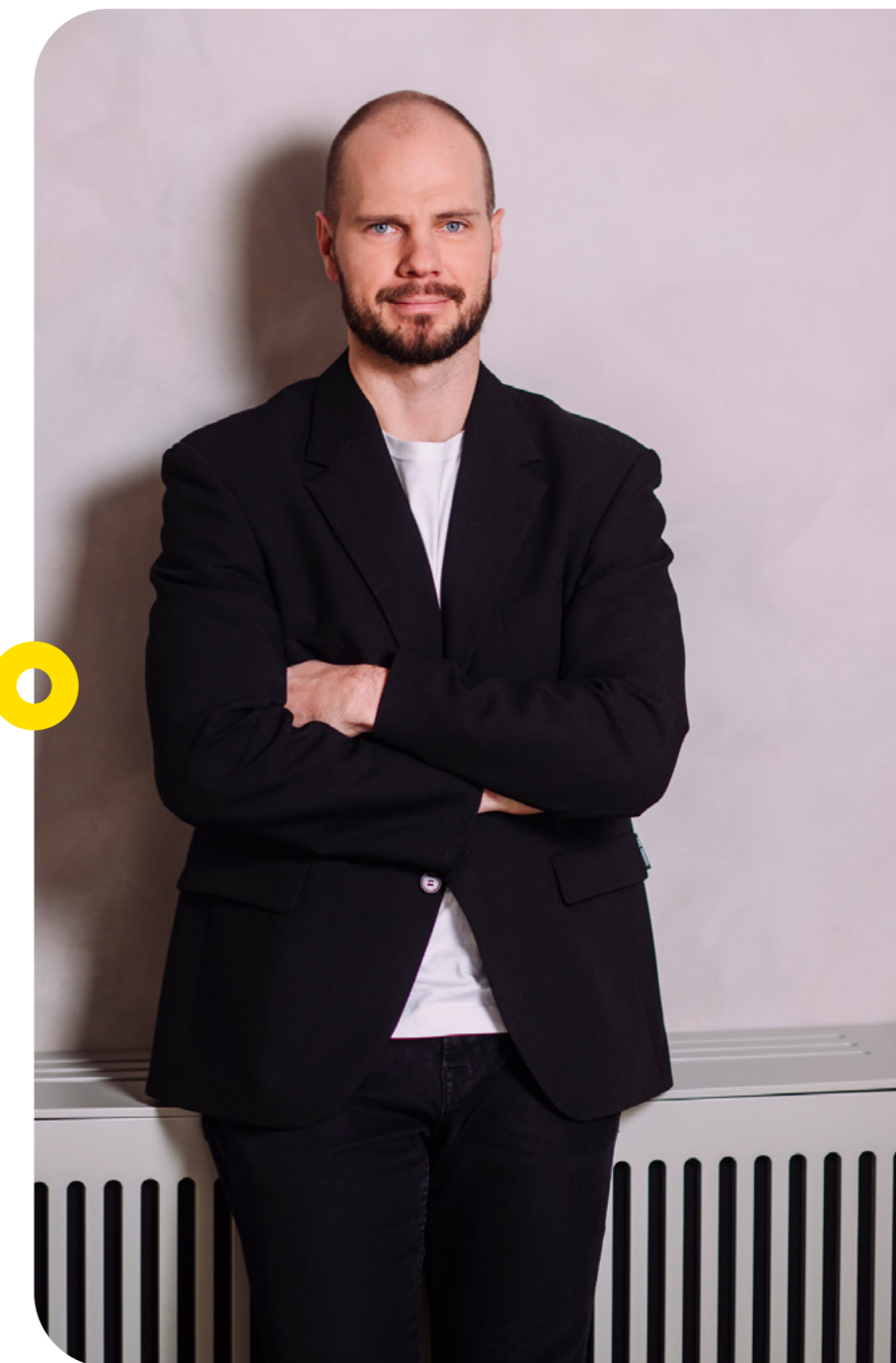


**Graanul Invest**  
**= leading value chain sustainability**

We are excited to announce that we've successfully met our multi-year sustainability-linked bond target—achieving a 5% reduction in our value chain footprint compared to 2020. This achievement is especially meaningful given our limited influence over upstream supply chain emissions and lack of control over the feedstock mix—making it all the more significant that the majority of reductions came from improvements within our own production chain.

We recognize that building trust and lasting impact requires persistent dialogue and adaptability. That's why we are continually evolving our methods and topics of stakeholder engagement. By doing so, we not only strengthen our environmental stewardship but also ensure our social responsibility is genuine, far-reaching, and future-ready. In 2024, we established regular stakeholder meeting, questionnaire and feedback formats to make sure we are capturing as well as documenting their valuable input.

2024 kickstarted some really ambitious projects for us that I am sure will deliver measurable ESG results and draw positive attention from our stakeholders for years to come. Adding flue gas condensers to CHPs, solar panels and battery storage to pellet plants and installing sails to our shipping vessels, are all strong projects that were started and validated in 2024, but I am certain will not be limited to single cases. The potential of these projects, for our value chain sustainability as well as financial performance, is very positive. As a subject matter expert, I'm proud to work for a company that continues to execute such projects and stay ahead of the "class".



# About



Graanul Invest AS Group is a leading international company specializing in renewable energy, particularly in the production of wood pellets and the generation of electricity and heat from biomass. Established in 2003, the company operates in Estonia, Latvia, Lithuania, and the United States.

As a forefront player in renewable energy, Graanul Invest operates 12 modern pellet plants, 6 CHPs, and 4 vessels in the Baltics and the U.S. We produce both premium-grade and industrial wood pellets of exemplary quality. Wood pellets are a sustainable, efficient, and economically beneficial energy source that can play a significant role in reducing greenhouse gas emissions and promoting renewable energy.

The company is committed to safety, sustainability and efficiency, implementing several management systems and certifications.

Graanul Invest operates under different brands in local markets, such as Latgran in Latvia and Woodville Pellets in the U.S. The company's vision is to globally develop the usage of renewable energy, and we are committed to finding better ways and more answers to meet the global climate challenge.

The group also focuses on climate resilience by investing in infrastructure, operational practices, and supply chain improvements to withstand extreme weather events and other climate-related disruptions. The company maintains year-round production scheduling to buffer against seasonal risks and implements a multi-port logistics strategy to mitigate risks from frozen waterways or transportation disruptions.

## Our business targets are based on the following principles:

- Safest workplaces
- Biggest GHG savings potential
- Highest quality product
- Minimum environmental impact
- Best energy performance in production

## Our vision

- We exist to accelerate the science and perception of sustainable biomass.



## Our mission

- To globally develop the usage of renewable energy.

## Our values

- We believe in our people and value their expertise highly
- We believe solutions must be sought right now, every single day
- We believe in the relentless pursuit of efficiency and learning
- We value trust and transparency
- We guarantee high quality and strive for innovation

# Our ambition in safety, health and sustainability



In 2024, Graanul Invest's operations and performance were shaped by the continued softness in European wood pellet demand. Despite this, the Group demonstrated resilience by proactively managing raw material sourcing and supply chains, and by optimizing production and sales volumes throughout market cycles. These efforts enabled Graanul to strengthen its results compared to the previous year, even amid volatile conditions.

Our commitment to safety, health, and sustainability is at the core of everything we do. We strive to create a work environment where safety is not just a priority but a fundamental value. We believe that every accident is preventable, and through rigorous training and the implementation of cutting-edge safety technologies, we aim to eliminate workplace incidents. Our approach includes continuous coaching, real-time hazard detection, and comprehensive safety audits to ensure that our employees are always protected.

In our dedication to sustainability, we have integrated environmentally responsible practices into every aspect of our operations. We are committed to reducing our carbon footprint and promoting biodiversity. By utilizing renewable energy sources such as sustainably produced wood pellets, we contribute to the global effort to combat climate change. Our wood pellets are derived from pre-existing residue streams, ensuring minimal environmental impact while providing a reliable and efficient source of energy. This not only helps reduce reliance on fossil fuels but also supports the transition to a more sustainable energy future.

Furthermore, we have embraced sustainability-linked financial instruments to align our business operations with our environmental goals. These instruments enable us to commit to specific sustainability outcomes, ensuring that our financial strategies support our environmental objectives. By partly linking our financing to our sustainability performance, we demonstrate our dedication to achieving ambitious environmental targets and contributing to the Sustainable Development Goals.

Our environmental management system is designed to monitor and minimize the impact of our operations. We regularly assess our emissions, energy use, and resource efficiency to ensure that we are operating in an environmentally responsible manner. This includes obtaining necessary environmental permits and continuously improving our processes to reduce our ecological footprint.

At Graanul Invest, we are passionate about creating a safer, healthier, and more sustainable world. Our commitment to these principles drives us to innovate and lead by example, ensuring that our operations not only meet but exceed industry standards. Through our efforts, we aim to make a positive impact on the environment and the communities we serve.

## Safety first!



# Management systems, certifications

Implementing management systems is crucial for us to guarantee efficient and compliant procedures. Quality systems assist us in managing our value chain efficiently and systematically, without underestimating potential risks or overlooking our set KPIs. **Graanul Invest has implemented several management systems and has been certified within the following standards:**

- ISO 9001:2015 – Quality management systems
- ISO 14001:2015 – Environmental management systems
- ISO 45001:2018 – Occupational health and safety
- ISO 50001:2018 – Energy management
- SBP – Sustainable Biomass Program
- FSC® – Forest Stewardship Council
- PEFC – Programme for the Endorsement of Forest Certification
- ENplus® – Pellet quality certification
- DINplus – Pellet quality certification

The 2024 management and chain of custody system multi-criteria external audits were carried out in all 13 locations (including the head office). These audits were carried out following the standardized requirements of all the certification systems listed above. All identified non-conformities from audits have been resolved and closed by the company upon reaching the specified deadlines.

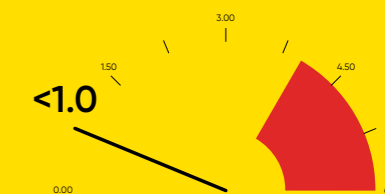
The non-conformities in company documentation were mainly due to the need for updates. These updates were required because of changes introduced by the Renewable Energy Directive (RED) and revised ENplus® standards, which prompted adjustments to procedures in 2024.

*Our recently set expectations are in line with our current ambitions and therefore remain the same.*

## Expectations towards 2025

- E**
  - Achieve energy savings by reducing electricity consumption (maximum kWh/t).
  - Decrease fines content of wood pellet shipment (maximum allowable %).
  - Extend the lifespan of key cost parts (minimum ton/piece).
- S**
  - Pursue the ultimate goal of zero work-related incidents and accidents.
  - Improve employee efficiency by minimizing overtime hours.
  - Improve overall housekeeping and workstation cleanliness metrics.
  - Adhere to safety requirements and set safety KPI (e.g. LTIR, TRIR)
- G**
  - Delivering a return on investment to our shareholder.
  - Enhance quality by reducing non-conformities and complaints compared to 2024.
  - Implement and expand the transport and logistics IT system.
  - Reduce material handling-related costs (min ton/liter).
  - Reduce spare parts cost and consumables through competitive bidding (max EUR/ton).

Each factory is assigned specific indicators to monitor the achievement of objectives.





# Environment

## GHG emissions

Graanul Invest's Greenhouse gas (GHG) monitoring and reporting are conducted in accordance with the Greenhouse Gas Protocol's Corporate Accounting and Reporting Standard.

Scope 3 emissions typically represent a vast majority of the total greenhouse gas emissions for EU companies. This high percentage is due to the comprehensive nature of Scope 3, which includes all indirect emissions that occur in a company's value chain, both upstream and downstream.

For example, in 2022, 92% of the emissions disclosed by European companies were Scope 3 emissions. The key hotspots for these emissions were the use of sold products (57%) and purchased goods and services (17%).

Understanding and managing Scope 3 emissions is crucial for companies aiming to reduce their overall carbon footprint and meet sustainability targets.

Graanul is proud to have enhanced the transparency and accuracy of our emissions reporting by adding more data points into our Scope 3 emissions. This shows our commitment to continuous improvement, openness and leading by example.



# A summary of our footprint:

! Please see the next chapter for more information on scopes and a breakdown of emissions.

Distribution of GHG emissions into scopes	Scope 1 Direct emissions from owned or controlled sources.	Scope 2 Indirect emissions from the generation of purchased energy.	Scope 3 Other indirect emissions that occur in the value chain.
	10,48%	19,51%	70,01%

GHG emission Scope 1-3 (S1, S2, S3)						
Scope (CO <sub>2</sub> e tons)	2022	2022	2023	2023	2024	2024
S1 Stationary Combustion	13,919	41,290	16,308	36,653	8,351	34,815
S1 Mobile Combustion	26,837		20,076		26,160	
S1 Refrigerants	534		270		304	
S2 Purchased electricity	82,926	82,926	89,702	89,702	64,819	64,819
S3 Purchased Goods and Services	-	81,589	1,628*	161,388	61,166	232,640
S3 Capital Goods	-		-		6,906	
S3 Fuel- and Energy-Related Activities Not Included in Scope 1 or Scope 2	4,346*		8,338		11,499	
S3 Upstream Transportation and Distribution	19,754		16,836		15,658	
S3 Waste Generated in Operations	-		-		170	
S3 Business Travel	-		315		434	
S3 Employee Commuting	-		629		572	
S3 Downstream Transportation and Distribution	57,489		66,055		44,101	
S3 Use of Sold Products	-		67,587		72,371	
S3 Downstream Leased Assets	-		-		19,763	
<b>TOTAL</b>	<b>205,805</b>		<b>287,743</b>		<b>332,274</b>	

\*Not all data available for 2022 and/or 2023  
- Data not available for 2022 and 2023.

## Own emission: Scope 1, Scope 2

GHG emission Scope 1 and 2 (S1, S2)						
Scope (CO <sub>2</sub> e tons)	2022	2022	2023	2023	2024	2024
S1 Stationary Combustion	13,919	41,290	16,308	36,653	8,351	34,815
S1 Mobile Combustion	26,837		20,076		26,160	
S1 Refrigerants	534		270		304	
S2 Purchased electricity	82,926	82,926	89,702	89,702	64,819	64,819

In 2024, we expanded our reliance on renewable electricity. Additionally, the grid electricity intensity indicator showed improvement.



## Scope 1 emissions are direct emissions from owned or controlled sources:

**Stationary Combustion** – production of heat and power, material drying, facility heating

- This includes incineration of wood residues, small quantities of diesel and natural gas.

**Mobile Combustion** – company owned or operated vehicles

- Emissions from trucks/loaders and passenger cars (based on diesel and petrol consumption) and from vessels.

**Fugitive Emissions** – process cooling and refrigeration

- Minor leaks of refrigerants during cooling buildings.

In 2024, we expanded our reliance on renewable electricity. Additionally, the grid electricity intensity indicator showed improvement, indicating that the company successfully optimized its electricity purchases to more effectively manage and reduce carbon emissions. Taken this into account we managed to decrease our Scope 2 emissions by 24,883 CO<sub>2</sub>e tons compared to 2023.



## Scope 2 emissions are indirect emissions from the generation of purchased energy:

**Purchased and Used Electricity** – facility electricity supply

- Purchased electricity market-based – Emissions from electricity consumption delivered from the grid reflecting residual mix country factors.

**Scope 3 emissions** refer to all indirect emissions that occur in the value chain of the reporting company, excluding those covered in Scope 1 and Scope 2. These emissions are a result of activities from assets not owned or controlled by the organization but that the organization indirectly affects its value chain. From 2024 all Scope 3 categories are covered in Graanul Invest greenhouse gas report.

33% of all greenhouse gas emissions are related to transportation, amounting to 110,363 tons of CO<sub>2</sub>e. This includes 24% from the fuel consumption of company-owned cars, loaders, and shipping vessels; 14% from raw material transportation; 40% from product transport to clients via road, rail, and maritime methods; 18% from leased assets such as vessels rented out; and 4% from the extraction, refining, and transportation of fuels used by company-owned vehicles.

Downstream Transportation and Distribution emissions decreased by 33% due to more pellets being delivered to clients using our own vessels. However, Scope 1 emissions under Mobile Combustion increased by 30% compared to 2023 as a result.

Product usage is the primary source of Scope 3 emissions, assuming all sold pellets are incinerated. It accounts for 31% of Scope 3 and 22% of total GHG emissions.

In 2024 transmission and distribution (T&D) losses emissions increased due to higher electricity consumption from the grid and challenges in generating electricity independently.

## GHG emission Scope 3 (S3)

Scope (CO <sub>2</sub> e tons)	2022	2022	2023	2023	2024	2024
S3 Purchased Goods and Services	–	81,589	1,628*	161,388	61,166	232,640
S3 Capital Goods	–		–		6,906	
S3 Fuel- and Energy-Related Activities Not Included in Scope 1 or Scope 2	4,346*		8,338		11,499	
S3 Upstream Transportation and Distribution	19,754		16,836		15,658	
S3 Waste Generated in Operations	–		–		170	
S3 Business Travel	–		315		434	
S3 Employee Commuting	–		629		572	
S3 Downstream Transportation and Distribution	57,489		66,055		44,101	
S3 Use of Sold Products	–		67,587		72,371	
S3 Downstream Leased Assets	–		–		19,763	

We have enhanced the transparency and accuracy of our emissions reporting by adding more data points into our Scope 3 emissions. This includes information on all purchased goods & services, capital goods, wastages, downstream leased assets. By gaining a better understanding of our impact areas, we can establish precise targets and objectives to reduce our emissions in the upcoming years.

\*Not all data available for 2022 and/or 2023  
– Data not available for 2022 and 2023.



## Scope 3 emissions, other indirect emissions that occur in the value chain:

<b>Purchased Goods and Services</b>	Emissions of purchased goods and services are based on Graanul Invest Group consolidated income statement. Separately water supply and sewage service emissions are calculated which are based on actual consumed water amount and purchased packing material which is based on actual packing material amount. Calculated emissions cover extraction, primary processing, manufacturing and transportation materials to the point of sale of plastic films, big-bags and pallets.
<b>Capital Goods</b>	Emissions of capital goods are based on investment cost in the reporting year.
<b>Fuel- and Energy-Related Activities Not Included in Scope 1 or Scope 2</b>	<b>Includes:</b> 1) Upstream emissions of purchased fuels – calculation is based on consumed amount in reporting year. Calculated emission covers extraction, refining and transportation of the raw fuel sources to a site. 2) Transmission and distribution (T&D) losses - losses that happen during the transmission of electricity from grid to our facilities. 3) Generation of purchased electricity that is sold to end users - electricity is bought from grid and sold to third parties. Market-based emission coefficient is applied.
<b>Upstream Transportation and Distribution</b>	Emissions of trucks which carry raw material (chips, sawdust, round wood) for pellet plants and CHPs based on driven kilometers (assumed that the truck will return empty). Emissions based on kilometers and tonnage delivered by rail transportation and by vessels.
<b>Waste Generated in Operations</b>	Emission calculation is based on waste amount and disposal methods. For landfills, emissions include collection, transportation and landfill emissions (gate to grave). For combustion and recycling, the emissions consider transport to an energy recovery or materials reclamation facility only. Separately calculated emissions of trucks which carry ash from plants to fertilizer user. Emissions based on driven kilometers (assumed that truck will return empty).
<b>Business Travels</b>	All trips made by GI employees by plane, bus, train etc. Including public transport usage and hotel stays.
<b>Employee Commuting</b>	All employees home-work-home travels, who do not own company car.
<b>Downstream Transportation and Distribution</b>	Emissions of trucks fuel consumption which carry pellets to the final receive point or ports based on driven kilometers (assumed that the truck will return empty). Emissions based on kilometers and tonnage delivered by rail transportation and by vessels.
<b>Use of Sold Products</b>	All sold pellets. It is assumed that all pellets are burn.
<b>Downstream Leased Assets</b>	Emissions are based on consumed fuel amount when GI's vessels are rented out.

## Cooperation to reduce GHG emission *GHG emission reduction and renewable energy*

One of our KPIs is the Sustainability Performance Target (SPT). Our goal was to reduce carbon intensity (Scope 1, 2 & 3) by 5% by end of 2024. Our baseline is from 2020 with carbon intensity of 7.08 gCO<sub>2</sub>e/MJ.

Carbon intensity (gCO <sub>2</sub> e/MJ) split by:	2018	2019	2020 (baseline)	2021	2022	2023	2024
	7.70	7.45	7.08	6.63	6.83	7.03	6.61
<i>Sourcing</i>	-	-	0.79	0.67	0.70	0.91	0.98
<i>Production</i>	-	-	3.50	3.41	3.62	3.60	2.99
<i>Transportation</i>	-	-	2.79	2.55	2.51	2.52	2.64

In 2024, the company made significant progress in reducing greenhouse gas (GHG) emissions and increasing the use of renewable energy. One of the main goals was to reduce carbon intensity (Scope 1, 2, and 3) by 5% compared to the 2020 baseline, which was 7.08 gCO<sub>2</sub>e/MJ.

In 2024, the company increased its use of renewable electricity, which contributed to the overall reduction in carbon intensity. Increasing the use of renewable electricity is a crucial step towards achieving sustainability goals and reducing environmental impacts.

In addition to increasing the use of renewable electricity, the grid electricity intensity indicator also improved, meaning the company managed to more efficiently handle and reduce carbon emissions associated with its electricity purchases.

- **The 2024 carbon intensity result was 5.97% lower than the 2023 result. Through dedicated efforts and strategic initiatives, the company not only met its long term KPI target but exceeded it, achieving a remarkable 6.64% reduction in carbon intensity, bringing it down to 6.61 gCO<sub>2</sub>e/MJ.**

This significant improvement highlights the company's commitment to sustainability and its proactive approach to environmental stewardship. The company has demonstrated its ability to effectively manage and reduce its carbon footprint.

"In 2024, we replaced the logline lifting equipment at the Ebavere plant. This upgrade resulted in approximately a 15% reduction in line stoppages and about a 90% decrease in hydraulic oil leaks. The consistent operation of the line has significantly increased the plant's energy efficiency"

**Kalju Erras,**  
Production Manager of the Ebavere Factory



# Renewable energy

We have six modern combined heat and power (CHP) plants in Estonia and Latvia producing renewable thermal energy and electricity for the pellet factories by using sustainably sourced forest chips and tree bark. One of our key sustainability indicators is the specific consumption of electricity. Despite lower production, the amount of electricity per ton of pellet remained at the same level compared to 2023. In 2023, the average group consumption was 160,7 kWh/t and in 2024 it was 160,94 kWh/t. Our overall energy consumption decreased remarkably from 2,105 GWh in 2023 to 1,593 GWh in 2024. Mainly due to lower pellet production.

Our ongoing goal is to increase the proportion of renewable energy used in our operations, encompassing both self-produced and purchased sources. We are proud to report that 93% of our total energy consumption is now renewable, a significant improvement from 88% in 2023. This achievement underscores our commitment to sustainability and our dedication to reducing our environmental footprint by leveraging cleaner energy solutions.

Last year we installed flue gas condenser to Incukalns' CHP. The working principle behind a flue gas condensing heat exchanger allows it to extract heat from the hot flue gases of combustion process, which would otherwise be lost to the atmosphere. Instead, the extracted heat can now be used to dry raw material. By harnessing this otherwise wasted energy, flue gas condensers help industries optimize their processes and reduce dependency on primary energy sources. A flue gas condenser replaces the more environmentally burdensome drum dryer by making better use of the existing energy.

"The investment will increase the plant's overall efficiency because "free" heat from the condenser is recovered during the cold months when the efficiency of belt dryers is lower and is used for the drying unit."

**Haralds Vigants,**  
Executive Director in Latvia

In 2024 Ebavere Graanul has installed a solar power plant on its premises to cover part of its energy needs with locally produced renewable energy. The use of solar energy reduces the amount of electricity purchased from the grid, which is predominantly produced from fossil fuels. This, in turn, helps to increase the company's energy security and further reduces its dependence on fossil fuels. As part of the same project, an electrochemical battery-based

energy storage system was also installed, allowing the storage of excess electricity during periods of favorable prices. This storage solution provides flexibility to use the collected energy precisely when consumption is higher or when market prices are higher.

"In summary, both the solar power plant and the storage technology help to reduce the consumption of energy produced from fossil fuels, stabilize energy costs, and strengthen the company's operational security. Additionally, this solution supports Estonia's and Europe's climate goals, benefiting both the company itself and the broader environment."

**Imre Dovtar,**  
Head of Electrical Systems



## Air pollution

All our production units are highly efficient and equipped with advanced air pollution control filters. Our factories operate under strict environmental permits that restrict our emissions of various air pollutants and mandate the measurement and assessment of our pollution control systems' efficiency. We regularly update and replace our air pollution control units to maintain optimal performance. Our emission sources include the storage of raw materials, processing woody biomass, combustion of biomass for heat and electricity production, use of fossil fuels, drying and cooling, and operations within our pellet production units. The pollutants emitted and monitored throughout our processes include heavy metals, solid particles, NMVOC, NOx, CO, SO2, NH3, and CO2.

### Reducing air pollution

Our objective is to remain significantly below the thresholds established by our environmental permits and to identify strategies that will further reduce pollutants throughout our production and value chain.

One of these strategies is adding flue gas condensers to CHPs reducing their greenhouse gas emissions and pollutants by capturing and reusing heat that would otherwise pollute the air. As mentioned, in 2024 this was already installed in Incukalns.

We regularly repurpose equipment between factories when it results in a net positive outcome. In 2023, the Krāslava pellet plant upgraded its drum dryer cyclones, and the replaced units were installed at the Jēkabpils facility to address worn-out equipment. This action enhanced air pollution control efficiency at both sites.

In Jaunjelgava, the service life of press filters was extended while maintaining high emissions control efficiency.

"Instead of replacing all filters, we refurbish them—using the exact same body and internals as the old ones, but made from stainless steel. This approach reduces our environmental footprint, and the stainless-steel implementation prevents corrosion, significantly extending the service life of the filters."

**Martins Zvejnieks,**  
Latvian Chief Operations Officer

In 2024, a significant project was completed at the Lithuanian plant, where a separate boiler house with a belt dryer for raw material drying was installed to enhance pellet production. The main objective of this modernization was to improve the existing wood pellet production process, increase efficiency, and ensure higher production capacity. This project expanded the handling capabilities for both wet and dry sawdust and established additional drying equipment that utilizes more efficient heat exchange and reduces exhaust gas temperatures.

As a result of the new boiler house and enhanced drying systems, the production process has become more uniform and energy-efficient. The facility utilizes wood industry residues, such as wood chips and bark, which allows for a better resource efficiency and minimizes waste. The modern drying and cleaning system, including an electrostatic filter, significantly reduces the amount of solid particles and other emissions thereby reducing environmental impact compared to the previous drum dryer.

Consequently, the air quality in the surrounding area should improve significantly, which is particularly beneficial given the factory's location on the outskirts of the city.

# Water use

Graanul Invest group uses water to produce heat and electricity in CHPs, as ballast water in its four vessels, and for maintenance functions in its pellet plants. Given the global importance of freshwater conservation, it is essential to minimize consumption. According to our current water risk analysis, the overall water risk in the countries where we operate, as evaluated by the World Resources Institute, ranges from low to medium.

## Water use data

The volume of water withdrawn (group): 264,476 m<sup>3</sup>. Includes all water from freshwater sources (ground water and municipal water supply).

### Total water consumption

Total water consumption (m <sup>3</sup> )	2022	2023	2024
	226,494	243,925	264,476

Total water consumption from public water supply and total wastewater discharged to public sewage is also part of greenhouse gas emissions, Scope 3.

	2023	2024
Total water consumption from public water supply (Group) (m <sup>3</sup> )	29,648	24,350
Total wastewater discharged to public sewage (Group) (m <sup>3</sup> )	23,619	16,958

## Water use efficiency

Water consumption per ton increases when production volumes are low. In 2024, cogeneration plants ran at near full capacity, but pellet production was limited. Consequently, water consumption per unit of pellet production increased.

	2020	2021	2022	2023	2024
Water usage per 1t pellets	0.092	0.096	0.098	0.099	0.123

# Logistics and transport

One of our primary Key Performance Indicators (KPIs) in logistics is the raw material procurement radius. For this, we give preference to suppliers that are in close proximity to our production sites. This strategy enhances cost-efficiency, reduces our logistical footprint, and ensures production stability.

In 2024, the weighted average raw material procurement radius for the entire Graanul Invest Group increased to 49.25 km, up from 43.48 km in 2023.

„The procurement radius of raw material has increased due to 2 main reasons. Firstly, our primary feedstock share is still higher than sawmill residues, causing more forest to pellet plant transport (compared to nearby sawmill > pellet plant). Secondly, we’ve managed to make route tracking even more precise over time. More data with increased accuracy can result in shifted averages.“

**Kert Kruusimägi,**  
Raw material purchasing and Production Manager

Our factories monitor fuel consumption KPIs during production to reduce usage and footprint. In 2023, the indicator was 1.40 ton/liter, increasing to 1.58 ton/liter in 2024. This means plants have used loaders more efficiently, moving 1.58 tons of material with 1 liter of diesel—13% more than in 2023.

Maritime transport is vital to the EU economy and resource-security, but it significantly contributes to greenhouse gas emissions. From January 2024, the EU’s Emissions Trading System (EU ETS) covers CO<sub>2</sub> emissions from large ships (5,000 gross tonnage and above) entering EU ports, regardless of their flag. Graanul Invest’s four vessels are included in this system. We closely monitor and annually report our emissions, fuel consumption, distance travelled, time at sea, and cargo carried per voyage. With the aim to continuously improve.

**Raw material procurement radius**



## Future steps for the Graanul fleet

Over the next two years, we will upgrade our vessels with specialized fuel-saving systems and equipment. These enhancements will help reduce fuel consumption and lower costs associated with Emissions Trading Schemes in the maritime sector. We’ve prioritized emerging technologies that improve vessel efficiency and have selected the most viable solutions that deliver both cost savings and environmental benefits.

“First, we will install “new” sails on MV Launkalne. Sails are a traditional but very efficient way of saving fuel and maximizing the performance of any ship. Harnessing wind energy will considerably reduce a ship’s reliance on the engine, thus resulting in significant fuel savings and operational costs.“

**Linards Jaunzems,**  
Head of Logistics

One of these solutions is the use of sails. Integrating sails into vessel design or retrofitting existing ships with modern sail technologies can significantly reduce fuel consumption—by 5–30%, depending on wind conditions. In addition to fuel savings, sails can enhance a vessel’s speed and maneuverability, especially when equipped with advanced systems like wing sails or retractable configurations. These benefits are particularly valuable for ships on long voyages or operating in regions with consistent wind patterns.

The second upgrade involves low-friction antifouling coatings. Traditional antifouling solutions rely on biocide leaching to prevent marine organism buildup. In contrast, low-friction coatings use advanced technologies—such as silicone, fluoropolymers, or nanomaterials—to create ultra-smooth surfaces that discourage biofouling and reduce drag between the hull and water. This not only improves fuel efficiency but also supports longer maintenance intervals and better environmental performance.

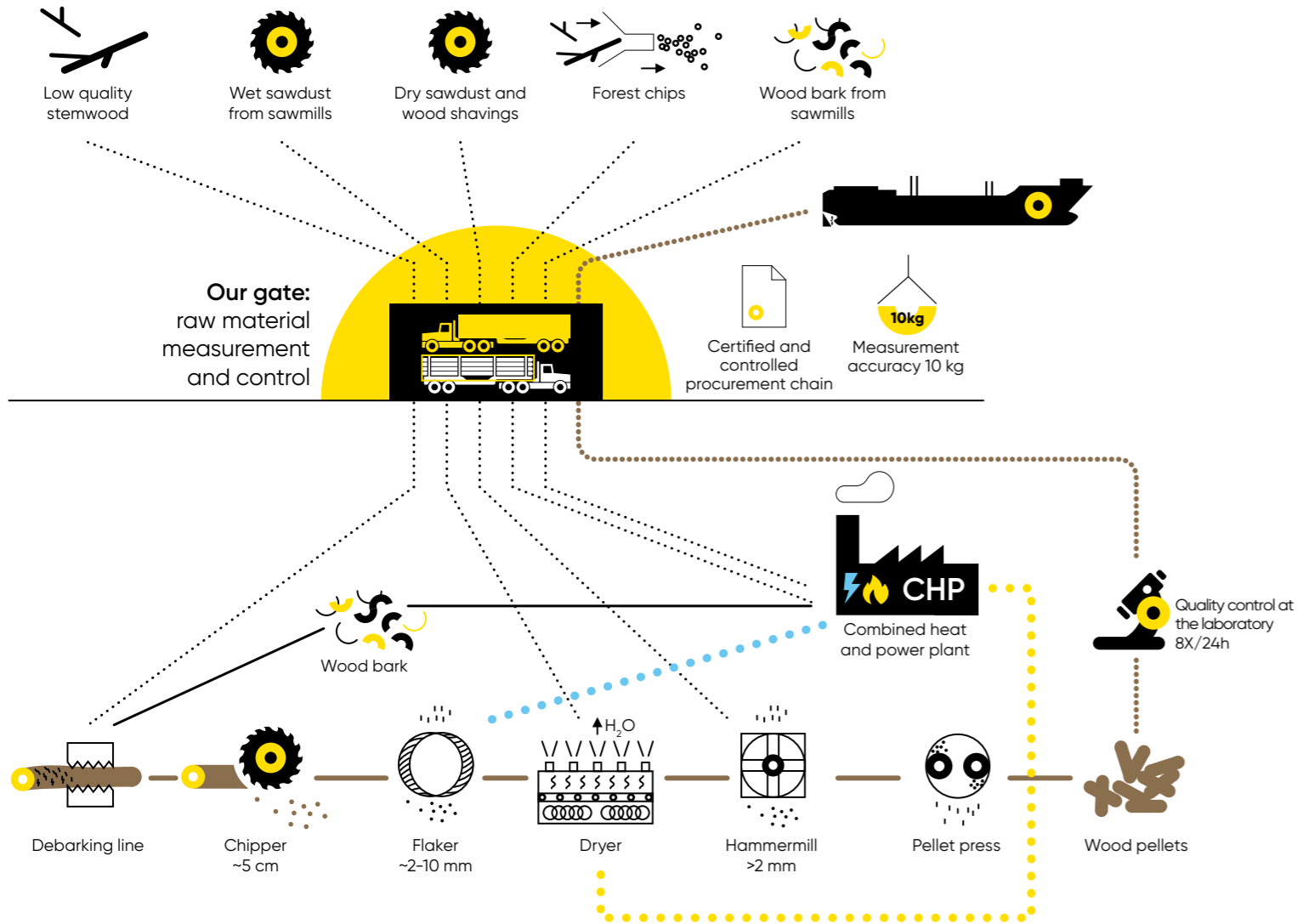
“The smoother the hull, the lower the resistance encountered by the vessel—resulting in reduced fuel consumption and fewer greenhouse gas emissions.“

**Linards Jaunzems,**  
Head of Logistics



# Pellet production and raw materials

Graanul Invest is one of the world's largest producers of wood pellets with a production capacity of 2.7 million tons. The group's 12 wood pellet plants are located in Estonia (4), Latvia (6), Lithuania (1), and the United States (1).



## Production volumes

In 2024, pellet production was 11% lower compared to 2023. The decrease in production volumes was due to two main factors: high electricity prices and a shortage of raw materials. Due to this, we optimized production based on electricity prices, with main production occurring only when prices were lower. The availability of raw materials was hindered by the continued pressure from the Scandinavian markets which import unprocessed wood from the Baltics.

"There has been significant export pressure on unprocessed raw materials, and some of our potential feedstock groups were sold out."

**Kert Kruusimägi,**  
Raw Material Purchasing and Production Manager

Premium pellet production fell 66% from 344,429 tons in 2023 to 118,479 tons in 2024.

Woodville plant encountered some difficult times during the first half of the year 2024 with several downtime events and resulting repair processes causing lower production volumes compared to last year. In the second half of the year the plant recovered and had more than 30% higher production than in the first six months of the year, with all key KPIs improving monthly towards 2025.

## Raw materials origin

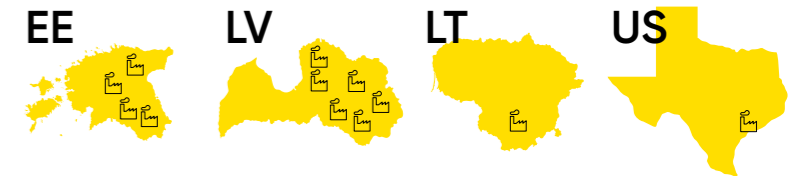
Pellets are primarily produced from wood residues and low quality stemwood that would otherwise go unused or wasted. These wood residues often come from sawmills and wood processing factories, where large amounts of sawdust, wood chips, and bark are generated. These materials, which would otherwise have no practical use, are processed into energy intense low carbon pellets. Pellet production helps reduce waste for other industries and gives new value to wood residues, turning them into a valuable energy source and beyond.

In 2024, preparations were made to upgrade our procedures to align with Sustainable Biomass Programme (SBP) standards 2.0. The standards 2.0 really underpin the SBP promise of good sustainable biomass. SBP-certified biomass guarantees that it is deforestation-free, with biodiversity maintained or enhanced through protecting key species, habitats and ecosystems, that water quality and soil quality are maintained or enhanced, that carbon stocks are stable or increasing, and that workers and their rights, local communities, and the rights of Indigenous Peoples are protected. Graanul Invest ensures that all these requirements are met for all our produced and sold pellets.

## Annual production

Annual production volumes by country

	2022 (tons)	2023 (tons)	2024 (tons)
<b>Total</b>	<b>2,319,839</b>	<b>2,341,916</b>	<b>2,079,841</b>
<b>Estonia</b>	912,994	860,965	673,736
<b>Latvia</b>	1,013,329	1,088,388	1,046,816
<b>Lithuania</b>	88,372	77,254	80,983
<b>USA</b>	305,144	315,148	278,306



## Raw materials for wood pellets



**Wood shavings and dry sawdust** are sourced from companies that add value to sawn timber as their raw material. These post-processing by-products have a low moisture content and fine fraction, making them highly suitable for our manufacturing operations. We exclusively use chemical-free raw materials because chemically processed by-products, which may contain varnishes and glues, are incompatible with our production process.



**Wet sawdust**, a major by-product of the sawmilling process, has been traditionally utilized in pellet production due to its minimal processing requirements, fine fraction and consistent quality.



**Wood chips derived from the sawmill and timber industries** are produced from processed sawn log offcuts that have already been debarked, resulting in uniform particle size and natural chemical composition.



**Low-quality stemwood** is received as residue from forestry operations when it can no longer be valorized for other industrial purposes. Additionally, we incorporate scrapped wood from sawmills, which may contain warped, damaged roundwood or wood with foreign materials, such as pieces of metal.

All forest management activities produce lower-quality wood. Either it is a part of a large single tree, a species outside its usual habitat, or a tree that is losing the battle for space, all wood deserves to be used and cascaded through potential end-users.



## Our raw material consumption

In comparing the raw materials used for pellet production between the years 2023 and 2024, several changes can be observed. The proportion of sawmilling and wood industry residues, including wood chips, sawdust, shavings, and off-cuts, saw a slight increase from 31.86% in 2023 to 33.71% in 2024. Specifically, wood chips decreased from 19.00% to 15.25%, indicating a reduction of 3.75 percentage points. Conversely, sawdust and shavings experienced a significant rise from 12.69% to 18.24%, marking an increase of 5.55 percentage points. On the other end of the feedstock mix, the use of low-quality stem wood slightly decreased from 68.14% in 2023 to 66.51% in 2024, showing a reduction of 1.63 percentage points.

## Raw materials for electricity and heat generation



**Forest chips** primarily consist of fine branches, brush, and other logging residues, often containing soil and sand that render mechanical processing impractical. These chips, distinct in composition and appearance from sawing residue chips, play a crucial role in our CHPs and drum-dryers, where they are utilized to generate renewable electricity and heat.



**Tree bark** is obtained from debarking lines in our factories and nearby sawmills. Mechanically stripped from logs, the bark is directed towards renewable energy production, ensuring the optimal use of every single gram of wood.

"We are developing a fully automated system for raw material reception and product dispatch. Completing the cycle from paperless to digital to fully automated scale houses"

**Kert Kruusimägi**,  
Raw Material Purchasing and Production Manager




### Raw materials used for pellet production

	2022	2023	2024
Sawmilling and wood industry residues, including:	<b>43.40%</b>	<b>31.86%</b>	<b>33,71%</b>
<i>Wood chips</i>	26.00%	19.00%	15,25%
<i>Sawdust and shavings</i>	17.00%	12.69%	18,24%
<i>Off-cuts</i>	0.40%	0.17%	0,22%
Low-quality stem wood	<b>56.60%</b>	<b>68.14%</b>	<b>66,51%</b>

## Where do our raw materials come from?

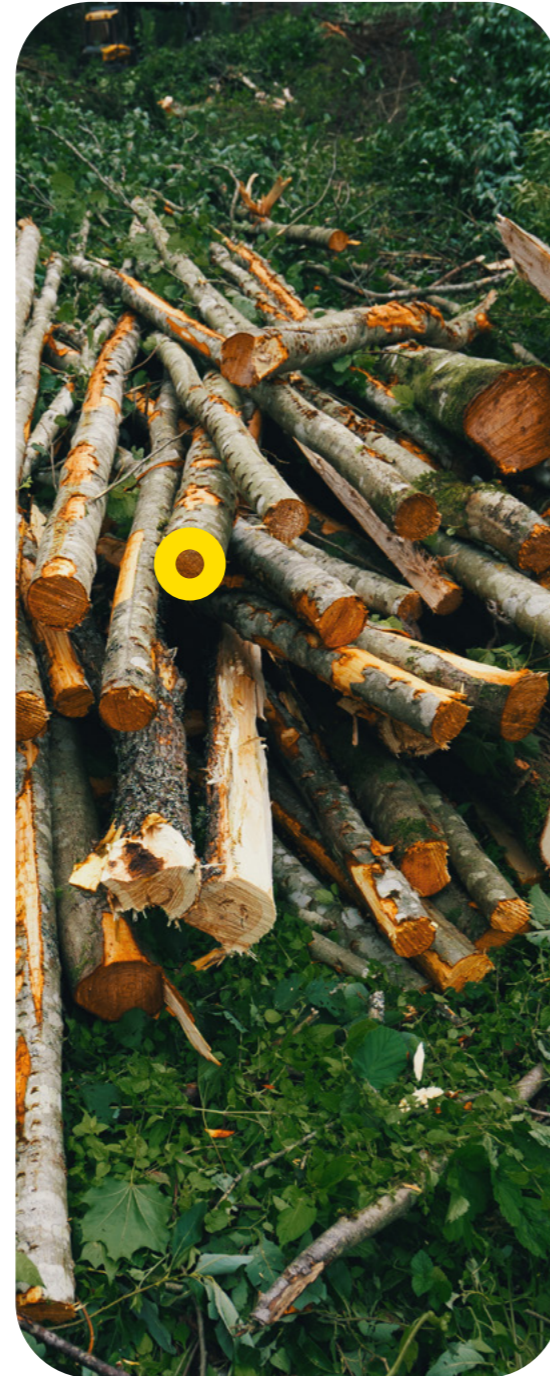
We prioritize sourcing our raw materials from locations that are in close proximity to our factories. This approach helps us minimize the carbon footprint associated with transporting these materials with highest possible traceability. By primarily utilizing wood industry residues from nearby areas, we ensure that our supply chain remains efficient and environmentally friendly. Our careful management of raw material flow allows us to maintain a local supply base without causing disruptions in the wood sector or creating competition with other industries or regions. In recent years, the majority of our raw materials have been sourced from Latvia, Estonia, and Lithuania, with Latvia being the largest contributor. In 2024, for example, 58.02% of our raw materials originated from Latvia, 38.18% from Estonia, and 2.94% from Lithuania. This strategic sourcing helps us reduce excess carbon emissions, support local economies and be a leader in sustainable bioenergy production.



Raw material origin by country in the Baltics	2022	2023	2024
Latvia	46.03%	51.25%	58.02%
Estonia	46.56%	44.79%	38.18%
Lithuania	4.93%	3.74%	2.94%
Poland	0.07%	0.04%	0.68 %
Sweden	1.49%	0.19%	0.03%
Finland	0%	0%	0.14%
Belarus	0.59%*	0%	0%
Norway	0.30%	0%	0%
Russia	0.04%*	0%	0%

\* We immediately stopped all imports from Russia and Belarus after Russia attacked Ukraine on 24th of February 2022.

The raw material of the Woodville pellet plant in Texas, US, is 100% originated from the USA.



## We produce premium-grade and industrial wood pellets

We ensure a reliable supply of industrial pellets by maintaining adequate storage in our warehouses at multiple locations, mitigating delays due to climate risks. In the Baltics, we use flat bed warehouses for optimal wood pellet quality with highest fire and handling safety.

Our production is based on forestry and timber residues. Climate risks pose challenges by impacting raw material availability and moisture levels. Heavy rainfall and mild winters can increase energy use during processing and force us to source materials from greater distances, raising our procurement and logistics footprint. We mitigate these risks by storing feedstock to cover longer production periods and by actively controlling moisture levels during storage.

The Renewable Energy Directive (RED) has introduced binding requirements for our sector. FSC® and PEFC® certifications, while valuable, cover only part of the supply chain and are not sufficient to demonstrate full compliance. To ensure a net positive impact across sustainable forestry, logistics, and production, we implement SBP-certified processes—now the ambitious benchmark in the wood-based bioenergy sector. SBP provides a robust system and third-party verified data platform that enables precise tracking of feedstock types, origins, supply chains, and associated greenhouse gas emissions. This allows us and our clients to really evaluate the positive impact of biomass sustainability as well as meet RED requirements and beyond.

Already 90% of the materials sold by Graanul Invest are “SBP-Compliant”, which meet the highest requirements of our industry. Our quality of premium wood pellets exceeds the strictest requirements in the market, laid down in standards ENplus® and DINplus®. The entire production of our premium pellets complies with the requirements of the highest quality class ENplus® A1.

Graanul Invest proudly announced the launch of its latest premium pellet brand, g Graanul, tailored specifically for Baltic customers but not limited for export. This locally produced, high-quality product represents a significant milestone for Graanul Invest as it celebrated its 20th anniversary.

Our mission is to offer local customers confidence and assurance that environmentally friendly, high-quality wood pellets made from local biomass are readily available at an affordable price for every consumer using wood pellets in their households.



## Waste generation volumes

Waste generation volumes in 2022-2024			
Waste type	2022 (tons)	2023 (tons)	2024 (tons)
Non-hazardous waste	21,332	21,460	23,910
Hazardous waste	124	88	130

The yearly generation of waste typically shows minor variations.

The non-hazardous waste that is generated during our operations are paper and cardboard, packaging waste (plastic, metals), scrap metal, municipal waste, biowaste, CHP sand and ash. Main hazardous waste are oily water from oil/water separators, fluorescent tubes, batteries, absorbents, filter materials, wiping cloths, chemicals waste, packaging containing residues of hazardous substances, engine-, gear- and lubricating oils, metal sludge (grinding sludge). All such waste is handed over to companies who have appropriate environmental permits.

The main part of non-hazardous waste is ash from boilers and furnaces. In 2024, 20,105 tons of ash were reused as agricultural fertilizer in the fields. This quantity is similar to previous years, with 19,088 tons in 2022 and 20,631 tons in 2023.

In today's world, waste management professionals are increasingly focusing on recycling and reusing waste materials rather than disposing of them in landfills. This shift towards a circular economy is driven by the need to reduce environmental impact and conserve natural resources. By implementing advanced recycling technologies and promoting sustainable practices, waste handlers are able to transform waste into valuable resources, thereby minimizing the amount of waste that ends up in landfills. This not only helps in reducing pollution but also supports the creation of a more sustainable and eco-friendly future.

Most waste generated in Graanul Invest is reused or recycled. 98% of non-hazardous waste is recycled or reused, and 79% of hazardous waste is re- or upcycled.



## Combined heat and power (CHP) plants

Graanul Invest operates six modern combined heat and power plants in Estonia and Latvia. Using forestry wood residues and bark, they produce thermal energy and electricity. The energy production units are situated next to the larger pellet plants, supplying them with heat and electricity. The cogeneration plants are designed to meet the thermal energy needs of the pellet plants, ensuring that produced thermal energy is efficiently used year-round in the drying process of pellet raw materials. The total production capacity of our cogeneration plants is 41 MW of electricity and 100 MW of thermal energy.

Electricity production volumes in 2024 decreased compared to the previous year, primarily due to an extended unplanned stoppage at the Osula CHP plant following a turbine failure. This situation was further complicated by delays from the manufacturer, resulting in almost six months of shutdown. Helme CHP generated significantly less heat in 2024, with a 23% reduction compared to 2023, owing to a broken heat exchanger.

Despite our advanced preventative maintenance systems, the Osula and Helme equipment malfunctions demonstrate that further mitigation measures are needed in our energy generation processes.



	2020	2021	2022	2023	2024
Electricity Production GWh/y	337	325	331	333	298
Heat, CHP, GWh/y	916	915	949	947	905



## Our approach to stakeholders

**Our major stakeholder groups are** our employees, shareholders, investors, business partners, suppliers, clients and end-consumers, governmental agencies, non-governmental organizations, local communities, and the natural environment.

At the beginning of the year we introduced [new safety instruction application](#) which helps our partners and guests familiarize themselves with the safety instructions and rules before entering the factory premises.



This application provides safety instructions for visitors to Graanul Invest Group's companies. It emphasizes the importance of wearing appropriate PPE, adhering to safety protocols, and maintaining environmental protection standards. It outlines specific areas where entry is prohibited and actions that are forbidden to ensure the safety of all personnel and visitors. It also includes emergency procedures and penalties for non-compliance to reinforce the importance of following the guidelines.

The new visitor tool collectively ensures that all individuals—whether truck drivers, service providers, or visitors—are aware of and follow the safety, fire, and environmental protection requirements at Graanul Invest Group's companies.

"A certificate will be sent to those who complete the training, which will allow them to enter the factory. The certificate is valid for a certain period, and once it expires, the safety training must be retaken."

**Mihkel Jugaste,**  
CSO



[new safety instruction application](#)

## The most important sustainability topics for our employees and partners are:

- Fair working conditions and secure working environment for employees
- Safety and wellbeing of employees
- Training and growth opportunities for employees
- Ambitious and proven carbon footprint (CO<sub>2</sub> emissions) reductions
- Protection of biodiversity and conservation of natural habitats
- Prevention of air pollution
- Responsible and ethical sourcing of raw materials, products or services
- Responsible and accurate sustainability-related communication and marketing

We consistently engage with our stakeholders, either through direct cooperation or via the organizations of which we are members. We also provide stakeholders with relevant information through our sustainability report, and systematically respond to submitted questionnaires, written complaints and suggestions as they arise.

The Group ensures that stakeholders can always submit notifications and feedback through clearly defined channels (e-mail addresses, links ) available on its website.

These include:

- Complaint and feedback handling procedures
- Stakeholder engagement plans
- Biomass and energy production activities
- Reporting violations of European Union legal requirements

## Our people

At our company, we deeply value our employees and their unwavering dedication. Recognizing that our success is built on their hard work and commitment, we prioritize their growth and development. We are committed to continuously educating and training our team members, ensuring they have the skills and knowledge needed to excel in their roles. By investing in their professional development, we not only enhance their capabilities but also foster a culture of continuous improvement and innovation.

**Our employees are our greatest asset, and we are proud to support their journey towards excellence.**

The company is deeply committed to fostering a healthy and supportive work environment through its comprehensive health and wellness programs. These initiatives are designed to enhance the overall well-being of employees, recognizing that a healthy workforce is a productive and engaged one. By prioritizing employee health, the company not only helps individuals achieve their personal wellness goals but also cultivates a culture of care and support. This holistic approach ensures that employees feel valued and empowered, ultimately contributing to their happiness and productivity at work.

In March, an electronic information sharing platform called HR Portal was introduced for the group's Estonian employees. From now on, the submission and modification of employees' personal data will only be done through this portal. Employees themselves decide how much and what kind of information they share with the employer. Mandatory data is specifically highlighted, and its collection is based on the local employment law. Another major goal of the portal is to share work-related information and quickly convey announcements that concern all employees of the respective company unit. It is also possible to download forms for applications and reports used in the company from the portal, fill them out electronically, digitally sign them, and send them via email to the direct supervisor for approval/coordination. The program is continuously being developed so that approvals for applications and forms can be obtained through the same program. In the future, the program's usage will be extended to other group employees.

These measures reflect our broader commitment to maintaining transparency, valuing employee engagement, and continually improving the systems that support our workforce. By integrating innovative tools and fostering open communication, we strive to create an environment where employees feel empowered and valued.

In 2024, the employee satisfaction survey was not conducted. 2024 results did not highlight any concerns for immediate follow ups.

Employee statistics

All our positions are permanent, with nearly all employees working full-time. The average employee is 42 years old and has been with the company for 7.5 years. Employment length considers the total service duration, not just time within the Graanul Invest group.



**Number of employees (head count)**

<b>2021</b>	502	<b>2023</b>	545
<b>2022</b>	516	<b>2024</b>	502

Due to the volatile nature of the energy and manufacturing sectors and the increasing competition in the feedstock market, the company had to become even more efficient in every corner and activity of the value chain. This meant reducing some functions but simultaneously expanding others as well as creating new roles.

In 2024, the total number of employees at our company decreased from 545 in 2023 to 502, marking a reduction of 43 employees. This occurred in multiple subsidiaries, different business functions and throughout the year. This reduction cannot be connected with one single location or reason.

Total voluntary turnover rate was 5,3 % in 2024. Of the newly hired employees, 18% were female.



**Our employees' statistics of men and females according to different job positions**

Year	Total	Male (M)	Female (F)	F/M ratio, %	Blue-collar, total	White-collar, total	WC/BC, %	Male, Blue-collar	Female, Blue-collar	F/M Blue-collar ratio, %	Male, White-collar	Female, White-collar	F/M White-collar ratio, %
2024	502	416	86	20.7	360	142	39.5	324	36	11.2	92	50	54.4

In comparison to the preceding two years, the gender ratio of employees has remained relatively stable at 20.7% female in 2024. Similarly, the proportion of office and production workers has stayed consistent, with 40% of all employees being office workers. In 2024, there was a slight decrease in the proportion of female employees among production workers, dropping to 11.2% from 13.8% in 2023. Conversely, the number of female employees among office workers saw an increase of 9.4% compared to 2023.

Working environment and safety first

**Our goal is to achieve zero work-related incidents and accidents**

At our company, workplace safety is not just a policy; it is a fundamental value that guides every aspect of our operations. We believe that the well-being of our employees is paramount, and we are committed to creating a safe and healthy work environment for everyone.

From the moment you step into our facilities, you will notice that safety is embedded into our culture. Our comprehensive safety programs are designed to prevent accidents and injuries, ensuring that each team member can perform their duties with confidence and peace of mind. We invest in state-of-the-art safety equipment, provide regular training sessions, and continuously review and improve our safety protocols to meet the highest standards.

Our commitment to safety extends beyond compliance with regulations. We actively encourage our employees to participate in safety initiatives, report potential hazards, and contribute to a culture of vigilance and care. By encouraging open communication and collaboration, we empower our workforce to take ownership of their safety and the safety of their colleagues.

In our processes, we prioritize the use of safe materials and technologies. We conduct thorough risk assessments and implement robust safety measures at every stage of production. Our goal is to minimize risks and create a work environment where safety is seamlessly integrated into daily operations.

Workplace safety is at the heart of our manufacturing company. It is a shared responsibility that we take seriously, and we are proud to uphold the highest standards of safety in everything we do. Together, we can create a safe, healthy, and thriving work environment for all.

In 2024, the number of workplace accidents in the group decreased significantly, with a total of 5 accidents compared to 12 in 2023.

**Number of workplace accidents**

<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>
6	5	5	6	12	5

A 60% reduction in Total Recordable Incident Rate (TRIR) performance compared to 2023 (3.26 vs 1.29).

This improvement demonstrates early positive impacts of our safety culture improvements initiated in late 2023. Safety culture 2024 developments were: Strengthened focus on preventive measures and hazard identification, Enhanced safety training programs, Development of behavioral safety action plans (particularly in US operations).

**TRIR value**

<b>2022</b>	<b>2023</b>	<b>2024</b>
1.29	3.26	1.29

**HS number\***

<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>
0.86	1.12	0.98	0.77

The lower the HS number a facility has, the better its health and safety compliance. In 2024, Estonian plants recorded the best HS numbers. The Imavere plant achieved the best work safety score with 0.23 (0.61 last year), while the Ebavere plant showed the most improvement with a score of 0.71 (1.33 last year). The average HS number for Estonian plants was 0.37, Latvia's average was 0.65, and the Group average was 0.77, a 21% improvement from 2023.



"Certainly, the weekly internal audits contributed to achieving this result, and we were extremely proud to be accident free in 2024."

**Andrus Rännik,**  
Factory Manager of the Imavere factory



\* In the health and safety number (HS number), we measure incidents and assess "housekeeping" at all our sites. This involves evaluating the general visual and technical order in occupational safety monitoring areas, including working spaces, availability of first aid materials, provision of protective equipment, working conditions, hazard labeling, fire and safety barriers, condition of hand tools, electrical equipment, ladders, etc. This approach allows us to increase the efficiency and accuracy of the potential improvement measures. Inspection audits are conducted in our plants four times per year to assess compliance. The results of these audits are applied to the number of employees at each location to gain a measurable metric for safety conditions and housekeeping. Our group target for the HS number is 1.00.

## Our principles for a safe working environment:

- Culture:** We foster a safety-first culture and encourage reporting hazards.
 

The Group's culture is founded on principles of equality, respect and inclusivity. The Group maintains a zero-tolerance policy towards work-related harassment, ensuring that every employee feels safe and valued in their workplace environment.
- Communication:** We share experiences and learn from past incidents.
- Individual Ownership:** Employees maintain their own protective gear and tools.
- Health and Mental Well-being:** Regular health check-ups and promotion of healthy lifestyles, with sufficient days off for training and personal time.
- Proper Use of PPE:** Mandatory appropriate equipment based on work nature to reduce risks.
- Training:** Regular safety training and guidelines updates, including digital training for visitors and subcontractors.
- Modernization:** Adoption of new tools and safer solutions.

"In 2024 we totally installed 7 new maintenance platform sets and 13 self-closing gates for vertical stairs to further improve work place safety"

**Aleksanders Zjatkovs,**  
Factory Manager of the Incukalns pellet plant

- Safety Checks:** Regular safety audits and mandatory personal safety equipment.
- Inspection and Maintenance:** Routine checks and maintenance of equipment.
- Partners:** Sharing safety practices and policies with diverse partners visiting our premises.

## Safety always comes first. Ensuring a safe workplace is our shared responsibility.

To enhance our fire safety infrastructure, in 2024 we invested in a new addressable fire alarm system at our Jaunjelgava pellet plant. This advanced system transmits signals via a single cable that runs through all installed detection devices, ensuring more efficient and reliable communication of potential hazards.

At the Jēkabpils plant, the fire water tanks were replaced due to corrosion in the existing metal tanks.

"These investments will not only bring our fire alarm system up to code but also improve the overall safety and functionality of our fire detection and response capabilities."

**Martins Zvejnieks,**  
Latgran Chief Operating Officer



### Human rights, the rights of employees and diversity

Graanul Invest is committed to respecting human rights of consumers, end-users, suppliers and other stakeholders and actors in the value chain adhering to internationally recognized frameworks such as the UN Guiding Principles on Business and Human Rights, the ILO Declaration on Fundamental Principles and Rights at Work, and the OECD Guidelines for Multinational Enterprises. We ensure compliance across our operations and expect our suppliers to uphold the same standards.

We focus on maintaining a sustainable and ethical supply chain and value chain by minimizing risks related to forced labor and promoting compliance with certifications such as FSC®, PEFC, and SBP. These efforts align with our commitment to high ethical standards and sustainability principles in all business operations.

### Principles of training and development of employees

We encourage practices that support flexible working arrangements and well-being programs, ensuring their right to a healthy work-life balance. The Group provides equal access to training and development opportunities for all employees while developing training programs, including practical training related to specific job tasks tailored to the needs of the respective production unit, as well as personal professional development.

In 2024, 64% of workers participated in the training programs, resulting in a total of 9,527 hours of training being completed. Employees were offered various trainings including safety, mental health, cybersecurity, environmental awareness, language skills, quality management and others.

## Safety always comes first.



## Workers in the value chain

Supplier audits are conducted annually under FSC®, PEFC, and SBP frameworks. Internal audits are carried out by relevant personnel in each operating region, including on-site production inspections. In 2024, Graanul Invest completed 428 supplier inspections.

The company prioritizes the safety, well-being, and protection of employees and extends similar care to workers within its value chain. Raw materials are sourced from suppliers audited for compliance with FSC®, PEFC, or SBP standards. These standards assess various aspects related to the rights of individuals within the biomass procurement value chain, emphasizing decent working conditions and labor rights protection.

Key elements evaluated include respect for freedom of association and collective bargaining, prohibition of forced or compulsory labor, and elimination of child labor. Additionally, the standards mandate non-discrimination in employment practices, ensure wages meet or exceed legal minimums, stipulate compliance with legal working hour requirements, and guarantee access to healthcare and other benefits for workers.

The evaluations and audits within these standards ensure adherence to ethical labor practices, environmental sustainability, and the protection of community rights throughout the biomass procurement process.

## Contribution to society

Graanul Invest is committed to giving back to communities by supporting youth-focused initiatives in sports, education, and scientific research. These efforts reflect the Group's focus on building a better future.



## Estonia

In 2024, Graanul Invest supported various sports activities in Estonia, including the Estonian Volleyball Association, local sports clubs, and Tõrva Sport Association's athletics day. The company also backed wrestling, a brass band, a memorial basketball tournament, and a cycling event. Annually, we also donate wood pellets to a cat shelter.

Youth scientific projects like the University of Tartu Science School, Estonian Physical Society, and Estonian Junior Achievement received our unconditional support.

Graanul Invest provided Imavere Primary School with a projector for their English classroom and supported Tõrva NGO's Children's Day event.



## Latvia

Graanul Invest has also extended its support to various sports activities in Latvia, including the Latvian Volleyball Federation, Latvian Sports Wrestling Federation, Latvian Sports Dance Federation, as well as numerous other sports clubs such as handball, basketball, fitness, BMX cycling, among others.

A rehabilitation center received a donation of pellets for heating and several schools were supported with resources for brain games and transportation services for field trips. The Kraslava Catholic Congregation was assisted with Christmas gifts for children from low-income families.

## United States

In the USA, Graanul Invest supported regional fire safety by assisting the Woodville and Ivanhoe Fire Departments.





# Governance

## Strategic sustainability management

In today's rapidly evolving business landscape, strategic sustainability management has become a cornerstone for companies aiming to balance economic growth with environmental stewardship. For a company engaged in the production of wood pellets and biomass-based electricity, this approach is not just a corporate responsibility but a strategic imperative that drives long-term success and resilience.

At the heart of the company's sustainability strategy is our Chief Sustainability Officer (CSO), a pivotal role within the executive board tasked with integrating sustainability into the core business operations. Ensuring that every decision aligns with the company's environmental goals and regulatory requirements. This leadership position underscores the company's commitment to sustainability at the highest level of governance.

The production of wood pellets and biomass energy inherently supports sustainability by utilizing renewable resources. However, the company goes beyond the basics by implementing advanced sustainable practices throughout its supply chain. This includes sourcing raw materials from responsibly managed forests, ensuring that the biomass used is sustainably harvested, and maintaining a transparent supply chain to verify the sustainability credentials of all suppliers.

A key aspect of strategic sustainability management is engaging with the community and stakeholders. The company actively seeks collaborations with local communities, environmental organizations, and government bodies to promote sustainable practices and support local economies. This engagement helps build trust and fosters a positive relationship with stakeholders, which is essential for long-term success.

Transparency and accountability are vital components of the company's sustainability strategy. Our CSO oversees rigorous monitoring and reporting mechanisms to track progress against set sustainability goals. Regular sustainability reports provide stakeholders with insights into the company's environmental performance, highlighting achievements and areas for improvement.

Strategic sustainability management is integral to the company's operations, driving both environmental and economic benefits. With a dedicated CSO at the helm, the company is well-positioned to navigate the challenges of the modern business environment while contributing to a more sustainable world.

## Ethics

### *Operating principles*

Graanul Invest is committed to ensuring a safe working environment and sustainable production processes, aiming to create high-quality, environmentally net positive products. The company adheres to all applicable laws and best practices, ensuring that both Graanul Invest and its partners operate ethically and sustainably.

Environmental responsibility is a core focus, with efforts directed towards reducing carbon emissions and developing a renewable energy solution for replacing fossil fuels in the energy sector and beyond. Regular monitoring of emissions, energy, and resource efficiency is conducted to continuously improve our value chain performance and minimize our own environmental impact within it.

The well-being of employees is paramount. Graanul Invest supports its workforce through training, education, and promoting healthy activities. The company ensures fair and transparent compensation, exceeding legal requirements, and maintains a safe and respectful working environment. Employees are encouraged to participate in all innovation and engineering projects through in-house working groups.

Ethical business operations are maintained by adhering to sustainable forestry and transparent supply chain standards. Regular audits are conducted to ensure compliance and mitigate corruption risks. The company also responsibly collects and analyzes data, ensuring proper storage and processing.

Continuous improvement is a guiding principle, with regular internal audits and feedback from customers and stakeholders giving us direction. Goals and results are communicated throughout the organization to ensure alignment and progress.

Community engagement is also a priority. Graanul Invest supports local initiatives, particularly those focused on youth sports, education, and scientific research. The company maintains close ties with local communities, supporting activities that align with their interests and needs.

These principles guide Graanul Invest in achieving its goals while ensuring ethical, sustainable, and high-quality operations.

### Whistleblower protection mechanism

In 2024 whistleblower protection solution was implemented.

The policy applies to all individuals who are in a working or service-related relationship with the Group, including employees, management, temporary staff, trainees, consultants, service providers and others.

Reportable matters include violations related to public procurement, financial services and anti-money laundering, product and transport safety, environmental protection, food and feed safety, animal welfare, public health, consumer protection, data privacy, network and information systems security, protection of EU financial interests, and breaches related to corporate tax rules.

The Group encourages all individuals in a working relationship to speak up, knowing they will be heard and treated fairly.

### Anti-corruption and bribery

The Group is firmly committed to eradicating corruption from its operations even if this means refraining from new business activities, avoiding the services of certain third parties or business partners, or tolerating delays in existing operations.

We are committed to operating with integrity, transparency, and full compliance with all applicable anti-corruption laws in every jurisdiction where we operate. This commitment is a core part of the Group's ethical business conduct and risk management framework.

The Group has a Group-wide Anti-Corruption Guideline in place, which applies to all entities, employees, and relevant third parties across the Group. The guideline provides practical instructions on, but not limited to:

- Identifying and assessing corruption risks
- Implementing internal controls and preventive measures
- Handling gifts, hospitality, sponsorships, and donations
- Managing third-party relationships and public official interactions
- Recognizing and reporting conflicts of interest
- Ensuring proper reporting channels and whistleblower protection

We maintain internal controls and procedures to prevent and detect corruption.

### Cybersecurity

In 2024, an IT security assessment was conducted across the entire group, resulting in significant improvements to the level of cybersecurity. Notable changes were made to the IT solutions infrastructure, including a transition to cloud solutions.

In December, the group moved from servers to a cloud system to enhance security, efficiency, and overall IT infrastructure by closing access to the company's remote desktop server. Files are now accessed via SharePoint instead of using the remote desktop to access shared folders. SharePoint provides a secure and reliable way to share and store files, with access available from any device with an internet connection, supporting remote work. Unlike the remote desktop server, which may be vulnerable to cyberattacks, SharePoint has strong security features, including automatic backups and improved data protection.

### Data protection

The Group processes personal data in accordance with applicable data protection laws, including the GDPR. We store data securely and retain it only as long as necessary for legal or operational purposes.

## Graanul Invest is a part of several industry organizations:

- Bioenergy Europe
- Estonian Forest and Wood Industry Association
- Estonian Renewable Energy Chamber
- Union of Electricity Industry of Estonia
- Latvian Renewable Energy Federation
- Latvian Timber Producers and Exporter Association
- United States Industrial Pellet Association

## Risk management

The management of Graanul Invest Group performs regular supervision, evaluates and attempts to anticipate potential risks that may impact the company's activities and financial performance.

In 2024 the key risks that we see and the measures for the mitigation or elimination of their effects include:

### ● Customer risk

A significant portion of the Group's revenue comes from a small number of customers, exposing us to business interruption risks. The wood pellet market is distinct due to the concentration of market volume among a few large customers. To mitigate this risk, we focus on acquiring new customers and developing new business lines over the long term.

### ● Risk of changing interest and foreign exchange rates

To mitigate the risk of significant changes in the base interest rates of loans, we have concluded agreements with banks to fix interest rates. Currency risks are hedged primarily by keeping the main incoming and outgoing cash flows in the same currency (the euro in the Baltic States and the U.S. dollar in the United States).

### ● Risk of a fire or other accidents

The Group's production units have been built on principles to lower such risk and to minimize the negative impact of such incidents. There are 12 production units, sufficient to ensure that damage at one plant does not significantly impact on the total results of the Group or the fulfilment of its agreements and obligations. To reduce this risk, we have entered an insurance contract which further covers all production units, compensating for potential losses which may arise from damage to assets or a business interruption.

### ● Macroeconomic environment risks

The main operational units of the Group are in the Baltic States, facing specific macroeconomic risks related to energy markets, raw material costs, and geopolitical tensions, especially given the impact of ongoing war in Ukraine. We navigate the risks by diversifying our revenue streams across multiple markets, managing our raw material sourcing and supply chain, and optimizing our cost structure through energy efficiency and process automation. Our focus on sustainable forestry practices and ESG integration further strengthens our resilience against economic fluctuations and geopolitical uncertainties.

## Transparency and Reporting

Since initiating our annual sustainability reporting in 2017, we have developed a format that incorporates more quantitative and comparable data with third party backing. We are committed to enhancing this report each year in line with the best practices and the Corporate Sustainability Reporting Directive.

The sustainability report is approved by the whole management board, which underscores our top-level endorsement and support for the sustainability strategy detailed within. This reassures stakeholders, including investors, employees, customers, and communities, of our unwavering commitment to sustainability.

## The material topics of Graanul Invest Group

Topic	Topic materiality
<b>Circular economy</b>	Material topic
<b>Climate Change</b>	Material topic
<b>Pollution</b>	Material topic
<b>Consumers and end-users</b>	Material topic
<b>Biodiversity and ecosystems</b>	Material topic
<b>Affected communities</b>	Material topic
<b>Own workforce</b>	Topic to be added as material, reporting scope needs to be specified
<b>Business conduct</b>	Topic to be added as material, reporting scope needs to be specified
<b>Water and marine resources</b>	Topic as immaterial, reporting on some sub-topics and reporting scope needs to be specified
<b>Workers in the value chain</b>	Topic as immaterial, reporting on some sub-topics and reporting scope needs to be specified



# Appendix → E, S, G

## E

Distribution of GHG emissions into scopes	Scope 1 Direct emissions from owned or controlled sources.	Scope 2 Indirect emissions from the generation of purchased energy.	Scope 3 Other indirect emissions that occur in the value chain.
	10%	20%	70%

GHG emission Scope 1-3 (S1, S2, S3)						
Scope (CO2e tons)	2022	2022	2023	2023	2024	2024
S1 Stationary Combustion	13,919	41,290	16,308	36,653	8,351	34,815
S1 Mobile Combustion	26,837		20,076		26,160	
S1 Refrigerants	534		270		304	
S2 Purchased electricity	82,926	82,926	89,702	89,702	64,819	64,819
S3 Purchased Goods and Services	-	81,589	1,628*	161,388	61,166	232,640
S3 Capital Goods	-		-		6,906	
S3 Fuel- and Energy-Related Activities Not Included in Scope 1 or Scope 2	4,346*		8,338		11,499	
S3 Upstream Transportation and Distribution	19,754		16,836		15,658	
S3 Waste Generated in Operations	-		-		170	
S3 Business Travel	-		315		434	
S3 Employee Commuting	-		629		572	
S3 Downstream Transportation and Distribution	57,489		66,055		44,101	
S3 Use of Sold Products	-		67,587		72,371	
S3 Downstream Leased Assets	-		-		19,763	
<b>TOTAL</b>	<b>205,805</b>		<b>287,743</b>		<b>332,274</b>	

\*Not all data available for 2022 and/or 2023  
- Data not available for 2022 and 2023.

## GHG emission Scope 1 and 2 (S1, S2)

Scope (CO <sub>2</sub> e tons)	2022	2022	2023	2023	2024	2024
S1 Stationary Combustion	13,919	41,290	16,308	36,653	8,351	34,815
S1 Mobile Combustion	26,837		20,076		26,160	
S1 Refrigerants	534		270		304	
S2 Purchased electricity	82,926	82,926	89,702	89,702	64,819	64,819

## GHG emission Scope 3 (S3)

Scope (CO <sub>2</sub> e tons)	2022	2022	2023	2023	2024	2024
S3 Purchased Goods and Services	-	81,589	1,628*	161,388	61,166	232,640
S3 Capital Goods	-		-		6,906	
S3 Fuel- and Energy-Related Activities Not Included in Scope 1 or Scope 2	4,346*		8,338		11,499	
S3 Upstream Transportation and Distribution	19,754		16,836		15,658	
S3 Waste Generated in Operations	-		-		170	
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S3 Use of Sold Products	-		67,587		72,371	
S3 Downstream Leased Assets	-		-		19,763	

## Carbon intensity (gCO<sub>2</sub>e/MJ) split by:

	2018	2019	2020 (baseline)	2021	2022	2023	2024
	7.70	7.45	7.08	6.63	6.83	7.03	6.61
Sourcing	-	-	0.79	0.67	0.70	0.91	0.98
Production	-	-	3.50	3.41	3.62	3.60	2.99
Transportation	-	-	2.79	2.55	2.51	2.52	2.64

## Raw materials used for pellet production

	2022	2023	2024
Sawmilling and wood industry residues, including:	43.40%	31.86%	33.71%
Wood chips	26.00%	19.00%	15.25%
Sawdust and shavings	17.00%	12.69%	18.24%
Off-cuts	0.40%	0.17%	0.22%
Low-quality stem wood	56.60%	68.14%	66.51%

## Total water consumption

Total water consumption (m <sup>3</sup> )	2022	2023	2024
	226,494	243,925	264,476

Total water consumption from public water supply and total wastewater discharged to public sewage is also part of greenhouse gas emissions, Scope 3.

	2023	2024
Total water consumption from public water supply (Group) (m3)	29,648	24,350
Total wastewater discharged to public sewage (Group) (m3)	23,619	16,958

	2020	2021	2022	2023	2024
Water usage per 1t pellets	0.092	0.096	0.098	0.099	0.123

## Raw material origin by country in the Baltics

	2022	2023	2024
Latvia	46.03%	51.25%	58.02%
Estonia	46.56%	44.79%	38.18%
Lithuania	4.93%	3.74%	2.94%
Poland	0.07%	0.04%	0.68%
Sweden	1.49%	0.19%	0.03%
Finland	0%	0%	0.14%
Belarus	0.59%*	0%	0%
Norway	0.30%	0%	0%
Russia	0.04%*	0%	0%

\* We immediately stopped all imports from Russia and Belarus after Russia attacked Ukraine on 24th of February 2022.

The raw material of the Woodville pellet plant in Texas, US, is 100% originated from the USA.

## Raw material procurement radius

2020	2021	2022	2023	2024
55.0 km	53.0 km	37.07 km	43.48 km	49.25 km

## Annual production

### Annual production volumes by country

	2022 (tons)	2023 (tons)	2024 (tons)
	2,319,839	2,341,916	2,079,841
Estonia	912,994	860,965	673,736
Latvia	1,013,329	1,088,388	1,046,816
Lithuania	88,372	77,254	80,983
USA	305,144	315,148	278,306

### Waste generation volumes in 2022-2024

Waste type	2022 (tons)	2023 (tons)	2024 (tons)
Non-hazardous waste	21,332	21,460	23,910
Hazardous waste	124	88	130

## Combined heat and power (CHP) plants

	2020	2021	2022	2023	2024
Electricity Production GWh/y	337	325	331	333	298
Heat, CHP, GWh/y	916	915	949	947	905

# S



Number of employees (head count)

<b>2021</b>	502	<b>2023</b>	545
<b>2022</b>	516	<b>2024</b>	502

## Our employees' statistics of men and females according to different job positions

Year	Total	Male (M)	Female (F)	F/M ratio, %	Blue-collar, total	White-collar, total	WC/BC, %	Male, Blue-collar	Female, Blue-collar	F/M Blue-collar ratio, %	Male, White-collar	Female, White-collar	F/M White-collar ratio, %
2024	502	416	86	20.7	360	142	39.5	324	36	11.2	92	50	54.4

## Number of workplace accidents

2019	2020	2021	2022	2023	2024
6	5	5	6	12	5

## TRIR value

2022	2023	2024
1.29	3.26	1.29

## HS number\*

2021	2022	2023	2024
0.86	1.12	0.98	0.77

The lower the HS number a facility has, the better its health and safety compliance. In 2024, Estonian plants recorded the best HS numbers. The Imavere plant achieved the best work safety score with 0.23 (0.61 last year), while the Ebavere plant showed the most improvement with a score of 0.71 (1.33 last year). The average HS number for Estonian plants was 0.37, Latvia's average was 0.65, and the Group average was 0.77, a 21% improvement from 2023.

# G

## The material topics of Graanul Invest Group

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## Used abbreviations

**ESG** - (environmental, social and corporate governance) means a sustainable and responsible approach to business management from an environmental, social and corporate governance perspective. Sustainability reporting standards are categorized according to E, S and G topics.

**ENplus\*** certification guarantees the physical quality of our premium pellets and enforces standardized laboratory procedures for precise verification and measurement. Seven of our European factories have obtained this certification.

**ISO 9001** certification validates our quality management system, encompassing the physical quality of the product, company procedures, operating environment and customer satisfaction. All our European factories have obtained this certification.

**FSC® (FSC-C103815)** chain of custody certification helps identify and mitigate potential risks in supply chains and ensures that the supply chain complies with international FSC® standards. All our European factories have obtained this certification.

**GHG** - Greenhouse gas emissions are reported in units of carbon dioxide equivalence (CO<sub>2</sub>e). It covers the accounting and reporting of the six greenhouse gases covered by the Kyoto Protocol - carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>).

**ISO 14001** certification demonstrates that our environmental management system ensures we map and manage our environmental impacts and engage in monitoring that exceeds the requirements. All our European factories have obtained this certification.

**ISO 45001** certification for occupational health and safety management systems is held by all of our European factories.

**ISO 50001** energy management and performance certification ensures systematic and effective energy consumption in our ten factories in Estonia and Latvia.

**KPI** - Key Performance Indicator. A quantifiable metric used to track progress towards a specific business objective.

**PEFC** - Programme for the Endorsement of Forest Certification ensures that our supply chain is sustainable and transparent. It defines requirements for the transparent and traceable movement of certified raw materials and helps to identify and mitigate potential risks in the movement of raw materials. All our factories have obtained this certification.

**RED** - The Renewable Energy Directive is the legal framework for the development of clean energy across all sectors of the EU economy, supporting cooperation between EU countries towards this goal. RED II is a revised version of the directive that entered into force 20 November 2023.

**SBP** - Sustainable Biomass Program is widely recognized as our sector's most important and impactful certification. What sets SBP apart is its comprehensive coverage of the entire value chain, ensuring rigorous requirements and supervision from raw material sourcing to goods transportation, and from forestry carbon cycle to energy sources used in production. All our factories have obtained this certification.

**SDG** - Sustainable Development Goal. The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership.

**The Paris Agreement (or Paris Accords, Paris Climate Accords)** is an international treaty on climate change that was adopted in 2015. The treaty covers climate change mitigation, adaptation, and finance. The Paris Agreement was negotiated by 196 parties at the 2015 United Nations Climate Change Conference near Paris, France. As of February 2023, 195 members of the United Nations Framework Convention on Climate Change (UNFCCC) are parties to the agreement.

**TRIR** - Total Recordable Incident Rate is a normalized metric that captures the frequency of any recordable or reportable injuries and illnesses. OSHA TRIR is calculated on an annual basis and is calculated with 200 000 working hours.

Graanul Invest Sustainability Report 2024  
[graanulinvest.com](https://www.graanulinvest.com)