

Sustainability Report 2025

Nipro PharmaPackaging Germany GmbH



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1. About this report

This report provides an update on our environmental, social, and energy-efficiency performance for the year 2025, assessed against our 2025 targets. We continue to publish our sustainability performance on an annual basis, with the previous report issued in April 2024.

The report includes performance data from our operating facilities, and we remain committed to ensuring that reporting on key sustainability indicators is as accurate, comprehensive, and reliable as possible. In addition to operational data, we also outline activities related to supplier engagement as part of our efforts to strengthen transparency and drive improvements across our value chain.

To further illustrate our progress toward the 2025 sustainability goals, the report also provides details related to the Carbon Disclosure Project and includes information on Scope 3 emissions, reflecting our ongoing work to better understand and manage upstream and downstream impacts. The environmental and energy policy supports our sustainability vision with clear commitments to:

- improve the production conditions systematically and holistically with respect to their environmental compatibility and efficiency in the long term
- comply with all statutory environmental and energy requirements if feasible even beyond the obligations and to continually improve the efficiency of the management systems
- train and support the staff in their sustainability activities to implement the company policy and carefully use resources and energy



Picture 1: Image of the large photovoltaic roof system which was installed in 2022.

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2. Environmental and Energy Management at NPG

The Münnerstadt sites in Germany have been successfully certified under the environmental management standard ISO 14001 since 1998. In addition, both plants hold certification according to DIN EN ISO 50001 for their energy management systems.

We are currently preparing our commitment to the Science Based Targets initiative (SBTi). However, the formal submission cannot take place until 2026, as it requires coordinated target setting and alignment across the entire corporate group.

We have joined the EcoVadis Network in 2019 and again successfully rated with BRONZE in 2025.

Nipro Group has joined the Carbon Disclosure Project (CDP) in 2022 and was B+ rated.

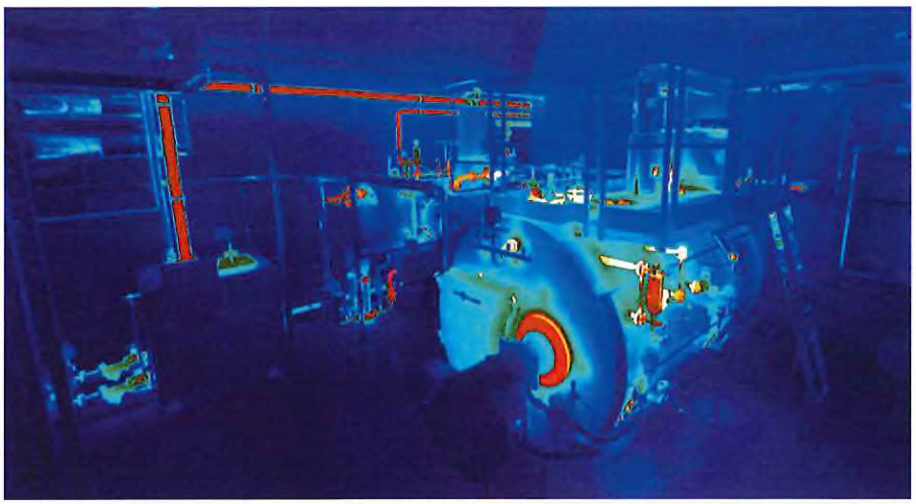


Picture 2: EcoVadis Ranking

Research and Development

We are currently working with a consortium of technical universities on a hydrogen-based forming process for pharmaceutical glass. We are advancing the development of a low-pressure energy grid to optimize distribution efficiency and reduce system losses across our operational network. Additionally, we recover excess heat from our glass-converting processes and reintegrate it into our thermal systems, thereby decreasing primary energy demand and improving overall process sustainability.

We have implemented an advanced system for the generation of pharmaceutical-grade water for injection (WFI), which has been fully operational since spring 2023. The system operates with near-zero CO_2 emissions across production, storage, and distribution due to its highly efficient thermal and process-integrated design.



Picture 3: Thermal image of the steam generator and its economiser and feed water supply

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3. Sustainability Goals 2025

We advance our sustainability strategy by enhancing operational efficiency, systematically reducing our environmental footprint, and fostering empowerment across the organization to enable informed, climate-aligned decision-making at all levels.

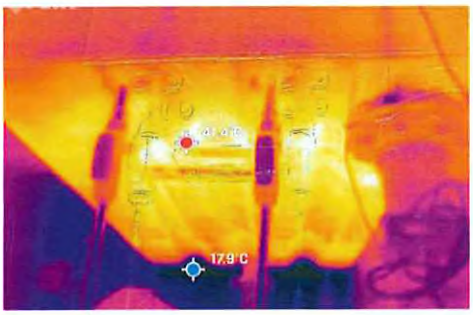
We evaluated and prioritized the environmental, social and energy factors most relevant to our business and defined three areas to focus that provide the framework for our 2025 sustainability goals.

3.1. Special projects in 2025

In 2025, we advanced a portfolio of decarbonization, and resource-efficiency projects designed to measurably reduce environmental impacts across multiple stages of our value chain. These initiatives focus on process optimization, energy-system transformation, and material-efficiency improvements, collectively supporting our transition toward low-emission and climate-resilient operations, and this section highlights selected 2025 projects that demonstrate tangible progress toward CO_2-neutral site transformation.

To reduce CO_2 emissions associated with downstream processes, targeted optimization of ETO sterilization began in 2025. Through revalidation of the sterilization protocol, fumigation exposure was reduced by 50%, substantially lowering process-related environmental impacts without compromising sterility assurance.





As part of our pathway to carbon-neutral operations, we are transitioning to heat-pump–based systems and advanced heat-recovery technologies. In 2025, we initiated the recovery of thermal energy from process wastewater for building heating, with full system commissioning planned for 2026 following completion of the trial phase.

Eliminating the stretch-net film in our D2F-products results in an annual reduction of approximately 1.7 t CO_2-equivalent, corresponding to the sequestration capacity of about 85 mature trees.



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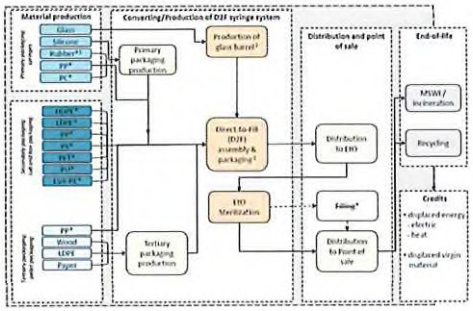
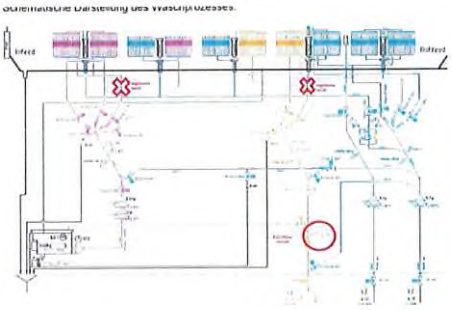
A key element of our process transformation is the transition from high-pressure systems to low-pressure or compressed-air-free operations. Baseline measurements were completed in 2025, and implementation of a pilot installation is scheduled to begin in 2026.

The life cycle assessment (LCA) of our D2F syringes was conducted across all products-system phases in alignment with the EU Product Environmental Footprint (PEF EF 3.1) methodology.





To further reduce process-water consumption while maintaining product quality, we successfully industrialized a reduced-water washing protocol in 2025 following an extensive testing and validation phase.

3.2. Efficiency

Building on the progress of our 2025 decarbonization and process-optimization initiatives, this section presents the quantitative effects of our transition measures on overall energy performance. As we expand manufacturing output, improving energy efficiency and reducing resource intensity remain critical levers—ensuring that operational growth is decoupled from environmental impact and aligned with our trajectory toward CO_2-neutral operations.

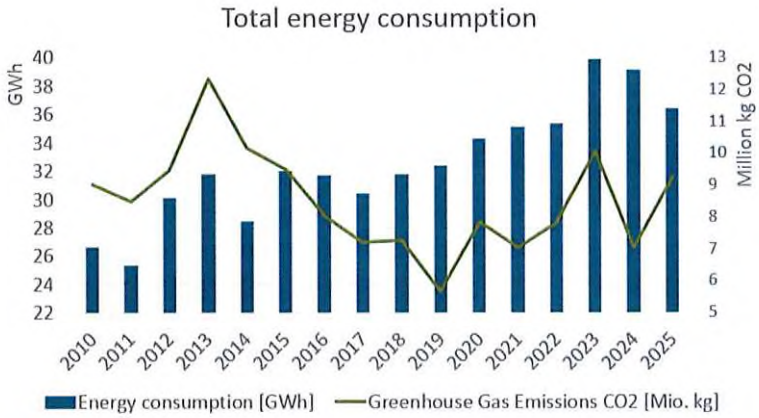
Emissions and energy conservation:

Reduction of Greenhouse Gas Emissions by 30% (Baseline 2015)

status -2.7%

Conservation in total energy consumption by 15% (Baseline 2015)

status +13.8%



Over the past twelve months, a combination of strategic decisions and global developments has led to a substantial setback in our transformation efforts, resulting in a deterioration of energy- and emissions-related performance. In the coming years, it will be essential to re-intensify our efforts—advancing the electrification of tempering furnaces, accelerating the transformation of our D2F process, expanding low-pressure and heat-recovery applications, and continuing the rollout of our photovoltaic roof systems—to restore momentum and achieve meaningful decarbonization.

Total energy consumption [MWh]	2015	2024	2025
Plant I + II	31,963	39,111	36,371
Plant I	24,504	10,602	9,477
Plant II	7,459	26,612	25,101
Own Generation	0	1,897	1,794
CO_2 - Emission [t]			
Plant I + II	9,519	7,033	9,263

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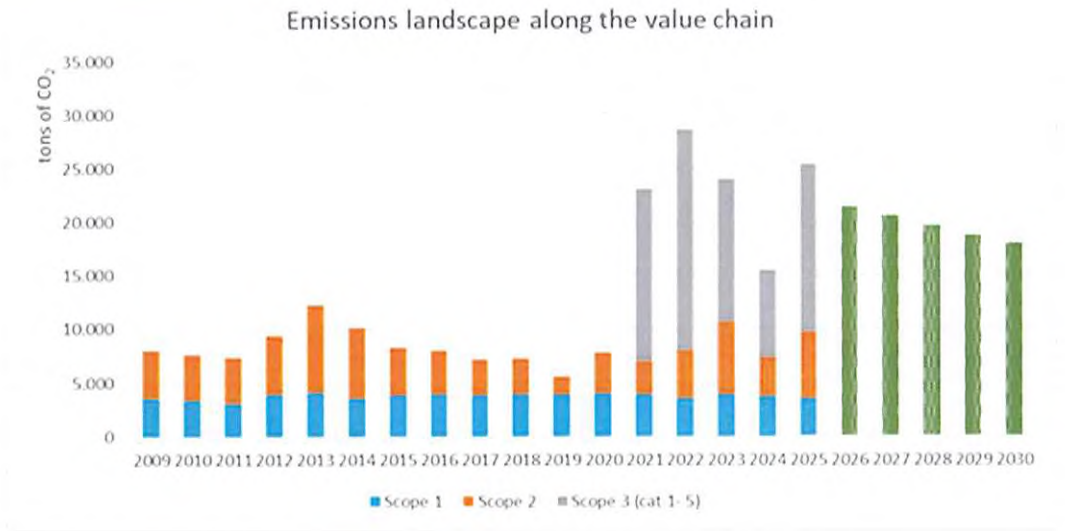
In 2025, overall energy consumption decreased for a variety of operational and structural reasons. However, greenhouse gas emissions at both sites increased significantly because of changes in the external electricity mix. While we had previously succeeded in decoupling strong production growth from CO_2 emissions, the past year has demonstrated how quickly external conditions can reverse positive trends. At present, these developments indicate that additional measures will be required to realign our trajectory with the long-term goal of achieving CO_2 neutrality by 2045.

3.3. Carbon Disclosure Project

Our climate strategy is based on the 2021 baseline year from Japan, against which all greenhouse gas reductions are measured. By 2030, we aim to reduce Scope 1 and Scope 2 emissions by 37.8% and achieve a 15% reduction in Scope 3 value-chain emissions. Looking further ahead, our long-term ambition is to reach net-zero emissions across Scope 1 and Scope 2 by 2045, comprising a 95% absolute reduction supplemented by a maximum of 5% certified offsetting. In parallel, we target an 80% reduction in Scope 3 emissions by 2045, reflecting our commitment to deep decarbonization throughout the entire value chain.

Emissions landscape along the value chain



Since their peak in 2013, our greenhouse gas emissions have decreased by 43%. A temporary rise in Scope 2 emissions in 2025 resulted from changes in the external electricity mix; our decarbonization target for Scope 2 remains 2030. The transition to heat-pump heating systems and process-integrated heat recovery, including wastewater heat recovery initiated in 2025, is expected to substantially lower Scope 1 emissions.

Process-specific mitigation measures progressed further. Revalidation of ETO sterilization reduced fumigation exposure by 50%, and discontinuation of stretch-net film in D2F products yields 1.7 t CO_2-eq annual savings. The shift from high-pressure to low-pressure/compressed-air-free technologies move to pilot implementation in 2026.

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We expanded our reporting to include Scope 3 categories 1–5, with corresponding reduction targets visualized as dashed bars. A full LCA of D2F syringes, aligned with EU PEF EF 3.1, was completed. Additionally, a reduced-water washing protocol was industrialized in 2025, lowering process water demand without affecting product quality.

Life cycle assessment

We conducted our life cycle assessment of the Direct-to-Fill glass syringe systems in accordance with the EU PEF EF 3.1 methodology, applying standardized system boundaries, high-quality datasets, and harmonized impact assessment rules to evaluate environmental performance across all life-cycle stages.

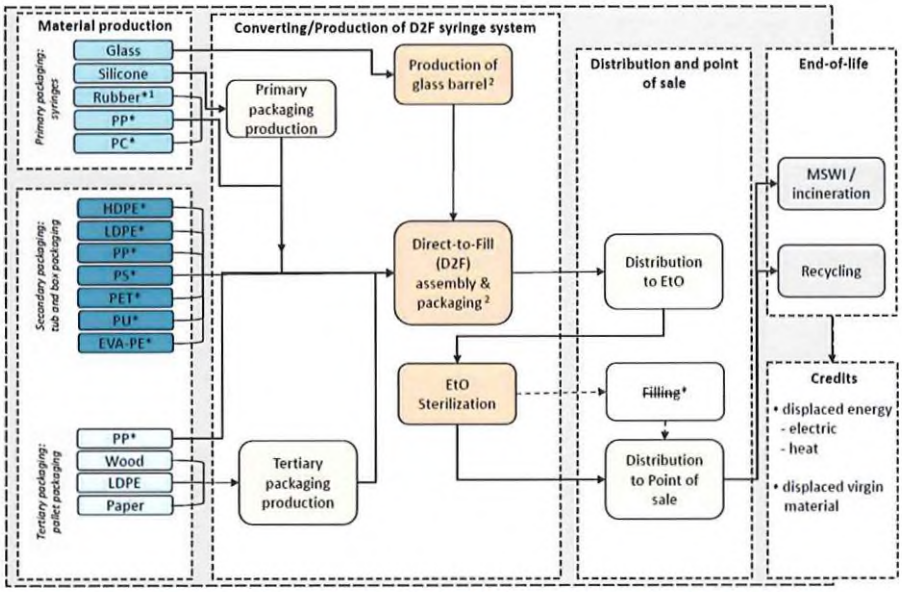
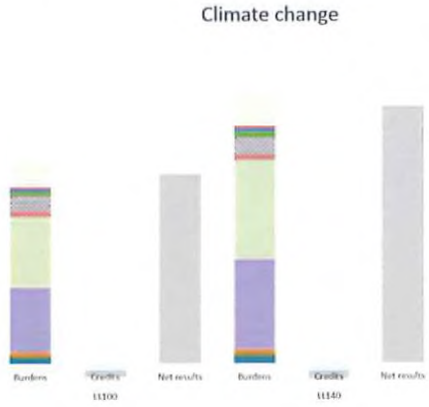


Figure 4: System boundaries of the 2.25ml D2F Luer-Lock syringes systems

The figure above illustrates the defined system boundaries for a Direct-to-Fill (D2F) Luer Lock syringe with a 10.85 mm diameter. The functional unit applied in this assessment is one pallet of product. Three distinct packaging levels were included within the system boundary. The filling of the syringes with pharmaceutical product is outside the scope of this LCA and was therefore not considered in the environmental impact calculations.



The figure on the right presents the comparative LCA results for two packaging configurations: the standard system with 15,000 syringes per pallet and an alternative 140-nest configuration accommodating 21,000 syringes. Transitioning to the 140-nest system yields a 17.5% reduction in packaging material per unit, while simultaneously enabling a 40% increase in product throughput per pallet. This represents a substantial improvement in packaging efficiency and environmental performance.

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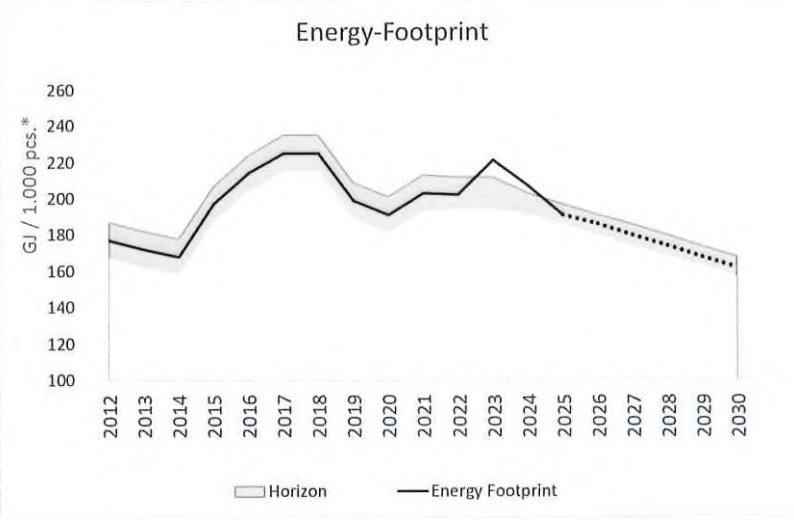
Production efficiency

Through targeted process optimizations, reduced utility demand, and increased system-level efficiency, we achieved a nearly six percent improvement in energy intensity, expressed as lower gigajoules per 1,000 pieces produced. Despite the rising share of energy-intensive sterile syringe manufacturing, these measures resulted in a net efficiency gain. Additional potential will come from expanding waste-heat recovery and introducing low-pressure compressed-air systems. In parallel, we will intensify our decarbonization pathway by electrifying tempering furnaces, accelerating D2F process transformation, and extending heat-recovery and photovoltaic installations.

Reduction of the Energy-Footprint by 20% (Baseline 2021)

status
-5.91%



The sulphur dioxide and nitrogen dioxide produced by NPG are mainly generated during the combustion processes using fossil fuels (natural gas) and during external electricity production. Both emitted gases have a damaging effect due to acidification of soil and water. The active admixture of oxygen in the combustion processes is practised at the sites to reduce harmful emissions to a minimum. Additional dust extraction systems are installed in all new exhaust air systems to prevent negative effects in the environment

Specific emissions	2015	2024	2025
SO_2 - Emissions [kg]	4,676	5,269	4,997
NO_2 - Emissions [kg]	9,848	11,357	10,642

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3.4. Environmental footprint

As a location that is increasingly driven by research, a technologically innovative approach is important for us to achieve our sustainability goals, particularly due to the expansive expansion of production. The continuous decrease of our CO_2-Footprint confirms our way towards CO_2-neutral business operation.

Company fleet

The transition to electrical cars has started in 2020. Charging points for electric cars are installed at both sites in Münnerstadt. Public charging infrastructure was installed in 2022. We see the results in continued descending consumption of classical fuels and are fully on track to become carbon zero even before 2040. In addition, we are also allowing our staff to charge for free their electrical vehicles to speed up the transformation of the employee commuting.

Fuel consumption	2019	2025	2040
Petrol, Diesel [kWh]	352,425	228,227	ZERO
Motor Gas [kg]	16,141	513	ZERO

Biodiversity

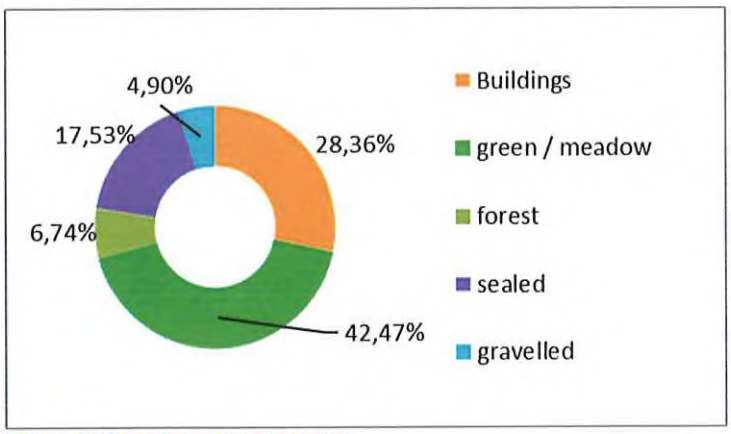

Figure 5: Premises by categories

The premises of NPG are 122,000 m² in total. They contain large areas of uncultivated meadows and forest that compensates eleven percent of our total emissions for the manufacturing processes. The rewarding cultivation of the company's own orchards also promotes biodiversity in the surrounding area.

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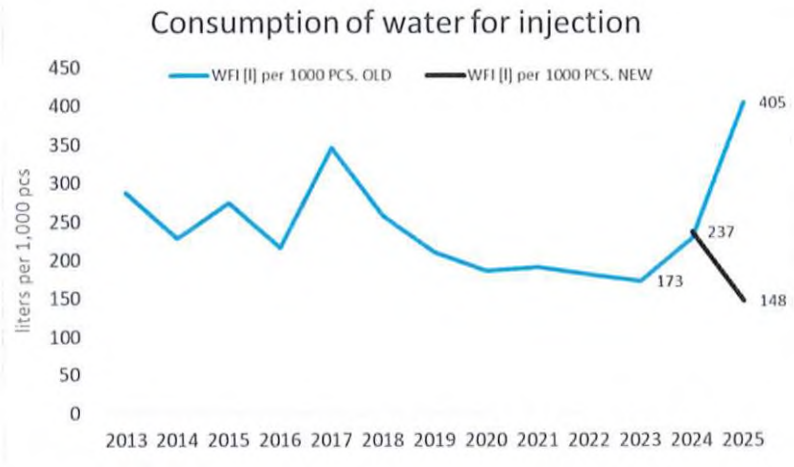
Water consumption

Water is an essential resource, and we have a responsibility to use it effectively. As our plants operating in an area of Germany where ground water scarcity is already an issue, we have made water conservation an essential part of our operations.



Reduction of water for injection consumption per 1,000 pcs. by 20% (Baseline 2015)

status -45%

The optimisation of the Water-for-Injection (WFI) system represents a key element of our sustainability programme. To this end, we have implemented a cold-WFI generation system based on reverse osmosis, replacing the previously used thermal process. The transition phase has been completed, and in 2025 the majority of prefilled syringes will be manufactured using the new system architecture. As illustrated in the figure above, the technology enables a water-use efficiency improvement of up to 40%, significantly increasing the yield from potable water.

Water consumption [m³]	2015	2024	2025
Plant I + II	31,899	63,335	54,822
Plant I	13,639	1,180	984
Plant II	18,260	62,155	53,838

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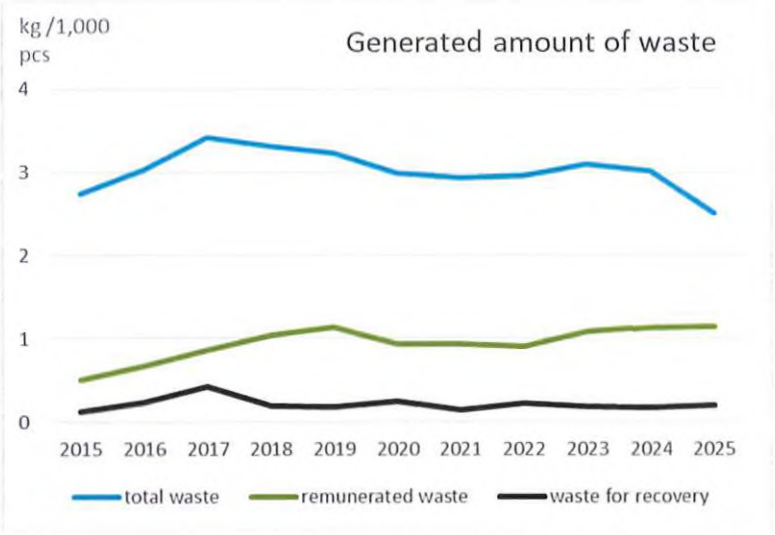
Non-hazardous waste

To enhance transparency and comparability, we have transitioned to reporting renumerated, total, and recovery waste in kg per 1,000 pieces. This enables a clearer view of our efficiency gains independent of output levels.

Last year, we achieved a significant improvement in glass rejects, resulting in a substantial reduction of our total waste volume. At the same time, recycling of directly saleable glass scrap continued to increase and consistently remained above 45%. These developments underline the effectiveness of our optimization measures and strengthen the overall performance of our waste and recycling processes.



Reduce the total waste in kg per 1,000 pcs. by 30% till 2033 (Baseline 2017)

status
-26.3%

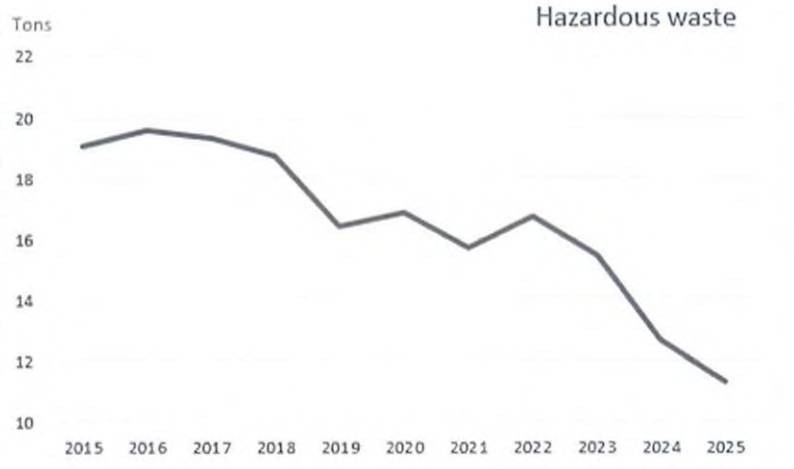
Increase the share of remunerated waste per total waste to 30% till 2033 (Baseline 2017)

status
+25.4%

Hazardous waste

Reduce of hazardous waste by 10% (Baseline 2015)

status
-40.6%



Last year, we reduced hazardous waste to its lowest level on record, driven by the oil-free moulding transfer and significantly decreased use of cooling lubricants in mandrel cooling.

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Footprint reduction strategy

We are pursuing a comprehensive decarbonization strategy to replace 95% of natural gas used for building heating by 2033. Our approach leverages multiple high-efficiency waste-heat recovery technologies embedded in production and utility systems.

At Plant II, a trigeneration system already supplies nearly two-thirds of total heating demand through recovered waste heat. A new absorption chiller utilizes surplus heat in summer for building cooling, ensuring year-round thermal efficiency. Further contributions come from water-cooled compressors, which provide a stable source of recoverable heat.

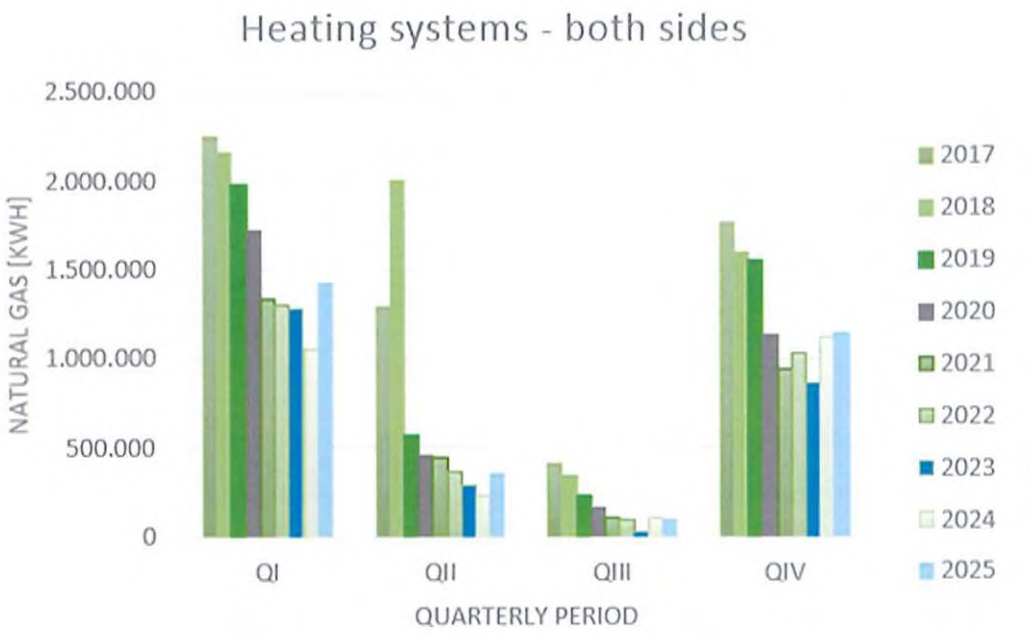

Figure 6: The heating energy of both sides adjusted with the degree-day's figures.

To expand renewable heat coverage, we are integrating waste heat from forming processes and high-temperature process water. These streams will be upgraded by industrial heat pumps, significantly increasing usable heat output and reducing remaining fossil-fuel dependency.

Heating energy (natural gas) per square meter [kWh / m²/a]	2016	2020	2025	2033-Target
Plant I	193	149	124	5-10
Plant II	149	35	37	5-10

Degree-days figure adjusted building heat energy per square meter.

Overall, these measures reduce the site's specific heat demand from 150 kWh/m²a to 5-10 kWh/m²a, establishing a clear and achievable pathway toward near-complete decarbonization of our building heating by 2033.

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3.5. Empowerment and Health and Safety

Safety Culture



Management and the entire leadership team are committed to making 2026 a decisive year for strengthening occupational safety performance. At the start of the year, the leadership team reaffirmed its responsibility to elevate safety awareness across the organization through visible and consistent engagement.

Key focus areas include structured safety dialogue walks, during which leaders actively observe safe acts and at-risk acts, provide immediate feedback, and reinforce expected safety behaviours. These activities are complemented by targeted communication, coaching, and strengthened follow-up processes to ensure that safety remains a core element of daily operations for all employees.

Training

Increase hours of training per employee (Baseline 2015)

CSR to 4 hours status 2.4h

Safety to 2 hours status 2.3h



The level of employee participation in CSR-related training declined, which is not satisfactory and highlights the need for renewed focus. To address this, we plan to expand our training portfolio in 2026 including best behavior training. Following the successful launch of dedicated office safety training last year, we will further increase the frequency and scope of these sessions to ensure consistent competence across all functions. In addition, we will actively engage and support managers in raising the participation rate within their teams, emphasizing their role in promoting a strong safety and CSR culture. This will be reinforced through regular safety dialogue walks, clear expectations, and structured follow-up to ensure continuous improvement.

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LTIR



Decrease of LTIR per 200,000 working hours (Baseline 2019)

Total bellow 2 until 2030

status 4.92

Target for 2026
3

The LTIR increased to 4.92, reflecting a higher number of lost-time injuries compared with the previous reporting period. While no critical or severe injuries occurred at either site, the rise indicates the need to further strengthen preventive measures, despite continued investments in protective equipment and ongoing safety awareness training.

Compliance

We set and continuously refine our own standards as a matter of course to comply with statutory requirements as well as environmental and sustainable aspects. Another integral part of our compliance system is the training of our employees to improve the general awareness and encourage them to put compliance rules into practice. This fosters a culture of continuous improvement in compliance and sustainable topics and protect us against infringements.

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Responsibility statement

To the best of our knowledge, and in accordance with the applicable reporting principles, the sustainability report gives a true and fair view of the development and performance of the energy and environment management system at Nipro PharmaPackaging Germany. It can be shared with all our neighbours and business partners.

Münnerstadt, Germany, February 12, 2026

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