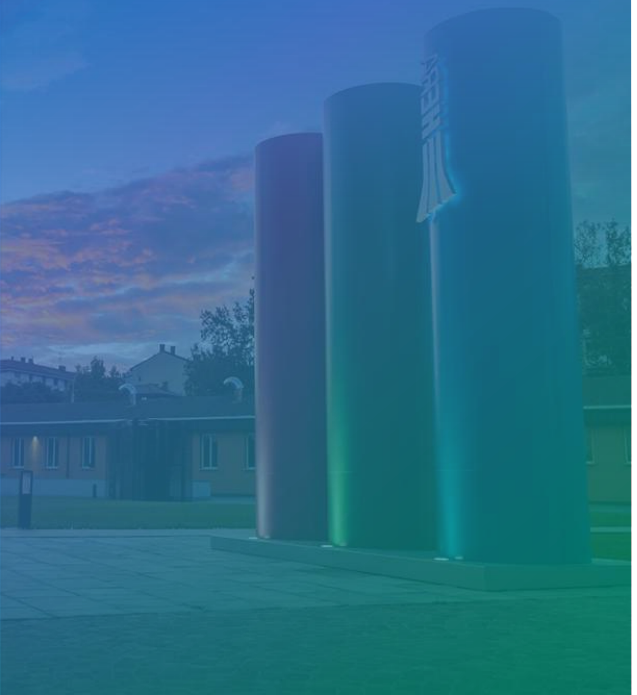
Emissions Management in Hera Group

Solid infrastructures for a long-term sustainable strategy

Photo by Silvia Camporesi: construction phase of the biomethane plant of Sant'Agata Bolognese

Non-GHG Emissions



Commitment to Reducing Non-GHG Emissions

The Hera Group, in line with its mission of sustainability and environmental responsibility, is actively committed to reducing non-GHG emissions (gases other than greenhouse gases such as CO_2, CH_4, N_2O). These emissions include pollutants such as nitrogen oxides (NOx), sulphur oxides (SOx) and other substances that have a direct impact on air quality and public health.

Initiatives for the Reduction of Non-GHG Emissions

- Adoption of Advanced Technologies at Plants: Hera invests in the modernisation of waste treatment and water purification plants through filtration technologies and systems to reduce emissions of particulates, NOx, and SOx. The installation of fabric filters, scrubbers, and advanced oxidation systems significantly reduces the release of pollutants into the atmosphere.
- Optimisation of Corporate Mobility: The company fleet is gradually being converted to low-emission or zero-emission vehicles, such as electric, hybrid, and methane-powered cars, thereby reducing NOx and PM emissions in urban areas.
- Continuous Control and Monitoring: Hera implements real-time monitoring systems for atmospheric emissions at its main plants, ensuring constant compliance with regulatory limits and transparency for citizens and stakeholders.
- Energy Efficiency Initiatives: The company promotes energy-saving measures in buildings and industrial processes to limit energy consumption and, consequently, the emissions of pollutants linked to combustion.
- Promotion of Separate Waste Collection: Increasing separate collection and recycling helps to reduce the amount of waste sent to incinerators, thereby lowering emissions of particulates, NOx, SOx, and other harmful compounds.
- Education and Awareness Projects: Hera develops educational campaigns aimed at citizens, schools, and businesses to promote virtuous behaviours that help reduce polluting emissions, such as sustainable mobility and energy saving.

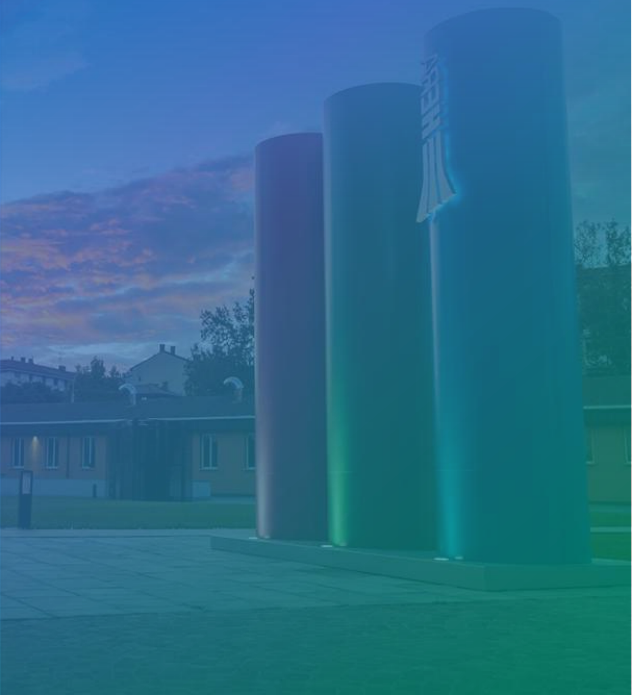
Targets for Reducing Non-GHG Emissions

The Hera Group sets ambitious and measurable medium- to long-term targets for reducing non-GHG emissions, including:

Atmospheric emissions from Hera's waste-to-energy plants and target to 2027

Dust		Hydrochloric acid		Nitrogen Oxides		Sulphur oxides		Carbon monoxide		Hydrofluoric acid		Total Organic Carbon	
2024	**2027**	**2023**	**2027**	**2024**	**2027**	**2024**	**2027**	**2023**	**2027**	**2023**	**2027**	**2023**	**2027**
3.2	≤ 5.5	20.6	≤ 20.0	812.3	≤ 700.0	23.2	≤ 21.0	87.3	≤ 85.0	0.8	≤ 0.8	10.4	≤ 10.0

GHG Risk Management



Management of greenhouse gas-related risks (GHG Risk Management) and, more generally, climate transition risks, represents a fundamental pillar in Hera's strategy, as defined by its climate transition plan. In a rapidly evolving regulatory and market context, characterised by increasing regulatory, financial and social pressures, the ability to identify, assess and manage such risks translates into a competitive advantage and long-term sustainability assurance. The transition towards a low-carbon economy requires the structural integration of climate risks into strategic, operational and financial decision-making processes.

Climate Risk Governance

The Board of Directors oversees risks and opportunities related to climate change with the support of the Control and Risk Committee, the Risk Committee, and indirectly, the Ethics and Sustainability Committee, which, among its duties, includes monitoring the implementation of sustainability policies and the preliminary review of sustainability reporting to be submitted to the Board of Directors. The Central Strategy, Regulation and Local Authorities Department, reporting to the Executive Chairman, is responsible for defining the group's strategic guidelines, also translating them into economic and investment objectives, ensuring the overall integration of the main initiatives with the group's strategic references, including those related to the commitments made in the Climate Transition Plan. The Shared Value and Sustainability Department, reporting to the CEO, is responsible for proposing and defining, at group level, the company guidelines relating to corporate social responsibility and the creation of shared value, as well as policies on reporting and accountability for shared value and sustainability, coordinating all company stakeholders involved in these matters.

Integration of Climate Transition Risks into Business Processes

Climate transition risks are integrated into Enterprise Risk Management, strategic planning, budgeting, investment management and new business development processes. This integration is achieved through:

- Qualitative and quantitative climate scenario analysis in defining medium- to long-term strategies
- Assessment of the impact of transition risks on assets, products and services
- Integration of climate risks into investment plan
- Alignment of company policies with decarbonisation objectives and ESG standards

Transition risks and opportunities are integrated into business strategy through the adoption of GHG emission reduction targets, investment in low-carbon technologies and the implementation of energy diversification strategies. These elements are reflected in financial planning: the Business Plan to 2028 provides for the allocation of dedicated resources to decarbonisation projects, infrastructure resilience and sustainable innovation. In particular:

- 1.1 b€ in decarbonisation projects
- 2.4 b€ in projects to increase infrastructure resilience to climate events
- 2.0 b€ in circular economy projects
- 1.3 b€ in innovative projects for the digitalisation and experimentation of new technologies

The resilience of Hera's strategy is tested through the analysis of different climate scenarios, both qualitative and quantitative, considering the evolution of decarbonisation policies, technological trends and changes in market behaviour. The company adopts a proactive approach, assessing the adaptability of its strategies in the event of accelerated transition scenarios or increased regulatory pressure.

Thanks to this approach, Hera is able to promptly identify emerging opportunities and mitigate risks arising from a non-linear transition, ensuring solidity and competitiveness in the long term.

GHG Risk Management

Transition Risks and Opportunities

Climate transition entails a range of risks and opportunities that Hera analyses over a detailed time horizon:

- Short term: regulatory risks (tightening of emission and carbon pricing regulations), reputational risks, changes in energy costs; opportunities linked to access to green incentives and financing.
- Medium term: technological obsolescence, evolution of customer and stakeholder preferences, development of new sustainable business models, opportunities for diversification of the offer.
- Long term: structural impacts on infrastructure, changes in consumption patterns, opportunities for leadership in the energy transition and circular economy.

Adaptation and Mitigation Plans: Priorities and Measures

Hera defines and implements climate risk adaptation and mitigation plans, establishing priorities according to the relevance and probability of transition events. The main measures include:

- Investments in energy efficiency and renewable sources
- Adoption of innovative technologies for emission reduction
- Internal training and awareness-raising plans on climate issues
- Increased resilience of critical infrastructure

These measures are integrated into the strategic plan and investment plan, ensuring alignment with long-term sustainability objectives.

The integration of climate transition risks in strategic and financial planning takes place through the inclusion of climate metrics in investment evaluation processes, the definition of environmental KPIs and the provision of budgets dedicated to high environmental impact projects. The investment plan favours solutions consistent with the objectives of carbon neutrality and resilience to future climate scenarios.

Financial Risks of Climate Change

The assessment of the financial impacts of climate risks is carried out through stress testing and scenario analysis, which make it possible to estimate asset vulnerability and identify priority areas for intervention.

- Risks driven by changes in regulation

There is an increased role for regulation aimed at facilitating and supporting the transition towards sustainable energy consumption, with implications for customer behaviour changes related to consumption and technology preferences.

The mitigation strategy is oriented towards satisfying new customer behaviour, especially in the shift of consumption technology, compensating for the potential margin reduction in gas sales with increased sales of electricity and related value-added services (VAS).

Estimated financial implication of the risk before taking action: €5 million.

Average estimated time frame (in years) for financial implications of this risk: 26 years.

- Risks driven by change in physical climate parameters or other climate change-related developments:

Chronic temperature increases in business-relevant areas leading to reduced gas sales due to lower consumption for traditional heating systems during the winter period. The mitigation strategy is oriented at compensating part of the reduction with the sales of VAS, related to protection and maintenance services for customers and energy efficiency initiatives.

Estimated financial implication of the risk before taking action: €15 million for each 1°C of temperature increase.

Average estimated time frame (in years) for financial implications of this risk: 26 years.

Financial Opportunities of Climate Change

In light of the external context and regulatory developments in the area of decarbonisation, and in line with the business plan to 2028 (five-year business plan), three relevant medium-term opportunities related to climate change have been identified. In particular, one of the three identified opportunities relates to the development of photovoltaic systems on owned or external sites.

Annual financial positive implications of this opportunity: €71 million.

Estimated time frame (in years) for positive financial implications of this opportunity: 5 years.

Estimate of the current annual costs associated with developing this opportunity: €7.8 million.

Physical Climate Risk Management

Physical Risk Analysis

Hera has developed a continuous assessment and monitoring system for the physical risks associated with climate change. This system involves analysing the vulnerabilities of its infrastructures, such as water networks, purification plants, electrical and thermal grids, in relation to phenomena like heatwaves, droughts, floods, and storms.

Adaptation and Resilience Plans

With the proverb “Prevention is better than cure” in mind, Hera has adopted a proactive approach through specific adaptation plans, which include:

- Investments in resilient infrastructure: upgrading networks to better withstand extreme events, such as heavy rainfall or prolonged drought periods.
- Water resource management: implementing monitoring and leak control systems, promoting the reuse of wastewater, and optimising distribution processes.
- Emergency plans: preparing operational procedures for timely management of critical situations, with specific staff training and periodic drills.

Managing Physical Climate Risk

The Group’s commitment to reducing carbon dioxide production involves reporting on its own performance and commitments in the area of climate change, alongside projects to promote energy production from renewable sources, reduce energy consumption, and provide customers with opportunities to cut their own greenhouse gas emissions. The Group is committed to contributing to mitigating environmental risks by complying with the energy efficiency objectives set by national legislation and the United Nations, continuing to improve its production facilities and encouraging virtuous and responsible forms of consumption on the part of its customers. The Group only uses electricity from renewable sources to operate its production sites. In relation to the consequences of extreme events, which are expected to occur with increasing frequency as a possible consequence of climate change, Hera has taken steps to adopt important measures. **Hera has adopted an environmental control system that is effective both in terms of the governance of environmental certification processes and related audits, and in terms of the operational management of controls and surveys**. The Group is able to face environmental hazards by constantly monitoring potential pollution factors and ensuring transparency in surveys, as well as through substantial investments in technological plants that ensure consistently better air and water quality than required by legal limits. Moreover, in line with its circular economy strategy, Hera has already invested (and continues to do so in the medium-to-long term) in sorting, recovery and composting plants, increasing the amount of waste treated while at the same time reducing the use of landfills, thus anticipating the requirements of European and national regulations. The reduction of the Group’s water footprint is pursued through the water management system, which aims to promote a sustainable management of this resource both inside the Group (by preventing network leaks, reducing diffuse consumption, recovering rainwater for irrigating green areas and washing vehicles) and externally (by monitoring domestic consumption and offering advice and solutions to optimise it, providing support with technological solutions for water-demanding customers, and providing support for the construction of treatment plants to reuse/recover water). **The implementation of water safety plans in the integrated water service also ensures an approach to water quality management based on risk assessment and management, and thus on prevention and control.**

Physical Climate Risk Management

Physical risks and how to deal with them

Physical Risk	Timescale	Priority	Initiatives implemented
Floods and flooding with resulting landslides and mudslides	Short to medium term	Medium-high	• Infrastructural upgrading of drainage networks, reservoirs and purification plants • Infrastructural enhancements through the creation of barriers to protect assets • Increased alert capacity for extreme events in critical areas
Rising temperatures	Long-term	Medium-high	• Market strategies oriented towards the development of customer-dedicated VAS to complement and enrich the offer portfolio
Extreme weather phenomena due to heat build-up in the atmosphere or particular cold and wet conditions	Long-term	Medium-low	• Network resilience plan and reinforcement of the electricity distribution network in the face of extreme winter events with interventions on overhead powerlines and substations
Changes in the temporal distribution of annual rainfall and average rainfall amounts with possible periods of prolonged drought	Long-term	Medium-low	• Strengthening and expanding water resources to increase the resilience of water networks • Construction of interconnections between water networks • Enhancement of the application of advanced leak detection techniques to increase the efficiency of the network

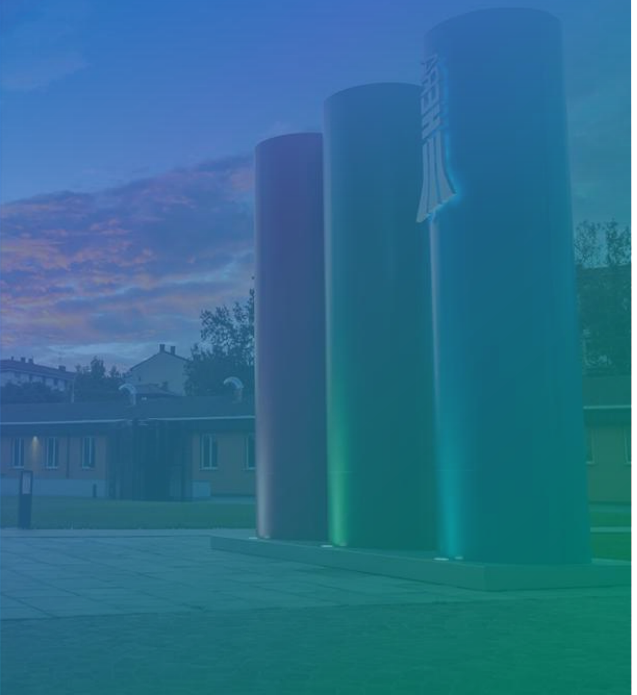
Innovation and Sustainability

Hera continually invests in innovative solutions to reduce its environmental footprint and increase the resilience of its operations. Among the most significant initiatives are:
Digitalisation of energy and water networks for real-time monitoring and rapid response to unexpected events.
Use of renewable energy and the promotion of energy efficiency in its plants.
Circular economy projects to maximise material recovery and reduce waste production.

Community Engagement and Transparency

Hera promotes environmental awareness among citizens and businesses through information campaigns and collaboration with institutions. Transparency in communicating risks and the strategies adopted is a fundamental element in maintaining stakeholder trust.

Emissions Targets



GHG EMISSIONS REDUCTION

Fight climate change is embedded in Hera strategy which aims to **reduce GHG emissions by 37% by 2030** (certified SBTi) vs. 2019: -28% Scope 1 and Scope 2; -30% Scope 3 from downstream sale of gas; -50% carbon intensity index of electricity sales. Furthermore, **since 2023 the Group is offering 100% electricity from renewable sources for domestic consumption**.

NON-GHG EMISSIONS REDUCTION

To further improve the air quality in the served areas, **also non-GHG are monitored and the Group is committed to keep them as lower as possible**. Values for nitrogen oxides (mainly related to waste treatment plants devoted to reduce third parties' environmental impacts) are stable since 2016 and concentrations measures at the chimney in 2023 for all pollutants (monitored 24/7 and publicly available in real-time) were once again **significantly lower** (-86.4%) **than the regulatory limits** *(i.e., at least 60.5% for nitrogen oxides and up to 97.1% in the case of dust).*

ENERGY PARKS

The **energy parks, patented by the Hera Group**, includes cutting-edge technologies such as **agrivoltaics** (photovoltaic panels raised off the ground so as not to subtract land for agriculture) and **precision agriculture** (use of digital techniques and tools to monitor and optimize processes). Besides **energy self-sufficiency of cities** through modular and scalable solutions, they allow to **improve the well-being of local citizens** through services such as **solar farms, hydrogen platform and Urban forests** (a green belt in the urban area for carbon sequestration and the promotion of biodiversity) including areas with community services.

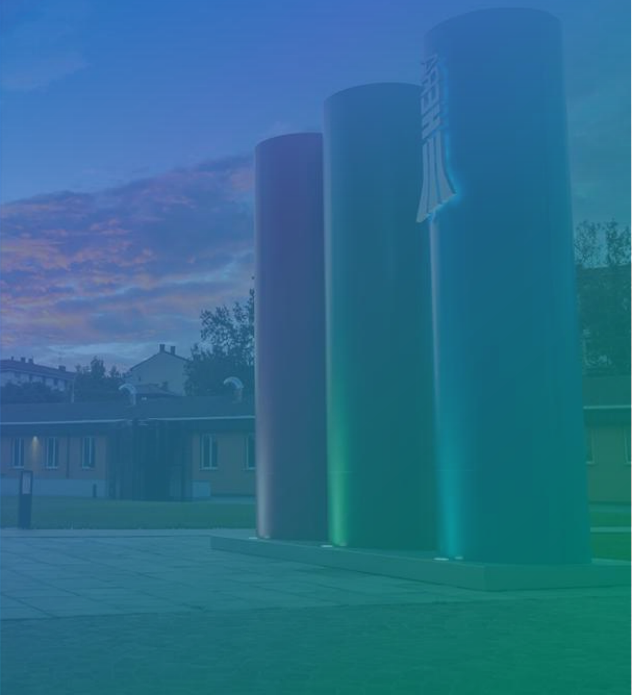
DISTRICT HEATING

District heating is an **answer to the city's air pollution problems** as it allows the replacement of domestic boilers by using high-efficiency, renewable energy or energy recovered from other processes to generate heat. **Hera operates 12 cogeneration plants, of which 4 are trigeneration plants** for a total nominal electrical power of over 114 MW which in 2023 produced approximately 142,000 MWh of thermal energy. Thanks to district heating systems, **in 2023 over 25,000 tons of oil equivalent, 36,000 tons of greenhouse gases, and 99 tons of nitrogen oxides were saved**, if compared to a traditional system. For the coming years Hera aims to **further develop district heating and increase in the volumes served (+7% to 2027 vs 2022).**

CARBON CAPTURE

Capturing carbon dioxide emitted from the **waste-to-energy plant's chimneys** and storing it in depleted natural gas fields, thereby significantly reducing plant emissions while contributing to the decarbonization of local areas. This is the goal of the **pioneering project for the Ferrara plant** - proposed by Hera Group, as the lead partner, in collaboration with Saipem - that **has been selected to receive funding under the fourth call for mid-scale projects from the EU Innovation Fund**. Once the allocation is finalized, the funding for the CO_2 emission capture project will amount to nearly **€24 million**. This industrial CO_2 capture project is the first of its kind in Italy designed for waste-to-energy plants and among the first in Europe. It involves the application of Bluenzyme™, Saipem's proprietary and modular solution based on "CO_2 Solutions", an innovative enzymatic technology for capturing carbon dioxide in industrial processes of small and medium emitters. **The initiative was selected by European authorities for its high level of innovation**, and its potential replicability in other waste-to-energy plants and other hard-to-abate industrial sectors in Italy, and more generally across Europe. **The European Funds will cover a significant portion of the €53 million planned for the construction of the CO_2 capture plant**. Depending on opportunities arising from changes in the regulatory framework, the **plant is expected to be operational by 2028**.

Carbon intensity trend



Hera is committed to reducing CO2 emissions intensity, starting from 2019 data, through a series of initiatives outlined in the climate transition plan. From 2019 to 2024, total emissions have decreased by 8.6%, even though the Group has continued to grow, with Ebitda increasing by +46.3%. As a result, **Carbon intensity have decreased by 37.5%.**
The growth in Ebitda stems both from the organic development investment plan and from the acquisition of companies in the sector, as the Italian utilities market remains much more fragmented compared to the European average.

	2019	2020	2021	2022	2023	2024	Ch. '19-'24
Scope 1 (ktons CO2)	1,082.6	986.2	981.8	936.6	935.7	899.4	(16.9%)
Scope 2 (ktons CO2)	48.4	44.4	46.6	0.0	0.0	0.0	(100.0%)
Scope 3 (ktons CO2)	12,495.0	11,613.0	11,723.0	12,251.0	11,692.0	11,559.0	(7.5%)
Scope 1+2+3 (ktons CO2)	13,626.0	12,643.6	12,751.4	13,187.6	12,627.7	12,458.4	(8.6%)
Ebitda (m€)	1,085.1	1,123.0	1,219.4	1,295.0	1,494.7	1,587.7	+46.3%
Carbon intensity (ktons CO2 / m€)	**12.6**	**11.3**	**10.5**	**10.2**	**8.4**	**7.8**	**(37.5%)**
Energy - Number of customers (mln)	3,338.3	3,409.8	3,473.6	3,543.0	3,849.6	4,623.4	+38.5%
Water - Regulated Asset Base (m€)	1,546.4	1,596.6	1,642.2	1,737.4	1,784.6	1,942.6	+25.6%
Waste - treated from third parties (ktons)	4,558.9	4,406.7	4,576.1	4,761.2	5,375.7	5,565.9	+22.1%

As shown in the table, in the three businesses managed by the Group (energy distribution, water distribution, and waste treatment):

- the **number of customers** supplied with energy has grown by **+38.5%** (energy that is not produced by Hera, but purchased on the wholesale market and distributed to end customers)
- the **value of water assets**, thanks to the investments made, has increased by **+25.6%**
- the **volume of third-party waste treated** has risen by **+22.1%**

Given the nature of Hera's business, in which the price of distributed energy is a pass-through with no impact on the Ebitda margin, it was decided not to use revenues as the denominator for carbon intensity, as the volatility of commodity prices does not reflect Hera's real effort in reducing emissions. In fact, if the price of electricity goes up or down, Hera's revenues rise or fall without any effect on Ebitda. Therefore, using revenues as the denominator for carbon intensity may lead to either overestimating or underestimating the progress in reducing carbon intensity.