2022
**Sustainability
Report**

tenova

Table of Contents

A Message from Our CEO

Dear Stakeholders,

The average consumer probably does not think much about the metals industry, yet without it our everyday lives would not be possible. Metals play such a pivotal role in enabling nearly every other global industry, and thus economic growth, that today iron and steel are responsible for 7% of global direct energy-related CO_2 emissions[1].

This is where Tenova comes in. Our teams of scientists and engineers are innovating solutions to some of our industry's age-old problems, making it possible to use lower-emission energy sources, keeping workers safe, minimizing and repurposing waste, and more. Our solutions are creating new pathways to green steelmaking that are revolutionizing how metals companies operate worldwide. Tenova's products marry digital technology with classic engineering brilliance to create solutions previously deemed impossible, like furnaces that can use up to 100% hydrogen as a fuel source.

Our work does not stop at customer solutions. As part of our commitment to sustainability, we are also measuring and mitigating our own emissions, as well as instituting measures to enhance well-being among our employees, all of which is detailed in this report. We are proud that, as a company with global clients, we play a key role in providing safe and stable jobs not only for our own teams, but also in the countries where our clients are located. Aware of the social challenges facing some of the countries in which we operate, Tenova has placed emphasis on sourcing from reputable suppliers through our new environmental, social, and governance (ESG) supplier screening criteria and by joining the Metals Technology Industry Initiative (MTI) to deter corruption. Some might shy away from the challenges our industry and global community are facing due to environmental instability and economic inequality, but at Tenova we view this as an opportunity to create value for all stakeholders. Indeed, the downstream benefits of greening the metals and mining industries can positively impact the environment and quality of life of every individual and community. Tenova is already acting towards these goals, and we will continue to bring the best minds together to solve the biggest challenges of our time.

Sincerely,
Roberto Pancaldi
Chief Executive Officer

1 International Energy Agency (IEA), "Iron and Steel Technology Roadmap: Towards more sustainable steelmaking," (2020).

2022 Highlights

- Conducted our first **materiality assessment** and began disclosing our ESG impact publicly
- Developed a **Sustainability Framework** to guide our ESG efforts
- Aligned our research, development, and innovation goals with the **UN Sustainable Development Goals (SDGs)**

- Launched **new customer solutions with sustainability benefits** like magnesium fly ash mining, expanding hydrogen readiness to additional burner types, standardizing the Life Cycle Assessment (LCA) of metal finishing machines after receiving EPD certification for the Pomini Digital Texturing™ (PDT™) system, and many more
- **Received a HorizonEU grant** for our TenovaLAB to demonstrate green hydrogen production/utilization at full industrial scale
- Launched **new partnerships** with companies like Tenaris and Snam to develop low-carbon solutions for the metals industry
- Organized **Tenova Innovation Days**, intrapreneurship workshops for employees

- **Reduced energy consumption** in 2022, compared to 2021, through energy efficiency measures including installing a new solar array on one of our facility rooftops
- **Reduced waste generation** and **increased recycling** over the previous year

- Launched **enhanced safety training** for project site personnel
- **Updated career path training offerings and a new online training** course platform, resulting in nearly 15,000 hours of completed training across the company
- **Launched an ESG supplier screening questionnaire** in order to strengthen sourcing guidelines
- **Confirmed zero substantiated complaints** concerning breaches of customer privacy and loss of customer data

4

About this Report

This document is Tenova's first Sustainability Report for the fiscal year 2022. In this report, any reference to "Tenova" is to be intended as inclusive of Tenova S.p.A. and its fully consolidated subsidiaries operating within the framework of the Tenova metals business[1]. As such, **the scope of this report does not include TAKRAF and DELKOR, companies operating in the mining business.**

This Sustainability Report outlines Tenova's sustainability approach, policies, actions, and performance achieved during the reporting year. The contents reported were identified on the basis of the results of the materiality assessment carried out in 2022, as explained in **"Our Material Topics"** (pag. 13).

Tenova has reported the information cited in this document and in its **GRI Content Index** for the period **1 January – 31 December 2022** with reference to the GRI Standards, published in 2021 by the Global Reporting Initiative (GRI). Data from previous year is included where available and relevant to ensure comparability over time.

The **reporting scope of human resources, health and safety, financial, and compliance data** refer to Tenova S.p.A. and its fully consolidated subsidiaries within the framework of the Tenova metals business.

The **reporting scope of the environmental data** refers to the main Italian offices, located in Castellanza and Genoa, as well as the production workshop in Castellanza. Any changes to this scope, or limitations and exclusions are clearly indicated in the document. To ensure data reliability, the use of estimates has been limited as much as possible. Those used, if any, are appropriately reported and based on the best available methods.

Tenova is committed to provide the highest level of accountability related to non-financial disclosure and will publish a sustainability report on an annual basis, improving the reporting process and overall data accuracy.

This report is available on the Tenova website at **sustainabilityreport.tenova.com**.

For more information and feedback regarding this Sustainability Report, please contact **sustainability@tenova.com**.

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1 For a full list of subsidiary companies, see GRI Content Index.

About Tenova

Tenova. Sustainable solutions for metals and mining.

Tenova, a Techint Group company, provides sustainable, innovative, and reliable solutions in the metals and – also through TAKRAF and DELKOR brands[1] – mining industries.

Headquartered in Italy, with over 2,300 employees across 19 countries, Tenova partners with global clients to design and develop innovative technologies and services that improve their business today and into the future, generating cost savings, energy reductions, limiting environmental impact and improving employee working conditions. Our collaborative working model ensures we are at the forefront of the industries we work in which we channel into positive transformations for our clients.

To learn more about our fully integrated range of sustainable products, technologies, and services for the metals and mining industries visit **tenova.com.**

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1 TAKRAF and DELKOR are not included in the scope of this report.

1. Our Brands

tenova

tenova HYL

tenova PYROMET

tenova ADVANCED TECHNOLOGIES

NOVA ANALYTICAL SYSTEMS A TENOVA COMPANY

tenova LOI THERMPROCESS

tenova ITALIMPIANTI

tenova I2S

Pomini TENOVA

tenova MATERIAL HANDLING

TAKRAF

DELKOR [1]

[1] TAKRAF and DELKOR are not included in the scope of this report.

2. Our Technologies

Tenova Group strives to innovate continuously for its clients in the metals and mining industries, focusing on **quality, energy savings, and reducing pollution and CO$_2$ emissions. We support sustainable development** by leveraging a comprehensive suite of lower emission products, technologies, and services that can provide clients with unmatched breadth and flexibility to **meet their needs today and well into the future**. We invest heavily in research and development to continue innovating technologies and business models that will continue to help clients optimize their production process, reduce costs, improve quality, and increase production volumes.

Our wide range of technologies includes:

Iron & Steel

Tenova offers a fully integrated range of high-quality products, technologies, and services for the steelmaking route, from iron ores and scrap to secondary metallurgy. Tenova is also on the leading edge offering innovative solutions for circular processes and environmental control.

Aluminum

From twin-chamber melting furnaces to advanced processing technologies and high-quality roll grinders, the aluminum group supplies its clients with cutting-edge solutions for a range of needs. Tenova is the leading supplier for aluminum treatment lines for the automotive industry, with several processing lines successfully in operation for most major aluminum producers. Confirming its commitment to sustainability, Tenova is a valuable partner providing top engineering solutions for aluminum melting and recycling.

Hydrometallurgy

Tenova Advanced Technologies (TAT) is our global brand which specializes in hydrometallurgical processing, with a special focus on lithium and phosphate processing and solvent extraction.

Pyrometallurgy

Tenova also designs and supplies high-capacity Alternate Current (AC) & Direct Current (DC) furnaces and complete smelting plants for the production of ferroalloys, platinum group metals, and base metals.

Rolling & Grinding

As a full-service, experienced partner, Tenova is also a world leader in the design and supply of roll grinders and roll shop equipment for steel and non-ferrous metals such as copper and aluminum, as well as for paper mills, guaranteeing the highest standards in terms of material quality, thickness tolerance, and flatness.

Port Facilities

Under the brand Tenova Material Handling, the company supplies standard and custom material handling equipment, with a particular focus on the loading and unloading of marine terminals.

The technologies portfolio of TAKRAF and DELKOR - which are not included in the scope of this report - encompass run-of-mine and bulk material handling as well as liquid/solid separation and beneficiation.

3. Our Journey

1945 Founding of Techint

1988 Techint acquires Pomini

1994 Techint acquires Intersteel Technology, gaining Consteel®

1996 Techint acquires part of Italimpianti and incorporates Tagliaferri

1997 Techint Technologies is established

2005 Techint Technologies acquires the Goodfellow Efsop® process control system and sets up HYL Technologies

2006 Group acquires LOI Thermprocess, which merges with Italimpianti. Pyromet and Key Solutions join the group

2007 The group rebrands as Tenova and acquires TAKRAF[1]

2008 Core Furnace Systems in North America joins Tenova

2011 Tenova expands into Vietnam, Sweden, and Thailand and acquires Nova Analytical Systems in Canada

2012 Tenova acquires the DELKOR Group[1]

2020 Tenova reorganizes itself with TAKRAF and DELKOR brands focused on mining and Tenova focused on steel and metals[1]

1 TAKRAF and DELKOR are not included in the scope of this report.

4. Our Global Presence

We have grown through **strategic acquisitions and organic expansion**, while staying true to our mission to **be among the best players in our market**. Tenova Group is headquartered in Castellanza, Italy, and has locations in 19 countries, providing customized products, technologies, and services for our clients based on their operating locations and local as well as regional regulations.

Where we are

- TENOVA
- TAKRAF/DELKOR
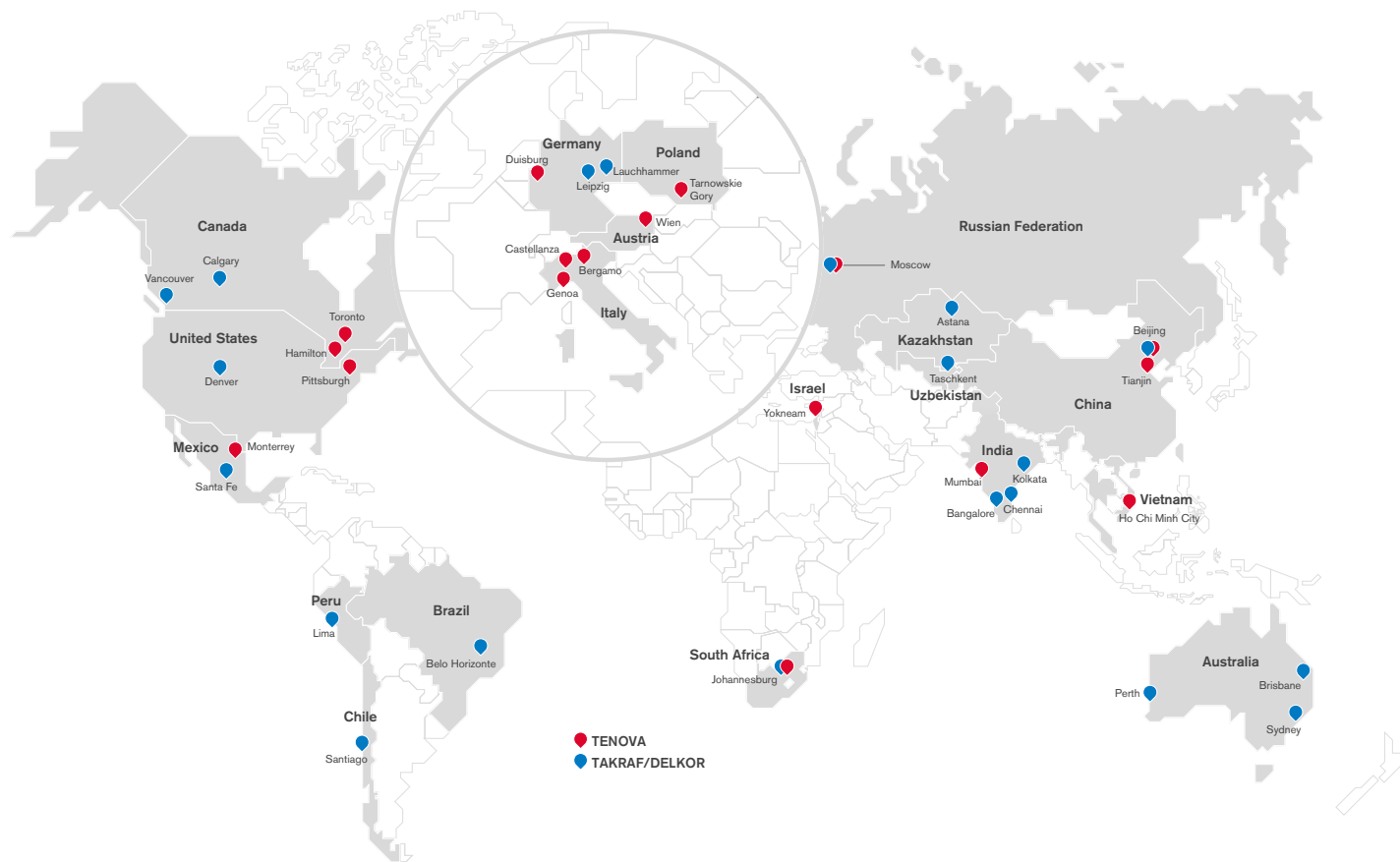
Our Sustainability Strategy

Our business strategy is built on **four commitments** and grounded in driving sustainable solutions for our clients and communities:

Sustainability – identifying opportunities to streamline industrial processes, resulting in increased efficiency;

Innovation – devising novel solutions to age-old problems;

Reliability – using our in-depth expertise to ensure our solutions last well into the future; and

Safety – making workplaces safer.

1. Our Material Topics

We performed our first **materiality assessment** in 2022 to identify the most relevant environmental, social, and governance (ESG) topics. This assessment, as well as the whole reporting project, was coordinated in-house by our dedicated, interdisciplinary **Sustainability Project Team**, supported by the **Operative Committee** – which includes representatives from all Tenova Business Units and Functional Areas – and overseen by the **Sustainability Steering Committee**, which validated the results of the assessment (see **Governance and ESG Management**, pag. 55).

Tenova's materiality assessment was characterized by an emerging approach called **"double materiality"** that considers both impact materiality and financial materiality[1]. The methodology used included quantitative and qualitative elements. The first part was carried out with a survey covering 25 ESG topics completed by over **200** internal and external stakeholders, which was then followed up with stakeholder interviews to gain more granular insights.

As part of our **Sustainability Framework**, we have organized our material topics under **three pillars** to guide our strategy and action planning.

Tenova's Material Topics[2] are:

Environment	Social	Governance and Business resilience
Energy transition	Health and safety	Business ethics, anti-corruption, and compliance
Energy efficient technologies	Product safety and quality	Transparency and reporting
Environmental impact of products and services	Employee well-being	Responsible procurement
Circular economy	Employee hiring and retention	Human rights
Climate impact of operations	Employee benefits and compensation	C-level accountability for ESG issues
Waste disposal and recycling	Employee training and development	Sustainable behavior promotion
Sustainable innovation and R&D	Diversity, inclusion, and equal opportunity	Sustainability advocacy
Digital transformation of processes		

1 A sustainability topic is material from an impact perspective if the organization is connected to actual or potential significant impacts on people or the environment related to the sustainability topic over the short, medium, or long term. A sustainability topic is material from a financial perspective if it triggers financial effects on the organization. (Source: EFRAG (European Financial Reporting Group) [Draft] European Sustainability Reporting Standard 4 Sustainability material impacts, risks, and opportunities).

2 For a list of definitions of material topics, please see the "Material Topic Definition" paragraph in the Appendix.

2. Our Sustainability Framework

After identifying our priority issues through the materiality assessment, we developed a **Sustainability Framework** to drive purposeful action on our material issues and clearly demonstrate our **sustainability ambition**.

For this scope, we activated a **participatory process** involving leaders and key internal stakeholders to co-design this sustainability framework including a shared sustainability ambition. This is the resulting ambition:

"We lead the way towards the sustainable transformation of our industry.

We enable our people, clients, suppliers, and stakeholders to grow and innovate while caring for the well-being of our planet.

We contribute to a resilient and fair world by operating responsibly."

This ambition represents the overarching mission that Tenova is committed to activate along the main focus areas and sustainability actions under **three major pillars**, which relate to our impact on the ESG topics:

- **We Transform Business**
  Helping our clients and suppliers transform to operate within planetary boundaries

- **We Build Trust**
  Empowering our employees and reinforcing mutual trust with all our stakeholders

- **We Act Transparently**
  Being transparent within our organization and with our stakeholders

Transformation, Trust, and Transparency are the three concepts underpinning these three pillars. It is no coincidence that they all start with the "T" of Tenova – this underscores our intention to deeply embed sustainability within our business. Presenting our pillars using "we" statements makes them more concrete while adding our personal Tenova touch.

We take action on our material topics as organized in the following Framework. In order to strengthen our Sustainability Framework, we prioritized the **Sustainable Development Goals (SDGs)** that Tenova contributes to and focuses on, reported at the bottom of the pillars.

Sustainability ambition

We **lead the way** towards the sustainable **transformation** of our industry.

We **enable** our people, clients, suppliers, and stakeholders to grow and innovate **while caring** for the well-being of our planet.

We **contribute to a resilient and fair world** by operating responsibly.

The pillars

WE TRANSFORM BUSINESS
Helping our clients and suppliers transform to operate within planetary boundaries.

WE BUILD TRUST
Empowering our employees and reinforcing every day mutual trust with all our stakeholders.

WE ACT TRANSPARENTLY
Being transparent within our organisation and with our stakeholders.

The focus areas

WE TRANSFORM BUSINESS
- Developing sustainable solutions & technologies
- Investing in sustainable innovation, R&D, and Digital Transformation
- Accounting responsibly for our direct environmental impact

SDGs: 7 Affordable and Clean Energy, 9 Industry, Innovation and Infrastructure, 12 Responsible Consumption and Production, 13 Climate Action

WE BUILD TRUST
- Providing a safe working environment
- Caring for our employees & providing equal opportunities
- Managing talent, empowering and training employees
- Developing safe-by-design technologies
- Strengthening our collaboration with communities and stakeholders at large

SDGs: 3 Good Health and Well-Being, 5 Gender Equality, 8 Decent Work and Economic Growth, 10 Reduced Inequalities

WE ACT TRANSPARENTLY
- Operating an ethical business
- Communicating our impact openly and responsibly
- Engaging suppliers for a sustainable and resilient supply chain, and providing supply chain transparency
- Embracing sustainable finance principles

SDGs: 16 Peace, Justice and Strong Institutions, 17 Partnerships for the Goals

15

3. Stakeholder Engagement

KEY STAKEHOLDERS

- SHARE-HOLDERS
- EMPLOYEES
- SUPPLIERS
- CLIENTS
- ACADEMICS
- TRADE ASSOCIATIONS
- COMMUNITY MEMBERS
- BUSINESS PARTNERS
- PEERS AND COMPETITORS
- THE MEDIA

Our **key stakeholders** are shareholders, employees, suppliers, clients, business partners, trade associations, peers and competitors, community members, academics, and the media.

We engage with our stakeholders through direct outreach, events, and by soliciting their feedback through avenues like our materiality assessment. We prioritize communication with our stakeholders because we carefully consider their perspectives on how our business impacts them. For further information on Tenova's stakeholder engagement practices, please refer to the section **"Stakeholder Engagement"** in the Appendix.

We are members of several global associations within the metals industry. Tenova is an executive committee board member of the: European Steel Technology Platform (**ESTEP**), Italian Association for Metallurgy (**AIM**), Lombardy Intelligent Factory Association (**AFIL**), and Association for Iron and Steel Technology (**AIST**)'s Mexico Chapter, through which we highlight ESG issues that are important to our industry.

We Transform Business

Helping our clients and suppliers transform to operate within planetary boundaries

The metals and mining industries must evolve to significantly reduce their carbon emissions in order to limit global warming to internationally-agreed limits. Tenova is helping drive this transformation by developing innovative technologies that not only help our clients deliver better products but also drastically reduce their environmental impact. In our efforts to transform our industries, we are also transforming our own business by seeking opportunities to reduce our environmental impact and operate more efficiently.

In this section, we report on how we help our clients reduce their own environmental impact through our varied portfolio of products, technologies, and services, with a focus on digital transformation. Lastly, we report on our own carbon footprint.

17

1. Driving Value for Our Clients

Our portfolio of solutions is principally dedicated to the sustainable transformation of the metal and mining industries. We create value for our clients by providing innovative technologies that ensure efficiency, resulting in better performance, less waste, and lower carbon emissions. We provide technologies that support the transition to cleaner fuels, utilize energy more efficiently, and recover and reuse previously wasted material. In developing these solutions, we are not only serving our clients, but are also working hard to accelerate our sector's transition to a lower environmental impact.

1.1. Energy Transition

The iron and steel industry is one of the largest emitters of CO_2, responsible for 7% of global direct energy-related CO_2 emissions[1]. The steelmaking industry is moving towards **natural gas-based and hydrogen-based iron reduction as substitutes for carbon-based processes**. However, current raw materials supply chain shortages and the geopolitical tensions affecting natural gas availability make this transition challenging.

Tenova is fostering a **shift in the energy paradigm** in the metals industry by promoting the use of **hydrogen-ready technologies** to its clients for the transformation process of their business. This is also carried out by means of partnerships and collaborations with gas supply operators, electrolyzer manufacturers, and other third parties that support a green energy transition.

[1] International Energy Agency (IEA), "**Iron and Steel Technology Roadmap: Towards more sustainable steelmaking**" (2020).

Electrical Steel

Indirectly, Tenova's technologies influence downstream technologies as well, enabling our customers to more efficiently produce metals that will be critical in facilitating the energy transition. One example is **electrical steel**, or **silicon steel**, which makes up roughly 1-2% of total crude steel production globally. Electrical steel is an **iron-carbon alloy with silicon** as its primary additive. It is highly valued for its ability to conduct magnetic fields, minimizing power losses.

The **market for electrical steel** is growing rapidly as global demand for electricity and electric goods increases. It is required for products like transformers, household appliances, and electric vehicles. Tenova has developed numerous technological advancements to make electrical steel even more efficient including annealing, pickling, decarburization, flattening and coating.

CASE STUDY

Improvements in Silicon Steel

As demand for silicon and magnetic steel increases due to growing demand for electric vehicles, Tenova's R&D team has been hard at work to develop technologies to improve the silicon steelmaking process. In addition to our suite of technologies for silicon steel, we have been working on improving the magnetic properties of silicon steel through hot band cold rolling and new descaling processes, like laser and other mechanical descaling. Our research intends to find the optimal process to improve surface finishing and enhance magnetic properties.

19

DRI and ENERGIRON®

The partial or total use of hydrogen for **DRI (Direct Reduced Iron)** production is an excellent source of carbon reduction. This solution is already widely adopted in the industry and has become the standard for the **decarbonization of integrated steelmaking** (i.e., steelmaking from ores as raw materials).

ENERGIRON® is an innovative HYL Direct Reduction technology, jointly developed by Tenova and Danieli. It has been designed to use **different types of reducing gas sources or pure dihydrogen** to reduce iron ores into metallic iron for its use in melting facilities to produce a wide range of **high-quality steels**. ENERGIRON® plants efficiently reduce any iron pellet or lump into "energized" hot or cold DRI or hot briquetted iron with controlled metallization and carbon levels. ENERGIRON® offers unparalleled flexibility: even with the same process scheme configuration, the client can select the best energy source — natural gas, reformed gas, syngas from a coal gasifier or even coke oven gas — without any modification and control the amount of embodied carbon. ENERGIRON® plants meet the **most stringent environmental regulations** as well. Because of its unique features, it has the lowest carbon footprint of any ironmaking technology,

with the further advantage that selectively removed CO_2 can be sold. Additionally, the water byproduct of the reduction reaction, easily condensed and removed from the gas stream, can be used as cooling water in a zero-water consumption circuit.

DRI plants are typically coupled with **electric arc furnaces (EAF)** for the melting of DRI and its transformation into sellable iron or steel. The use of electrical energy substituting chemical energy (which creates CO_2 emissions): the world's most productive DRI-fed EAF in the world was produced by Tenova and we are currently embarking on building a second one.

SAF and Open Slag Bath Furnace

Open Slag Bath Furnace (OSBF) is the perfect solution for melting high carbon DRI to produce hot metal. The electric furnace — a **submerged arc furnace (SAF)** in this case — works using Søderberg electrodes operating with a very short electrical arc or "brush arc". It can tap hot metal into torpedo cars. The resulting slag has the same composition as blast furnace slag.

iBLUE®

The emissions from the conventional blast furnace-basic oxygen furnace or oxygen converter (BF-BOF) route represent the greatest potential for CO_2 reduction in the steelmaking industry: the BF-BOF route from iron ores produces two tons of CO_2 for each ton of steel produced (while the EAF route from scrap produces 80% fewer emissions). As of 2019, 71% of global steel was produced via the BF-BOF route, while only 29% was produced via the electric (EAF) process. Tenova's proven technology to **substitute any Blast Furnace** is iBLUE® which enables the **production of Liquid Pig Iron via the BF-BOF route** while massively reducing emissions. iBLUE® combines the production of high carbon DRI with an electric arc melter to produce hot metal and granulated slag. iBLUE® can also utilize BF grade pellets as raw material, making this solution the perfect substitute to blast furnace technology. The use of green hydrogen in the reduction process can further **minimize greenhouse gas emissions**. This represents a less costly option to produce pig iron with a minimal carbon footprint and results in minimal disruption to the operations of an integrated steel plant that plans to shift towards green steel production.

"Our products provide clients with improved plant sustainability even before cleaner fuels become available."

Combustion Systems for Furnaces

Traditional hot rolling heat treatment and melting processes utilize fossil feedstocks resulting in a high carbon footprint for final products like long or flat products. Tenova is committed to developing and deploying **clean-burning hydrogen-based solutions** for reheating and heat treatment furnaces. Since 2008, we have specialized in the development of **regenerative and self-regenerative burners** that provide at least a **10% reduction in CO$_2$ emissions** using a fossil feedstock. However, Tenova's regenerative burners are **hydrogen-ready**: whenever green hydrogen becomes readily available, our clients can immediately swap to the clean-burning fuel and drastically reduce their carbon emissions without any additional adaptations to their equipment.

We have also integrated this latest technology into our line of **SmartBurners** to provide up-to-the-minute data on the operating efficiency and processes of our burners to ease inspections and maintenance. Our **Industrial Internet of Things (IIoT)** framework offers a complete set of process diagnostics, KPIs to control key parameters like the combustion ratio, leakage of switching valves, and combustion quality. Our multi-megawatt TSX SmartBurner family for reheating and non-ferrous melting furnaces is fueled with a mixture of natural gas and hydrogen – it can run on 100% hydrogen as well. Our 200-kilowatt TRKSX (Tenova Self-ReKuperative Flameless) SmartBurner also uses a variable fuel mixture of natural gas and hydrogen and works in flame and flameless mode, helping to keep **nitrogen dioxide emissions well below the strictest limits.**

In 2021, we reached a key milestone in this endeavor by developing the first burners for heat treatment furnaces using up to **100% hydrogen**, while keeping NOx emissions below even the strictest limits. Tenova's regenerative flameless burners combine the lowest NOx emission levels with high temperature combustion air preheating, while allowing a drastic reduction of CO$_2$ emissions through high combustion efficiency. That means our products provide clients with improved plant sustainability even before cleaner fuels become available.

TenovaLAB

We continuously invest in new research and development activities to create cutting-edge technologies that provide low-carbon solutions to our clients in the metals and mining industries. For this reason, Tenova has invested in its own R&D facilities by installing an **experimental laboratory in our headquarters in Castellanza**. Our TenovaLAB (T-LAB) carries out experimental industrial activities for the development and testing of all burner technologies. Equipped with **three test furnaces** of different thermal power, T-LAB allows our R&D team to close the loop between our in-house modeling and simulation capabilities and the engineering of industrial products. On-site product testing, like thermal and emissions measurement, enables us to fine-tune product specifications, minimizing technology risks for our clients. Furthermore, T-LAB allows our customers to see our products in use in real operating conditions.

In 2022, we expanded hydrogen-readiness to our self-recuperative and radiant tube burner families. Additionally, T-LAB was awarded a **HorizonEU grant** - the European Union's key funding program for research and innovation - to demonstrate the green hydrogen production/utilization chain at full industrial scale, from electrolyzer generation of hydrogen to furnace combustion. As part of this project, in 2023 we are upgrading our T-LAB combustion facility to use variable blending rates of green hydrogen with traditional fossil fuels. The on-site water electrolysis plant will be provided by our partners Snam and Industrie De Nora and powered by our new rooftop solar field, representing an industrial example of the benefits of zero-emissions hydrogen.

21

CASE STUDY   **Partnering with Clients for a Low-Carbon Future**

As our economies move towards net-zero emissions, steel companies have a major role to play in emissions reduction. Tenova is constantly innovating to develop low-carbon solutions for the metals industry.

- In 2022, we were awarded a contract with Tenaris, a global manufacturer and supplier of steel pipes and related services, to supply the first hydrogen-ready industrial furnace for the application of heat treatment on specialty steel. This moving hood furnace located at Tenaris's site in Dalmine is equipped with 34 hydrogen-ready self-recuperative TRKSX burners. These burners can use pure natural gas, pure hydrogen, or a fully variable blend of hydrogen and natural gas, providing energy savings, reduced carbon emissions, and reduced NOx emissions compared to traditional fossil fuel burners. According to Giuseppe Pandini, Senior Project Manager at Tenaris, "Besides selecting the best energy saving technology for the burners, with this project we took the opportunity to take a step forward. Working with Tenova's engineering and R&D, we designed a plant ready to start the substitution of natural gas with hydrogen as fuel for our industrial furnaces."

- We partnered with Snam, Europe's largest energy infrastructure operator, to conduct joint strategic studies and market analyses to implement green hydrogen projects within the metals industry. The aim is to bring integrated, turnkey commercial solutions tested in industrial plants to implement a substantial reduction of CO_2 and NOx emissions in metals production processes – from melting up to thermal processing of long and flat products.

- We have partnered with Tenaris and Snam to pilot green hydrogen steelmaking at Tenaris Dalmine's pipe mill on our "Dalmine Zero Emissions" project. The project marks the first industrial-scale application of hydrogen in Italy to decarbonize the steel sector. The project aims to generate hydrogen and oxygen through the installation of a 20 MW electrolyzer and will likely include the construction of a storage site for the accumulation of high-pressure hydrogen and the use of oxygen within the melting process. The results of the project could significantly reduce CO_2 emissions related to electric arc furnace steelmaking.

22

1.2. Energy Efficiency

In cases where it is not yet feasible to transition to cleaner fuels, we have developed a suite of technologies to help our clients use their existing fuels more efficiently or adapt their existing processes, thus reducing their emissions. One such example is our Ferrochrome Multiple Preheater technology which reduces electrical energy consumption by preheating the ores before they enter the furnace using the furnace waste gases, recovering the energy otherwise lost to the environment.

Consteel®

In use for over 30 years and in 80 sites across all continents, our **Consteel® Electric Arc Furnace (EAF)** has proven its value to clients around the world. Consteel® is a process by which raw feed materials, in particular scrap, are preheated and charged continuously into an EAF and melted by immersion in the liquid steel present in the furnace. The EAF operates in constant flat bath conditions, a key advantage over conventional batch processes where scrap is melted by the direct action of the electric arc. **EAF gases are used to preheat the incoming scrap and feed materials**. Their composition is controlled and sent to a fume-cleaning plant in conditions suitable for the complete combustion of carbon monoxide and other pollutants without any fuel consumption. This process produces liquid steel with high productivity, a short and adjustable heat cycle, and the lowest power cost compared to any other EAF installation using conventional or other alternative steelmaking technology.

iRecovery® Captures and Reuses Thermal Heat

Today, process optimization and energy efficiency to reduce emissions are more important than ever for steel producers. Tenova began working on this over a decade ago, well before other companies were thinking about sustainability in the industry. We developed the **iRecovery**® system for recovering thermal power from EAF waste flue gas and using it as an energy source. This energy comprises the biggest fraction of the primary energy input in the EAF process yet typically goes to waste. iRecovery® captures the thermal energy created by the off-gas and uses it to produce steam to power steelmaking and other activities. In Brescia, for example, our client ORI-Martin uses **iRecovery**® at their steel plant. The captured heat from their plant heats 2,000 homes in wintertime and powers 700 homes in the summer, reducing 10,000 tons of CO_2 every year. In 2022, we further enhanced **iRecovery**® by also developing a method to capture and utilize the dissipated heat itself, in addition to the flue gas, and use it to generate energy.

1.3. Circular Economy

Industrial processes create numerous byproducts. Our solutions contribute to the circular economy by enhancing their recovery and reuse through our technologies.

EAF-LF (Electric Arc Furnaces - Ladle Furnace)

The primary production of steel from virgin iron ore is highly energy intensive. This can be mitigated without loss in quality by using ferrous scrap mixed with DRI/HBI and other virgin iron units (pig iron / hot metal) when necessary. Quality and availability of steel scrap are therefore an important factor, especially considering the trend in the quality of world steel scrap shows a decrease in quality. Having this in mind, we are conducting research and implementing Industry 4.0 technologies to manage low-quality scrap in furnaces.
EAF steel production is already an integral part of the circular economy. This role can be further enhanced. Tenova is implementing innovative approaches to increase the recycling process, replacing the use of injected coal in the EAF with alternative materials that are byproducts from other industrial processes, like polymers from waste plastic and by treating EAF process residues such as slag and fume dust to recover both metal and mineral fraction for internal use or application in other industries.

Dry Slag Granulation

The **capture and reuse of currently wasted materials**, such as ladle furnace slag, is a critical step in the decarbonization of the steel industry. In 2016, the European steel industry generated about 43 million metric tons of slag, of which about 7% — or 3 million metric tons — is not being reused[1], representing not only a serious environmental problem in Europe, but also a **huge amount of available material for potential recycling**. Today, slag handling is a costly and time-consuming operation that poses significant safety and operational risks, requires water, and is a potential source of fugitive dust and fumes.

Tenova has developed a **ladle furnace slag granulation solution** which uses forced air steam to rapidly cool and solidify slag, enabling the capture of its lime content, which constitutes roughly 55% of the total slag stream. Our solution allows the **processing and reuse of slag industrially**, rather than manually, decreasing workers' exposure to harmful chemicals in slag, reducing water use, and reducing the need for virgin lime mining. The solution also successfully enables the reuse of slag in the EAF process itself or as a byproduct for industries in soil stabilization, fertilizer, concrete production, and more. Further, Tenova extended its dry-granulation technology to EAF slag to high alloy steel grades and slag produced by the DRI/EAF process.

Tenova is currently developing a **market for dry granulated slag from LF** which has applications in cement production, chemicals for the building industry, and more.

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1 *European Steel in Figures,* Eurofer, 2019, eurofer.eu

Lithium Recovery

Lithium is widely used in metallurgical processes to promote metal melting, eliminate the formation of oxides, and absorb impurities. Its growing use **in clean energy technologies**, like solar arrays and electric vehicle batteries, make it a crucial metal for achieving a net-zero future. Building on this potential, Tenova scientists have explored various processes to produce lithium more efficiently. **Tenova Advanced Technologies (TAT)** adapted its SX technology for producing **lithium from primary sources** to produce recycled **lithium from batteries**. The new process can be applied across all feed streams, originating from any source, including solar, hard rock, recycled waste, and process waste streams, to produce high quality lithium hydroxide. The key characteristics of this process are the **high efficiency of extraction**, superior to the traditional process, and a **lower use of water**.

Magnesia Metal from Coal Ash

As global demand for magnesium metal rises, **Latrobe Magnesium Limited (LMG)** in Australia is using Tenova's technology to **harvest magnesium metal from fly ash byproduct** – a hazardous waste material deriving from brown coal power generation. Originally developed to have a zero-waste pickling process during steelmaking, our pyrohydrolysis process was adapted to LMG's unique situation to recover magnesium metal. The related emissions from this technology are roughly half of those of conventional magnesium production plants. Launched in 2022, LMG eventually intends to develop a commercial scale operation producing 10,000 to 40,000 tons of magnesium metal per year.

Aluminum

Aluminum's many useful qualities have made it ubiquitous across all areas of modern life. Additionally, its recyclability makes it a highly valuable material. **Recycling aluminum uses only 5% of the energy it takes to mine virgin material** and creates fewer emissions. Tenova has created new technologies to further enhance the environmental benefits of recycling aluminum. Our **Twin-Chamber Melting Furnace (TCF®)**, a **Tenova LOI Thermprocess** technology, enables the remelting of organically contaminated aluminum or other scrap metal without pre-treatment. Its dual chamber design includes a post-combustion process to completely incinerate contaminants

and use the resulting energy generated for furnace processes, thus reducing consumption of external energy. Our TCF® technology has **30 installations worldwide**, producing approximately a combined 1,500,000 MT of liquid aluminum every year. And for existing casthouses, the application of TCF® to the recycling of post-consumer scrap can significantly reduce the overall CO_2 emissions of the plant, as the process generates only 80 kg of additional CO_2 per ton of liquid aluminum.

26

1.4. Impact Monitoring

As a responsible company in the metallurgy field, we recognize the importance of monitoring the impact of our products and services on the environment and human health. We commit to improving our processes and products to ensure their impact is accounted for along their entire life cycle.
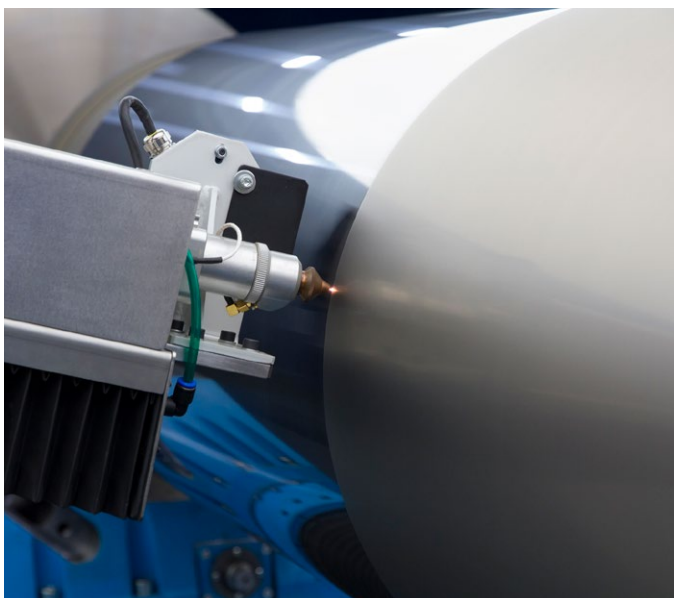
Pomini Digital Texturing™

Our **PDT™ Pomini Digital Texturing™ process** covers an extensive range of **surfaces for work roll texturing** in cold rolling mill applications for both the **steel and aluminum** sectors. With up to four state-of-the-art lasers and no need for ancillary equipment, the process requires **minimal power consumption**. A simple digital process, based on modern **fiber-optic laser heads**, PDT™ enables an unparalleled range of surface possibilities compared to any other existing texturing technology.

PDT™ offers **benefits beyond energy efficiency**. It does not have adverse impacts on human health. Other texturing technologies may require, as a post-process in many applications, the use of significant quantities of hexavalent chromium, a highly carcinogenic material which can be difficult to remove from the environment. PDT™ makes it possible to significantly reduce, and even completely **eliminate hexavalent chromium**, making it a much safer and less toxic alternative.

Looking ahead, Pomini Tenova foresees **several exciting potential uses** for the revolutionary PDT™ technology. One potential use we are currently exploring is in the field of electrolyzers, designing a machine that converts water into hydrogen to be used as a clean-burning fuel – a key enabler of a low-carbon future. A second area of development is in electric vehicle batteries. We are exploring the use of PDT™ on aluminum foil to obtain a reduction in intrinsic resistance characteristics through texturing. We look forward to sharing more about these and other potential applications in the future.

PDTTM becomes "Product Category Rule" through Life-Cycle-Assessment (LCA) as per ISO 14025:2006

In 2021, Pomini Digital Texturing™ (PDT™) became the **first machine in the metal surface finishing sector to complete a lifecycle analysis (LCA)**. As a result, the technology was certified as complying with the ISO 14025:2006 standard. The LCA analysis was registered on the **EPD® Portal** – the platform of the International EPD® System, the world's leading global LCA program operating in accordance with the ISO 14025, ISO/TS 14027, and ISO 14040, among others standards – and is now **accessible to all users**. Subsequently, thanks to the experience gained through the LCA process, Pomini Tenova led the creation of the **"Product Category Rule"** – the rules, requirements, and guidelines to develop a high-quality EPD for a specific product category – ensuring that functionally similar products are assessed and compared in the same way when measured through an LCA.

1.5. R&D and Sustainable Innovation

We not only improve existing technologies for metals industries, but also design and produce new technologies that reduce the environmental impact of our clients' facilities while improving production efficiency and performance. Our solutions reduce CO_2 emissions to some of the lowest levels in the metals industry. We create cutting-edge technologies that **reduce fine particles**, NOx emissions, dioxins, and other hazardous substances. We strongly believe in the potential of alternative and renewable energy sources, incorporating them into our solutions wherever possible. We have already put **hydrogen-ready technologies** on the market, and many of our solutions are designed around the concept of **recovery, reuse, and circularity**, from dispersed energy to reutilized residues and more, fostering an effective circular economy.

Our innovation process begins with **research, an open-ended creative ideation phase**, and is followed by development, where ideas with high potential are transformed into prototypes of future products. Finally, once tested and finalized, the product is produced and marketed to customers. This process cuts across a number of teams and Business Units, including engineering, functional units, sales, and more. Our attention to sustainability has been a successful driver of business growth for Tenova. We are coordinating our **R&D&I efforts across Business Units and Product Lines**, to find integrated, synergistic solutions through collaboration.

Our R&D&I focus areas for 2022-2024 are **energy transition, local environment, process flexibility and efficiency, raw materials and residual valorization, safety, and final product quality**. We have identified how each of these focus areas contributes to the **Sustainable Development Goals (SDGs)**. The SDGs serve as a useful guide for businesses and society to align on to advance sustainable development. To further our impact, we also participate in national and regional working groups, including EU ones, on sustainable topics like circular economy and decarbonization to generate projects, roadmaps, and partnerships.

2022-2024 R&D&I Focus Areas and SDGs

Energy Transition	7 AFFORDABLE AND CLEAN ENERGY / 13 CLIMATE ACTION	Process Flexibility / Efficiency (OPEX)	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	Safety	3 GOOD HEALTH AND WELL-BEING
Local Environment	11 SUSTAINABLE CITIES AND COMMUNITIES / 15 LIFE ON LAND	Raw materials / Residual valorization	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	Quality of final product	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

Tenova Innovation Days

In 2022, our Global R&D Team hosted **Tenova Innovation Days** — internal ideation workshops to generate novel product ideas. During this series of four events, over 80 employees from different Product Lines and Staff Functions attended. Each event was focused around **six different R&D&I focus areas** and attendees across roles were split up into six working groups to develop ideas. The Innovation Days events were emblematic of the **collaborative mindset** the company is adopting to enable cross-Business Units R&D&I projects. At the end of the event, teams presented their ideas to an **R&D Committee** which identified the most impactful projects to consider for future development.

EcoSlag

Valorization of Ladle Furnace (LF) slag currently represents a significant target for steel producers to reach the goal of zero waste and reduced carbon emissions. EcoSlag project aims to improve the quality and handling of slag compared to current processes. EcoSlag will identify and assess potential operational solutions for waste heat recovery from steelworks' slag, while generating slag that can be used as a valuable input, minimizing slag production's ecological footprint. Industrial tests with the **Dry LF Slag Granulation** successfully proved that the new process could minimize environmental impact, increase workers' safety, and reduce operational cost. Moreover, a feasibility study on heat recovery from slag has been carried out implementing industrial test on heat recovery together with a concept study for heat utilization.

CyberMan4.0

In 2018, **Pomini Tenova** joined a cluster of other European organizations on **CyberMan4.0** — a Cyber-Physical System-based approach for intelligent data-driven maintenance operations applied to the rolling area. The consortium of the CyberMan4.0 project consisted of **five companies and three research institutes** located in Italy, the Netherlands, and Germany. We worked on four use cases: two in Roll Shop operations and two for the production of long laminates.

CyberMan4.0 was designed to develop an **innovative Integrated-Maintenance-Model4.0**, supporting the transition from traditional preventive maintenance to predictive maintenance. To properly maintain equipment, data collection is necessary but not sufficient: in collaboration with Tenova Digital, CyberMan4.0 created a **cloud-based system** that can cross-reference the data of several plants and, using algorithms, predict possible anomalies in order to schedule maintenance at the right moment. The project successfully prevented equipment downtime, resulting in greater efficiency and productivity. It also increased quality by reducing waste, and extended the useful life of cylinders, which reduced the overall use of oil and energy.

Burner 4.0

Combustion systems and burners for the steel industry have improved in recent years, with a focus on energy savings, pollutant emissions reductions, and process flexibility. **Burner 4.0** uses Industry 4.0 technologies to **extend the current technological limits of burner combustion systems** across different areas, including design, manufacturing, control and process optimization, operating life, and maintenance. Additive manufacturing, Internet of Things, smart sensors, data analytics for process optimization, and predictive maintenance have been introduced to current burner systems to find breakthrough innovations. Funded by the **European Commission**, Burner 4.0 started by identifying materials and shapes for 3D printing of critical burner components for heat treatment furnaces. In order to maintain burner performances at nominal levels throughout its life, Tenova has also introduced the concept of **SmartBurner**. SmartBurner's IIoT framework offers a complete set of process diagnostics, KPIs, and KHIs that enable important process parameters like combustion ratio, leakage of switching valves, and combustion quality to be controlled and facilitate burner inspections and maintenance interventions.

Insoluble Anode Tin Coating and Chromium-Free Passivation

Due to its anti-corrosive qualities, tin is used as coating in many steel applications, such as food canning and pipes. **Tinning**, however, is the **most complex and sophisticated strip processing line**. In the most advanced lines, tin plating is performed using insoluble anodes where, in older plants, the dissolution of tin results in the generation of large quantities of sludge — with a high loss of tin, a valuable commodity, in the sludge.

Tin coatings are also often passivated using chromium to prevent oxidation. **Hexavalent chromium**, however can have negative health impacts on workers and its use will soon be banned by the EU.

Tenova's **insoluble anode tin coating process** greatly **minimizes the amount of sludge** produced and, hence, the loss of tin, and its **chromium-free passivation process** provides tin passivation without the harmful effects of chromium. The resulting tin coating also provides more uniform coverage and better edges while more efficiently utilizing the tin. Other benefits are the **reduction of manpower** for anode handling and therefore an increase in safety during operation, the generation of fewer fumes, better process control, more flexible campaigns, and the lowest tin coating thickness reachable on the strip.

2. Digital Transformation

Digital technologies have the potential to revolutionize the metals and mining industries. This is why Tenova has not only integrated digital solutions into many of its technologies but has also created a digital strategy team to stay ahead of the curve. Our strategy places customer value and sustainability at its center, helping us stay focused in this rapidly evolving space. It leverages technologies through the use of AI, and leverages machine learning and data analytics to increase efficiency and reduce environmental impacts for our clients.

Adopting a Digital Mindset

To continue to optimize productivity through our new hybrid working model, we encourage our employees to adopt a **digital mindset** — seeking digital solutions to solve problems across categories from smart working to Industry 4.0 integration. The ambition of our digital mindset mentality is to **promote a deep cultural change** wherein our teams understand and harness the pioneering modern technologies that could revolutionize our industries.

Some of our activities to advance a digital mindset have been around the deployment of specific tools and technologies to promote them amongst our employees. We have several technological systems in place to support remote collaboration within Tenova and our business partners as well, including the Project Collaboration Portal and the Supplier Portal, all accessible on multiple, user-friendly devices.

We have begun digitizing certain business processes using workflow engines and increasing efficiency by automating repetitive processes through **robotic process automation**.

We also provide employees with **supplementary training** to help them feel connected to each other, learn how to use new tools, and remind them to protect sensitive data, such as enhanced **cybersecurity awareness** features and information about Tenova procedures and guidelines.

"Acciaio_4.0" Plant of the Future

The **Cluster Fabbrica Intelligente**, or Italian Smart Factory Cluster, is an association sponsored by the Italian Ministry of Scientific Research with the aim of implementing a strategy based on research and innovation for the competitiveness of Italian manufacturing. To promote the development of digitally-enabled factories, the Cluster launched its **Lighthouse Plant** challenge. Lighthouse Plants are factories that are already operational and ready to become smart factories by using Industry 4.0 technologies like big data, IoT, and artificial intelligence.

Tenova **ORI Martin's "Acciaio_4.0"** plant was one of four plants accepted as a Lighthouse. "Acciaio_4.0" aims to **develop a Cyber Physical Factory** that will allow the vertical, horizontal, and transversal integration of the entire steelmaking process, making it more efficient, flexible, and sustainable. As the industrial technological partner, Tenova designs innovative models of integrated process for the plant, using smart sensors (IoT) and gathering data in cloud systems to develop machine learning applications, remote support, and predictive maintenance, taking into consideration environmental sustainability, people's safety and data security.

Support Client Engagement

In addition to the digital features embedded in our products, we want to provide our clients with the best possible service so we have created several systems to help employees communicate effectively with clients. Customers have access to a **Customer Portal** where they can request support for specific products and order spare parts. The portal is regularly updated with new features. Internally, Tenova teams are set up for success with our project management platform that provides an accessible central depository of all project information, such as relevant documents, procurement plans, and more. We plan to enhance the platform with **AI features** in the near future to reduce repetitive processes, therefore increasing efficiency.

Some of the proprietary digital tools we have developed include:

- **Tenova IIoT Platform**, which facilitates communication with our customers through **Tenova Edge, our cloud platform**. The IIoT platform retrieves plant data and analyzes it to develop new services and AI applications which help customers use and maintain their equipment.

- **Tenova adVISOR**, a **virtual assistant** that provides suggestions on product maintenance and operation. It can be used on a mobile device and provides real-time updates. The tool's remote assistance feature, available on mobile and wearable devices, provides support to field operators.

- **Tenova Catalog Creator,** which enables customers to easily **select spare parts** with fewer mistakes by connecting to the customer's portfolio database to accurately identify the correct part.

33

3. Environmental Impact from Our Operations

Tenova has long recognized the harmful impacts that climate change can have on the environment. That is why the core of our business is helping clients mitigate that impact through our products, technologies, and services. Alongside helping our clients, we are also taking steps to reduce the environmental impact of our own operations.

3.1. Our emissions and energy use

26%

2024 Goal

Reduction of Scope 2 emissions (market-based) of **450 tCO$_2$e** by 2024 (*)

(*) equivalent to a 26% reduction (baseline 2022)

Tenova's own energy consumption and direct CO$_2$ emissions stem largely **from our corporate offices and a few productive sites** and laboratories located in Italy, Poland, Canada, and Israel. Due to the minor scale of our in-house production, **our direct carbon impact is negligible**.

In this report our primary energy consumption and direct CO$_2$ emissions are disclosed, in particular those relating to our **main Italian offices, located in Castellanza and Genoa**, as well as the **production location in Castellanza**.

We currently do not measure or disclose environmental data for our sites in Poland, Canada, or Israel, though Tenova will evaluate structuring a monitoring process to also gather this data in the coming years.

Our Energy Use[1]

GRI 302-1 Energy consumption within the organization	2021		2022	
	Total	Total in GJ	Total	Total in GJ
Fuel consumption from non-renewable sources	**–**	**26,492.6**	**–**	**16,284.6**
Fuels used for productive purposes	**–**	**26,485.0**	**–**	16,135.7
Natural gas	737,356.0 mc	26,459.9	449,653.0 mc	16,135.7
Diesel	700.0 litres	25.1	500.0 litres	18.0
Fuels used for fleet vehicles owned by the organization or long-term leases (only company use)[2]	**209.0 litres**	**7.5**	**3,645.0 litres**	**131.0**
Diesel	209.0 litres	7.5	3,645.0 litres	131.0
Electricity consumption	**3,779,329.5 kWh**	**13,605.6**	**3,672,192.0 kWh**	**13,219.9**
Purchased electricity from non-renewable sources	3,779,329.5 kWh	13,605.6	3,672,192.0 kWh	13,219.9
Total energy consumption within the organization	**–**	**40,098.1**	**–**	**29,504.5**

Since 2018, we have utilized an energy management system that monitors utility usage at our most energy intensive site in Castellanza. Using the data from the system, we have implemented a number of energy efficiency measures including reducing our base load energy usage after work hours, which helped reduce our energy costs by roughly 12%. In 2022, we used this data to further reduce our emissions and energy use, in particular natural gas consumption, through numerous initiatives including:

- replacing windows in the factory building at our Castellanza site with thermal block models;
- optimizing thermostat settings;
- using high energy machine tools more efficiently;
- replacing traditional lightbulbs with LED bulbs; and
- raising awareness among employees of the environmental impact of relevant daily activities, such as keeping doors open while loading and unloading.

1 Data related to energy consumption and Scope 1 and 2 emissions refers to Tenova's Castellanza and Genoa sites

2 Data related to fuel use for fleet vehicles owned by the organization or leased long-term (mixed use) is currently not available

Our CO_2 Emissions

GRI 305-1 Direct (Scope 1) GHG emissions
GRI 305-2 Energy indirect (Scope 2) GHG emissions

	Unit of measure	2021	2022
Scope 1 GHG emissions[1]	tCO_2eq	438.7	278.9
Scope 2 GHG emissions – location based[2]	tCO_2eq	928.6	902.3
Scope 2 GHG emissions – market based	tCO_2eq	1,725.5	1,676.6

Our other air emissions[3]

GRI 305-7 Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions

	Unit of measure	2021	2022
Particulate matter (PM)	kg	17.2	5.8
Chrome[4]	kg	<0.01	<0.01
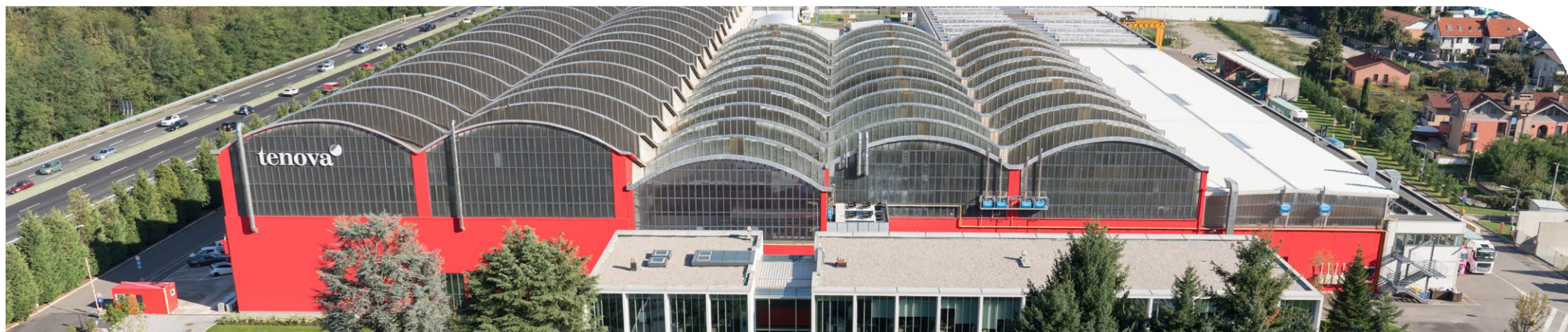
1 Scope 1 GHG emissions include emissions related to refrigerant gases used (4.5 kg of R407C in 2021 and 0 kg in 2022). Data related to fuel use for fleet vehicles owned by the organization or leased long-term (mixed use) is currently not available

2 A location-based method reflects the average emissions intensity of grids on which energy consumption occurs (using mostly grid-average emission factor data). A market-based method reflects emissions from electricity that companies have purposefully chosen (or their lack of choice).

3 Data related to significant air emissions refers to Tenova's Castellanza site. Data based on chemical analysis at the emissions. The monitoring of the air emission is not in continuous, therefore the available data was used to estimate total emissions during the year.
4 0.0075 kg in 2021 and 0.0000528 in 2022

In order to reduce our direct CO_2 emissions, we have **committed to reducing our energy and gas consumption** across all of our Italian sites and HCFC plants (cooling systems). To achieve this, we set up an **energy measurement** system in 2018 as well as an energy and gas consumption working group to identify opportunities to reduce our usage.

We have also undertaken several **energy efficiency measures** including:

- optimizing the energy usage of our most energy-intensive locations, achieving in 2021 an average base load reduction of 10% and a reduction in average energy usage of 50% during non-working hours compared to 2020;

- replacing windows in our workshop locations with more efficient thermal break windows;

- monitoring and mitigating HCFCs leaks;

- encouraging employees to work from home two days per week to reduce transport emissions;

- installing electric vehicle charging points at our Castellanza offices; and

- encouraging employees to adopt sustainable behaviors.

Looking ahead, we have also invested in the development of a **solar photovoltaic (PV) field** that will generate **around 1 MWh/year of electricity**. Going live in 2023, the 9,000 sqm solar field will be installed on the roof of the Pomini workshop buildings located at Tenova's Castellanza site. It will produce about 30% of the current energy needs of the premises, preventing 540.6 t of CO_2 emissions.

90% of the energy produced by the solar field will be used on the **campus**, while the remaining 10% will be sold back to the grid. The solar field is set to power our forthcoming electrolyzer which will create hydrogen from water for industrial applications, further reducing the impact of this green hydrogen source. We are also considering environmental building approaches as we renovate older facilities, in particular our Castellanza site.

3.2. Waste and Water

In addition to energy and electricity, we strive to **reduce our use of other resources** as well, including our generation of waste and water use.

Our **waste collection and disposal** comply with all local regulations. Given that most of our operations are office buildings, with few small manufacturing locations, most of the waste we produce is non-hazardous. Our industrial waste is managed by authorized third-party companies.

We have committed to finding ways to **reduce the amount of waste we generate**, repurposing waste in-house when possible, and recycling as much as possible in order to minimize waste sent to the landfill. We have increased the number of waste collection points in our office locations and all employees receive training on correct separation of waste to improve landfill diversion. We also compact our waste to reduce its overall volume. Additionally, in Castellanza we have installed **water refilling stations** and offer reusable, dishwasher-safe cups to encourage the use of reusable bottles over single-use plastic ones. Since installing the stations in October 2022, we have prevented the use of an estimated 6,500 plastic bottles.

In 2022, our overall waste generated decreased while recycling increased, compared to 2021. We are currently exploring ways to improve the separation of waste types. Looking ahead, we aim to conduct more granular research on our waste's pathways downstream to further **improve our diversion rate**.

Waste Generated[1]

GRI 306-3 Waste generated

	Unit of measure	2021	2022
Hazardous waste	tons	89.3	62.5
Non-hazardous waste	tons	178.9	179.2
Total weight of waste generated	tons	268.2	241.7

GRI 306-4 Waste diverted from disposal

	Unit of measure	2021	2022
Hazardous waste diverted from disposal	tons	83.9	53.0
Recycling	tons	83.9	53.0
Non-hazardous waste diverted from disposal	tons	144.5	179.0
Recycling	tons	144.5	179.0
Total weight of waste diverted from disposal	tons	228.4	232.0

GRI 306-5 Waste directed to disposal

	Unit of measure	2021	2022
Hazardous waste directed to disposal	tons	5.5	9.5
Incineration (without energy recovery)	tons	0.2	0.1
Landfilling	tons	5.3	9.4
Non-hazardous waste directed to disposal	tons	34.3	0.2
Landfilling	tons	34.3	0.2
Total weight of waste directed to disposal	tons	39.8	9.7

1 Data related to waste generated refer to Tenova's Castellanza and Genoa sites

CASE STUDY

Improving Coolant Filtration

In 2022, Pomini Tenova piloted a process to more effectively **separate solids and liquids during the grinding process**. Coolant-lubricant used during the grinding process produces a **waste byproduct** that is filtered so it can be **recirculated and reused**. The filtration process requires a magnet and paper filter which separate solids from liquids. We tested using a magnet of 9,000 g strength, versus the existing 850 g magnet, which provided roughly double the separation capacity, extending the usable life of the coolant-lubricant. Additionally, the waste sludge that results from the filtration process was tested as a secondary raw material input for use in foundry applications. Its use significantly **reduced residual moisture** in briquettes. This innovation would provide not only an environmental benefit by extending the useful life of coolant-lubricant but would reduce costs related to the disposal of waste sludge.
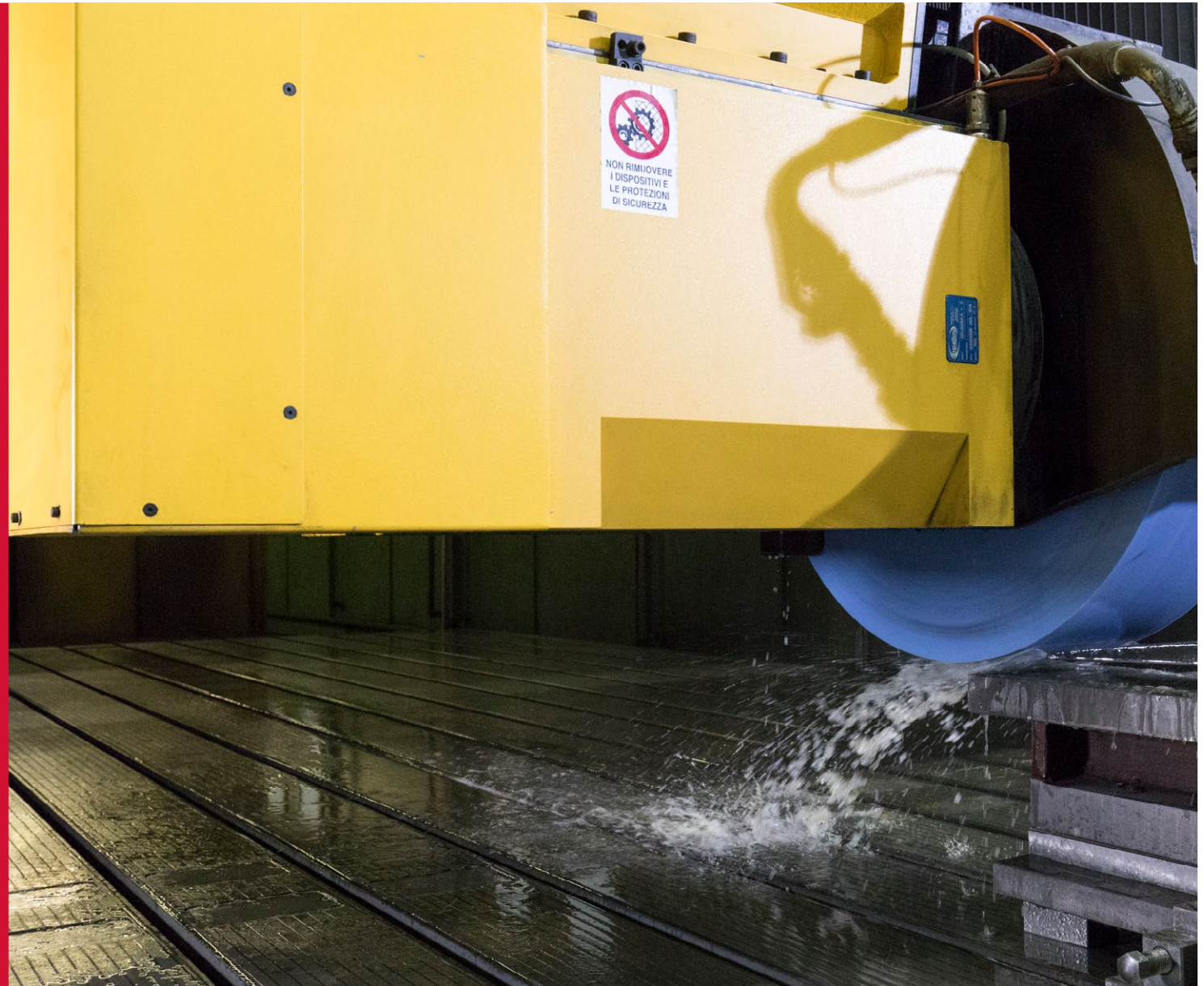
We manage our water use in compliance with Italian current legislation. At our Castellanza site, water is withdrawn from on-site wells to load fire extinguishers, irrigate landscaped areas, and load hydraulic power units to test roll grinders. If water is mixed with oil or other solvents, it is discharged temporarily into a tank and subsequently disposed of as wastewater, following regulatory guidelines. For our Genoa and Castellanza sites, water for daily employee use is withdrawn from the aqueduct and discharged into the sewer. Water withdrawn from wells and discharged water are monitored through chemical analysis on an annual basis. Wastewater is monitored through chemical analysis every six months. Data is shared with management every year. In 2022, a drought in Italy required us to replenish our site wells, resulting in an increase in water use compared to the previous year.

Water Use[1]

GRI 303-3 Water withdrawal
GRI 303-4 Water discharge
GRI 303-5 Water consumption

	Unit of measure	2021	2022
Total Water withdrawal	Megaliters	28,095.0	41,169.0
Groundwater – Freshwater (≤1,000 mg/L Total Dissolved Solids)	Megaliters	17,570.0	27,410
Third-party water – Freshwater (≤1,000 mg/L Total Dissolved Solids)	Megaliters	10,525.0	13,759.0
Total water discharge	Megaliters	9,707.0	9,064.0
Third-party water – Freshwater (≤1,000 mg/L Total Dissolved Solids)	Megaliters	9,707.0	9,064.0
Total water consumption	Megaliters	18,388.0	32,105.0

1 Data related to water withdrawal, consumption and discharge refers to Tenova's Castellanza and Genoa sites, which are not located in water stressed areas (Source: World Resources Institute, Aqueduct Water Risk Atlas, www.wri.org/our-work/project/aqueduct). During 2021 and 2022 there were not significant changes in water storage.

We Build Trust

Empowering our employees and reinforcing mutual trust with all our stakeholders

At Tenova, we believe trust is our license to operate. We build trusting relationships with all our stakeholders, from our employees to our clients. For us, trust is based first and foremost on safe and reliable technology that enables long-lasting client relationships. Our commitment to safety is distilled into two focus areas: **"Safety First"**, promoting a culture of safety among our people; and **"Safety by Design"**, designing robust safeguards directly into our technologies.

Creating a safe workplace is just the baseline. We also want our teams to thrive. We provide them with market-leading benefits, pathways to growth, and equitable access to opportunities. In this section, we detail the programs we have put in place to make Tenova a workplace and enterprise that fosters trust.

We also report on how we empower our employees by creating a safe and supportive workplace and develop trust with our customers and other stakeholders through proven, reliable technologies and services.

1. Safety, Well-Being, and Personal Development

1.1. Occupational Health and Safety

Safety is paramount at Tenova. From worksites to production facilities, from technology labs to office headquarters, we make the mental and physical well-being of our people and those they interact with a top priority.

No matter where our facilities are located or which local laws govern them, **we always apply the most stringent international safety regulations** available. Tenova S.p.A.'s Health, Safety, and Environment system is certified to **ISO 45001** standards, the most rigorous global standards for environmental and occupational health and safety. The system covers all workers and processes, including design, manufacturing, and commissioning of equipment, plants, and ancillary machines.

All **new employees of Tenova S.p.A.** are required to complete a **two-hour safety induction course**, as well as additional required trainings depending on their role. We schedule and conduct regular safety training sessions and provide all our people with **Basic Safety Rules** to govern day-to-day activities. We also **distribute a Tenova Project Site Safety Rules booklet** across our company to ensure all our entities are operating at the same high level of standards and to promote safety awareness among all personnel. Employees are empowered to stop work in the case of unsafe

activities and anonymously report safety risks to their representative, their manager, or directly to the Health and Safety team. Reported incidents are investigated, root causes are identified, and corrective action is taken.

Our **training programs** prepare our people to identify, evaluate, mitigate, and – wherever possible – eliminate safety risks. In 2022, at our locations in Italy, we rolled out new rigorous mandatory training for project site personnel. We also continuously analyze error reports, warning flags and near misses, including any incidents that might help us improve Health, Safety, and Environmental Management protocols.

We regularly carry out a **risk assessment of work sites and activities** conducted by internal health and safety team members and external consultants. The assessment includes inspection of work sites and interviews with employees to identify potential hazards or risks associated with each site and work activity. A **company doctor** is on-site at each of our Castellanza and Genoa locations. The doctors organize annual health checks and contribute to our risk assessment. From these various inputs, we identify priority actions points. This process is periodically audited by ISO 19011/45001-accredited auditors.

In 2022, we issued a **new procedure for global project sites** to better manage health and safety issues as they arise. We also made a **significant investment in our machine fleet**, which will result in an overhaul of our whole fleet within the next five years. This investment has helped our Pomini workshop remain at top performance. The key activities related to this overhaul in 2022 included:

- **Replacing machines with highest safety risks**, such as vertical-horizontal lathes and radial drills, with new, safer machines;

- **Replacing outdated machinery**, including milling and boring machines; and

- Purchasing a new milling machine tool and **retiring CNC machine tools**.

44

Safety Day

Since 2015, we have hosted an **annual Safety Day** held every year on **World Day for Safety and Health at Work, April 28th**. Safety represents one of the company's core commitments and permeates every single activity and project, with the aim of safeguarding the health and mental well-being of all employees and other stakeholders collaborating with us. This is why safety is at the heart of Tenova's culture – with the motto **Safety First** – as well as of our technologies – which is called Safety by Design.

To help maintain the rigor of our health and safety standards, we host a permanent **health and safety working group** that meets monthly to assess our illness and injury data, consider new regulations, and recommend changes to management. We also run **regular audits** that measure and review existing safety standards as part of our standard work routine. We report our progress to all stakeholders, reinforcing the company's open work culture, strengthening accountability, and making sure improvements are ongoing.

In 2023, we plan to implement a new procedure and training on health and safety for the management of project sites. We also plan to act on data collected in 2022 of accidents, injuries, and near misses by creating new company-wide safety awareness campaigns.

Work-related injuries

GRI 403-9 Work-related injuries

Employees		
	2021	2022
Number of fatalities as a result of work-related injury	0	0
Number of high-consequence work-related injuries (excluding fatalities)	0	0
Number of recordable work-related injuries[1]	3	4
Number of hours worked	550,992	644,815
Multiplier	1,000,000	1,000,000
Rate of fatalities as a result of work-related injury	0	0
Rate of high-consequence work-related injuries (excluding fatalities)	0	0
Rate of recordable work-related injuries	5.4	6.2

Workers who are not employees but whose work and/or workplace is controlled by the organization[2]		
	2021	2022
Number of fatalities as a result of work-related injury	0	0
Number of high-consequence work-related injuries (excluding fatalities)	0	0
Number of recordable work-related injuries	1	5
Number of hours worked	117,662	585,599
Multiplier	1,000,000	1,000,000
Rate of fatalities as a result of work-related injury	0	0
Rate of high-consequence work-related injuries (excluding fatalities)	0	0
Rate of recordable work-related injuries	8.5	8.5

1 The main types of work-related injuries are related to fall of materials, fall from height, mechanical activities, uneven ground, animal attack, grinding activities. Workers can directly contact their representatives (RLS), Direct Manager or QHSE Dept to report work-related hazards/hazardous situations. The RLS are required to manage the report anonymously. Finally, the supervision body can be contacted as well. The processes used to investigate work-related incidents include incident notification, investigation and corrective actions, according to an internal procedure.

2 This safety data refers to the following workers:
• workshops Tenova workers and subcontractors involved in the production (no maintenance companies)
• temporary sites Tenova workers and subcontractors involved
Workers operating in the offices are not included.

1.2. Talent

1,386 Tenova employees as of December 31, 2022[1]
95% permanent employees
11 average hours of training per employee in 2022

For Tenova to succeed, our talent must have the latest skills in an industry that is constantly evolving. We pride ourselves on providing a **supportive work environment where employees can grow and develop in their careers**. In 2022, we experienced a 14% new employee hires and 8% employee turnover rates, demonstrating employee job satisfaction.

We consider ourselves a **learning company** – we upskill and reskill our employees through on-the-job training, cultural exposure, and education. We support their professional development through numerous **training and upskilling programs** that span all employee levels, including:

INTERNSHIPS

We offer **internship opportunities** to students who are studying towards a BA/MA degree, so they can gain hands-on experience. Moreover, we collaborate with local high schools for **school-work alternation initiatives** in our headquarter's departments, in particular in our Pomini workshop. Interns are able to gain hard and soft skills by interacting with Tenova employees.

T-READY

Launched in 2019, T-Ready is a **talent development program** targeting recent graduates. The two-year program assigns new hires to a global Techint Group office for the first year and Tenova headquarters for the second. They follow an individual development path supported by a dedicated tutor.

HIGH TECH PROGRAM

Our High Tech Program is a **two-year, global internal training program** for a select pool of high-potential, talented young people. The program aims to train the pool in managerial and business skills.

TENOVA CORPORATE ACADEMY

Our **in-house academy** provides specific training around the four pillars that are central to Tenova's needs: **institutional corporate guidelines, technical training, managerial training**, and **linguistic training**. A core focus is on keeping employees up-to-date with the latest trends in innovation, leadership, and business, such as digitization, sustainability, and process innovation.

DEVELOPMENT CENTER

Tenova's Development Center provides employees with access to a **digital platform** where they can take **self-guided courses** to improve business, interpersonal, and leadership skills.

1 Number of employees not including TAKRAF and DELKOR.

We also provide one-on-one support to employees through **peer mentorship**. Our **Leadership Mentorship** program pairs mid-level employees with senior executives to improve their leadership skills and create a pipeline for the leaders of tomorrow. Our **Reverse Mentoring** program pairs a junior and senior employee to bridge the generation gap, foster digital and technical skills, and improve Tenova's internal networks.

In 2022, we updated several of our training path course offerings, including on digital products and services, soft skills for sales, retaining our culture while hybrid working, and global trade and commerce. We also revamped our **Tenova Corporate Academy**, streamlining the programs into the four areas mentioned above as well as expanding the catalog with the Tenova Leadership Lab, an experimental digital space for managers and employees to connect with each other, develop new competencies, reflect on work contexts in which these competencies are actionable and experiment with new situations and ways of operating.

Moreover, we enhanced our **High Tech Program** with a three-day intensive training program. Looking ahead, we plan to continue to formalize training as a part of each employee's Tenova journey by creating individual development plans as part of performance reviews and identifying a core set of learning programs for each employee level, starting at onboarding. In 2022, our employees collectively completed more than 15,000 hours of training.

1.3. Benefits and Well-being

We know that attracting and retaining the right talent includes creating a package of benefits that proves our commitment to creating an equitable and supportive workplace. This begins with a competitive salary. Our **compensation policy** sets common rules for determining salaries and increases to ensure fair treatment of all employees. High-performing employees are additionally rewarded with an annual bonus based on performance.

All full-time employees receive a full suite of **standard benefits**, in line with local standards in their country of residence. Tenova has always been sensitive to employees' benefits and well-being; therefore, Tenova complies with local rules and to follow high well-being standards. Employee well-being extends beyond standard salary and benefits which is why we also offer employees **additional benefits and services** based on regional norms.

For example:

- In **Italy**, we provide employees with access to a campus gym and cafeteria, shuttle transport to our offices, annual influenza vaccinations, and more.

- In **South Africa**, we provide educational support for employees' children, supplemental life insurance, travel insurance, and counseling services, among others.

- In **India**, we subsidize transport to our campuses, provide access to an on-campus cafeteria, and more.

CASE STUDY

Employee Opinion Survey (EOS) 2021

Tenova regularly carries out an **internal feedback survey**, a tradition established by the Techint Group. During our most recent survey in 2021, we checked in with our team members to assess their well-being through our online EOS. Overall, our employee **response rate was 88%**, which increased by 10% compared to the last EOS, indicating a **high level of engagement**.

The EOS included 36 questions, grouped into 30 clusters. The **Purpose** cluster of questions achieved the highest scores, underlining the importance of Tenova's mission to our employees, which also has a high impact on engagement.

According to our employees, Tenova is a company based on **Ethics** where **Diversity** is respected and enhanced, by constantly trying to reduce the gender gap; it is a company where employees are proud of its **Products and Services**.

EOS 2021 KEY NUMBERS

RESPONDENTS

1,133 vs 1,282

RESPONSE RATE

88% VS 80% GLINT BENCHMARK[1]

COMMENTS RATE

57% 1,835 comments by 651 commenters

ENGAGEMENT INDEX

73 eSat[2]

1 Glint is a survey platform that leverages real-time people data to help global organizations increase employee engagement, develop their people, and improve results. Glint defines employee engagement as the degree to which employees invest their cognitive, emotional, and behavioral energies toward positive organizational outcomes.

2 eSat, or Employee Satisfaction Index, is the key indicator to measure employee engagement, and it is detected by the question "How happy are you working at Tenova?".

1.4. Diversity, Inclusion, and Equal Opportunity

We strive to create an environment where **all our employees feel respected and treated fairly**, regardless of gender, religion, origin, nationality, age, sexual orientation, or disability. We adhere to all local and national regulations relating to equal employment opportunities in all jurisdictions where we operate. While we universally hold values related to fairness and equal opportunity, as stated in our **Code of Conduct**, we also tailor our diversity and inclusion programs by country, taking into account specific, regional socio-historic contexts. For example, our South Africa offices have a policy to promote diversity related to the country's history of apartheid. In India, we maintain a committee against sexual harassment to make the workplace safe and welcoming for female employees. We also promote diversity at the recruitment stage of employment to ensure we attract the widest possible array of candidates. Tenova is working to **enhance gender diversity** among our staff as well.

To support our diverse employees and communities, we hold regular **awareness-raising events and campaigns** to educate and engage employees on diversity, inclusion, and equal opportunities. For example:

- On **November 25, 2021**, we held our first campaign in honor of the **International Day for the Elimination of Violence Against Women** to raise awareness about this issue. We invited employees to wear a red garment of clothing as a pledge to fight all forms of abuse and harassment against women. In 2022, the initiative was renewed with the motto

"Stand up, Don't Stand by". All are encouraged to support victims of any form of violence through concrete actions, by following the 5 Ds – Distract, Delegate, Document, Delay, and Direct. The company distributed to employees a 5Ds guide and bookmark to discover what each D stands for.

- In honor of **2022 International Women's Day**, Tenova Advanced Technology held a fundraiser for The Gorgeous Initiative collecting new toiletries and makeup from our employees and other organizations for women's shelters.

- In **2022**, we hosted an online seminar in Italy about violence at the workplace and how to recognize and help victims of violence. It had 267 attendees.

- During **Jewish holidays**, our Tenova Advanced Technology site in Israel supports local non-profits helping children and people with disabilities by purchasing calendars and gifts from them to give to our employees.

Employees (HC) as of 31st December 2022		
by gender	Male	82%
	Female	18%
by region	Africa	4%
	Americas	17%
	China	9%
	Europe & CIS	57%
	Middle, Far East & Oceania	13%
by age range	under 30 years old	10%
	30-50 years old	54%
	over 50 years old	36%

51

2. Safety by Design

2.1. Safe Technology for Clients

Tenova encourages employees at every level to focus on eliminating potential dangers before they emerge. This means **safety starts at the design stage**, leveraging the experience, know-how, and innovative approaches of our experts and engineers to build safety directly into products from the start. This attention to detail has enabled us to build an extensive, multi-decade track record of safe and high-performing products, systems, and facilities.

A tech-forward approach, focused on digital technologies, data gathering, data analysis, and dedicated training, enables us to deliver products with significant safety advantages. We build monitoring features – including robotics, smart sensors, and AI – directly into our products. We collect digital data on facility performance and production errors, and compile digital report cards for maintenance effectiveness and troubleshooting. These innovations provide real-time and predictive analytics to **enable clients to prevent accidents** before they happen and reduce potential harm to their employees. For example:

- Our **iBOF Intelligent ISDSR Slop Detection System** closely monitors vibrations in the BOF route and alerts technicians when the risk of slopping, or an overflow, increases past a given threshold. iSDS® technology **significantly** reduces the number of slopping events through effective prediction of such occurrences and alerting of the furnace operators. Accurate slop

prediction is a critical tool in the BOF operation that provides an additional protective system to increase yield and productivity while reducing operating costs and minimizing fugitive emissions. Preventing slopping **reduces potential harm to workers** from direct contact or slop emissions and reduces product loss.

- Our **Water Detection System (WDS) predicts leaks** with a high degree of accuracy. The WDS monitors leaks and alerts plant operators when higher than normal water conditions are present in the EAF. Tenova's WDS is the only commercially-available system that is capable of continuously analyzing EAF off-gas for both H_2 and H_2O vapor. The real-time EAF process information and NextGen® off-gas hardware include full spectrum analysis of the water conditions in the EAF, which are evaluated for abnormalities compared to standard levels.

- Our **Platinum Group Metals (PGM)** Submerged Arc Furnaces provide more **reliability and safety when processing ferro-alloys** than other furnaces. Because they use electricity as an energy source, our SAFs provide high process efficiency at low energy utilization levels. Furthermore, Tenova has developed a patent that covers the use of graphite with copper cooling to prevent the sulfide corrosion of the copper cooling elements in a furnace sidewall. The use of graphite helps to protect the copper cooler from the corrosion caused by free sulfur

present in the furnace sidewall adjacent to the concentrate feed layer.

- **Pomini Digital Texturing™ (PDT™)** is inherently, by nature, fire risk-free, and fully enclosed, thus **reducing the exposure of workers** to internal processes.

We Act Transparently

Being transparent within our organization and with our stakeholders

At Tenova, we believe in leading by example. We recognize that the leadership position we have earned in the metals industry comes with important responsibilities. We aspire to be a trustworthy partner for our stakeholders and a driver for exemplary behavior within our industry. Therefore, we have chosen to adopt comprehensive, far-reaching internal policies that govern both the behavior of our employees and our relationships with outside stakeholders.

In this section, we report on how we advance transparency in our highest governance bodies and policies, ensuring our employees behave in ethical and principled ways that reflect our company's values.

54

1. Governance and ESG Management

Tenova Group is headed by **Tenova S.p.A.**, based in Italy and led by a five-member **Board of Directors**, including our Chairman and key persons leading relevant disciplines including HR, Finance and Accounting, Business, and Markets bringing a diversified range of experiences. With reference to local Tenova Group companies, Boards of Directors are generally composed of the local business manager, the head of the relevant BU, and the local CFO. Each Board of Directors makes strategic decisions on the organization's direction and considers sustainable development. Alignment of activities with our values and mission are determined by the Boards of Directors and the CEO.

The Tenova S.p.A. Board is supported by two management committees, the **Compliance Committee** and the **Risk Committee**. Additionally, Tenova S.p.A. is supported by the **Supervisory Body (Organismo di Vigilanza)**, in accordance with Italian Legislative Decree n. 231/2001. Management of our ESG issues sits with the Risk Committee.

Sustainability is at the heart of our business and our values. We have created **three management bodies** to benchmark our progress, create goals, monitor progress, and cascade accountability across the organization:

- Our nine-member **Sustainability Steering Committee** devises our overall strategy on sustainability and sets our goals. It determines the right partners to achieve our goals and creates an action plan.

- The Steering Committee is supported by the **Sustainability Project Team** which manages projects created in the action plan, coordinates with relevant partners, monitors progress against KPIs, and keeps projects running on schedule.

- Finally, our **Operative Committee** communicates the strategy, goals, and action plan across the organization and cascades responsibility for projects to the appropriate groups within Tenova.

Progress against our goals and action plan is reported to the Board's Risk Committee by the Sustainability Steering Committee at least twice a year. Ultimately, our **C-level executives** are accountable for progress against our sustainability vision, so we tie their annual compensation incentive to performance on sustainability.

Tenova Board of Directors as of December 31st, 2022[1]

GRI 2-9 Governance structure and composition

Member name	Gender	Executive and non-executive members[2]	Competencies relevant to the impacts of the organization
Andrea Alberto Lovato	M	EXECUTIVE	Business and markets
Federico Metzger	M	EXECUTIVE	Human resources
Roberto Pancaldi	M	EXECUTIVE	Business and markets
Gianfelice Rocca[3]	M	NON-EXECUTIVE	Strategy, business
Michele Zerbi	M	NON-EXECUTIVE	Administration, finance, internal controls

GRI 405-1 Diversity of governance bodies[4]

Tenova Spa Board of Directors	2021		2022	
	Number	Percentage	Number	Percentage
By gender	**5**	**100%**	**5**	**100%**
of which female	–	0%	–	0%
of which male	5	100%	5	100%
By age group	**5**	**100%**	**5**	**100%**
under 30 years old	–	0%	–	0%
30-50 years old	1	20%	1	20%
over 50 years old	4	80%	4	80%

1 All Board of Directors members are not independent and do not belong to under-represented social groups. Furthermore, they all have a tenure of 1 year and represent their main stakeholder of reference, which are the shareholders.

2 The term "Executive" is used according to the definition provided by the "Codice di Autodisciplina delle società quotate"

3 He is a Board Member in 2 listed companies and in various companies of Techint Group or other institutions in the education realm.
4 The reported data refer only to Tenova S.p.A.

2. Compliance and Ethics

The metals industries are closely regulated and Tenova is committed to continuing to comply with all local, regional, and national regulations in the localities in which we operate. In Italy, Tenova S.p.A. adopted an **Organization, Management, and Control Model** in accordance with the requirements of Italian Legislative Decree Number 231/2001 and the criteria established by the main trade associations. The model is defined and tailored based on risks specific to Tenova S.p.A. and updated through periodic risk assessment activities.

All Tenova employees are required to conduct business activities in compliance with Tenova ethics and integrity values, existing guidelines, rules, and internal regulations. Every employee is expected to honor our **Code of Conduct**, including being transparent about conflicts of interest in compliance with **Tenova Transparency Guidelines**, immediately notifying the company (in writing) of potential issues, and acting at all times in a transparent, proper and honest manner in order to best protect the company's interests.

The **Compliance Committee** oversees our internal control system, which is designed to reinforce our existing compliance-oriented corporate culture. The system consists of a set of principles, rules, and procedures designed to guarantee efficient and effective management of all business processes. Our **Compliance Department** supports the definition of the system's processes and controls, while our **Internal Audit Department** provides independent, objective analysis designed to monitor system effectiveness.

As part of our ongoing commitment to fair and transparent business practices, in 2017 we joined the **Metals Technology Initiative (MTI)**. Hosted by the **Basel Institute on Governance**, MTI provides a forum for members to develop anti-corruption compliance practices and safeguard fair competition in the metals industry. MTI members pledge to prohibit bribery, maintain robust internal control systems, compete fairly in the market, address key ethics risks in the industry, and share best practices.

57

Code of Conduct

Our **Code of Conduct** outlines our expectations for employee behavior, guaranteeing ethical and responsible conduct company-wide. This includes appropriate interactions with clients, suppliers, and third parties in general, as well as rules against any type of discrimination, and more. **All employees are required to accept our Code of Conduct** at the end of the recruitment and hiring process, as well as periodically during campaigns aimed at reinforcing the awareness of the Code and its principles. Our **Tenova Anti-Bribery Policy** outlines values, principles, and responsibilities that we adopt to fight corruption. We additionally comply with the OECD Anti-Bribery Convention, the UN Convention Against Corruption,

the U.S. Foreign Corrupt Practices Act, the U.K. 2010 Bribery Act and Italian Legislative Decree 231/2001. According to **Tenova Transparency Guidelines**, employees and Board Members are also required to declare any conflicts of interest whenever they occur during their tenure. We have set a goal for 100% of employees to complete a conflict-of-interest declaration. In 2019 and 2020, we ensured that 99% of existing employees had completed one. Thereafter, new hires are required to complete one when they are onboarded. As it is a continuous process, we estimate 95% or more of our employees have completed the declaration to date.

We also have a **whistleblowing procedure** open to all Tenova personnel and external parties. Reports can address issues of conduct relating to entities, employees, and external collaborators with which the company operates or maintains business relations. Whistleblowers can email our Audit or Compliance Departments directly, or through internal or regular mail. The confidentiality and data protection rights of whistleblowers are guaranteed and good faith whistle-blowers are protected from retaliation. Information on how stakeholders can make a report are available on **Tenova's website** and through our intranet site.

Data Privacy and Security

Protecting the data of our employees, customers, and partners, and securing our infrastructure from cyberattacks is a top priority for Tenova. We adhere to the highest standards of **data privacy and security** in the countries where we operate, including GDPR.

Cybersecurity

We have several policies aimed at **mitigating cyber risk**, including a mobile device management policy, access control policy, and security incident procedure. We have a **Cybersecurity Roadmap** that outlines key safeguards we maintain and identifies potential threats as they arise. Risks we monitored closely in 2022 included data loss prevention, security

information, and event management. We utilize tools such as AI and machine learning to help us continuously monitor for and identify potential security risks. In 2021 and 2022, no substantiated complaints concerning breaches of customer privacy and losses of customer data occurred at Tenova companies included within this report's scope.

58

3. Our Supply Chain

Tenova is a global company with a **global supply chain**. We operate and purchase inputs from around the world, respecting all legal regulations related to procurement in the countries we operate in and purchase from. We expect our supply chain partners to also adhere to all relevant regulations. We approach sourcing from two angles: **strategic sourcing** and **supply chain risk management**. Strategic sourcing prioritizes moving procurement closer to customers and creating longer term contracts for critical components that we purchase in high volumes. Supply chain risk management prioritizes diversifying supplies of key components, enhancing due diligence of existing suppliers, and taking more direct action related to transport and expediting. To address these risks, we prioritize suppliers that have achieved ISO certification which has strict rules related to health, safety, environmental compliance, and more.

In 2022, a **questionnaire to screen suppliers** was developed, covering the main environment, social, and governance areas. The questionnaire was provided to a sample of suppliers representing 36% of purchased volume and representatives of all major procurement legal entities or areas — Italy, Germany, the U.S., India, China, and South Africa. This step was the first in our new **Sustainable Supply Chain Roadmap to 2025**. The ambition of the roadmap is for Tenova to annually determine **actionable steps to enhance our supply chain with best practices** regarding environmental, social and governance criteria.

Tenova Sustainable Supply Chain Roadmap to 2025

2022	2023	2024	2025

ACTIVITIES

2022	2023	2024	2025
• Analysis of current Tenova Supply Chain (SC) versus ESG criteria • Fine-tuning of **SC Roadmap** • Design of **Supplier Questionnaire** • Tests with shortlisted suppliers to be ESG rated	• Publishing of Tenova **Sustainable SC Program** • **Distribution of SC ESG Awareness Handout** • Training to shortlisted suppliers • Performance Monitoring system • Increase of rated suppliers • Audit of shortlisted suppliers • Integration of **Supplier Portal (Qualification Module)**	• Tests on selected bids • Procedure for bid awarding also based on ESG Rating • Integration of **Supplier Portal (Bid Module)** • Increase of rated, audited, and trained suppliers • Data and Trend Analysis	• Awarding of bids weighting ESG Rating

RESULTS

2022	2023	2024	2025
• ESG Principles and Rating Definition	• Comprehensive portfolio of rated suppliers • First Publishing of Sustainable Supply Chain Program	• Non-Financial Reporting (NFR) readiness	• Tenova Sustainable Supply Chain fully operational

59

4. Human Rights

Tenova pays particular attention to **respecting the culture of the people we work with**, both internally and externally. Our final goal is to create a working environment where equal opportunities, personal development, and equal pay are offered regardless of location. We prohibit discrimination based on gender, religion, origin, nationality, age, sexual orientation, or disability. We also adhere to all human rights laws in the countries in which we operate.

Tenova allows collective bargaining and supports **workers' right to freedom of association**. For our unionized employees, we abide by rules set by the national collective labor agreements in the countries in which we operate, such as the defined notice period. We also condemn child and forced labor and avoid working with suppliers that do not strictly prohibit the use of child or forced labor.

Appendix

1. Material topic definitions

ENVIRONMENTAL TOPICS	
Energy Transition	Developing technologies that ultimately facilitate the low-carbon transition in the steel sector. For example, by developing technologies that run on clean energy, by designing technologies that can work now on currently available energy and will also be compatible with more sustainable energy sources in the future.
Energy Efficiency Technologies	Developing technologies that reduce energy consumption in processes, by maximizing energy efficiency and/or recovery, compared to other existing technologies.
Environmental Impact of Products and Services	Promoting technologies that have the lowest possible environmental impact.
Circular Economy	Proposing technologies that ultimately promote circularity, that enable the recovery of residues and to produce new secondary raw materials.
Climate Impact of Tenova's Operations	Assessing, managing, and reducing the overall impact of Tenova's own operations (Scope 1 and Scope 2) on climate change - calculate GHG emissions, diminish electricity consumption, maximize energy efficiency, rely on green energy, etc.
Waste Disposal and Recycling	Measuring and managing waste, handling waste responsibly, acknowledging and making efforts to minimize waste. Includes assessment of all recycling opportunities and actions to implement recycling everywhere possible.

SOCIAL TOPICS	
Health & Safety	Ensuring a healthy and safe workplace for all employees and for those who may be affected by the company's activities. Includes incidents' tracking systems, training, identification of risks rates of injury, health and safety education and processes. Improvement of health and safety as a company value.
Product Safety & Quality	Developing and offering technologies that are ultimately safe to operate and follow the highest possible quality standards.
Employee Well-Being	Ensuring a good working environment for Tenova's employees, including a comfortable workplace and a supportive company culture. Well-being relates to all aspects of working life.
Talent Attraction, Retention & Fostering Job Expertise	Attracting new talent, retain existing employees, and encourage the development of expertise. This can be achieved by a stimulating working environment, fair compensation, sufficient benefits etc.
Employee Benefits & Compensation	Ensuring fair and equitable treatment to all employees in terms of benefits such as health insurance, retirement provisions, and guaranteeing access to innovative ways of working when possible. Includes fair compensation.
Employee Training & Development	Offering programs for developing employee skills and assisting with employee transitions. Ensuring that employees receive regular performance and career development reviews.
Human Rights	Ensuring that human rights are respected in our own operations and throughout the whole value chain. Taking corrective actions where signs of non-compliance are discovered.
Diversity, inclusion, & Equal opportunity	Cultivating and supporting a diverse, inclusive, and equitable company culture that fosters gender equality. Includes employee diversity, non-discrimination, equity in career opportunities, compensation, and social inclusion efforts.

GOVERNANCE AND BUSINESS RESILIENCE TOPICS

Business Ethics, Anti-Corruption & Compliance
Operating business in an ethical way, in Tenova's own operations but also in relation with its partners and suppliers. Includes Tenova's compliance with environmental financial and social norms and regulations.

Sustainable Innovation and R&D
Integrate sustainability in the innovation and R&D strategies and define specific KPIs to quantify the efforts to foster sustainable innovation.

Digital Transformation of Processes
Develop and nurture employees' digital mind-set, foster digital transformation processes within the company and implement digital technologies and processes to optimize production and reduce health and safety risks.

Transparency & Reporting
Applying the best standards of transparency and accuracy in reporting activities. Foster a transparent company culture.

Responsible Procurement
Applying responsible procurement practices. Proceed to a sustainability screening of suppliers, looking at both environmental and social performance. Taking corrective actions in response to negative social or environmental impacts in our supply chain.

C-level Accountability of ESG Issues
Taking accountability at C-level (first-line management) for the integration of the sustainability strategy. Having members of the top management that are competent in sustainability. Linking their remuneration to the achievement of sustainability objectives.

Sustainable Behavior Promotion
Promoting sustainability and sustainable habits/practices to employees. Part of compensation is linked to the sustainability performance of employees.

Advocate for Sustainability
Driving sustainable change on the demand side and raise and influence partners and clients' awareness and habits in terms of sustainability.

2. Stakeholder engagement

A constant and solid relationship with all our stakeholders is fundamental for us and for the creation of shared value. For this reason, we dialogue and collaborate with our stakeholders through several engagement activities. The following table shows a map of our engagement activities carried out in 2022.

OUR STAKEHOLDER ENGAGEMENT ACTIVITIES IN 2022			
Stakeholder	**Type of engagement**	**Stakeholder**	**Type of engagement**
Employees	Internal Audit, for review of processes and procedures	**Suppliers**	Daily business interactions
	Employee Opinion Survey (EOS)		Co-operation to develop and improve the main technological equipment for digital texturing
	"Take a Stand against Violence" Campaign		Involved in the Materiality Assessment
	Onboarding programs for new hires		Involved in the Supplier Questionnaire
	Career paths: Job Fairs, Online webinars, Assessments		Code of Conduct
	Company intranet		Compliance due diligence on specific categories of suppliers
	Training sessions and digital seminar (Compliance, Circular Economy, etc.)		Seasonal and annual training
	Regular Town Hall Meetings to communicate on company performance, general issues and an opportunity for a Q&A session.		
	Well-being partnership (Humanitas Mater Domini Hospital) and initiatives for Tenova's employees' families (i.e. Scholarships for Tenova employees' children (Italy), Christmas presents for employee children under age 12 (Italy)		

Stakeholder	Type of engagement	Stakeholder	Type of engagement
Customers	Continuous collaboration, feedback and cooperation	**Partner**	Ad-hoc meetings
	Customer surveys		Identification and development of joint projects
	Code of Conduct		Participation in working groups
	Client service		Project collaboration
	Seasonal and annual training		Employee well-being and development partnerships
Industry Association	Active participation in roundtables discussion		Papers and publication
	Exchange best practices	**NGOs**	Open dialogue and specific initiatives with local relevant stakeholders
	Annual meetings	**Academia**	Training programs
	WEB conferences		Osservatorio PoliMi and Scuola Superiore Sant'Anna Collaboration
	Co-develop training/learning programs		Job Fairs Webinars
	Definition of initiatives or projects in collaboration		Lectures
Investors & Banks	Questionnaires on sustainability performance (Materiality Assessment)		Innovation events
	Review main economic and financial KPI linked to outstanding loans or to the opening of new credit lines		Company presentation at Universities and High schools
			Trainee opportunities
Community / Regulatory	Open dialogue		
	Institutional meetings		
	Participation in projects of public utility		

3. Our Sustainability Performance

WE TRANSFORM BUSINESS

GRI 306-3 Waste generated

	Unit of measure	2021	2022
Hazardous waste	tons	89.4	62.5
120109* - Emulsions and solutions for machinery, halogen-free (D15)	tons	60.2	35.3
120301* - Aqueous washing solutions (D15)	tons	19.8	12.3
120107* - Mineral oils for machines, halogen-free (R13)	tons	5.9	6.7
120118* - Metal muds (grinding, sharpening and lapping muds) containing oils (D15)	tons	3.1	7.9
180103* - Waste that must be collected and disposed of by applying special precautions to avoid infections (D15)	tons	0.2	0.0
080111* - Waste paints and varnishes, containing organic solvents or other dangerous substances	tons	0.0	0.2
200121* - Fluorescent tubes and other waste containing mercury (R13)	tons	0.2	0.1
Non-hazardous waste	tons	448.8	179.2
170405 - Iron and steel (R13)	tons	304.1	25.8
150103 - Wooden packaging (R13)	tons	38.3	41.2
120101 - filings and shavings of ferrous materials (R13)	tons	34.9	63.1
200304 - Sludge from septic tanks (D08)	tons	34.2	0.0
150106 - Packaging in mixed materials (R13)	tons	26.5	37.4
150101 - Paper and cardboard packaging (R13)	tons	7.2	10.8
150203 - Absorbents, filter materials, wiping cloths and protective clothing, other than those mentioned in heading 150202 (R13)	tons	2.6	0.2
170411 - Cables, other than those mentioned in item 170410 (R13)	tons	0.4	0.0
120121 - Spent tool bodies and grinding materials, other than those mentioned in item 120120 (R13)	tons	0.3	0.0
160214 - Disused equipment, other than those referred to in items from 160209 to 160213	tons	0.2	0.1
200307 - Bulky waste	tons	0.0	0.2
160604 - Alkaline batteries (except 160603)	tons	0.1	0.0
Total weight of waste generated	tons	538.2	241.7

66

Source of conversions and emission factors used

Conversion factors	UK Government GHG Conversion Factors for Company Reporting (DEFRA), Conversion Factors 2022
Emission factors – Scope 1	Ecoinvent attributional, version 3.6
Emission factors – Scope 2 Location based	ISPRA, Italian National Inventory Report 2022
Emission factors – Scope 2 Market based	Association of Issuing Bodies (AIB), European Residual Mixes 2021

WE BUILD TRUST

Employee composition[1]

GRI 2-7 Employees

Employees (HC) by employment contract and by gender	As of 31st December 2021	As of 31st December 2022
Total number of employees	**1,312**	**1,386**
of which female	248	253
of which male	1,064	1,133
Total number of permanent employees	**1,243**	**1,324**
of which female	235	239
of which male	1,008	1,085
Total number of temporary employees	**69**	**62**
of which female	13	14
of which male	56	48
Total number of full-time employees	**1,294**	**1,365**
of which female	235	240
of which male	1,059	1,125
Total number of part-time employees	**18**	**21**
of which female	13	13
of which male	5	8
Employees (HC) by employment contract and by region	**As of 31st December 2021**	**As of 31st December 2022**
Total number of employees	**1,312**	**1,386**
Africa	52	57

[1] Non-guarantee employee hours are not tracked in Tenova as of today. Part-time and full-time employees are tracked only in Tenova S.p.A. (Italian perimeter).

Employees (HC) by employment contract and by region	As of 31st December 2021	As of 31st December 2022
Americas	213	238
China	116	121
Europe & CIS	765	790
Middle, Far East & Oceania	166	180
Total number of permanent employees	**1,243**	**1,324**
Africa	49	57
Americas	196	237
China	86	85
Europe & CIS	747	766
Middle, Far East & Oceania	165	179
Total number of temporary employees	**69**	**62**
Africa	3	–
Americas	17	1
China	30	36
Europe & CIS	18	24
Middle, Far East & Oceania	1	1
Total number of full-time employees	**1,294**	**1,365**
Africa	52	57
Americas	213	238
China	116	121
Europe & CIS	747	769
Middle, Far East & Oceania	166	180
Total number of part-time employees	**18**	**21**
Africa	–	–
Americas	–	–
China	–	–
Europe & CIS	18	21
Middle, Far East & Oceania	–	–

Diversity and Equal Opportunity

GRI 405-1 Diversity of governance bodies and employees

Employees (HC) by employee category and gender	As of 31st December 2021		As of 31st December 2022	
	Number	Percentage	Number	Percentage
Executives	**16**	**100%**	**17**	**100%**
of which female	1	6%	1	6%
of which male	15	94%	16	94%
Managers	**121**	**100%**	**122**	**100%**
of which female	13	11%	12	10%
of which male	108	89%	110	90%
Middle managers	**222**	**100%**	**221**	**100%**
of which female	25	11%	25	11%
of which male	197	89%	196	89%
White collars	**843**	**100%**	**920**	**100%**
of which female	209	25%	215	23%
of which male	634	75%	705	77%
Blue collars	**110**	**100%**	**106**	**100%**
of which female	–	0%	–	0%
of which male	110	100%	106	100%

Employees (HC) by employee category and age range	As of 31st December 2021		As of 31st December 2022	
	Number	Percentage	Number	Percentage
Executives	**16**	**100%**	**17**	**100%**
under 30 years old	6	38%	–	0%
30-50 years old	10	63%	4	24%
over 50 years old	–	0%	13	76%
Managers	121	100%	122	100%
under 30 years old	–	0%	–	0%
30-50 years old	41	34%	46	38%
over 50 years old	80	66%	76	62%
Middle managers	222	100%	221	100%
under 30 years old	–	0%	–	0%
30-50 years old	123	55%	116	52%
over 50 years old	99	45%	105	48%
White collars	843	100%	920	100%
under 30 years old	74	9%	120	13%
30-50 years old	495	59%	523	57%
over 50 years old	274	33%	277	30%
Blue collars	110	100%	106	100%
under 30 years old	16	15%	16	15%
30-50 years old	54	49%	56	53%
over 50 years old	40	36%	34	32%

Total number of employees by age range	As of 31st December 2021		As of 31st December 2022	
	Number	Percentage	Number	Percentage
	1,312	100%	1,386	100%
under 30 years old	96	7%	136	10%
30-50 years old	723	55%	745	54%
over 50 years old	493	38%	505	36%

New employee hires[1]

GRI 401-1 New employee hires and employee turnover

Employees (HC) by employee category and age range	2021		2022	
	Number	Rate	Number	Rate
By gender	**117**	**9%**	**188**	**14%**
of which female	25	10%	28	11%
of which male	92	9%	160	14%
By age group	**117**	**9%**	**188**	**14%**
under 30 years old	37	39%	78	57%
30-50 years old	54	8%	92	12%
over 50 years old	26	6%	18	4%
By region	**117**	**9%**	**188**	**14%**
Africa	1	2%	12	21%
Americas	64	30%	50	21%
China	9	8%	9	7%
Europe & CIS	35	5%	91	12%
Middle, Far East & Oceania	8	5%	26	14%

1 The German Legal entity, called LOI Thermprocess, during 2020 and 2022, faced an increase of consensual termination due to internal renovation, the majority related to a pre-retirement procedure. In 2021, the important number of hiring in Mexico was related to changes in government regulations on how to manage contractors. New employee hires and turnover figures do not account for intracompany mobility.

Turnover

GRI 401-1 New employee hires and employee turnover

	2021		2022	
	Number	**Rate**	**Number**	**Rate**
By gender	**127**	**10%**	**114**	**8%**
of which female	24	10%	23	9%
of which male	103	10%	91	8%
By age group	**127**	**10%**	**114**	**8%**
under 30 years old	13	14%	16	12%
30-50 years old	54	8%	45	6%
over 50 years old	60	13%	53	10%
By region	**127**	**10%**	**114**	**8%**
Africa	2	4%	6	11%
Americas	39	18%	29	12%
China	10	9%	6	5%
Europe & CIS	66	9%	63	8%
Middle, Far East & Oceania	10	6%	10	6%

Training and Education

GRI 404-1 Average hours of training per year per employee

Training hours provided to employees, by gender and employee category	2021		2022	
	Total hours	**Average hours**	**Total hours**	**Average hours**
Executives	**325**	**20**	**355**	**21**
of which female	17	17	66	66
of which male	308	21	289	18
Managers	**779**	**6**	**1,278**	**10**
of which female	34	3	56	5
of which male	745	7	1,222	11
Middle managers	1,941	9	2,491	11

Training hours provided to employees, by gender and employee category	2021		2022	
	Total hours	**Average hours**	**Total hours**	**Average hours**
of which female	183	7	226	9
of which male	1,758	9	2,265	12
White collars	**6,493**	**8**	**9,637**	**10**
of which female	1,706	8	1,808	8
of which male	4,787	8	7,829	11
Blue collars	**2,342**	**21**	**901**	**9**
of which female	–	0	–	–
of which male	2,342	21	901	9

GRI 404-3 Percentage of employees receiving regular performance and career development reviews

Employees who received a regular performance and career development review, by gender and employee category	2021		2022	
	Number	**Percentage**	**Number**	**Percentage**
Executives	**16**	**100%**	**16**	**94%**
of which female	1	100%	1	100%
of which male	15	100%	15	94%
Managers	**111**	**92%**	**112**	**92%**
of which female	13	100%	12	100%
of which male	98	91%	100	91%
Middle managers	**197**	**89%**	**198**	**90%**
of which female	24	96%	23	92%
of which male	173	88%	175	89%
White collars	**599**	**71%**	**646**	**70%**
of which female	152	73%	166	77%
of which male	447	71%	480	68%
Blue collars	**63**	**57%**	**69**	**65%**
of which female	–	0%	–	0%
of which male	63	57%	69	65%

Collective bargaining agreements[1]

GRI 2-30 Collective bargaining agreements

	As of 31st December 2021	As of 31st December 2022
Percentage of total employees covered by collective bargaining agreements	**47%**	**46%**
Number of employees covered by collective bargaining agreements	623	635
Total number of employees	**1,312**	**1,386**

1 Collective bargaining agreements are in place only in Italy (CCNL Metalmeccanico) and in Germany (Work Council). For employees not covered by collective bargaining agreements, Tenova determines their working conditions and terms of employment following local labor laws.

WE ACT TRANSPARENTLY

GRI 205-2 Communication and training about anti-corruption policies and procedures[2]

Governance body members (Board of Directors) that the organization's anti-corruption policies and procedures have been communicated to	2021	2022
Number of governance body members that the organization's anticorruption policies and procedures have been communicated to	**5**	**5**
Number of governance body members	5	5
Percentage of governance body members that the organization's anticorruption policies and procedures have been communicated to	100%	100%

2 Activities managed or sponsored by HQ are included; local initiatives shared only where deemed necessary or appropriate by subsidiaries.

Governance body members (Board of Directors) that have received training on anti-corruption	2021	2022
Number of governance body members that have received training on anti-corruption	**1**	**1**
Total number of governance body members	5	5
Percentage of governance body members that have received training on anti-corruption	20%	20%

Employees that the organization's anti-corruption policies and procedures have been communicated to:

		2021						2022					
		Total	Africa	Americas	China	Europe & CIS	Middle, Far East & Oceania	Total	Africa	Americas	China	Europe & CIS	Middle, Far East & Oceania
Number of	Executives	16	1	2	0	13	0	17	1	2	1	13	0
Percentage of		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Number of	Managers	121	7	20	3	63	28	122	8	19	2	66	27
Percentage of		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Number of	Middle managers	207	8	20	10	159	25	221	7	24	10	157	23
Percentage of		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Number of	White collars	843	36	157	101	440	109	920	41	178	104	470	127
Percentage of		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Number of	Blue collars	110	0	15	0	92	3	106	0	14	0	89	3
Percentage of		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Number of	Employees	1312	52	214	114	767	165	13861	57	237	117	795	180
Percentage of		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Employees that have received training on anticorruption:

		2021						2022					
		Total	Africa	Americas	China	Europe & CIS	Middle, Far East & Oceania	Total	Africa	Americas	China	Europe & CIS	Middle, Far East & Oceania
Number of	Executives	3	0	2	0	1	0	4	1	2	0	1	0
Percentage of		19%	0%	100%	0%	8%	0%	24%	100%	100%	0%	8%	0%
Number of	Managers	19%	0	9	1	3	6	15	2	5	0	5	3
Percentage of		16%	0%	45%	33%	5%	21%	12%	25%	26%	0%	8%	11%
Number of	Middle managers	0	0	0	0	0	0	5	1	2	0	1	1
Percentage of		0%	0%	0%	0%	0%	0%	2%	14%	8%	0%	1%	4%
Number of	White collars	15	0	3	0	4	8	3	0	2	0	1	0
Percentage of		2%	0%	2%	0%	1%	7%	0%	0%	1%	0%	0%	0%
Number of	Blue collars	0	0	0	0	0	0	0	0	0	0	0	0
Percentage of		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Number of	Employees	37	0	14	1	8	14	27	4	11	0	8	4
Percentage of		3%	0%	7%	1%	1%	8%	2%	7%	5%	0%	1%	2%

GRI 308-1 New suppliers that were screened using environmental criteria
GRI 414-1 New suppliers that were screened using social criteria

New suppliers that were screened using environmental and social criteria	2021	2022
Number of new suppliers that were screened using environmental and social criteria	0	120
Number of new suppliers	3,032	2,861
% of new suppliers that were screened using environmental and social criteria	0%	4%

Purchasing volumes from supplier screened using environmental and social criteria	2021	2022
Purchasing volumes from supplier screened using environmental and social criteria [in Euros]	0	139,000,000
Purchasing volumes [in Euros]	272,000,000	270,000,000
Percentage of purchasing volumes from supplier screened using environmental and social criteria	0%	51%

4. GRI Content Index

Tenova S.p.A. and its fully consolidated subsidiaries operating within the framework of the Tenova metals business has reported the information cited in this GRI content index for the period 1st January 2022 - 31st December 2022 with reference to the GRI Standards.
The scope of this report does not include TAKRAF and DELKOR companies operating in the mining business. For more detailed information please refer to the "About this Report".

GRI STANDARDS	DISCLOSURE	LOCATION
General disclosures		
GRI 2: General Disclosures 2021	2-1 Organizational details	Pag. 5; 11
	2-2 Entities included in the organization's sustainability reporting	Pag. 5 The fully consolidated subsidiaries operating within the framework of the Tenova metals business, as of 31st December 2022, are the following: Tenova S.p.A., Tenova Industrial Technologies (Beijing) Co. Ltd., Tenova Goodfellow Inc., Hyl Services, S.A. de CV, Hyl Technologies, SA de CV, Loi - Poland Spolka Z.O.O., Tenova Technologies (Tianjin) Co. Ltd., Tenova East Europe L.L.C., MVC (Metallurgical V.C.) S.A., Tenova Inc., Core Furnace Canada Ltd., Tenova Advanced Technologies Ltd, Tenova South Africa Pty Ltd, Tenova Technologies Pvt Ltd., Loi Thermprocess Gmbh, CFS Holding Corp.
	2-3 Reporting period, frequency and contact point	Pag. 5
	2-4 Restatements of information	This document is the first Sustainability Report published by Tenova S.p.A.
	2-5 External assurance	This Sustainability Report has not been externally assured.
	2-6 Activities, value chain and other business relationships	Pag. 7-11; 59
	2-7 Employees	Pag. 47; 51; 67-68
	2-9 Governance structure and composition	Pag. 55-56
	2-13 Delegation of responsibility for managing impacts	Pag. 55
	2-22 Statement on sustainable development strategy	Pag. 3
	2-27 Compliance with laws and regulations	During 2021 and 2022 there were no significant instances of non-compliance with laws and regulation nor related fines.[1]
	2-28 Membership associations	Pag. 16
	2-29 Approach to stakeholder engagement	Pag. 16; 64-65
	2-30 Collective bargaining agreements	Pag. 60; 74

[1] Data are referred to the areas of responsibility of Tenova Compliance Committee (as defined in Tenova Compliance Committee Regulation) and the Compliance Department and, in some cases, are limited to Tenova S.p.A.

Material topics		
GRI 3: Material Topics 2021	3-1 Process to determine material topics	Pag. 13; 16
	3-2 List of material topics	Pag. 13; 62-63
Climate Impact of Tenova's Operations		
GRI 3: Material Topics 2021	3-3 Management of material topics	Pag. 14-15; 34-35; 38-39; 42 The information reported is compliant with disclosure 3-3 from GRI 3: Material Topics 2021, except for requirement f.
GRI 302: Energy 2016	302-1 Energy consumption within the organization	Pag. 36
GRI 305: Emissions 2016	305-1 Direct (Scope 1) GHG emissions	Pag. 37
	305-2 Energy indirect (Scope 2) GHG emissions	Pag. 37
	305-7 Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	Pag. 37
GRI 303: Water and Effluents 2018	303-1 Interactions with water as a shared resource	Pag. 42
	303-3 Water withdrawal	Pag. 42
	303-4 Water discharge	Pag. 42
	303-5 Water consumption	Pag. 42
Waste Disposal and Recycling		
GRI 3: Material Topics 2021	3-3 Management of material topics	Pag. 14-15; 39 The information reported is compliant with disclosure 3-3 from GRI 3: Material Topics 2021, except for requirement f.
GRI 306: Waste 2020	306-1 Waste generation and significant waste-related impacts	Pag. 39
	306-2 Management of significant waste-related impacts	Pag. 39
	306-3 Waste generated	Pag. 40; 66-67
	306-4 Waste diverted from disposal	Pag. 40
	306-5 Waste directed to disposal	Pag. 40
Health & Safety		
GRI 3: Material Topics 2021	3-3 Management of material topics	Pag. 14-15; 43-45
GRI 403: Occupational Health and Safety 2018	403-1 Occupational health and safety management system	Pag. 44
	403-2 Hazard identification, risk assessment, and incident investigation	Pag. 44
	403-3 Occupational health services	Pag. 44-45
	403-4 Worker participation, consultation, and communication on occupational health and safety	Pag. 44-45 A formal joint management-worker health and safety committee is not present.
	403-5 Worker training on occupational health and safety	Pag. 44-45
	403-9 Work-related injuries	Pag. 46

Product Safety & Quality

GRI 3: Material Topics 2021	3-3 Management of material topics	Pag. 14-15; 52-53 The information reported is compliant with disclosure 3-3 from GRI 3: Material Topics 2021, except for requirements e and f.
GRI 416: Customer Health and Safety 2016	416-2 Incidents of non-compliance concerning the health and safety impacts of products and services	Pag. 52-53 During 2021 and 2022 there were no incidents of non-compliance with regulations and/or voluntary codes concerning the health and safety impacts of products and services. [1]

Employees Well-Being

GRI 3: Material Topics 2021	3-3 Management of material topics	Pag. 14-15; 49-50 The information reported is compliant with disclosure 3-3 from GRI 3: Material Topics 2021, except for requirements e and f.

Talent Attraction, Retention & Fostering Job Expertise

GRI 3: Material Topics 2021	3-3 Management of material topics	Pag. 14-15; 47-48 The information reported is compliant with disclosure 3-3 from GRI 3: Material Topics 2021, except for requirements b and f.
GRI 401: Employment 2016	401-1 New employee hires and employee turnover	Pag. 71-72
GRI 404: Training and Education 2016	404-3 Percentage of employees receiving regular performance and career development reviews	Pag. 73

Employee Benefits & Compensation

GRI 3: Material Topics 2021	3-3 Management of material topics	Pag. 14-15; 49 The information reported is compliant with requirements a, c, d of disclosure 3-3 from GRI 3: Material Topics 2021.

Employee Training & Development

GRI 3: Material Topics 2021	3-3 Management of material topics	Pag. 14-15; 47-48 The information reported is compliant with disclosure 3-3 from GRI 3: Material Topics 2021, except for requirements b and f.
GRI 401: Employment 2016	404-1 Average hours of training per year per employee	Pag. 72-73

Human Rights

GRI 3: Material Topics 2021	3-3 Management of material topics	Pag. 14; 15 - 60 The information reported is compliant with requirements a, c of disclosure 3-3 from GRI 3: Material Topics 2021.
GRI 406: Non-discrimination 2016	406-1 Incidents of discrimination and corrective actions taken	Pag. 60 In 2021 and 2022, there were no substantiated incidents of discrimination. In Canada, an accusation of discrimination and harassment was reported by a female employee after her resignation in February 2022. Tenova's local human resources department investigated the allegation but ultimately was not able to substantiate the claim and closed the investigation.

Diversity, Inclusion and Equal Opportunity		
GRI 3: Material Topics 2021	3-3 Management of material topics	Pag. 14-15; 51 The information reported is compliant with requirements a, c, d of disclosure 3-3 from GRI 3: Material Topics 2021.
GRI 405: Diversity and Equal Opportunity 2016	405-1 Diversity of governance bodies and employees	Pag. 51; 56; 69-71
Business Ethics, Anti Corruption & Compliance		
GRI 3: Material Topics 2021	3-3 Management of material topics	Pag. 14-15; 57 The information reported is compliant with disclosure 3-3 from GRI 3: Material Topics 2021, except for requirement f.
GRI 205: Anti-corruption 2016	205-2 Communication and training about anti-corruption policies and procedures	Pag. 74-76 The information reported is compliant with requirements a, b, d, e of disclosure 205-2 from GRI 205: Anti-corruption 2021.
	205-3 Confirmed incidents of corruption and actions taken	Pag. 57-58 During 2021 and 2022 there were no confirmed incidents of corruption.[1]
GRI 206: Anti-competitive Behavior 2016	206-1 Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	Pag. 57-58 During 2021 and 2022 there were no legal actions pending or completed regarding anti-competitive behavior and violations of anti-trust and monopoly legislation in which the organization has been identified as a participant.[1]
GRI 418: Customer Privacy 2016	418-1 Substantiated complaints concerning breaches of customer privacy and losses of customer data	Pag. 58 During 2021 and 2022 there were no substantiated complaints received concerning breaches of customer privacy nor identified leaks, thefts, or losses of customer data.[1]
Sustainable Innovation and R&D		
GRI 3: Material Topics 2021	3-3 Management of material topics	Pag. 14-15; 28-31
Digital Transformation of Processes		
GRI 3: Material Topics 2021	3-3 Management of material topics	Pag. 14-15; 32-33 The information reported is compliant with requirements a, c, d of disclosure 3-3 from GRI 3: Material Topics 2021.
Transparency & Reporting		
GRI 3: Material Topics 2021	3-3 Management of material topics	Pag. 14-15; 54-55; 57 The information reported is compliant with disclosure 3-3 from GRI 3: Material Topics 2021, except for requirements e and f.

1 Corporate Legal Dept. receives information flows about incidents/claims only when specific conditions are met. Incidents that do not fall under the indicated conditions are managed directly by the involved legal entity or function/department and, in any case according to the power of attorneys and the relevant approval and information flows.

Responsible Procurement		
GRI 3: Material Topics 2021	3-3 Management of material topics	Pag. 14-15; 59-60 The information reported is compliant with disclosure 3-3 from GRI 3: Material Topics 2021, except for requirements b and e.
GRI 308: Supplier Environmental Assessment 2016	308-1 New suppliers that were screened using environmental criteria	Pag. 77
GRI 414: Supplier Social Assessment 2016	414-1 New suppliers that were screened using social criteria	Pag. 77
C-level Accountability of ESG Issues		
GRI 3: Material Topics 2021	3-3 Management of material topics	Pag. 14-15; 18-22 The information reported is compliant with requirements a, c, d of disclosure 3-3 from GRI 3: Material Topics 2021.
Energy transition		
GRI 3: Material Topics 2021	3-3 Management of material topics	Pag. 14-15; 18-22
Energy efficiency technologies		
GRI 3: Material Topics 2021	3-3 Management of material topics	Pag. 14-15; 23-24 The information reported is compliant with disclosure 3-3 from GRI 3: Material Topics 2021, except for requirement f.
Environmental Impact of Products and Services		
GRI 3: Material Topics 2021	3-3 Management of material topics	Pag. 14-15; 17; 27 The information reported is compliant with requirements a, c, d of disclosure 3-3 from GRI 3: Material Topics 2021.
Circular economy		
GRI 3: Material Topics 2021	3-3 Management of material topics	Pag. 14-15; 25-26 The information reported is compliant with disclosure 3-3 from GRI 3: Material Topics 2021, except for requirement b and f.

2022

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