SUSTAINABILITY REPORT 2020

ACCIAI SPECIALI TERNI

INDEX

INTRODUCTION

This is our second Sustainability Report which details the activities of the Acciai Speciali Terni for the 2018/2019 fiscal year. When the first edition was introduced, none of us could have ever imagined finding ourselves in a situation such as the one we are living because of the pandemic.

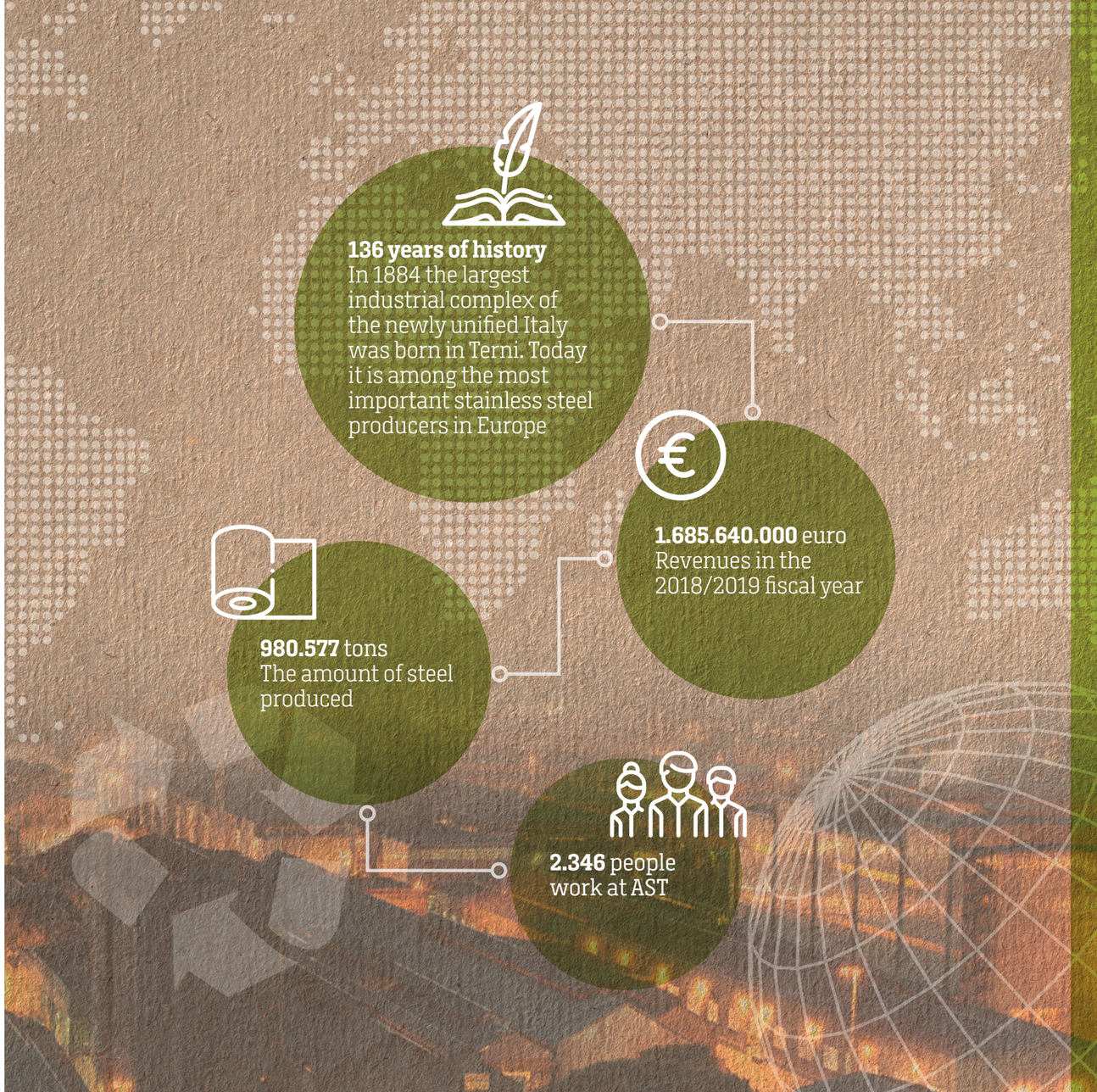
In compliance with the Prime Ministerial Decree, for the first time in its history AST shut down all work activities in the first weeks of lockdown. Then, as soon as it was deemed possible, the company started marching again thanks to the measures implemented for the protection of the workers' health. As a matter of fact, after evaluating the efficacy of our protocols against the spread of the Covid 19 virus, AST was the first Italian entity to receive the anti-Covid certification from the DNV GL Business Assurance, which is one of the leading verification and certification agencies in the world.

In AST we would like this period so tough and difficult to be an opportunity to face with detremination the crucial challenges of our times and to begin an era of deep changes. The United Nations' 2030 Agenda for the Sustainable Development represents the most important project in the quest of identifying solutions to global problems and, within this context, also the steel industry is called upon to do its part.

Therefore, the AST's commitment evolves in three directions: by aiming more and more all activities toward the circular economy and the ecological transition by means of a more efficient use of materials and energy; by guaranteeing the environmental and health protection using effective environmental impact's management and control systems; by developing environmental requalification and eco-innovation for the sustainable development of the territory in the Terni area.

It is a demanding challenge in which AST has always been greatly committed

Massimiliano Burelli
Chief Executive Officer of the Acciai Speciali Terni



1

OUR COMMITMENT TO SUSTAINABILITY

This is our second Sustainability Report which details the AST's activities for the 2018/2019 fiscal year. When the first edition was introduced, none of us could have ever imagined finding ourselves in a situation such as the one we are living in 2020 because of the pandemic.

A situation that has put in extreme jeopardy the healthcare system, thus causing tragic losses of human lives, as well as creating an economic and social crisis without precedents in peacetime history.

The safety measures against Coronavirus

During the lockdown our factory stopped its activities for few days until the authorities gave the green light to the reopening following the implementation of measures for the workers' health protection.

The Terni Steel Factories were the first Italian company to receive the recognition and specific attestation from the DNV GL Business Assurance, one of the leading verification and certification agencies in the world, regarding what has been implemented in the fight against Coronavirus in the past months.

According to the DNV GL Business Assurance: "AST faced the COVID-19 emergency by employing its own Business Continuity Organisational Model which has been well defined as far as the organisation, the escalation's procedures and the risk evaluation tools were concerned. The Business Continuity Model established defined and clearly documented levels of activation, responsibilities, and organisational structures. These factors gave the company the ability to respond promptly and at times proactively with respect to the regulations issued by lawmakers throughout the evolution of the crisis".

"AST has provided the financial and human resources necessary to implement the plans of action issued following the directions of the Business Continuity Committee, comprising the company's entities that were most relevant with respect to the pandemic scenario.
Another piece put in place has been the creation of a Joint Committee which included the direct participation of workers representatives and was a valid organisational solution for sharing

information and for quickly responding to the evolution of the epidemiological context".

It is also highlighted in the certification the efficient use of the internal communication channels "finalised to create a steady flow of information to all personnel with regards to the implemented measures of mitigation and prevention, to give awareness to the employees with respect to the behaviours to adopt in order to reduce the risks of contagion, and to update the employees on all applicable rules and regulations (at the national as well as regional level). Effective use of external channels of communication has been used to spread the information relating to the measures introduced during the different phases of the crisis to the other stakeholders (e.g. top management's announcements, web publications, videoclips, etc.).

The Manual for Training and Information of the AST's employees' targeted at COVID-19 is worth noting for its usability and contents. The Manual describes all adopted measures and lists the contacts to call in case of need and it is intended for the workers to engage them personally as proactive elements in the fight against the epidemic spread, also as far as their co-workers and all the people around them are concerned".

1.1 Overcoming the crisis caused by the pandemic

The pandemic and the recession opened scenarios of extreme uncertainty. In order to overcome this crisis an exceptional effort will be necessary. At the same time this period so harsh and difficult must represent an opportunity to face with resolve the crucial challenges of our time and to begin an era of deep changes. If we really want to reverse the effects of the deepest recession since the end of World War II, much worse than the one following the 2008 crisis, we need to have a forward-looking strategic vision.

The United Nations' 2030 Agenda for the Sustainable Development remains the most important project of reference in order to find solutions for the current global problems just like the Green Deal promoted by the European Union represents a strategic priority for the future of our continent and one of the main pillars of the "Next Generation UE" Recovery Plan.
Aiming at sustainability requires first of all to speed up the process of transition towards a green economy – circular and with low carbon emissions – by pointing in this direction the public policies and the private investments with the goal of a solid and long-lasting economic recovery. Such goal can be achieved through new industrial strategies focused on an ecological and digital transition.
In this context the steel industry is also called to do its part It is a demanding challenge that focuses on two keywords: sustainability and innovation and it is a challenge in which AST has always been greatly committed.

A Green Deal for Europe

At the end end of 2019 the new European Commission introduced the Green Deal plan, which aims at making the ecological transition the opportunity for a new development model and, at the same time, allowing Europe to gain a position of leadership on the world scene.
The goal is to become the first carbon-neutral continent before 2050 by strengthening the European industry through an industrial revolution able to guarantee a sustainable production. The ecological transition will be supported by an investment plan aimed at mobilise in the next decade at least 1,000 billion euros, which will include both public and private resources.

The new plan of actions for a circular economy
The Green Deal aims also at making Europe a world leader in the circular economy. In this context, in March 2020 the European Commission introduced an updated plan of action for the circular economy with the goal of speeding up the transition to a new model of development. It is a challenge as ambitious as forward-looking, of the utmost importance both from the economic and from the environmental perspective.
This is a challenge even more important nowadays in light of the coronavirus pandemic and its serious consequences for the European economy. Betting on the circular economy is a way to promote a recovery based not only on a strong relaunch of public and private investments but also on a new economic paradigm. It is not by chance that the "Next Generation UE" Recovery Plan embraced the Green Deal as a strategic priority.

The new European industrial strategy
Together with the new Plan of action for the circular economy, in March 2020 the European Commission issued the new industrial strategy. The objective of the two measures is to sustain the European industrial leadership pointing it toward the goals expected in 2050 around three priorities: to keep the competitiveness of the European industry at the global level; to make Europe neutral from the climate point of view; to develop digital infrastructures.
The strategy defines the drivers of the European industrial transformation and proposes a series of actions aimed at speeding up the transition toward an economy more and more environmentally sustainable, circular, and digital.

1.2 The role of steel in the ecological transition

Steel not only represents an essential resource for the economy but for many reasons it can have also an important role in the ecological transition and in building a sustainable future.

- Steel is the single most recycled material in the world. It is present in packaging materials, in machinery, in buildings, in cars, and in thousands of objects we use everyday. It can be reused infinite times to generate new products without losing its original properties. It can be considered not simply "recyclable" but a true "permanent" material. Therefore in the transition toward a circular economy steel takes a paramount role both in reducing the use of material resources and in reducing the waste.
- The steel industry has an important role also in the reduction of CO_2 emissions and in the fight against climate changes. As a matter of fact the Italian steel industry has already reduced drastically its own climate-changing emissions from 1990 until today. In the next decades the path to decarbonisation provided by the Green Deal and by the EU climate goals will cause a deep transformation of the entire energy-intensive industry thanks to huge investments in new low carbon technologies. In this context it will be necessary to guarantee the competitiveness of the European industry by providing appropriate support policies.
- The steel sector has a strong potentiality to innovate due to research and new technologies. A constant effort in applying the best technologies available already allowed to improve over the years the quality standards, thus reducing the environmental impact and the energy usage. Today the application of new digital technologies and the path toward the "industry 4.0" allow to introduce systems of advanced automation which are essential for the competitiveness and the sustainability of the steel industry.
- The use of steel is essential not only in industrial production chains of strategic importance such as mechanical engineering, construction, automotive, production of home appliances, shipbuilding, but also in a series of applications necessary for the ecological transition and the sustainable development: from the energy production from renewable sources to the construction of building with high energy efficiency, from the infrastructures for the water supply resources to the transportation by train.

1.2

1.3 Sustainability as a shared value and a strategic driver

The sustainability is a value essential in the AST's strategy. For that reason, we report our activities making reference to the sustainability goals specified in the United Nations' "2030 Agenda".

The 2030 agenda of the United Nations

In 2015 the United Nations approved the Global Agenda for the sustainable development, which included 17 objectives (Sustainable Development Goals – SDGs), to be reached by 2030. After considering unsustainable the current model of development, the United Nations stated that all Nations must work together to aim the global development toward sustainability. In order to reach said objectives it is necessary a strong commitment not just by the governments but by all elements of society, starting with the private enterprises.

Sustainability in all of its forms – environmental, social, economic – represents for AST a value shared and at the same time a strategic driver.

- **Shared value:** based on the principles of social responsibility we want to contribute to the environmental protection and social progress.
- **Strategic driver:** the efficient use of resources and the reduction of environmental impacts not only help the environment, but they are also productivity, innovation, and economic competitiveness factors.

The steel sector is one of the sectors most committed in the efficient use of resources according to the principles of circular economy. AST is already today among the most advanced realities in Italy in this field and as a matter of fact:

- AST utilises mostly **materials coming from recycling**.
- **The technology employed in the electric furnaces** and the measures for **high energy efficiency** allow to **reduce the greenhouse gas emissions.**
- An important project for **the reutilisation of the production slag is in progress.**

1.3

Starting from the important results already achieved, AST intends to increase its efforts and commitment in this direction, in order to make an even greater contribution to a sustainable development.

AST at the OCSE sustainability meeting

It is necessary to change the course by pointing the economy toward sustainability. For that reason, a company must evaluate its own actions not only on the basis of its economic and financial objectives but also on the basis of its social and environmental impact. These are convictions that AST has emphasised during a round table organised by the OCSE in Paris in October 2019.

Paths of sustainability in the steel industry

According to a survey conducted by *Siderweb* on a sample of companies involved in the steel production chain, **82% of Italian enterprises** have begun a **path of sustainability.** The sample represented the entire production chain (35% production; 10% distribution of scrap metal; 22% transformation; 33% distribution).

The actions undertaken by the companies concerned in particular the reduction of the environmental impact, the implementation of circular economy criteria, the paths of *Corporate social responsibility*, the certifications of materials (mostly ISO 14001 and analysis of the *Life cycle assessment* - ISO 14040), the protection of workers. The most active companies were the ones involved in the steel production. 57% of the companies surveyed carried out communication actions regarding the paths they undertook, mostly through the annual sustainability report and by means of their communication bodies.

1.4 Report guide

A choice of social responsibility

AST discloses every year a sustainability report as an act of **transparency and social responsibility** to report its activities to the stakeholders.

The social report, started as a voluntary instrument to give details on the aspects regarding the company's impact on the community, over the years has steadily expanded from addressing only social themes to focusing also on the environment.

The European Directive 95 of 2014, adopted in Italy with the law decree 254 of 2016, made this report mandatory (in the form of an annual statement of "non-financial report") for some specific types of enterprises, such as banks, insurance companies, publicly traded companies with specific requisites regarding their size, finances and assets.

AST, although not included in the subjects for which the law requires such compliance mandatory, has chosen **voluntarily** to disclose its own sustainability report.
This is a choice that anticipates what is expected from the European Union's Green Deal. Among the Green Deal's objectives, in fact, there is the strengthening of the reporting on sustainability with a revision of the Directive regarding non-financial reporting and an expectation of new company requisites with the goal of increasing the level of information on the risks and opportunities linked to sustainability.

GRI guidelines

The report measures the footprint of the company's activities and gives details on its performance relating to the most relevant topics concerning environmental, economic, and social sustainability.

The report has been written in collaboration with the firm **Greening Marketing Italia**, following the guidelines provided by the **Global Reporting Initiative (GRI)**, an independent international organisation recognised by the United Nations as the main point of reference globally as far as the activities on sustainability reporting are concerned.

The report uses 4 groups of indicators related to the GRI standards:

- **general indicators,** regarding the legal and organisational profile of the company;
- **economic indicators,** regarding the economic results and the added value created and distributed by the company;
- **environmental indicators,** regarding environmental aspects and particularly those related to energy, water, emissions, and waste;
- **social indicators,** regarding the social aspects and particularly those related to safety in the workplace, training, equal opportunities, and relationship with the territory.

1.4

Period in question

The data and the information provided herein refer to the 2018/2019 fiscal year (from October 1st 2018 to September 30th 2019). The data regarding the 2016/2017 and 2017/2018 are also reported, thus giving the opportunity to review the trends of the main indicators in the last three years.

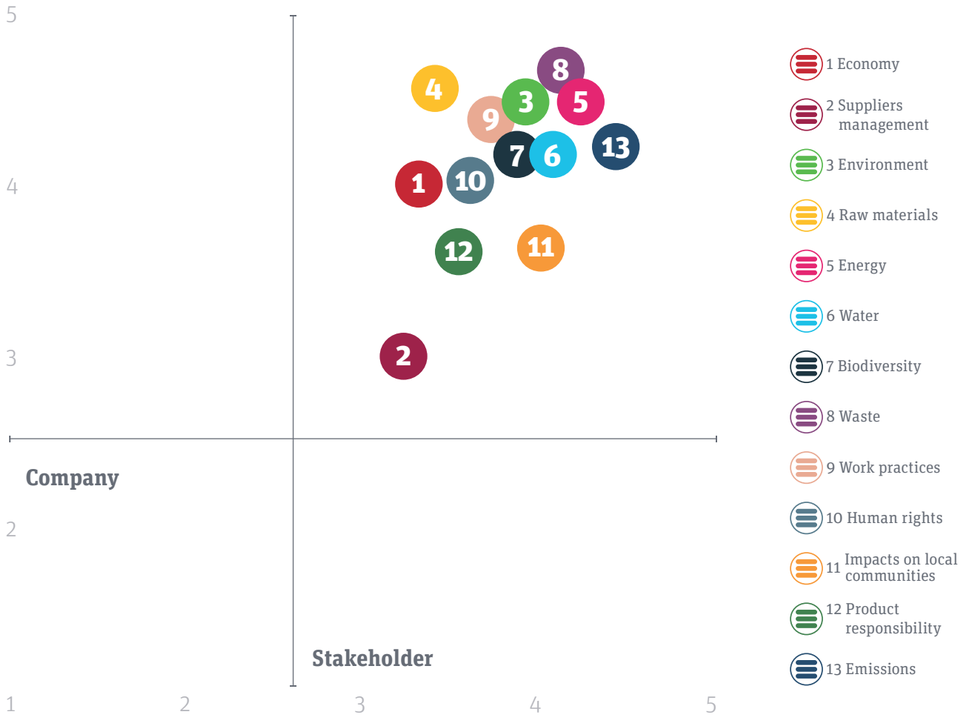
Materiality analysis

The primary topics of this section called "materiality analysis" have been identified through an assessment shared with the company management and the main stakeholders (employees, shareholders, institutions, local communities, trade unions, research organisations, suppliers, etc.).
The materiality analysis done in preparation of the previous AST's sustainability report was conducted via direct meetings as well as a questionnaire where the people consulted indicated the degree of importance given to the various economic, environmental and social aspects with respect to the AST's activities. Considering the problems in performing a new consultation with the **stakeholders** in 2020 due to the pandemic, the results of the materiality analysis done for the previous report have been confirmed as a point of reference for this second report.

Circularity indicators

AST is committed to point its activities more and more toward a circular economy, consistently with the European Union's strategy. For that reason, together with the results reported in accordance to the GRI guidelines, indicators of circularity able to measure the company's performance with respect to the goals connected to the transition toward a circular economy have been highlighted in a dedicated chapter of this report.

Materiality Matrix



2
WHO WE ARE

2.1 The company

Founded in 1884, shortly after the unification of Italy, the steel factories of Terni have always had a leading role in the Italian industrial landscape. Today Acciai Speciali Terni S.p.A. is one of the most important European steel sites.

The production of flat stainless steel laminate sheets represent our core business, in which the company is a leader in Italy and among the main producers in Europe.

In addition to flat laminate sheets, the company produces stainless steel tubes and forged products made with special steel. The company has customers all over the world thanks to the international sales network and the service centers of the holding company Thyssenkrupp. The range of services includes the direct distribution of flat laminate sheets by our subsidiary Terninox.

2.1.1 Ownership

The share capital is 100% owned by Thyssenkrupp Nederland Holding B.V, which itself is 100% owned by the holding company Thyssenkrupp AG, whose headquarters are located in Essen (Germany).
Following the reorganisation of the holding company and its subsidiaries, starting from October 1st 2020 AST is not a part of the Business Area called “Material Services” anymore, instead it has been reallocated into a new thyssenkrupp’s segment called “Multi-Tracks”.

2.1.2 Governance

The corporate governance system adopted by AST, in compliance with what is required by law, is regulated by a Code of Ethics and an Organisational Model pursuant to the law decree 231/2001.

· Corporate Bodies ·

Board of Directors

Chairman
with legal and Statute powers

Chief Executive Officer
with responsibility of supervising production; ecological, environmental, and safety subjects; procurement; the internal control system; supply chains; information systems; human resources; general, legal, asset management, and company affairs; internal auditing; outside relations; quality; innovation, research and development

Managing Director
with responsibility of supervising management, administration, finances, and reporting

Managing Director
with responsibility of supervising sales and marketing

Director
The Board of Statutory Auditors comprises 3 members. The responsibility of accounting auditing has been given to the auditing firm PricewaterhouseCoopers SpA.

· Organisational Model ·

The company adopted an organisational and management Model, pursuant to the law decree 231/2001, in order to avoid the risk of being in violation of the law. In June 2020 the Board of Directors approved a model update to include violations of the tax code.
A specific Supervisory Body, comprising individuals with a high degree of autonomy, independence, and professionalism, was created to monitor the operation and observance of what is required by the Model.
The AST principles and codes of conduct refer to the following documents:

- Code of ethics
- Organisational, management, and control model
- Group documentation regarding compliance
- Company's Guidelines and Procedures which include, among other things, principles and norms aimed at the adoption of ethical behaviours and inspiring integrity, legality, transparency, and traceability.

2.1.3 Code of ethics

The AST's Code of ethics, updated in December 2019, is based on the conviction that:

- legality represents a fundamental principle;
- the company's trustworthiness and its reputation represent a competitive factor;
- the relationship with the stakeholders must be based on criteria of honesty, collaboration, and loyalty;
- workplace conditions respectful of workers' rights and human dignity must be guaranteed to employees and collaborators.

Administrators, employees, collaborators, and supervisory bodies must respect the Code and assist in making sure that the Code is implemented.

Legality

Integrity and high ethical standards are essential elements for a company. For that reason AST not only created specific tools but paid also attention to spreading the **culture of legality**. With this goal in mind, during the period of time covered by this report AST:

- obtained the **certification ISO 37001 - Management System for the prevention of corruption.** AST is one of the first eight big corporations in Italy and the first steel company in Europe to receive such certification.
- developed the initiative called *"Legality Days"*, through 6 public meetings with the patronage of the Prefecture, the Regione Umbria, the City of Terni, and the Umbrian branch of the Confederation of the Italian Industry.
- organised in February 2019 the event *"No Corruption Day"* in order to introduce to the employees the anti-corruption Model adopted by AST as well as to hear the point of views of OCSE members, the Ministry of Foreign Affairs, and the national industrial system.

It is worth mentioning also that AST:

- In 2016 signed **a memorandum of understanding** with the Prefecture of Terni on legality and fight against corruption.
- In 2017 joined the group **Transparency International Italia**, which is the main global organisation dedicated to the prevention and fight against corruption. Founded in 1993 and headquartered in Berlin, Transparency International is present in over 100 countries in the world. The participation to Transparency International Italia includes the BIF - Business Integrity Forum, a watchdog that includes 14 among the largest Italian companies which collaborate with the network in projects for the adoption of instruments to fight corruption.
- Is an active member of the BIAC – Anti Corruption Task Force
- Participates to several workshops organised by OCSE and to international events.
- Was one of the participants of the meetings *Italian Business Integrity Day*, promoted by the Ministry of Foreign Affairs in collaboration with Transparency International and held in Washington D.C. in December 2018, in London in December 2019, and in Berlin in January 2020.

THE FIRST STEEL COMPANY IN EUROPE TO BE CERTIFIED IN THE PREVENTION OF CORRUPTION

Certification ISO 37001

The ISO 37001 certification is a voluntary instrument for the prevention of corruption.

- Approx. 260 companies in Italy are ISO 37001 certified. The greatest majority of them belong to the energy and service sectors.
- Less than 10 certified companies have revenues over 1.5 billion euros. None of them, except AST, is a steel company. None of the other main European steel companies are ISO 37001 certified.

The certification

- From 2016 AST started a transformation programme based on the implementation of an anti-fraud model aimed at preventing and identifying promptly corruption cases.
- Thanks to this programme based on artificial intelligence and constant monitoring, AST was able to request a fast-tracked certification audit.

What is it?

ISO 37001:2016 is an international standard in which the requisites for defining, implementing, maintaining, updating, and improving a management system for the prevention of corruption are specified.

Why?

- Improvement of its reputation
- Strengthening of the effectiveness of model 231 and of the anti-corruption system
- Useful instrument for managing the inspections carried out by the Authorities

When?

- AST was able to obtain the certification ISO 37001 in less than 6 months and without any non-compliance.
- The certification was obtained in July 2019.

2.1.4 Internal control system

The Internal control system is a process comprising 4 interrelated elements:

- System of values
- System of proxies
- Risk management
- Internal body of regulations

System of values

Specific actions have been undertaken in order to reinforce the principles of legality and transparency as well as to spread the culture of internal control.

Principles, values, codes of conduct and standards can be found in the following documents:

- Code of Ethics
- Policy for the prevention of corruption
- Policy regarding health and safety in the workplace
- Policy regarding the environment
- Organisation, management, and control model pursuant to Law Decree 231/2001
- Group documentation regarding compliance
- Company's Guidelines and Procedures containing principles and norms aimed at the adoption by all interested subjects of ethical behaviours and inspiring integrity, transparency, and traceability.

System of powers of attorney and proxies

The company adopted a process specifically designed to the management of the system of proxies and powers of attorney which is based on the following fundamental principles:

- the powers given must be consistent with the organisation and with the role and the responsibilities of the attorney-in-fact and of the representative;
- it must be avoided giving unlimited powers;
- whenever possible, the "four-eyed" principle must be guaranteed (e.g. by means of joint signatures and information flows before or after the fact);
- the system of proxies and powers of attorney must be communicated and disseminated within the organisation;
- the system of proxies and powers of attorney must be promptly updated following any changes in the company organisation and/or governance.

Risk management

The risk management system identifies and monitors, via a risk map, a wide variety of events that may be harmful for the company. The risk map, updated every six months, has the goals of identifying risks, evaluating the probability of occurrence, estimating the potential damage, and putting in place countermeasures designed to reduce the probability of occurrence and/or the possible damages.
The activities of risk management are structured on multiple levels:

- **Focusing on the top company's risks:** by using verification methods on the company's processes, Top Risks are identified and ran-

ked based on their typology (strategic, operational, financial, compliance-related). On the basis of such analysis specific projects for the mitigation of risks are initiated, such as the implementation of a business continuity Model and an anti-fraud control Model, and the revision of the organisational, management, and control Model pursuant to Law Decree 231

- **Risk management tool:** this is a process of mapping and evaluating the main company's risks, performed periodically and managed in accordance with the guidelines of the thyssenkrupp group as well as with the internal operational procedures.

- **Internal monitoring programme:** starting from the 2015/2016 fiscal year the company activated a programme in order to: a) document and keep the Internal Control System updated; b) verify the controls' operability; c) identify potential shortcomings and areas of improvement of the controls designed to protect against risks, thus defining the appropriate "action plans". In the 2018/19 fiscal year AST has completed such programme for the fourth consecutive year and has expanded the analysis in order to guarantee a greater coverage. Just like in the previous years, substantial improvements regarding risks protected, gaps identified, and corrective actions implemented were achieved. During the previous four fiscal years over 1,400 risks have been mapped and approx. 800 controls have been performed by means of testing activities.

Internal body of regulations

The company adopted a specific framework for ranking the sources in order to guarantee:

- the alignment between the company's mission, the Code of ethics, the Guidelines, the management Procedures, the operational Procedures and instructions, and other internal regulatory documentation;
- the effective and efficient management of the body of regulations.

Monitoring

The company performs a constant monitoring of the internal control system. Furthermore, in order to guarantee the monitoring of business continuity, fraud and corruption risks, the following control models have been defined by adopting a process-based approach:

- **Business continuity model:** mapping the potential incidents affecting the business continuity, defining the governance for the management of those incidents, designing the activities to employ during the different phases of management of the incidents, defining the instruments to use;

- **Anti-fraud control model,** in which we defined specific controls able to prevent the risks of fraud.

- **Anti-corruption model,** with the objective of making AST a *"No Corruption Zone"*, or in other words an area where it is impossible to commit any type of corruption. Consistently with the undertaken path, during the last fiscal year AST obtained the certification ISO 37001 – A management system for the prevention of corruption.

Prevention of conflicts of interest

The prevention of conflicts of interest occurs by means of different instruments such as:

- The obligation for the top management to report any personal situation that may create a conflict of interest. Such obligation applies also to middle managers, to all personnel working in manager's and director's offices or in positions more exposed to this type of risk, and to all the suppliers
- Specific informational and training activities
- The obligation for the members of the Board of Directors to report any potential conflict of interest
- Specific analyses on suppliers in order to identify possible interrelationships between them

Internal auditing

The function of internal auditing, under the direct supervision of the CEO, has the responsibility to support the company in the evaluation of the internal control system and of the management of the company's risks. It acts in cooperation with the Supervisory Body in monitoring the application of the procedures dictated by the organisational model pursuant to law 231/2001.

2.2 Strategies

Thanks to the path taken, AST operated in the last few years in a relatively calm environment within a context, such as the steel sector, uncertain and difficult, by supplying stainless steel finished and semi-finished products designed specifically for the end users. The AST repositioning within the global markets combined with the activities initiated to reach an equilibrium in the cost structure and in the financial management allowed the company to conquer relevant market niches, thus avoiding competing with the Asian low-cost producers in markets with low profitability. This market approach relied also on the direct distribution network and on BA Materials Services.

In reference to the period herein reported, it is worth noting that the effects caused by the protectionist measures introduced by the USA and by the restrictive measures in the commercial exchanges created a difficult context for the steel industry in Italy and in Europe. Within this context, the company concentrated on keeping a position of leadership in the market of stainless steel flat products both in Italy and abroad by focusing on innovation and a constant improvement of the production process and of the products themselves.

2.2

Lean Transformation

In order to face these uncertain and difficult times, AST adopted an industrial philosophy called *"Lean transformation"*, which is here applied for the first time within a large steel company and is aimed at a constant improvement through a series of actions, starting from the improvement of production and from the reorganisation of the work process in the name of efficiency.

In the world of Industry 4.0, the full control of the processes allows to avoid wasting resources and materials and to take advantage of the opportunities given by both technologies and human factors.
The AST constant improvement relies on the *Back to Basics* project started in 2016. Since then, the production lines have been organised and managed according to standards of visual management allowing to reach the full control of the production with the highest involvement of all operators through the use of simple tools (graphic, diagrams, and colours). *Back to Basics* is one of the main operational instruments designed for production optimisation and allows also to secure the company's qualitative certifications.

During the last fiscal year such project was further developed with the completion of 369 *Kaizen blitzes* involving 1,208 people.

The Back to Basics project has been recognised within the thyssenkrupp group through the participation to the activities of the tk AG *Operational Excellence* team and, as a pilot case study, to the thyssenkrupp Materials NA meeting in Chicago in August 2019.

2.3 Production

The production centre

The AST's factory is one of the main integrated production sites in the world, covering an area of approx. **1,500,000 square metres.** The **integrated process** allows to gather in a single site all production phases and to guarantee high quality standards. Moreover, AST can rely on **a logistic service** and **a sales area** able to follow its customers in each of the five continents.

The production cycle

Acciai Speciali Terni is one of the main European and world producers of **stainless steel flat laminate sheets** with an integrated hot/cold production cycle.

The **production cycle**, based on advanced technologies, includes electric arc furnaces, AOD/VOD converters, non-stop castings, a hot steel rolling mill, treatment plants for stainless steel strips using procedures of ecological pickling, cold steel rolling mills *Sendzimir*, annealing lines *Bright Annealing*, one of them equipped with *Skin Pass* and *Stretch Leveller* in line, as well as numerous cut and finishing lines.

Products

The main products are **rolls and foils laminated using hot and cold processes and made of austenitic, ferritic, and martensitic stainless steel**. They are offered in a wide variety of surface finishes and formats. AST produces also **prepainted stainless steel** prepared at the Finishing Centre which is equipped with a specialised painting line as well as lines for longitudinal and transverse cutting and lines for brushing and satin finishing.

The stainless steel products are used in many applications: from the transportation to the home appliances sectors, from the home applications to the construction industry, all the way to a wide variety of industrial applications.

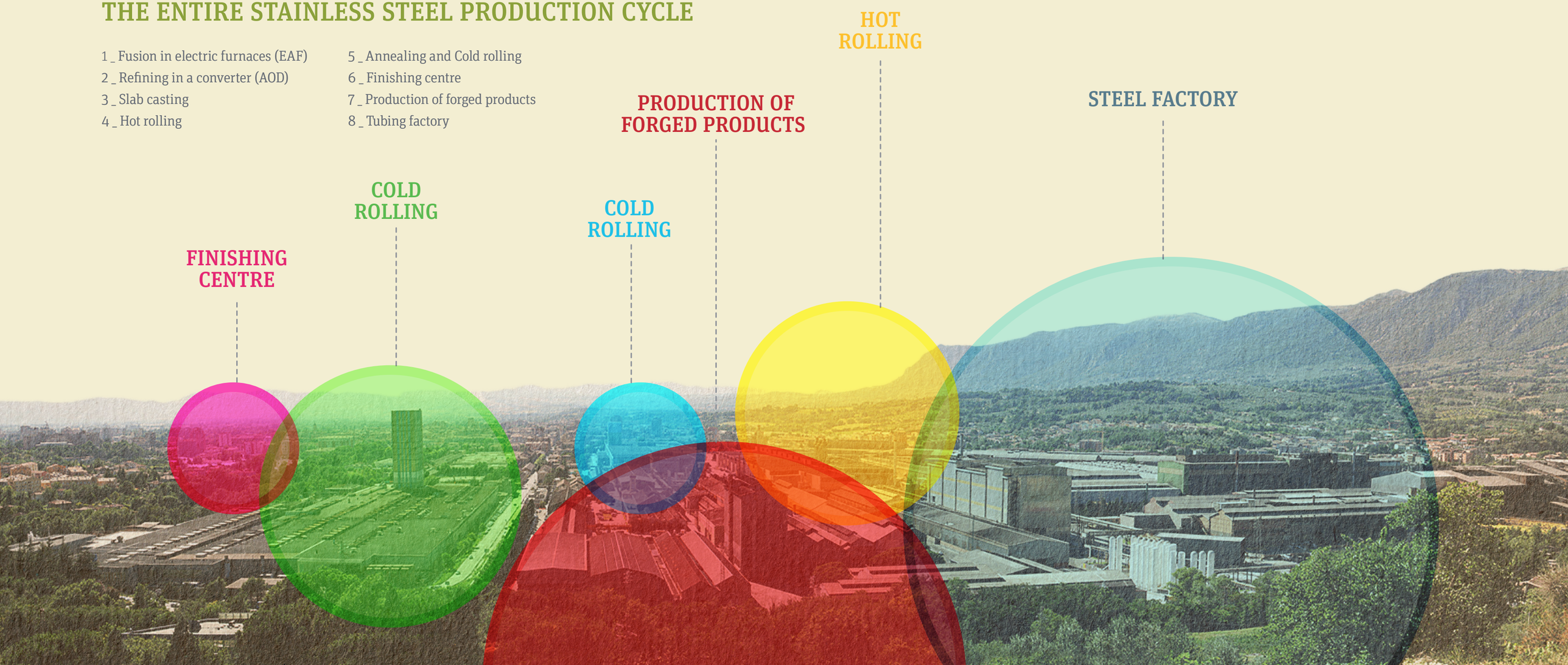
The range of products includes also:

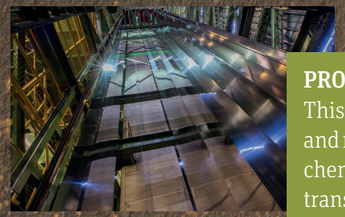
- **stainless steel welded tubes** for the automotive market, of which AST is the leader, and for decorative and industrial use (Tubes division);
- **big forged products** intended for the energy, industry and engineering sectors (Forged products division) and information technology services provided by the Aspasiel division.

2.3

THE AST'S PLANTS COVER THE ENTIRE STAINLESS STEEL PRODUCTION CYCLE

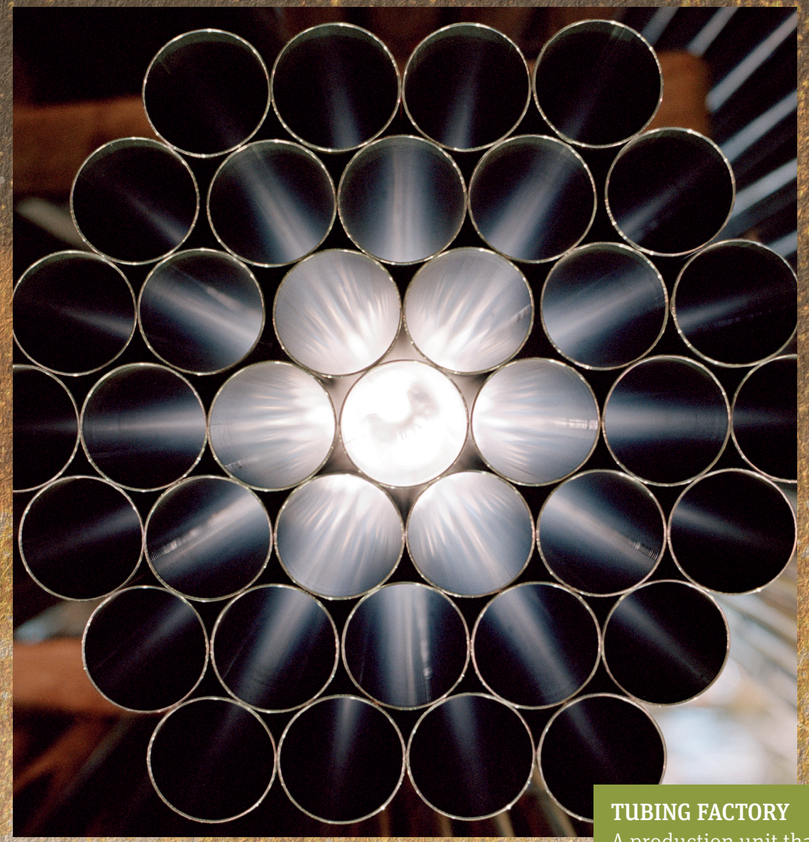
1 _ Fusion in electric furnaces (EAF)
2 _ Refining in a converter (AOD)
3 _ Slab casting
4 _ Hot rolling
5 _ Annealing and Cold rolling
6 _ Finishing centre
7 _ Production of forged products
8 _ Tubing factory



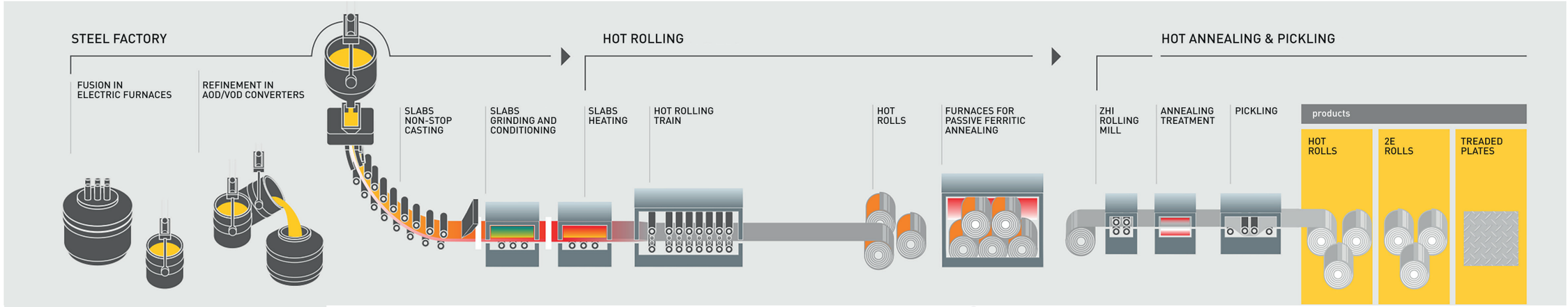


PRODUCTION OF LAMINATE SHEETS
This is the heart of the factory. It produces austenitic, ferritic, and martensitic stainless steel of very high quality, with different chemical formulations and characteristics, which is then is transformed into sheets using hot and cold rolling processes. They are produced with multiple types of finishing, thickness, width and length and shipped in custom-made packaging.

FORGED PRODUCTS
This division produces a wide range of forged products, obtained from high quality steel, by employing the most modern manufacturing methods.

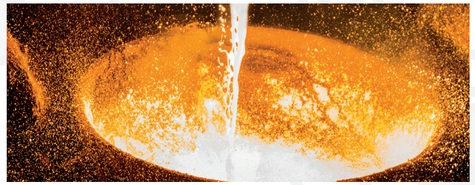


TUBING FACTORY
A production unit that makes electro welded stainless steel tubes.



HEATED AREA

In the hot rolling mill the slabs, coming from the walking-beam furnace, are laminated using multiple passes on the reversible milling train followed by a pass on the seven cages finishing train.

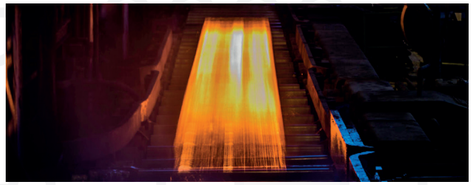


Loading of scrap metal and fusion of steel in the electric furnace

In the steel factory, the final product originates from the fusion of iron scrap metal and the addition of raw materials. In this phase the load is transformed from the solid state to the liquid one by using an electric arc and oxygen gas.

Steel processing in refining plants outside the furnace

The steel is then treated outside the furnace in plants specifically designed to obtain the requested analysis, temperature, and quality: the AOD, VOD e ASEA converters.

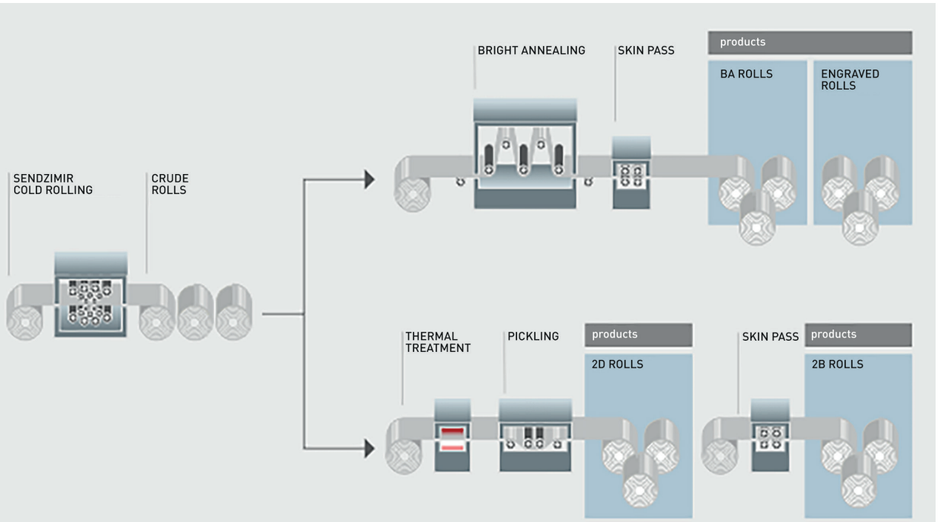


Casting in machines with non-stop casting

After refining it, the steel is transformed in few minutes into a semi-finished product called slab via traditional machines with non-stop casting.

Hot rolling of semi-finished products for the transformation into coils

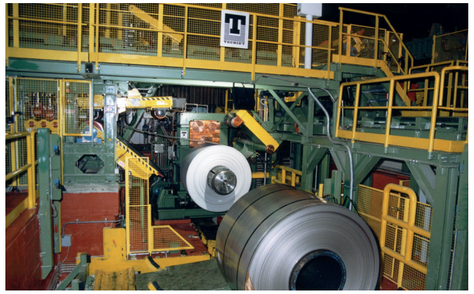
In the hot rolling mill the slabs coming from the steel factory are heated in the **walking beam furnace**, then laminated with multiple passes on the **reversible roughing train** and a single pass on the **seven cages finishing train**, and finally sent to the **winder**. At this point we have a semi-finished product called *"black"*, which is a steel coil with a dark/black colour due to the oxides formed on the surface during the cooling phase.



COLD AREA

Cold rolling

The cold area of the stainless steel process contains lines for the annealing and pickling of the hot rolled strips, Sendzimir hot rolling mills, lines for the bright annealing of the cold rolled strips, lines for the annealing and pickling of the cold rolled strips, and Skin-pass rolling mills.



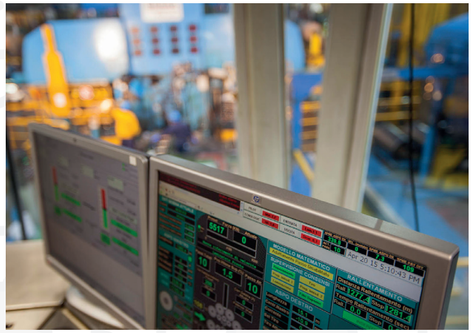
Annealing and pickling

The pickling and annealing process of the hot rolled strips consists of three main phases: **the annealing** that can be done in passive ovens, in bell-shaped ovens, or directly on the line and it is aimed at stretching the structure's internal warps created during the hot rolling process; **mechanical pickling** via sanding and brushing; and **chemical pickling** with immersion of the strip in an acid solution.

Cold rolling

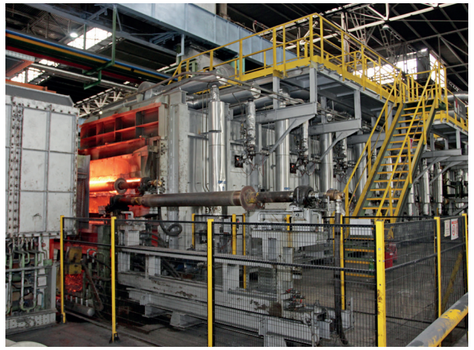
The cold rolling process is done using a Sendzimir machine, which can reduce dramatically and with extreme precision the strips' thickness thanks to its unique frame and process (pull-crushing).

Cold rolling is very important to obtain optimal results in the following treatments from a surface point of view (BA), and the best mechanical characteristics (strain hardening).



Annealing in an inert atmosphere furnace (BA)

The annealing in a BA furnace does not cause the oxidation of the strip because the furnace's internal atmosphere is not oxidative (H_2-N_2 mix), and, therefore, the strip will not need to be pickled. Once annealed, the strip is "skin passed" to acquire the required mechanical characteristics, an optimal planarity and the best brightness. The final surface obtained in the BA process is shiny, bright, and highly reflective.
The methods of rolling in the Z/Mills are also very important to obtain a BA product of high quality.

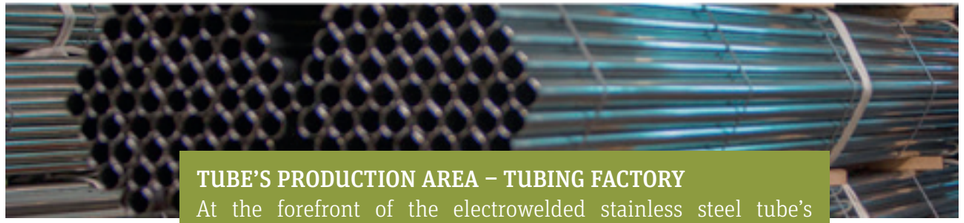


LAF annealing

In the LAF annealing the passing of the strip in the furnace causes the oxidation of the surfaces. In order to clean up the surfaces from the oxidation, the strip goes through the pickling tanks where the oxidation is removed chemically and electrochemically (H_2SO_4+HF). Once pickled, the strip goes through the "skin passing" where it acquires the required mechanical characteristics and the planarity.
The surfaces obtained with this process are not particularly reflective.

FINISHING CENTRE
Once the production cycle ends, the material can be further processed at the Finishing centre in order to satisfy the size and the surface appearance specifications requested by the customer.

FORGERY DIVISION
This unit produces a wide variety of big size forged products. The forged products are mainly used for energy production and for the engineering, chemical, petrochemical, offshore, and aerospace indutries.



TUBE'S PRODUCTION AREA – TUBING FACTORY
At the forefront of the electrowelded stainless steel tube's production, this unit offers a wide variety of products used particularly in the automotive and the furnishing markets.

2.4 Quality and safety of our products

Our products comply with all international regulations regarding chemical composition, mechanical characteristics, and surface finishing. In some cases AST adopts standards even more restrictive. The safety of the products is guaranteed also by quality management systems long-established and verified by independent agencies.

- The **quality management system** is certified in accordance with **ISO 9001:2015** via the certificate 261796-2018-AQ-ITA-ACCREDIA issued by the agency DNV-GL
- The **Forgery Division** has been certified as a Material Organisation in accordance with the **standard ASME NCA-3800** (nuclear). This certification has been renewed and its validity extended until 2022.
- The **Tubes' Production Area** is certified in accordance with **IATF 16949** (automotive).
- As far as the area of application of the **IATF 16949** certification is concerned, AST is working on the implementation of a quality management system for its **Finishing Centre** that will comply with those requisites. The project, currently underway, is scheduled to be completed in 2022.

Furthermore, AST holds **specific certifications** for:

- products intended for the manufacturing of pressure containers;
- construction products;
- skid-proof characteristics of almond-laminate flooring;
- minimal post-consumer content of scrap metals for austenitic, ferritic, and carbon steel
- stainless steel for naval applications.

All products sold by AST comply with the European directives and the national regulations regarding their use in the food sector.

Risks

As far as the safety of our products is concerned, the risks are generally limited to the radioactivity and the mix-up risks.

2.4

Radioactivity risk

It consists of the possibility that scrap metals coming from applications with a level of radioactivity greater than the basal natural level could be mixed with the scrap metal loads and end up in the furnaces. In order to prevent this risk specific measures have been adopted:

- use of panels measuring radioactivity at the factory entrances;
- radioactivity gauges on all means that transport scrap metals;
- analysis performed in the chemical laboratory on screen tests collected from each casting.

All that allows to locate the possible presence of even small quantities of radioactive or radiocontaminated scrap metal. In case a level of radioactivity greater than the basal natural level is found on a scrap metal load, a procedure involving the immediate separation of the load, the removal and transfer of the radioactive or radiocontaminated material to an appropriate storage facility outside the factory, and the notification to the authority in charge is activated.
Thanks to the warnings given to the scrap metal suppliers, the cases of contaminated materials or of radiation sources have been going down dramatically in the last few years.

Mix-up risk

The mix-up risk is the possibility that a customer receives by mistake a type of steel different from what he ordered because an exchange occurred during any of the phases of the production cycle. This represents a potential risk especially if during the accidental exchange a less performing steel replaced a more performing one. In order to prevent this risk various measures have been put in place:

- improvement of the internal tracking systems for a correct and certain identification during the entire slab and coil cycle;
- a complete chemical analysis for an antimix verification on all coil samples going to the laboratory of mechanical testing;
- further verifications of coils;
- consistency verification of the weight coming out of the hot rolling mill and the weight of the coil at time of shipping;
- collection of samples also for all strip going through a second pass in the line;
- chemical analysis using hand-held spectrometers in the factory's packaging locations;
- the cross verification between the weight coming out of the hot train and the weight during packaging, already in force for the cold laminates, has been also extended to the shipping of black coils.

3 ENVIRONMENTAL SUSTAINABILITY

CIRCULAR ECONOMY

76,5%

76.5 % of the metals used come from recycling.

REDUCTION OF THE GREENHOUSE GASES

-9%

the direct and indirect CO_2 emissions per unit of products shrank 9% in the last three years.

WASTE REDUCTION

-14,3% in three years

The amount of waste per unit of products shrank 14.3% in the last three years.

ECO-INNOVATION

Over 40 million

5.6 million euros of environmental investments and 35 million euros of spendings for the environmental protection in 2018/19.

RICICLO DELLE SCORIE

ZERO WASTE

A cutting edge project in Europe toward a circular economy and a “zero waste” objective.

URBAN RE-GENERATION

A district for sustainability, circular economy and urban regeneration in the Terni area.

The AST's commitment is pointed in three directions:

1. To steer more and more all activities toward a **circular economy** through an efficient use of materials and energy
2. To guarantee the **environmental and health protection** via an effective system of management and control of the environmental impacts.
3. To create plans of **environmental requalification and eco-innovation** for the sustainable development of the territory of Terni.

Prevention and reduction of emissions for the protection of the air and the climate

Effective management of materials and energy according to the principles of the circular economy

Projects of environmental requalification for the sustainable development of the territory

3.1 The environmental management

AST adopts guidelines inspired by the best practices of environmental management. The attention paid to the environmental protection, reinforced by the fact that the production site is embedded in an urban context, lead to the adoption of criteria even stricter than the ones required by the current regulations.

Certifications

- The company decided voluntarily to have its environmental **management system certified**. AST received the certificate 273777-2018-AE-I-TA-ACCREDIA in accordance with the **standard ISO 14001:2015** for its environmental management system, which will expire in October 2021. This management system, audited annually, has as objective the constant improvement of the company's environmental performance in order to reduce as much as possible its environmental impact, to save energy, and to protect natural resources.
- As far as **energy** is concerned, in November 2019 AST received the certificate 288012-2019-AE-I-TA-ACCREDIA in accordance with the **standard ISO 50001:2018**. By doing so, the company seeked to develop a management system aimed at improving its performance, at making the use of energy more and more efficient, and at protecting the environment by following the criteria of environmental, economic, and social sustainability.

Company's bodies

Two specific company's departments work on activities connected to the environmental management:

- EAS (Ecology Environment and Safety)
- ASE (Services Area)

Another company's unit is responsible for energy with the goal of reducing consumption and developing plans to increase energy efficiency.
In case of interventions of plant or structural engineering, the company's entities SVI (Plant Development) and PAS (Projects Environment and Safety) also play an important role;
more specifically PAS has been created in the 2018/2019 fiscal year to plan and implement specific projects in the fields of safety and environment.

Autorizzazioni ambientali

In the month of December 2019 Regione Umbria renewed the Integrated Environmental Authorisation (AIA) valid for 12 years (instead of 10 years since AST is ISO 14001 certified).

Transparency

The tracking data regarding the emissions into the atmosphere not only are provided in real-time to the Regional Agency for the Environmental Protection (ARPA) but are also displayed on screens located in the library and in other places throughout the city of Terni.
ARPA developed also a pc and smartphone app in order to give easy access to the data to anyone interested. Moreover, AST activated a toll-free number for the environment which anybody can call for information or clarifications and to report incidents.

3.1

Prevention of risks related to relevant incidents

The factory is ranked pursuant to Law Decree 105/15 (execution of the "Seveso Directive") as a pre-existing factory with higher threshold for the presence of harmful substances (in particular solutions containing fluoridric acid, dust containing zinc oxide, sodium hypochlorite, petrol, and fuel oils). For the prevention of risks AST:

- notifies ISPRA and posts all relevant data on the ISPRA's web site in order to ensure that all agencies receive the correct information;
- implements a specific safety management system. The planning of operational controls on the most critical pieces of equipment and a non-stop planning of activities regarding information sharing, education, and training of all personnel are also carried out. The effectiveness of the management system is monitored by means of recurring internal audits;
- writes a detailed "Safety Report" where all possible incidents are analised and the measures of prevention and protection adopted are specified;
- prepares an internal Emergency plan by taking into consideration the incident scenarios analised and deemed "credible" in probabilistic terms;
- provides the Prefecture of Terni with all information necessary to prepare an external Emergency plan with respect to incident scenarios which may also impact areas outside the factory.

The European regulations for the prevention of pollution in the steel industry

The steel sector is regulated by the European Union as far as prevention and integrated control of pollution is concerned, which is a concept introduced for the first time at the EU level starting from1996 with the **directive IPPC** (Integrated Pollution Prevention and Control).
This directive introduced an innovative principle in the policies regarding prevention and control of environmental impacts from industrial sources. Such principle was based on three fundamental pillars:

· **Integrated approach:** the different environmental aspects (emissions into the atmosphere, draining into the water systems, production of waste, consumption of resources, noise, etc.) cannot be considered separately, but they must be managed in an integrated way within a single Integrated Environmental Authorisation (A.I.A.);

· **BAT (Best Available Techniques):** the conditions for the authorisation must be based on the best available technologies intended as the totality of the most advanced technical solutions (engineering, management and control) from an economic and technical perspective which can be adopted in the context of the pertinent industrial sector;

· **Information and public participation**: the interested parties must be informed and included in the decision-making process.

The IPPC directive has been later modified and integrated with the Directive regarding industrial emissions (*Industrial Emissions Directive*, 2010/75/UE, adopted in Italy with the Law Decree No 46/2014), which further reinforced the above mentioned principles by assigning a fundamental role to the so-called "BAT Conclusions" representing today the point of reference for the member Nation's authorities in charge of defining the conditions and the provisions (emission limits included) in the Integrated Environmental Authorisations (AIA) given to each factory.

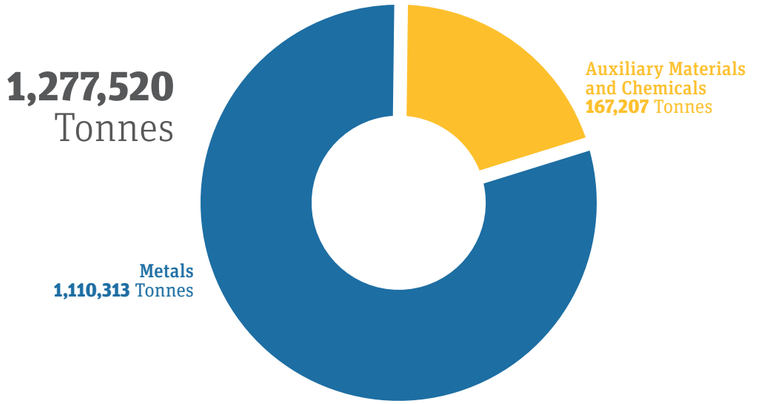
3.2 Materials

Using efficiently the resources available is a factor of productivity and economic competitiveness as well as a factor of environmental sustainability.
The main materials employed by AST in the production cycle are **stainless steel scrap metal, carbon scrap metal, ferroalloys** (such as chromium, nickel, silicon, titanium, niobium, etc.), as well as scorifying products necessary for the generation and treatment of slag. The process of fusion requires also the use of **auxiliary raw materials and additives** such as coal, lime, dolomite, ferroalloy, electrodes, oxygen, and nitrogen.
The most important material among them is the **iron scrap metal**, categorised as an *end of waste* on the basis of the regulations on ceasing to categorise it as a waste and on the basis of the European guidelines EU 333/2011. The incoming scrap metals go through accurate preventive controls, both visual and with the use of instruments, in order to eliminate non-compliant materials.

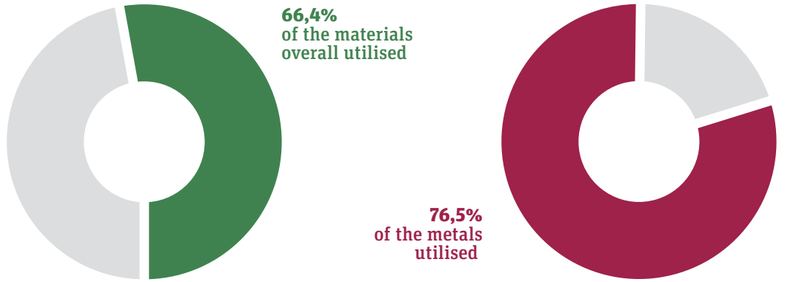
Materials deriving from recycling

The AST's productions are already significantly directed toward the principles of circular economy, as we will describe more thoroughly later in a specific chapter of this report. Within this context, the first piece of data that jumps out is how much **recycled material** AST utilises: in 2018/19 on a total of **1,277,520 tonnes** of materials used, **66.4% of them were coming from recycling.** More precisely, the materials coming from recycling were equal to 849,449 tonnes, of which 213,540 tonnes of common scrap metals and 635,908 tonnes of stainless steel scrap metals. If measured only based on the **amount of metals used**, the percentage of recycled materials goes up to **76.5%.**

MATERIALS UTILISED



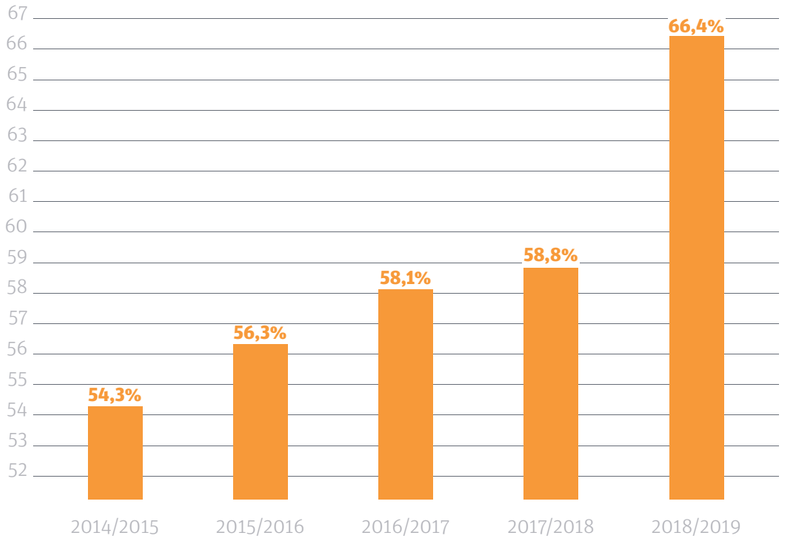
The materials deriving from recycling represent



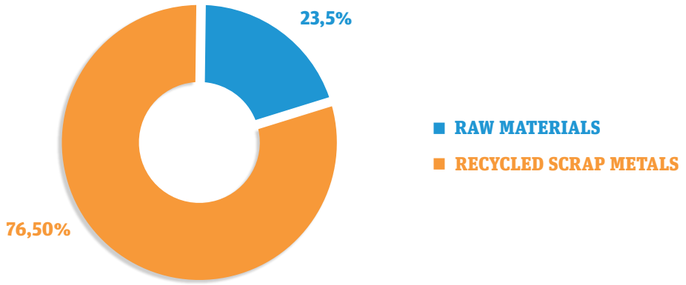
The amount of materials coming from recycling has grown significantly in the last 5 years, going **from 54.3% to 66.4%.**
In the last year only **the increase was 7.6%.**

3.2

Percentage of materials deriving from recycling



Metals utilised



3.3 Waste

Excluding the production waste managed by the Ilserv company, the waste generated by AST in 2018/19 were equal to **126,067 tonnes**, of which:

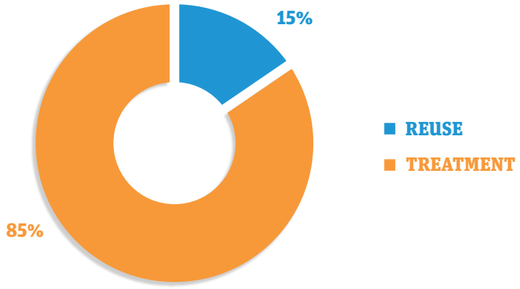
- 79.402 tonnes of toxic waste
- 46.665 tonnes of non-toxic waste

Compared to the previous year a **4.7% reduction has been recorded.**
The toxic waste were almost entirely sent for treatment (99%), while only the remaining 1% was reused. The **non-toxic waste** were reused in a higher percentage (38.8%) and the rest was dumped (61.2%).

All in all the percentage of **waste that were reused** was equal to 15% with a significant increase compared to the previous year when only 7.2% was being reused.

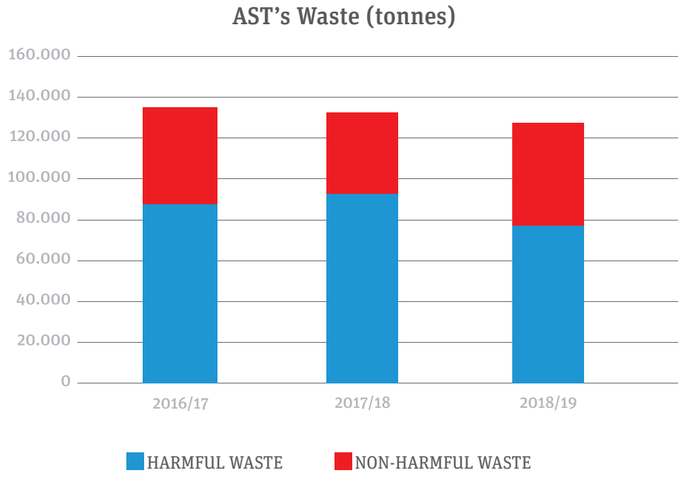
3.3

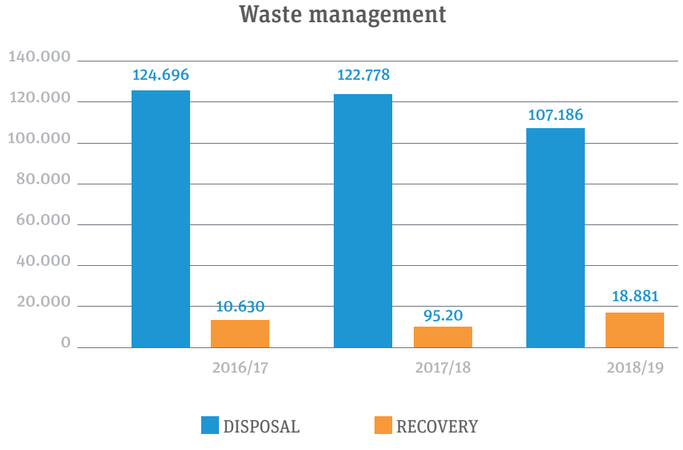
Waste management



Waste produced (tonnes) excluding slag	**2016/17**	**2017/18**	**2018/19**
Toxic waste	**87.770**	**91.774**	**79.402**
- of which bound for treatment	87.323	91.403	78.649
- of which reused	447	371	753
Non-toxic waste	**47.556**	**40.524**	**46.665**
- of which bound for treatment	37.373	31.375	28.537
- of which reused	10.183	9.149	18.128
Total Waste [tonnes]	**135.326**	**132.298**	**126.067**

** the data is calculated according to the E-PRTR criteria and on a fiscal year basis*





Treatment plant

A treatment **plant** (*Dorr Oliver*) for dump leachate, waste aqueous solutions and liquid waste produced during the clean-up of groundwaters, is present on our site. In 2018/19 the plant treated **m³ 61,451 of leachate**, thus producing **55.8 tonnes of sludge.**

Slag

In addition to the data on waste attributable formally to AST, we should basically consider also the data regarding the slag sent for treatment, which, starting from 2013, although produced by the AST's factory have been recorded as produced by Ilserv Srl.

Ilserv waste	**2016/17**	**2017/18**	**2018/19**
Waste generated from slag treatment* (tonnes)	340.738	345.262	345.968

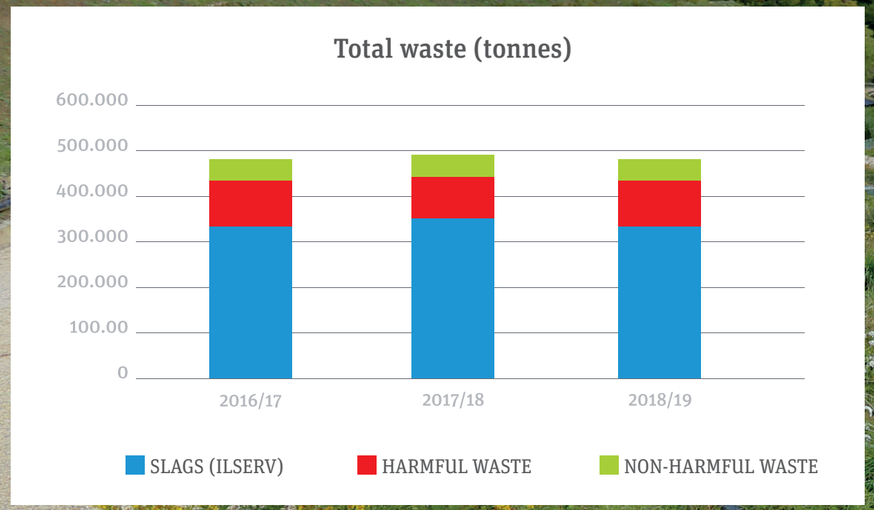
**The data regarding the slag sent for treatment are affected by the rate in which the slag is held in storage and, therefore, it may not correspond precisely to the rate of production.*

Total waste production

If the slag is also accounted for, the total amount of waste produced in the factory in the fiscal year 2018/29 was **472.035 tonnes**, with a **1.2% reduction when compared to the previous year.**

Reuse of fire-resistant materials

A plant that reuses fire-resistant materials putting them back into the production cycle as partial substitute of the lime is operational at the factory site. Its activity allows to avoid dumping approx. 15-20 tonnes of waste annually, thus reducing the consumption of lime and, at the same time, the production of waste.



Slag park

The slag park, owned by AST, was built in the 70s in the Valle location. The authorisations obtained dictate that the park is used exclusively for the disposal of waste coming from the factory following waterproofing and proper disposal of leachate.

On June 28th 2019 the residual volume was equal to m^3 2,567,438. A portion of this area has been completely abandoned since 2015 because its volumetric capacity was exhausted and the authorised quotas were met.

The revitalisation of this area based on a project of environmental requalification, which will be described in a later chapter, has been planned.

Consumption

Steel production requires the use of a lot of energy. Therefore, being able to reduce the consumption by improving the energy efficiency is an important goal for both environmental and economic reasons.

AST uses electric energy and natural gas. The two furnaces of the steel factory operate primarily on **electric energy**, while the heating ovens of the rolling mills are powered by **natural gas.** Furthermore, the company makes use of **diesel oil** for the means of transportation as well as for moving materials within the factory.

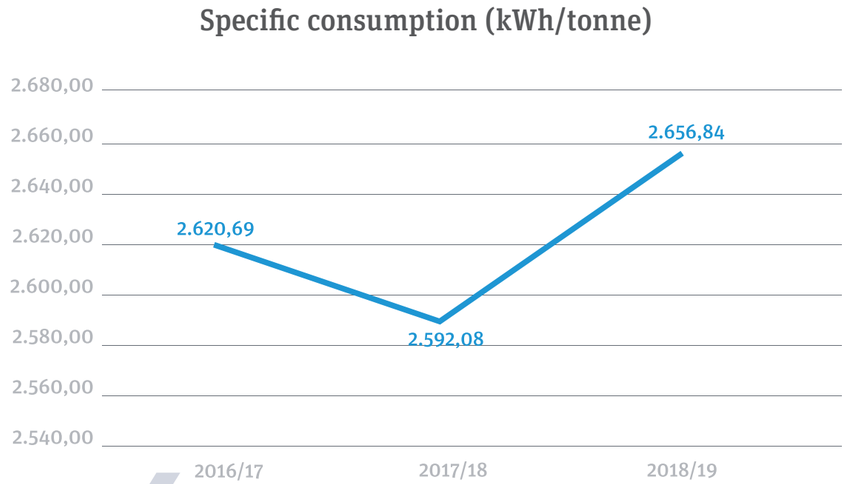
In 2018/19 AST consumed an overall amount of energy (electric energy, natural gas, and diesel oil) equal to **2.605,24 GWh.**

ENERGY CONSUMPTION	2016/17	2017/18	2018/19
Electricity (GWh)	993,62	1.043,55	1.023,47
Natural gas (excluded LINDE/SR) (GWh)	1.480,64	1.552,08	1.578,13
Diesel Oil (GWh)	3,85	3,64	3,64
Total consumption (GWh)	**2.478,11**	**2.599,27**	**2.605,24**

Energy intensity

Beyond the absolute value of energy consumption that depends of course on the volume of production, the most significant indicator to measure the level of efficiency is the one measuring the **energy intensity** or, in other words, the specific consumption of energy per each tonne of steel produced. In 2018/19 it was equal to **2,656.84 kWh/tonne.** After a gradual reduction in the previous years, a 2.5% increase has been recorded in the last year. What was the cause of that? Basically it happened for two reasons. First of all during the past year some types of laminate sheets that require, in the cold phase, highly energy-consuming manufacturing processes were produced because of market demand. Secondly, the calorific value of the natural gas utilised was lower than in previous years.

SPECIFIC CONSUMPTION (Y/Y)	2016/17	2017/18	2018/19
Electricity (KWh/tonne)	-1%	-1%	1,8%
Nat Gas (excluding LINDE/SR) (KWh/tonne)	0%	-1%	2,9%
Diesel oil (KWh/tonne)	4%	-11%	3,8%
Total	**0%**	**-1%**	**2,50%**



3.4

More specifically, for each tonne of steel the following specific consumption have been calculated:

- electric energy 1,044 kWh
- natural gas 1,609 kWh
- diesel oil 3.7 kWh

Production of renewable energy

Inside the steel complex there are plants producing energy from renewable sources:

- **3 photovoltaic plants** (owned by third parties) located in the parking lot next to the company's canteen, in the Finishing Centre, and above the roof of the Tubing unit's warehouse;
- **2 mini-hydroelectric plants** that take advantage of the difference in height between the loading tank of the main steel factory site and the Nera river discharge location for the used water (after purification).

The energy produced as a whole was equal to **8.18 GWh.**

Energy efficiency

The **electric furnace** technology provides obvious environmental advantages, thanks to the recycling of the iron material, however it requires high energy consumption. Improving as much as we can the levels of efficiency and reducing consumption are very important goals for both market competitiveness and environmental reasons.

For this reason Thyssenkrupp AG, in accordance with the directive 2012/27/EU on energy efficiency, promoted the **"GEEP programme"**.

Within the context of this programme, AST implemented a series of actions to improve the levels of efficiency and to reduce consumption. Among them:

- the heating of scrap metals inside the vat of the electric furnace, is done using natural gas burners which assist the electric arc during the initial part of the fusion process;
- the transfer of semi-finished products while they are still hot directly to the heating ovens, as it happens with the partial "hot load" of slabs in the WB oven of the hot rolling mill;
- **"smart" switching off** of service machines of the production lines during planned stops;
- **use of LED lights;**
- an installation for **recovering the heat** present in the fumes produced by the slab heating oven (hot rolling mill) started working in 2019.

The new heat recovering installation

It is a really innovative project, the first of its kind in Italy, built thanks to a **4 million euros** investment. Introduced in April 2019, the new installation for the **generation of vapor** allows to **recover a high quantity of heat** (so-called thermal waste) coming from the hot rolling mill, to transform it into vapour, and to **reuse it in the production cycle.**

The installation of **a heat recovery boiler** allows to produce vapour overheated by the exhaust gas from the WB oven's chimney. Thanks to this innovation a significant reduction of natural gas consumption is possible.

The factory utilises over **230 thousand tonnes of vapour each year.** Vapour is usually produced by using fossil fuels inside the boilers, while, by using the heat recovery vapour generator, the company now brings to **70%** the amount of vapour produced without the use of fossil fuels. That allows to **reduce the CO_2 emissions by approx. 30 thousand tonnes per year.** To give a better idea, since that corresponds to the consumption of approx. 15 thousand families, it is like 1/3 of the residents of Terni will not use natural gas for their energy needs anymore.

Vapour Production

Reduction of Gas Consumption 15 Millions M^3/year

Reduction of CO_2 emissions 30.000 tonnes/year

Indirect consumption

Steel production naturally implies also a series of other activities either pre- or post-production in the supply chain leading to the end consumer. Those activities consume energy for moving and processing steel products as well as raw materials used for their production. The energy consumption coming from these activities represent the indirect energy consumption, which, because it is characterised by a high degree of vagueness, it is not easily measurable.

3.5 Greenhouse gas emissions

The steel sector is actively involved in the reduction of climate-changing emissions, as required by the Paris agreement. It also participates to the Emissions Trading System, as defined in the Directive No 2003/87. This Directive requires that the administrators of industrial plants belonging to specific categories (among them the steel production) request an authorisation for greenhouse gas emissions to the national authority in charge. Periodically each member Nation develops a national plan to determine the total quotas of emissions to be granted to each plant for the period and manner in which they are assigned.
In the sustainability report, both the direct emissions of greenhouse gas, generated by the AST's production activities, and the indirect emissions linked to the consumption of electric energy purchased from the electric company are reported.

Direct and indirect emissions

The calculation of the greenhouse gas emissions is based on the reporting system GHG, which ranks the greenhouse gas emissions in:

- direct emissions
- indirect emissions deriving from production processes of the purchased energy
- other indirect emissions (in the case of AST they derive from transportation).

Since the data on the emissions deriving from transportation is not available, the calculation of the emissions reported in the sustainability report refers to the direct emissions and the indirect emissions acquired from energy carriers. In order to calculate the indirect emissions we use the data on the company's electricity consumption and the factors of greenhouse gas emission for the Italian energy mix ("Factors of greenhouse gas emission of the national electric system" ISPRA, preliminary assessment for 2019).

CO_2 emissions of the steel industry

Steel production entails CO_2 emission into the atmosphere, either directly because of the process and combustion requirements during the various phases of the production cycle or indirectly mainly due to its electric energy consumption.

- In **the integral cycle production** the main contribution to the emissions is given by the significant input of carbon needed for the process of reduction of the iron mineral in the blast furnace.
- In **the electric furnace cycle**, in addition to a contribution due to reducing agents as well as to a process which is part of loading, the emissions are mainly of the indirect kind which are connected, in other words, to the electricity production needed to melt steel scrap metals.
- The CO_2 emissions from **the activities of steel manufacturing and transformation** (rolling, forging, etc.) are instead basically due to the natural gas combustion in the heating or thermal treatment ovens.

The progress of the Italian steel industry

In 2018 **the direct emissions of CO_2** by the Italian steel industry (taking into consideration all plants included in the ETS system) were equal to approx. **10.8 million tonnes.** The direct emissions of the steel producing plants represent about 7.5 % of the total of the Italian emissions covered by the ETS system.
If we take into consideration also the **indirect emissions** due to the electricity consumption in the steel industry plants and those linked to the combustion of steel producing gases in the process of producing electric energy and heat, we can estimate a total value of approx. **23 million tonnes of CO_2**. Based on the national inventory of greenhouse gases published by ISPRA in 2019 (pertaining to 2017) such emissions can be estimated to be approx. 5% of the total national emissions of greenhouse gases.
These data, if compared with the ones from 1990, which are the baseline for the Kyoto protocol (and they are also used as a reference point for the new European and international goals for 2030 and 2050), show the progresses attained by the steel sector as far as the reduction of the emissions in the past 30 years is concerned. As a matter of fact, the Italian steel industry's CO_2 emissions from 1990 to 2017 are less than half both in absolute and in specific terms.

3.5

Direct emissions

By taking as a reference the fiscal year, in 2018/2019 the direct emissions were equal to **315,712 tonnes of CO_2.** A **reduction of 11.4%** with respect to the previous year has been recorded.

DIRECT EMISSIONS (estimate*)	2016/17	2017/18	2018/19
CO_2 from mass balance C (tonnes)	48.176,34	49.756,81	33.521,57
CO_2 from methane, anthracite and electrodes (tonnes)	286.554,98	306.490,37	282.190,83
Total	**334.731,32**	**356.247,18**	**315.712,4**

DIRECT EMISSIONS IN THE CALENDAR YEAR

In order to provide a complete set of information, the direct emissions calculated with reference to the calendar year (January 1st – December 31st), as required by the Directive ETS, have also been reported. In 2019 they were equal to 336,465 tonnes with a reduction of 4.9% compared to the previous year.

Direct emissions Calendar year	2017	2018	2019
tonnes of CO_2	**337.976**	**353.886**	**336.465**

The **specific emissions,** intended as the amount of greenhouse gas **directly** generated per each tonne of production, were equal to **0.32 tonnes of CO_2/tonne,** down when compared to the previous years.

Specific emissions	2016/17	2017/18	2018/19
tonne of CO_2/tonne	**0,34**	**0,34**	**0,32**

Indirect emissions

As we mentioned before, the **indirect emissions of greenhouse gas** linked to **the electricity purchased from electric companies** and used by AST have also been reported, although these are greenhouse gas emissions generated by other subjects in other locations. In 2018/19 these emissions were equal to 282,785 tonnes of CO_2 eq. The reduction with respect to the previous year is due to an improvement of the factors of emission of the national energy mix.

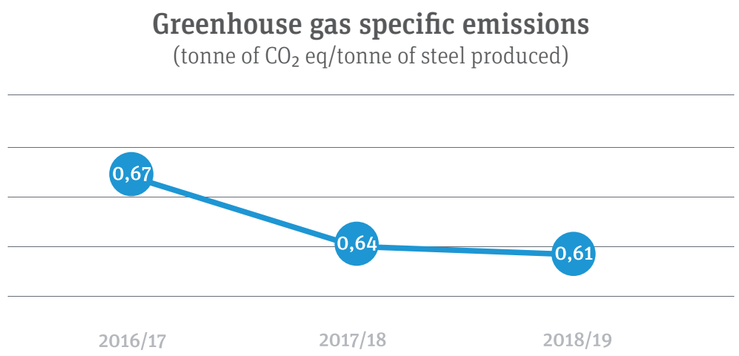
Indirect emission greenhouse gas	2016/17	2017/18	2018/19
tonne CO_2	**307.376**	**303.464**	**282.785**

Total emissions

Including direct and indirect emissions, **the total emissions** in 2018/19 were equal to **598,497 tonnes of CO_2 eq.** The **reduction** with respect to the previous year (659,710 tonnes) is **9,3%.**

Specific emissions

The more significant value is the one relating to the **specific emissions** or, in other words, the amount of emissions (direct and indirect) per each tonne of steel produces. The data highlight a trend of **gradual reduction**. In fact, it goes from 0.67 tonnes of CO_2 eq. per each tonne of steel in 2016/17 to 0.64 in 2017/18 to a value of **0.61** in 2018/19.



3.6 Other emissions in the atmosphere

The prevention and reduction of emissions into the atmosphere represents one of the priorities from an environmental perspective. The data relating to the fiscal year 2018/19 show a reduction of emissions of nitrogen oxide (NOx) and dust containing chromium and nickel when compared to the previous year.

Emissions in the atmosphere	2016/17	2017/18	2018/19
NOx [tonne/anno]	**1.281,1**	**1.826,6**	**1.141,8**
PM 10 [tonne/anno]	**18,0**	**17,0**	**18,3**

Dust contains metals. Among them it is worth mentioning the data relating to **chromium** and **nickel** as they are elements characteristic of stainless steel products.

	2016/17	2017/18	2018/19
Chromium [kg/year]	**310,3**	**652,2**	**336,3**
Nickel [kg/year]	**60,4**	**89,1**	**56,4**

Relevant parameters for the steel sector are the ones related to persistent organic pollutants **(POP)**, regulated in Europe by specific rules, updated in July2019, for the protection of the human health and the environment.

Emissioni PCDD+PCDF*	2016/17	2017/18	2018/19
g/year	**0,172**	**0,174**	**0,187**

*dioxins and furans

Emissioni PCB**	2016/17	2017/18	2018/19
kg/year	**1,5**	**2,79**	**0,92**

**biphenyl polychloride

Methodological note

The data regarding the amounts were calculated by AST pursuant to the criteria E-PRTR (system of communication of the AIA's data included in the "European Pollutant Release and Transfer Register" pursuant to article 4 DPR 157/2011 which provides the rules for the implementation of the CE 166/2006 Regulation).

The emissions of dust (essentially coming from the steel producing plant and to a lesser extent from the downstream processing steps of hot and cold rolling) and NOx coming mostly from the methane combustion in the ovens for heating and treatment located in the hot and cold rolling mills areas and, to a lesser extent, from emissions in the steel producing plant have been deemed significant.

3.6

Specific emissions

The data on the **specific** emissions or, in other words, the emissions generated per each tonne of products, show an improvement when compared to the previous year as far as NOx, chromium and nickel are concerned, while an increase of emissions of PM10 have been recorded.

ESPECIFIC EMISSIONS	2016/17	2017/18	2018/19
NOx (kg/tonne)	1,33	1,79	1,16
PM 10 (kg/tonne)	0,018	0,016	0,018
CHROMIUM (g/tonne)	0,32	0,64	0,34
NICHEL (g/tonne)	0,06	0,08	0,06

The dust of Prisciano

A situation followed very closely is the one concerning **Prisciano**, a town located north-east of the steel factory, where big dust grains fell on the buildings near an area of the factory (slag ramp) without significantly affecting the concentration values of the fine dust. As a matter of fact, the trend of the concentration of PM10 measured by the monitoring control unit AST installed in accordance with AIA's regulations do not show any significant change. The data from the control unit, just like the data transmitted by other control units located on the entire Umbrian territory, are managed by ARPA and posted on its web site and app.

The **completion of the project of slag recovery** will allow to deal with the problem of Prisciano's dust once and for all.

Biological monitoring of the air quality

Within the context of monitoring required by the Integrated Environmental Authorisation (AIA), the Department of Biosciences and Territory of the University of Molise put in place and implemented from 2015 to 2018 on AST's behalf a plan for the biological monitoring of the air quality using IBL (lichen biodiversity index) in the greater area affected by the presence of the steel factory. The monitoring is performed via 21 survey stations and in accordance with the guidelines of the National Agency for the Environmental Protection.

The methodology used allowed to give a thorough idea of the environmental modifications in 2015 (year of the first campaign) and the changes occurred in a period of almost three years in an area of approx 50 square kms, which included the points of interest A1 (Terni-Le Grazie control unit), A2 (Prisciano control unit), and A3 (Borgo Rivo control unit) as well as the urban area where the steel pant is located, the peri-urban areas occasionally anthropised, and residual centres of wooden areas.
The 2018 campaign confirmed the levels of naturality/alteration with respect to conditions considered natural, which were already detected during the 2015 campaign. Those results showed a widespread improvement almost everywhere although statistically significant only in the Campomicciolo area.

Substances harmful for the stratospheric ozon

As far as cooling units, heat pumps, and fire-extinguishing units are concerned, the company uses **fluorinated gases** (e.g. HFCs) which are not included in the list of substances harmful for the stratospheric ozone but they are still subject to the regulations regarding greenhouse gas and, therefore, they are required to be reported on an annual basis.
The last data recorded by AST and subject to annual reporting using the *Fgas* disclaimer are the ones from 2017 because the DPR 146/2018 abolished the obligation to keep the equipment records and the *Fgas* disclaimer has been substituted by statements from certified maintenance companies. Therefore, AST does not have any obligation any more except verifying the work of the maintenance supplier. Only in five **cooling units** HCFC gas of type R-22, which is included in the category of substances harmful for the ozone layer, is still present. As required by the current regulations, these types of substances are being gradually eliminated and substituted by other types of gas at each maintenance cycle.

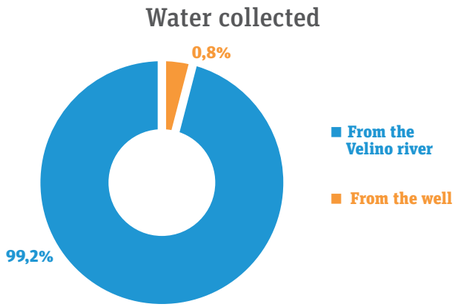
3.7 Water

Consumption

Water is mostly used for the industrial process. To a much lesser extent, water is used for services such as cleaning courtyards, hosing grass areas, in toilets etc.

- The water **for industrial use** is collected from **the Velino river** and in small part from **the well.**
- The water collected from **the well** is used primarily in **toilets** and to a lesser extent for industrial use in the indirect cooling process of some control units.
- The water purchased from **the water supply companies** is used exclusively for **human consumption.**

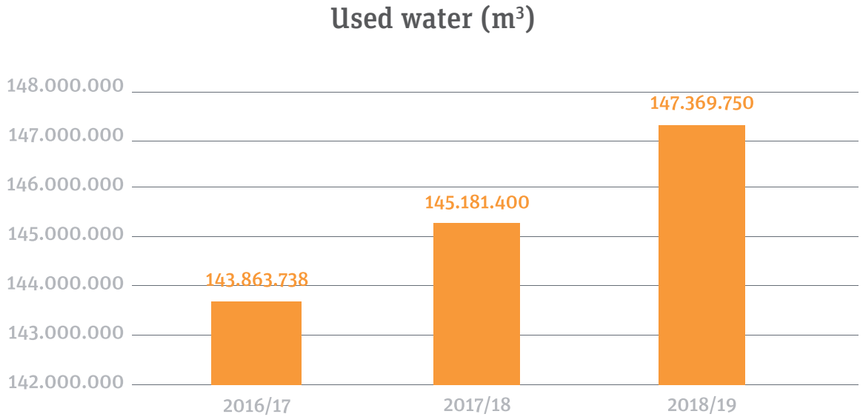
In 2018/19 **147,369,750 cubic meters of water** have been utilised. 99.2% of them were collected from the Velino river and 0.8% from the well.



Reuse

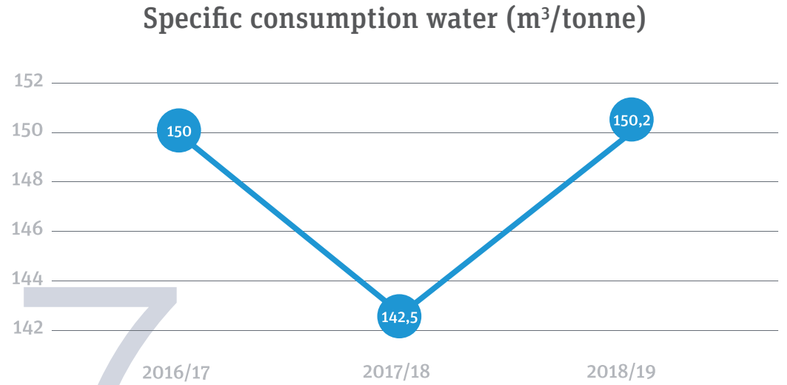
The factory adopts two different **ways of reusing the water resources:** a true recirculation (closed-circuit) and a recirculation intended as a reutilisation of the water cascading from a production process to another.
A very high percentage of water is reused this way.

Furthermore, we have to keep in mind that, **after purification,** the water collected from the Velino river is almost entirely, excluding some evaporation, given back to the Nera river. Therefore, there is not a real "consumption" of water resources since the water collected, once used in the production cycle and later purified, is **reintroduced into the Nera river,** where the Velino river merges, through the company's drains, through a hydroelectric power plant, and through the Marmore waterfall.



Specific consumption

In 2018/19 the specific consumption of water or, in other words, the amount used per each tonne of production was equal to m³ 150.2.



Purification

Waters used by the company are purified via **a chemical/physical treatment plant** using selective resins for heavy metals, sand filters, and charcoal carbon filters.

Inside the factory there are also other purification units for the treatment of some specific types of water waste (such as the slightly acidic water coming from pickling). For such water waste it is required for the concentration limit to be similar to the one set for draining into the surface water bodies before merging into the company's main sewerage.

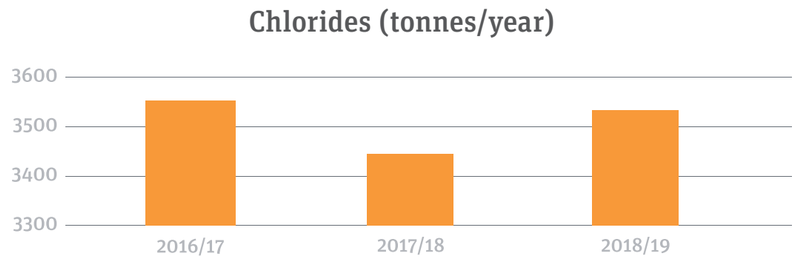
Drains

During the last fiscal year, the amount of water drained has been equal to **m³ 152,358,550.** A constant monitoring ensures the compliance with **respect to the limits** imposed by the current laws regarding the final water drains merging into the surface water bodies or into the city sewerage.

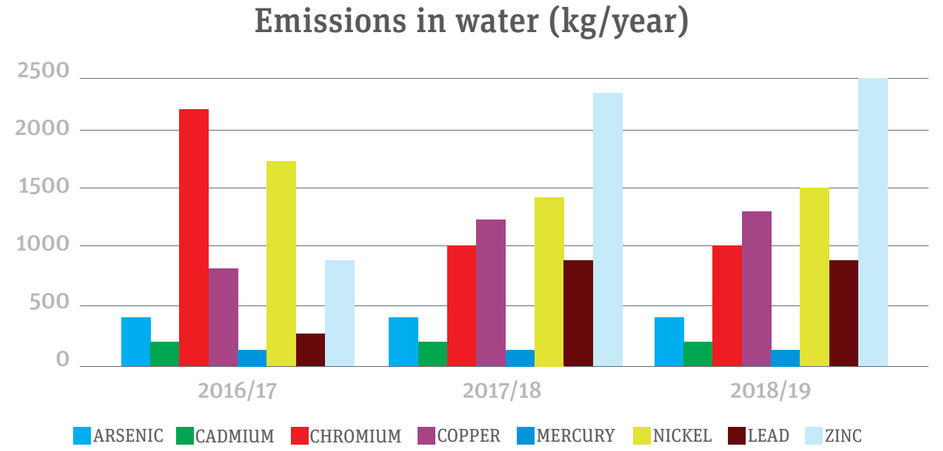
The four final drains merge into **the surface water bodies or into the city sewerage.** There are also three partial drains that merge into the factory's sewerage and, therefore, flow into drain no. 1. For such partial drains it is still required to comply with the limits in surface waters established by the law.

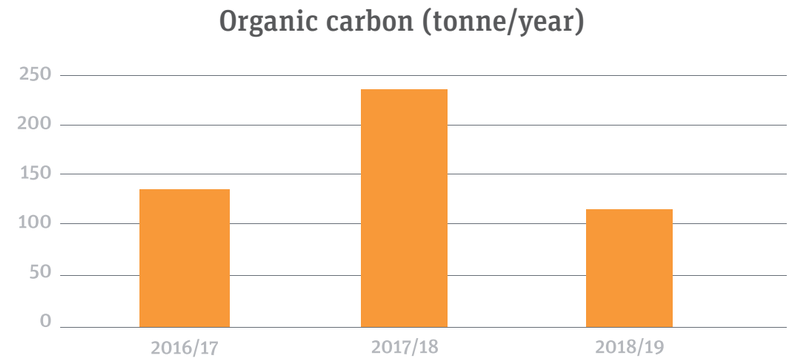
Methodological note

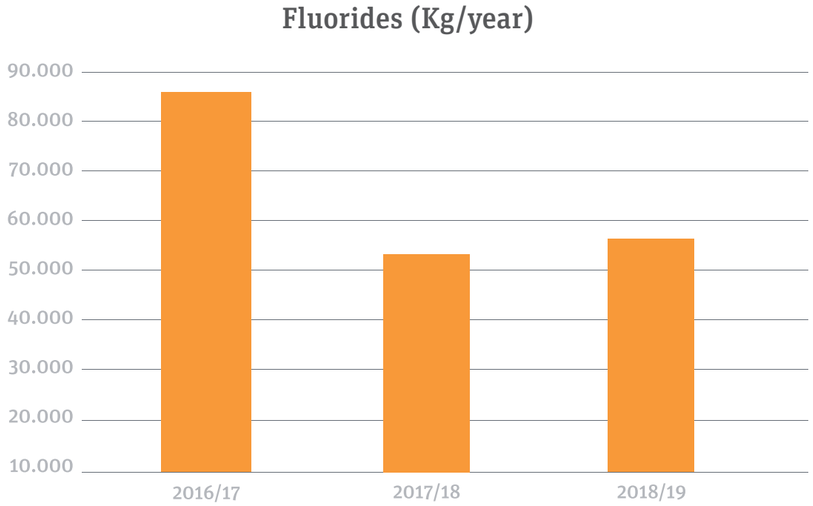
During the period herein reported, in compliance with the AIA's regulations, the company carried out the analysis of a larger number of samples and performed a higher number of tests (e.g. marcury and arsenic). The data pertain to quantities calculated in accordance with the criteria of EPRTR*



EMISSIONS IN WATER		2016/17	2017/18	2018/19
Arsenic (As) and compounds	kg/yr	341,7	335,1	342,8
Cadmium (Cd) and compounds	kg/yr	170,8	167,6	171,4
Chromium(Cr) and compounds	kg/yr	2.308,0	1.054,6	1.081,4
Copper (Cu) and compounds	kg/yr	854,1	1287,3	1.319,4
Mercury (Hg) and compounds	kg/yr	68,3	67,0	68,5
Nickel (Ni) and compounds	kg/yr	1.833,2	1.515,1	1.533,5
Lead (Pb) and compounds	kg/yr	170,8	670,2	685,7
Zinc (Zn) and compounds	kg/yr	932,2	2494,0	2.554,4
Fluorides	kg/yr	84.116,4	57.078,1	57.932,5
Chlorides	tonne/yr	3.529,2	3.435,3	3.526,3
Total organic carbon	tonne/yr	135,3	235,0	142,5







3.8 Noise

In order to verify the compliance with the limits required by the acoustic zoning of the City of Terni measurements on 9 receptors located inside the factory are regularly performed following an agreement with the authorities in charge.
Measures for soundproofing and noise reduction are being developed. The construction of the new plant for slag recovery will bring considerable improvements also from this perspective.

3.8

3.9 Transportations

Approx. **30% of our shipping** on the Italian territory occur **using the railroad system** compared to a national average of 8%

Transportation on railroad increased during the pandemic

During the months of the coronavirus emergency, AST further increased the freight transport on trains, up from 30% in the beginning of 2020 to 40% in the month of May (with spikes of 50% in July). By doing so, AST increased the use of railroad and intermodal transport, thus reducing the road transport and curbing both the costs and the emission of pollutants.

In the context of Supply Chain Management, AST developed a series of projects and alternative solutions to freight transport on roads. By developing the projects “Transporeon”, “Taxi Train Shipment Flow”, and “Groupage Project” the company invested in types of intermodal transport which allow the movement of freight by combining two or more means of transportation, with the objective of reducing movements on roads, curb the shipping costs and the emission of pollutants.

Projects for sustainable mobility

- **TRANSPOREON:** for an interconnection of industrial and trading companies with their respective suppliers of logistic services. Thanks to solutions based on internet, tendering, transport assignments, time slot reservations, and monitoring, the transport can be managed in an easy and efficient way.
- **TAXI TRAIN SHIPMENT FLOW:** “virtual” trucks which, by exiting the factory as taxi-trains, travel together on tracks for a long way before completing the last portion of their journey on the road.
- **GROUPAGE PROJECT:** abatement of the environmental impact via a reduction of the number of heavy vehicles circulating on the roads.

It is also worth noting that recently:

- a railroad service on a logistics platform in the Milan area with last mile completed on roads has been activated for the freight transport to the Lombardy region;
- for the largest customers traditionally served by railroads through the Piadena logistics platform a doubling of the tracks usually used has been activated;
- for the transport abroad, by applying the same principle, a logistics platform in the Netherlands has been identified for the customers of the Benelux area.

Electric vehicles

AST chose to equip itself with 50 electric vehicles which form the company’s new green fleet (35 vans and 15 cars that renew and substitute the old fleet of vehicles). Inside the factory specific areas for recharging these vehicles have also been created.

3.9

3.10 Biodiversity

The AST's industrial activities are not conducted in protected areas of significant biodiversity value. In some of the AST's properties located in sites of community interest (S.I.C) and in special protection zones (Z.P.S.) the pipes bringing the water from the Velino river to the factory pass through.

Environmental monitoring using bees, reliable environmental guards

In order to monitor the health of the ecosystem and the biodiversity in the industrial area, **AST** signed an agreement with the Department of Chemistry, Biology, and Biotechnologies of the University of Perugia for the *"Development of a monitoring network in the Terni basin for studying the pollutant dispersion into the atmosphere by using beehives containing colonies of the Italian indigenous specie Apis mellifera ligustica"*.

The project consists in the installation in the factory area of two apiaries comprising 10 beehives each containing colonies of indigenous Italian bees and in the monitoring and acquisition of data (sampling of adult bees, honey, pollen, and wax). The bees are in fact better suited in searching the surrounding territory and in detecting the possible dispersion of pollutants in the Terni basin. The goal of this initiative is to keep under control the level of pollutants by analyzing in the laboratory the honey produced by the bees.

The biomonitoring of bees represents an innovative instrument that allows to register potential ecological changes due to pollutants present in the industrial area and its surroundings. Considering that these hymenoptera visit thousands of flowers in a single day and usually in a maximum radius of 3 kms – they are able to provide a highly localised evaluation system.
Bees, as we all know, are reliable guards of the environmental health and their presence guarantees the equilibrium of an ecosystem. If we want to investigate the presence of heavy metals and fine dust or simply the level of pollution in the environment, we can learn more about it also thanks to the bees. Because of their organisation and industriousness, they are among the most reliable species as bioindicators of the air quality.

The requalification of the slag park area

The Vocabolo Valley slag park is located in a place of strong environmental interest, close to the urban fabric but also close to the Marmore waterfalls, which is a unique scenic beauty of nature. The company **secured this area** with a project approved by the Ministry of the Environment, ISPRA, the Regional, Provincial, and City Administrations, ARPA and the ASL. The plan included the process of *capping* and a strict control programme to monitor the adjacent aquifers.

A project designed by the architect Andreas Kipar, an expert of requalification of industrial areas, **will transform this area into a park** available to all residents, a new green zone that will become integral part of the urban landscape and the Terni basin. This project will allow to requalify an area of approx. 40 hectares while showing respect for the **biodiversity** of the Terni hills and will include an outdoor auditorium, an area dedicated to mountain biking, a park dedicated to steel artworks, ascending installations made of steel, and relaxation areas with panoramic views.

3.10

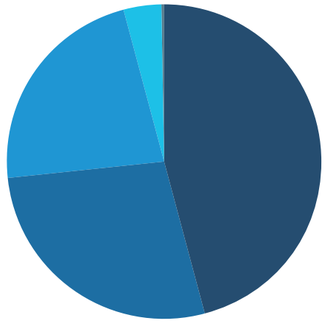
3.11 Environmental costs and investments

Costs for the environmental protection

The costs for managing the environmental protection were up 3.8% compared to the previous fiscal year, and they were over 35 million euros in 2018/2019.

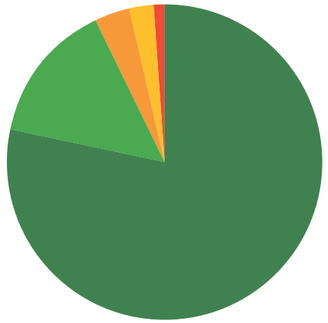
COSTS FOR ENVIRONMENTAL PROTECTION	2016/17	2017/18	2018/19
euro/000	29.183	33.838	35.108

COSTS FOR ENVIRONMENTAL PROTECTION 2018/19



- WASTE MANAGEMENT 16.127.000 euro
- PROTECTION OF WATER RESOURCES 9.670.000 euro
- PREVENTION OF EMISSIONS FOR THE PROTECTION OF AIR AND CLIMATE 7.924.000 euro
- PREVENTION OF SOIL POLLUTION 1.308.000 euro
- PREVENTION OF NOISE POLLUTION 79.000 euro

ENVIRONMENTAL INVESTMENTS 2018/19



- PROTECTION OF AIR AND CLIMATE 4.371.000 euro
- WASTE MANAGEMENT 818.000 euro
- LAND PROTECTION 196.000 euro
- PROTECTION OF WATER RESOURCES 135.000 euro
- PREVENTION OF NOISE POLLUTION 60.000 euro

Environmental investments

During the 2018/19 fiscal year approx. **5.6 million euros** were invested for the environment. Those investments were used not only to continue the activities needed to comply with the AIA's and the Ministry of the Environment's provisions relating to the SIN's ("National Interest Sites") regulations but also to make improvements able to guarantee a better protection of the environmental matrices (air, water, soil). In particular the following activities stand out:

- measures for **noise remediation** taken on the noisiest sources present in the SIDA purification plant and in the abatement plant "De Cardenas";
- the completion of revamping the "Bertolotti" installation (loading of ferroalloys and additives in baskets) with further improvements with respect to **the capture of dus**t;
- **the heat recovery** from fumes produced by the slab heating oven (Walking Beam) for **the production of vapour** to use inside the factory;
- measures for capturing and **abating emissions** put in place in the "forging" area (new installation for the quenching tank, strengthening of the existing installation "Messer cut");
- **the capture of fumes** coming from the potential slabs emergency cut at **the CCO7 non-stop casting plant;**
- a preliminary engineering study for **the capture of fumes** deriving from **the slagging process at the ASEA refinement station;**
- a preliminary engineering study for **the capture of residual emissions** escaping from the "furnace tapping bay";
- the increase of **the network of piezometers,** both in the factory area and in the "slag park" area, for the characterisation of underground waters.

As for **the project of slag recovery,** which will be described in more details in the following chapter, in addition to formalising the contractual aspects with our partner Tapojärvi, we moved forward with the preparation work of the areas where the new "Metal Recovery" plant will be built.

4

THE TRANSITION TO A CIRCULAR ECONOMY

4.1 The European strategy

With the United Nations' 2030 Agenda and the Paris Agreement on climate the international community established the importance and the urgency of building a model of economic development more sustainable from an environmental and social perspective.

The circular economy plays a central role because it provides a new paradigm for the production and consumption systems able to preserve the products value, to increase **the efficiency in the use of resources,** and to consider the waste not as items to discard but as resources to transform and reintroduce in the production cycle.

The strategic value of the circular economy consists in its ability to limit the consumption of non-renewable resources, which has reached at this point unsustainable levels.

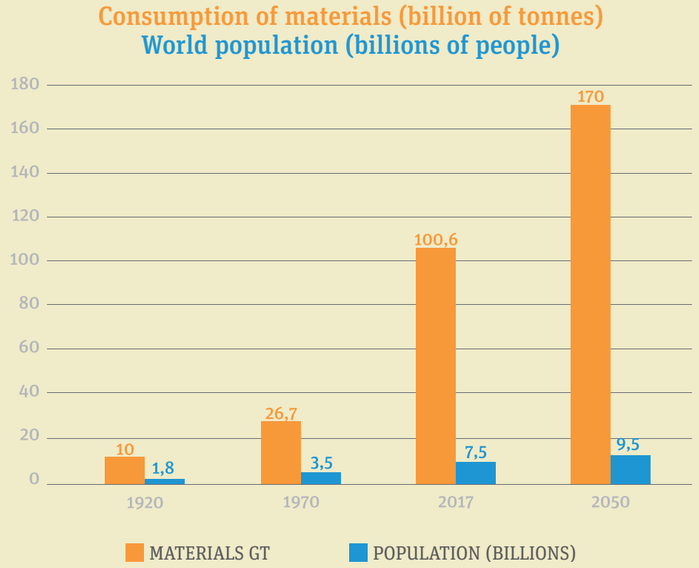
The transition from a model of linear development (take, transform, use, discard) to a circular one (reduce, optimise, make it last, reuse, recycle) implies a transformation of the way our entire economy works, by involving the way we plan, produce, work, consume.

In this context, **the European Union** set the goal, with **the Green Deal,** of taking a leadership role at the global level to speed up the transition toward a circular economy.

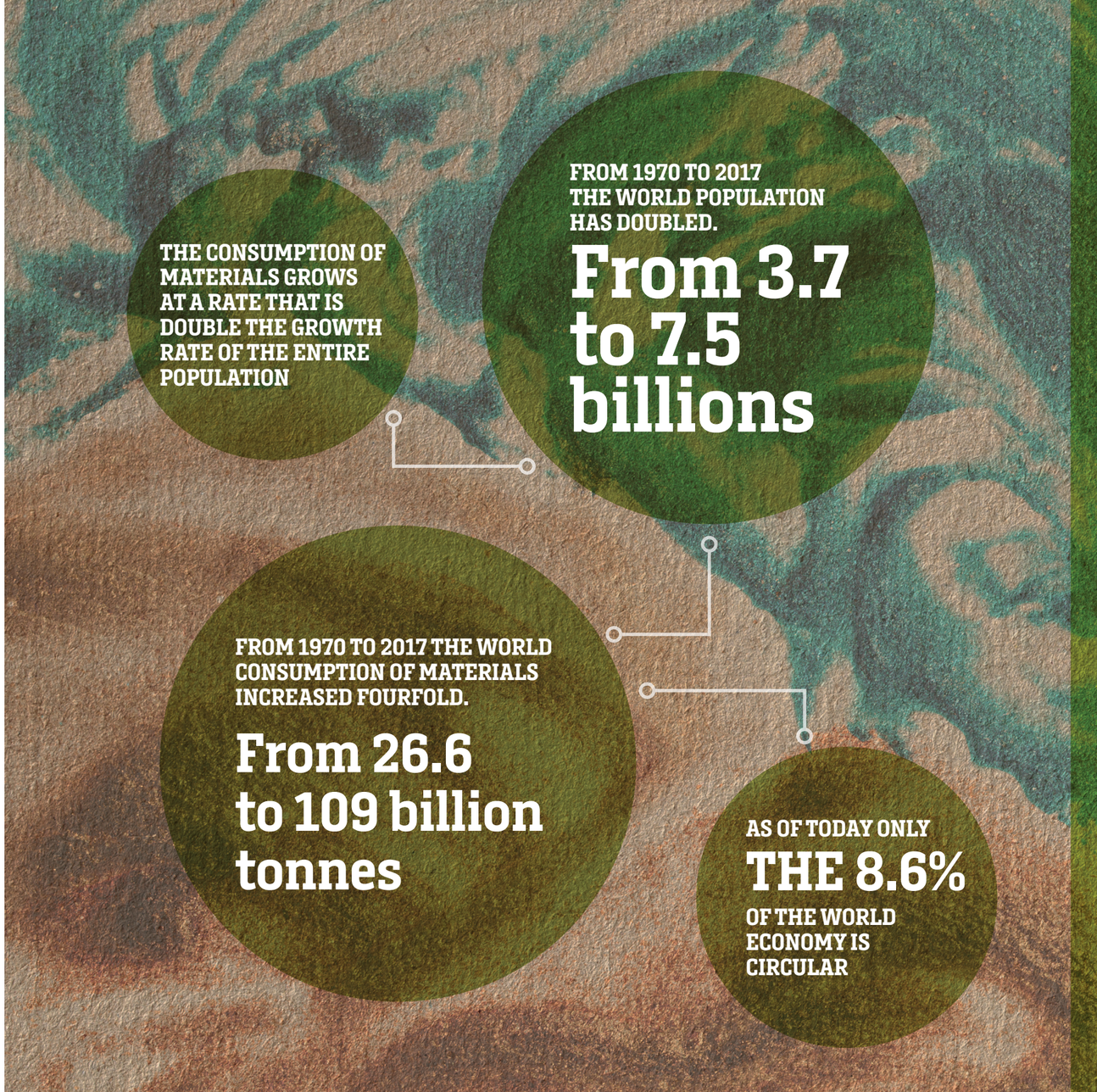
4.1

The need of a circular economy

Why is a circular economy more and more urgent? Few pieces of data are sufficient to understand why. Every year the world economy consumes approx. **100 billion tonnes of materials** (minerals, fossil fuels, metals, biomass) and of them only 8.6% is currently reused or recycled. By following the current trend, the consumption of natural resources, already tripled since 1970, could reach approx. **180 billion tonnes before 2050.**



Source: Circularity Gap Report 2020



- The consumption of materials grows at a rate that is double the growth rate of the entire population.
- From 1970 to 2017 the world population has doubled: from 3.7 billion people to 7.5 billion.
- In the same time frame the world consumption of materials has increased 4 times, going from 26.6 to 109 billion tonnes.
- As of today, only 8.6% of the world economy is circular.

Circular economy and climate changes

The transition to a circular economy is therefore an inevitable challenge for the sustainability of development and **the protection of the climate.**

The greenhous gas emissions are not going down fast enough to reach the climate goals and the transition to renewable energy sources can only reduce them by 55%. The remaining **45% of those emissions** depend on how we produce and use goods. The transition to a circular economy is a fundamental step also toward the achievement of the climate objectives.

Efficient use of resources

The current model of linear growth implies that natural resources are unlimited and available at low-cost but this is not the case: the resources are limited, their demand keeps on growing, and the equilibrium of the ecosystem is more and more compromised.

From this context the need of an economy based on **a more efficient use of natural resources** and on **a reduction of waste** comes to life. An economy where the products keep their use value as long as possible and where, at the end of the product lifecycle, the resources are not lost as waste but they are reintroduced in the production cycle to create new value. A circular economy in which the products are designed to be **reused, regenerated, and recycled.**

The advantages of the circular economy

The transition to a circular economy has a strategic importance for Europe and for Italy not only from an environmental point of view but also from the perspective of **economic competitiveness** because it reduces the risks connected to the procurement of raw materials.

This is not a simple challenge but brings many **benefits:** lower consumption of raw materials, lower procurement costs for the manufacturing sector, reduction of greenhouse gas emissions, new technologies, job growth, and companies' competitiveness.

The new European Plan of action

On March 11th 2020 the European Commission completed the framework of the European industrial strategy with the publication of **a new Plan of action** for a circuar economy, which contains a series of measures for speeding up the process of transition.

In particular the Commission will propose specific measures:

- so that the design and sale of **sustainable products** will become the rule;
- to guarantee that **products will be designed to last as long as possible** and to be **easier to reuse, repair, and recycle;**
- to make sure that products will be made as much as possible of **recycled materials** instead of virgin raw materials.

The actions will focus on the sectors that utilise more resources and where the potential circularity is greater. A primary objective is also to reduce the waste production and to transform them, by recycling them, into reusable resources.

The goals regarding the circular economy are an essential part of the **Green Deal** and **the EU Next Generation plan** in order to overcome the economic and social crisis caused by the pandemic.

The potentialities of Italy

Italy is a manufacturing nation traditionally poor of raw materials. In order to obviate this deficiency, sooner and more than other nations, it had to find ways **to use more efficiently the resources** and to reduce waste. In other words, Italy was forced to make the best of it, way before they started talking about circular economy.

By combining this old inclination with more recent and innovative activities of recovery and recycle, today **our nation is one of the leaders in Europe** as far as the transition to a circular economy is concerned. The Italian production system recycles more than people commonly think: in the steel industry, for example, our country is among the most upstanding as far as the use of materials coming from recycling is concerned.

The challenge of the Green New Deal and the circular economy represents therefore an opportunity for Italy. An encounter for which it can be ready with its manufacturing industry and its enterprises

4.2 The steel in the circular economy

The steel sector is one of the most crucial sectors for the achievement of a model of circular economy.
Already today, **the steel industry cycle** represents **an upstanding example of circular economy.** All steel products, from the ones with the shortest life span (e.g. shipping products) to the ones with an intermediate life span (e.g. cars) to the more long-lasting ones (such as the construction products), **achieve very high recycling rates** with the highest levels reached actually in Italy.
The recycling of processing waste coming directly from the steel production and transformation processes, which are automatically reintroduced into the production cycle, should be added to the recycling of end-of-life products.

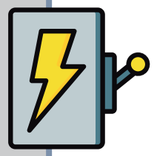
The technological evolution

The role of recycling is more and more significant thanks also to the evolution of technologies. Approx. one fourth of the world steel production occurs **in electric arc installations** using **iron scrap metal as secondary raw materials.** This technology, used primarily in Europe and North America, allows also to reduce up to 70% the greenhouse gas emissions when compared to the use of virgin materials in the traditional furnaces.
Italy is the leader in Europe: the production using the electrical cycle **represents 78% of the total,** while **the average is 39% in the EU and 25% in the world.**

The electric arc ovens

The electric arc ovens guarantee several environmental advantages when compared to the traditional ovens:

- reduction of the energy demand
- reduction of CO_2 emissions
- reduction of dust
- reduction of water demand
- reduction of noise



A material strategic for the circular economy

- Steel is by far **the most recycled material in the world.** Thanks also to the permanent retention of all of its characteristic properties (resistance, ductility, formability, resistance to corrosion of the stainless steel products), steel reaches very high recycling rates ranging from 75% for the shipping products, to 85% for the construction production, up to 90% for cars and machinery *(source: Federacciai)*.

- **The iron scrap metal** is a sort of unlimited source since steel can be recycled an infinite number of times without losing its original characteristics. The steel life span is potentially infinite. Therefore, it represents a true **permanent resource,** essential for the development of a circular economy. As a matter of fact, once the useful life of a steel product is over, it can be reused for new products and new functions by transforming the scrap metal via processes using electric arc ovens. This property of steel is known by the name *up-cycling,* in order to distinguish it from the materials subject to loss of properties and employed in lower level applications *(down-cycling)*.

- In the steel production the circular economy can allow **a saving of virgin raw materials of over 100 million tonnes** worldwide before 2025. According to estimates from the *World Steel Association,* over 90% of steel contained in consumer products will be recycled before 2050.

- In the last 50 years the steel industry has invested a lot in **research and technology** in order to create new advanced and ultra resistant steel grades. Thanks to that effort, it was possible to reduce the weight of many steel components by as much as 40%.
- Optimising the weight of products is an integral part of a circular economy.

- The steel industry has also reduced the use of energy. Producing a tonne of steel nowadays requires **60% less energy than what was required in 1960.**

- Many **subproducts** of steel production cycles can be recovered to create new products, thus reducing the waste to discard in landfills and conserving raw materials.

- Thanks to the ease of their disassembly and separation, the steel components promote **ecodesign, reuse, and regeneration.**

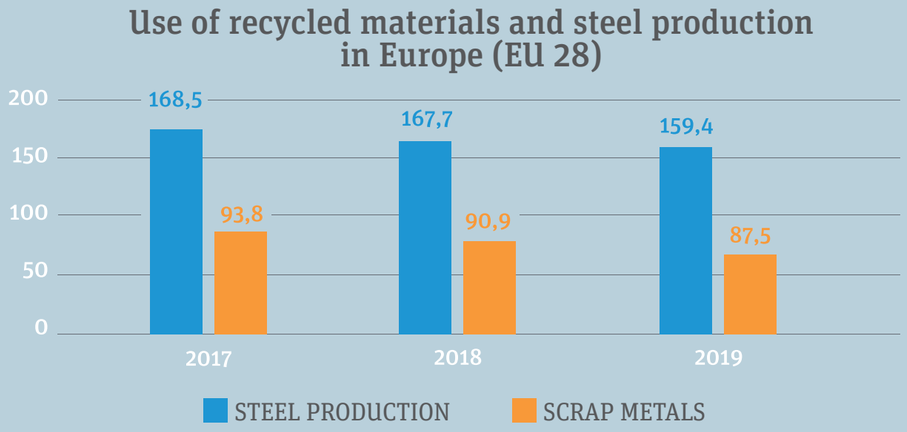
- The residuals of the production processes, such as **steel slags,** can be revalued and **used for new products** in different sectors.

4.2

The recycling of steel

630 million tonnes of steel scrap metals recycled every year worldwide
In 2019 630 million tonnes of steel scrap metals were recycled out of a global **production of 1,870 million tonnes of steel** produced according to estimates from Worldsteel with savings of almost **950 million tonnes of CO_2 emissions** that would have been generated otherwise by the use of virgin raw materials. Besides providing an important contribution to the climate protection, steel recycling allows to save energy and to avoid the consumption of natural resources.

The recycling in Europe
The European Union registered in 2019 **a decrease of 3.7%** of the consumption of steel scrap metals (87.5 million tonnes) in face of a reduction of 4.9% of crude steel production. The percentage of steel scrap metals used in the production cycle was **54.8%**.



A permanent material

Speaking of steel as simply a recyclable material would be reductive. Steel is something more: it is a "permanent" material because it is a durable substance that can be melted many times without losing any of its properties. Steel, of which buildings, machines, cars, and so many other objects of daily use are made, remains as a permanent value, ready to be recycled and to give life to new products with the same properties of the original material.

The **permanent materials** are a category of long-lasting substances able to combine the simplistic distinction between recyclable and non-recyclable or renewable and non-renewable materials. This principle has been recently included in the paper entitled *"Circular economy and efficient use of resources – Indicators for the measurement of the circular economy"* published in December 2018 by the Ministry of the Environment in collaboration with the Ministry of the Economic Development.

4.3 The Italian steel industry

The Italian steel industry is among the ones with the best performance in terms of efficiency in the use of resources.

- Italy is ranked in **the first place in Europe with respect to steel recycling.** In 2018 the Italian steel factories have melted over 19 million tonnes of iron scrap metals *(source: Federacciai)*. This is an amount equal to approx. 2,600 times the iron contained in the Eiffel Tower.
- Over **80%** of the national production is generated thanks to recycling.
- The recycling of **shipping products** made of steel was equal to 78.6% in 2018 (source: Ricrea). Italy is the leader in Europe in this field.
- Approx. 2/3 of the scrap metals used come from **the national market,** while the remaining 1/3 comes from other European and extra-European countries.
- Italy is also among the leaders in Europe as far as **energy efficiency** in steel-producing processes is concerned. The energy consumption per unit of product from the Italian steel industries has gone down **25%** since 1995.
- The **CO_2 emissions** per unit of product from the Italian steel industries have gone down approx. 35% since 1990.
- The **water consumption** of the Italian steel factories has gone down **20%** since 2010.

The proposals of Federacciai for the development of a circular economy

The national steel manufacturing sector is already today set on circularity or, at worst, is in the best position to seize the opportunities that can derive from a further speed-up of the circular economy. However, there are still some crucial aspects we need to work on, for example the possibility to assign more value to production residuals and subproducts. But, generally speaking, it is necessary to pay attention to some crucial aspects so that the circular economy does not remain a sterile concept and will be able to concretely free up competitive resources for the industry.
Within this context, we can identify four main routes to follow for a regulatory and technical development, which will allow the implementation of the guidelines expressed by the European institutions:

1.To promote and incentivise in the European Union the use of 100% recyclable materials, best-suited for multiple recycling and reuse, and with characteristics of durability (permanent materials).

In this context, there are different tools that can be developed or strengthened. For instance, we can think of ecoplanning or extended producer's responsibility (EPR), which should take into consideration, in a more coherent way, the appropriate criteria of recyclability, durability, separability of materials, repairability, etc. In order to correctly evaluate, quantify, compare, and communicate the environmental sustainability of products, the environmental product's declaration (EPD) and the product's environmental footprint (PEF) will be used more profusely. However, these are instruments that cannot disregard an approach based on the evaluation of the entire product's life cycle (life cycle thinking). The frameworks of the "Green Public Procurement" (GPP) can certainly play an important role. In Italy such frameworks have been recently reinforced and made more binding by requiring in public procurements mandatory quotas of materials with specific characteristics from a circularity point of view or alternative to natural resources (including among them not only recycled materials but also subproducts).

2.To sustain the quality recycling and the competitive functioning of the secondary raw materials' market in Europe, thus guaranteeing availability and quality of strategic resources such as iron scrap metal.

Italy is a net importer of scrap metals. The national collection covers only two thirds of the steel factories' needs in terms of iron input. The EU instead is an overall net exporter of scrap metals with an import/export gap growing significantly in the last decade. It has been calculated that over 20% of scrap metal generated in the EU is sent to extra-European countries. Considering the limited amount of primary mining resources in the old continent, the iron scrap metal, whose use allows huge savings in terms of energy and CO_2 emissions, should be deemed as a true European "mine" to preserve carefully by increasing its availability and quality. Paraphrasing the slogan promoted by the EU Commission ("Closing the loop"), it is necessary to create conditions so that the virtuous cycle of the circular economy can close effectively in the territory, thus avoiding a drainage of materials, ready to be recycled, toward countries that in many cases do

4.3

not guarantee the same standards of sustainability.

3.To facilitate industrial synergies and the sustainable use of production's residuals and subproducts

There are multiple possible ways, already established or at least technically possible. to add value to the residuals of steel production processes. However, the potentiality not yet tapped into available in this field are significant anyway. It is necessary first of all to complete a transition also from a cultural perspective, so that we can move from an approach based on "waste management" to one really launched into a "resource management". In order to do that it is necessary to remove various types of obstacles (regulatory, technical, economic, cultural) which, still today, block the process of maximisation of the benefits relating to an efficient use of production's residuals. This is achieved through internal recovery or through the increase of their value in other processes of production or use, thus promoting industrial synergies. Some of the obstacles are often due to an uncoordinated or improper interaction between different regulations (dangerousness classification of waste, Reach, CLP, soil remediation, etc.) or to a technically incorrect application of methodologies of eco-compatibility evaluation. The application of limits based on a principle of extreme precaution and the use of classification methodologies of subproducts or industrial residuals entirely based on their dangerousness rather than the risks associated with them, could make more difficult or even compromise the continuation of practices of industrial symbiosis and synergy, thus placing itself in stark contrast with the objectives of the circular economy. Furthermore, in this field it is of paramount importance to have available a simple legislation which is consistent throughout Europe and would not leave any possibility of multiple interpretations at the national or local level, which would create obvious distortions.

4.To sustain research and innovation

The research of innovative solutions either in designing manufacturing products, or in technologies for end-of-life recovery, or in the possibility of using production's residuals, can play a critical role and, for this reason, must be appropriately incentivised and financed. A push to the development of ecodesigns while planning products containing steel components can contribute to the improvement of the possibility of disassembly or separation of end-of-life iron components, thus providing an increase of the recovery rates (already very high). In the same way the technologies for the recovery and preparation of scrap metals could be improved, thus contributing to the improvement of the quality of the raw material going into the steel factories, to the increase of efficiency, and, consequently, to the saving of materials and energy. Appropriate resources should also be dedicated to the research of sustainable solutions for reusing production's residuals, with the goal of reducing or bringing to zero the portion of waste that is still sent to landfills.
(source: 2019 Federacciai sustainability report)

4.4 The AST's commitment

Measuring the circularity

How is the circular economy measured? While a standardised methodology of monitoring is still in the process of being defined by the European Union, in Italy the Ministry of the Environment and the Ministry of the Economic Development published in December 2018 the paper *"Circular economy and efficient use of resources – Indicators for the measurement of the circular economy"*, containing a series of guidelines and a first group of indicators.

In this AST's sustainability report. Just like in the previous one, some **indicators of circularity** relating to the company's activities have been elaborated by adopting as reference points said guidelines.

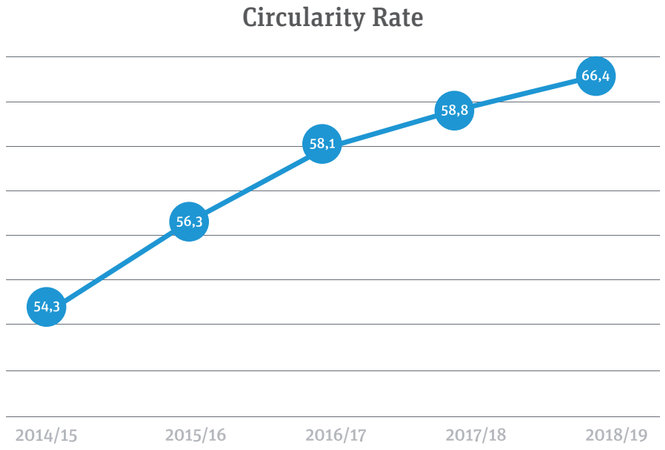
This way the company, already engaged in important projects directed toward a circular economy, intends to measure the efficiency in the use of resources and to monitor its own performance over the years.

4.4.1 Indicators of circularity

4.4

Circularity rate

The circularity rate measures **the quota of materials coming from recycling** with respect to the **total of used materials.** AST reaches already today strong results, leaning on the technological choice of using electric ovens and on the high use of scrap metals (common and stainless steel). The circularity rate in the last five years is **gradually increasing,** going from 54.3% to **66.4%.**



Circularity rate in the use of metals

76.5%

If calculated on the amount of metals used in production instead of all used metals, the circularity rate is even higher. In fact, in 2018/19 it reached 76.5%. This means that less than ¼ of used metals is represented by virgin raw material. This is a very important result in the path toward a circular economy.

Resource productivity

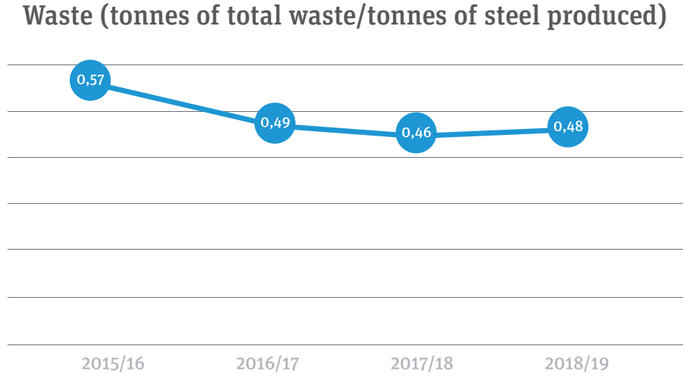
As far as the efficiency in the use of resources is concerned a significant indicator is the one relating to the relationship between the amount of **material used and the company's production.** In 2018/19 per each tonne of production **1.3 tonnes of materials** were used while 1.1 tonnes were used in the previous year.

If the resource productivity is **measured with respect to the revenues,** we calculated that in 2018/19 **per each kg of materials used a value of 1.3 euro was generated.** This is a reduction when compared to the data of 1.6 euro recorded in the previous year.

Waste

The transition to a circular economy requires a gradual reduction of waste and an increase of the recovery of materials both inside the production cycle and during the post-production. An important indicator, from this point of view, is the one related to **the amount of waste per unit of product.**

If measured excluding the slags, officially produced by the company Ilserv, this rate i**n 2018/19 was equal to 0.12 tonne of waste per each tonne of production.** This data is similar to the one from the previous year but down when compared to 2016/17 when it was equal to 0.14 tonne/tonne. If we consider also **the slags** and we refer to the **total waste,** in the last fiscal year **0.48 tonne of waste** was generated per each tonne of production.



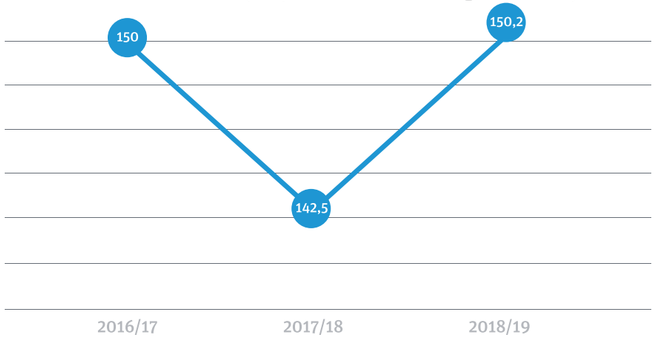
Among the steps taken regarding the waste reduction it is worth noting:

- the construction of a plant inside the factory which has allowed to reuse **fire-resistant materials** since 2014, by reintroducing them in the production cycle and, therefore, by avoiding to discard 15-20 thousand tonnes of waste each year;
- the project for **slag recovery** which will demolish the waste production by allowing to recycle the slags according to a virtuous model of circular economy.

Efficiency in the use of water resources

The amount of **water used in the factory per each tonne of production** was equal to m³ 150.2 in 2018/19. We recorded an increase of the specific consumption with respect to the previous years. In fact, the specific consumption was equal to m³ 142.5 in 2017/18 and 150 m³ in 2016/17.

Water utilized (m³/tonnes of steel produced)



Among the measures adopted to improve the efficiency in the use of water resources, it is worth mentioning that various methods of water recirculation have been implemented inside the factory either by means of a closed circuit or through the reutilisation of water among the different phases of the production cycle.

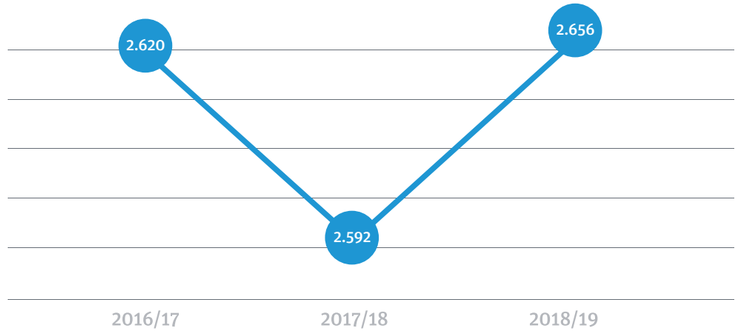
This allows to recycle a significant portion of **the water resources** used and to largely reduce the water collection.

Moreover, it should be reminded that the water collected from one river (Velino), after **purification,** is **reintroduced** into the Nera river.

Efficiency in the use of energy

In 2018/19 **the consumption of energy per unit of product** was equal to 2,656 kWh/tonne. When compared to the previous years an increase was recorded for the reasons already highlighted in paragraph 3.4.

Specific consumption of energy (kWh/tonne)



As far as the steps taken are concerned, it is worth remembering that in the context of the thyssenkrupp AG's programme "GEEP" several projects to improve energy efficiency have been implemented.

The project completed in 2019 for **the heat recovery** from fumes produced by the slab heating oven with generation of vapour is of particular significance. Thanks to the new installation approx. 70% of the vapours used in the production cycle will be generated without the use of fossil fuels, with a reduction of energy consumption equal to 15 million cubic meters of natural gas and 30 thousand tonnes of CO_2 prevented each year.

Eco-innovation

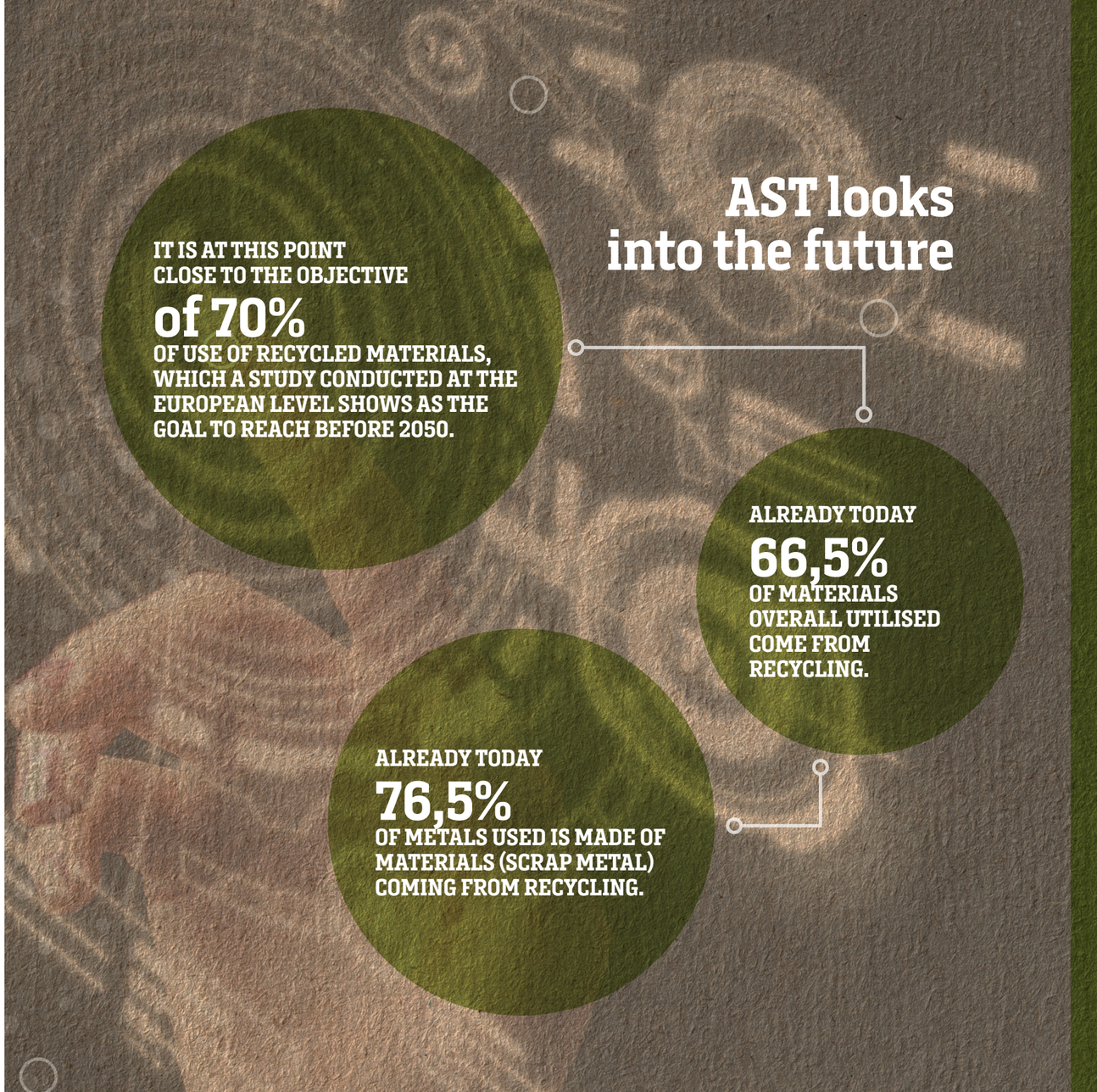
The transition to a eircular economy requires investments in research and development, technological innovations, eco-designs, new business models, and industrial symbiosis. In other words, it requires investments in eco-innovation.
The AST's growing commitment in this direction is attested by **environmental investments** (almost 6 million euros in 2018/29), **the costs for the management of environmental protection activities** (over 35 million euros), the investments in **research and development** aimed at product quality and efficiency in the use of resources, as well as the slag recycling project for which approx. 60 millions of investments have been estimated.

AST, together with other local companies, is also working on the project called **Urban Re-Generation:** a district for sustainability, circular economy, and urban regeneration, which we will address in one of the next chapters.

The new steel frontiers

A study ("Industrial Transformation 2050 – Pathways to Net-Zero Emissions from EU Heavy Industry"), commissioned by the European Climate Foundation and conducted by Material Economics with the support of the University of Cambrigde, shows how even the heavy industry can contribute significantly to the effort against global warming by reducing its emissions up to 240 million tonnes of CO_2 per year by means of a circular economy.

Some sectors are more advanced than others; among them, in particular, the steel sector. Already today "90 million tonnes of steel scrap metals generated in Europe each year, for a value of approx. 20-25 billion euros, are recycled to produce new steel". And before 2050 70% of steel could be produced using recycled raw materials.



4.4.2 The slag recycling project

Betting on the cicrcular economy is the challenge taken on by AST with a project for slag recovery. This is a project at the forefront both at the national and international level and was brought to life with the goal of finding the best possible solution for the recovery of slags coming from the manufacturing of steel.

After a complex preparatory phase, AST discovered a solution consistent with the principles of circular economy, industrially sustainable, and in line with the most advanced environmental standards.

Slags

The production process generates every year **over 300,000 tonnes of slags.** Of those, approx. 120,000 tonnes come from the fusion process in the furnaces ("black slag") and approx. 180,000 tonnes from the refining process in the converters ("white slag").
The project will allow to increase significantly the recovery of the residual materials generated by the steel manufacturing process, first among them the slag, which is equal to 1/3 of the steel produced.

The international invitation to tender

AST promoted in 2016 **an international call** for tenders regarding the development of this project. The invitation to tender, whose management was supported by a group of experts and distinguished trustees, involved the largest world operators.

After a complex phase of selection, in December 2018 an agreement that officialised the choice of the **Tapojärvi Oy** company was signed.
Tapojärvi Oy, a Finnish company specialised in the development of circular economy and in the research of new solutions for reusing materials deriving from the steel manufacturing, will provide an integrated service of management, **slag recovery, and commercialisation of recycled materials.**

The products obtained from recycling

The steel factory slags, after undertaking processes of recovery, can be used for various purposes, starting from **the production of aggregates for road foundations, and for cement or bituminous conglomerates.**

The slags generated by AST, once treated, will acquire mechanical and performance characteristics of materials such as gravel and sand. They will carry the CE label and they can be used in alternative to natural materials for the construction of road foundations, or they can be added to a bituminous or cement matrix to produce concrete or asphalt.

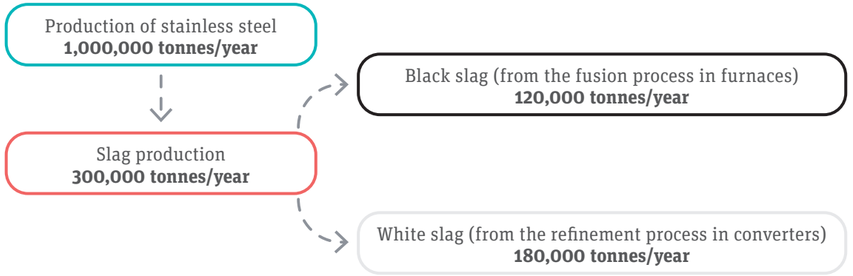
The steel production process leads to the generation of slag, and, subsequently, it requires its disposal

AST identified a solution for slag recovery:

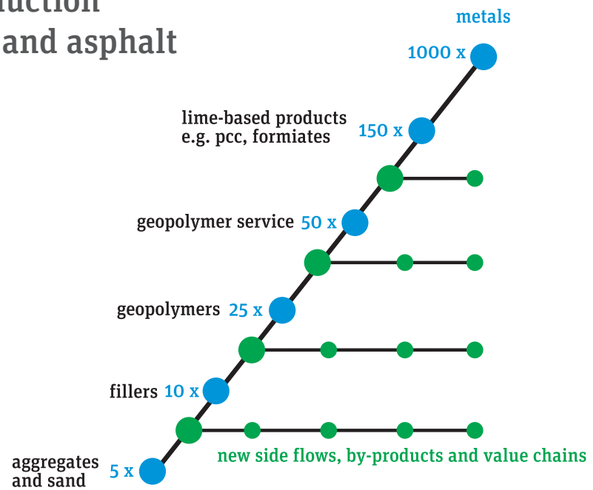
Industrially sustainable

In line with the most advanced environmental standards

Consistent with market demands



Cement production for concrete and asphalt



The environmental benefits

The project of slags recovery will produce multiple environmental benefits, both in the area of the Terni steel factory and in a more general sense:

- The slags treatment and reutilisation will generate a significant improvement of the environmental quality of the industrial site as well as the surrounding territory, with a large reduction of dust and noise if compared to the current situation;
- The use of slags instead of extracting and using natural materials will contribute to a reduction of the entire environmental impact, since the request for construction aggregates and the use of quarries cause an unsustainable consumption of territory;
- Not considering slag as waste to discard anymore but as a material to reutilise will allow to activate a virtuous process of recovery of materials in accordance with the principles of the circular economy.

The project implementation

Investments for a total amount of between 57 and 65 million euros have been estimated.

ACCIAI SPECIALI TERNI

- Planning and building the hangar for the new Slag Ramp
- Planning and building ancillary installations for the new Slag Ramp
- Renovation and modernisation of hangars for the new Metal Recovery
- Estimated investment in the first 2 years: 12–15 million euros

TAPOJÄRVI

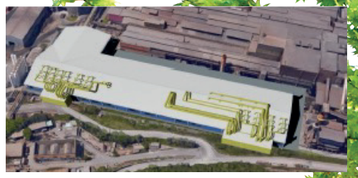
- Planning and building plant for the slag treatment
- Planning and building the new Metal Recovery
- Supplying means of transportation for the recovered slags and metals
- Estimated investment in the first 2 years: 45–50 million euros

57–65 million euros

The construction of the new slag ramp, completely indoor and equipped with installations for suction and thermal reduction, will allow to reduce significantly the current environmental impact (dust and noise). The same thing will occur thanks to the construction of the new metal recovery plant, also indoor with elimination of dust and minimisation of noise.

The new slag ramp

1. The slag ramp is completely indoor and equipped with suction, thermal reduction, and dust recovery installations
2. Minimisation of the environmental impact generated by the management and the movement of slags
3. Innovative cooling system for obtaining better chemical-physical characteristics of slags, both the ones to reuse and to bring to market and the residual ones to dump in landfills.



The new metal recovery

1. New plant completely indoor with elimination of dust and minimisation of noise
2. Recuperation of areas already present in the factory through a requalification and modernisation with sound absorbing walls
3. Dismantling of the old outdoor plant with interventions aimed at the recuperation and readjustment of the area
4. Use of a technology at the forefront of metal recovery, able to guarantee that the amount of residual metal in the slag is less than 1%.

AST's European Centre of excellence for the recycling of the steel factory slags

The transition to a circular economy is an essential condition for a sustainable development. With the AST's project, the steel manufacturing centre and the industrial district of the city of Terni take an important step in this direction.

5
SOCIAL SUSTAINABILITY

HEALTH AND SAFETY
IN THE WORKPLACE

COMMITMENT TO LEGALITY

COMPANY'S WELFARE

TRAINING IN HUMAN RIGHTS

RELATIONSHIP
WITH THE TERRITORY

TERNI WORKERS' CLUB

COMPANY'S HEALTH
INSURANCE PLAN

The social sustainability – in particular regarding the protection and value appreciation of the human capital, the safety in the workplace, the relationship with the territory and the local communities – is a fundamental value for AST.

5.1

5.1 Stakeholders and local community

AST pays particular attention to its relationship with **the stakeholders,** starting from employees, customers, suppliers, and commercial partners. The relationship with local and national institutions, unions and trade associations, schools and universities, environmental and voluntary associations is also very important for AST.

- A fundamental element is the relationship with the **RSU (Unitary Representation Bodies)** and the trade unions at the local and national level.
- The relationships with t**he City of Terni and the Regione Umbria** are quite strong when it comes to policies for the economic development of the territory, to environmental topics, and to the initiatives for the local community.
- The strategic role of AST in the steel manufacturing sector requires a constant dialogue with national institutions, such as **the Ministry of the Economic Development, the Ministry of Labour, and the Ministry of the Environment, as well as with business associations, such as Confindustria and Federacciai.**
- Among the stakeholders, besides **the environmental associations, organisations of volunteers,** particularly Caritas and AVIS, should also be mentioned.
- An important relationship is the one with some **high schools**, which allowed to develop work-school projects. Moreover, AST collaborates, via the Terni Workers' Club, with the Italian Olympic Committee (CONI) and with the School Regional Office for the promotion of sport activities.
- Among the most important stakeholders there is **the University of Perugia,** with which specific agreements have been signed. A recent agreement between AST and the Bachelor Degree in Industrial Engineering of Terni made this collaboration even stronger by offering the opportunity of a first contact with the workplace to the students and the chance to improve their training to the AST's employees through lessons and seminars held by college professors. The company also allows the students of the University of Terni to take advantage of the company's restaurant thanks to an agreement signed with the regional agency for the right to college studies.

Relationship with the local community

Since their birth the history of the steel factories has intertwined with the history of the city of Terni. If the role of AST is strategic at the national level, it is even more strategic locally where it represents one of the main occupational centres. The activities of the steel factory and of all other businesses which are connected to it are one of the main resources of the Umbrian economy. Just

think that the AST's revenues represent approx. 8% of the GDP of the entire region.
Furthermore, the presence of the steel factory not only created over the years economic and occupational benefits for the territory but marked deeply its history and it is still today an integral part of its social and cultural fabric. Besides the experiences dating back to many years ago such as The Terni Workers' Club (CLT) and the Company's Health Insurance (CMA), AST worked hard in recent years to strengthen the ties that connect the company to the local community.

5.2 Work

5.2.1 Company's policies

The management of policies and conditions in the workplace is regulated by national laws and by the trade unions contract agreements (CCNL metalworking industry). All aspects to protect in the relationship with personnel and social partners are specified in the organisational, management, and control model and in the Code of ethics. Besides the contractual references, specific procedures both for the hiring phase and for the training phase are provided. There are no risk regarding the right to freedom of association and to collective bargaining because all provisions included in the labour laws and in the collective bargaining agreements are followed.

Our commitment to human rights

AST supports and respects human rights in accordance with the United Nations' Universal Declaration of Human Rights as part of the commitments made by thyssenkrupp as one of the signers of *the United Nation Global Compact*.
Moreover, with the above mentioned Declaration and the *Conflict-Mineral* policy, AST supports the fight against violations of human rights and against the environmental degradation caused by the extraction and commercialisation of minerals from the geographical area known as "region of conflicts" comprising the Democratic Republic of the Congo (DRC) and surrounding countries. *The Securities and Exchange Commission (SEC)* released regulations requiring the producers to inform if their products contain metals extracted in the eastern provinces of the Democratic Republic of the Congo (DRC) or in any of the surrounding countries, where the extraction could finance, directly or indirectly, violations of human rights or bring benefits to armed groups. AST shares completely such regulations through an absolute commitment to avoid any use of minerals that are not *"conflict free"* certified.

5.2.2 Employees

On September 30th 2019 the company had **2,346 employees,** with a reduction of 22 units (of which 20 were factory workers and 2 were office worker/middle managers) when compared to the previous year.
All employees are covered by **the national collective bargaining contract.** Only 5 have a temporary contract.

During the 2018/19 fiscal year AST recorded 20 new hires (of which 14 were men and 6 women) while 42 were the employees leaving the company. The new hires were 16 office workers, 3 middle managers, and 1 top manager. The employees leaving the company were 20 factory workers, 14 office workers, 7 middle managers, and 1 top manager.

Makeup of the workforce based on their role, type of contract, and gender

EMPLOYEES	2018/19 (at 30/9/2019)		2017/18 (at 30/9/2018)		2016/17 (at 30/9/2017)	
TOP MANAGERS	29	1,2%	29	1,2%	26	1,1 %
MIDDLE MANAGERS	122	5,2%	120	5,1%	116	4,9%
OFFICE WORKERS	510	21,7%	513	21,7%	517	21,7%
FACTORY WORKERS	1.685	71,9%	1706	72,1%	1.719	72,3%
TOTAL EMPLOYEES	2.346		2.368		2.378	
TEMPORARY	5	0,2%	8	0,3	7	0,3%
PERMANENT	2.341	99,8%	2360	99,7	2.371	99,7%
MEN	2.220	94,6%	2241	94,6%	2.247	94,5%
WOMEN	126	5,4%	127	5,4%	131	5,5%

As far as age groups are concerned, the greatest majority of employees are 41 to 50 year old (58.2%). The next age groups are 31 to 40 years of age (21.8%) and 51 to 60 (17.4%), which includes the greatest majority of top positions (14 top managers out of 29 and 54 middle managers out of 122). The percentage of employees under 30 years of age is equal to 1.4%.

	TOP MANAGEMENT	MIDDLE MANAGEMENT	OFFICE WORKERS	FACTORY WORKERS	TOTAL
TOTAL	**29**	**122**	**510**	**1.685**	**2.346**
men	29	104	403	1684	**2.220**
women	0	18	107	1	**126**

AGE RANGE					
UNDER 30			11	21	**32**
31-40	1	9	63	438	**511**
41-50	11	49	302	1.004	**1.366**
51-60	14	54	128	213	**409**
OVER 60	3	10	6	9	**28**
TOTAL	**29**	**122**	**510**	**1.685**	**2.346**

The greatest majority of employees (96%) comes from the Umbria region, 3% from the neighbouring Lazio region, and only 1% from other regions. **The new hires** in the 2018/19 fiscal year were 20, of which 14 men and 6 women. 60% of them were younger people under 30 years of age. The new hires were mainly from the Umbria region (16 out of 20).

5.2.3 Equal opportunities

On September 30th 2019 the women were 126, equal to 5.4% of all employees, and they were almost entirely office workers and middle managers.

5.2.4 Training

Training is a fundamental step to compete effectively in a job market in constant evolution. It increases the professional expertise not only of each single individual but of the entire company. AST organises both mandatory training activities on **safety and training and refresher courses** and seminars inside and outside the company.

Two important changes occurred in the fiscal year 2018/19:

- since April 2019 the Training Centre has been transformed into the **AST Academy**, a tangible as well as virtual place where knowledge, values, technology, and behaviours represent crucial elements for the growth of people and the entire company alike;
- **a Catalogue** comprising not only technical, linguistic, and computer science courses but also classes on soft skills (e.g. conflict management, assertiveness, time management) has been published and made available to all employees.

52,000 TRAINING HOURS
22 HOURS ON AVERAGE
PER EACH EMPLOYEE

In 2018/19 there was an increase in the number of training hours granted. In fact, there were approx. **52,000 hours,** compared to approx. 40,000 in the previous year. That means an average of over **22 hours of training per employee each year** (which go up to 25 if only the attendees are considered).

AST ACADEMY

MEDIA ORE DI FORMAZIONE PER DIPENDENTE *	2016/17	2017/18	2018/19
MEN	13	10,3	8,4
WOMEN	11.2	8,5	10,5
FACTORY WORKERS	11	10,8	8,7
OFFICE WORKERS	16.3	6,8	8,4
MIDDLE MANAGERS	12.2	8,2	7,9

**excluding top managers*

In 2018/19 AST paid great attention to training activities on safety and to strengthen technical and transversal competencies by keeping the projects *change management* and "Customers in Our Heart" going and starting the project "Customer C.A.R.E.".

Training activities

Safety

As fas as safety training is concerned:

- special attention has been paid to increasing the number of employees in charge of fire emergencies. The first training phase has been concluded with the issuance of 70 certificates of technical qualification by the provincial Firefighters Command to as many employees.
- the collaboration with the LHS foundation is still in progress. Particularly, the module "Stay on Board" has been organised and delivered. This module is an 8 hours training programme involving 340 participants and is aimed at creating a true Circle of Safety or, in other words, is able to efficiently intercept and neutralise the risks connected to activities in the workplace.

Technical-professional training

The following activities are particularly worth mentioning:

- the project entitled **"Versatility"** is still underway. This project, already started in 2017/18, is aimed at the professional development of versatile individuals able to play multiple roles within a specific production unit;
- in the context of projects for technical training, the **"rolling mills"** training course has been held in front of 50 operators by one of the top international experts with the goal of analyzing and standardising the current process of lamination;
- a training course on **Oleodynamic** topics, targeted at maintenance technicians and engineers of all production areas, has been activated;
- among the technical-transversal training activities, it is worth noting the training on version 8 of the **Coswin** system adopted by the company in April 2019. Over 250 employees participated to this course.

Thyssenkrupp courses

At the thyssenkrupp AG's group level, among the training initiatives included in the "Pillar of Integrity", the following courses have been held:

- data safety and protection;
- conflict of interest.

All employees, middle managers, and top managers attended the course on data safety and protection, while the course on conflict of interest has been held in front of approx. 250 employees.

AST's Lean School

This project started in March 2019 with the first cycle of courses on *Green and Yellow Belt,* which was followed by the cycle of courses on *Black Belt*. The training activities of the AST's Lean School are organised on a monthly basis and, at the end of each cycle, the attendees receive a specific diploma. The Yellow Belt certification has been given to 188 participants of which 24 were interns, while the Green Belt certification was awarded to 34 attendees of which 2 were top managers and 2 were interns.

Linguistic training

This course was divided into two training sessions. The first one involved 118 participants, while 133 employees attended the second session, for a total of 12,500 hours of training completed. At the end of this path, each participant received a certificate of attendance showing which level he or she had reached.

Work-school programme

The work-school project, included in the objectives of the *AST's Corporate Social Responsibility,* has been held in collaboration with the Technical Institute "Allievi-Sangallo" located in the city of Terni. 9 students were selected to participate in specific training courses split into different areas of competency (basic automation, mechanics and maintenance, chemistry, computer sciences). Moreover, in the summer session held in June, a student of the "Gaio Cornelio Tacito" High School was invited to participate in an internship programme in the Human Resources area.

PerformAST

Since 2018 AST has developed a process of performance management and professional development, by using the *tool PerformAST*. This tool, addressed to top managers, middle managers, and office workers, supports them in the evaluation of the assigned objectives and the overall performance, and in the creation of a plan for the individual development. The cycle starts with assigning objectives, is characterised by constant feedback throughout the year, and ends with an evaluation of the results and the overall performance.

5.2.5 Health and safety in the workplace

The safety in the workplace is a crucial issue in the steel manufacturing sector. AST adopts a system of management designed to prevent potential risks and measures to protect the health and safety of all employees.

- Beside following the provisions of the current laws regarding health and safety and the provisions of the national collective bargaining agreement, in 2008 **a Safety protocol** has been signed, and later renewed multiple times.

- AST chose voluntarily to have its system of health and safety management in the workplace **certified** according to the requisites of management standards **OHSAS 18001:2007.**
- During 2019/2020 the certification Agency DNV-GL, after a specific auditing process, confirmed the safety certification. The company is currently committed to transition to **the new standard ISO 45001.**

OHSAS Certification

The standard OHSAS 18001 allows to:

- identify the risks and run the controls for risk management;
- create the best work conditions in its organisation;
- reduce the work-related injuries and illnesses;
- involve all personnel by guaranteeing better and safer work conditions;
- show to customers and suppliers that the company is compliant with international standards.

Work safely

The AST's measures against Covid-19

Video cameras to measure employees' temperatures at the factory entrance, constant disinfection of the company's spaces, plexiglass cages, sanitising soap dispensers, single-use telephones and keywords plastic covers. These measures, combined with many others, allowed AST to restart production safely after shutting down for only two weeks following the lockdown ordered by the government on March 11th 2020. Thanks to the dialogue with the Prefecture, the local authorities, and the trade unions, safety measures and rules aimed at integrating the guidelines established by the healthcare authorities have been defined, thus allowing the company to restart the activities inside the factory.

The policy for health and safety in the workplace

AST considers the health and safety of its employees as well as of collaborators, suppliers and subcontractors a goal of paramount importance for the company's success just like any production, or sales goals.

Therefore, AST is committed to ensure that the goals of improving the workers' safety and health are an integral and primary part of its activities by making available adequate human, instrumental, and economic resources. To this end, AST is committed to develop and integrate its own Safety Management System in accordance with the requisites of the regulation BS OHSAS 18001:2007.

The policy declaration has been redacted after analyzing the health and safety risks deriving from all activities carried out by AST.
AST is also committed to:

- continuously analise processes and related procedures so that the risks could be reduced or eliminated, thus removing the causes that could jeopardise the safety and the health of its personnel, of other workers present on location, and of nearby communities;
- train and make workers aware so that they can perform their duties safely and assume their responsibilities in the context of workers' safety and health, in accordance with procedures adopted by the company, and according to their duties and competencies, by verifying often their level of awareness;
- constantly improve its own performance regarding the health and safety through methodical planning and internal control of its activities;
- operate in accordance with current laws and regulations, agreed-upon voluntary rules, and the company's procedures by following the standards so defined;
- demand that subcontractors and suppliers operate with safety standards and respect for the environment that are aligned with the company's principles, under penalty of termination of any further collaboration;
- develop a relationship of constructive collaboration, built on maximum transparency and

trust, both within the company and with the outside communities, the regulatory agencies, and the institutions for the management of safety issues, thus making operational the "Protocol for planning interventions in matters of safety in the workplace in the Terni factory of Acciai Speciali Terni S.p.A. and its subsidiaries" signed by AST and the local Agencies;

- implement specific safety programmes, monitoring, inspections, and verifications at all levels in order to prevent and control the dangers for the workers' safety and health and for the population and surrounding environment;
- promote a steady collaboration on the topic of health and safety with the appointed workers' representatives and engage the academic world through training internships;
- apply and maintain the Safety Management System in order to guarantee the compliance with the requisites established by the regulation BS OHSAS 18001:2007 and to ensure the availability of qualified personnel, documented procedures, and adequate tools.

Risks of major accidents

Since it falls into the category of companies for which the law regarding the risks of major accidents (so-called Seveso Directive) is applicable, AST put together a "Policy for the prevention of risks of major accidents".
As far as the number of employees working on activities at high risk of accident is concerned, the personnel of the steel/heavy metal industry is considered at "high" risk (administrative personnel excluded) based on the criteria of the ATECO codes. With such criteria in mind, we can estimate that approx. 1700 factory workers and 250 office workers are "at elevated risk of accident". However, considering the true meaning of the expression "activity at elevated risk of accident", we can refer only to the factory areas included in the field of application of the "Seveso Directive" (activities at risk of major accidents). By adopting this criteria the number can be estimated in approx. 250 people (between factory and office workers) located in the areas PIX1 – treatments, PIX2 – treatments, and SEA (acid storage facility) where fluoridric acid is used.

Training

The activity of information and training on regulations regarding safety is crucial. Such activity is carried out both at the moment each worker is hired and when he/she is transferred, when his/her duties are changed, and when there is the introduction of new work equipment, technologies, and substances or compounds potentially harmful. Workers are obligated to participate in regularly scheduled refresher courses.

Operational procedures

The working activity is disciplined by specific Safety Operational Procedures (POS) which provides the worker with guidelines in the course of his/her activity in order to prevent a potential injury or be exposed to substances, temperatures, noises, and any other thing that can cause an illness. Particular attention has been paid to the fact that each worker is given and makes use of Individual Protection Devices (DPI).

Company's functions (EAS)

A specific company's function has the responsibility to ensure the full compliance with all regulations by supporting the elaboration and update of the Document of risks evaluation, by making sure that facilities and procedures comply with the laws, and by guaranteeing the personnel's training. As established by the safety protocol signed at the Prefecture of Terni, a workers' representative for safety (RLS) coordinating the relationship between the company's safety entity and the RSU is always present on site.
In the context of the *Supply Chain Management & Continouos Improvement (SCM)* an improvement plan focusing on an "Internal logistic zone" is active. In this plan potential risks and critical issues are identified and response actions with related deadlines are specified for the macro areas "Storage facility for final products" and "Handling".

Actions

The main actions during the last fiscal year, besides what was expected to comply with the law, concerned both plants and structures as well as aspects linked to spreading a **"culture of safety"** and ensuring that such culture is embedded at every level within the company's organisation, from top managers to factory workers including those who work for subcontractors, by implementing a specific multi annual programme.

- Following what is stated in the OHSAS 18001 certification, the activities relating to projects for the modernisation of production and electric plants, as well as those regarding the modernisation of the entire workplace are in progress.

- As far as the management aspects are concerned, all audits scheduled in the annual plan have been completed, including the ones regarding the management of work given to subcontractors. In addition to these internal audits, also safety *"cross-audits"* between Italian companies belonging to the thyssenkrupp's group and safety audits done by qualified external auditors on behalf of the Supervisory Body have been performed.

- As far as the actions aimed at increasing the culture of safety among employees are concerned, besides what is required by the current regulations and in addition to the widespread initiatives already carried out for some years, such as the *"Safety Pills"* (short daily training sessions targeted at all workers), the *"Leadership Safety Tours"* (daily inspections carried out by a pair of safety technicians and production managers according to scheduled programmes), and the *"Gemba Walks"* (safety inspections conducted by members of the Board of Directors or by other company's top managers), the implementation of a multi annual programme specifically dedicated to a cultural change on health and safety, called *"Leadership in Health & Safety",* is getting to the heart of the matter. During 2018/19 the activities regarding such programme involved approx. 340 individuals between managers, supervisors, representatives of subcontractors, and representatives of the OO.SS. Moreover, the foundations for the creation of a true *"community of safety leaders"* have been laid out by also organising theatrical events on the topic of safety.

- As for the obligations regarding "Risks of Major Accidents", it is worth mentioning the activities arisen from the onsite inspection carried out in 2019 by the specific Ministerial Commission and those deriving from the approval of the AST's *"Safety Report"* by the Technical Regional Committee. Among such activities, regarding both management and plant-related aspects, we should mention those related to earthquakes and to the management of ageing equipment.

Leadership in health & safety

AST collaborates with the LiHS *(Leadership in Health and Safety)* Foundation, a non-profit organisation founded in 2010 with the objective of developing research activities, training programmes, and information campaigns on health and safety focused on four fundamental points: culture, behaviour, leadership, and change.

By drawing inspiration from values such as the central role of human life and the protection of the individual's well-being, the Foundation is committed to deeply change the perception of health and safety by spreading an innovative method able to permanently affect people's culture through the use of the methodology "Leadership in Health and Safety".

The strategies and tools used in this methodology are intended to make workers at all levels more responsible in the context of health and safety, both their own and of the people involved in their activities, thus creating true *safety leaders*.
This is an approach that AST made its own and pursues by organising several workshops. Emotional involvement, interactivity, and practical tools are the basic elements of this approach able to lead to effective and measurable results. However, another crucial component must be added to it: leadership.

Fire prevention

The responsibility of implementing the policy to prevent fires is given to the company's entity PAS/ANT, which is an organisation of 17 people comprising a person in charge and an internal group of fire fighters.
Their duties pertain to managing emergency, performing periodic controls and planned maintenance of the fire extinguishing systems (fixed installations for extinguishing and detecting fires, fire hydrants network, water pump stations, REI doors, and fire extinguishers of various types), managing fire-fighting devices to reduce the risk of fire, coordinating work and maintenance activities which could result in fires or explosions, and developing new fire-fighting installations for active and passive protection. The fire-fighting squad covers also a role of emergency squad with the responsibility of supporting, whenever necessary, the emergency responses by the company's medical personnel, available 24 hours a day. During 2018/19 the activity of investment implementation regarding the factory's fire-fighting protection has continued as planned.

Health, environment, and safety Protocol

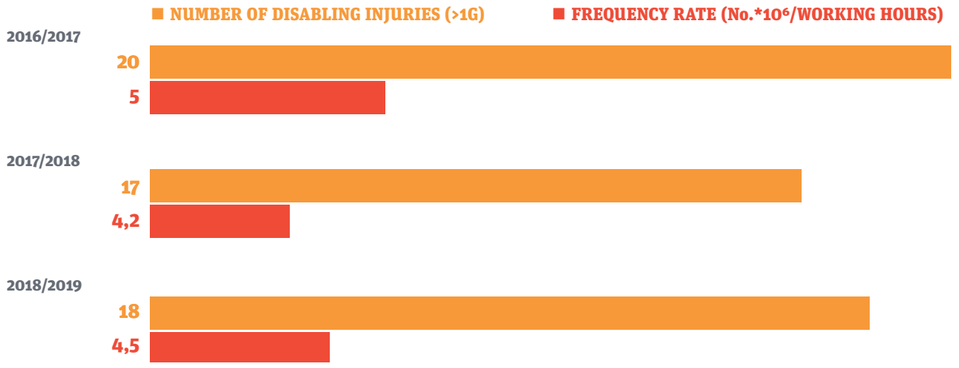
At the end of 2018 AST signed in the Prefecture of Terni the renewal of the protocol for planning interventions regarding health, environment, and safety. The memorandum of understanding, signed by AST, the institutions, and the trade unions, has as objective to promote and implement a coordinated system which guarantees levels of workers' safety and health higher and higher, as well as protection of the environment.

This protocol has been signed by: Regione Umbria, the City of Terni, the Fire-fighters Department, the USL Agency Umbria 2, the I.N.A.I.L., the Territorial Labour Inspectorate, Arpa, AST, and the trade unions Cgil, Cisl, Uil, Ugl, Fiom-Cgil, Fim-Cisl, Uilm-Uil, Fismic, Usb.

Work-related injuries

The injuries' frequency rate in the AST's factory settled in the last few years at values significantly lower than the national average of the steel manufacturing sector.

In the fiscal year 2018/19 a value slightly higher than the 2017/18 one, which was the best result ever attained by AST, has been recorded.



Seriousness index

The injuries' seriousness index is calculated by the company using its own methodology (by multiplying the hours lost because of injuries by 1,000,000 and dividing the result by the hours worked multiplied by 7.7).

SERIOUSNESS INDEX (AST's Methodology)	2016/17	2017/18	2018/19
INDUSTRIAL INJURIES	20	17	18
TOTAL WORKING HOURS	4.028.481	4.057.960	3.965.596
LOST HOURS	5.030	4.522	5.557
SERIOUSNESS INDEX	**162**	**145**	**182**

According to the UNI 7249.07 regulation adopted by INAIL and consistent with the GRI indicator, which evokes the concept of injury rate (but not the system of calculation), the seriousness index is calculated multiplying the number of total injury days by 1000 and dividing the result by the number of working hours, as reported in the following table:

SERIOUSNESS INDEX (INAIL-GRI's Methodology)	2016/17	2017/18	2018/19
INJURY DAYS	629	565	695
X 1.000	628.750	565.000	694.630
WORKING HOURS	4.028.481	4.057.960	3.965.596
SERIOUSNESS INDEX	**0,156**	**0,139**	**0,175**

A further improvement

The most recent data show that AST is further improving its safety levels. Today the company has an injury incidence estimated to have **a frequency rate equal to 3.4** while the average rate in similar other companies is 22.

In more concrete terms, it means that only 12 injuries occurred in the fiscal year 2019/2020 compared to 18 injuries in 2028/19, outlined in this report, and 24 in 2015/2016. The positive trend appears to be even more significant if we look back even further in time: for example, in 2004/2005 the injuries were 208.

5.2.6 Company's Welfare

The AST's welfare systems represent invaluable instruments for improving the quality of life, inside and outside the company, for promoting the dialogue with the workers, and for increasing productivity and sense of belonging. Particularly, among the company's welfare institutions, the employees' Health Insurance Plan and the Terni Workers Club have created, also thanks to constructive relationships with the trade unions, a system directed at satisfying the needs of workers and their families in the context of a supplemental healthcare coverage and cultural as well as sport activities. The company awards every year fellowships to worthy students and book tokens to the employees' children.
In a dedicated portal workers can also find other offers given at highly beneficial terms.

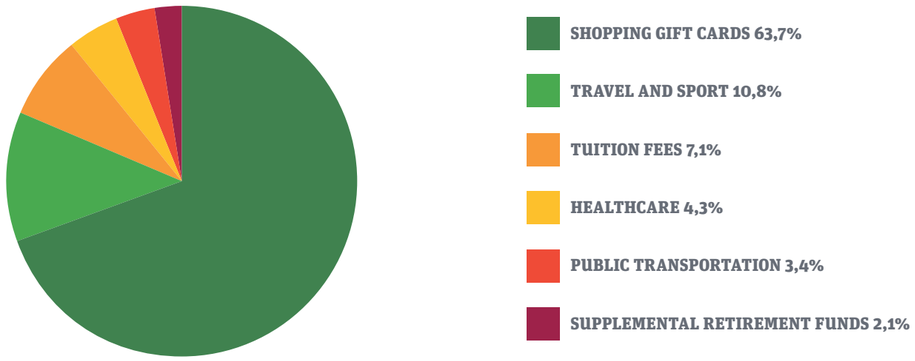
Welfare plan

Since 2017 AST, together with the Unitary Representation Bodies (RSU), has established **a Welfare plan** which allows workers to choose a wide variety of services aimed also at their families, their children, and those who have an elderly or non-self sufficient relative.
This initiative represents a concrete measure to financially support the employees, since it allows them to take advantage of flexible benefits packages that do not constitute taxable income.
By using a specific web platform each employee can decide how to take advantage of the welfare credits he or she are entitled to, by choosing among:

- reimbursement of the school tuition fees for their children;
- reimbursement of expenses for the assistance of elderly or non-self sufficient relatives;
- gift cards for goods and services (gift cards for groceries, for petrol, for mobile phone cards, for shopping, and for technology);
- leisure (Terni Workers Club and gym, cinema, and theatre memberships) and personal care
- travel on demand service;
- healthcare (Company's Health Insurance Plan, vouchers for medical exams with a specialist, medical check-ups, dental care cards)
- deposits to supplemental retirement funds.

On September 30th 2019 **2,332** employees were registered on the AST's web platform allowing them to take advantage of the sums of 500 euros and 300 euros provided by AST in accordance with the agreement between the company and RSU signed on June 2019, as well as the sum of 200 euros included in the national collective bargaining agreement which starting from January 1st 2020 is under the rule of retroactive applicability. During the last fiscal year orders for a total of approx. **634 thousand euros,** split mainly between shopping gift cards (63.7%), travel and sport (10.8%), tuition fees (7.1%), healthcare (4.3%), public transportation season cards (3.4%), and supplemental retirement funds (2.1%), have been placed.

USE OF WELFARE CREDITS



The Company's Health Insurance Plan

The Company's Health Insurance Plan (CMA) was created in 1968 following an agreement between trade unions and what was then called "Società Terni per l'Industria e l'Elettricità S.p.A." in order to give healthcare assistance to employees and, with the 1997 trade union's agreement, to factory workers, as a replacement of the healthcare plan provided by the National Agency for the Assistance against Diseases (INAM) and after withholding the contributions for medical assistance as required by law.

CASSA MUTUA AZIENDALE TERNI

The goal of the CMA, which has been in operation without interruptions for 50 years, is to allow employees and their families to benefit from supplemental medical practices that are better than the ones provided by the National Healthcare System.
As of December 31st 2019, the employees enrolled in the Company's Health Insurance Plan are 1,552, for a total of 3,302 beneficiaries which include also the employees' dependents.

The financial means necessary to cover the costs come from the employees' contributions, while AST provides space and administrative services. The management is entrusted to a Board of Directors whose members are appointed on an equal basis by the company and by the trade unions. From a medical standpoint, the Company's Health Insurance Plan, coordinated by a competent doctor, provides assistance directly by employing the following services:

- dental service: this service represents the only form of corporate dental assistance in the Umbrian region and one of the few in Europe;
- instrumental diagnostics services (ecography, venous-arterial and transcranial echo doppler, echocardio color doppler, electrocardiogram, and ortho panoramic x-rays), equipped with the most advanced machines;
- services offered by specialists, which covers the totality of the recurrent pathologies.

Furthermore, CMA offers an indirect assistance by reimbursing external medical services, even the ones in highly specialised structures in Italy and abroad. That way the goal of providing medical assistance (visits, examinations, clinical tests, physical cures) is achieved according to principles of subsidiarity and solidarity.

In 2019 the services offered inside the clinics directly by the Company's Health Insurance Plan, thanks to qualified medical collaborations and medical equipment constantly upgraded, represented 87% of the total, while 13% were the reimbursements of medical expenses sustained externally. This is a piece of data that highlights the importance of the medical services provided by the Insurance Plan in alternative to services provided by the private sector and as a supplement to the National Healthcare System (significantly unburdened from the services and costs that would otherwise fall on the ASL of the territory).

Health Insurance Plan

1.552
ENROLLED

3.302
BENEFICIARIES

14.508
MEDICAL EXAMS WITH SPECIALISTS

10.336
DENTAL CARE VISITS

1.178
PHYSIOTHERAPY SESSIONS

2019 Kaizen Awards

In June 2019 AST received the 2019 Kaizen Awards, a recognition given to companies committed to a constant improvement and promotion of best practices. The award was given in the category “Culture of constant healthcare improvement” after AST completed a path of commitment to apply the good practices of the *lean transformation*, already implemented in the factory, to the Company’s Health Insurance Plan as well.

KAIZEN™ INSTITUTE

The Terni workers club

The history of the Terni Workers Club is a testimonial of the strong connection between the steel factory and the city of Terni.

CIRCOLO LAVORATORI TERNI

- It was born in 1927 as an after work club for the employees of what was then called “Terni Società per l’Industria e l’Elettricità”, and it was named “Unione Sportiva Società Terni”.
- Already in the following decade four peripheral locations (in Collestatte, in Morgnano, in Nera Montoro and in Sant’Angelo in Mercole di Spoleto) were added to the main headquarters. The number of members grew from a thousand in the beginning to over 18 thousands in 1940.
- In 1925 the “Terni Società per l’Industria e l’Elettricità” built a stadium in viale Brin, renamed “racetrack” by the Terni residents because, around the football pitch, there was a ring made of cement with elevated parabolic curves for cycling and motorcycling in addition to a four-lanes track made of charcoal and used for Athletics.
- The Club’s activities, at the time aimed at “workers’ religious, physical, and cultural education”, included art and cultural events, dance nights, excursions and tours, in addition to a strong effort to promote sport activities.
- After the forced closure during the war, its activities started again during the reconstruction years.
- In 1949 The sport complex in via Muratori was inaugurated and it is still nowadays the Club’s headquarters.
- In 1960 the Unione Sportiva Società Terni was dissolved and, at its place, the Company’s After work Club was born. The Club comprised a growing number of leisure and cultural activities and was run by a management which, after the approval of the Worker’s Statute, included also trade union’s representatives.
- In 1974 the project for the new Club’s headquarters, assigned to the architect and city planner Cesare De Seta, was completed in a green area located in the city centre and included also a library.
- In 1998 the Polisportiva Dilettantistica Circolo Lavoratori Terni S.r.l. was created. This entity had the Terni Workers Club as the only member and comprised 11 sport disciplines practised by approx. 1,200 athletes.
- During the following years its assets, consisting of recreational and sport facilities (conference rooms, a library, a restaurant, an olympic-size pool, a beach volley court, tennis and paddle courts, futsal courts, and gyms), with permission to use granted to the Terni Workers Club, have grown substantially. Furthermore, its presence in the recreational, cultural, and sport sectors, consisting of multiple activities open not only to AST’s employees but to all residents, has grown and diversified.

The Club’s management is entrusted to a a Governing Council whose members are nominated by AST, by the trade unions, and by members elected to represent the Club’s associates.

On August 31st 2019 the total number of Club’s associates who can make use of the Terni Workers Club’s services on preferential terms, including entitled family members, were 10,088, of which 3,842 employees, 1,036 retired employees, and 5,210 external members.
AST constantly supports the upgrading of the Club’s sport and recreational facilities. Such interventions should be considered of public utility since, as mentioned before, the Terni Workers Club offers facilities and services to everybody who wants to use them, whether they are AST’s employees or not.

10.088 MEMBERS

3.842 employees | 1.036 ex-employees | 5.210 external members

REVENUES
1.685.640.000 euros

ADDED VALUE
185.538.000 euros

INVESTMENTS
35.828.000 euros

PRODUCTION
980.577 tonnes

VALUE FOR THE TERRITORY
THE AST'S REVENUES REPRESENTS 8% OF THE UMBRIAN GDP

ADDED VALUE
183 MILLION EUROS DISTRIBUTED TO THE MAIN STAKEHOLDERS

6
ECONOMIC SUSTAINABILITY

6.1 The steel manufacturing sector

The steel production

In 2019 the global steel production was 1,870 millions tonnes, up 3.4% compared to the previous year. The production increased only in Asia and in the Middle East, while decreased in all other areas of the world.

WORLD PRODUCTION	2017	2018	2019	% 2019/2018
(million tonnes)	1.730	1.786	1.870	+3,4

COUNTRIES/CONTINENTS	2017	2018	2019	% 2019/2018
E.U. (28)	168,5	167,7	159,4	-4,9
RUSSIA	71,6	72,8	71,6	-0,8
TURKEY	37,5	37,3	33,7	-9,6
USA	81,6	86,6	87,9	+1,5
CHINA	870,9	920,0	996,3	+8,3
JAPAN	104,7	104,3	99,3	-4,8
INDIA	101,4	109,3	111,2	+1,8
AFRICA	15,0	14,5	13,5	-6,9
SOUTH AMERICA	43,7	44,9	41,2	-8,4

(source: Worldsteel)

The production using oxygen furnaces increased to 1,343 million tonnes, while the production using electric furnaces remained basically unchanged at 523 million tonnes. An increase of 2.5% in the global production of blast furnace cast iron (1,278 million tonnes) and 2.4% of DRI production (90.2 million tonnes) has been reported.

The data show an increase equal to 8.3% in crude steel production in China (996 million tonnes), bringing its percentage quota from 50.9% in2018 to 53.3% in 2019. There was also an increase in the USA (+1.5%) to 88 million tonnes while a decrease in production have been recorded in the EU (-4.9%) with 159 million tonnes, Japan (-4.8%) with 99 million tonnes, Russia (-0.8%) with 71 million tonnes, the Republic of Korea (-1.4%) with 71 million tonnes, Turkey (-9.6%) with 34 million tonnes, and Canada (-4.9%) with 13 million tonnes.

MAIN STEEL PRODUCING COUNTRIES	2019	% 2019/2018
1. CHINA	996,3	+8,3
2. INDIA	111,2	+1,8
3. JAPAN	99,3	-4,8
4. USA	87,9	+1,5
5. RUSSIA	71,6	-0,8
6. KOREA	71,4	-1,4
7. GERMANY	39,7	-6,5
8. TURKEY	37,3	-9,6
9. BRAZIL	32,2	-9,0
10. IRAN	31,9	+30,1
11. ITALY	23,2	-5,2
12. TAIWAN	22,1	-5,1

The data confirm the predominant role of the Asian countries. China alone covers 53.3% of the global production, followed by India, Japan, and the United States. Europe in its entirety represents approx. 8.6% of the global production. The first European country, Germany, is at the seventh place. Italy, with a production of 23.2 million tonnes, is at the eleventh place globally and at the second place in Europe.

PRODUCTION USING ELECTRIC FURNACES (2019)	MILIONI DI TONNELLATE	% SUL TOTALE DELLA PRODUZIONE
EU (28)	65,0	40,9
RUSSIA	24,0	33,6
TURKEY	22,9	67,8
USA	61,2	67,8
CHINA	103,2	10,4
JAPAN	24,3	24,5
INDIA	62,6	56,2
AFRICA	12,7	76,5
SOUTH AMERICA	13,0	31,5
GLOBAL PRODUCTION	**523,0**	**27,9**

The effects of the pandemic in the first semester of 2020

The data regarding steel production in the first semester of 2020 show the strong negative impact of the economic and social crisis caused by the pandemic on the steel manufacturing industry.

GLOBAL PRODUCTION **-6%**
EUROPEAN UNION **-18,7**
ITALY **-19,7%**

Because of the coronavirus pandemic, in the first semester of 2020 the Italian steel manufacturing sector – which accounts for 33 thousands direct workers and 70 thousands in related sectors as well as a total revenue of approx. 40 billion euros – has registered a decrease in production close to 20%.

THE PRODUCTION OF STEEL IN ITALY

2019
The steel production was *23.2million tonnes*
-5,2% compared to 2018

Italia 11th
In the world among the steel producing countries
2nd *in Europe after Germany*

Italia 1st
in Europe in the production using electric furnaces with recycling of iron scrap metals

(sources: World Steel Association and Federacciai)

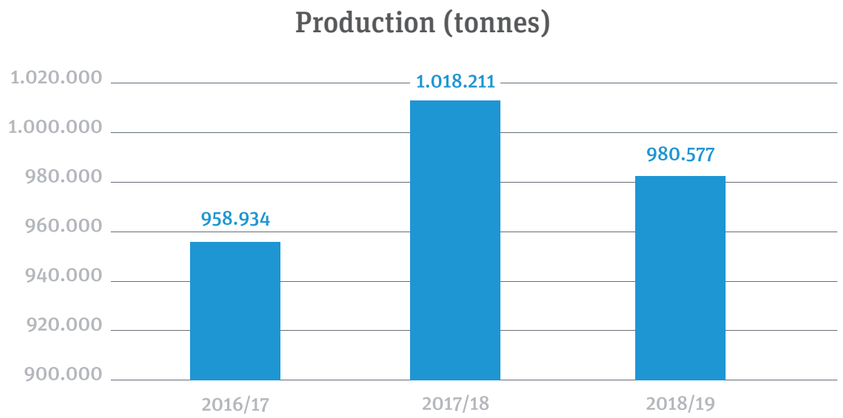
The Italian steel manufacturing industry accounts for **33 thousands direct workers**, approx. 70 thousands workers in related sectors, and revenues of approx. 40 billion euros.

6.2

6.2 Production and sales

Production data

In the fiscal year 2018/19 the AST's production was 980,577 tonnes. When compared to the previous year we registered a reduction of 3.7%.

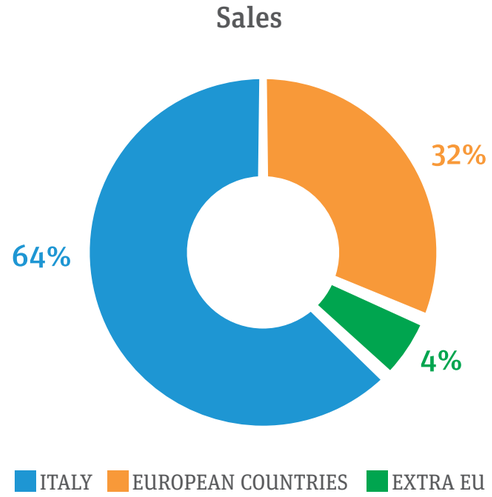


Sales

Shipping has registered a reduction of 5.6% compared to the previous fiscal year.
In particular:

- shipping of LAF (cold rolling laminate sheet) went down 1.1% (from 456,000 tonnes to 451,000 tonnes)
- shipping of NAC (hot rolling strips) went down 11.3% (from 177,000 to 157,000 tonnes)
- shipping of BLK (black) went down 10.8% (from 181,000 tonnes to 162,000 tonnes);
- shipping of tubes went down 8.7% (from 67,100 tonnes to 61,300 tonnes)
- shipping of forged products went up 8.5% (from 8,000 to 8,700 tonnes).

The sales were intended mainly for the national market (64%). Approx. 32% went to other European countries, while the remaining 4% went outside the EU.



6.3 Creation of sustainable value

AST promotes the creation of long term sustainable value by committing to:

- solidify the sustainability of its business model
- promote the development of innovative products
- invest in growth by selecting the best projects
- promote an efficient use of resources
- guarantee a solid financial structure
- pursue an operational efficiency
- manage the company's risks
- use the leverage provided by research and innovation.

Such commitments must be measured in economic terms and, therefore, also in accounting and control procedures. This process is done by setting the *Key Performance Indicators (KPI)*, which measure the company's ability to reach its goals through a constant optimisation of its operational activities, cash flow, and results.

6.4 Economic results

In the fiscal year 2018/19 AST **had revenues of 1,685,640,000 euros.** When compared to the previous fiscal year there was a reduction of 7%. The earnings before taxes were 332,549 euros. After 2,218,489 euros of taxes (both current and deferred), **the net earnings were equal to a loss of 1,885,940 euros.**

This result appears to be in contrast with the two previous fiscal years, which closed with widely positive results. In that regard, we must keep in mind **the very difficult market conditions** in which the company had to operate because of the import barriers introduced by the USA in 2018 that moved the excess of the Asian capacity towards Europe causing a collapse in prices despite the protective measures adopted by the European Union.

Within this context, the negative budget results are due not only to the reduction of shipping volumes but also to the price decline necessary to face the competition and keep market share. The tensions in the stainless steel market, caused by the introduction in the European market of low-cost products coming from Asian countries, produced **a reduction in shipping (-5.6%)** and an even **higher reduction in sales prices.** As a consequence, a significant erosion of **the net operating margins,** although still in positive territory, has been registered. The financial management gave a positive contribution (+1,904,144 euros) also thanks to the dividends received by the subsidiary Terninox S.p.A., while the adjustments to the value of derivative contracts in place at the end of the year weighed negatively on the budget (-7,128,205 euros).

The outcome in such a difficult year would have definitely been worse if the company did not adopt in previous fiscal years measures aimed at a greater competitiveness by leveraging the quality of its products and services and by developing innovative processes.

COMPANY'S CAPITAL
159,682,400 euros

NET ASSETS
243,478,512 euros

		2018/19	2017-18	2016-17
ORDERS	euro/000	1.658.686	1.788.681	1.683.757
REVENUES	euro/000	1.685.640	1.813.458	1.674.142
NET OPERATING MARGINS	euro/000	5.557	70.251	61.602
EARNINGS BEFORE TAXES	euro/000	333	89.303	62.333
% NET OPERATING MARGINS*	%	0,3%	3,9%	3,7%
% EARNINGS AFTER TAXES	%	0%	4,9%	3,7%
FINAL WORKFORCE	n.	2.346	2.368	2.378
AVERAGE WORKFORCE	n.	2.361	2.375	2.377
REVENUE PER EMPLOYEE**	euro/000	719	763	704
LABOUR COSTS RATE***	%	8%	7,6%	7,4%

** Net operating margins: production value – production costs*
*** Revenue per employee: revenues/final workforce*
**** Labour costs rate: lanour costs/revenues*

6.4

6.5 Shared added value

The reclassification of the economic budget allows to identify **the added value** created and shared among the main stakeholders (employees, shareholders, public administration, investors, and the community) or kept by the company.

This added value represents the ability of an enterprise to produce wealth that will be later distributed and, therefore, constitutes **the point of connection between the fiscal budget and the sustainability budget.** In fact, by calculating the difference between revenues and incurred costs, it measures the value that a company adds to the external factors of production and, therefore, allows to link the sustainability budget to the fiscal budget and to look at the latter from the stakeholders' perspective.

Shared value* (thousands of euros)	Personal	Financial capital	Public Administration	Liberality	Shareholder	Enterprise
2016/17	134.341	4.037	-	66	82.733	33.366
2017/18	136.564	3.846	-	7	90.865	39.440
2018/19	138.897	4.224	5.905	-	-	33.911

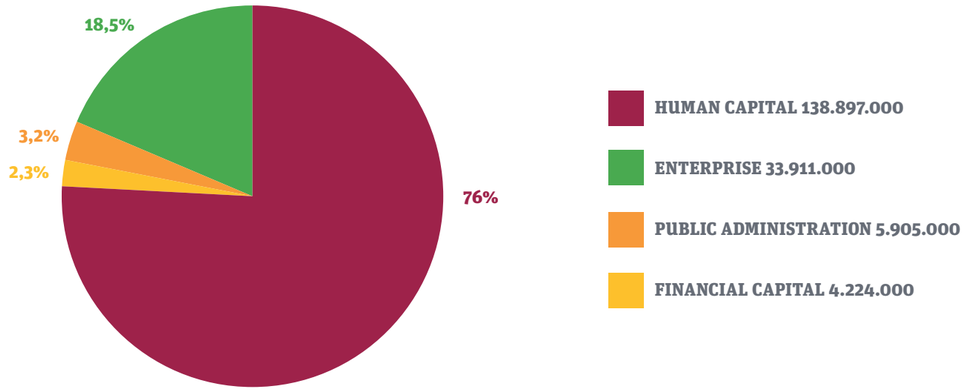
** The calculation of the shared value has been done by adopting the methodology proposed by the Study Group for the Social Budget (GBS).*

The data show that the amount of added value distributed to the human capital remained substantial over the years. In 2018/19 it was equal to 138,897,000 euros, showing an increase when compared to previous fiscal years. 133,741,000 euros of them were given to employees (102,961,000 as direct compensation and 30,780,000 as indirect compensation), while 5,156,000 euros were given to independent contractors.
The payments to the financial capital (in terms of interests on debt capital) was equal to 4,224,000 euros.
No dividends were paid to shareholders.

The value kept by the company for amortisations was 33,911,000 euros.

The value paid out to the Public Administration in terms of direct and indirect taxes (after subtracting a subsidy of 7 thousand euros) was 5,905,000 euros.

SHARED ADDED VALUE 2018/2019



6.5

6.6 Suppliers

Supply of materials

In 2818/19 the value of all supplies of direct materials* was **1,135,798,911 euros.**
36.4% of those supplies came from Italy. The procurement of materials from abroad appertained mainly to ferroalloys. On the other hand, 100% of scorifiers, 96.2% of carbon fiber scraps and 53.7% of stainless steel scrap metal came from Italian suppliers. AST is constantly committed to the research of better standards of quality and reliability as well as to the need to find new markets and, therefore, to find suppliers at the international level. These circumstances lead to the research of suppliers of international level and prestige without necessarily focusing on local and/or national suppliers

**Goods and raw materials contributing directly to the manufacturing of final products.*

MATERIALS	2018/19		
	Fornitori locali* (euro)	Totale** (euro)	% fornitori locali
Stainless steel scrap metals	290.073.300,6 €	539.822.160,7 €	53,73%
Carbon fibers scraps	62.344.195,9 €	64.827.097,8 €	96,17%
Cast iron and other scrap metals	26.135.837,8 €	51.000.402,2 €	51,25%
Ferroalloys	19.196.882,2 €	464.285.817,7 €	4,13%
Scorifiers	15.863.433,2 €	15.863.433,2 €	100,00%
Total	**413.613.650**	**1.135.798.911,68 €**	**36,42%**

**With the term local suppliers we mean suppliers whoselegal offices are located on the Italian territory, even if the raw materials come from abroad (with the exception of the carbon fiber scraps which come exclusively from the national market).*
*** The figures refer to amounts reported into the Business Information System SAP.*

Criteria for choosing suppliers

The choice of suppliers for raw materials, highly strategic for the company and with a high economic impact, is based on criteria of product's quality and purchase price.

Having said that, choosing a new supplier is done in full compliance with the internal procedures, which consist, among other things, of accepting the AST's and the thyssenkrupp's Codes of ethics with particular attention paid to the *Conflict Mineral Statement* and to the *Slavery and Human Trafficking Statement* in order to guarantee the respect of human rights.

Whenever possible, the purchase contracts will include a declaration from the supplier stating that its product and production process follow the rules regarding environmental sustainability. The same criteria are applied as far as the respect of the workers' rights is concerned.

6.6

6.7 Investments

The volume of investments in the fiscal year 2018/19 was **35,824,000 euros,** higher than the previous fiscal year.
As in previous years, a portion of the investments has been aimed at **the modernisation of the facilities and at the purchase of replacement parts and equipment.**

Some **projects** particularly important were completed or are still underway, among them:

- The renovation of **the laboratory** for analyzing the chemical composition of materials. A new robotic system for testing has also been installed;
- The completion of the project, started during the previous year, to build **a generator for the production of vapour** heated by the discharge gases from the *Walking Beam's (WB)* furnace chimney. The new installation allows to improve the energy efficiency, thus reducing both costs and CO_2 emissions;
- Investments in the area of **the hot rolling mills**. Installation of a gauge to measure the thickness in the centre of the strips and an automated system to optimise the cutting of slabs;
- The installation of a new **magnetic separator** on the ZHI line;
- Activities related to a railway system: improving the internal **railway** network (the company has a rail network for moving goods, which includes a connection with the
- Terni train station) and equipping 3 locomotives;
- The installation in various departments of **LED lights** in order to improve energy efficiency.

The implementation of the multi annual programme of **modernisation of the company's information systems** and the carrying out of measures for **safety in the workplace and for fire prevention** are also moving forward as scheduled.

It is also worth mentioning that, in order to improve the safety conditions and reduce the risks of injuries in the workplace, AST is committed to modify some equipment so that they will meet the safety standards as required by the certification OHSAS 18001.

6.7

6.8 Research and development

In the fiscal year 2018/19 the activities of research and development focused in particular on the following objectives:

- development of innovative products and standard products for innovative applications;
- implementation of innovative solutions for process control and for constant improvement;
- implementation of innovative solutions for improving the process in the context of industry 4.0;
- projects of virtualisation of the lines by using softwares designed for advanced modelling.

Innovation to keep growing

The collaboration with the Materials Development Centre, one of the major Italian research centres in the field of materials, ensures qualitative standards of excellence. The synergy with the IT internal department guarantees solutions able to optimise times and modalities for managing the customers' needs.
The innovation is all around: in the production processes, in packaging, in logistics, and to create cutting edge products and services.

- **New products and finishes for specific market sectors**
- **Research for emerging and innovative applications**
- **A state of the art IT system and personalised technical solutions.**

6.8

7

URBAN RE-GENERATION: THE DISTRICT OF SUSTAINABILITY

7.1 The project

Terni has been an industrial city since the Middle Ages, when in its territory many water mills were operational, and it had a leading role during the industrial revolution in the second half of the 1800s, so much that it was renamed “the Italian Manchester”. **Nowadays Terni is still one of the most important industrial realities of our country.**

Therefore, it is not by chance that at this moment, when Europe is promoting through the Green Deal a “green” transformation of its industrial system, Terni started a project for **a district of sustainability, circular economy, and urban regeneration called Urban Re-Generation.**

Promoted by **the Confindustria Umbria** business association and supported by **the Fondazione Cassa di Risparmio of Terni and Narni,** this project has as founding members eight companies: Acciai Speciali Terni, Beaulieu Fibres International, Exolon Group, ERG Hydro, Fucine Umbre, Sangraf International, Novamont e Tarkett.

These are leading companies at the regional and national level, which operate in strategic sectors such as steel, renewable energy, and green chemistry, and formed an alliance in the name of sustainable development.

CONFINDUSTRIA UMBRIA

FONDAZIONE CASSA DI RISPARMIO DI TERNI E NARNI

PARTICIPATING COMPANIES

ACCIAI SPECIALI TERNI

Beaulieu International Group

ERG EVOLVING ENERGIES

exolon GROUP

Fucine umbre we'll do it

SANGRAF INTERNATIONAL

NOVAMONT

Tarkett

7.1

7.2 Good practices

The first phase of the project had as objective to highlight which best practices should apply to the participating companies on the basis of 10 "pillars" defined in reference to the 17 objectives of sustainable development outlined in the United Nations' Agenda 2030.

Pillars	Global objectives of Sustainable Development of the Agenda 2030 linked to the Pillars
1. Green regeneration of companies and recuperation of industrial areas in order to create a connection between culture and business	
2. Decision sharing in order to create cooperating networks	
3. Transformation of waste and discarded raw materials to be reintroduced in the production cycles	
4. Diffusion of the industrial innovation "through contagion". Green companies become a driving force	
5. Support to culture and creativity as drivers of social innovation	
6. Total opening toward all innovations in the context of pragmatism and with a long term vision of the future	
7. Investments in secondary and tertiary education	
8. Sharing all regeneration procedures with the communities	
9. Building networls of cities and integrated territorial policies	
10. Creation of a new framework of innovative governance	

In the first semester of 2020 the participating companies compared their data for a first mapping of the good practices in the fields of environmental sustainability and circular economy. The research, made public in September 2020, outlined a series of positive results already achieved:

- reduction of approx. 25,000 tonnes of CO_2emissions in 2019, equal to about 7% of the total emissions of the industrial sector in the Terni area;
- reduction up to 60% of the consumption of energy used for lighting thanks to the use of LED lights;
- up to 80% of the total materials used in production is made of recycled materials;
- up to 100% of the production waste is reused as raw material in the production cycle or recovered through composting;
- production of electric and thermal energy via cogeneration, with a reduction up to 30% of the fossil fuels used;
- investment of profits (from 5% to 20%) in research and development for the reduction of emissions into the atmosphere and in the development of innovative and sustainable products;
- reduction of the consumption of drinkable water thanks to the process of water recicrculation and rainwater harvesting;
- involvement of suppliers in projects for waste reduction and for optimisation of the processes for raw materials' production/supply;
- projects of dematerialisation and digitalisation for the reduction of paper consumption;
- analysis of the products' life cycles, recognised by certifications such as EPD (Environmental Product Declaration), Carbon Footprint, and Eco-Label, in order to identify crucial points and to define appropriate improvement strategies.

WHAT HAS BEEN DONE		
PILLAR	STRATEGY	ACHIEVED RESULTS
1. Green regeneration of companies and recuperation of industrial areas	**Energy from Renewable Sources: 100% green certified electric energy and installation of plants powered by renewable sources.** -LED lighting. -Policies of sustainable purchasing. -Certification ISO 50001 and ISO 14001. **Environmental analysis of the products and/or the organisation (LCA, EPD, Carbon Footprint, Eco-Label).** -Reduction of water consumption.	· Thanks to green energy and renewable installations the District blocked the immission into the atmosphere of approx. 25,000 tonnes of CO_2 in just 2019 (7% of the total of the Terni industrial sector). · Reduction of energy consumption for lighting up to 60%. · Reduction of business trips up to 60%. · Use of paper/carton certified PEFC/FSC. · Environmental certification of products such as EPD (Environmental Product Declaration), Carbon Footprint, and Eco-Label. · Reduction (almost to zero) of the consumption of drinkable water. · Use of environmental criteria in the selection of suppliers.
2. Decision sharing	**Formalisation and sharing of environmental policies.**	· Publication of the sustainability report. · Identification of targets for monitoring the environmental performances. · Development of the protocol Urban Re-Generation.

WHAT HAS BEEN DONE		
PILLAR	STRATEGY	ACHIEVED RESULTS
3. Transformation of waste and discarded raw materials	**Reduction of raw materials and waste during the production cycle.** - Implementation of the principles of circular economy.	· Up to 80% of materials used come from recycling. · Up to 100% of waste is reused as raw materials. · Reduction of packaging and recovery/reuse of packaging materials. · Energy recovery of the organic waste as fuel. · Digitalisation of the documentation. · Up to 80/90% of waste is sent to recycling and/or composting.
4. Diffusion of the industrial innovation "through contagion"	- Promoting models of sustainable development	· Investments in start-ups in the territory. · Collaboration with the suppliers for waste reduction and for the optimisation of processes for the production of raw materials.
5. Support to culture and creativity	- Initiatives for the community.	· Participation and promotion of projects for the environmental protection (cleaning of spaces destined to the community). · Promotion of music festivals and shows.
6. Total opening toward all innovations	- Innovation and research in order to promote a sustainable industrialisation	· Investments from 5% to 20% of the profits in Research and Development.

WHAT HAS BEEN DONE		
PILLAR	STRATEGY	ACHIEVED RESULTS
7. Investments in secondary and tertiary education **8. Sharing with the communities**	**Training of the new generations.** - Training of personnel.	· Set up a toll-free number to be used by residents in the area for obtaining information regarding the environment. · Collaboration with schools and institutes in the territory for planning visits to the factory, educational activities, internships, and thesis for college undergraduates. · Over 200 hours of employees' training on environmental topics.
9. Building networks **10. Creation of a new framework of innovative governance**	- Formalisation of environmental policies. - Joining business networks	· Development of the protocol Urban Re-Generation. · Joining organisations representing enterprises.

7.3 Goals and future developments

The project Urban Re-Generation is the basis on which the eco-district is built also with the participation of new enterprises. An open dialogue with the local communities will be developed and communication initiatives at the national and international levels aimed at promoting the territory and at comparing us with the best European practices will be sponsored.

Meanwhile, the participating companies have already identified 17 goals for a further improvement of their sustainability performances

FUTURE DEVELOPMENTS		
PILLAR	STRATEGY	DESIRABLE RESULTS
1. Green regeneration of companies and recuperation of industrial areas	- Increase of the quota of energy produced by Renewable Sources - Emissions offsetting - Ecological means of transportation and remote work systems - Analysis of life cycles and energy efficiency	· Commitment to increasing the quota of energy produced by Renewable Sources. · Neutralisation of the residual emissions (impossible to avoid in the production cycle) through certified projects of forestation in the territory. · Also because of the Covid-19 emergency, reduction of business trips. · Introduction of green vehicles (hybrid, electric, methane gas-powered vehicles) in the company's fleet and encouragement of car pooling. · Promotion of remote work systems (Smart Working) · Incentivising the analysis of environmental impacts in the life cycles.
2. Decision sharing	- Constant updating and sharing targets for the District's improvement	· Constant updating the identified macro-objectives (non-stop alignment with the European policies)
3. Transformation of waste and discarded raw materials	- Promoting the circular economy	· Promoting activities of discarded materials/waste reduction by favouring recovery and recycling.
4. Diffusion of the industrial innovation "through contagion"	- Extending the protocol	· Promotion of the Urban Re-Generation protocol in order to include additional companies present in the territory

7.3

FUTURE DEVELOPMENTS		
PILLAR	STRATEGY	DESIRABLE RESULTS
5. Support to culture and creativity	- Invest in the community	· Promotion of social and environmental events · Increased interactions with academia
6. Total opening toward all innovations	- Modifications of packaging - Product innovation aimed at substituting all harmful chemical substances	· Promoting compostable and/or completely recyclable packaging. · Increasing the sustainability of products through a constant effort in research and innovation
7. Investments in secondary and tertiary education **8. Sharing with the communities**	- Internal training - Training of new generations - Training events directed at the communities.	· Constant staff retraining on environmental topics. · The training strategies directed at the secondary schools and at academia will be strengthened · Promotion of the Urban Re-Generation protocol in the communities.
9. Building networks **10. Creation of a new framework of innovative governance**	- Commitment in developing new collaborations with the local administrations - Commitment in developing new collaborations with other realities present in the territory.	· New projects for the recuperation of green areas in the territory will be carried out in collaboration with the local administrations. · Sharing policies with other realities present in the territory in order to promote the model of a “Sustainable District”.

8
APPENDIX

8.1 Methodological note

The sustainability report has been written in accordance with **the guidelines issued by the Global Reporting Initiative (GRI)**.
The sustainable reporting standards (GRI standards) measure and allow to report the performances and the impact of the company's activities in the context of environmental, social, and economic sustainability.

The report has been prepared with the assistance of the consulting firm **Greening Marketing Italia.** As far as the calculation of the **generated added value** and its distribution to the stakeholders are concerned, the GBS' (National study group for the social budget) method of calculation has been applied.

As for **the indicators of circularity,** in the absence of standardised criteria still today under development at the European level on the basis of the Plan of action for the circular economy, we referred to the paper *"Circular economy and efficient use of resources – indicators for measuring the circular economy"* published in December 2018 by the Ministry of Environment with the collaboration of the Ministry of Economic Development and the technical and scientific support of ENEA.

Reporting boundary

The report pertains to the activities of Acciai Speciali Terni. Along with the indicators of environmental, economic, and social sustainability, it also includes more general information on the company and on the context in which it operates.

Reporting period

The report pertains to the fiscal year 2018/19 (from October 1st 2018 to September 30th 2019). It also contains data and information relating to the two previous years in order to provide a more comprehensive picture of their trends over the year.

Definition of concepts included in the report

Materiality: the data included in the report and their relative level of depth take into consideration their impact from an economic, environmental, and social point of view, and the aspects that could substantially affect the stakeholders' evaluations and decisions.

Stakeholders' inclusiveness: the report is intended for all stakeholders, internal and external, who are involved or could be involved in the activities of the factory and the Company at large.

Sustainability context: the report describes the factory's performance with respect to the objectives of sustainable development by taking into consideration both the global impact (such as climate change) and the specific characteristics of the territory where the most significant impacts of its industrial activity are made.

Completeness: the report describes the company's environmental, economic, and social performances by using a system of indicators which outline the main impacts of the activities carried out by the company and by highlighting the evolution during the period of reference.
Besides the GRI standards and guidelines, we used in the report some "indicators of circularity" in order to describe the company's performance regarding the objectives linked to the transition toward a circular economy.

Moreover, the results achieved have also been examined in the context of their conformity to the goals of sustainable development indicated by the United Nations' Agenda 2030.

Principles of quality assurance

Balance: the report describes both the positive and the negative aspects of the company's environmental, social, and economic performances by reporting qualitative information and quantitative data, which allow the reader to form an independent and balanced opinion.

Comparability: the indicators developed in the report follow the methods indicated by the GRI guidelines, thus making the comparison between the performance of the company and of other industrial realities possible and allowing to evaluate its evolution during the reporting period.

Accuracy: each indicator used in the report is computed according to a homogenous schema by reporting the numerical data in tables, by adding explanatory graphic representations, and by explaining the main results observed with a concise text. In both tables and charts the units of measurement used are shown.
Clarity: the report has been written using a language as simple as possible by avoiding to report technical data in too many details. The way the index and the GRI correlation table have been structured helps the stakeholders in finding the topics they are more interested in. Also, the graphic processing make the understanding of data easier.

Verifiability: the information is provided in a way that it will be verifiable over the years.

8.2 GRI CORRELATION TABLE

GRI INDICATOR	DESCRIPTION	PARAGRAPH
PROFILE		
Profile of the organisation		
102 - 1	Name of the organisation	2.1
102 - 2	Activities, brands, products, and services	2.1 -2.3
102 - 3	Location of the executive offices	2.1
102 - 4	Location of the carried out activities	2.1
102 – 5	Ownership and legal status	2.1
102 – 7	Size of the organisation	2.1-2.3
102 – 8	Information on employees and other workers	5.2
102 – 9	Supply chain	6.6
102 – 10	Significant changes in the relationship between the company and its supply chain	6.6
102 – 11	Principle of precaution	2.4
102 – 12	External initiatives	5.1-5.2
102 – 13	Affiliation to associations	5.1
Strategy		
102 – 14	Statement from the highest decision centres	Letter to the stakeholders
102 – 15	Main effects, risks, and opportunities	6.1
102 – 16	Values, principles. standards, and behavioural rules	2.1
102 – 17	Advisory mechanisms regarding ethics	2.1
102 – 18	Governance structure	2.1
102 – 19	Delegation process	2.1

GRI INDICATOR	DESCRIPTION	PARAGRAPH
102 – 20	Executive level for economic, environmental, and social topics	2.1
102 – 21	Consultation with stakeholders on economic, environmental, and social topics	5.1
102 – 22	Makeup of the governance at the highest levels	2.1
102 – 23	Chairmanship of the highest level of governance	2.1
102-24	Nomination and selection of the leading figures	2.1
102-26	Role of governance leading figures in establishing values and intent	2.1
102-27	Knowledge of governance leading figures on each single topic	2.1
102-28	Evaluation of the performance of governance leading figures	2.1
102-29	Identification and management of economic, environmental, and social impacts	3.1-5.1-6.3
102-30	Efficacy of the risk management's procedures	2.1
102-31	Control on economic, environmental, and social topics	2.1
102-32	Role of governance top figures in the sustainability report	
102-33	Communication of crucial aspects	
102-34	Nature and number of critical issues	
102-35	Salary policies	5.2
102-36	Process of wage determination	
102-37	Level of the stakeholders' involvement in the compensation process	
102-38	Annual total compensation ratio	
102-39	Percentage increase in the compensation ratio	
102-40	List of stakeholders involved	1.4

GRI INDICATOR	DESCRIPTION	PARAGRAPH
102-41	Collective bargaining agreements	5.2
102-42	Identification and selection of stakeholders	5.1
102-43	Approach to the stakeholders' involvement	1.4-5.1
102-44	Key topics	1.4
	Reporting	
102-45	Entities included in the financial reports	6.4-6.5
102-46	Definition of contents and topics' boundaries	1.4
102-47	List of materials inherent to the topics	1.4
102-48	Reviewing of information	1.4
102-49	Changes in reporting	1.4
102-50	Period of reference	Fiscal year 2018/2019
102-51	Most recent report data	Fiscal year 2017/2018
102-52	Report's activity cycle	Annual
	Management approach	
103-1	Explanation of the topic and its boundaries	
103-2	Reporting requirements	
ECONOMIC PERFORMANCE		
201-1	Direct economic value generated and distributed	6.5
201-2	Financial implications and other risks and opportunities linked to the climate change	1.2-4.2
201-3	Significant financing received from the public administration	

GRI INDICATOR	DESCRIPTION	PARAGRAPH
	Market presence	
202-1	Relationship between the local minimum wage and the starting average wage	
202-2	Number of senior managers hired from the local community	
	Indirect economic impacts	
203-1	Investments in infrastructures and services	5.2
203-2	Significant indirect economic impacts	6.5-6.6
	Practices of contracts tendering	
204-1	Amount of expenditures with local suppliers	6.6
	Anti-corruption	
205-1	Operations regarding the risks connected to corruption	2.1
205-2	Communication and training regarding anti-corruption procedures	2.1
205-3	Ascertained corruption cases and responses	
	Harmful behaviours of competitors	
206-1	Legal actions for anti-competitive, anti-trust and monopolistic practices	2.1

GRI INDICATOR	DESCRIPTION	PARAGRAPH
ENVIRONMENTAL PERFORMANCE		
	Materials	
301-1	Materials used, by weight or volume	3.2
301-2	Recycled materials used	3.2
301-3	Reused products and their packaging materials	3.2
	Energy	
302-1	Energy consumption	3.4
302-2	Energy consumption outside the organisation	3.4
302-3	Energy intensity	3.4
302-4	Reduction of the energy consumption	3.4
302-5	Reduction of the energy demand for products and services	3.4
	Water	
303-1	Water collection	3.7
303-2	Water sources significantly affected by the collection	3.7
303-3	Recycled and reused water	3.7
	Biodiversity	
304-1	Operational sites owned, leased, managed or adjacent to protected areas	3.10
304-2	Significant impacts of the activities, products and services	3.10
304-3	Protected or restored habitats	3.10

GRI INDICATOR	DESCRIPTION	PARAGRAPH
304-4	Species present in the IUCN's red list	
	Emissions	
305-1	Direct greenhouse gas emissions (scope 1)	3.5
305-2	Indirect greenhouse gas emissions (scope 2)	3.5
305-3	Other indirect greenhouse gas emissions (scope 3)	
305-4	Intensity of greenhouse gas emissions	3.5
305-5	Reduction of greenhouse gas emissions	3.5
305-6	Emissions of substances that cause the depletion of the ozone layer	3.6
305-7	Nitrogen oxides, Sulfur oxides and other significant emissions into the air	3.6
	Waste and discarded materials	
306-1	Final wastewater discharge	3.7
306-2	Waste and methods for their disposal	3.3
306-3	Spills	
306-4	Transportation of harmful waste	
306-5	Bodies of water affected by discharges and/or runoffs	3.7
	Environmental conformity	
307-1	Non-conformity with environmental laws and regulations	3.1
	Emvironmental evaluation of suppliers	
308-1	Reporting requirements	6.6
308-2	Environmentally negative impacts in the supply chain	

GRI INDICATOR	DESCRIPTION	PARAGRAPH
SOCIAL PERFORMANCE		
	Workers	
401-1	Hiring of new employees and turnover of employees	5.2
401-2	Benefits exclusively reserved to full-time employees	5.2
401-3	Parental leave	5.2
	Working relationship within the company	
402-1	Minimum notice period related to operational changes	5.2
	Health and safety	
403-1	Workers' representation in the management/ employees joint commissions on health	5.2
403-2	Types and percentage of injuries, work-related illnesses, absences and deaths in the workplace	5.2
403-3	Workers with high accident rate or at high risk of professional illnesses	5.2
403-4	Health and safety issues covered by formal agreements with the trade unions	5.2

GRI INDICATOR	DESCRIPTION	PARAGRAPH
	Training	
404-1	Average annual number of hours dedicated to training	5.2
404-2	Programmes for the implementation of competencies and programmes for assistance in the transition	5.2
404-3	Percentage of performance and review	5.2
	Equal opportunities	
405-1	Diversity in the management bodies	5.2
405-2	Men/women salary ratio	5.2
	Non-discrimination	
406-1	Discrimination cases and actions taken	5.2
	Freedom of association and collective bargaining	
407-1	Operations and suppliers where risks of association exist	5.2-6.6
	Underage labour	
408-1	Operations and suppliers subject to underage labour risk	2.1-6.6
	Forced labouri	
409-1	Operations and suppliers at risk of forced labour	

GRI INDICATOR	DESCRIPTION	PARAGRAPH
	Security practices	
410-1	Security personnel schooled on human rights	
	Rights of the native populations	
411-1	Incidents related to violations of the native populations' rights	2.1-6.6
	Evaluation of human rights	
412-1	Operations subject to controls on human rights	2.1
412-2	Training on the policies regarding human rights	
412-3	Agreements related to investments for the protection of human rights	2.1
	Local communities	
413-1	Activities with the involvement of local communities	5.1
413-2	Operations with significant impacts on the communities	5.1-5.2
	Social evaluation of suppliers	
414-1	New suppliers screened based on social criteria	6.6
414-2	Negative social impacts in the supply chain	6.6
	Public policies	
415-1	Public contributions	

GRI INDICATOR	DESCRIPTION	PARAGRAPH
	Consumer's health and safety	
416-1	Evaluation of the impacts on safety and health	2.4
416-2	Accidents caused by the non-conformity of services and products	2.4
	Marketing and labelling	
417-1	Requirements regarding the information about products and the labelling	2.4
417-2	Incidents related to non-compliance	
417-3	Incidents related to non-compliance regarding communication	
	Consumer's privacy	
418-1	Complaints motivated by violation of privacy	
	Socioeconomic conformity	
419-1	Non-compliance with laws regarding socioeconomic issues	

ACCIAI
SPECIALI
TERNI

Registered Office address
V.le B.Brin, 218 - 05100 Terni - Italy
Tel.: **+39 0744 4901**
Web site: **www.acciaiterni.it**

The report has been prepared
in collaboration with
Greening Marketing Italia

Graphic design and layout by:
NMK - nmkstudio.com