SARLUX
Refining & Power
SARAS

Environmental Statement THREE-YEAR PERIOD 2022 - 2024

Data updated to 2023

EMAS
GESTIONE AMBIENTALE VERIFICATA
Reg.n.IT - 000995

SARLUX | Environmental Statement THREE-YEAR PERIOD 2022 - 2024

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SARLUX
Refining & Power
SARAS

Sarlux Srl
registered office Sarroch (CA)
strada statale 195 Sulcitana, Km 19

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Environmental Statement
THREE-YEAR PERIOD 2022 - 2024

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Environmental Statement
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Sixth Edition - Rev. 2 of 13 June 2024
(performance data updated to 31 December 2023)
This "Environmental Statement" is the English translation of the original "Dichiarazione Ambientale" in Italian, validated by LRQA on 19/06/2024.
Drafted in accordance with the requirements of Regulation (EC) no. 1221/2009, Regulation (EU) 2017/1505 and Regulation (EU) 2018/2016. EMAS registration number: IT - 000995 of 20 October 2008.

EMAS
GESTIONE AMBIENTALE
VERIFICATA
Reg.n.IT - 000995

The accredited environmental verifier that validated the Sarlux Environmental Statement in accordance with the requirements of Regulation (EC) no. 1221/2009, Regulation (EU) 2017/1505 and Regulation (EU) 2018/2026 is LRQA Italy S.r.l., with EMAS accreditation number: IT-V-0010 of 19 September 2008

The Environmental Statement is updated annually and a complete version will be re-issued in 2025.

(*) The certifier's validation is attached at the end of this document.

Sarlux has published its **Environmental Statement** for the Sarroch site, prepared in accordance with the EU Eco-Management and Audit Scheme (EMAS), pursuant to Regulation (EC) no. 1221/2009, Regulation (EU) 2017/1505 and Regulation (EU) 2018/2026 - EMAS registration number: IT - 000995 of 20 October 2008.

EMAS is a voluntary scheme available to public and private organisations and companies that commit to evaluating, measuring and reporting on their environmental performance. The Environmental Statement is the report produced by EMAS-registered organisations that is updated each year in the "Data and improvement actions" section and is a key tool for communicating with external and internal stakeholders.
The purpose of the Statement is to establish a transparent relationship with all our stakeholders, particularly the local population, local authorities and our employees, who play an active role in the correct management of our operations. The Statement provides a detailed picture of our production site's environmental performance.
Environmental management is also addressed in collaboration with the university research community, by choosing technology investments and management approaches that minimise our environmental footprint. This includes implementing innovative systems for the digitisation of corporate processes.

The Environmental Statement is verified by an accredited and independent verifier, who assesses both the adequacy of Sarlux's Management System for Health, Safety and the Environment, implemented in accordance with UNI EN ISO 14001 and UNI ISO 45001 and the accuracy of the information we provide to the public.
The Environmental Statement, validated by the verifier, must be sent for registration to our national competent body, in Italy ISPRA, which starts the procedure by sending to ARPA Sardegna and to the other competent bodies a request for information on Sarlux's compliance with the applicable environmental legislation (Article 13 of the EMAS III Regulation).
The competent body will then notify Sarlux of the registration and issue the certificate.

The steady improvement of our environmental performance over the years is proof of our dedication to value creation and strengthens our determination to continue along this path.

This report describes in a clear and transparent manner our organisation, activities, environmental policy, significant environmental aspects and related performance data, as well as the objectives that we set from time to time to improve our environmental performance.

The information contained in this Statement complies with the requirements of the EMAS Regulation. Sarlux declares that it complies with the requirements of the applicable legislation.

The Environmental Statement 2022-2024 contains four sections. The first three are mainly descriptive, presenting and developing the environmental aspects. The fourth section contains the data collected up to and including the reporting year, and the improvement actions.

Table of contents

This Environmental Statement has been prepared by the HSE Integrated Management Systems function of Sarlux in accordance with the requirements of the EMAS III Regulation (Regulation (EC) no. 1221/2009 of November 2009 and subsequent regulations).

Sarlux srl - Site: Sarroch production facility

SCOPE

Refining, receipt, storage, manufacture and shipping of petroleum products
NACE code 19.20
IPPC code 1.2

Production and sale of electricity
NACE code 35.11
IPPC code 1.1

Manufacture of other organic basic chemicals
NACE code 20.14
IPPC code 4.1

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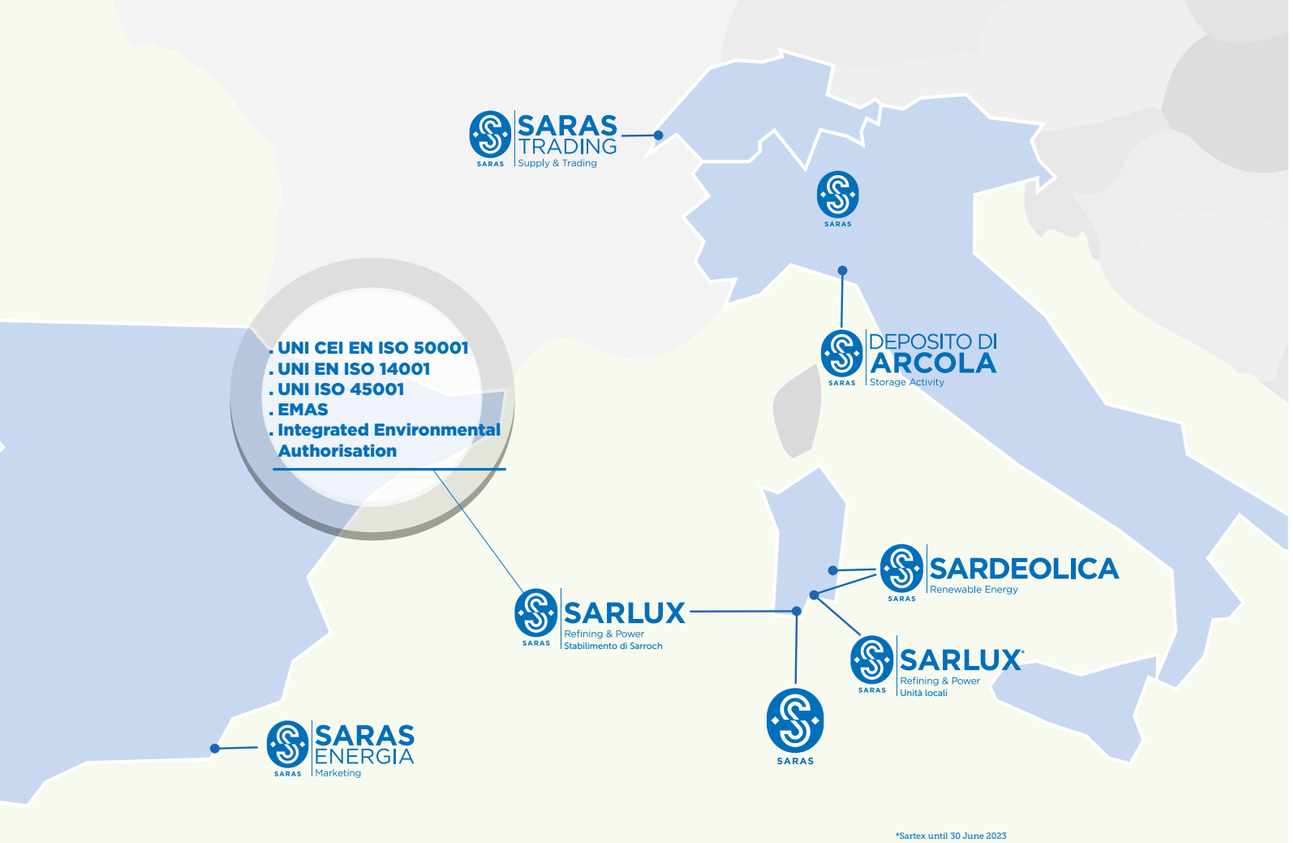
1. Sarlux: sustainable energy

Respect for the environment as a key factor for long-term sustainability, productivity and market competitiveness.

Sarlux in the Saras Group

Operating in the oil and energy sector since 1962, the Saras Group is one of the main independent oil refining operators in Europe.
The heart of the Group is the Sarroch industrial site, operated by the subsidiary Sarlux, on the south-western coast of Sardinia. The site is home to one of the largest refineries in the Mediterranean in terms of production capacity (about 15 million tonnes per year, or 300 thousand barrels per day) and among the most advanced in terms of plant complexity.
In the early 2000s, the company added to its oil refining operations the generation and sale of electricity, by installing one of the largest integrated gasification combined-cycle plants (IGCC) of its kind in the world. The Sarroch IGCC with an installed capacity of 575 MW, in 2023 covered more than 41.9 percent of Sardinia's internal electricity demand.
The Group's global dimension was strengthened by its listing on the Milan Stock Exchange in 2006.

In the area of power generation, ARERA (the Italian Regulatory Authority for Energy, Networks and the Environment) has included the Sarlux IGCC plant among the key plants for the security of the electricity system for the year 2023 too, and defined the economic conditions of operation.



Regarding the business model, the Group has developed an integrated management process to coordinate the refinery's production activities with its planning and commercial activities.
The subsidiary Saras Trading SA, based in Geneva and acting under an agency agreement on behalf of the parent company, handles the purchase of crude oil and other raw materials for the refinery, the sale of finished products and, thanks to its strategic location, the independent trading of oil commodities.
Directly and through its subsidiaries, Saras sells and distributes oil products, such as diesel, petrol, heating oil, liquefied petroleum gas (LPG), virgin naphtha and aviation fuel, mainly in the Italian and Spanish markets, but also in other European and non-European countries. In 2023, around 2.2 million tonnes of oil products were sold in Italy in the wholesale market, and a further 1 million tonnes in the Spanish market through the subsidiary Saras Energia SAU.

Saras has broadened its offer by generating and selling electricity from renewable sources. Our subsidiary Sardeolica, with wind farms in Sardinia at Ulassai and at the Macchiareddu industrial area, the latter acquired in 2021, has an installed capacity of 171 MW.
In March 2022, Sardeolica obtained the permit ("Autorizzazione Unica") for a 79 MW photovoltaic plant project in the Macchiareddu Industrial area (South Sardinia), named "Helianto", with an estimated generation capacity of about 150 GWh/year. The PV plant, currently under construction, will be able to exploit significant synergies with the neighbouring wind farm. It will become operational in 2024.
Sartec Srl, a former subsidiary of the Group as a competence centre for industrial and environmental performance, was merged into Sarlux on 1 July 2023.

Relationship with the territory and external communication

The Saras Group, a strong international player based in Sardinia for the past 60 years, has always been integrated with the local communities, working on creating sustainable value and promoting social projects for the community. The Group's constant dialogue with the territory fosters local social, economic and cultural development, yielding mutual benefits for the company and the community around it.

External communication

The Saras Group and the Sarlux site have become a point of reference for the community in many respects: for its key role as a major employer and for its contribution to not just industrial growth but broader societal development.
A key aspect is the focus on the environmental sustainability of our industrial operations. In this regard, the annual publication and dissemination of the Environmental Statement is an opportunity for open dialogue with the community. When publishing its environmental performance data, Sarlux highlights the results achieved, progress made and areas for improvement for responsible, sustainability-focused production.
The Environmental Statement's digital edition is promoted through a newsletter and published on the website www.sarlux.saras.it.
The website also has constantly updated, clear and reader-friendly information on production, plants, investments in personal safety and protection of the environment, their reliability and results. The more than 100-page website also has a news section providing constant and timely information on the Group's and the production site's initiatives in the areas of environmental sustainability, technological innovation and social engagement.
When publishing each article, Sarlux also sends out a newsletter to local institutions, partners and stakeholders.

The Saras Group's value for the community

The Group's policy "Our Stakeholders" outlines our approach in managing relations with local communities, whom we recognise as strategically important stakeholders. The communities around the Sarlux plant have strong ties to their traditions, are actively engaged in cultural and sports activities and attentive to the environment and welfare needs.
The Group interacts with these communities via shared values and objectives and supports those projects that are the most beneficial for the territory, which support social cohesion and enhance local history and traditions.
One of Saras' main goals is to promote entrepreneurial culture and help people to understand its value and importance. For this reason, the Saras Group offers educational activities to school students and works closely with universities to strengthen knowledge, skills and professional standards. The aim is to help young people to play an active role in social development on the themes of employment, sustainability and economic growth, in a Region affected by high rates of youth unemployment and the brain drain of inland areas. In this perspective, the Group's initiatives for students' skill-building and guidance are extended to the whole of Sardinia.

Saras for Schools

Through its Group companies, Saras offers a range of projects to respond to the schools' requests and to foster innovative and more effective teaching practices.
Over the last few years, more than 1,000 high school students have taken part in the ministerial "soft skills and orientation paths" (PCTO). They have been able to have first-hand experience of the world of work and, in particular, to observe the complex system of knowledge and technological innovation that develops in an industrial Group.
In 2023, more than 185 students from nine high schools took part in activities expanding on their school subjects with a focus on the energy transition and sustainability at the Sarlux refinery.
In 2023, the Saras Group refreshed its initiatives for students to reflect the technical and intellectual development of industrial production. The themes addressed, in areas such as cybersecurity and ICTs, were greeted by students with strong interest and motivation.

The activities, specifically designed to match each school syllabus, were led by company experts and managers who covered industrial topics, often using simulations to demonstrate the Group's way of working and give practical tips on developing employability skills.
The students also appreciated the opportunity to visit the industrial facility and to supplement the theoretical education received in school.
On the topics of sustainable development and alternative energy sources, numerous visits by vocational-technical high school students were organised to the Sardeolica wind farm at Ulassai.

As part of the "Saras for Schools" educational programme, as every year, the Group donated textbooks to the Istituto Comprensivo (primary and middle school) of Sarroch and Villa San Pietro. In line with sustainability and the circular economy, the books are given out on loan to the more than 100 students and handed over at the end of the year to incoming students. Over the years, Saras has supported the school by supplying tablets, computers and printers.
Furthermore, in 2023, we donated 200 new books to the school's library.
The Group's support to the school, from the early years of Saras' presence, has led to the creation of a chemical laboratory and sports facilities, equipped with defibrillators.

Saras for Universities

Under the Memorandum of Understanding signed with the University of Cagliari on 14 December 1999 and renewed in 2014, Saras continued in 2023 its commitment to corporate social responsibility, providing its know-how to the University.
To complete the training of future engineers, three seminars were organised, aimed at developing scientific and technological innovation: one with the Department of Mechanical, Chemical and Materials Engineering, one with the Italian Association of Professors in Industrial Systems Engineering, and one with the Department of Electrical Energy and Electronics.
In addition, two guidance projects were organised with high schools to provide guidance to last-year students in their choice of university. During the meetings, managers and engineers from the Saras Group presented the company: an industrial site that fully integrates its refining, energy production and petrochemical operations, focused on the green transition, and which brings added value to the area in terms of economic and social growth.

A highlight of the meetings was the presentation of current innovations for energy saving and environmental sustainability, based on the guidelines of the European Green Deal and the National Integrated Energy and Climate Plan (PNIEC).
Lastly, in 2023 too Saras took part in initiatives organised by the Italian Association of Chemical Engineering (AIDIC) and the Italian Thermotechnical Association (ATI) and, together with AIDIC and other Sardinian companies, sponsored scholarships for the best Chemical Engineering graduates.

Saras for sports and the community

Cultural and sports associations in the Sarroch area respond to social and environmental needs and create projects to support the local communities and culture. This is why in 2023 too the Group supported a number of initiatives in the areas of sports, culture, welfare and traditions. Saras' contribution to societal wellbeing makes the Group a point of reference for the industry, the community and all the stakeholders with whom it interacts.

Supporting sport

The Sarroch Boxing Academy has won this year the Italian junior championship title and numerous gold, silver and bronze medals; cycling club Veloclub Sarroch, which has over 50 athletes, has won the first cyclo-cross sprint race organised in Sardinia; Amatori Rugby Capoterra competes in the national championships; youth football club ASD Gioventù Sarroch competes in the third category championship; ASD Kayak Sarroch, ASD Podismo Sarroch, Tennis Club Sarroch, Gioventù Sarroch Calcio, throughout the summer of 2023 have involved children aged 5 to 14 in sports and social and recreational activities, offering development opportunities to young athletes; lastly, Sarlux Sarroch Volleyball competes in the A3 national championship.

Supporting the community

The Shark Max Days combine leisure and education, sports events, musical concerts and entertainment for children. The aim is to teach and promote the culture of sea protection to more than 60 primary and middle school children.
The Diapason Association teaches various musical genres to its members and at the end of the course organises the Sa*Rock festival, an established music event in Sardinia now in its second year.
L'officina delle idee, together with Muìdas, organises cultural events in some of the most fascinating nature and landscape settings in the territory of Sarroch; the S'Arrocca NGO with its ancient history experts organises the Filarchaios archaeological camp, allowing more than 50 children to discover the area's rich heritage of Nuragic sites.
The Santa Vittoria Association organises the activities surrounding the traditional religious festival of Sant'Efisio.
Significant for social issues was the sponsorship of the 2023 edition of the women's marathon Cagliari SoloWomenRun, a regional-scale event that gathered 12,000 women athletes.

The area where the plant is located

The Sarlux site is located in the multi-company industrial area of Sarroch (CA), located on the south coast of Sardinia in the Gulf of Cagliari and precisely at km 19 of State road 195 "Sulcitana". This geographical position is strategic for trade with central-western Mediterranean countries, both European and North African.

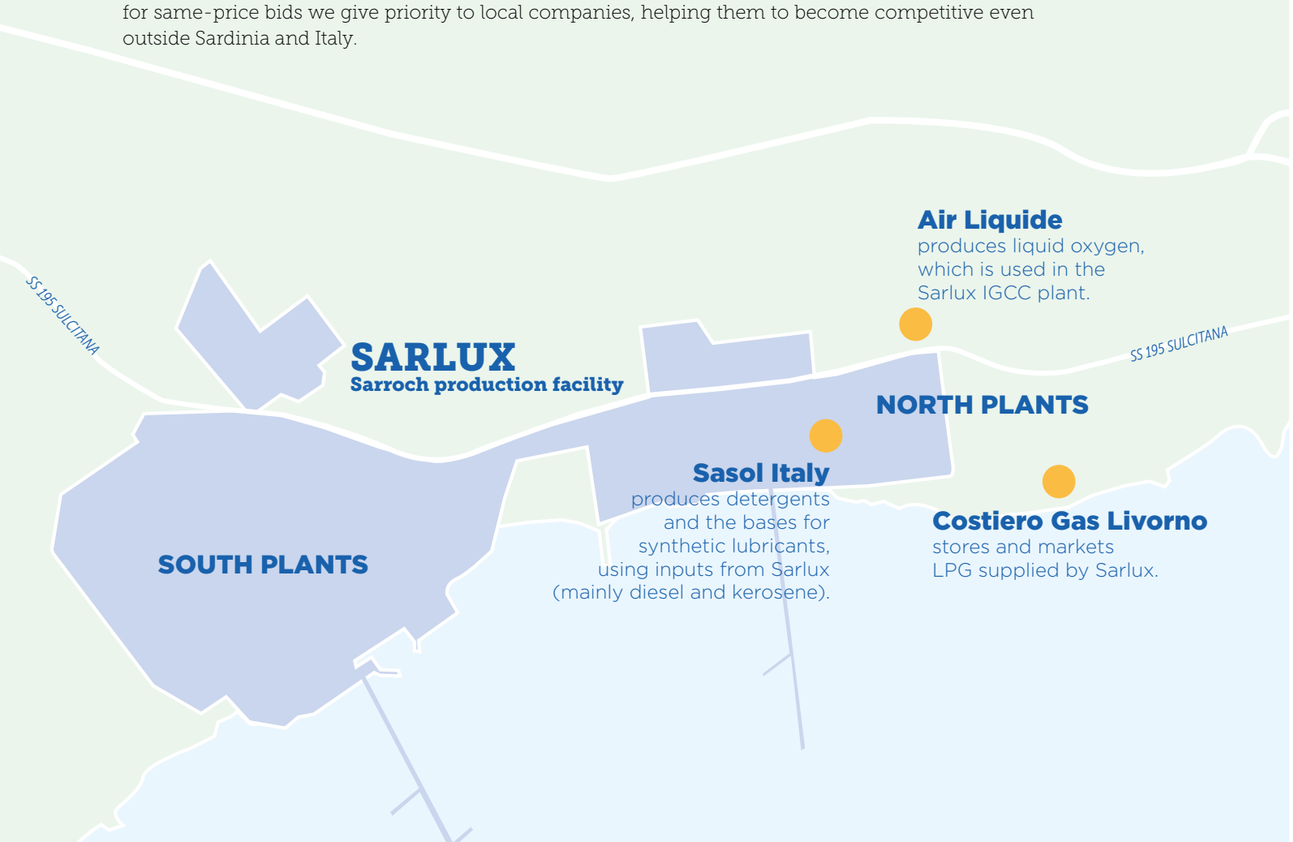
The plant covers two areas:
- eastern area where the production plants and part of the storage tanks are located
- western area reserved for the storage of raw material and products.

The two areas are separated by State Road 195 and connected by underpasses. The Southern Plants sector covers an area of 310 hectares, of which 272.3 belong to the production site, while about 35 hectares, outside the fenced area are used for services but not production activities (port services, industrial consortium green areas, buffer zone, consortium equipment and equipped green spaces).
An area of 52.5 hectares is occupied by:
- covered areas (plants, tanks, buildings) totalling 36 hectares including the area of the IGCC plant
- the LPG storage area, covering approximately 6.5 hectares
- the coastal terraces, covering approximately 10 hectares.

The Northern Plants area owned by Sarlux covers approximately 49 hectares.

One of the strengths of the Sarroch industrial area is the cluster of SMEs that have grown around the Saras plant starting from the 1960s to supply ancillary and maintenance services. Thus, in addition to the large industrial operations of Versalis, Sasol, Costiero Gas Livorno (former Eni R&M), the industrial area has a number of local businesses which have grown over the years together with Sarlux and which today make up a major industrial cluster of Sardinia.

Over the years, we have made investments to increase the site's capacity while also focusing on safety and respect for the environment, strongly engaging with the local communities, both directly and by boosting downstream businesses. Indeed, Sarlux has traditionally focused on hiring locally when searching the expertise necessary for its development. Moreover, when sourcing goods and services, for same-price bids we give priority to local companies, helping them to become competitive even outside Sardinia and Italy.



1,203 Sarlux employees (of whom 1,114 in Sarroch)
2,500 indirect workers
more than 550 suppliers
numbers as of 31/12/2023

Our people

The Saras Group has a history of creating value based on responsibility, fairness and transparency in the actions of our people, both in the areas where our operations are based and worldwide wherever we develop business relationships.
The value, commitment and professionalism of our people are key elements to ensure the ongoing improvement of the company's performance and the business' sustainability within the community. The Group also focuses on building and strengthening relationships based on loyalty, trust and mutual respect and on avoiding any form of discrimination, respecting the dignity of each individual and offering equal opportunities.

As part of the Group's evolution, the subsidiary Sartec was merged into Sarlux as of 1 July 2023. The new corporate structure provides the necessary flexibility to meet efficiency targets supporting business sustainability, thanks to the associated organisational and process synergies. The merger is also a major investment in the Group's people, whose contribution and skills are essential to implement our strategy.
Following the merger, a new organisational structure was defined at Sarlux and, consistent with this structure and in continuity with previous organisational developments, the integration of Sarlux's organisation was completed to maximise its contribution to the Group's strategy.

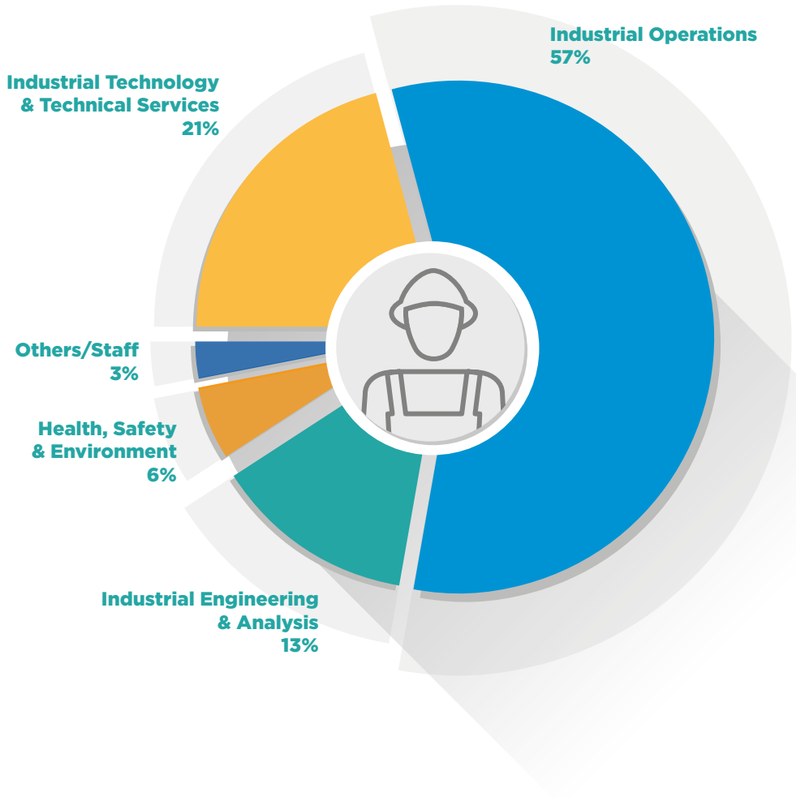
The current organisational structure is made up of the following functions reporting to the Chief Executive Officer:

- *Industrial Technology & Technical Services* manages technological expertise in production and in asset management and development
- *Industrial Operations* manages industrial operations for the execution of production plans (fuels, biofuels, basic chemicals and electricity)
- *Industrial Engineering & Analysis* manages the entire engineering chain, from multidisciplinary design to ICS Management activities, Investment Project Management and analytical services.

The *HSE* and *Security & Facility Management* functions report directly to the Chief Executive Officer. As a result of the merger, Sarlux acquired two local units at the Macchiareddu industrial park (municipality of Assemini), on 2° strada and 5° strada, respectively, in addition to the Sarroch site, where the company has its registered office.

Breakdown of Sarlux Employees

numbers as of 31/12/2023



Technological supervision, asset management and development, the set of operations necessary for plant operation, and the supervision of engineering and analytical services form a complex system, governed by operational procedures and instructions, including through the support of state-of-the-art technological facilities and equipment.
Preventing major accidents and protecting workers' health and safety and the environment are key values for the Company, to ensure the sustainability of our operations.
The Company provides continuous training to ensure the continual improvement of our people's skills, competencies and expertise. We design our staffing chart in line with corporate objectives and select organisational solutions that maximise process effectiveness and efficiency and promote teamwork.

At the industrial site, in addition to the daytime staff, the staff assigned to production processes and operational safety works in three shifts covering 24 hours a day, 365 days a year. Compatibly with their job description, daytime staff have access to flexitime and remote working.

In addition, an average of 1,288 employees of works and services contractors (BdS 2023) access the Sarlux site every day.

COMPANY ORGANISATION

Sarlux has the following agile structure:

Chairman and Chief Executive Officer

The Chairman and Chief Executive Officer is also the Employer and General Manager. The CEO has the broadest managerial, decision-making, control and spending powers in matters of health, safety and the environment over all the persons working within the Site. He also has the broadest powers to delegate specific activities and to grant the necessary powers to the persons he deems fit and qualified.

Health Safety & Environment

The HSE Department supports the Employer and General Manager in implementing and fulfilling all obligations arising from HSE legislation, including managing the Site's operational safety.
The Department ensures that our major-accident prevention, OHS and environmental protection policy is thoroughly disseminated and embedded at all levels of the organisation, monitoring the overall achievement of targets and helping to identify and implement necessary improvement and/or corrective actions.
With a view to continual improvement, the Department oversees the HSE and major accident prevention system, in line with the mandatory and/or voluntary certifications, planning and implementing initiatives that deliver value and sustainability to the business.

Security & Facility Management

This Department oversees security processes at the company's site and operational locations and manages collective and shared mobility both on the home-to-work route and between and within sites with a view to efficiency and sustainability. It provides efficient management of the facilities, coordinating with the relevant corporate functions, to carry out the actions required to ensure their best use at all times with the aim of integrating and optimising services.

Industrial Technology & Technical Services

This Department focuses on improving industrial processes to maximise productivity and profitability and ensure the highest uptime and efficiency of the site's plants and improving their performance.
To this end, it develops and proposes technological upgrades, studies, projects and plans, with a short and medium-term focus, in line with the Group's stated strategies and goals. The Department also handles the asset management and development process, by drawing up the maintenance and investment plans and ensuring that activities are executed in compliance with HSE standards and applicable legislation and in accordance with production plans.

Industrial Operations

This Department ensures industrial operations aimed at the production of fuels, biofuels, basic chemicals and electricity, by focussing on the execution of production plans and programmes and on optimising performance in compliance with HSE standards and applicable regulations.
It oversees the operation of the Offsite processes linked to the production plans and arrangements, ensuring their timeliness and target performance levels. It ensures the necessary cross-functional collaboration between Operations and the Supply Chain to activate the necessary synergies and guarantee the expected production performance.

Industrial Engineering & Analysis

This Department handles project management and multidisciplinary design activities, Industrial Control System (ICS) activities and analysis systems, and the development of digital initiatives for improving industrial performance in line with the company's business innovation and evolution strategies. It also manages laboratory testing activities in compliance with the highest quality and accreditation standards.

Sarlux, as a subsidiary of the Saras Group, uses the centralised services provided by the parent company, in particular in the following areas: Procurement, Information & Communication Technology, Human Resources, General Counsel & Corporate Affairs, Administration, Finance & Control.

Governance

In accordance with the provisions of the Italian Civil Code, Sarlux governance is based on the traditional management and control model, which comprises: i) a Board of Directors that manages the Company; ii) a Board of Auditors, comprising three standing auditors and two alternate members, which monitors compliance with the law and the articles of association and verifies the adequacy of the company's organisational structure and administrative and accounting system; iii) a Shareholders' Meeting.

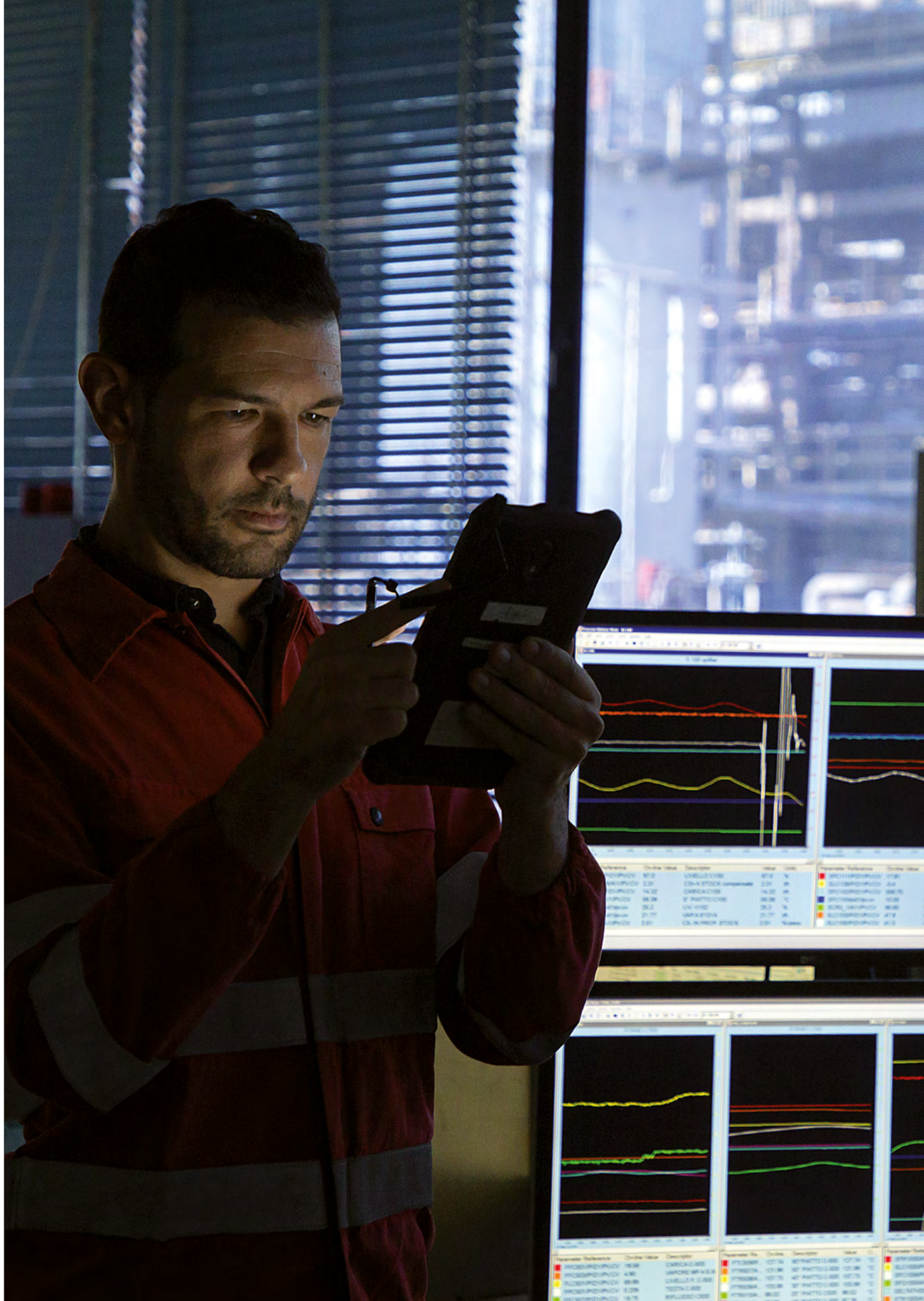
In 2023 too, Sarlux has entrusted the independent auditing of its financial statements to audit firm EY SpA.
The current composition of the Sarlux Board of Directors and Board of Auditors is as follows:

Board of Directors:
- Chair and Chief Executive Officer
- five directors.

Board of Statutory Auditors:
- Chair
- two Standing Auditors
- two Alternate Auditors.

The Internal Control and Risk Management System

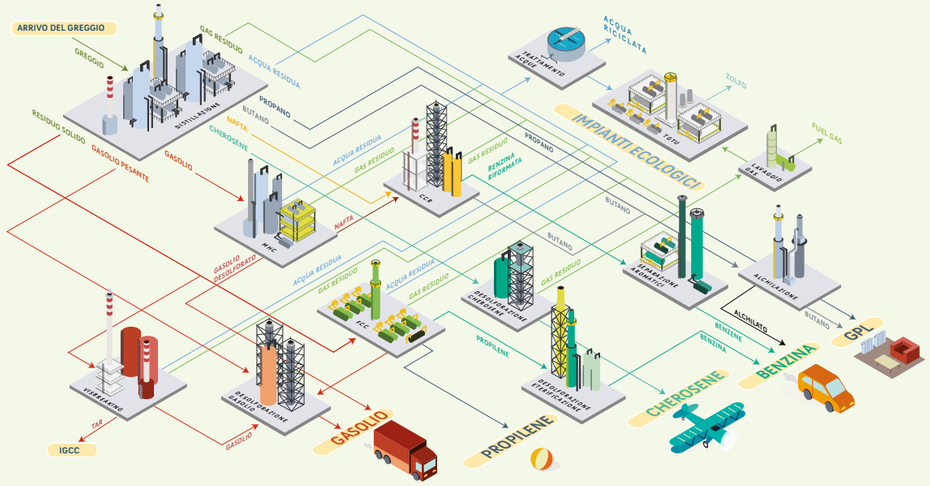
The internal control and risk management system is the set of rules, regulatory documents and organisational structures designed to ensure sound and compliant business management, consistent with pre-set objectives, through an effective process for identifying, measuring, managing, and monitoring the main risks.
The Sarlux Board of Directors is responsible for incorporating the guidelines issued by the parent company in the internal control and risk management system, and for regularly monitoring its adequacy and proper operation.
The Group Internal Audit function monitors the efficiency and effectiveness of the internal control and risk management system via its independent and objective activity and contributes to assessing and improving the efficiency of the governance, risk management and control processes of Sarlux and the Saras Group companies.
The Saras Group has laid down its values, principles and rules of conduct in the Group Code of Ethics, with which Sarlux complies in all its operations.
The values laid down in the Code of Ethics also underpin all the relationships and interactions between Sarlux and its counterparts.
The internal control system was further strengthened by the adoption of Saras' Organisation, Management and Control Model (the "Model"), approved by the Board of Directors on 10 July 2006 and updated several times in application of the law on the administrative liability of entities, Legislative Decree 231/2001, to prepare a system of procedures and controls intended to reduce the risk of the offences covered by the Decree.
The Sarlux Model was drafted in accordance with the guidelines issued by Confindustria, and comprises a "general part" (which describes, inter alia, the objectives and operation of the Model, the duties of the internal control body responsible for supervising the operation of, and compliance with, the Model and the system of sanctions), and "special parts" relating to the various types of offence covered by Legislative Decree 231/2001.
To promote the effective and proper implementation of the Sarlux Model, when adopting the Model, the Board of Directors also set up the Sarlux Supervisory Board.



Operations

The refining operation is located in Sarroch, on the southern coast of Sardinia. With a processing capacity of approximately 15 million tonnes of crude oil per year (300 thousand barrels per day), Sarlux is one of the largest refineries in the Mediterranean in terms of production capacity and structural complexity and accounts for around 20 percent of Italy's refining output.
With its IGCC plant (Integrated Gasification Combined Cycle), with installed capacity of over 575 MW, the site generates and feeds to the national grid more than 3.55 TWh of electricity per year (data from 2023), corresponding to about 41.9 percent of Sardinia's electricity requirement. The refining cycle is fully integrated with the IGCC plant, which uses the heavy hydrocarbons left over from the refining process - which alternatively could be turned into fuel oil - and converts them into electricity and heat.

Refining plants



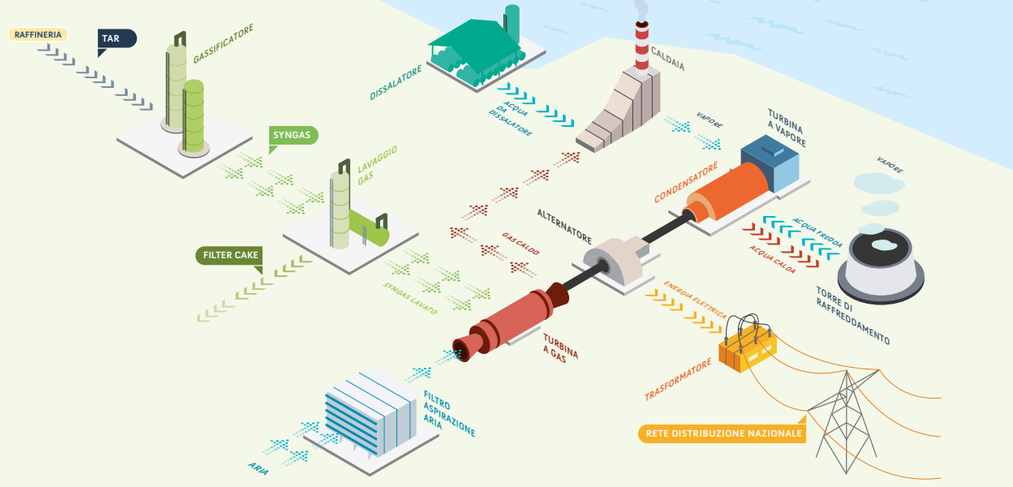
- atmospheric distillation plants (topping) and vacuum distillation plants for raw materials, which produce the primary fractions (fuel gas, propane, butane, isopentane, virgin naphtha, heavy naphtha, kerosene, diesel)
- conversion plants (Visbreaking, mild Hydrocracking 1 and 2, fluid catalytic cracking-FCC), where heavy hydrocarbons and distillates are converted into middle-light fractions. The heavy hydrocarbons (TAR) are sent from the Visbreaking plant to the IGCC plant
- continuous catalytic reforming (CCR) plant, where light distillates (naphtha) are converted into high-octane components; the process also produces byproduct hydrogen, which is used in desulphurisation processes
- plants that improve the quality (alkylation) and performance of gasoline (TAME, Tertiary-Amyl-Methyl-Ether plant)

- U800 unit, producing low-sulphur gasoline
- PSA plants that purify the hydrogen used in the desulphurisation of motor diesel, with very low sulphur content
- Northern plants (Reforming, BTX, Formex, Pseudocumene, Splitter) where high-quality aromatics from virgin naphtha are produced.

Environmental impact mitigation facilities:

- desulphurisation units, where middle distillates (kerosene and diesel) undergo catalytic hydrogenation to remove sulphur and improve product quality
- DEA 1, 2, 3 and 4 plants that remove sulphur compounds (H_2S) from non-condensable fuel gas which is then reused internally
- Tail Gas Treatment Unit (TGTU), which treats tail gases, increasing the plant's sulphur recovery and hence reducing sulphur dioxide emissions (SO_2) to the atmosphere, which have been cut by over 45 percent since 2009
- vapour abatement plant, at the Northern Plants, where nitrogen and HC vapour mixtures from covered water treatment equipment, some tanks and ship cargo are extracted and recovered by cryogenic condensation
- Vapour Recovery Unit or VRU, completed in 2020, which recovers the vapours produced during ship loading operations at the Southern Plants marine terminal using an activated carbon adsorption unit.

Power plants



The Integrated Gasification Combined Cycle (IGCC) plant generates electricity, hydrogen and steam from the heavy hydrocarbons left over from oil refining (tar, a substance similar to bitumen). The IGCC plant's power-generating technology is state-of-the-art and certainly the cleanest among those powered by liquid hydrocarbons. It is recognised by the European Union as Best Available Technique (BAT) to limit the environmental impact of refineries, as it minimises emissions into the atmosphere and noise impact.
The Environmental Impact Assessment certifies that the integration of the power plant with the refinery reduces the overall impact of the industrial site in terms of air emissions.
The raw materials strategy is supported by the refining structure, whose main strengths include high storage and interconnection capacity and installed conversion capacity, which translates into a high complexity score.

2. Protection of the environment, health and safety

Continual improvement is the overarching principle steering the development and growth of our environmental performance. In pursuit of this principle we have made environmental management one of our organisation's priorities.

Main regulatory standards

The integrated environmental authorisation

As of 9 April 2009, all the environmental authorisations for operating the refinery and the IGCC plant were joined together and replaced by the Integrated Environmental Authorisation (IEA) by Decree DSA-DEC-2009-0000230 of 24 March 2009. Sarlux was the first refinery in Italy to obtain the IEA, in 2009.

After the Northern Plants (formerly Versalis, Eni Group) were acquired in 2015, the review process for merging the two existing authorisations was launched, and was completed by the issuance of Ministerial Decree 286 of 21 December 2015 by the Ministry of the Environment to Sarlux S.r.l., upgrading the authorisation pursuant to Decree DSA-DEC-230 of 24 March 2009 to the new operation comprising the "Refinery, IGCC and Northern Plants", also including the plants acquired by Versalis S.p.A.

In 2017, the Ministry of the Environment issued Decree DEC-MIN-0000263 of 11 October 2017, published in the Gazette of the Italian Republic on 4/11/2017, completing the overall review of Integrated Environmental Authorisation (IEA) to Sarlux for the operation of the "Refinery, IGCC plant and Northern Plants" complex. The assessment review became necessary for all refineries after the new BAT were published in October 2014.

The current IEA - valid for 16 years since the Sarlux plant has the ISO 14001 certification and the EMAS registration, which in 2016 was also extended to the Northern Plants - authorises the operator to carry out the three operations established at the Sarroch site, namely:
refinery: production of oil and petroleum products from the oil refining process
IGCC plant: electricity generation
Northern Plants: manufacture of basic organic chemicals.

In 2021, Sarlux submitted three new applications for non-substantial changes to the IEA:

1. **Application ID 87/11551 - Request for extension of the deadline for implementing the requirements of Ministerial Decree no. 263 of 11/01/2017.**
   In light of the continuing Covid-19 pandemic emergency, and its global economic impacts, in 2021 an application for a non-substantial change was made to the Ministry of the Environment (MATTM) and ISPRA (Institute For Environmental Protection and Research) requesting extension of the deadline for implementing the requirements of Ministerial Decree no. 263 of 11/01/2017 for issue of the IEA authorisation for the "sealing of tank containment basins", "construction of double bottoms and tank inspections" and "installation of an H_2S measurement system at the acid flare". In spite of the extension request, throughout 2021 Sarlux spared no effort to push forward the works covered by the application, completing the paving of two containment basins, completing the double bottom of one tank, and continuing the works on decommissioning and gas freeing the tanks included in the double bottom installation programme, to remove any potential environmental impact. Sarlux also pushed forward the project to install the H_2S measurement system at the acid flare.
   In response to Sarlux's deadline extension application, on 21/05/21 the Ministry of the Environment notified the start of a partial IEA review procedure (ID 87/11551) for the aspects included in the application. Subsequently, by Decree no. 105 of 09/03/2022, published in the Official Gazette on 21/03/2022, the Ministry granted the application subject to conditions contained in the final assessment.

2. **Application ID 87/11355 - Green buffer between the perimeter of the industrial compound and the town.**
   On 5 February 2021, an application for a partial IEA review was submitted, concerning the extension of the deadline for construction of the "Green Buffer", to obtain the necessary administrative permits.
   In response to the application, the Ministry of Ecological Transition (MITE) conducted the partial review and granted the update of the IEA Decree - M.D. no. 263 of 11 October 2017, subject to the changes requested in the final assessment, by issuing M.D. no. 93 of 22/02/2022, published in the Official Gazette on 10/03/2022.

3. **Application ID 87/11578 - Change in the authorised operational management structure of the three Large Combustion Plants (GIC).**
   On 24/05/2021, an application for a partial IEA review was submitted (ID 87/11578), seeking to change the authorised operational management structure of the three multi-fuel GIC (Large Combustion Plants). The requested change was the possibility of using, according to the availability of gaseous fluid, a mixture of liquid/gaseous fuels with the liquid fuel's share of heat generation being lower than the previous 50 percent requirement, i.e. with a greater share of gaseous fuel to improve environmental performance.
   In response to the application, the Ministry of Ecological Transition (MITE) conducted the partial review and granted the application, updating the IEA M.D. no. 263 of 11 October 2017, with the amendments set out in the final assessment, by issuing M.D. no. 95 of 22/02/2022, published in the Official Gazette on 10/03/2022.

Moreover, in the first quarter of 2021, the Ministry of Ecological Transition launched, pursuant to Article 29-octies of Legislative Decree no. 152 of 3 April 2006, a partial IEA review procedure (ID 87/11305) on the following aspects:
- blow down system management
- rainwater management
- temporary storage of filter cake waste.

The Ministry asked Sarlux to provide the necessary documentation for the review and launched the assessment process.
After the IEA Committee issued its final assessment, the Interdepartmental Conference conducted its review, also on the basis of the opinions of the relevant local authorities and public agencies, and gave its favourable opinion subject to the conditions set out in the final assessment and the associated draft Monitoring and Control Plan.
The Ministry of Ecological Transition thus completed the review and updated the IEA by M.D. no. 159 of 14/04/2022, published in the Official Gazette on 11/05/2022.

In 2023, Sarlux submitted a new application for a non-substantial change to the IEA:
- green buffer between the perimeter of the industrial plant and the town.

On 20/01/2023, by letter no. 1393, we requested a change to the timeline for the executive project for protected areas only, scheduling completion of the works by June 2024.

Lastly, in the course of 2023, the Ministry of the Environment and Energy Security started an IEA review (ID 87/14343) for fulfilment of the requirement of Ministerial Decree no. 95/2022, which changed the prescribed emission limit values for the three multi-fuel Large Combustion Plants (GIC). This review is currently ongoing.

Seveso Directive

The Sarlux plant falls within the scope of Legislative Decree 105/2015 (Seveso Directive) and is classified as being at risk of a major accident due to the presence of dangerous substances.
Pursuant to Legislative Decree no. 105 of 2015, Sarlux has:
- drawn up the Safety Report
- established a major-accident prevention policy
- implemented and maintained a Safety Management System for Major-Accident Prevention (SMS-MAP)
- defined an Internal Emergency Plan (IEP)
- considered, when assessing possible accidents, the domino effects
- sent to the Cagliari Prefecture the information needed to draw up the External Emergency Plan (EEP).

The Safety Report

The Safety Report (pursuant to Article 15 of Legislative Decree 105/2015) is a technical document for the identification of possible major accidents within an establishment, with the aim of implementing prevention and protection systems for major deviations from normal operation.
The first Safety Report was drawn up after the entry into force of the Italian law implementing the first European Directive on establishments exposed to the risk of major accidents, dating back to 1989.
This is because the activities performed at the Sarlux site involve the presence of substances with different hazard properties and levels. The purpose of the Safety Report is precisely to study possible risks in order to prevent and mitigate them.
The analysis of potential accident scenarios has ruled out that such accidents might produce significant impacts outside the site perimeter. Any involvement of external areas would be limited to small areas in the direction of SS 195 and of the access road to Porto Foxi, both being uninhabited. The Safety Report has been drawn up after an accurate and in-depth analysis of the company's activities and the risks associated with them, arising from the industrial processes and substances used.
Since its first edition, the document has been continually updated in accordance with the applicable

Major Accident Prevention, OHS and Environmental Protection Policy

Preventing major accidents, protecting people's health and safety, protecting the enviroment and promoting public safety are the **key values** that underpin Sarlux's commitment to the sustainability of our operations.

Based on these values and in line with the Saras Group's policies, Sarlux has definied its **guiding principles:**

Responsible and sustainable management

- **take** all appropriate actions to prevent any accident and to minimise any consequences for people, the environment and equipment;
- **manage** all our activities in compliance with the obligations established by applicable regulations, the voluntary schemes we have joined and stakeholders' requests;
- **preserve and protect** the environment by minimising the impacts of our operations and ensuring the rational and sustainable use of natural resources, energy and materials;

Cooperation and employee involvement

- **disseminate** the Policy to all employees, suppliers, contractors and any person interacting with Sarlux, actively involving our staff, within the scope of their duties and responsibilities;
- **share** knowledge and skills, stimulate participation and enhance professionalism and experience;

Continual improvement

- **promote** innovation and continuous technological development in our products and services, in line with the Group's vision, preferring sector choices that offer the greatest benefits in terms of Major Accident Prevention, Occupational Health & Safety, Environmental Protection and Public Safety.

In accordance with these guiding principles, Sarlux is committed to the following **objectives:**

Health & Safety and Environmental Protection

- **operate** at all times in compliance with the requirements of the applicable legislation and the voluntary schemes we have joined, and their subsequent amendments and additions;
- **prevent** and avoid all possible types of accidents by effectively identifying hazards and assessing the risks associated with our operations;
- **identify** possible emergency situations to prevent their occurrence or, if they cannot be avoided, plan the actions to be taken to minimise their impacts;
- **ensure** the correct operation of machinery and equipment and the proper execution of works in accordance with internal guidelines, procedures and instructions, to prevent the occurrence of dangerous situations;
- **use** qualified vendors able to operate in line with the company's HSE standards;
- **prevent** pollution and minimise the impact of our operations on air, water, soil and subsoil; reduce the production of waste by optimising its recovery;
- **safeguard** health through the continuous health surveillance of employees, contractors' workers and the local community;

Social and cultural development of the Company and the Community

- **build** constructive cooperation, creating an environment of utmost transparency and trust with internal and external stakeholders on issues relating to the Prevention of Major Accidents, Occupational Health and Safety, Environmental Protection and Public Safety;
- **promote** the development of a pleasant work environment and a positive, collaborative climate, fostering involvement, motivation and awareness of each worker's role in achieving the company's objectives;
- periodically **involve** and consult workers, also through their representatives, on the development, planning, implementation and evaluation of actions contributing to improvement in terms of Major Accident Prevention, Occupational Health and Safety, Protection of the Environment and Public Safety;
- **ensure** that all employees, contractors' staff and any person involved in Sarlux operations within the scope of their duties and responsibilities are informed, trained and instructed to operate with full knowledge of the potential risks linked to the industrial site under ordinary, abnormal and emergency conditions;
- **ensure that** all employees receive information and training on specific risks and are trained in the use of personal protection equipment according to their duties;

Promotion of technological development in line with best practices

- **formulate** and **implement** programmes for continuous improvement of our performance by adopting principles, standards and solutions that constitute the best available techniques;
- **ensure** that the design, construction and maintenance of plant, machinery and equipment safeguard our workers, the community and the environment.

The HSE Management System is the tool Sarlux has adopted and keeps effective in accordance with current legislation and international standards to achieve these objectives.

All employees, contractors' workers, suppliers of goods and any other person involved in Sarlux activities must comply with the spirit and letter of our Policy. The Prevention of Major 'Accidents, Protection of Workers' Health and Safety, Protection of the Environment and Public Safety are integrai parts of each person's commitment.

Sarroch, 22 December 2023

SARLUX Refining & Power

The Managing Director

legislation and in order to incorporate all the changes that have been made to the plants over the years. It was last updated in May 2021.
The Safety Report looks at all the different types of hazardous substances, characterised by a low flash point (e.g. crude oil, gasoline, LPG), high toxicity (e.g. hydrogen sulphide) and environmental hazardousness (e.g. diesel, kerosene). On the basis of the quantity and types of substances present at the site and the processes in which they are used, possible accident events and scenarios have been identified, such as fires, explosions, toxic gas clouds and the release of hazardous substances into the soil or sea.
The potential consequences of the accident scenarios identified have been studied to determine their impact on the safety of individuals in and around the site and on the environment.

The Internal Emergency Plans for the Southern and Northern Plants and the Specific Emergency Plans are aligned with the updates to the Safety Report, as is the information sent to the Prefecture for the external emergency plans for the industrial plants at risk of a major accident in the Sarroch industrial park.

Pending the conclusion of the assessment of the Safety Report's update submitted in May 2021, we continued throughout 2023 our work to ensure compliance with current requirements, periodically reporting progress to the CTR (Sardinia Regional Technical Committee for Fire Prevention).

Policy

Sarlux considers environmental protection one of the key elements of its HSE policy aimed at achieving sustainable development.
As a company, we are aware that to achieve our environmental goals we need the active contribution not only of all our people, starting with management, but also of all those working with us, i.e. contractors, suppliers and external collaborators. This is why continuous training is crucial, to enhance professional skills and awareness of the key role each person can and must play in achieving our targets.
Our major-accident prevention, OHS and environmental protection policy has been updated to align it more effectively to the requirements of Legislative Decree 105/2015 (specifically, to fine-tune our Safety Management System for Major-Accident Prevention) and of environmental standard ISO 14001:2015. In particular, a section on objectives has been included to more precisely connect the objectives with the improvement programmes and the consequent actions/initiatives to be implemented.

Sarlux and safety

Preventing major accidents, protecting the environment and our workers' health and safety are the key values that underpin our commitment to the sustainability of our operations.

The Internal Emergency Plan (IEP)

After defining the risk scenario for the whole establishment (Southern and Northern Plants), we prepared Internal Emergency Plans (IEP) setting out the procedures and actions to be taken to manage any accidents with the greatest efficiency and minimising their impacts, through the coordinated intervention of personnel and vehicles. The aim is to prevent and minimise injury to people, harm to the environment and loss of company assets, provide care to any person hurt, keep incidents and significant events under control, and minimise their impacts.
The IEP ranks the possible emergencies at the site into different levels.

To ensure that accidents are dealt with quickly and efficiently, it is crucial to have reliable alarm and reporting procedures to alert all relevant company roles according to the type of event. Another key component of the Plan is the system for reporting incidents to external emergency response teams, the authorities and, through them, the community.
Communication and alarm devices (fire alarm buttons, telephones, fixed and mobile intercom units at various plant locations or held by key personnel, indoor and outdoor intercoms, and CCTV system) are available throughout the site, to ensure immediate deployment of personnel and equipment.
Following a list of priorities, the emergency coordination centres within the Southern and Northern Plants provide information and updates on the management of accidents to the relevant organisations.

A comprehensive fire protection water distribution system covers the whole site. All the storage tanks are protected by fire prevention cooling systems. The most critical are activated automatically in response to detection systems. Similar systems are installed on all the storage facilities where a rise in temperature could compromise safety.
The site has 11 fire trucks (seven in the Southern Plants and four in the Northern Plants) which can be deployed rapidly in emergencies providing additional support to the fixed systems. All safety equipment and systems are regularly checked and undergo accurate periodic maintenance. In addition, to upgrade our fire-fighting fleet at the Sarroch site, in 2021 we added a latest-generation multi-person rescue and fire-fighting unit, and in 2023 we purchased a new vehicle, put into service in 2024, equipped with a high-performance water pump, with a guaranteed range of 100 metres, for more effective response in the tank farm and on elevated parts of the industrial plants.
Operational staff members are provided with a personal safety monitoring device which is constantly connected, called Digital Safety Advice (DSA). In 2023 we purchased 50 additional devices, which will be deployed in 2024.

As part of its Safety Management System, Sarlux has implemented an IT platform – Asset Management System (AMS) – which manages the Active Fire Protection System for the Sarroch site and the local units in Macchiareddu.
The AMS platform ensures the efficiency, effectiveness and constant reliability of active fire protection systems. This is done through precise and systematic scheduling of surveillance, control and maintenance of the fire protection installations, equipment and systems at the Sarlux site.

The External Emergency Plan (EEP)

The External Emergency Plan is closely related to the Internal Emergency Plans. The EEP is drawn up by the Prefecture of Cagliari on the basis of joint assessments with local authorities, law enforcement agencies and emergency services, including the regional government, the Metropolitan city of Cagliari, the Municipalities of Sarroch, Capoterra, Villa San Pietro and Pula, the fire service, the local health authority and the port authority.
The plan covers the whole industrial park of Sarroch, and considers accident scenarios at the establishments of the companies located there (Sarlux, Sasol Italy, Costiero Gas Livorno, Air Liquide) that could have harmful impacts on the surrounding areas. The main input for the EEP were the Safety reports for the various establishments and analyses of accident scenarios, together with a study of the local area, including the location of urban settlements and infrastructure. Based on these data, the Plan defines the best procedures for managing accidents to ensure the safety of the population.
The plan (in Italian) is publicly available and downloadable from the website of the Cagliari Prefecture, under Prefettura - Ufficio territoriale del Governo di Cagliari - section "Attività - Protezione Civile" - "Piani provinciali di Protezione Civile".

The Marine pollution prevention plan

The Marine Pollution Prevention Plan addresses possible emergencies arising from the release of hydrocarbons in the sea bordering the Sarlux site in Sarroch.
A marine emergency may be caused by spills of hydrocarbons from the marine terminal. In the event of a spill, fast response vessels and equipment would be deployed, following the procedures set out in the Marine Pollution Prevention Plan. The establishment has four seagoing vessels that operate 24 hours a day and a wide range of equipment (skimmers, floating booms, etc.) ensuring its full and prompt response to any spillage accidents. Measures to prevent spills into the sea include a programme of inspections carried out on board ships during the loading of products and unloading of raw materials. A high percentage of ships are inspected and drills are conducted to ensure the site's full response readiness at all times.

Torrential rainfall management

The establishment has a specific operating instruction for "Torrential Rainfall Management". The document describes in detail the actions to be taken and the equipment to be used either before, if foreseeable, or during very heavy rainfall events, to contain and mitigate their impacts. The operating instruction describes the way the different departments must work together to use the full storage capacity of the stormwater collection tanks, as well as the dedicated crude tanks, to manage emergency situations arising from exceptional rainfall at the site.

The HSE management system

In order to achieve the expected outcomes and increase performance in the areas of major-accident prevention, OHS and environmental protection, Sarlux implements, maintains and continuously improves its HSE Management System.
In establishing and maintaining the HSE Management System, Sarlux considers the knowledge of its organisation, the reference context and the scope of HSE application.

Context and scope

Sarlux has defined its reference context taking into account its stakeholders' needs and expectations, identified with reference to the industrial, environmental, legislative, social, scientific-technological and economic sectors.
Through monitoring and subsequent reviews, the stakeholders' needs and expectations are translated into HSE Management System requirements.
Sarlux has defined the scope of the HSE Management System by assessing internal and external factors, the context, the planned and implemented activities, the products and services offered, production units, compliance obligations and its own authority and ability to exercise control. Specifically, for the voluntary certification components, the HSE Management System applies to the processes related to the following services and products:

- refining, receipt, storage, preparation and shipping of oil products
- electricity production and sale
- manufacture of other basic organic chemicals.

The above scope is also documented in the certificates issued by certification body. The certificates are available at www.sarlux.saras.it.
The HSE management system meets the requirements of the following standards:

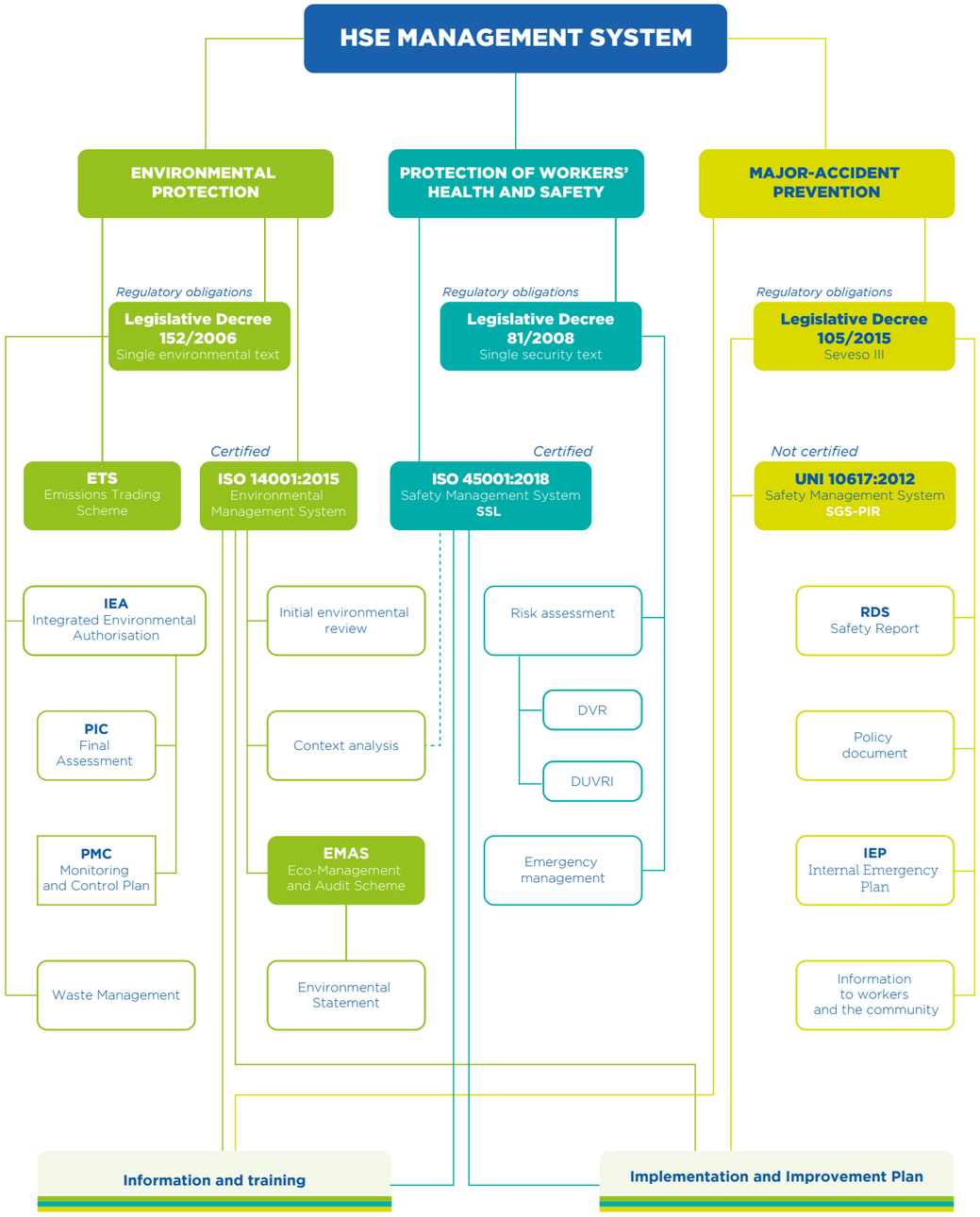
- UNI EN ISO 14001:2015 "Environmental Management systems: Requirements with guidance for use"
- Regulation (EC) no. 1221/2009, Commission Regulation (EU) 2017/1505 and Commission Regulation (EU) 2018/2026 - The EU Eco-Management and Audit Scheme (EMAS).
- Directive 2003/87/EC of 13 October 2003 - ETS (EU Emission Trading System)
- UNI ISO 45001:2018 "Occupational Health and Safety Management System"
- UNI 10617:2019 "Establishments with major-accident hazard - Safety Management Systems - Essential requirements".

The criteria and methods necessary to ensure the effective operation and control of industrial processes are described in the documented information of the HSE Management System (Guidelines, manual, procedures, operating instructions, etc.).

Our management's commitment

Each year, our Management defines the objectives for preventing major accidents, protecting workers' health and safety and the environment and makes the appropriate budget allocations to cover the human and technical resources (equipment, machinery, instruments, etc.) necessary to remove or minimise risks. Management promotes and supports all the actions necessary to achieve the planned results and continual improvement of processes, which are managed in accordance with the standards referenced here. Synergistic use of the shared features of the standards, performance measurement and the planning of improvement objectives and targets are the main pillars of our strategy for achieving continual improvement at our production site.
Sarlux has also put in place an Energy Management System (EMS) pursuant to standard 50001:2018.
Obtaining certifications is an important objective that entails new challenges and requires us to step up our commitment in line with rapid regulatory evolution and increasing societal awareness of environmental protection and occupational health and safety.

MAJOR-ACCIDENT PREVENTION, OCCUPATIONAL HEALTH & SAFETY AND ENVIRONMENTAL PROTECTION POLICY



EU Emission Trading System - ETS

As required by national and EU legislation on greenhouse gas emission accounting, our HSE Management System implements a data collection and management system to report by 31 March of each year the GHG emissions released into the atmosphere monitored in accordance with the provisions of Commission Implementing Regulation (EU) 2018/2066 of 19 December 2018.
For this process, Sarlux defines the methods, duties and responsibilities for all data flow management activities and for all GHG emission monitoring activities at the Sarroch production site, in accordance with the requirements of the permit and the associated Monitoring and Control Plan issued and approved by the competent national authority.
Sarlux collaborates with its parent company Saras to establish and implement the Improvement Plan to reduce the amount of our GHG emissions.
The parent company Saras manages the annual offsetting of CO_2 emissions, through the purchase and sale of allowances (European Union Allowances - EUAs, equivalent to one tonne of CO_2eq).

HSE internal communication

We believe in the importance of effective internal communication and information sharing to make our people aware of the importance of each operation and obtain their engagement in improving environmental performance. Our communications are addressed to both our employees and to those of the contractors operating at our site.
Similarly to previous years, our Health, Safety and Environment Committee, chaired by the HSE Manager, meets at least quarterly. The Committee members are:

- the employer/manager or his delegate
- the HSE Manager
- the HSE OH&S compliance Manager
- the IMS (Integrated Management System) and HSE training /information Manager
- HSE field analysis and monitoring Manager
- environmental compliance Manager
- operational safety Manager
- competent doctor
- Industrial relations and HR Manager
- Sarlux HR BP Manager
- workers' representatives for health, safety and the environment.

During the meetings, health, safety and environmental protection issues are addressed and, depending on the needs and topics on the agenda, other corporate functions and the parent company Saras may be asked to attend.

To obtain the engagement and participation of the contractors' workers, periodic meetings with contractors are held at least quarterly. During extraordinary maintenance periods (plant shutdowns, turnarounds, etc.) the meetings are held weekly and are attended by the Sarlux manager/employer or its representative, Sarlux front-line staff and representatives of the contractors operating at the site (employers, work managers, Prevention and Protection Service Managers (PPSM)). A significant portion of the meetings is devoted to raising staff awareness on environmental issues, including the correct management of waste produced at the site, by presenting and comparing the results progressively recorded, analysing specific situations and reporting on the most effective actions for their improvement.

Management performance indicators

HSE training

To achieve continuing environmental performance improvements, it is essential to provide training to personnel, both to bring them up to date and to raise awareness of the importance of their individual contribution.
In 2023 classroom-based training was gradually resumed, in combination with remote training.
Ad hoc training was provided to workers from the former Sartec, to bring them up to speed.

In 2023, training covered the following topics:

- continuous training on environmental protection and safeguarding issues
- specialist technical training on environmental issues
- compulsory training under Legislative Decree 105/2015 (Seveso Directive).

The following information activities were implemented:

- meetings of the health, safety and environment committees
- meetings of the HSE implementation committees related to the Behaviour Based Safety protocol.

The indicator consisting of the ratio of the hours of training devoted to the management and protection of significant environmental aspects and impacts to the total HSE training (per year and as a percentage) has increased from the 10 percent in 2018 to around 37 percent in 2023, reflecting the steadily increasing focus on environmental issues over the years.
Environmental training is flanked by health & safety training. Induction training on these topics is provided to all newly hired workers, followed by regular refresher training throughout their employment at the site, including instruction and practice sessions.

Internal audits

Sarlux places particular emphasis on internal audits as a verification, training and improvement tool. Our staff includes a team of about 30 internal auditors trained to carry out major-accident prevention, environmental and safety audits. Each year, we prepare an internal audit plan, which covers all the activities that directly or indirectly affect the management of environmental, safety and major-accident prevention issues for each audited process.

Audits may reveal areas for improvement or instances of non-compliance with the management system procedures or reference standards. Any nonconformities are officially flagged to the relevant line managers in order to identify measures to restore compliance and prevent issues from recurring. In the last three years, about twenty internal audits per year were carried out, covering different refinery areas and processes, with the participation of about a hundred people including auditors and respondents for a total commitment of more than 500 hours/year.

Behaviour-based safety (BBS)

Sarlux promotes the culture of safety through training, information and monitoring of the effectiveness of the activities carried out. Spreading the safety culture means conducting continuous research and training, and creating working conditions aimed at progressively reducing emergencies and accidents involving workers, with the goal of zero incidents.
In an established and technologically advanced company such as the Saras Group, the "human factor" is the key component of the occupational safety management system. It is therefore necessary to reduce risky behaviour (which is often the main cause of incidents and accidents), focusing on what individuals do and understanding why they do it, and then identifying strategies to modify any hazardous and non-compliant work behaviour.

This includes the implementation of the Behaviour-Based Safety (BBS) protocol. More precisely, according to the behavioural theories underpinning BBS, behaviour is the result of learning by means of negative reinforcement (punishments) and especially positive reinforcement (rewards), in a sequence of "antecedents" (or activators) that trigger "behaviour", which in turn then leads to "consequences" (these three phases make up the "three-term contingency model: A-B-C").
In general, the BBS protocol includes the following steps:

- define the expected observable behaviour
- observe and collect data
- Provide feedback and steer behaviour towards expected behaviour
- measure the results obtained.

The BBS protocol was first applied in 2015 via a pilot project implemented in some areas at the site (Energy, Utilities, Movement and Assets), and was quickly extended to the whole site and all operating functions.
Since 2018, safe behaviour rates of over 98 percent have been recorded, based on the analysis of the large number of checklists compiled (with a peak of 22,000 "all workers" observations per year in 2020). This excellent score shows that the safety culture has become deeply embedded in all company operations.

Since 2020, due to the pandemic, the BBS protocol has been revised, adding to the checklists behaviours to prevent the spread of Covid-19 (e.g. knowing the hygiene rules recommended by the Ministry of Health, avoiding crowded places, maintaining social distancing, using face masks, applying room ventilation, etc.). The protocol update was very effective throughout the site to minimise the likelihood of infection.

Worksite inspections

Regular inspections are carried out at contractors' worksites to verify their compliance with health, safety and environmental procedures and requirements.
The inspections are based on an annual plan, which ensures that each contractor worksite within the Sarlux site is inspected at least once a year.

Continual improvement and HSE investment Plan

Continual improvement is pursued through the commitment of all Sarlux people and the investments that the Saras Group has always made in environmental sustainability. Over the last three years, around EUR 12 million/year have been spent on environmental performance and safety actions.

The investments are made to implement the HSE Improvement Plan, an annual plan drawn up on the basis of the management review and which covers all processes.
The plan includes:

- situation analysis and rationale for each action
- objectives and expected results
- operating phase
- plan of planned activities and verification of Plan outcomes
- identification of key success factors
- proposals for future activities and projects.

Promoted by the ISO 14001 standard and the EMAS Regulation, the continual improvement approach has over the years resulted in a large number of upgrades and technological innovations to our production plants, as well as improvements in their management and operation.
This has made it possible to exceed compliance with legislative and permit limits and requirements, at times anticipating the evolution of the applicable standards.
For detailed information, please see the "Data and Improvement Actions" section.

3. Significant environmental aspects

Sarlux sets out all the significant environmental aspects for understanding how its production site interacts with the environment and the surrounding area.
This is an ongoing commitment for our company, which allows us to maintain over time concrete and transparent dialogue in order to give the local community the answers they expect.
The information in this section shows the continual improvement achieved over time as the result of strategic, technological and management decisions always focused on making progress across all dimensions: environment, health & safety, and production quality.

The performance indicators are set out in the section on Improvement Data and Improvement Actions 2023 (section 4).

Environmental review

In accordance with the requirements of Regulation (EC) No 1221/2009 of the European Parliament and of the Council, as amended and supplemented, applicable to the organisations that have voluntarily joined EMAS, a thorough environmental review has been carried out of Sarlux's operations under normal, abnormal and emergency conditions. The environmental review is updated periodically and every time significant changes are made.
The direct and indirect environmental aspects of Sarlux's activities have been determined with reference to Annex I to the Regulation.
Direct environmental aspects are those over which the organisation has direct management control.
Examples of direct aspects are emissions to air and water discharge.
Indirect environmental aspects are those aspects the organisation can influence despite not having direct control over them. Examples of indirect aspects are the transport of raw materials and products.
The significance of each direct and indirect environmental aspect under normal operating conditions is assessed using the following criteria:

- the extent of the impact on the environment
- the existence of legislation, authorisation and other regulations to be followed
- the sensitivity of the issue for the local community.

Significant direct environmental aspects	Environmental impacts
Raw materials	
Consumption	Consumption of a non-renewable resource
Storage, handling and use	Risk of accidents (fires, explosions, releases into the soil and sea)
Consumption of energy (in the form of)	
Fuels produced by the refinery	Emissions to air from the site and resulting impacts
Electricity purchased	Indirect impacts from external electricity generation sites
Water consumption	
Water from industrial water supply	Consumption of natural resource in the local area
Seawater desalinated internally	Energy consumption and resulting impacts
Emissions to air	Effect on air quality at local level
	Contribution to large-scale effects (greenhouse effect, acid rain)
Waste	
Storage and treatment within the site	Indirect impacts on external disposal and recycling sites
Off-site treatment	Risk of releases into the soil
Releases to water	Impact on seawater quality
Releases into the soil and subsoil	
Past activities	Contamination of soil, subsoil and groundwater at the site
Prevention activities	Reduction of the risk of contamination of the soil, subsoil and groundwater
Noise	Impact on the noise climate outside the site (Sarroch area)
Odour	Nuisance caused outside the production site (Sarroch area)
Visual impact	Visibility of the production site from the surrounding area

Significant indirect environmental aspects	Environmental impacts
Product design	Indirect impact on air quality (fuel combustion)
Transport of products, auxiliary materials and employees by road	Emissions to air
	Road traffic, risk of traffic accidents
Transport of raw materials by sea	Emissions to air
	Risk of incidents causing sea pollution
Environmental conduct of contractors	
Internal waste management	Risk of incidents causing soil and subsoil pollution
Transport by road of employees, materials and equipment	Road traffic, risk of traffic accidents

Significant direct environmental aspects

The identification and use of appropriate environmental indicators is essential for measuring and monitoring the improvement of our organisation's environmental performance as required by UNI EN ISO 14001 and Regulation (EC) no. 1221/2009 (EMAS).
The standard defines the requirements of the data collection process and the characteristics that indicators should have in order to be adequate to describe environmental performance and its development over time.

The indicators shall:
- give an accurate appraisal of performance
- be understandable and unambiguous
- allow for an intertemporal comparison on the environmental performance of the organisation
- allow for comparison with sector, national or regional benchmarks, etc.
- allow for comparison with regulatory requirements.

The key environmental indicators for Sarlux mainly concern the following issues:
- material
- energy
- emissions
- water
- waste
- land use in relation to biodiversity
- other environmental aspects (noise, odours, asbestos, etc.)
- visual impact.

Materials

Environmental aspect: Consumption of raw materials
Assessment: significant

Applicable legislation:
- Regulation (EC) no. 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
- Regulation (EC) no. 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures
- Legislative Decree no. 105 of 26 June 2015 - Implementation of Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances

Raw materials

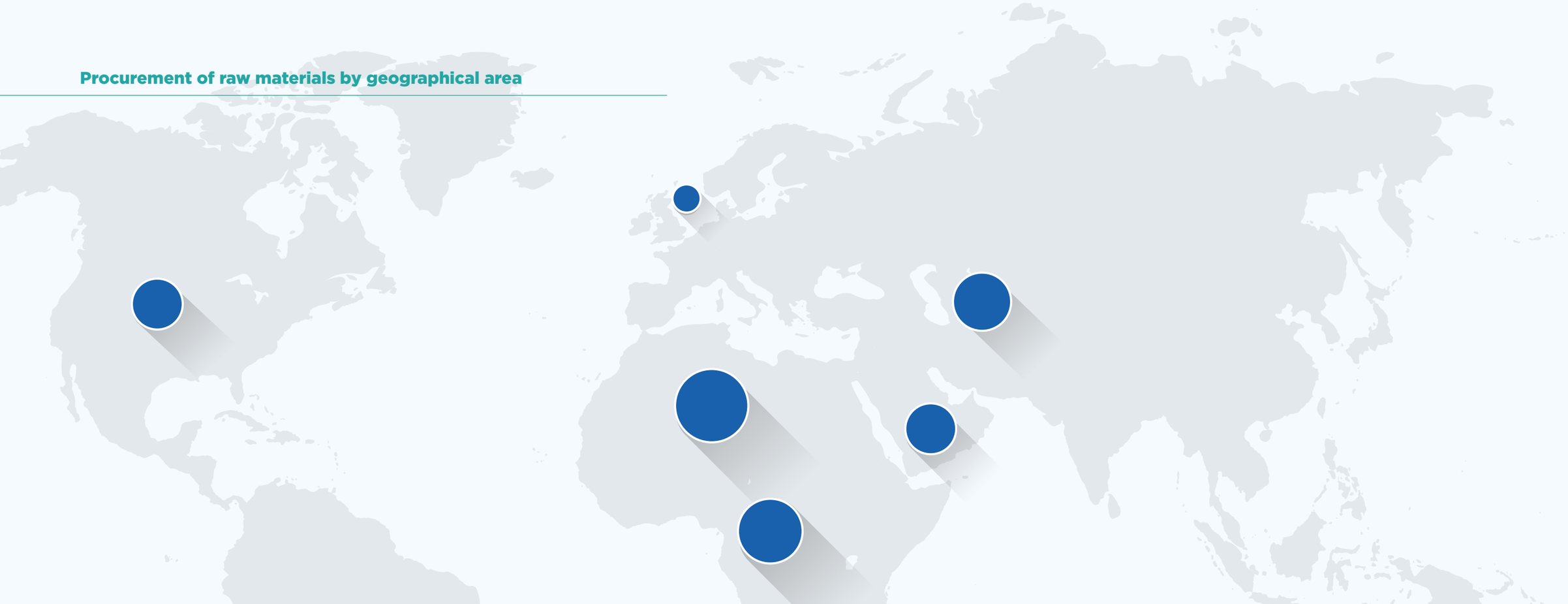
The consumption of raw materials is a significant environmental aspect of Sarlux's operations, since petroleum is a non-renewable natural resource and the quantities processed are significant.
Crude oil is made up of a mix of various hydrocarbons, which are substances formed by hydrogen and carbon. Crude oils can differ in origin, density, viscosity, sulphur content and product yield, and knowledge of these parameters is essential for designing crude oil refining equipment to optimise its environmental performance.
Our flexible infrastructure and strong logistical organisation enable us to purchase and process raw materials with different characteristics and origins. In recent years, Sarlux has processed 31 different crude oils from 30 countries.
Oil refineries must obtain a specific authorisation, which sets the maximum processable amount of mineral oils (petroleum). The limit for our refinery is 18 million tonnes per year (Decree of the Italian Ministry for Productive Activities no. 17086 of 7 July 2003).
The actual quantity of raw material processed at our refinery (crude oil and fuel oil) is on average about 13 million tonnes/year.

In addition to the quantity of materials processed, the sulphur content in crude oil is another important parameter for managing the refining processes and controlling product characteristics.
In recent years, 60-70 percent of the raw material processed at the refinery was low sulphur oil.

Production of oil products

The Sarroch site production averages a high output of middle distillates (gasoil and kerosene) and light distillates (LPG, naphtha, petrol) accounting for around 92 percent of the total. The remaining 8 percent is made up of fuel oil, sulphur and other materials.
In recent years, in line with legal requirements, we have strongly reduced the sulphur content of our automotive fuels, which since 2009 must be lower than 10 ppm for both petrol and diesel.
In January 2020, the new IMO (International Maritime Organization) regulation came into force, kickstarting the production of the new low-sulphur marine engine fuel (0.5 percent compared to 3.5 percent in the previous specification), through a sophisticated and multi-faceted process: from the selection of crude oils to be processed, to the use of suitable mixing techniques with low-sulphur fluxes.

The lower sulphur content in motor vehicle fuels intended for sale has led to a reduction in SO_2 emissions from vehicle traffic. Consequently, the quantity of sulphur recovered from the production cycle increases. Sulphur itself is a valuable raw material that can be used in other production cycles, reducing the need to obtain from natural raw materials, hence saving energy and other resources.



Auxiliaries of raw materials

In addition to oil, auxiliary chemical substances are also used in the refining cycle and the IGCC plant. They can be grouped into the following main categories:

- chemical reaction catalysts
- treatment and process additives
- product formulation additives
- oxygen, hydrogen, nitrogen.

The consumption of auxiliary chemicals is less significant than that of raw materials, since auxiliary chemicals are generally purchased in much smaller quantities.

However, the procurement of raw materials and auxiliary substances involves their transport by sea and road, which is an indirect environmental aspect. This aspect is examined in the section on "Maritime traffic".

Storage, handling and use

Storage facilities at the Sarlux site are divided between the Southern and Northern plants and include:

- raw materials and products in the south/north tank farm
- excise duty-paid products held in the National Storage Facility, located outside the "bonded area", across from State road (SS) 195
- liquefied gases stored in special pressure tanks ("spheres", "bullets" and "horton spheres").

In total, there are 202 tanks with an overall capacity of around 3.8 million m3.

All tanks are equipped with fixed fire fighting systems and containment basins to prevent and contain any spillage.

The fire prevention system in the LPG storage areas is controlled by automatically activated prevention and protection devices which, using process parameters, environmental sensors, fire detectors and CCTV cameras, activate automated fire prevention and spill containment systems. The LPG tanks are also equipped with storage pressure gauges.

In line with BAT (Best Available Techniques), an upgrading plan is under way at the tank farm, with the gradual installation of double bottoms and paving in the pipeways and containment basins.

Raw materials and products are transferred within the site between plants, storage areas and shipping and reception areas using pipelines and pumping systems, including pipelines connecting to the National Storage Facility and the marine terminal, product measurement and additive mixing before shipping the products, land-loading systems (loading bays), and sea-loading systems (marine terminal equipment).

Energy

Environmental aspect: electricity and fuel oil consumption
Assessment: significant

Applicable legislation:

- Law no. 10 of 9 January 1991 - Rules for the implementation of the National Energy Plan on the rational use of energy, energy saving and the development of renewable energy sources
- Legislative Decree no. 387 of 29 December 2003 - Implementing Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal electricity market
- Legislative Decree no. 28 of 3 March 2011 - Implementing Directive 2009/28/EC on the promotion of the use of energy from renewable sources
- Legislative Decree no. 102 of 4 July 2014 - Implementing Directive 2012/27/EU on energy efficiency
- Legislative Decree no. 152 of 3 April 2006 - Code on the Environment. Part Five - Rules on air protection and reduction of air emissions - Title III - Fuels
- Interministerial Decree of 11 January 2017 as amended and supplemented – Determination of the national energy saving quantitative targets for electricity and gas distributors in the years from 2017 to 2020 and for approval of the new Guidelines for preparing, implementing and evaluating energy efficiency projects
- LEGISLATIVE DECREE no. 199 of 8 November 2021 - Implementing Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources
- Commission Implementing Regulation (EU) 2022/2299 - Integrated National Energy and Climate Plans - Approval of the structure, format, technical details and process for the integrated national energy and climate progress reports pursuant to Regulation (EU) 2018/1999

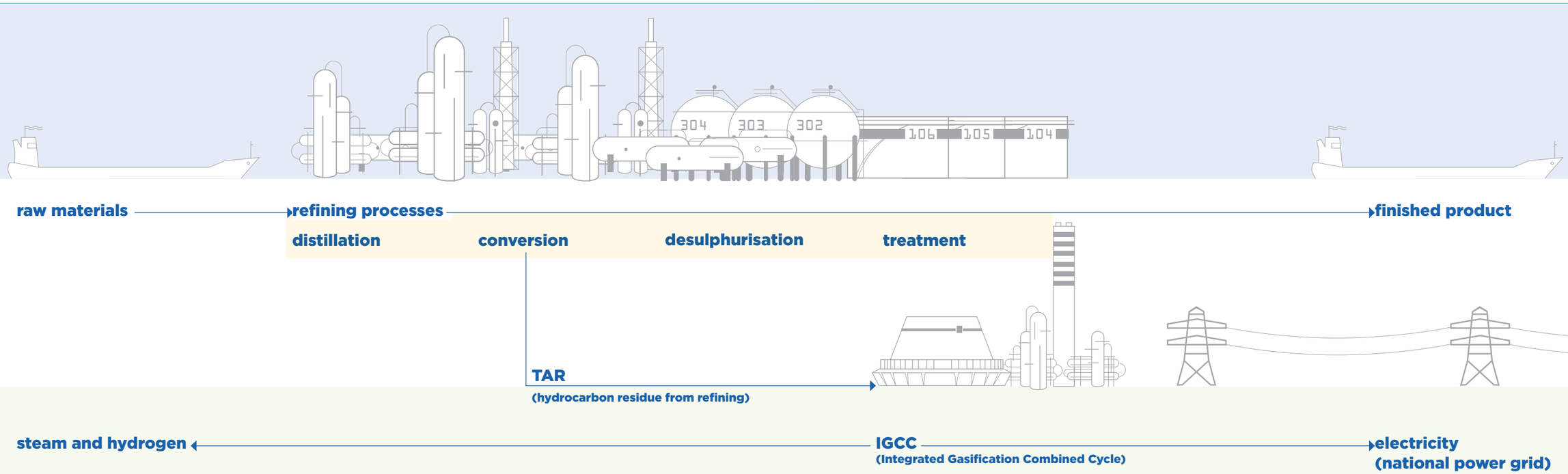
Energy consumption

Our commitment to improving energy efficiency dates back to the late 1970s and early 1980s, when we began to invest heavily in energy and heat conservation. Today, energy saving and efficiency are more than ever key objectives linked to the improvement of the industrial site's overall environmental performance. In this respect, over the years, we have implemented major heat recovery projects. Together with operational improvements, these projects have enabled us to reduce consumption.

To consolidate our constant commitment to energy efficiency we decided to implement an Energy Management System (EMS), certified on 21 May 2018 under UNI EN ISO 50001:2018.

The industrial site's energy performance is monitored through the specific consumption index defined as the ratio between the net energy consumed by the industrial site (expressed in GJ) and the amount of crude oil and semi-finished products (expressed in tonnes) entering the industrial site (Best Available Techniques BAT Reference Document for the Refining of Mineral Oil and Gas - 2015).

Energy efficiency of the Sarlux integrated cycle



Air

Environmental aspect: emissions to air
Assessment: significant

Applicable legislation:
- DEC-MIN-000263 of 11/10/2017 - Review of the Integrated Environmental Authorisation issued to Sarlux Srl for the operation of the "Refinery, Integrated Gasification Combined Cycle plant (IGCC) and Northern Plants" complex in Sarroch, as amended and supplemented
- Legislative Decree no. 152 of 03/04/2006 - Code on the Environment - Part V: Rules on air quality protection and reduction of air emissions
- Legislative Decree no. 155 of 13 August 2010 – Implementing Directive 2008/50/EC on ambient air quality and cleaner air for Europe
- Presidential Decree no. 416 of 26 October 2001 – Rules on the charging of tax on sulphur dioxide and nitrogen oxide emissions, pursuant to Article 17(29) of Law no. 449 of 1997

Emissions to air are a significant environmental aspect of the activities carried out at the Sarlux site under normal conditions and in specific abnormal and emergency conditions.

On 4 November 2017, the new IEA decree DEC-MIN-0000263 of 11 October 2017 came into force. The Decree introduced the following changes for emissions to air:
- the "refinery bubble" concept - renamed Integrated Emission Management - remains valid, with two additional emission points, Reforming NORTH and CTE NORTH
- under the Integrated Emission Management (IEM), mass flow and concentration limits are set only for SO_2 and NOx
- CO and dust are not covered by the IEM but are only subject to concentration limits referred to individual emission points
- all the limits assigned under the previous IEA for Large Combustion Plants (GICs) remain valid
- among the plants with specific emission limits, the IGCC plant as well as BTX NORD have been upgraded.

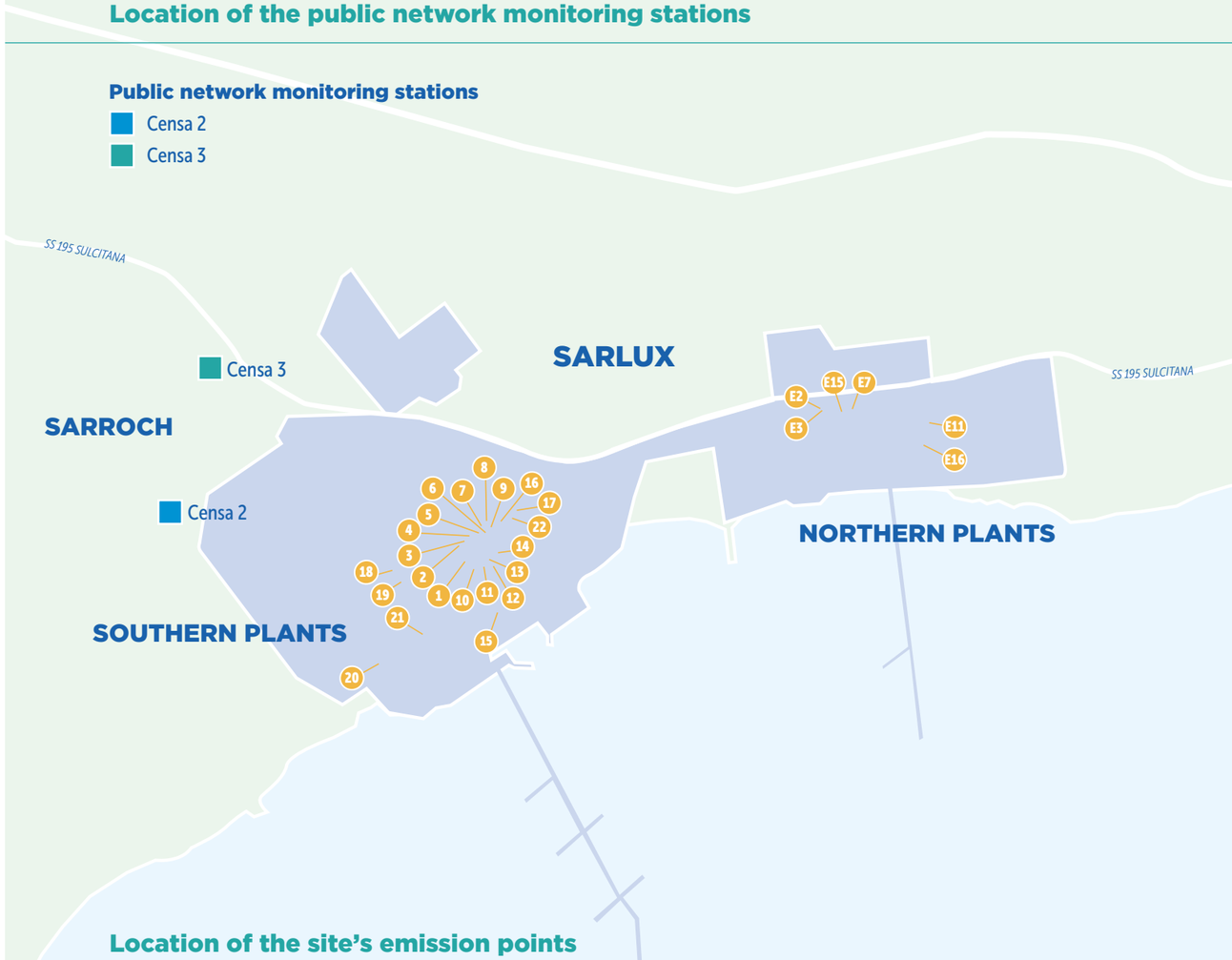
In accordance with legislation, emissions to air can be divided into:
- emissions channelled to smokestacks
- non-channelled emissions.

The emission limits introduced in 2016, concerning monthly point concentrations at Large Combustion Plants (LCPs) remain in place and have led us to step up our efforts for continual improvement, and thus optimise emission performance.
Furthermore, Ministerial Decree no. 95/2022 updated the monthly emission limits for multi-fuel fired Large Combustion Plants (LCPs).

Channelled emissions

The figure on the next page shows the location of the channelled emission points from the Southern Plants and the Northern Plants. A number of objectives and improvement measures have been defined for channelled emissions to air.
Channelled emissions from smokestacks are mainly generated by:
- furnace combustion processes providing the thermal energy required for the production cycle
- combustion processes for producing electricity and steam (northern thermoelectric plant, southern plant and IGCC)
- volatile organic compound abatement systems.

Location of the public network monitoring stations



Location of the site's emission points

Emission points at the Southern Plants

1 Central stack
Topping 1 Plant
Boiler B1-A Plant
Boiler B1-B Plant
CTE
2 U400-F461 Plant
3 U300-F301 Plant
4 U500-F501 Plant
5 U700-F701 Plant
6 VSB-F102C Plant
7 VSB-F102B Plant
8 RT2-F1A Plant
9 RT2-F1B Plant
10 FCC-K1 F3 Plant
11 Co-Boiler Plant
12 Vacuum F1-A Plant
13 Vacuum F1-B Plant
14 Topping 2-F1 Plant
15 CCR-F11 Alkylation Plant
16 Z3-F2 Plant
17 Z4-F2 Plant
18 MHC1 (F101-F251) Plant
19 MHC2-F201 Plant
20 IGCC central stack
Line 701/702/703
21 U800 (F801-F802) Plant
22 C31 Reforming CCR

Emission points at the Northern Plants

E2 BTX Furnace
E3 BTX Furnace
E7 Reforming Furnace
E11 Northern CTE
E12 Northern Reforming Regenerator
E15 Cryogenic Plant

A dedicated monitoring system measures emissions of SO_2, NOx, total suspended particulates, CO and the flue gas flow rate from the following smokestacks:

- Centralised
- Z3 and Z4 incinerators
- Topping 2
- Reformer-Alkylation unit (CCR-Alky)
- CO Boiler
- FCC-K1F3
- Visbreaking
- Thermoelectric plant Northern Plants
- Northern Reforming
- MHC1
- IGCC.

In addition to monitoring, we perform monthly and six-monthly sampling of various other parameters.

Air quality monitoring with fixed monitoring stations

Since air emissions from the industrial site can affect the air quality of the surrounding areas, two external air monitoring networks are in place, one operated by Sarlux and one by the Regional Environmental Protection Agency of Sardegna (ARPAS). Sarlux owns and operates its own monitoring stations (Villa d'Orri, Sarroch, Porto Foxi and the National Storage Facility), while ARPAS operates the two stations owned by the Region of Sardinia.
The data measured by the monitoring stations include emissions from all sources in the area, including industrial, urban and non-urban emissions, such as those from vehicle traffic.
The location of the public air monitoring stations is shown in the figure on the previous page.
The reference legislation for air quality monitoring methodology and pollutant concentration limits is Legislative Decree no. 155/2010 for SO_2, nitrogen oxides (NO_2 and NOx), small dust particles (PM10), CO, benzene and ozone.
Hydrogen sulphide (H_2S) is not currently regulated. However, the limits previously set by Presidential Decree no. 322/1971, which was repealed, can be used as indicative references. The ARPAS air quality monitoring network records concentrations of the following pollutants: SO_2, NO_2, H_2S, PM10, ozone, benzene, $PM_{2,5}$ and CO.
The Sarlux network, managed alongside that of ARPAS, measures air quality parameters in real time, to ensure that pollutant concentration values remain below the legal limits and immediate action is taken when necessary.

Air quality monitoring using bio-indicators

The Sarroch industrial site is located along the coast and is surrounded by protected nature areas. Therefore, we have a responsibility to preserve land and marine fauna and flora.
The nature areas surrounding the Sarroch industrial site are:

- the "Gutturu Mannu" Regional Nature Park, about 3 km west of the refinery
- the "Stagno di Cagliari" wetland, approximately 6.7 km to the east
- the Monte Arcosu forest, about 11 km to the west.

Air quality can be monitored using bioindicators as well as chemical indicators. Epiphytic mosses, i.e. those that grow on tree trunks, are the most frequently used air quality bioindicators. The monitoring methodology is based on the measurement of biodiversity, i.e. the abundance of different moss species.
The presence of atmospheric pollutants (mainly sulphur and nitrogen oxides) can reduce biodiversity values. For a number of years now, the Botanical Sciences Department of the Faculty of Mathematical, Physical and Natural Sciences of Cagliari University has been monitoring the vegetation over a wide area inland of Sarroch, as shown in the figure using, among other parameters, epiphytic mosses for air pollution biomonitoring.

Location of the air quality biomonitoring stations

Non-channelled emissions

Non-channelled emissions are mainly generated by:

- the storage and transportation of raw materials and products, and the treatment of wastewater (diffuse emissions)
- normal minor emissions from sealing components, such as valves and flanges (fugitive emissions).

Diffuse and fugitive emissions cannot be channelled for technical reasons. These non-channelled emissions can be contained by installing appropriate sealing systems and through monitoring and maintenance.
The substances present in diffuse and fugitive emissions are volatile organic compounds (VOCs), which contain light hydrocarbons and can evaporate in the ambient and process conditions present at the site.
The areas from which diffuse emissions can originate relate to storage, shipment, the production processes and wastewater treatment.
For diffuse and fugitive air emissions too we have set objectives and improvement actions.

The data on non-channelled emissions, comprising diffuse and fugitive emissions, are summarised in the section on Data and Actions for Improvement.

Management of the Flare Blow Down System

The Flare Blow Down System is an authorised safety device installed at the site. It operates by burning off any releases of gases from the industrial units due to operating anomalies, emergency situations, transient operations, or plant shutdown or start-up. More specifically, the Flare Blow Down System is employed to protect all sections or circuits of the process and storage plants.
The Sarlux site is equipped with two emergency Flare Blow Down Systems, one for the Southern Plants (the refinery and the IGCC plant), consisting of two flare stacks and related equipment, and one for the Northern Plants, consisting of a single flare stack.

Carbon Dioxide, CO_2 (greenhouse gases)

Environmental aspect: emissions to air
Assessment: significant

Applicable legislation:
- Directive (EU) 2018/410 of the European Parliament and of the Council of 14 March 2018 amending Directive 2003/87/EC to enhance cost-effective emission reductions and low-carbon investments, and Decision (EU) 2015/1814
- Commission Implementing Regulation (EU) 2018/2066 of 19 December 2018 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council and amending Commission Regulation (EU) no. 601/2012
- Commission Implementing Regulation (EU) 2018/2067 of 19 December 2018 on the verification of data and on the accreditation of verifiers pursuant to Directive 2003/87/EC of the European Parliament and of the Council
- Commission Implementing Regulation (EU) 2020/2084 of 14 December 2020 amending and correcting Implementing Regulation (EU) 2018/2067 on the verification of data and on the accreditation of verifiers pursuant to Directive 2003/87/EC of the European Parliament and of the Council
- Legislative Decree No 47 of 9 June 2020 - Implementing Directive (EU) 2018/410 of the European Parliament and of the Council of 14 March 2018 amending Directive 2003/87/EC to enhance cost-effective emission reductions and low-carbon investments, and aligning national legislation with Regulation (EU) 2017/2392 on aviation activities and Decision (EU) 2015/1814 of the European Parliament and of the Council of 6 October 2015 concerning the establishment and operation of a market stability reserve
- Commission Delegated Regulation (EU) 2019/331 of 19 December 2018 determining transitional Union-wide rules for harmonised free allocation of emission allowances pursuant to Article 10a of Directive 2003/87/EC of the European Parliament and of the Council
- Commission Implementing Regulation (EU) 2019/1842 of 31 October 2019 laying down rules for the application of Directive 2003/87/EC of the European Parliament and of the Council as regards further arrangements for the adjustments to free allocation of emission allowances due to activity level changes
- Resolution no. 70/2019 - Data collection for preparing the list referred to in Article 11 of Directive 2003/87/EC as amended by Directive (EU) 2018/410
- Resolution no. 9/2021 - Annual reporting on activity levels and application for free allocation

The activities carried out at the Sarroch site (refining, electricity generation and manufacturing of organic basic chemicals) fall within the scope of the European "Emission Trading" Directive. The Directive was introduced in all EU Member States to control and contain carbon dioxide emissions under the Kyoto Protocol. The aim of the Directive is to reduce greenhouse gas emissions, in particular of carbon dioxide, which are the main culprits of the gradual global warming of our planet, known as the "greenhouse effect".
The Emissions Trading Scheme (ETS) was introduced in 2005 to help Member States to comply with their commitments under the Kyoto Protocol. It works by assigning each individual plant falling within the scope of the Directive an emission allowance established by the Member State through a National Allocation Plan.
Under the system, companies that have surplus allowances can sell them or keep them for future use, while those that have a shortfall can purchase them on the market.
Previous allocation rules have been changed: Directive (EU) 2018/410, which amended Directive 2003/87/EC to establish fully-harmonised EU-wide rules, allocated free allowances of CO_2 for the sectors exposed to a genuine risk of carbon leakage.

Since 2005, CO_2 emissions from the site have been validated annually by LRQA, a duly accredited validation body. Our Group has focused on the rational use of energy and the deployment of efficient production systems to control and reduce CO_2 emissions, which are the main component of Sarlux's GHG emissions (other gases are negligible).

Water

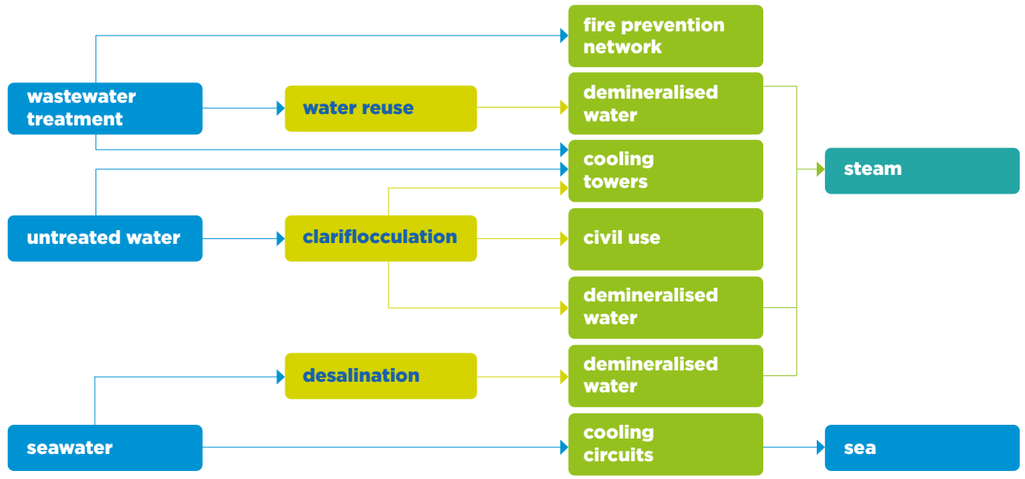
Environmental aspect: water consumption and releases into water
Assessment: significant

Applicable legislation:
- DEC-MIN-000263 of 11/10/2017 - Review of the Integrated Environmental Authorisation issued to Sarlux Srl for the operation of the "Refinery, Integrated Gasification Combined Cycle plant (IGCC) and Northern Plants" complex in Sarroch, as amended and supplemented
- Legislative Decree no. 152 of 03/04/2006 - Code on the Environment Part III: Rules on water pollution prevention and water resource management

Consumption

The Sarroch industrial site uses water for a number of purposes, the main one being the production of steam for technological uses (heat transport, steam stripping and electricity generation). Water is also used for the plant cooling circuits, the fire prevention system and for civil uses.
In light of the scarcity of water resources in the area, we have adopted policies at the Sarroch site to minimise the use of local primary sources and we continue to regularly monitor, manage and optimise the refinery's water footprint through the Environmental Management System.
More specifically, site water consumption is defined as the amount of water required to ensure the operation of production facilities and related services. Water consumption is given by the sum of the following factors:
- untreated water from the CACIP industrial consortium
- seawater (only for the quantity collected and not returned to the sea)
- water recovered internally from water treatment plants for the sewerage system (water reuse).

The simplified diagram of the site's water cycle shows the three factors described above, two of which are from external sources (untreated water and seawater) and one from an internal source, the site's wastewater treatment system.



In order to reduce the amount of water extracted from primary sources and thus make an increasing amount of untreated water available to the territory for non-industrial uses, over the years we have carried out a number of investments in technology and process improvements to steadily reduce our water demand. In parallel, and with the same aim, we have boosted the recovery of water from wastewater treatment and increased the installed capacity of our seawater desalination systems.

Releases to water

In accordance with the Integrated Environmental Authorisation, the Sarlux production site has a number of discharge points into the sea used in normal operating conditions, and exceptionally, in case of emergencies. For each discharge into the sea, the quantities released into the receiving body of water and their chemical and physical characteristics are monitored by means of daily, monthly and quarterly sampling and analysis by an accredited external laboratory.

The figure on the next page shows the location of the discharge points, each with an identification code.

Discharge points under normal conditions

The Southern Plants have the following authorised discharge points:
The main discharge point (1), collects and releases into the sea the water from the plants and units listed below.

- treatment plant for the wastewater generated by the refinery, which has two discharge points (1A and 1B); the plant carries out chemical, physical and biological treatment of waters from the oily water sewer network, to which wastewater and stormwater from the plant area and domestic water are channelled
- treatment plant for ballast water (slop water and washing water) and bilge water from tankers that dock at the marine terminal and from private ships, respectively; water pumped from the wells belonging to the site's hydraulic barrier; and stormwater, except for runoff from the plant area; the treatment plant has one discharge point (1C)
- filter tank, which collects the water that has been treated in the wastewater treatment plant, equipped with an overflow discharge point (1D)
- discharge point from the IGCC cooling tower (1G)
- discharge point from the plant producing demineralised/deionised water from seawater (1H).

Discharge points 4, 7, 9 and 10 also convey to the sea the water from the following plants:

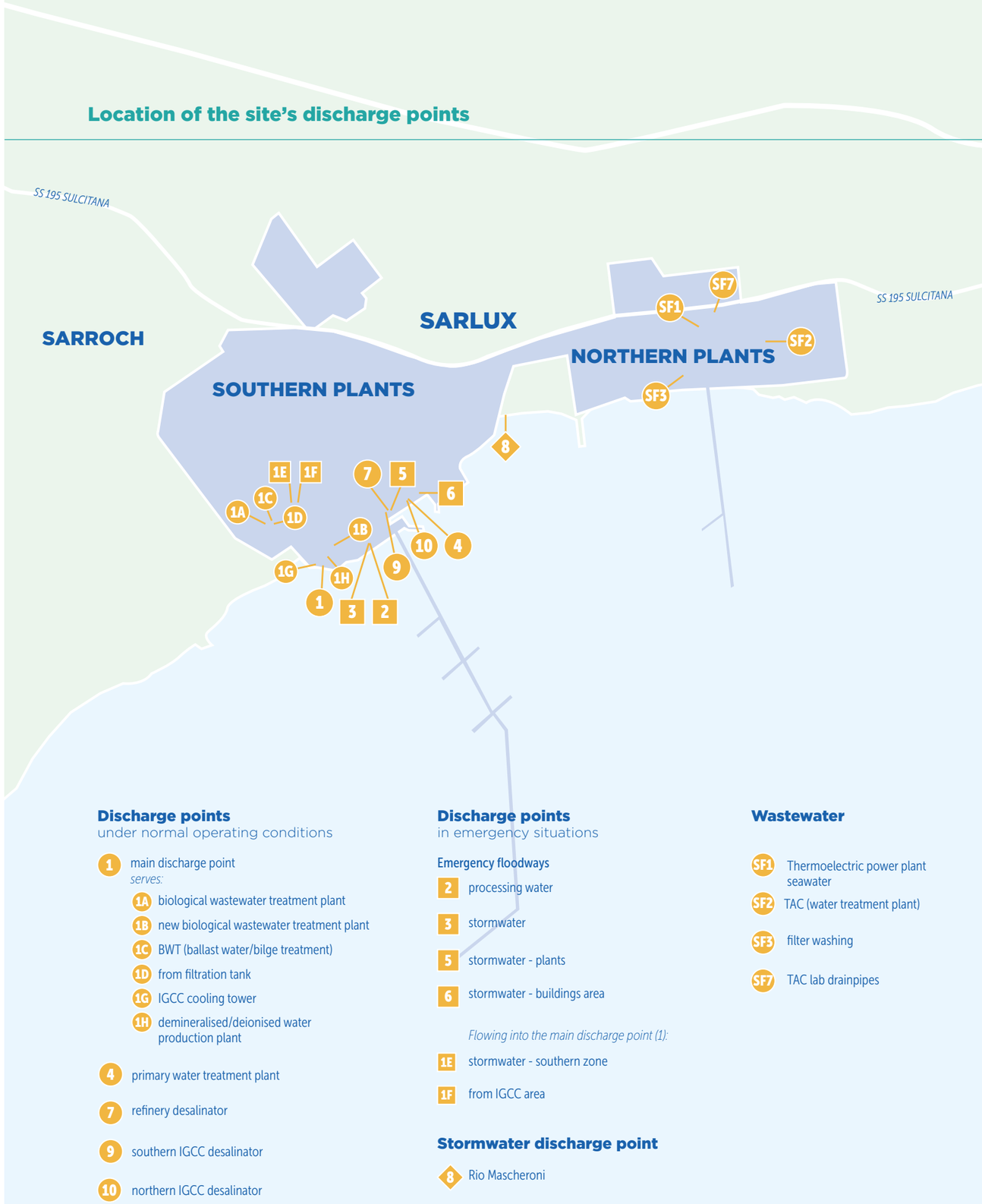
- unit for the primary treatment of the untreated water coming into the site (4), from the industrial water supply system
- desalinators of the refinery and the IGCC (7, 9, 10). Discharge points 9 and 10 have been inactive since 2018.

All the above-mentioned discharge points are active under normal conditions and operate continuously, except for the discharge points from the filter tank (1D), the untreated water primary treatment unit (4) and the biological wastewater treatment plant (1A).
The stormwater consisting of runoff from roads and paved areas in the northern part of the refinery and from the basins around the LPG spherical tanks, which does not come in contact with pollution sources, is discharged into the Rio Mascheroni and from there to the sea (8).

The Northern Plants have four authorised discharge points into the sea:

- SF1 continuous discharge point for the cooling seawater used in the thermoelectric power plant serving the Northern Plants
- SF2 non-continuous discharge point from the TAC plant which treats untreated and condensed water

Location of the site's discharge points



Discharge points
under normal operating conditions

- 1 main discharge point
  serves:
  - 1A biological wastewater treatment plant
  - 1B new biological wastewater treatment plant
  - 1C BWT (ballast water/bilge treatment)
  - 1D from filtration tank
  - 1G IGCC cooling tower
  - 1H demineralised/deionised water production plant
- 4 primary water treatment plant
- 7 refinery desalinator
- 9 southern IGCC desalinator
- 10 northern IGCC desalinator

Discharge points
in emergency situations

Emergency floodways

- 2 processing water
- 3 stormwater
- 5 stormwater - plants
- 6 stormwater - buildings area

Flowing into the main discharge point (1):

- 1E stormwater - southern zone
- 1F from IGCC area

Stormwater discharge point

- 8 Rio Mascheroni

Wastewater

- SF1 Thermoelectric power plant seawater
- SF2 TAC (water treatment plant)
- SF3 filter washing
- SF7 TAC lab drainpipes

- SF3 non-continuous discharge point for water from the backwash filter system of the seawater lifting station
- SF7 discharge point for rainwater runoff from the roof of the laboratory building.

The water from all these discharge points is conveyed to the northern canal (Rio Antigori) and from there to the sea.

The significant parameters regarding quantities of releases into water are reported in the Data and Actions for Improvement section.

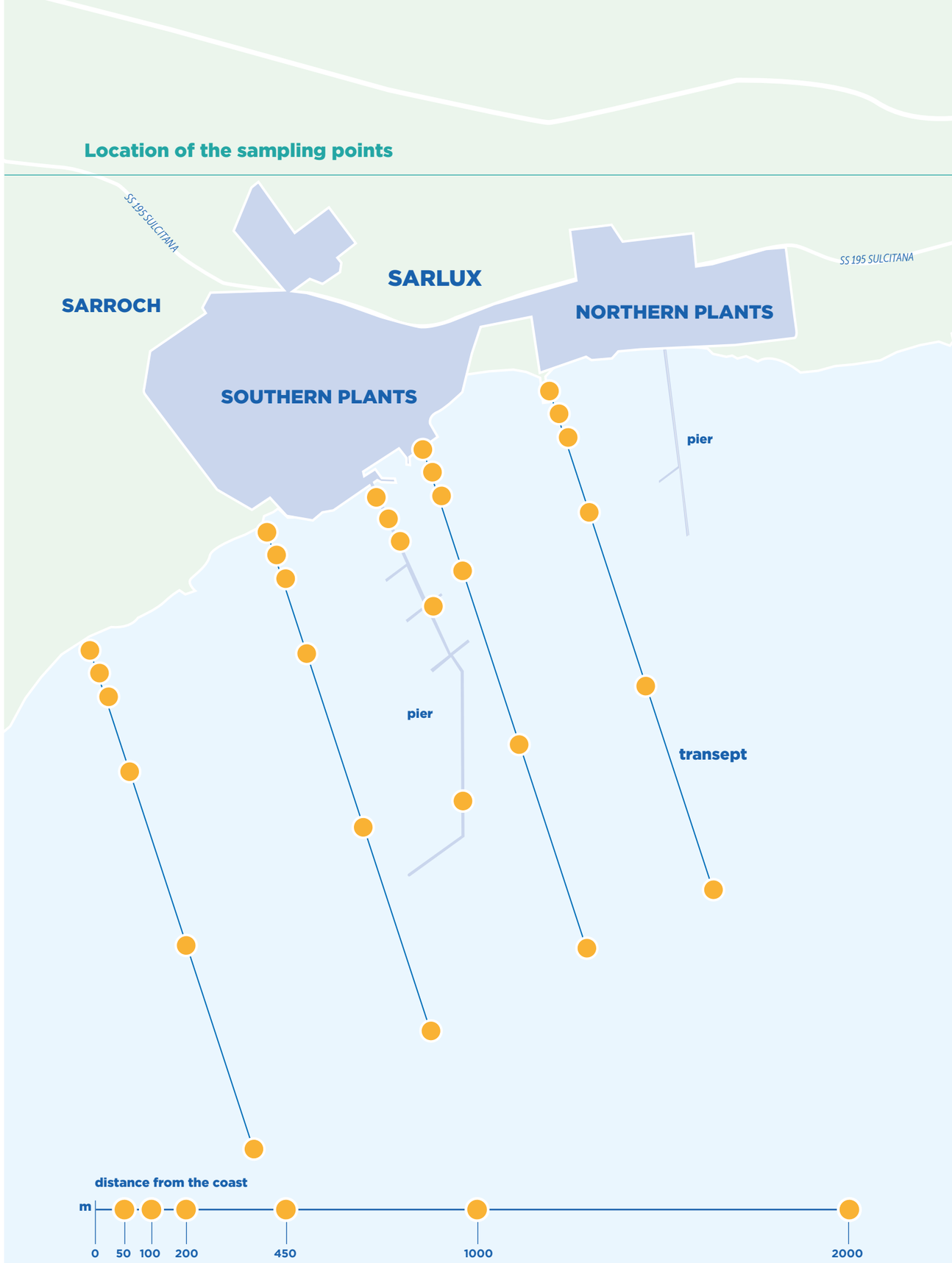
Discharge points under emergency conditions

In emergency conditions caused by extraordinary events (e.g. torrential rain), stormwater (including runoff from the roofs of the buildings in the IGCC area and from the terraces seaward of the IGCC) is conveyed via emergency floodways (1E, 1F, 2, 3, 5, 6). These discharge points are normally closed and sealed by the supervisory authorities. The integrity of the seal applied by the authorities is periodically checked and any tampering is reported. If it becomes necessary to open one or more of these discharge points, we will activate an internal emergency procedure and notify the supervisory bodies, within the time limits specified in the permit, of why the seal had to be removed and the time it will take to restore normal conditions. We will also request the application of a new seal.

Seawater quality

For several years now, we have appointed marine biologists to carry out periodic tests on the quality of the seawater in the sea area in front of the Sarlux site.
The surveys consist of detailed chemical and physical analysis of seawater samples taken at different depths at a number of points along lines perpendicular to the coastline, as shown in the figure on the next page.

Location of the sampling points



Waste

Environmental aspect: waste
Assessment: significant

Applicable legislation:
- DEC-MIN-000263 of 11/10/2017 - Review of the Integrated Environmental Authorisation issued to Sarlux Srl for the operation of the "Refinery, Integrated Gasification Combined Cycle plant (IGCC) and Northern Plants" complex in Sarroch, as amended and supplemented
- Legislative Decree 152 of 03/04/2006 as amended and supplemented - Code on the Environment - Part IV: Rules on waste management and the remediation of polluted sites
- Regulation (EC) No 1013/2006 of 14 June 2006 – Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste

Waste management

Sarlux's waste management policy is aimed at optimising the type and quantity of waste produced and maximising waste recovery.
As shown in the figure, the main waste management steps at the site before the waste is sent off-site for disposal or recovery are as follows:
- the waste generated, appropriately sorted by type, is generally sent to temporary storage areas (point 2, see figure)
- ferrous scrap metal is recovered in a specially designated area, managed by an authorised external company[1], which sorts the scrap metal and reduces its volumes without altering the type and mass (point 1, see figure)
- used oils are removed from the equipment during maintenance activities and sent directly for recovery
- plastic, glass, aluminium and paper waste is collected separately and sent to the dedicated waste recycling centre managed by the Municipality of Sarroch
- most of the waste generated, consisting mainly of waste containing hydrocarbons, is sent to an internal plant (point 4, see figure), which separates it into its solid (waste sludges) and liquid phases (oily and aqueous phases); the recovered liquid phase is channelled to the wastewater treatment plant, while the solid phase undergoes a further process to dry it out under heat and convert it into chemically inert matter; the plant is managed by an authorised external company[2]
- filter cake from the IGCC (rich in vanadium and nickel) can be stored in the temporary storage area and/or in an area specifically authorised[3] for this purpose before it is despatched externally for the metals to be recovered (point 3, see figure)

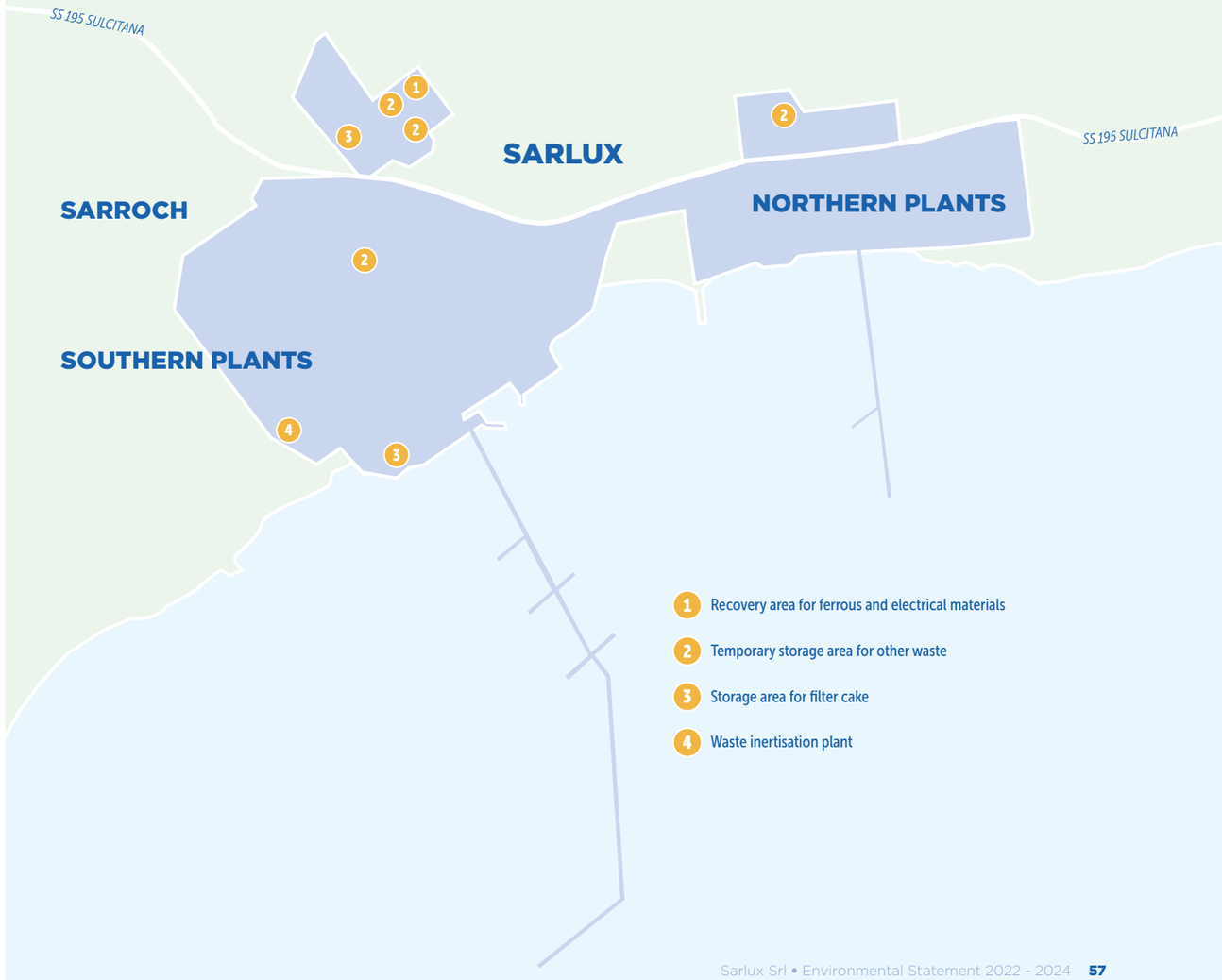
To reduce the quantity of waste leaving the site, a thermal drying system (TDS) was installed and put into operation at the end of 2019. This unit, also operated by an authorised external company, treats most of the process sludge from the wastewater treatment plants as an alternative to the inerting plant.
The effectiveness of the new waste drying system is shown by a few figures: in 2023, 91 percent of the sludge from the wastewater treatment plant was treated in the thermal drying unit, reducing by about 82 percent the amount of waste produced, compared to use of the inerting unit alone.
The two external companies that carry out the first treatment at the units within the site, take over management of the waste conveyed to their units, and report in their annual statement (MUD [unified environmental statement]) the quantities of waste they send externally after carrying out the treatment processes. These companies were carefully selected and are checked regularly, including by means of targeted audits.

1. Decision no. 30 of the Province of Cagliari of 18/03/2014.
2. Decision no. 86 of the Province of Cagliari of 21/04/2010.
3. Ministerial Decree 0000263 of 11 October 2017, as amended and supplemented

The filter cake is sent for external recovery to plants in Germany. To do so, each year we request the permit for the cross-border movements of waste, in accordance with Regulation (EC) no. 1013/2006. Sarlux is also authorised[4] to receive and treat waste consisting of bilge water, slop water and ballast water from ships. We carry out this activity at no cost for the ships that dock at the marine terminal and the ships that send these types of wastewater to Sarlux from regional ports in tanker trucks. These types of of wastewater are treated at the ballast water treatment plant mentioned in the paragraph "Releases into water".

4. Ministerial Decree 0000159 of 14/04/2022 as amended and supplemented.
Regional Decision no. 2520/IV of 04/11/2004 supplemented by Decision no. 964/IV of 31/05/2005, replaced by IEA DEC-MIN-2017-263 of 11/10/2017.

Areas reserved for the site's main waste management activities



Soil and subsoil

Environmental aspect: soil and subsoil
Assessment: significant

Applicable legislation:
- DEC-MIN-000263 of 11/10/2017 - Review of the Integrated Environmental Authorisation issued to Sarlux Srl for the operation of the "Refinery, Integrated Gasification Combined Cycle plant (IGCC) and Northern Plants" complex in Sarroch, as amended and supplemented
- Legislative Decree no. 152 of 03/04/2006 - Code on the Environment - Part IV: Rules on waste management and the remediation of polluted sites
- DEC-MIN - 0000207 of 09/05/2016 - Sarlux industrial facility groundwater remediation project
- DEC-MIN - DEC STA 108 of 29.04.2019 - Soil remediation and operational safety (MISO) project

The Characterisation Plan

Ministerial Decree no. 468 of 18/09/2001 included the territory of Sarroch, in which the Sarlux production site is located, together with 33 other municipalities in the "Sulcis Iglesiente Guspinese" area, designated a site of national interest for remediation.
For this reason, as required by Ministerial Decree no. 471 of 25 October 1999 (regulation on the criteria, procedures and methods for the safety, remediation and environmental restoration of polluted sites), Sarlux submitted to the competent authorities for approval a Site Characterisation Plan on the soil and groundwater in the area of the Southern Plants.

In 2004, together with the Italian Ministry for the Environment, the Region of Sardinia, the Province of Cagliari, Local Health Authority no. 8 and the Municipality of Sarroch, we defined the procedures for implementing the Site Characterisation Plan, which included a series of surveys, and proposed additional actions to protect the environment and safeguard public health. The main actions were:
- execution of the Site Characterisation Plan (Southern Plant)
- emergency safety measures (MISE) for groundwater by constructing a dynamic water-extracting barrier
- operational safety measures (MISOP) for groundwater by constructing a physical barrier on the sea side, which was subsequently replaced by the creation of the "diffuse" hydraulic barrier boosting the emergency safety measures ("procedural variant").
- remediation project for soil hot spots in the Western Tank Farm area and the area of the former ST1 reservoir.

The Site Characterisation Plan, completed in 2010, involved 879 soil samplings, 144 piezometer samplings and 539 control points ("gas surveys").
After completing the plan, in 2012 we requested the supervisory bodies' approval.

Dynamic barrier – Groundwater emergency safety measures

The hydraulic barrier plan submitted, relating to the Sarlux production facility in Sarroch, comprises the construction of 46 wells equipped with an extraction or replenishment system, located as follows:
- 27 on the industrial facility's mid-line, with the function of extracting contaminated water and recovering supernatant
- 6 hydrogeologically upstream extraction wells for controlling the barrier's groundwater level
- 13 replenishment wells on the sea side, including one on the south side outside the refinery, to prevent seawater ingress.

Subsequently, following the entry into operation of the systems, the barrier was modified as follows:
- 2 extraction wells located hydrogeologically upstream of the refinery were decommissioned;
- the replenishment well outside the refinery, designed to prevent seawater ingress in the south area, is currently not being used as no ingress has occurred.

MISOP – Operational safety measures for groundwater

The initial MISOP plan provided for a physical barrier having a length of 3,050 m, to be constructed using jet grouting and waterproofing injections.
In 2013 we submitted an alternative project to the Ministry for the Environment, proposing to expand the extraction and replenishment system instead of building a physical barrier. The new plan is based on constructing a new line of extraction wells, between the previous hydraulic barrier and the sea front, and increasing the number of replenishment wells on the sea front (34 new extraction wells and 7 new replenishment wells).
In July 2015, the Ministry of the Environment approved the change of method for both MISE and MISO, i.e. extension of the existing hydraulic barrier by constructing a new line of extraction and replenishment wells (41) between it and the sea front.
After determining no EIA was required, the final decree approving the change of method was issued in May 2016. Construction works started in September 2016.
The on-site activities were completed in December 2017 in compliance with the project schedule sent in June 2017. Thus, the works for the construction of additional hydraulic barriers, in addition to the barrier system already in operation, consist of a total of 34 extraction wells and 7 replenishment wells and associated "indicator" piezometers (65 in total) and 6 piezometer clusters.

Well equipment installation and commissioning were completed in January 2019. In February 2019, system-wide tests were launched to:
- evaluate the hydraulic and hydrochemical effectiveness of the extraction and replenishment barriers for operational groundwater management;
- verify the predictive value of the hydrogeological flow mathematical model implemented to support the design and management of the hydraulic barrier.

Exchanges with the supervisory bodies for the preparation of the systems monitoring plan began in 2021 and were completed during 2023.
In December 2023 we informed the competent authorities that the works under the Methodological Variant would be permanently put into operation, at the same time as the new groundwater environmental monitoring plan, as of 01/01/2024. Thus, the overall operational groundwater safety system consists of:
- 66 extraction wells, 60 of which are equipped with skimmer pumps for the recovery of the supernatant phase
- 19 replenishment wells
- 210 (145+65) on-site monitoring piezometers
- 6 multi-level piezometer clusters.

The system is completed by all ancillary works, including 17 FADs and 6 Cabinets to control the new well system.

Groundwater Treatment (TAF)

In compliance with Authorisation DEC STA no. 207 of 09 May 2016, which approved the groundwater remediation project, and given that groundwater is a strategic resource, we are currently designing a plant for water treatment and reuse in the production cycle.

Operational safety and remediation plan for soil and the production facility - Southern Plants

In November 2013, after completing the site characterisation, we completed the "absolute risk analysis". Absolute risk analysis is currently the most advanced decision support tool for the management of contaminated sites. It allows quantitative assessment of the risks for human health from the presence of pollutants in environmental media.
In March 2015, the Ministry of the Environment approved the absolute risk analysis for the site and asked us to submit a soil remediation project.
The project was submitted in early 2016. The interdepartmental conference held in October 2016 endorsed our project.
Following assessment by the Region of Sardinia (October 2017), requested by the Ministry of the Environment (February 2017), in March 2018 we submitted a study to determine whether

Environmental Impact Assessment pursuant to Legislative Decree no. 152/2006 and Decree of the Regional Government 45/24 of 09/27/2017 was a requirement for our operational soil safety and remediation project.
By Resolution no. 38/37 of 24/07/2018, the Region of Sardinia determined that there was no need to carry out an EIA on the "Operational safety and remediation plan for the site's soil".

The project was finally approved by Departmental Decree of the Ministry of the Environment dated 29/04/2019, file no. 108.
In 2021/2022, the project was optimised; at the same time, a pilot Landfarming test was carried out at an authorised third-party plant. In 2023 the detailed design phases were completed.

Soil hot-spot remediation project in the west park area and former ST1 basin area

The remediation of the hot-spots detected by site characterisation in the areas of the western park and the former ST1 area began between 2008 and 2009, following approval by the competent Ministry.
For the former ST1 area, we submitted a contaminated soil excavation and disposal project, seeking return of the area to us for new activities.
In 2019-2020, regional environmental agency ARPAS carried out site inspections in the former ST1 area to validate our remediation activity. Following the successful checks, the procedure was concluded in 2021.

With regard to the Western Park area, which underwent hot-spot remediation, in 2023 we continued to perform tests on the excavated soils to identify treatments guaranteeing environmental optimisation and sustainability, in agreement with the competent authorities.

North Plants - MISE ISLAND 6

On 30 July 2021, a hydrocarbon leak was detected in the pipeway at Isola 6 of the Northern Plants. We reported the leak pursuant to Article 249 of Legislative Decree no. 152/2006, activating the Emergency Safety (MISE) measures for the environmental compartments of groundwater and soil, potentially involved, and we started the relevant monitoring activities.
We provide below an overview of the works we carried out following the incident for the purpose of safety:

- verification of the presence of supernatant (NAPL) and possible recovery
- putting a number of piezometers into operation
- hydrochemical monitoring of the groundwater in the affected area and transmission of results to the authorities
- sampling, soil characterisation and transmission of results to the authorities.

During 2023, we launched a tender procedure to select the suppliers of a Soil Vapor Extraction (SVE) system as part of ongoing MISE actions; SVE technology was chosen as the best technology for managing soil contamination in light of the surveys carried out.

ISOLA 27 EVENT

On 10 March 2022, after Versalis, a company also based at the Site, reported the presence of a separate hydrocarbon phase on an indicator piezometer of the Isola 27 barrier, we immediately carried out the necessary checks, finding no active sources of soil contamination, and removed the potential contamination found.
The results of the sampling performed on the surface soil showed that the parameter "heavy hydrocarbons C>12" was abnormal in only one point. Therefore, in order to restore the area's safety and operability, the point in question was paved.
We also carried out checks on the portion of aquifer bordering the affected area.

ST-42 EVENT

On 22 June 2022, in compliance with the IEA Decree and Legislative Decree no. 152/2006, we notified the competent authorities of a heavy-hydrocarbon leak from a flange coupling of a service line, detected during routine checks in the containment basin of the ST-42 tank. All Emergency Safety (MISE) measures were immediately implemented by our personnel and the product was removed together with the affected surface soil layer. The results of the sampling performed on the surface soil showed that the parameter "heavy hydrocarbons C>12" was abnormal in a single point. Therefore, in order to restore the area's safety and operability, the point in question was paved. At the same time we carried out checks on the other environmental media, which revealed no deviations from previous monitoring data.

ISOLA 24 EVENT

On 7 July 2023, after Versalis, a company also based at the Site, reported the presence of a separate hydrocarbon phase on a monitoring piezometer at Isola 24, we immediately carried out the necessary field checks to identify any anomalies. Our checks identified a small hydrocarbon leakage from a 1" section of a pipeway at Isola 24. Next, we also checked the portion of aquifer bordering the affected area.
The results of the sampling subsequently performed on the surface soil underneath the line section, in a very small area, showed that the parameter "heavy hydrocarbons C>12" was abnormal in just one point. Therefore, to restore the area's safety and operability, the point in question was paved.

ISOLA 17 EVENT

On 3 August 2023, after Sasol, a company also based at the Northern Plants, reported an increasing trend of high conductivity in the wells and piezometers on Isola 17, presumably connected to the use of seawater, pursuant to Article 249 of Legislative Decree no. 152/06 we reported to the authorities that we had identified as a potential source an already segregated underground section of the seawater collector formerly used to cool the thermoelectric power station, which we therefore capped as a precaution. Consequently, we performed checks on the Sasol-owned wells located near the collector, and continued with field investigations and prevention and safety measures.

The seizure ordered in June 2022 by the Forest and Environmental Surveillance Corps on a small area (about 70m²) of the tank farm due to traces of hydrocarbons on one of the stormwater collection tanks due to the presence of oily products and on a mobile trolley supporting the fixed odour molecule capture systems is still in place.
The non-availability of the seized equipment and areas is not affecting the normal course of industrial operations and levels of health, safety and environmental protection.

Prevention of soil and subsoil contamination

Under normal conditions, there is no possibility of contamination of the soil and subsoil, which could only occur in the event of accidental spillage of liquid hydrocarbons (raw materials, semi-processed materials and final products). Spillages might affect, in particular, product storage areas and the areas beneath the pipelines connecting the plants, the tanks and the pier.
Assessments of abnormal and emergency situations related to the internal handling and storage of hazardous substances are studied and documented in the Safety Report.

Please see the section on Improvement Actions for details of the ongoing prevention of soil and subsoil contamination.

Noise

Environmental aspect: noise
Assessment: significant

Applicable legislation:
- DEC-MIN-000263 of 11/10/2017 - Review of the Integrated Environmental Authorisation issued to Sarlux Srl for the operation of the "Refinery, Integrated Gasification Combined Cycle plant (IGCC) and Northern Plants" complex in Sarroch, as amended and supplemented
- Municipality of Sarroch - Municipal noise plan approved on 13.04.2011 - Noise classification plan for the Municipality of Sarroch, in accordance with Law no. 447/1995 and the Guidelines set out in Resolution of the Regional Council no. 30/9 of 8 July 2005
- Resolution of the Regional Council (Sardinia) no. 62/9 of 14/11/2008 - Regional directives on environmental noise pollution
- Ministerial Decree 16/03/1998 - Noise pollution detection and measurement techniques
- Ministerial Decree 11/12/1996 - Application of the differential criterion for continuous production plants
- Law no. 447 of 26/10/1995 - Framework law on noise pollution
- Prime Ministerial Decree of 14/11/1997 - Determination of limit values for sound sources
- Prime Ministerial Decree of 1/03/1991 as amended and supplemented. - Maximum noise exposure limits in living environments and outdoors

The production site undergoes each year periodic measurements of noise emissions to the local area, by means of phonometric monitoring to obtain the noise characterisation of the surrounding environment. The surveys have been repeated over the years at specific measurement points, some within the production site and in the roads along its boundaries, while others are in access roads and in the town of Sarroch. The noise monitoring network comprises six stations within the industrial facility, three of which are near its boundaries, and ten external stations, including six in the town.

Odour

Environmental aspect: odour emissions
Assessment: significant

Applicable legislation:
- DEC-MIN-000263 of 11/10/2017 - Review of the Integrated Environmental Authorisation issued to Sarlux Srl for the operation of the "Refinery, Integrated Gasification Combined Cycle plant (IGCC) and Northern Plants" complex in Sarroch, as amended and supplemented
- Legislative Decree no. 152 of 3 April 2006 - Code on the Environment. Part Five - Rules on air protection and reduction of emissions to air - Article 272 BIS
- Technical Standard UNI EN 13725 of 1 October 2004 Air Quality – Determination of Odour Concentration by Dynamic Olfactometry

One of Sarlux's constant and fundamental commitments concerns the issue of odour emissions. This is because refining activities can generate odour emissions that can affect perception of the refinery by the local community.
In 2004, we conducted an initial measuring survey to identify the sources of the odours reported in the surrounding area. Over the next few years, we carried out more in-depth surveys and analyses, which led us in 2008, after a test phase, to develop a monitoring methodology using a combination of analytical and modelling techniques and olfactometric assessments.

In 2009, we carried out a number sampling and analysis activities within the industrial facility (sources) and at the most sensitive points in the town of Sarroch (receivers). They allowed us to validate the methodology and prepare the Monitoring and Control Plan for odour emissions. To comply with the requirements set out in the EIA permit (opinion of 12 January 2009), in October 2009 we submitted a Monitoring and Control Plan to the Ministry of the Environment. The Plan describes the methodology, timeframe and methods of reporting the results obtained. The methodology is based on an integrated approach that uses instrumentation and sensory techniques to examine the odour-emitting sources and identify the compounds responsible for the odour (tracers), together with modelling to study the dispersion of odour-emitting compounds into the air. This approach provides an accurate assessment of the olfactory impact produced by the odour source on sensitive receivers.

The IEA Monitoring and Control Plan includes two six-monthly monitoring campaigns: a "summer" one in the spring/summer (June-July) and a "winter" one in the autumn/winter period (November-December). In each campaign, samplings are carried out both at the production facility and at the sensitive points in Sarroch. The first monitoring campaign was carried out in June 2010.
The monitoring campaigns carried out in the following years mapped the odour concentration in the air samples collected near the emission sources and sensitive receivers, as well as the chemical compounds present in the samples.
Over time we also realised that we needed to strengthen the use of statistical methodology to monitor and manage odour emissions from the site, by increasing the statistical sample (number of analytical measurement) in order to better assess potential correlations between odour impact and the statistical concentrations found.

To date, the results have not revealed a clear and consistent correlation at the sensitive receivers between the odour concentration measured and the chemical compounds found.
The chemical compounds found in the air samples collected at the emission sources, within the site, are present in concentrations below the respective Odour Threshold value, except for a few rare cases that are not deemed scientifically significant.
The results of the campaigns carried out in recent years confirm that, at the sensitive receivers, only a few compounds exceed the respective odour thresholds. However, no significant correlation has been found with Sarlux's odour sources.

In particular, it is evident that the measurement of high odour concentrations in air samples having a chemical speciation that makes it impossible to identify individual chemical compounds as being responsible for this impact, can have two explanations: synergistic effect of the compounds present in the air sample taken, or the presence of compounds that escape current chemical analysis.
Although no causal relationship has been established between the individual compounds emitted by the site's sources and the odour impact found at sensitive receivers, based on the results of the monitoring plan, we have carried out detailed studies that have enabled us to plan and implement investments to minimise odour impacts.
Over the years, we have made investments to equip the floating roof tanks with double seals installed between the tank shell and the roof. In addition, fixed-roof tanks ST99, ST25, ST26, ST27, ST29 and ST98 have been equipped with an odour mitigation/abatement system, consisting of specifically sized atomising nozzles; on tank ST24, currently out of service for maintenance, the odour mitigation/abatement system will be installed before its return to service.
These systems have reduced odour concentration by more than 80 percent.

In addition, we have carried out the following prevention activities to reduce emissions of VOCs and, consequently, of odours:

- in 2022 we completed extension of the new cover of the API tanks to the upper portion of the third tank, which was subsequently put into service; in 2023 we completed the work planned on the fourth tank which was then put into service
- at the end of 2023 we upgraded the cooling system of the gas oil pouring from MHC1 to the tanks, adding further cooling systems to the existing ones; we are currently verifying the performance of the system which, in the first month of operation, produced in the fixed roof tanks ST201, ST202, ST203, ST205, ST207, ST208 a reduction in average storage temperature of 3.3 °C, with a consequent 13.2 percent reduction in VOC emissions.

Visual impact

Environmental aspect: visibility of the production site from the surrounding area
Assessment: significant

Applicable legislation:

- DEC-MIN-000263 of 11/10/2017 - Review of the Integrated Environmental Authorisation issued to Sarlux Srl for the operation of the "Refinery, Integrated Gasification Combined Cycle plant (IGCC) and Northern Plants" complex in Sarroch, as amended and supplemented

While in assessing the visual impact aspect it must be considered that the refinery complex has a "historical" presence, an environmental and landscape mitigation and improvement project called "green buffer" is under way (see Article 52 of Ministerial Decree no. 263).
The project is being developed in three areas bordering on the site, as shown in the map.

- area 1 (filter area) located in the industrial zone to the north-west of the site
- area 2 (agricultural park area) to the west of the site, beyond the Sulcitana state road
- area 3 (equipped filter park) between the south-west boundary of the site and the town of Sarroch.

In each revegetation area, native plant species consistent with the local ecology have been selected, namely trees and shrubs belonging to the thermo-Mediterranean bioclimatic zone. The choice of native plant species that are consistent with local environment also maximises the success of the project and reduces the need for pest control and plant maintenance.
The planting of new vegetation will on the one hand mitigate the visual impact of the refinery from the nearby roads and on the other the odour impact produced by the industrial facility.

The three action areas of the project

Less significant environmental aspects

PCBs

Environmental aspect: PCBs (Polychlorinated biphenyls)
Assessment: not significant

Applicable legislation:
- Legislative Decree no. 209 of 22/05/1999 - Implementing Directive 96/59/EC on the disposal of polychlorinated biphenyls and polychlorinated terphenyls
- Decree of the Ministry of the Environment of 11/10/2001 - Conditions for using transformers containing PCBs that are awaiting decontamination or disposal
- Law no. 62 of 18 April 2005, Community Law 2004, Article 18 - Obligations for holders of equipment containing PCBs and PCTs

Polychlorinated biphenyls (PCBs) are chlorinated organic compounds that are chemically and thermally very stable. For this reason, they were widely used in the past as dielectric fluids in electrical equipment (e.g. industrial transformers) before their dangers to the environment were recognised and their use was banned.

Today, the sale and use of PCBs in new equipment is prohibited but, given the recognised difficulties in disposing of such substances, there are various legal provisions that apply to existing equipment, according to the quantities and concentrations of PCBs present.
Following an inventory and periodic analytical checks, the 130 oil-insulated transformers in the Southern Plants have been decontaminated by removing the PCBs. Periodic checks are carried out to verify the condition of the transformers and to ensure that their PCB content is kept below the minimum threshold required by law to consider an item of equipment decontaminated.

The transformer fleet of the Northern Plants underwent preliminary analysis in 1999 for the characterisation of oils with respect to PCB content. Most of the machines were found to be contaminated with PCB under the legal criteria in force (Ministerial Decree no. 11/10/2001 - Use of transformers containing PCBs and Legislative Decree no. 209/99 - Disposal of PCBs and PCTs); in light of this finding, the transformers were subsequently decontaminated using the dehalogenation method. The decontamination campaign ended in 2006.
All work carried out is duly recorded and the decontaminated transformers are provided with a plate bearing the date of decontamination and the final PCB concentration in accordance with the applicable laws.

In light of the possible long-term release of residual PCB particles from the internal insulating paper of already dehalogenated transformers, in 2019 we started a PCB content verification campaign and continued it in the following years.
The measured values were within the legal parameters, with the exception of two transformers which were found to have PCB content above the legal limit.
In 2022, oil dehalogenation was carried out on the non-compliant machines by a certified specialist company, and the PCB content returned under the legal limit. In the first half of 2023, a further analysis was carried out to verify that there was no further release of PCB particles from the transformers' internal insulating paper, confirming that the PCB content was below the legal limit.

Asbestos

Environmental aspect: Asbestos
Assessment: not significant
Applicable legislation:
- Legislative Decree no. 81 of 9 April 2008 - Implementing Article 1 of Law no. 123 of 3 August 2007 on the protection of occupational health and safety - Chapter III: Protection from risks related to asbestos exposure
- Ministerial Decree no. 248 of 29 July 2004 - Regulation on the determination and regulation of activities for the recovery of asbestos and asbestos-containing products and goods.

Asbestos was used for a long time in a variety of industrial and domestic applications until the dangers of this material for human health were discovered and its use banned.

Southern Plants

Over the years, the site has implemented the requirements of sectoral legislation. We have compiled an inventory of asbestos-containing materials, notified all the supervisory authorities and decontaminated plant and equipment whenever plant maintenance was carried out.
Over the years, cement asbestos roofs have gradually been removed, from a surface area of 10,800 m2 in 2004 to no such roofs at the site today. Any asbestos still present (as an insulator around pipes) is protected from the effects of atmospheric agents that could cause it to deteriorate, and is removed if discovered during maintenance work, with the support of specialist firms.

Northern Plants

At the Northern Plants, some materials containing compact and confined asbestos in a good state of preservation have been identified. These materials are properly confined, isolated and periodically monitored and therefore pose no health risks.
Periodic asbestos inspections are carried out across the entire site. The latest checks have found no significant airborne particles and showed that the asbestos-containing materials are in good condition.

Fluorinated greenhouse gases

Environmental aspect: fluorinated gases
Assessment: not significant
Applicable legislation:
- Regulation (EU) 2024/573 of 7 February 2024 on fluorinated greenhouse gases
- Regulation (EC) no. 1005/2009 of 16 September 2009 on substances that deplete the ozone layer
- Legislative Decree no. 193/2019 rules on penalties

Following the entry into force of Regulation (EU) 2024/573 on fluorinated gases (FGAS), which are responsible for depleting the ozone layer and increasing the greenhouse effect, Sarlux maintains and inspects equipment containing refrigerant gases through external companies and FGAS-certified personnel in order to prevent the release of these substances into the air.
All equipment in the refinery containing fluorocarbons in amounts greater than 5 tonnes of CO_2 equivalent is monitored for leakage.
One tonne of CO_2 equivalent is the quantity of greenhouse gas expressed as the product of the weight of the gas by the global warming potential (GWP), specific to each refrigerant.
The legislation requires gradual transition to the use of refrigerants with steadily decreasing GWP.

Ionising and non-ionising radiation

Environmental aspect: ionising and non-ionising radiation
Assessment: not significant

Applicable legislation:
- Legislative Decree no. 81 of 9 April 2008, Chapter IV: Protecting workers from the risks of exposure to electromagnetic fields
- Legislative Decree no. 256/16 transposing Directive 2013/35/EU
- Legislative Decree no. 101/2020 as amended and supplemented.

Non-ionising (electromagnetic fields)

Electromagnetic fields, both low-frequency and high-frequency, are a type of "non-ionising radiation" (NIR).
This type of radiation cannot break atomic and molecular bonds (it does not have sufficient energy to create ions). IR waves (Ionising Radiations), on the other hand, are electromagnetic radiations that, when interacting with the nuclei of the atoms of molecules, have sufficient energy to form positively and negatively charged ions, thus breaking the atomic bonds that hold molecules together.
Ionising radiation can therefore alter the chemical and physical characteristics of the materials it interacts with (examples of IR include ultraviolet radiation, X-rays, Gamma rays). The full range of electromagnetic radiation frequencies is called the electromagnetic spectrum.
In 2020 Sarlux carried out a study to quantify the levels of electrical and magnetic fields generated by electrical equipment (electrical switchboards, lighting systems, electricity lines) and electronic equipment used at the production facility, in order to compare the levels of exposure with the limits established by Legislative Decree no. 81/2008, Title VIII, Chapter IV (protection from the risk of exposure to electromagnetic fields). The assessment was made by directly measuring the electrical and magnetic field in the relevant frequency range.
The electromagnetic field monitoring surveys covering the entire Sarlux site in Sarroch are regularly carried out at the intervals and in the manner required by the applicable legislation. The latest measurements carried out near the most significant sources of electromagnetic fields (over 400) have shown that all the electric, magnetic and electromagnetic field levels are below the action values laid down by Legislative Decree no. 81/08 as amended by Legislative Decree no. 159/16 transposing Directive 2013/35/EU. Therefore the risk level for all exposed workers is acceptable.
The values measured were also lower than the exposure limits for sensitive workers, which have been set by ICNIRP 1998, at 100 μT for magnetic fields and 5000 V/for electric fields. Therefore, it is not necessary to indicate, with appropriate signs, the access areas as required by UNI EN ISO 7020:2012 for workers sensitive to the risk of electromagnetic fields.

Ionising

Certain instruments and items of equipment containing radioactive sources are used within the production facility; these instruments and equipment are present in the CCR and FCC plants and in the chemical laboratory, while an X-ray tube is present in the baggage control machine at the access gate to the Southern Plants. Small radioactive elements may also be present inside the transformer rooms from some old switchboards. The possible presence of naturally occurring radionuclides in crude oil and radon in underground civil structures must also be taken into account. To ensure the safety and health of workers, we have appointed a radiation protection expert in accordance with Legislative Decree no. 101/2020, as amended and supplemented, to periodically assess personnel exposure to ionising radiation, assess risk and prepare related documentation, in compliance with the relevant standards. No areas to be designated as "controlled" or "supervised" areas have been identified based on the measurements taken, the characteristics of the equipment, operational and procedural conditions, and dose assessment. Therefore, all the monitored areas have been defined as "unclassified", since no values above the reference thresholds have been found.

Significant indirect environmental aspects

The key indicators for Sarlux mainly concern the following environmental issues:
- operating performance indicators: transport
- management performance indicators: contractors and road traffic

Transport

Maritime traffic

All raw materials entering the site and a significant portion of the oil products leaving the site are transported by sea. Given the large number of ships used (around 700-800 per year), we have for several years promoted a policy of selecting and checking the ships used by consulting international databases (e.g. SIRE), with the aim of preventing incidents and hazardous substance spills at sea. We have done this ahead of the deadlines stipulated by European regulations on discontinuing the use of single-hulled ships.
Furthermore, given the potential seriousness of an incident at sea, in addition to the above selection process, we have also implemented a policy of performing inspections and controls on both ships delivering raw materials and those transporting processed products.
Moreover, the ships expected at the site have already been carefully checked by specialist companies at their port of departure.
Our checks are performed in line with the "Vessel Acceptance Policy and Safety Criteria" document, adopted first by Saras and now also by Sarlux, in accordance with the ship inspection protocols established by the Oil Companies International Marine Forum (OCIMF), which promotes improved safety and responsible environmental management in the transportation of oil and its derivatives, and in marine terminal management.
In recent years, we have inspected 100 percent of the ships transiting through the site (both loading and unloading).

The marine terminal

The incoming raw materials and intermediate products and the outgoing finished products pass through two terminals, called the South Pier and the North Pier. In order to be admitted to the Sarlux marine terminal, all incoming ships must comply with rigorous safety standards that conform to internationally recognised criteria, and with additional requirements laid down by Saras at group level and incorporated by Sarlux as described in the paragraph "Maritime traffic".

South Pier

The marine terminal linked to the refinery has a 1,600-long pier and fixed platforms ("isole") connected to the pier by a 1,200 m piling. Almost all the incoming raw materials and most of the outgoing oil products pass through this terminal. The terminal has 11 independent berths, nine of which for shipping finished oil products and receiving semi-finished products, able to accommodate oil tankers of up to 85,000 tonnes. The other two platforms, used for receiving crude oils, can accommodate ships with a deadweight capacity of up to 300,000 tonnes.
The different berths can be used at the same time, minimising waiting times for ships at anchor. We also use advanced monitoring systems to ensure maximum safety during all unloading and loading operations. The phases relating to the docking and mooring of ships and the connection between the ship and the loading arms transferring raw materials to the shore and finished products to the ship are carried out under continuous surveillance. A dedicated control room, equipped with the latest monitoring technology, is manned and operational 24 hours a day. This enables continuous radio contact with the ships operating in the terminal, ensuring that all operations fully comply with all safety and environmental protection requirements.

North Pier

The North Pier has two berths, "A1" and "A2", which can accommodate ships of various weights, allowing the transfer of different products.
The central load-bearing structure consists of a roadway deck suitable for traffic travelling in one direction to access platform "A1" and a secondary steelwork deck for pedestrian traffic accessing platform "A2". Pipes for liquid and gaseous products run along both sides of these structures.
The length from the foot of the pier to the farthest platform ("A1") is 1,125 m, while the intersection with platform "A2" lies at 727.5 m along the pier. The distance between the intersection and the "A2" platform is 225 m. All the structures are protected against corrosion by cathodic protection equipment.
The two platforms, equipped for the handling of oil products, chemicals and LPG, can accommodate vessels up to 212 m long, with draught of 9.5 m and 36,000 tonnes deadweight.

Vapour Recovery Unit

Both the North and South Piers are equipped with a system for channelling and recovering vapour from ship loading activities to prevent the emission to air of the effluent, which is a gaseous mixture of air and hydrocarbon vapours. This effluent develops, during the loading of tanker ships berthed at the pier platforms, due to the air displacement and partial evaporation of the liquid products poured into the tanker.

Road traffic

The road traffic generated by activities at the site is due mainly to:

- transport of refined oil products via tanker trucks (around 28,000 vehicles a year)
- transport of sulphur via articulated lorries (around 3,000 vehicles a year)
- transport of auxiliary materials and substances for production (around 400 vehicles a month)
- transport of Group employees and contractors working on the site (around 1,000 cars and 60 buses a day).

Land transport of auxiliary products and materials

Products to be shipped by road are loaded into trucks by means of loading gantries at the Southern Plants, which comprise:

- three loading bays for LPG and twelve loading bays for mineral oils (kerosene, diesel and fuel oil), located near the site's manned entrance
- a loading bay for liquid sulphur and a loading bay for solid sulphur
- ten loading bays for petrol and gas oil, located in the national storage facility.

The Sarlux site is connected by gas pipeline to Costiero Gas Livorno S.p.a. (Sarroch site) and via three oil pipelines to the national storage facility.

The years 2020-2021 saw a decrease of about 5,000 vehicles/year compared to previous years. The decrease mainly concerned tanker trucks for the transport of products and, to a lesser extent, HGVs for the transport of sulphur, due to lower consumption as a result of the Covid-19 pandemic.
One indicator of heavy goods vehicle traffic is the ratio of the number of heavy goods vehicles/year to the quantity of raw materials expressed in kt. For Sarlux, the average ratio in recent years has been approximately 2.3.
In 2007, we implemented a plan of regular checks on the tanker trucks transporting products to verify their compliance. In 2023, 37 percent of the tanker trucks authorised for entry were checked.

Transport of employees and contractors

In line with the Saras Group's Sustainability Policy, Sarlux promotes sustainable mobility with a reduced impact on the community. Over the years, our "Mobility Management" function has developed and continues to implement an internal and external transport system designed to meet the needs of employees, capable of connecting the site to the surrounding area, maximising safety by reducing the number of cars on the road and reducing our environmental impact in terms of emissions and consumption.
We have always had a dedicated public transport service linking the Sarroch industrial area to the main towns and cities in southern Sardinia. This service is used by employees of Saras, Sarlux and other companies based at the site (Eni, Versalis, Sasol, etc.) and the numerous contractors that work on the site.
We have also carried out surveys using anonymous questionnaires, with the aim of preparing a company Home-to-Work Travel Plan (HWTP). This allowed us to collect useful information to make our mobility more sustainable by providing services that meet the specific needs expressed by employees. Since 2024, Saras has been providing employees with a carpooling platform (Jojob Real Time Carpooling), which works with a simple and intuitive app.
For on-site mobility, with the ambition of changing our mobility culture, we have implemented shared mobility solutions such as "Car Sharing" (26 cars, 2 of which serve the Macchiareddu site) and the "On-Call Bus", which only runs on demand and consumes only what is needed, when needed.
At the same time, the shuttle bus service within the site remains in operation. With its new, more modern and environmentally friendly vehicles, it provides a collective transport service to and from manned entrances at scheduled times, e.g. at the shift change for shift workers and at the start and end of the working day for daytime workers.
With a view to increasingly efficient and sustainable mobility, in the future we are planning to trial "Bike Sharing" within the site.

Contractors

Provision of information to contractors

Sarlux has put in place strict procedures governing relationships with external contractors, to ensure that their personnel comply fully with Sarlux's policies on safety, health, the environment and major accident prevention.

Before being allowed to carry out any type of work at the site, each contractor must be qualified, i.e., it must prove that it complies with its legal obligations in administrative, tax and insurance matters and that its operations protect health, safety and the environment both on the industrial site and outside it. In addition to the requirement to work in accordance with their own company's organisational safety plan, before entering the facility, employees of external companies undergo further basic training on the risks relevant to the areas in which they will work. This information focuses on health and safety, environmental protection and major accident prevention.

Waste production and management, audits and controls

One of the major impacts of external companies' activities, in terms of environmental management, relates to the generation and management of waste. Two specialist waste treatment companies operate on the site. Specific procedures govern the methods of waste management at our industrial site, including transfer to waste treatment plants and storage areas.
These activities are subject to regular checks and various audit activities, in accordance with the waste management procedure.
More generally, the conduct of employees of external companies is monitored through checks, as part of field worksite inspections and those of the B-BS (Behaviour-Based Safety) programme, as mentioned in the relevant paragraph.

Contractors and their commitment to management systems

Sarlux appreciates its contractors' commitment to obtaining and maintaining certifications for their quality, environmental and safety management systems. Sarlux monitors this commitment through the index defined as the ratio of certified contractors to the total number of contractors with at least one of the three ISO certifications: quality, environmental and safety management systems, respectively ISO 9000/14001/45001.

4.
Data and improvement actions

Data updated to 2023

Significant events reference year

Evolution of the socio-economic context

Together with its parent company Saras, Sarlux considers it of prime importance to hold a highly competitive position at international level, and at the same time be a driver of socio-economic development in the context in which we operate, engaging constructively with our stakeholders to create shared value.
The year 2023 was characterised by high volatility in the energy markets, which continued to be affected by the fallout of the Russian-Ukrainian conflict, albeit to a lesser extent than in 2022. This was compounded by the growing geopolitical tensions in the Middle East.
In light of the changing context, within the global Energy Transition process towards new, less carbon-intensive energy sources, the need and strategic importance of preserving an efficient cluster of traditional plants in Europe has become evident, to ensure the availability of petroleum products and gas even in times of geopolitical disruption.

Our industrial vision

In light of the central role that oil will continue to play in the global energy mix for many years to come, and the need to ensure the stability and security of energy supplies for Sardinia, Italy and the entire Mediterranean region, Saras' strategy aims to maintain and optimise Sarlux's operations, by means of ever more efficient, safe and reliable management, with the goal of limiting dependence on non-EU imports and increasing energy security in the Mediterranean basin.
Expertise, technological development and digitisation are fundamental resources not only to efficiently manage the industrial site, but also to adapt the changes brought about by the Energy Transition, to effectively evolve towards increasingly sustainable and competitive business models. Our approach not only contributes to the country's environmental goals, but is also a vital economic driving force for the region of Sardinia.

As part of the optimisation of operations, on 1 July 2023 Sarlux absorbed Sartec Srl, a Saras subsidiary that provided cutting-edge environmental engineering, monitoring, measurement and analytical services.

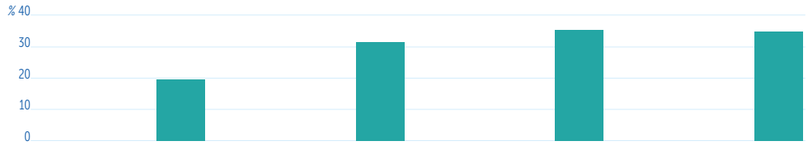
The Group's initiatives include the project for green hydrogen production from renewable sources: this is one of the energy sources proposed by the European Commission for the energy transition and can also be integrated into the national grid, overcoming the intermittent availability and storage problems of other renewable sources. In 2021, in partnership with Enel Green Power, Saras established a new company, SardHy Green Hydrogen Srl, with the aim of building a plant for the production of green hydrogen from water electrolysis at the Sarroch site. The first concession Decree was published in December 2023. The preliminary engineering and procurement activities have been started. We are currently finalising the financing arrangements with the authorities. We are aiming to start up the plant in the first quarter of 2026.

Management performance indicators

HSE training

To achieve continuing environmental performance improvements, it is essential to provide training to personnel, so as to bring them up to date and raise their awareness of the role each of them can play.
In 2023, classroom-based training was gradually resumed, in combination with distance learning training. Ad hoc training was provided to workers affected by the merger of Sartec into Sarlux, to bring them up to speed.
The reference indicator used is the total number of training hours devoted to the control of significant environmental aspects and impacts out of total HSE training (including hours of health, safety and environment committees and HSE implementation committees related to the Behaviour Based Safety protocol).
Overall, in 2023, the hours of training delivered amounted to 3,575 or 35.4 percent of the total HSE training.

Table 1. **Environmental training for in-house staff**

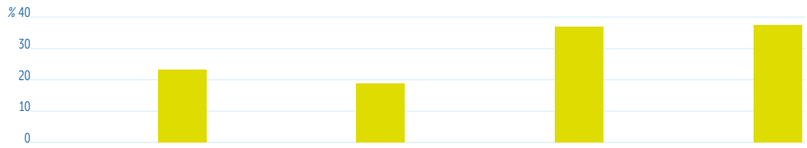


	2020	2021	2022	2023
Specific values*1	19.6	31.5	35.6	35.4

*1 No. of environmental training hours/total training hours (%)
. Continuous training on environmental protection and safeguarding issues.
. Specialist technical training relevant to environmental issues.
. Compulsory training required by Legislative Decree 105/2015.

Environmental training is flanked by health & safety training.
In 2023, 10,145 (10,045 in 2022) hours of training in total were dedicated to health, safety and environmental protection, of which 3,703 (3,696 in 2022) hours were dedicated to the training of personnel directly involved in emergency management, amounting to 37.0 percent.

Table 2. **Emergency response training**



	2020	2021	2022	2023
Specific values*1	24.3	19.1	36.8	37.0

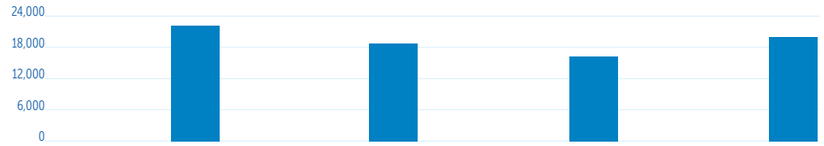
*1 No. of emergency training hours/total training hours (%)
The reduction in training hours was due to the suspension of classroom-based training. This was followed by the rescheduling of training in 2021, as described above due to the persisting Covid-19 emergency.

Behaviour-based safety (BBS) activities

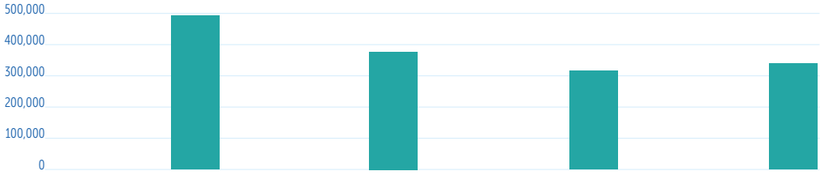
The number of checklists compiled (behaviour record sheet), observed behaviours and feedback provided is shown below.
In 2020 - 2021, the implementation of the B-BS Protocol also played a key role in the management of behaviour related to the containment of Covid-19 infections.
In 2021, due to fewer workers coming to the industrial site as a result of the continuing pandemic emergency, the number of observations decreased. However, more feedback was given, which is a key factor for the protocol to succeed. In addition, observed safe behaviour increased further (98.7 percent).
In 2022, out of more than 16,000 observations made, some 9,200 feedbacks were given, and a very high percentage of safe behaviour (98.6 percent) was recorded.
In 2023, the number of observations made (more than 20,000) significantly increased. Thus, through the feedback provided, we were able to further increase the rate of safe behaviours to 98.8 percent.

In 2023, we continued to work on updating the current Safety Protocol, to maintain and improve the results achieved over the years and to reduce the behaviours identified as contributors to the accidents that occurred in the last three years. At the same time, we engaged with the Contractors, presenting to them the Protocol to encourage them to implement a model that can benefit the entire local industrial system.

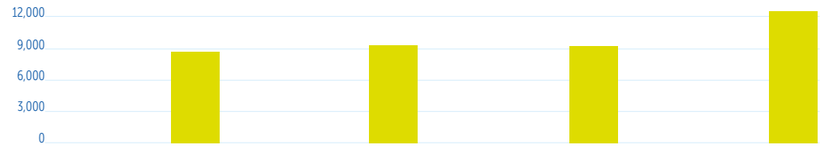
Table 3. **BBS programme activities**



	2020	2021	2022	2023
Number of checklists completed	22,336	18,920	16,404	20,099



	2020	2021	2022	2023
Number of observed behaviours	488,475	373,083	312,426	351,603



	2020	2021	2022	2023
Number of feedbacks	8,623	9,207	9,159	12,385

The BBS (Behaviour-Based Safety) Programme consists of three phases:
. Observing behaviour
. Analysing reports and setting improvement objectives
. Communicating analysis results and improvement objectives.

In 2023, we continued to conduct regular inspections at contractors' worksites to verify their compliance with health, safety and environmental procedures and requirements.

Table 4. **Activities under the Contractor worksite inspection programme (field inspections)**

	2020	2021	2022	2023
Number of site inspections	129	93	136	57

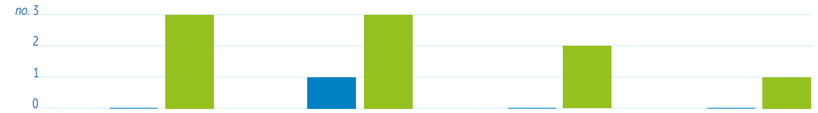
The inspections are based on an annual plan under which each contractor worksite within the Sarlux site is inspected at least once a year.

We reduced the number of planned inspections considering that all companies would be subject to HSE monitoring during the many plant shutdowns planned for 2023.

Emergencies

During 2023 only one small emergency occurred:
The incident took place at the LPG-B plant in the South Movement area, where a slight leakage of ammonia occurred during maintenance of a valve.
Sarlux personnel promptly took the necessary action to restore safe operating conditions, resolving the emergency.

Table 5. **Emergencies**



	2020	2021	2022	2023
Number of general emergencies	0	1	0	0
Number of localised emergencies	3	3	2	1

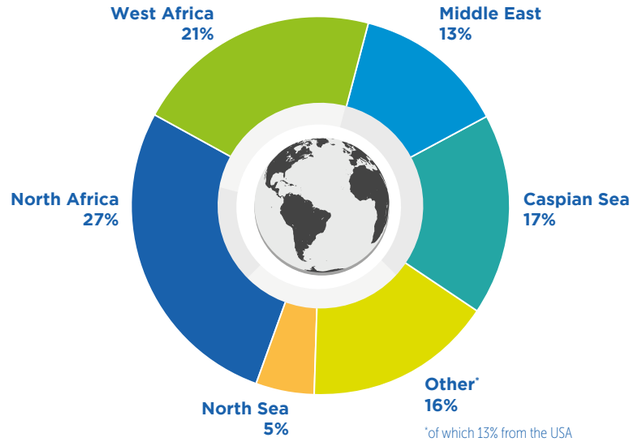
.A localised/first level emergency refers to an accident affecting a distinct area of the plant, usually without fire or with a very small fire that can be quickly handled using locally available resources.
.A general/second level emergency is an accident that, due to its nature or because of particular environmental conditions, risks spreading to other parts of the plant, there is a fire and/or it may degenerate and affect areas outside the refinery.

Significant direct environmental aspects

Material

During 2023, Sarlux processed crude oil coming mainly from six macro geographical areas.

Table 6. **Sarlux raw materials by geographical area of origin in 2023**

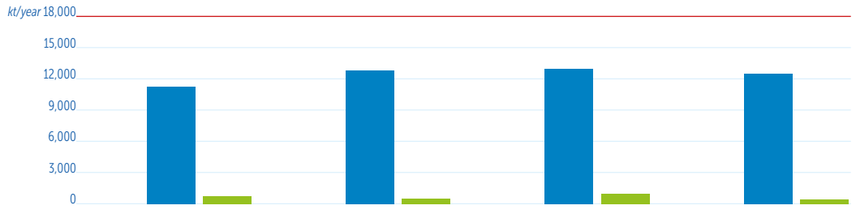


Clearly, in procuring raw materials, the Group complies with all national and international laws on trade in oil products. Since 2022, in response to the Russia-Ukraine war, the Saras Group promptly stopped purchasing any crude and/or semi-finished oil products of Russian origin. We are continuing to purchase crude oil of US origin, which we started buying in 2022. In the raw materials by origin table, these purchases are under the category "Other".

Processed raw materials

The quantities processed in 2023 are in line with pre-pandemic years, taking into account plant availability. The figure for processed raw materials also includes the share of BSW (Bottom Sediment Water), which amounted to 30,887 kt in 2023; this figure is not included in the calculation of site-specific consumption indicators as this share is not involved in the processing of atmospheric distillation plants. The quantity of raw materials used to calculate specific consumption in 2023 was 13,227.427 kt/year, which corresponds to the processing of crude oil net of BSW and includes complementary feedstock (semi-finished products) at secondary plants, while it excludes semi-finished mixing products.

Table 7. **Processed raw materials**



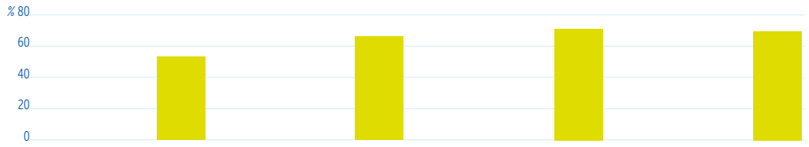
	2020	2021	2022	2023
Processed raw materials	11,369	12,978	13,168	12,885
complementary feedstock (semi-finished products)	662	545	756	373
Maximum authorised processing [*1]				

[*1] Concession to process mineral oils (Decree of the Ministry of Productive Activities no. 17086 of 7/07/2003).

Consumption of low-sulphur crude oils

The year 2023, similarly to the two previous years, was characterised by increased processing of low-sulphur crude oil supported by the demand for very-low-sulphur fuel oil, which is required by IMO (International Maritime Organisation) regulations.

Table 8. **Consumption of low-sulphur crude oils**



	2020	2021	2022	2023
Low-sulphur crude oil/total raw materials processed	55	65	72	71

Using the same criterion as that set out in Legislative Decree 152/06, Part V, Appendix X, for low-sulphur fuel oils, low- sulphur crude oils are defined as those with a sulphur content of less than 1%.

Production of oil products

In 2023, the production of middle distillates (gas oil) and light distillates (LPG, naphtha, petrol) accounted for 88.5 percent of total production. Fuel oil, sulphur and other products made up the remaining 11.5 percent, excluding tar used for electricity generation.

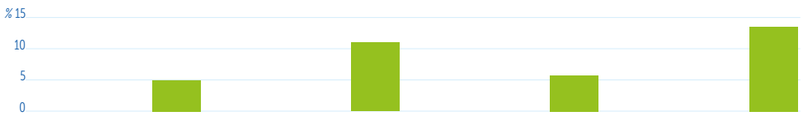
Table 9. **Plant production (t/year)**

	2020	2021	2022	2023
LPG	210,934	267,015	268,340	252,871
Petrol and virgin naphtha	2,887,767	3,909,872	3,543,034	3,407,522
Middle distillates (gas oil and kerosene)	5,621,233	5,902,133	6,540,024	6,195,306
Fuel oil	553,187	819,824	722,784	1,100,157
Sulphur	140,854	128,158	117,258	93,819
Tar	1,072,880	936,918	1,087,329	951,390
Benzene	79,957	76,354	72,124	76,536
Pseudocumene	10,030	13,151	6,890	8,040
Xylene (C9)*	29,606	11,997	1,715	-

* In 2023, xylenes were used for mixing.

In 2023, the percentage of sulphur in products was 13.8 percent of the content in raw materials (Table 10).

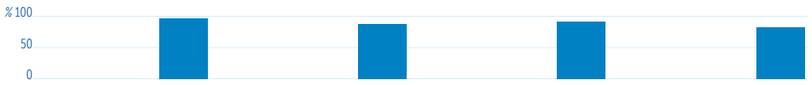
Table 10. **Sulphur in products**



	2020	2021	2022	2023
Quantity of sulphur in products/quantity of sulphur entering the site with raw materials	5.0	10.1	6.5	13.8

The higher percentage of sulphur in products is due to the different plant availability compared to previous years, resulting in higher production of high-sulphur fuel oil, low-sulphur fuel oil and high-sulphur gas oil.

Table 11. **Sulphur recovered in the production cycle**



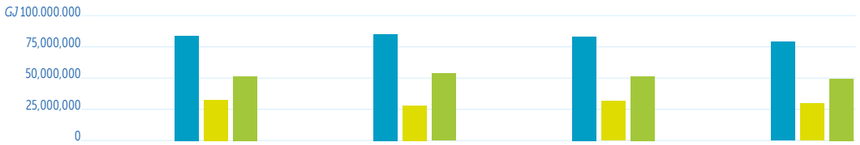
	2020	2021	2022	2023
Quantity of sulphur produced/quantity of sulphur entering the site with raw materials	94.3	88.8	92.1	84.8

Energy

Energy consumption

In 2023, the site-specific consumption index (SCI) confirmed the reduction already recorded in 2022. Please note that in 2020-2021 the specific consumption index (SCI) had been negatively affected by major planned maintenance shutdowns and by subsequent processing reductions due to the severe impact of the global pandemic. See the breakdown below.
The year 2023 was characterised by the once-every-10-years general shutdown of the IGCC plant. This reduced both Tar-LCO-Naptha consumption and the amount of electricity fed into the grid.

Table 12. **Site's energy consumption**



	2020	2021	2022	2023
Gross energy consumption	84,518,495	84,967,061	84,836,473	78,237,721
Exported energy	32,695,590	28,288,056	32,933,042	28,654,425
Net energy consumption	51,822,905	56,679,006	51,903,431	49,583,296

Table 13. **Site-specific integrated cycle consumption index**

	2020	2021	2022	2023
Net energy consumption (GJ)	51,822,905	56,679,006	51,903,431	49,583,296
Crude oils + semi-finished products (South+North) (t)	12,031,377	13,522,790	13,893,346	13,227,427
SCI Specific consumption index (GJ/t)	4.3	4.2	3.7	3.7

The site's energy balance

Table 14. **Site energy balance**

Energy input to the site (GJ)	2020	2021	2022	2023
Primary energy taken from the grid	8,612,064	8,686,623	8,524,053	7,733,634
Fuels produced by the refinery	75,906,431	76,280,439	76,312,419	70,504,087
Fuel gas	20,149,925	21,257,795	22,407,647	21,409,144
Fuel oil	6,084,304	6,123,506	5,018,291	4,962,581
Coke	5,170,576	8,594,754	8,518,270	7,133,654
TAR+LCO+Naphta+Gasoil	44,501,626	40,304,384	40,368,212	36,998,707
Total energy input to the site	**84,518,495**	**84,967,061**	**84,836,473**	**78,237,721**

Energy output from the site (GJ)	2020	2021	2022	2023
Primary energy fed into the power grid from the IGCC	31,863,245	27,526,407	32,090,568	27,787,677
Primary energy fed into the grid from the Northern Plants	481,744	391,296	462,572	503,507
Primary electricity from the Northern Plants to other companies based at the site	120,011	141,190	151,021	135,508
Primary electricity from the Southern Plants to other companies based at the site*[1]	175,982	174,727	185,739	180,926
Primary thermal energy from the Northern Plants to other companies based at the site *[2]	54,608	54,435	43,140	46,807
Total energy output from the site	**32,695,590**	**28,288,056**	**32,933,042**	**28,654,425**

*[1] Since 2018, when the electricity system was transformed into a IUN (Internal User Network), the electricity consumption by the other companies based at the site is also accounted for at the Southern Plants, which was previously attributed to Sarlux.
*[2] Heat is sold to the other companies located at the site in the form of steam.

Air

Channelled emissions

Emissions channelled to smokestacks are mainly due to:

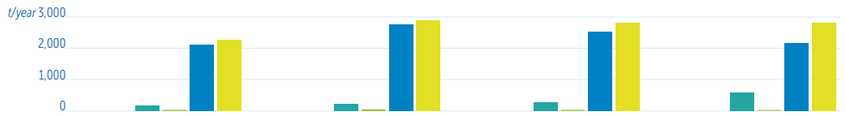
- combustion processes carried out in furnaces to guarantee the thermal energy necessary for the production cycle
- combustion processes necessary for producing electricity and steam (northern thermoelectric plant, southern plant and IGCC).

The main substances generated are SO2, NOx, CO, dust and CO2, for which details are given below.
Since emissions to air from the industrial facility may affect the air quality in the surrounding area, we provide the air quality data collected by the public monitoring network in the Sarroch area and processed by the Sardinian regional environment agency (ARPA Sardegna) in addition to emission data.

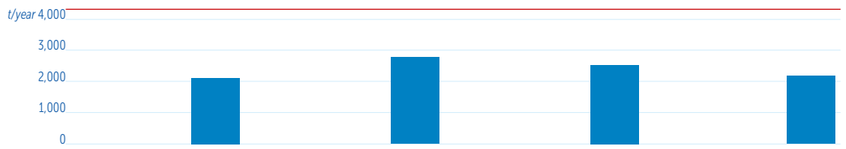
Sulphur dioxide (SO_2)

SO2 emissions are due solely to the presence of sulphur in the fuels used refining, electricity generation (IGCC) and the production of organic chemicals (North Plants).
In recent years, mass flow values, measured in tonnes per year, have always been well below the authorised limit (Table 15). Specific emissions expressed in tonnes of SO2 per kt of raw material processed have remained broadly stable in recent years (Table 16).

Table 15. **SO2 emissions: absolute mass flow values**



	2020	2021	2022	2023
IGCC	171.00	183.50	292.20	441.82
Northern Plants E2/E3	1.68	1.73	1.38	1.05
Integrated emission management	2,084.00	2,785.00	2,584.20	2,194.00
Whole site	2,256.40	2,970.19	2,877.70	2,636.87

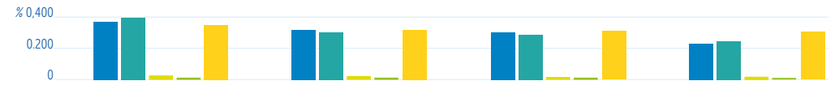


	2020	2021	2022	2023
Integrated emission management	2,084.00	2,785.00	2,584.20	2,194.00
Annual mass-flow limit value Integrated Emission Management	4,300.00	4,300.00	4,300.00	4,300.00

Table 16. **SO2 emissions: Specific mass flow values**

	2020	2021	2022	2023
Specific values	0.19	0.22	0.21	0.20

Table 17. **Sulphur content of fuels used at the site**

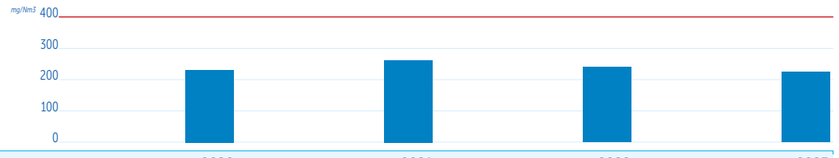


	2020	2021	2022	2023
Fuel oil burned - Southern Plants	0.370	0.310	0.300	0.237
Fuel oil burned - Northern Plants	0.400	0.300	0.290	0.249
Fuel gas burned - Southern Plants	0.015	0.013	0.010	0.012
Fuel gas burned - Northern Plants	0.007	0.007	0.007	0.005
Coke*1	0.350	0.320	0.310	0.309

*1 Fuel produced internally and consumed in the Fluid Catalytic Cracking (FCC) plant.

The SO2 concentration of the integrated management is well below legal limits.

Table 18. **SO2 emissions: concentration values for integrated emission management**

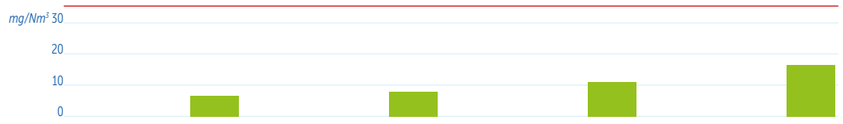


	2020	2021	2022	2023
Integrated Emissions Management - annual average	235	266	246	227
Integrated Emission Management - Monthly average limit value	400	400	400	400

The monthly average limit value was not exceeded during 2023.

Table 19 shows the annual average concentration of IGCC smokestacks.

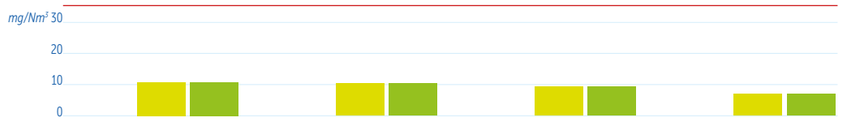
Table 19. **SO2 emissions: concentration values for the IGCC**



	2020	2021	2022	2023
SO2 annual mean concentration at IGCC	7	8	11	17
Monthly average limit value per IGCC stack	35	35	35	35

The monthly average limit value was not exceeded during 2023.

Table 20. **SO2 emissions: concentration values at the Northern Plants**



	2020	2021	2022	2023
BTX-E2	10.9	10.2	9.3	7.2
BTX-E3	10.9	10.2	9.3	7.2
Regulatory monthly average limit value	35	35	35	35

In terms of concentration, individual emission points have their own limit values, all of which were respected in 2023.

Regional network measurements for SO2

As regards SO2 measurements by the regional network, the report by regional environmental agency ARPAS shows that the improvement on previous years continued in 2023, and that no legal limits were exceeded.

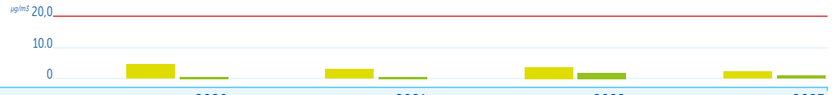
Breach of the alert threshold: in the past four years, no breaches of the value set out by Legislative Decree 155/2010 of 500 µg/m³ were recorded (limit that must not be exceeded for two consecutive hours).

Breach of the hourly limit for the protection of human health: in the past four years, no breaches of the limit value set out by Legislative Decree 155/2010 of 350 µg/m³ were recorded. This limit value cannot be exceeded more than 24 times a calendar year.

Breach of the daily limit for the protection of human health: in the past four years, no breaches of the limit value set out by Legislative Decree 155/2010 of 125 µg/m³ were recorded. This limit value cannot be exceeded more than 3 times in a calendar year.

Reports of alert thresholds breaches/year: in the past four years, Sarlux received no reports of alert threshold breaches for SO2 referred to in Ministerial Decree 155/2010, measured by the sensors of the public air quality monitoring network for SO2.

Table 21. **SO2 emissions: regional network measurements - annual mean concentration**



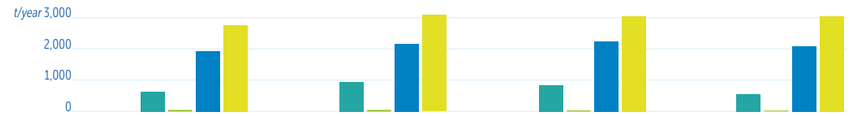
	2020	2021	2022	2023
CENSA 2	3.9	2.8	3.0	1.7
CENSA 3	0.7	0.7	1.1	0.8
Regulatory limit value*1	20	20	20	20

Limit value established by Ministerial Decree 155/2010: 20 µg/m³ limit for the protection of ecosystems.

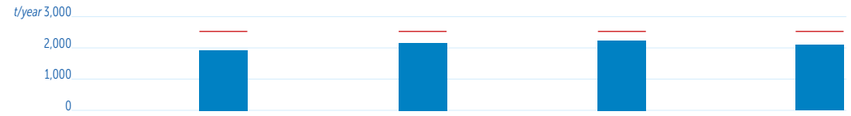
Nitrogen oxide (NOx)

NOx emissions are only marginally affected by the quality of the fuels used, as they largely depend on combustion techniques. These, in turn, are related to technological factors such as the low-NOx burners we have installed, which have achieved a significant reduction in emissions from the refinery.

Table 22. **NOx emissions: absolute mass flow values**



	2020	2021	2022	2023
IGCC	736.00	935.00	789.10	712.40
Northern Plants E2/E3	20.30	22.20	19.50	19.10
Integrated emission management	1,999.00	2,181.00	2,295.00	2,179.00
Whole site *1	2,762.00	3,148.00	3,110.90	2,910.60



	2020	2021	2022	2023
Integrated emission management	1,999.00	2,181.00	2,295.00	2,179.00
Annual mass-flow limit value Integrated Emission Management	2,500.00	2,500.00	2,500.00	2,500.00

*1 Including mass flow (related Z3F2 and Z4F2 not included in integrated emission management).

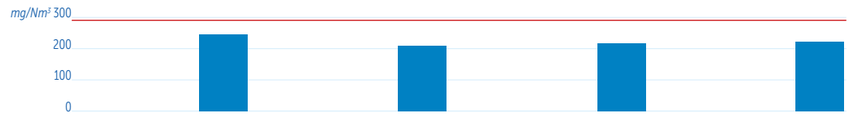
Table 23. **NOx emissions: specific mass flow values**

	2020	2021	2022	2023
Specific values	0.23	0.23	0.22	0.22

*1 Tonnes of NOx from the whole site.

Concentration indicators are below the applicable limits, as shown in the following tables and graphs.

Table 24. **NOx emissions: concentration values for Integrated Emission Management**

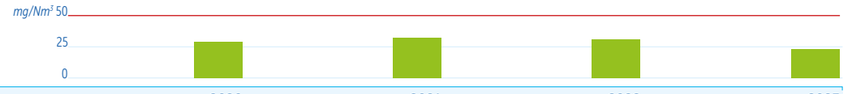


	2020	2021	2022	2023
Integrated Emission Management	241	222	228	230
Monthly average limit value Integrated Emission Management	280	280	280	280

The monthly average limit value was not exceeded during 2023.

For smokestacks C25 (Centralised), C18/19 (Topping2) a monthly average NOx concentration limit of 300 mg/Nm³ is required.
During 2023, these limits were complied with.

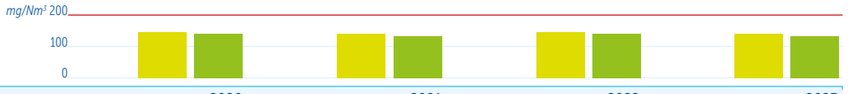
Table 25. **NOx emissions: concentration values for the IGCC**



	2020	2021	2022	2023
Annual mean NOx concentration at IGCC	28	31	30	24
Monthly average limit value per IGCC stack	50	50	50	50

The monthly average limit value was not exceeded during 2023.

Table 26. **NOx emissions: concentration values for the Northern Plants**



	2020	2021	2022	2023
BTX-E2	133	132	133	132
BTX-E3	131	130	131	130
Legal limit value*1	200	200	200	200

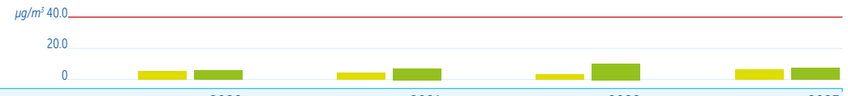
*1 Monthly average limit value.

The values recorded were stable and well below the limits for all smokestacks. In the four-year period under consideration, the values were below the emission limits at all smokestacks.
In terms of concentration, individual emission points have their own limit values, all of which were respected in 2023.

Regional network measurements for NO2

The indicators at all stations show that the values for NO2 are well below the legal limits.
In the four-year period under consideration, no breaches of the hourly limit for the protection of human health were recorded.

Table 27. **NO2 emissions: regional network measurements - annual mean concentration**



	2020	2021	2022	2023
CENSA 2	5.8	5.3	4.4	7.3
CENSA 3	6.2	8.0	8.9	8.4
Legal limit value*1	40	40	40	40

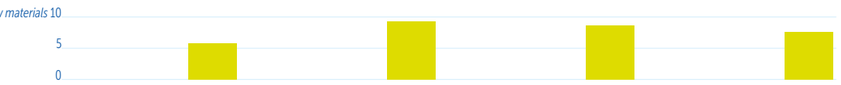
*1 Limit value set by Legislative Decree 155/2010 for the protection of human health.

Dust

There are no mass flow limits for dust; the emission values are given for illustrative purposes.

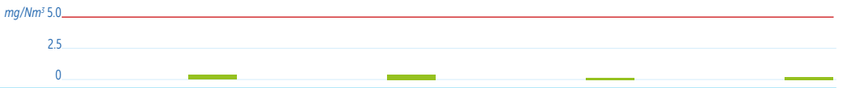
Table 28. **Dust emissions: mass flow**

absolute values	2020	2021	2022	2023
Whole site	77	126	113	91



specific values	2020	2021	2022	2023
Whole site	6	9	8	7

Table 29. **Dust emissions: concentration values for the IGCC**



	2020	2021	2022	2023
IGCC dust concentrations	0.16	0.17	0.06	0.07
IEA limit value*1	5	5	5	5

*1 Since November 2017, a monthly average limit value of 5 mg/Nm³ has been prescribed.

In terms of concentration, individual emission points have their own limit values, all of which were respected in 2023.

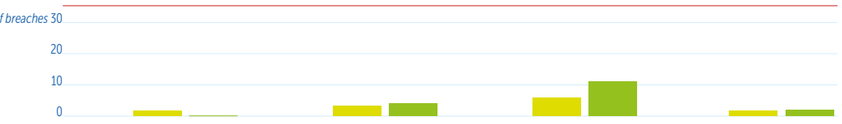
PM10

The values are calculated using the methods available in the literature. In recent years, both the absolute mass flow indicator and the site-specific value have remained stable.

PM10 measurements recorded by the regional network

No breaches of the legal limit for PM10 were recorded in the four-year period considered, as shown by the tables below.

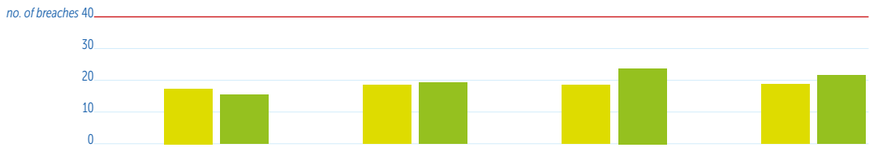
Table 30. **PM10 emissions: breaches of the daily limit for the protection of human health**



	2020	2021	2022	2023
CENSA 2	1	3	6	1
CENSA 3	0	4	11	3
Annual authorised breaches*1	35	35	35	35

*1 The limit value of 50 µg/Nm³ should not be exceeded more than 35 times in any calendar year.

Table 31. **PM10 Emissions: annual mean concentration values**

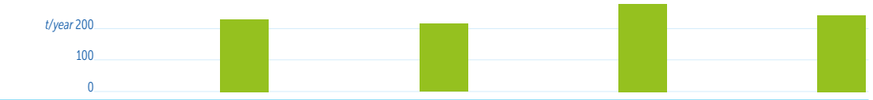


	2020	2021	2022	2023
CENSA 2	17.5	18.5	18.6	18.7
CENSA 3	15.2	19.3	23.4	21.1
Regulatory limit value	40	40	40	40

Carbon monoxide (CO)

There are no mass flow limits for CO, the emission values are given for illustrative purposes.
The site-specific mass flow indicator confirms a trend largely in line with previous years, well below legal limits.

Table 32. **CO emissions: mass flow**

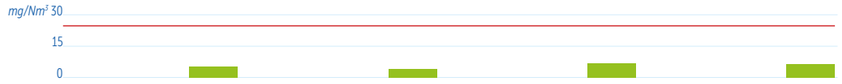


absolute values	2020	2021	2022	2023
Whole site	226	214	275	255

specific values	2020	2021	2022	2023
Whole site	19	16	20	19

In terms of concentration, individual emission points have their own limit values, all of which were respected in 2023. We provide the average annual CO concentration of the IGCC plant by way of example.

Table 33. **CO emissions: concentration values for the IGCC**



	2020	2021	2022	2023
Annual mean concentration of CO at IGCC	2.9	2.8	4.8	4.0
IEA monthly average limit value	25	25	25	25

Regional network measurements for other pollutants (CO, H2S, benzene and ozone)

For the other monitored pollutants, the Region's report shows the following:

- for CO, data from the CENSA2 and CENSA3 stations, received in the period 2020 to 2023, confirm that the legal limit was not breached
- for benzene, the values recorded in the last four-year period were below the legal limit
- ozone pollution can only be tackled on a large scale, given that ozone can be transported over long-distances. In 2020, 2021, 2022 and 2023, no breaches of the target value for the protection of human health and no breaches of the information or alert thresholds were recorded by CENSA2; in 2021, three breaches of the target value for the protection of human health were recorded by CENSA3, but no breaches of the information or alert thresholds; in 2022, one breach of the target value for the protection of human health was recorded, but no breaches of the information or alert thresholds; in 2023, six breaches of the target value for the protection of human health were recorded, but no breaches of the information or alert thresholds
- for hydrogen sulphide, the concentration values in the period 2020-2023 did not register any breaches, either of the legal limit of 40 µg/m^3 for average daily concentrations, or of the legal limit of 100 µg/m^3 for average half-hourly concentrations.

Air quality monitoring using bioindicators

The following table shows the key criteria for interpreting the categories of air quality and atmospheric purity, with reference to the Index of Atmospheric Purity (IAP[5]). The IAP 3 and 4 categories, which include the values measured at the monitoring stations are also highlighted in the table.
Please note that in 2023, as in the last four years, the air quality data in the area studied was stable. Air quality falls in the "IAP 3" category in 9 out of 11 monitoring stations, and in the "IAP 4" category in the remaining 2 stations.

Index of Atmospheric Purity (IAP): Atmospheric Quality and Purity Categories

IAP Categories	IAP Values	Air quality assessment	Naturality/alteration
7	IAP = 0	Very poor	Very high alteration
6	1 < IAP < 10	Poor	High alteration
5	11 < IAP < 20	Low	Medium alteration
4	21 < IAP < 30	Mediocre	Low naturality/low alteration
3	31 < IAP < 40	Medium	Medium naturality
2	41 < IAP < 50	Fair	High naturality
1	IAP > 50	Good	Very high naturality

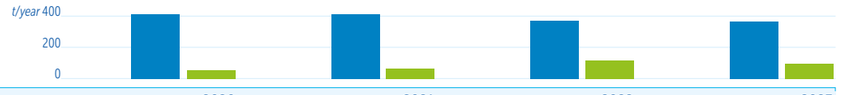
As was to be expected, air quality is generally higher at the stations further inland and lowest at the station closest to the Sarroch industrial area. The results of the bioindicator-based analysis thus show that air quality falls in the mid range of the IAP index. In the monitored area, surveys of the status of vegetation are also carried out. The survey includes visual checks of the condition of different species of vegetation and measurement of pollutant bioaccumulation. The field data collected have shown that the bioaccumulation of these substances in the surveyed area is lower than the Italian and European annual averages.

5. The IAP (Index of Atmospheric Purity) was proposed by P.L. Nimis, Linee guida per la bioindicazione degli effetti dell'inquinamento tramite la biodiversita dei muschi epifiti ('Guidelines for the bio-indication of the effects of pollution through the biodiversity of epiphytic mosses'), Department of Biology, University of Trieste, 1999, and has been used in various air quality studies, as well as by the ARPAs (Regional Environmental Protection Agencies).

Non-channelled emissions

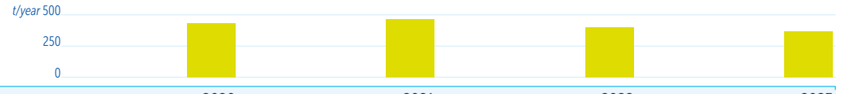
Fugitive emissions are measured using dedicated technology (infrared camera with variable optics) and monitored using a Smart LDAR approach. Diffuse emissions are estimated using specific Toxchem software developed by EPA (the US Environmental Protection Agency) and verified by experimental measurements.
The data on non-channelled emissions, comprising diffuse and fugitive emissions, are summarised in the table.

Table 34. **Non-channelled emissions of volatile organic compounds**



diffuse	2020	2021	2022	2023
Refinery	417	417	384	385
Northern Plants	50	53	50	46

fugitive	2020	2021	2022	2023
Refinery	9.2	9.3	9.5	8.9
Northern Plants	0.8	1.0	1.0	0.9



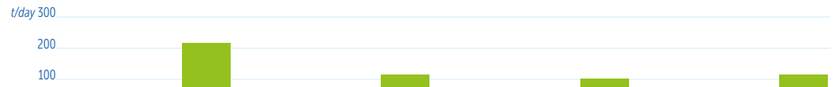
diffuse+fugitive	2020	2021	2022	2023
Refinery+Northern Plant Totals	477	480	445	441

Management of the Blowdown - Flares System

The total flare emissions recorded in 2023 were influenced by the "external events" recorded in April and July; the emission value net of these is 103 t/day, in line with 2022[6].
Below is the amount of gas channelled to the Blowdown - Flares System, in kt/year and t/day.
In 2023, four breaches of the legal limit occurred (on 10, 11, 15 and 24 July).

Table 35. **Gases burned in the flare system**

	2020	2021	2022	2023
kt/year	79.6	42.9	36.9	42.7



	2020	2021	2022	2023
t/day annual average	218	118	101	117

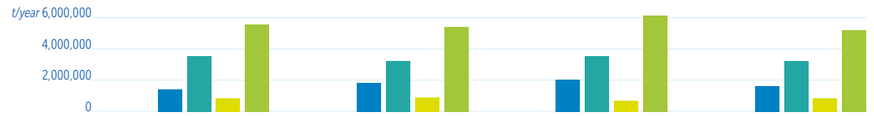
- The table compares the limit under IEA (AIA) Decree DEC-MIN-0000263 of 11 October 2017, of the daily quantity of gas sent to the flare system, expressed in t/d, with the daily average on an annual basis.
- The overall value as of 2022 includes the contribution of Acid Flares, measured as of 01/01/2022.
  2022 The acid flares contribution was 2.21 kt/year.
  2023 The acid flares contribution was 1.7 kt/year.

6. External events occurred on 18 April-20 May - AirLiquide event with oxygen supply interruption, and on 10-31 July - Terna event with general blackout. The net value was calculated by assigning to the two periods affected by external events the average daily value for 2023 net of the same two periods.

Carbon Dioxide, CO_2 (greenhouse gases)

In 2021, the fourth phase (covering the period 2021 - 2030) started, which saw a further revision of the emission mechanisms, with the aim of achieving the EU emission reduction targets for 2030.
The following tables and charts show the annual figures on CO_2 emissions from the site in both absolute and relative terms, as a proportion of the quantity of raw materials processed in a year. As has been the case since 2005, the figures for 2023 have been validated by companies on the list of bodies accredited for this purpose by the Italian Ministry for the Environment. Emissions in tonnes/year show a decreasing trend for the entire site over the last four years.

Table 36. **CO_2 emissions: absolute values and allocated allowances**



	2020	2021	2022	2023
Refinery	1,665,743	1,967,804	2,002,247	1,839,943
IGCC	3,577,617	3,193,972	3,623,257	3,280,314
Northern Plants (E11, E7, E2/E3)	528,984	537,127	479,391	483,180
Whole site	5,772,344	5,698,903	6,104,895	5,603,437
Allowance allocated for free	2,560,628	2,143,510	1,798,838	2,143,510

Table 37. **CO_2 emissions: specific mass flow values**

	2020	2021	2022	2023
Whole-site emissions	481	423	439	424
Refinery+Northern Plant Emissions	183	186	179	176

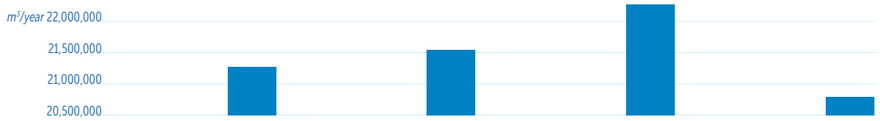
In 2023, the total processing of crude oil (net of BSW) and complementary feedstock was 13,227.427 kt, slightly lower than in 2022.

Water

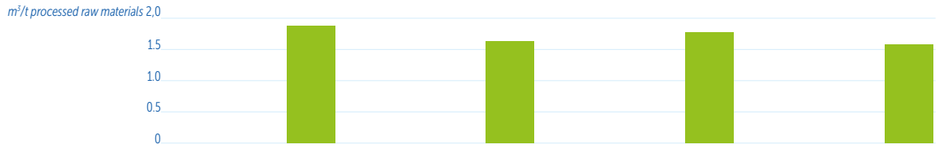
Consumption

Below are the year-end figures of the site's water consumption, given by the sum of water from the industrial consortium (untreated water), seawater (net of water returned to the sea) and water recovered from the wastewater treatment system (water reuse), in absolute terms (m3/year) and specific terms (m3/tonne of processing).

Table 38. **Water consumption at Site**



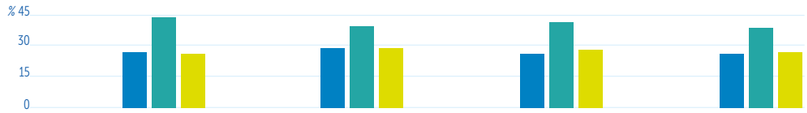
	2020	2021	2022	2023
Absolute values	21,303,724	21,511,015	22,434,927	20,764,800



	2020	2021	2022	2023
Specific values	1.777	1.596	1.615	1.570

Table 39 shows the breakdown of the site's water consumption into the three water sources mentioned above: two external sources and internal reuse.
For each year, the table shows the percent incidence of each water source (raw water, seawater, recovered wastewater) on total water consumption.
Over the years, we have reduced the amount of untreated water supplied to us by the industrial consortium by gradually increasing internal reuse and commissioning the new desalination plant, which was started up in 2018 and became fully operational in 2019.

Table 39. **Site water consumption: sources of supply**



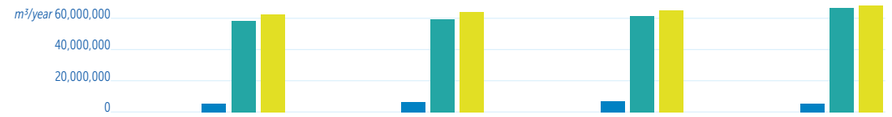
	2020		2021		2022		2023	
	10³m³/year	*%*	*10³m³/year*	*%*	*10³m³/year*	*%*	*10³m³/year*	*%*
Untreated water	5,998	28.1	6,060	28.2	6,277	28.0	5,991	28.9
Seawater	9,429	44.3	9,071	42.2	9,735	43.4	8,644	41.6
Recovered water (water reuse)	5,877	27.6	6,380	29.6	6,422	28.6	6,130	29.5
Total (water consumption at site)	21,304	100	21,511	100	22,434	100	20,765	100

- 2018 - The new desalination plant was put into operation and in 2019 a new desalinator was commissioned and internal water recovery was improved (recovery of wastewater).
- 2020 - Reduction of site water consumption, mainly untreated water, reduction of processing as a consequence of the pandemic crisis.
- 2021-2022 - Reduction in untreated water consumption in percentage terms, thanks to projects and optimisation actions.

In 2023, the reduction in the consumption of untreated water from the consortium continued in absolute terms, while water reuse declined slightly.
Untreated water consumption increased slightly in percentage terms due to the sharp decrease in seawater use during the IGCC turnaround. Nonetheless, it recorded the lowest absolute value to date.

It should be noted that since 2021, thanks to our projects and optimisation, untreated water from the consortium has become the smallest source of water supply in percentage terms, compared to previous years.

Table 40. **Site water demand - absolute values**

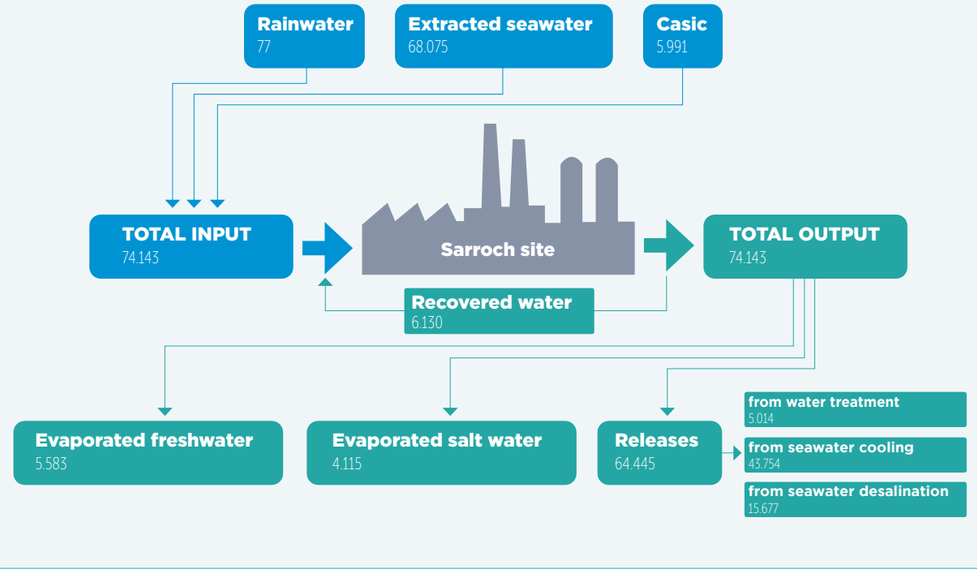


	2020	2021	2022	2023
Untreated water (Industrial Consortium)	5,997,790	6,060,035	6,277,376	5,991,252
Seawater (total quantity collected)	58,832,422	59,264,685	60,371,482	68,074,680
Total water collected (site water demand)	64,830,212	65,324,720	66,648,858	74,065,932

In 2023, most of the seawater collected was discharged back into the sea (59,431 10^3m^3/year net of water consumed - Table 39) with almost unchanged quality characteristics; variations in temperature and saline concentration were immaterial, while flow rate changes are related to optimisation of the cooling circuit (upgrading of lines and measuring system).

Below is the site's water balance for 2023, including the contribution of stormwater.

Site water balance in 2023: absolute values in 10^3m^3/year



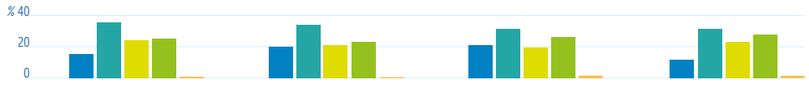
Discharges into water

Discharge points in normal conditions

We provide below the data on discharge points.

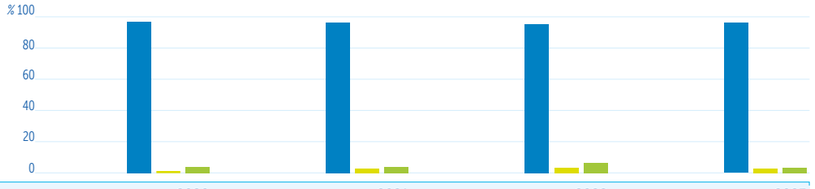
Quantities released into the receiving body of water

Table 41. **Contributions to the water discharge flow rate: Southern Plants**



	2020	2021	2022	2023
Main discharge point (excluding IGCC tower)	14.6	19.8	21.6	15.6
Desalinator discharges	35.4	36	32.8	32.7
IGCC tower discharge	24.2	20.2	19	23.1
demineralised/deionised water production discharge (1H)	24.9	23.3	25.3	27.7
Incoming water treatment discharge	0.9	0.7	1.3	1.0

Table 42. **Contributions to the water discharge flow rate: Northern Plants**



	2020	2021	2022	2023
Discharge point SF1	96.2	96	95.7	96.7
Discharge point SF2 neutralisation	0.1	0.3	0.4	0.3
Discharge point SF3	3.7	3.8	3.9	3.1

Process-related discharges

The significant parameters regarding quantities of discharges into water channelled to the main discharge point (1) are as follows[7]:

- **COD (Chemical Oxygen Demand)**
- **total hydrocarbons**
- **total nitrogen**

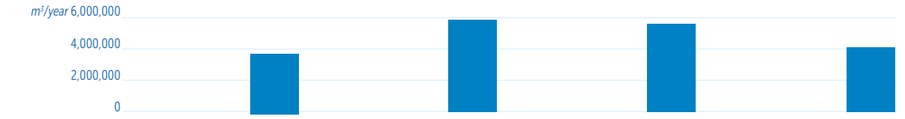
The data on these parameters for the four discharge points related to the refining process (1a, 1b, 1C and 1D) channelled to the main discharge point are shown below.

7. These data do not include discharge points 1G, 1H, 1E and 1F, as they are not discharges from wastewater treatment units.

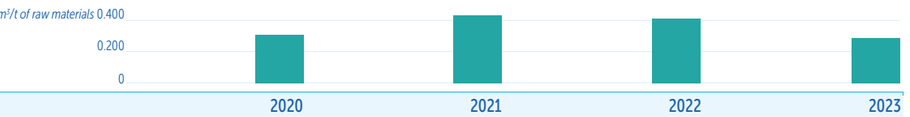
Flow rate of discharged water

Table 43 shows data on the annual flow rate of the discharged water both in absolute terms and in specific terms as a proportion of the raw materials processed.
Over the four-year period, the annual flow rate of the discharged water in absolute value is within the typical range of variation due to plant shutdowns.

Table 43. **Discharges from wastewater treatment plants (discharge points 1A, 1B, 1C, 1D)**



	2020	2021	2022	2023
Absolute values	3,962,471	5,957,570	5,886,608	4,048,690



	2020	2021	2022	2023
Specific values*1	0.330	0.440	0.420	0.310

*1 Total water discharged (points 1A, 1B, 1C, 1D)/processed raw materials.

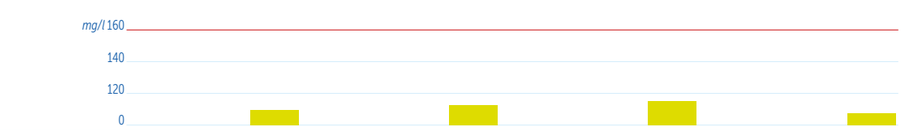
COD (Chemical Oxygen Demand)

The following are annual data on COD (Chemical Oxygen Demand), i.e. the quantity of oxygen needed to oxidise the organic content of wastewater (including non-biodegradable matter).
COD-related data, expressed as absolute and specific mass flow values and annual average concentration values, are shown in Table 44.

Table 44. **Discharges from wastewater treatment plants (discharge points 1A, 1B, 1C, 1D): Chemical Oxygen Demand**

	2020	2021	2022	2023
Absolute values	251.0	417.0	424.4	238.0

	2020	2021	2022	2023
Specific values	21.0	30.9	30.5	18.0



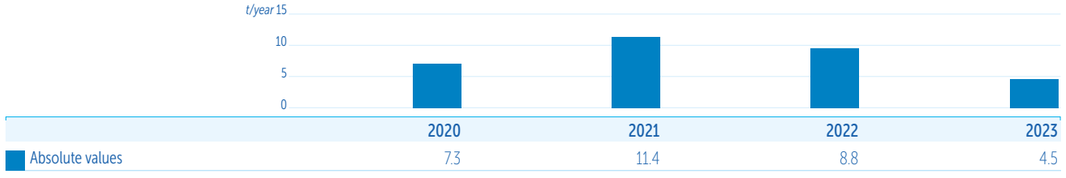
	2020	2021	2022	2023
Mean concentration values	63.4	69.9	72.1	58.8
Regulatory limit value*1	160	160	160	160

*1 Single limit value of 160 mg/l, according to Legislative Decree 152, Part III, Annex 5. **No single breaches of the regulatory limit value were recorded during 2023.**

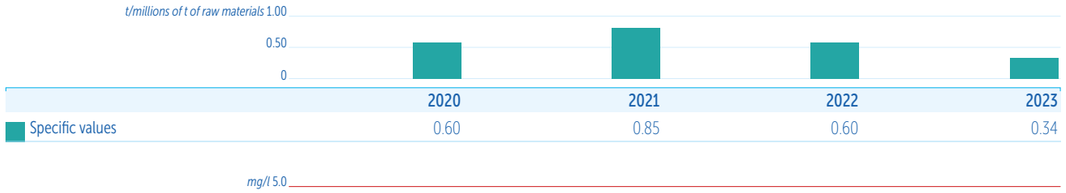
Hydrocarbons and nitrogen

Table 45 shows total hydrocarbon indicator data, expressed as absolute and specific mass flow values and annual average concentration values.

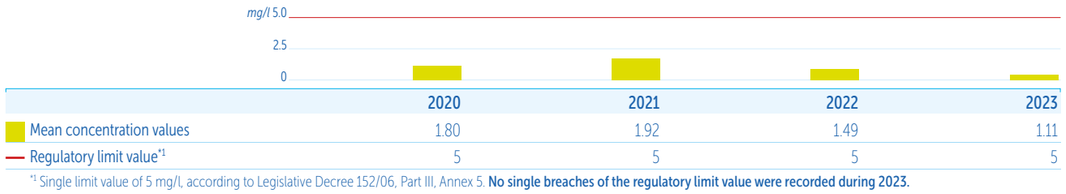
Table 45. **Discharges from wastewater treatment plants (discharge points 1A, 1B, 1C, 1D): total hydrocarbons**



	2020	2021	2022	2023
Absolute values	7.3	11.4	8.8	4.5



	2020	2021	2022	2023
Specific values	0.60	0.85	0.60	0.34

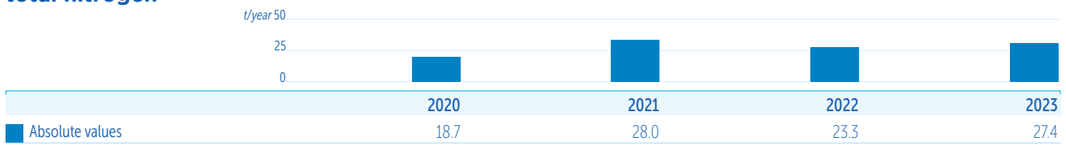


	2020	2021	2022	2023
Mean concentration values	1.80	1.92	1.49	1.11
Regulatory limit value*1	5	5	5	5

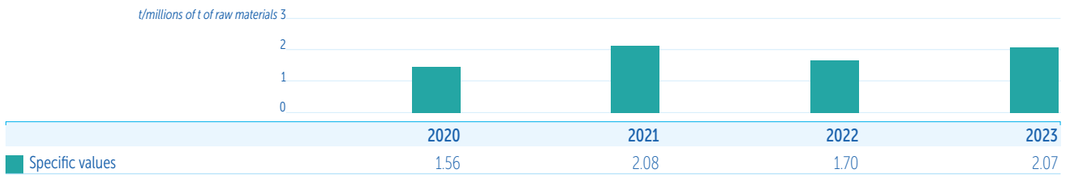
*1 Single limit value of 5 mg/l, according to Legislative Decree 152/06, Part III, Annex 5. **No single breaches of the regulatory limit value were recorded during 2023.**

Over the years, there has been a reduction in the amount of hydrocarbons and nitrogen released due to the improved efficiency of the nitrification and oxidation sections.

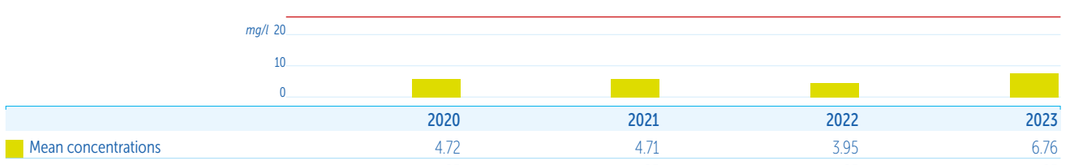
Table 46. **Discharges from wastewater treatment plants (discharge points 1A, 1B, 1C, 1D): total nitrogen**



	2020	2021	2022	2023
Absolute values	18.7	28.0	23.3	27.4



	2020	2021	2022	2023
Specific values	1.56	2.08	1.70	2.07



	2020	2021	2022	2023
Mean concentrations	4.72	4.71	3.95	6.76
Regulatory limit value*1	25	25	25	25

*1 Annual mean concentration limit value stipulated by IEA DEC-MIN 0000263 of 11 October 2017. **The average limit value was not exceeded during 2023.**

Releases from other units

The flow rate of discharged water and suspended solids are the two main parameters for the discharge points from the following units:

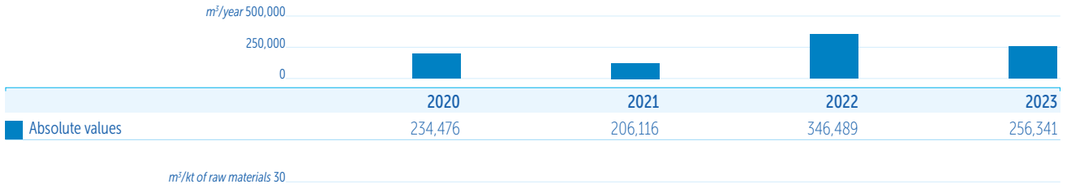
- primary treatment units for incoming water (discharge point 4)
- desalinators (discharge points 7, 9, 10)
- IGCC tower (discharge point 1G)
- demineralised/deionised water production from seawater (1H)
- seawater cooling Thermoelectric North Plants
- neutralisation of water from the TAC plant (discharge point SF2 North Plants)
- seawater backwash filter system (discharge points SF3 North Plants).

The figures relating to these parameters for the types of discharges mentioned above are shown in the tables and charts below.

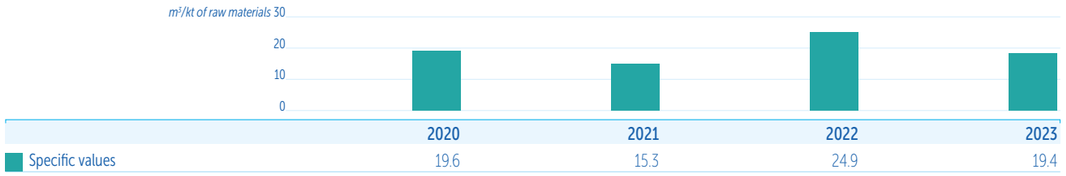
Flow rate of discharged water

The following tables present the discharged water flow rate data, with absolute and specific values.

Table 47. **Discharges from the incoming water primary treatment units (point no. 4)**

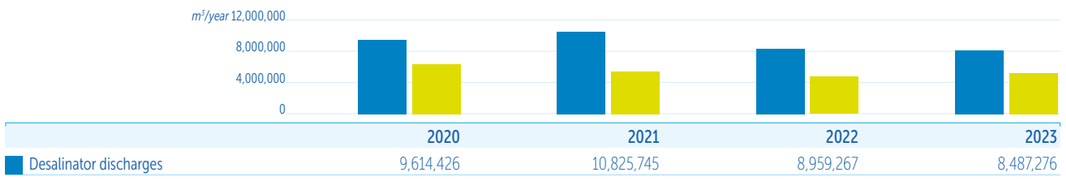


	2020	2021	2022	2023
Absolute values	234,476	206,116	346,489	256,341

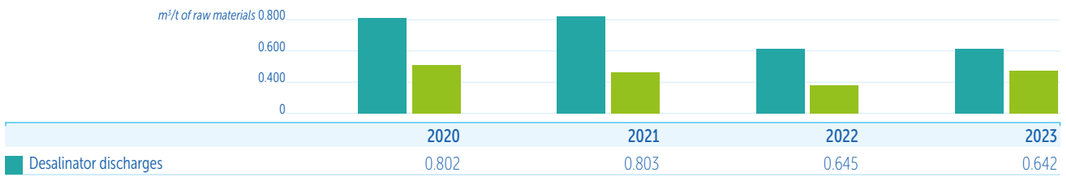


	2020	2021	2022	2023
Specific values	19.6	15.3	24.9	19.4

Table 48. **Discharges from desalinators (points 7, 9, 10)* and IGCC towers (point 1G)**



	2020	2021	2022	2023
Desalinator discharges	9,614,426	10,825,745	8,959,267	8,487,276
IGCC tower discharges	6,564,450	6,067,827	5,190,052	5,986,986



	2020	2021	2022	2023
Desalinator discharges	0.802	0.803	0.645	0.642
IGCC tower discharges	0.547	0.450	0.374	0.453

* Discharge point 9 has not been active since May 2019; discharge point 10 has not been active since January 2019.

Table 49. **Discharges from the plant producing demineralised/deionised water from seawater (1H)**

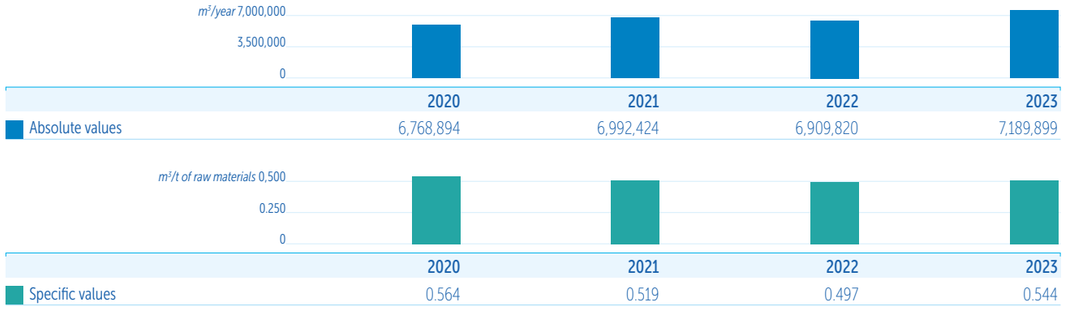
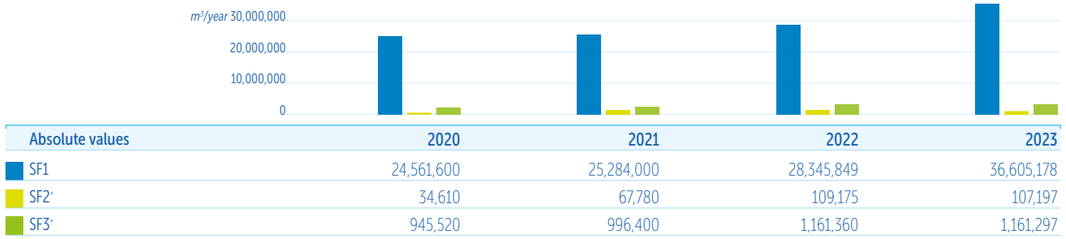
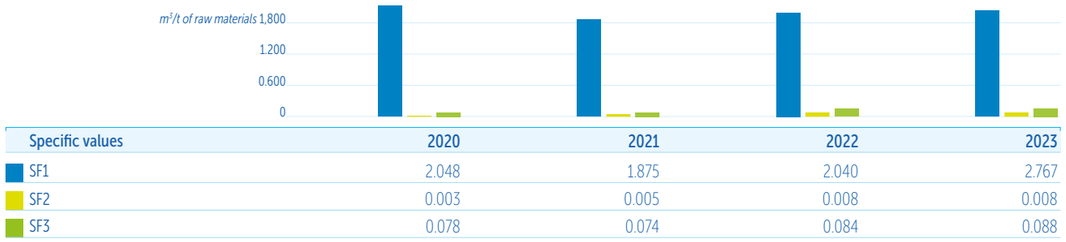


Table 50. **Discharges from Northern Plants (discharge points SF1, SF2, SF3)**



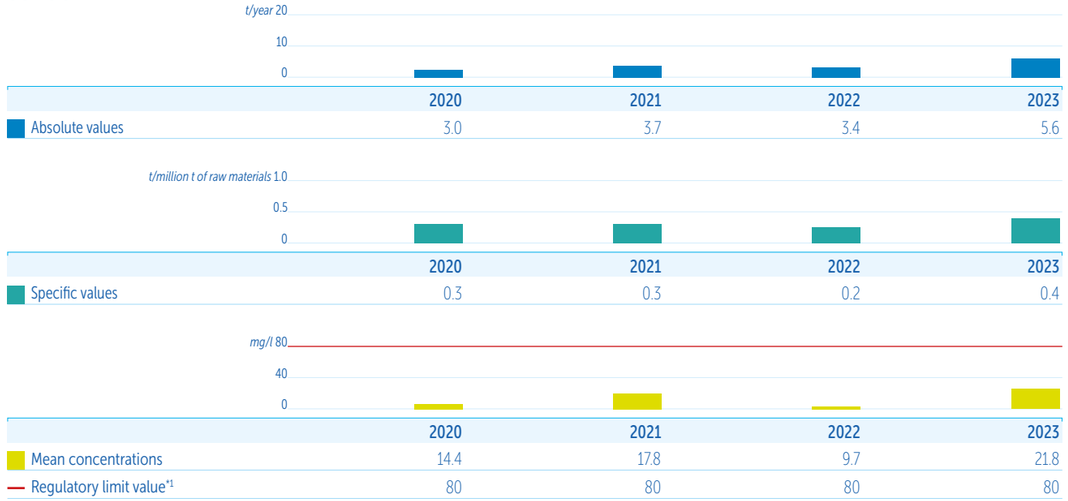
* Estimated on the basis of the pumps' rated flow rate and hours of operation.



Suspended solids

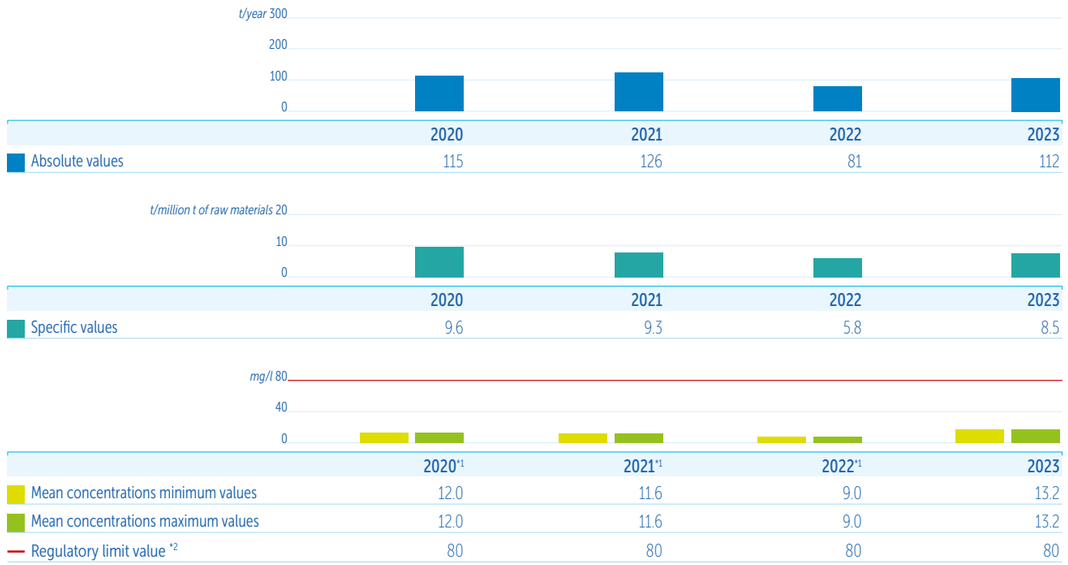
Table 51 shows the data relating to suspended solids indicators, expressed as absolute and specific mass flow values. The table also shows the annual average concentrations.
The recorded data show variable fluctuations over the years, well below the legal limit.

Table 51. **Discharges from the incoming water primary treatment units (point no. 4) suspended solids**



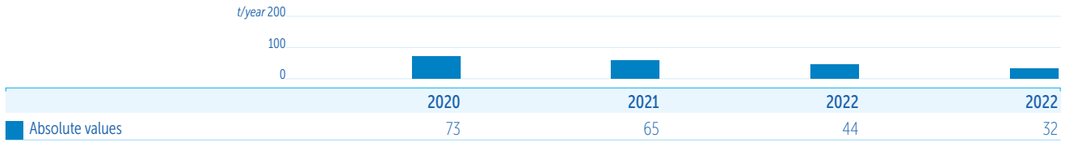
*1 Single limit value pursuant to Legislative Decree 152/06, Part III, Annex 5. **No single breaches of the regulatory limit value were recorded during 2023.**

Table 52**. Discharges from desalinators (discharge points 7, 9, 10) suspended solids**



*1 In the years indicated, only the annual mean concentration value of point 7 is reported, as points 9 and 10 were not active.
*2 Single limit value pursuant to Legislative Decree 152/06, Part III, Annex 5. **No single breaches of the regulatory limit value were recorded during 2023.**

Table 53. **IGCC tower discharges (discharge point 1G) suspended solids**



	2020	2021	2022	2022
Absolute values	73	65	44	32
Specific values	6.1	4.8	3.1	2.4
Mean concentration values	11.1	10.7	8.4	5.3
Regulatory limit *1	80	80	80	80

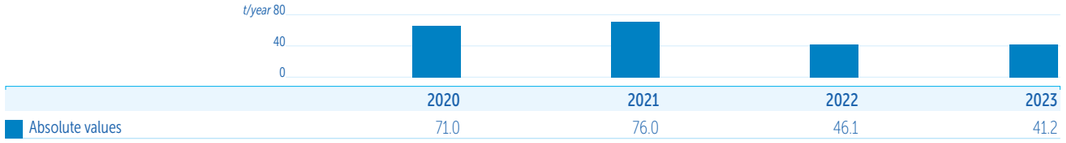
*1 Single limit value pursuant to Legislative Decree 152/06, Part III, Annex 5. **No single breaches of the regulatory limit value were recorded during 2023.**

Table 54. **Discharges from Northern Plants (discharge points SF1, SF2, SF3) suspended solids**

Absolute values	2020	2021	2022	2023
SF1	276.0	274.3	193.7	215.6
SF2	0.6	1.2	2.3	2.4
SF3	13.2	11.7	8.9	6.4
Specific values	**2020**	**2021**	**2022**	**2023**
SF1	23.00	20.35	13.94	16.30
SF2	0.05	0.09	0.16	0.18
SF3	1.1	0.87	0.64	0.48
Average concentrations	**2020**	**2021**	**2022**	**2023**
SF1	11.2	10.8	6.8	5.9
SF2	16.7	18.0	20.9	22.8
SF3	13.9	11.8	7.7	5.5
Regulatory limit value *1	80	80	80	80

*1 Limit value pursuant to Legislative Decree 152/06, Part III, Annex 5. **The regulatory limit value was not breached during 2023.**

Table 55. **Discharge point from the plant producing demineralised/deionised water from seawater (1H) suspended solids**



	2020	2021	2022	2023
Absolute values	71.0	76.0	46.1	41.2
Specific values	5.9	5.6	3.3	3.1
Mean concentration values	10.5	10.9	6.7	5.7
Regulatory limit value *1	80	80	80	80

*1 Limit value pursuant to Legislative Decree 152/06, Part III, Annex 5. **The regulatory limit value was not breached during 2023.**

Discharge points in emergency conditions

During 2023, no rainfall events occurred such as to require the activation of discharge points by opening emergency floodways.

Seawater quality

The quality of seawater can be described in summary form using an indicator known as the Trophic Index (TRIX for short). This indicator is calculated using a mathematical formula that takes into account chemical values (percentage of dissolved oxygen, concentrations of phosphorous and nitrogen) and biological values (chlorophyll "a") measured in the seawater.
The following table provides a key to interpreting the categories of seawater quality at the surveyed points. The results of the seawater surveys in the last four-year period all fall into the top two bands of classification (good/high).

Table 56. **Trophic index (TRIX) seawater quality categories and results**

Trophic index	Trophic state	Seawater quality
2-4	High	Good water transparency; no abnormal water colouration; no undersaturation of dissolved oxygen in the benthic zone.
4-5	Good	Occasional water turbidity; occasional water colouring, occasional hypoxia in the benthic zone.
5-6	Mediocre	Poor water transparency; abnormal water colouration, hypoxia and occasional anoxia of the benthic zone; benthic ecosystem under stress.
6-8	Poor	High degree of water turbidity; widespread and persistent abnormal water colouration; widespread and persistent hypoxia/anoxia in the benthic zone; mass mortality of benthic organisms; alteration/simplification of benthic communities; economic damage to the tourism, fishing and aquaculture industries.

For a number of years now we have been using the CAM5[8] (seawater classification) index to assess the trophic state of seawater. This index is based on specific algorithms for the sea around Sardinia.
Overall, the CAM index has shown that water quality is "high" throughout the surveyed area.

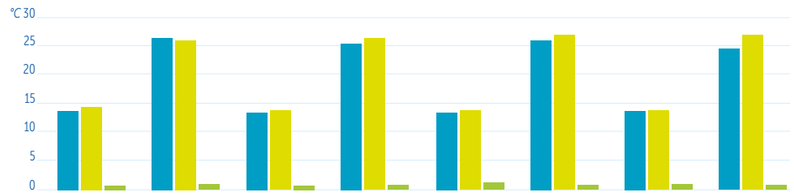
8. This index (Seawater Classification) is used to monitor the coastal marine environment. It uses the values measured to formulate an overall assessment of seawater quality.

Table 57. **CAM index (specific to the sea around Sardinia)**

	Surface water	Bottom water
January 2020	High	High
July 2020	High	High
January 2021	Low	Average
July 2021	High	High
January 2022	Average	Average
July 2022	High	High
January 2023	Average	Average
July 2023	High	High

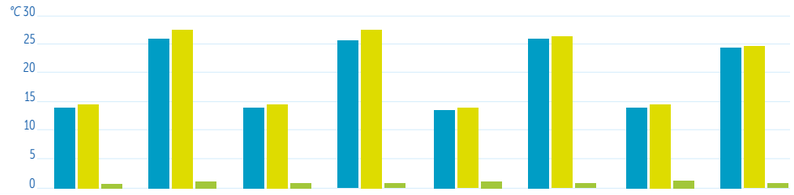
The stretch of sea covered by the analysis is also affected by discharges of water at a higher temperature than the sea temperature.
Applicable legislation requires that the increase in the temperature of the receiving body of water should not exceed 3°C beyond 1,000 m from the discharge point.
Every six months, in accordance with the IRSA method (Manuale dei metodi analitici per le acque, Quaderno Istituto Ricerca sulle Acque no. 100, 1995, Manual of water analysis methodology, Institute of Water Research Paper 100, 1995) required by Ministerial Decree of 16 April 1996, we verify temperature differences at 1,000 m from the discharge point, the IGCC and Northern Plants seawater cooling circuit along a half circle having the discharge point at its centre.
The results of the checks carried out over the last four years are shown in Tables 58 and 59; the temperature increase values fall within the variability range of coastal seawaters.

Table 58. **Measurements taken at a depth of 0.1 m along the arc of the semicircle of radius 1,000 m with the IGCC tower discharge point at the centre (point no. 1G)**



	Jan '20	Jul '20	Jan '21	Jul '21	Jan '22	Jul '22	Jan '23	Jul '23
Minimum temperature	14.5	25.6	14.1	25.8	12.2	26.8	13.5	24.3
Maximum temperature	15.1	26.3	14.7	26.3	14.5	27.3	14.2	24.9
Temperature increase	0.6	0.7	0.6	0.5	2.3	0.5	0.8	0.6

Table 59. **Measurements taken at a depth of 0.1 m along the arc of the semicircle of radius 1,000 m with the Northern Plants discharge point at the centre**



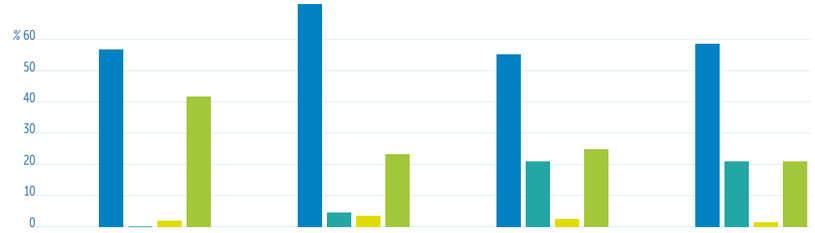
	Jan '20	Jul '20	Jan '21	Jul '21	Jan '22	Jul '22	Jan '23	Jul '23
Minimum temperature	14.1	25.5	14.1	25.7	12.4	26.7	13.0	24.3
Maximum temperature	14.6	26.0	14.5	26.0	13.1	26.9	14.0	24.8
Temperature increase	0.5	0.6	0.4	0.3	0.7	0.2	1.0	0.5

Waste

Waste produced

The following table shows waste produced in percentage terms. The greatest share of waste, is managed at the site's in-house thermal-drying/inerting plant.

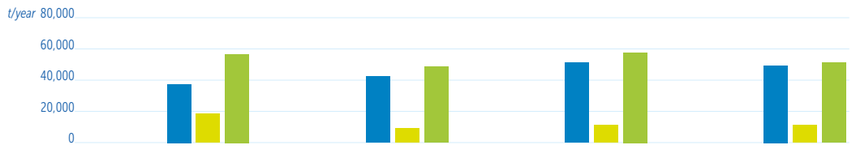
Table 60. **Breakdown of waste generated at the site**



	2020	2021	2022	2023
Waste to internal Thermal-drying (TDS)/Inerting Plant	56.7	69.5	54.2	57.8
Extracted groundwater	0.0	4.2	20.2	20.2
Filter cake with external recovery	2.5	3.8	2.9	1.8
Other types of waste	40.8	22.5	22.7	20.2

In 2023, due to maintenance activities, the progress of investment activities and the extraction of groundwater from the Northern Plants' wells, the total amount of waste produced at the Sarlux site was comparable to the 2022 values. In 2023, the amount of hazardous waste increased, in line with 2022, due to the extraction of water from the wells. We continued to see the improvements achieved in previous years through specific actions such as optimised use of the thermal-drying system (TDS), optimisation of catalyst lifecycle management, the use of new materials and changes made to certain processes to reduce waste production.

Table 61. **Waste generated at the site divided into hazardous and non-hazardous categories: absolute values**[*1]

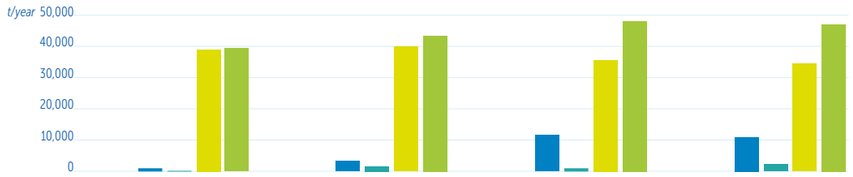


	2020	2021	2022	2023
Hazardous waste	37,350	40,236	47,894	45,333
Non-hazardous waste	19,396	8,001	9,437	6,493
Total waste produced	56,746	48,237	57,331	51,826

[*1] This includes all types of waste generated at the site and reported in the Environmental Statement.

With regard to waste production in 2023, it is also noted (Table 62) that the quantity of water extracted is in line with that of 2022, while waste produced by ordinary and extraordinary activities is decreaing.

Table 62. **Hazardous waste: breakdown by absolute values**



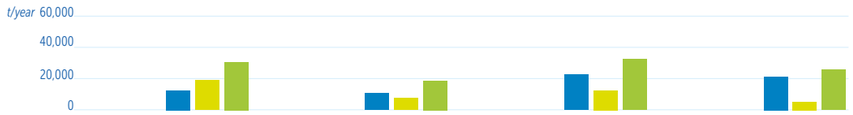
	2020	2021	2022	2023
Extracted groundwater	6	2,008	11,556	10,471
Soil from remediation activities	0	359	194	373
Hazardous waste from ordinary and extraordinary activities*1	37,334	37,869	36,144	34,489
Total	37,350	40,236	47,894	45,333

*1 The amount of waste produced in 2022 was influenced by changes to investment and extraordinary activities.

Outgoing waste from the site

The outgoing waste from the site (Table 63) compared with the waste generated (Table 61) shows the benefits of using the thermal-drying system (TDS).

Table 63. **Outgoing waste from the site: absolute values*1**



	2020	2021	2022	2023
Hazardous waste	12,426	10,682	23,331	21,041
Non-hazardous waste	19,396	8,001	9,437	6,493
Total outgoing waste from the site	31,822	18,683	32,768	27,535

*1 This includes all types of waste generated by the site, excluding waste sent to the on-site inerting plant and including inertised/thermal-dried waste generated by the plant.

The amount of filter cake from the IGCC process is lower than in previous years mainly due to the once-in-10-year shutdown of the IGCC plant.

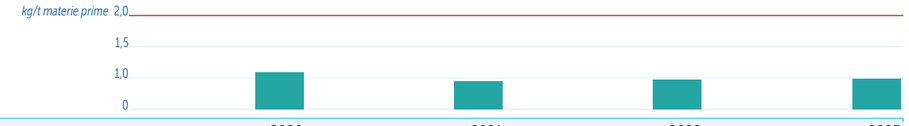
Table 64. **Outgoing waste from the site: filter cake**

	2020	2021	2022	2023
Filter cake - quantity leaving the site	1,441	1,823	1,673	892

The indicator in Table 65 below is calculated taking into account the various types of waste from the refining process, as a proportion of the quantity of raw materials processed. Therefore, the indicator does not account for the quantities of waste generated by extraordinary activities, such as: remediation, investment land and extraordinary cleaning of plant equipment. The indicator values are compared with the reference values (less than two kg of waste per tonne of crude processed) contained in the Italian guidelines on BATs in the refining sector.

In 2023, the value was slightly higher than in 2022, but still far lower than the indicator, confirming that the process-side actions taken together with technical choices and the effective use of the thermal-drying system (TDS) have yielded real benefits.

Tabella 65. **Produzione di rifiuti da attività Sarlux**



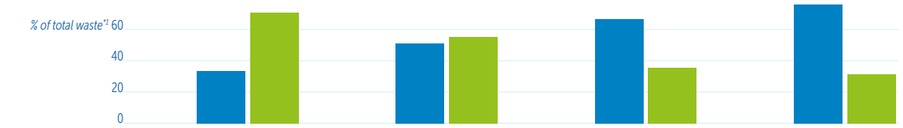
	2020	2021	2022	2023
Indicatore di produzione rifiuti tipici del ciclo di raffinazione*1	1,26	0,82	0,90	0,92
Valore limite di legge*2	<=2	<=2	<=2	<=2

*1 Indicatore calcolato detraendo dai rifiuti totali uscenti dal sito i rifiuti derivanti da attività straordinarie e/o non pertinenti il ciclo di raffinazione (es. terre e rocce da scavo, CLS, bitume, Filter Cake da impianto IGCC, morchie, bonifiche etc.)
*2 Valore indicato dalle linee guida sulle migliori tecniche disponibili (Decreto Ministero dell'Ambiente 29/01/2007).

Outgoing waste from the site sent for recovery

Table 66 shows the percentages of waste sent for recovery and disposal.

Table 66. **Destination of waste leaving the Sarlux site**



	2020	2021	2022	2023
Waste sent for disposal	32.2	48.8	67.2	68.8
Waste sent for recovery	67.8	51.2	32.8	31.2

*1 The percentages take into account all waste delivered to authorised plants for treatment-disposal (D1:D15) and recovery (R1:R13) activities, with reference to Legislative Decree 152/06.

Table 67 shows the absolute quantities of waste sent for recovery.
In absolute terms, the amount of waste sent for recovery is lower than in 2022.

Table 67. **Total waste sent for recovery (within and outside the site)**

	2020	2021	2022	2023
Waste sent for recovery	21,578	9,569	10,752	8,611

Table 68 shows the absolute quantities of waste sent for recovery.
The percentage of hazardous waste sent for recovery is higher than in recent years.

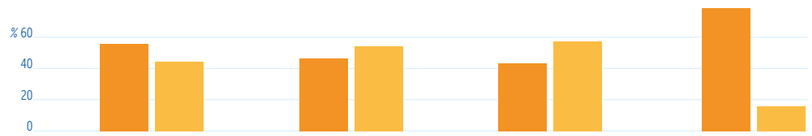
Table 68. **Destination of waste leaving the Sarlux site**

	2020	2021	2022	2023
Hazardous waste sent for recovery	14.97	27.54	25.88	29.98
Non-hazardous waste sent for recovery	85.03	72.46	74.12	70.02

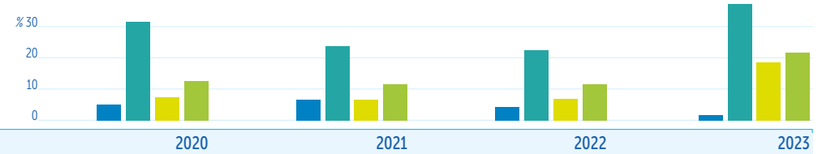
Municipal waste produced at the site

The total amount of recyclable and non-recyclable municipal waste produced in 2023 is 311 tonnes, about 50 tonnes less than the in 2022.
The sorted collection of plastic, glass and paper, which started in 2006 with 50 tonnes of sorted waste collected, reached approximately 186 tonnes in 2023. Including food waste in the calculation, the amount of waste sent to recycling in 2023 was approximately 256 tonnes.
The percentages and the absolute quantity of recyclable waste are significantly influenced by the decrease in paper waste from office activities thanks to our "zero paper" project.
With a view to continual improvement, we had launched many initiatives, which reaped results in 2023, with separate waste collection reaching 82.1 percent.
This result places the Sarroch industrial facility among the best-performing companies nationwide (ISPRA website - National Waste Register, Municipal Waste), giving an important contribution to the results of municipal waste management in the area.

Table 69. **Municipal waste**



	2020	2021	2022	2023
Sorted municipal waste	55.7	45.99	43.00	81.65
Mixed municipal waste	44.3	54.01	57.00	18.35



	2020	2021	2022	2023
Glass and cans	4.80	6.32	4.18	1.91
Paper and cardboard	31.90	22.29	21.34	38.59
Plastics	7.10	6.35	6.50	18.95
Food waste	11.90	11.03	10.97	22.20

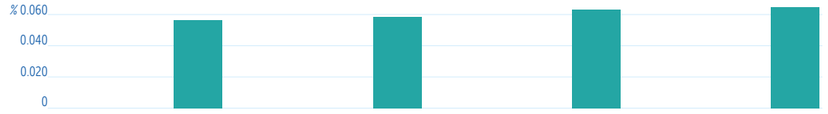
Soil and subsoil

This section, supplementing the descriptive part of this Environmental Statement, reports on the performance of the indicators.

Dynamic barrier – Groundwater emergency safety measures

The indicator chosen to assess hydraulic barrier activity is the ratio (Table 70) of the amount of product recovered to the amount of water extracted.
The value of the ratio in 2023 is largely in line with previous years.

Table 70. **Past activities**



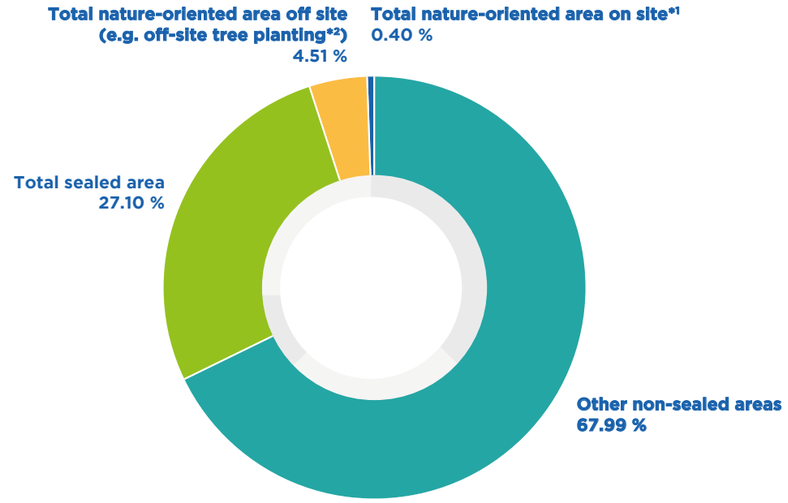
	2020	2021	2022	2023
Ratio of quantity of product recovered to water extracted*1	0.055	0.057	0.062	0.065

*1 Hydraulic barrier and product recovery activities became fully operational in 2007.

Land use in relation to biodiversity

The forms of land use in relation to biodiversity, as a percentage, are shown in the graph below.

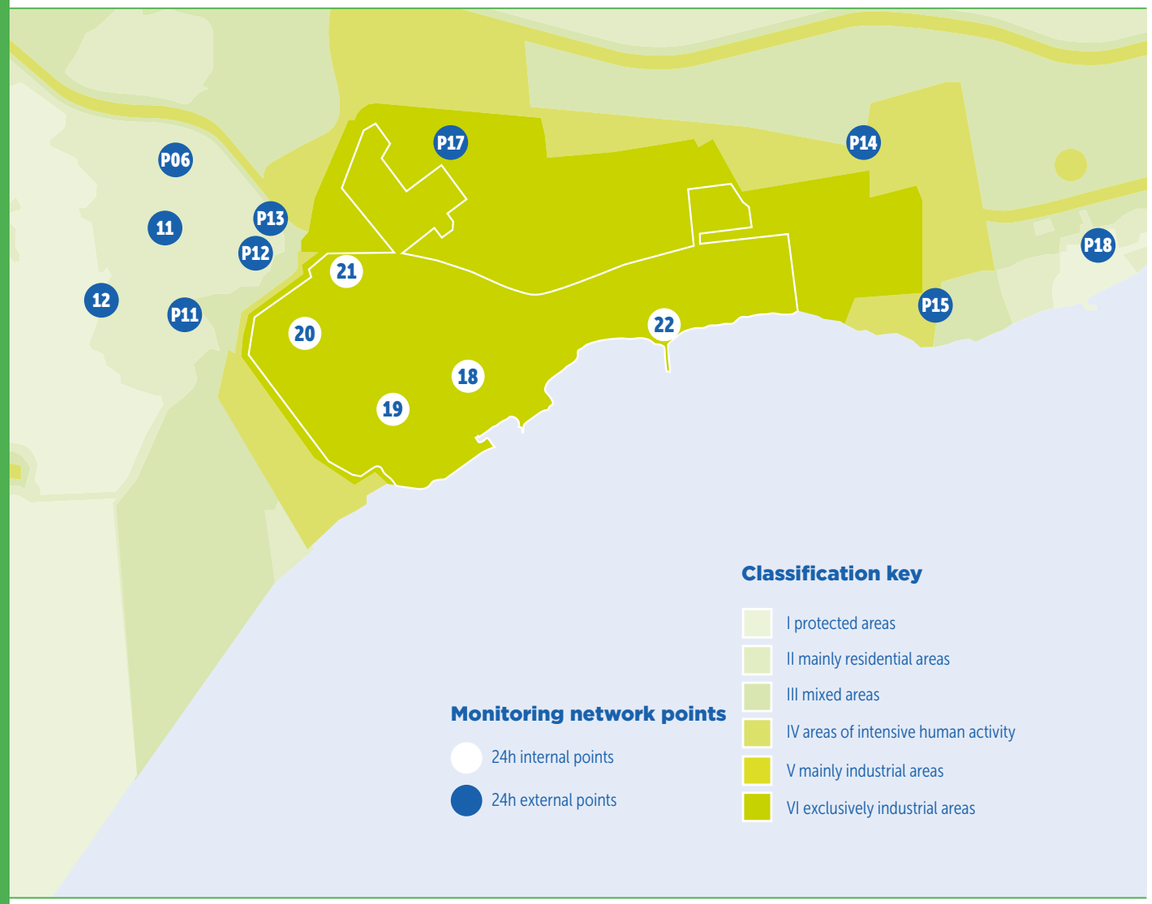
Tabella 71. **Total use of land**



*1. A "nature-oriented area" is an area dedicated primarily to nature preservation or restoration (areas reclaimed from industrial use).
*2. A "sealed area" means any area where the original soil has been covered (such as roads) making it impermeable.

Noise

The location of the measurement points is shown in the following figure, which is based on the Municipal Town Plan.



The mandatory noise emission limits at the measuring points are those set out in the Noise Classification Plan, approved by the Municipal administration by Resolution No 6 of 13 April 2011. The plan divides the area into noise zones governed by the limits set out in Article 2 of Law 447/95 and defines the noise category and consequently the absolute emission and immission limits that must be respected at the sampling points.
During the annual monitoring, only continuous measurements over two entire 24-hour periods are carried out, to analyse noise continuously and to constantly reference noise levels with the plant's noise emissions, which are continuously monitored over the same periods.

The absolute noise emission (Table 72) and immission (Table 74) limits to be respected at the sampling points and the emission (Table 73) and immission (Table 75) values measured over the last four years are shown below.

Table 72. **Municipal Noise Classification Emission limit values** *1

Land use categories	Daytime limits* 2 LAeq [dB(A)]	Nighttime limits* 2 LAeq [dB(A)]
I protected areas	45	35
II mainly residential areas	50	40
III mixed areas	55	45
IV areas of intensive human activity	60	50
V mainly industrial areas	65	55
VI exclusively industrial areas	65	65

*1. Prime Ministerial Decree of 14 November 1997 - Municipal Noise Classification, Municipal Council Resolution No 6 of 13 April 2011.
*2. The daytime period runs from 6 a.m. to 10 p.m.; the night-time period runs from 10 p.m. to 6 a.m.

Table 73 shows the emissions values recorded in the last four-year period at some of the points monitored inside the production site (no. 19 and no. 21); these values can be compared with the emission limits set for the wider industrial area, given that compliance in the areas inside our facility guarantee compliance in the external areas.

Table 73. **Noise emission values at representative points near the boundary of the Sarlux site**

Noise classification	Measurement point	Measured values [dB(A)] (L90 values)			Emission limit (applicable in the vicinity of emission sources)	
		Year	Daytime	Nighttime	Daytime	Nighttime
VI	19	2020	64.5	64.0	65	65
		2021	62.5	64.0		
		2022	62.5	58.0		
		2023	53.5	47.0		
	21	2020	54.5	56.5		
		2021	56.0	54.5		
		2022	58.5	52.5		
		2023	53.5	56.0		

The applicable immission limits set in the Municipal Noise Classification for the areas where the measurement points are located are shown below.

Table 74. **Municipal Noise Classification, immission limit values***1

Land use categories	Daytime limits* 2 LAeq [dB(A)]	Nighttime limits* 2 LAeq [dB(A)]
I protected areas	50	40
II mainly residential areas	55	45
III mixed areas	60	50
IV areas of intensive human activity	65	55
V mainly industrial areas	70	60
VI exclusively industrial areas	70	70

*1. Prime Ministerial Decree of 14 November 1997 - Municipal Noise Classification, Municipal Council Resolution no. 6 of 13 April 2011.
*2. The daytime period runs from 6 a.m. to 10 p.m.; the night-time period runs from 10 p.m. to 6 a.m.

Table 75 shows the immission values for the last four years measured outdoors at three stations in the town of Sarroch, close to the boundaries of the industrial site, no. 11, no. P12 and no. P06. Immission values from the Sarlux production site can be compared with the limits set by the Municipal Noise Classification.

These values refer to the statistical parameter L90, i.e. the noise level exceeded in 90 percent of the measurement time. This parameter includes industrial noise that is continuous and substantially stationary in time, therefore excluding accidental noise events and including noise generated by the Sarlux production site, other industrial sites and noise events of significant duration not attributable to the activities taking place at the production site (e.g. noise from vehicle traffic). This parameter can therefore characterise the specific contribution of our production site.

Table 75. **Noise immission values at representative points in the town of Sarroch**

Noise classification	Measurement Point	Measured values [dB(A)] (LAeq values, refinery)			Immission limit (applicable in the vicinity of emission sources)	
		Year	Daytime	Nighttime	Daytime	Nighttime
III	11	2020	50.5	46.0	60	50
		2021	50.0	47.5		
		2022	51.0	46.5		
		2023	48.5	45.0		
II	P12	2020	44.9	45.0	55	45
		2021	49.5	42.5		
		2022	51.0	44.5		
		2023	44.5	42.0		
	P06	2020	46.0	43.0		
		2021	44.0	39.5		
		2022	43.5	40.0		
		2023	43.0	38.0		

Measurement points P12 and P06 are located in "Class II - Mainly residential area", while point 11 is located in "Class III - Mixed area".

The differential criterion is not applicable to the existing continuous production cycle plants or plants that already held permits at the time the decree came into force, as is the case for the refinery and the IGCC at the Sarroch site, pursuant to Article 31 of Ministerial Decree of 11 December 1996.

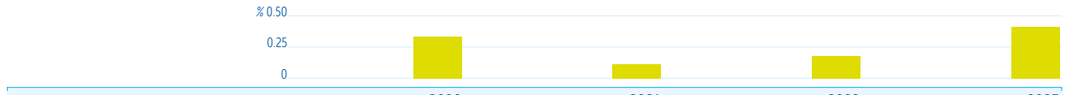
Significant indirect environmental aspects

Contractors

Provision of information to contractors

The percentage figure for the number of hours of information to contractors' staff in 2023 is significantly higher than that recorded in 2022, as we went back to the pre-COVID information methods and we performed works that required more than double the number of staff than in the previous year.

Table 76. **Information to contractors**



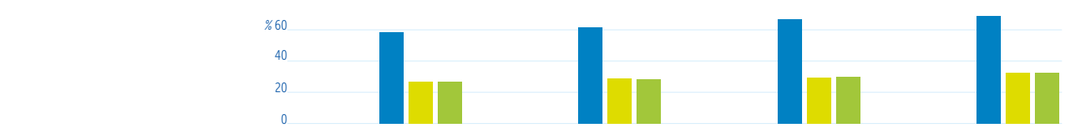
	2020	2021	2022	2023
Percentage values*1	0.32	0.11	0.17	0.43

*1 Number of HSE information hours/number of hours worked by contractors.

Contractors and their commitment to management systems

The index consisting of the percentage of contractors holding at least one of the three ISO certifications mentioned below, shows the contractors' commitment to obtaining and maintaining certifications for their quality, environmental and safety management systems.

Table 77. **Contractors with certified management systems**



	2020	2021	2022	2023
Contractors with ISO 9001 certification*1	60.9	62.0	64.4	65.6
Contractors with ISO 14001 certification*2	26.4	26.8	28.1	31.3
Contractors with OHSAS 18001/ISO 45001 certification*3	26.4	26.6	28.6	31.3

*1 Quality Management System.
*2 Environmental Management System.
*3 Occupational Health and Safety Management System.

Improvement actions

In the pursuit of continual improvement of its performance, Sarlux provides a description* of the actions implemented and planned to improve environmental performance in order to achieve the set objectives and ensure compliance with regulatory obligations relating to the environment.

This section presents the activities undertaken in relation to EMAS significant environmental aspects in the year 2023 and the projection to the end of the three-year period 2022-2024.

* Annex IV of the EMAS Regulation (points b-d-e).

Sustainable value

Building on the improvement actions pursued since 2021, in the period 2022-2024 too we will continue to pursue environmental, operational and social improvements that create sustainable value, while also increasing process efficiency and the medium-term reliability of our assets.
Continual improvement is pursued through the commitment of all Sarlux people, with management control actions aimed at achieving improved performance and with the investments that the Saras Group has always made in environmental sustainability.

ENVIRONMENTAL SUSTAINABILITY

Energy efficiency
Implementation of specific measures and plans aimed at the responsible use of energy resources, aiming at reducing consumption and increasing energy efficiency.

Protecting biodiversity
Safeguarding and preserving the biodiversity of land and aquatic animal and plant species in the areas where the Saras Group carries out its activities.

Greenhouse gases
Commitment to limit GHG emissions related to the Group's activities through direct measures (e.g. energy efficiency and/or technological developments such as CCS at the Sarroch site) and through offsetting initiatives (e.g. renewable energy sources (wind and solar), nature-based solutions, forestation initiatives, etc.).

Air emissions
Commitment to the reduction of air emissions of pollutants, to protect neighbouring communities, even beyond the legal thresholds (IEA requirements), and attention to odour aspects as well.

Waste and discharge management
Minimisation of waste production and discharges and responsible management, ensuring compliance with legal regulations and increasing the use of recycling/reuse wherever possible.

Water resource management
Optimisation of the Sarroch site's water footprint to safeguard environmental resources and the ecosystem in order to reduce reliance on primary water sources for the benefit of greater water availability for the local area.

HSE Investments

Over the three-year period 2021-2023, we invested approximately Euro 37.4 million in environmental and safety measures.

Table 78. **HSE measures**

EURO	2021	2022	2023
HSE Investments	15,536,013	11,532,672	10,347,794
Safety	1,550,403	3,844,376	5,162,196
Environment	13,985,610*	7,688,296	5,185,597

*This figure was influenced by major investments aimed at maximising plant availability (service factor).

Activities in the period 2023 - 2024

The consolidation of technological, management and control measures developed over the years has produced significant improvements in the area of environmental sustainability; the summary of improvement actions for 2023 and the projection for end 2023-2024 are shown below.

Air emissions and energy

Reduction of CO_2 emissions

Mitigating climate change is a steadfast commitment that Sarlux has always maintained, consolidated for the 2023 financial year with the achievement of specific objectives undertaken in 2022, such as the reduction of greenhouse gas emissions directly related to the operations of the Sarroch industrial site and avoided through energy efficiency measures.
Initiatives aimed at improving production efficiency also continued, with a focus on identifying existing opportunities in Planning and Operations to achieve significant reductions in CO_2 production at the Sarroch site.
The "CO_2 Dashboard" was implemented to improve the process of tracking, reporting and modelling CO_2 emissions. To this end, a dedicated acquisition and calculation system was completed at the end of 2023, capable of monitoring in near-real time mode, on a daily basis, the CO_2 emissions in relation to the fuels actually used for each plant, and comparing them with the emissions forecasted in our production plans.

The information can be analysed through a set of interactive guides available on the company systems.

CO_2 DASHBOARD

The Dashboard can:

- provide the organisation with a tool for daily monitoring of CO_2 emissions
- gather information from different sources in order to compare actual and planned results
- provide high-level views for management
- provide detailed views for specialists to compare performance against targets for each unit
- support the improvement of planning models for energy and emissions
- support the reporting and measurement of emissions
- support the management of the CO_2 purchasing process.

With reference to the metric for monitoring CO_2 emissions, calculated in specific terms, i.e. CO_2 emissions as a ratio of processing (crude oil plus complementary feedstock), in 2023 the CO_2 emissions of the refinery and Northern Plants were 3 tCO_2/kt of processing less than in the previous year, with a reduction in the two-year period 2022-2023 of 10 tCO_2/kt of processing.

This achievement is the result of multiple actions taken, including:

- increase from 2022 of fuel gas combustion flexibility at the multi-fuel furnaces/boilers (ref. Ministerial Decree no. 95 of 22/02/2022), fully available in 2023
- increased efficiency of furnaces/boilers and preheating trains, optimisation of fuel gas combustion at the T1/T2 Topping plants, and other energy recovery actions completed in 2023.

With the aim of reducing specific CO_2 emissions, alongside initiatives to reduce consumption, assessments are underway to optimise the mix of fuels used. This will increasingly lead to the use of low carbon-emission fuels.

Reduction of gas delivery to the Blowdown Flare system

As in previous year, we have continued to work on limiting flare emissions so as to minimise our environmental footprint.
The total flare emissions recorded in 2023, net of two external events that affected the final value, are basically in line with 2022.
The target for the end of the three-year period 2022-2024 of achieving and maintaining flare gas combustion of no more than 106 t/day, already achieved in 2022, was consolidated in 2023 (again net of external events).
The investment in upgrading the flare gas recovery system with an ejector system has been completed, and further optimisation actions are under way.

Studies on the decarbonisation of the Sarroch industrial site

Saras is studying a project for the capture and permanent storage (CCS) of the CO_2 produced by the IGCC plant, to equip the Sarroch industrial site to meet regional and national electricity and oil demands over the long term, while also meeting the European Union's decarbonisation targets. To this end, on 15 September 2021, Saras signed a Memorandum of Understanding (MoU) with Air Liquide, with the initial objective of exploring the applicability at the Sarroch site of the "CryocapTM" technology, designed and patented by Air Liquide, for the capture of approximately 1.5 Mton/year of carbon dioxide. Such a development would substantially reduce the carbon footprint of the industrial site, in line with the EU's climate commitments.
An initial feasibility study has been completed on both the CO_2 capture process part of the IGCC plant and the industrial site, on the FCC unit by way of a cryogenic process, which is an interesting alternative to traditional solvent adsorption processes, thanks to its smaller footprint and environmental impact.

The project's design would also ensure strong integration and optimisation with the refinery's existing plants, as well as the reorganisation and reconfiguration of the site's wiring circuit. The feasibility study also considers the temporary storage and the logistics of liquid CO_2 management, to be sent by ship to possible permanent CO_2 storage sites in the Mediterranean.
Complementary activities to storage are under way; they involve the upgrading of CO_2 towards e-fuels. These activities include the construction of a pilot plant, which has been financed in the "Hard to Abate" sector using CO_2 and green hydrogen for fuel synthesis. The start-up of this pilot unit is planned by 2025.
We are currently searching for additional funding for further in-depth project design activities, in order to better integrate the new units with those existing at the industrial site and to start the first stages of detailed engineering.

Reducing fuel oil combustion at the CTE North boilers

In 2023, engineering activities and the procurement of materials, as well as the authorisation procedures pursuant to Article 242-ter of Legislative Decree no. 152/06 ("Iter Terre") were completed. Construction activities are now in progress to upgrade the fuel gas lines at the north boilers to maximise the combustion of fuel gas up to 100 percent in order to reduce NO_x and SO_x emissions.
The completion of the investment has been rescheduled to 2024.

Reduction of odour emissions

As in previous years, we continued to work on containing odour emissions from the site. In 2023, we completed the Technical-Economic Feasibility Study for installing an automated system for mitigating/abating the odours emitted by the breather valves of the fixed-roof tanks (the study was carried out on tank ST25) of the "Tank Farm", with an extendable dosing station for the simultaneous management of four tanks. We are continuing with the maintenance and renovation of the sealing systems of the still pipes and supports of the floating roof tanks and the double seals installed between the shell and the roof according to the best standards available on the market.
Other initiatives planned for 2023 include the extension of the API tank cover and the laboratory-scale testing of an odour mitigation system consisting of a Scrubber with nanoparticle micro-sponges on a pilot scale for industrial use.

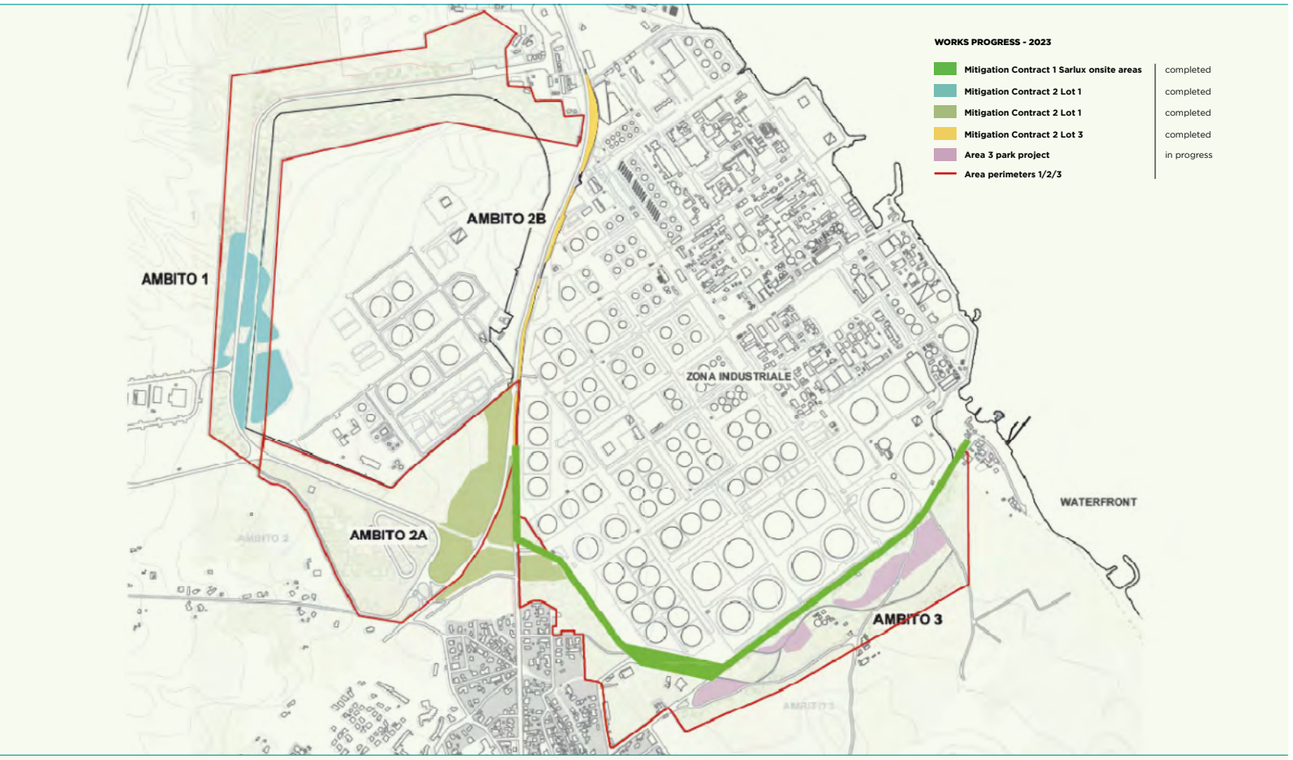
Activities to ensure the stability of the electricity grid

In order to overcome instability events in the external electricity grid to which the Sarlux site is connected and to protect plant operations, Sarlux has planned a major investment to achieve an "island shutdown" of the plants, called "self-supply of electricity to the South Plants".
The new system will go into service as soon as favourable operating conditions are in place to minimise the risk of plant shutdowns.
The "EG3 Modification" activity in the synchronous condenser has been rescheduled to 2025.

Visual impact mitigation and biodiversity: green buffer

The tree planting activities envisaged by the landscape and environmental mitigation project, called "Green Buffer" for short, continued in 2022, with the completion of approximately 85 percent of the total areas covered by the executive plan.
The only areas in the executive plan still to be completed relate to private properties (indicated in pink in the plan below) that are not available for executing the works.
From discussions with the municipal administration during the presentation of the executive plan, an amendment to the Municipal Town Plan (MTP) and the subsequent expropriation of the land concerned had been initially considered for these areas, in a timeframe compatible with the project schedule. In September 2022, Sarlux notified the competent authority of the updated schedule for the completion of the planned activities on the unrestricted property areas in order to define the necessary project variant which should have been incorporated into the Municipal Town Plan (MTP). Subsequent discussions with the same administration, however, revealed the impossibility of the MTP amendment and expropriations necessary to complete the works within a reasonable and certain timeframe.
In January 2023, Sarlux submitted a request to change the timeline for the executive project only for the restricted areas, scheduling completion of the works for June 2024.

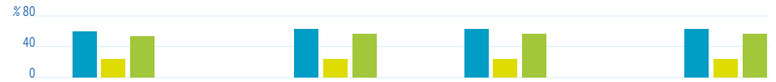
The three action areas of the project



Double bottom tanks, paving of basins and pipeways

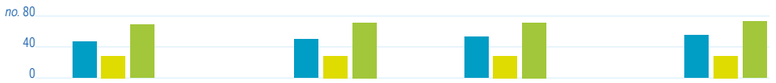
The activities for inserting double bottoms on the tanks have continued with the aim of minimising the risks of potential spillage of crude oil and products into the soil; with the same aim, the paving of the containment basins and pipeways also continued, although activities slowed down in the two-year period 2020-2021 due to the pandemic (see section 2 Integrated Environmental Authorisation - Application for a non-substantial change ID 87/11551).
The activities, which will continue in the three-year period 2023-2026, are carried out under a multi-year plan, the progress of which is communicated in annual reports, along with the schedule for the following years, as required by the Monitoring and Control Plan contained in the IEA Decree.

Table 79. **Contamination prevention activities**



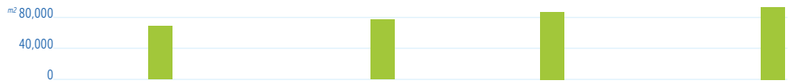
Paving of basins *1	2020	2021	2022	2023
Southern Plants + National Storage facility	59.7	63.16	63.16	63.16
Northern Plants	20.9	20.9	20.9	20.9
Total	55.5	58.6	58.6	58.6

*1 The percentage reported is obtained through the ratio of the area of all paved basins to the total area of basins to be paved.



No. of double bottom tanks*2	2020	2021	2022	2023
Southern Plants + National Storage facility	43	44	45	46
Northern Plants	24	24	24	24
Total	67	68	69	70

*2 The total number of double bottom tanks is shown as the cumulative total of those of the Southern Plants (including the two tanks with lining), the National Storage Facility and the Northern Plants.



Paved surface area m²	2020	2021	2022	2023
Protection of the soil along pipeways	77,481	79,621	82,448	82,795

Upgrading of the torrential rainfall management system

Activity commenced in 2018 and consisted of several stages of implementation that were completed in 2023. This consists of carrying out the necessary modifications to exploit the full capacity of the pumping system, installed in the tanks that collect stormwater, during exceptional weather events (torrential rainfall) in order to prevent emergency situations that may require the opening of the floodways.

Reduction of untreated water consumption

Awareness of the importance and scarcity of water resources has, over time, reinforced the policy of reducing the use of primary water sources, making increasing amounts of untreated water available to the territory for non-industrial uses.

Consumption optimisation and increased water recovery from the wastewater treatment system, together with investments in advanced technology, will result in a target of 650 m^3/h or less untreated water consumption by 2022-2024.
The attainable target of 90 percent of the rolling average of untreated water consumption over the three year period 2019-2021 has been rescheduled for 2022, defined as 691 m^3/h, achieved with 648 m^3/h net of exceptional weather events. Indeed, 2022 was characterised by extraordinary storm surges that prevented the normal use of seawater, leading to increased consumption of untreated water instead.
Untreated water consumption in 2023 is on target for the three-year period: about 640 m^3/h net of some exceptional weather events, which have resulted in increased consumption partially offset by recovery.

Waste

In order to reduce the production of waste, Sarlux has adopted, implemented and maintained over time effective waste management policies and systems in accordance with the best international standards. We have also designed and adopted specific technologies and efficiency measures, favouring recycling and reuse from a circular economy perspective.

Increased recovery of sorted municipal waste

The initiatives carried out over the past three years have pursued the twofold objective of reducing overall waste production and increasing the capacity to sort recyclable waste.
In recent years, building on the trend started in 2021, we have continued to reduce the volume of municipal waste we produce at the site, through constant initiatives and staff awareness campaigns. We have achieved the target of reducing by approximately 50 percent our municipal waste production compared to the value in the two-year period 2019-2020.
The goal for the three-year period 2022-2024 is to improve the ratio of sorted waste to total municipal waste by one percentage point per year from 44 percent in 2021; in 2023, this target was far exceeded, reaching 82 percent of sorted waste. In order to achieve this result, a great deal of work was carried out to optimise and harmonise waste collection points and collectors, introducing a widespread and targeted "micro-collection system". This was the result of the observation and needs reported by workers in the places where the waste is produced (e.g. canteens and refreshment areas, plant area, etc.), thus activating a strong corporate awareness.
In 2024 we will continue to implement the initiatives undertaken, to ensure continual improvement and consolidate the results achieved so far.

Industrial waste reduction

Over the years, new management approaches to reduce waste production or maximise recovery have been evaluated.
With regard to 2023, new projects have been initiated after the previous studies, which are summarised below:

1. Reducing in the amount of Filter Cake produced - use of Poly Aluminium Chloride instead of Iron(III) Sulphate
2. Reducing in the production of contaminated packaging - use of small roll-off vehicles to transport waste from the production point to temporary storage
3. Increasing the sending of waste for recovery instead of disposal - we are carrying out market searches to select specialised companies for the recovery of certain types of waste such as rock wool and FCC catalyst
4. Reducing the environmental footprint in the waste transport process.

In the pipeline for 2024 are the first shipments of recovered FCC catalyst and rock wool, and the first shipments of Filter Cake to Italy instead of Germany: the change of destination will lead to an optimisation of transport of about 1,000 km per trip, thereby reducing our environmental footprint.

Material

Biofuels and vegetable oil processing

The "Renewable Energy Directive II" (RED II), implemented by Legislative Decree no. 199 of 8 November 2021, aims to increase the use of biofuels for road transport (for both diesel and petrol vehicles). More precisely, under RED II the minimum quantity of biofuels blended into traditional fuels had to be 14 percent by 2030. The subsequent REDIII of 2023 increased this target to 29 percent.

With this in mind, we are considering promoting and implementing the production of HVO (Hydrogenated Vegetable Oil) in pure form or mixed with fossil fuel, for use as an alternative to traditional diesel without changes to the vehicle fuel system. HVO is obtained by hydrotreating various types of lipids (vegetable oils, waste and residual oils, animal fats).

Since 2019, Sarlux has been producing HVO in co-processing at our desulphurisation plants (MHC1, MHC2 and U700). We now have a production potential of around 230 kton/year, thanks to investments in logistics. Among the investments completed in 2023 is the construction of a new infrastructure to receive vegetable oils by road tanker, which also allows local oils to be processed, fostering the development of a circular economy.

The average processing of vegetable oil in 2019 - 2021 was 23 kt/year.
The processing targets of 30-40-55 kt/year are defined for 2022 - 2023 - 2024, respectively.
Processing in 2023 was lower than the target due to reduced refinery output related to the shutdown period and for economic reasons.

Table 80. **Biofuels - Vegetable oil processing**

Data in kt/year	Value	Target
2019-2021 average	23	
2022	62	30
2023	36	40
2024		55

An important new feature, included in the 2024 budget, is the production of pure HVO, which is to be confirmed by economic-based monthly processing schedules.
As part of the energy transition, studies are also underway on the production of HVO and SAF (sustainable aviation fuel) and the pre-treatment of crude vegetable oils.

Auxiliary materials

Reduction in nitrogen gas consumption

In the context of evaluating the use of auxiliary fluids, the consumption of nitrogen from the nearby Air Liquide plant, from an energy-intensive production process, can be identified as an indirect environmental aspect.
In view of its high concern for energy consumption issues, Sarlux has already activated actions for reducing nitrogen gas consumption in the second half of 2021.
With regard to the reduction of nitrogen gas consumption, the target of 95 percent of the rolling average of the last three-year period was defined.
In 2022, the target of 6602 Nm^3/h was reached with a final figure of 6272 Nm^3/h.
In 2023, the target of 6455 Nm^3/h was reached with a final figure of 5951 Nm^3/h.
For 2024, we expect to consolidate these improvements by maintaining the target of 6455 Nm^3/h.

An investment is being made in transformers for the cathodic protection of the pier, aimed at replacing mineral insulating oil with biodegradable vegetable insulating oil.

APPENDICES

Appendix to section 4. Data and improvement actions

Management performance indicators

Environmental medium concerned	Applicability	Definition of indicator	Unit of measurement
Training	Environmental training for in-house staff	Environmental protection training/total training hours	%
		Emergency management training/total training hours	%
BBS (Behaviour-Based Safety) Activities	BBS Activities BBS Field inspections and worksite inspections	Number of checklists/findings/feedbacks/worksite inspections carried out	number of checklists/ number of findings/ feedbacks/worksite inspections
Emergencies	Process emergencies and anomalies	Number of general and localised emergencies	number

Significant direct environmental aspects

Environmental aspect concerned	Definition of indicator	Unit of measurement
Consumption of raw materials	Quantity of raw materials processed	kt/year
	Raw materials by geographical area	%
	Production of oil products	t/year
	Low-sulphur crude oil processed/total raw materials processed	%
	Quantity of sulphur in products/quantity of sulphur in raw materials entering the site	%
	Quantity of sulphur recovered in the production cycle/quantity of sulphur in raw materials entering the site	%
Energy consumption	Gross energy consumption	GJ/year
	Exported Energy	GJ/year
	Net energy consumption	GJ/year
	Site Specific Consumption Index (SCI)	GJ/t
Emissions to air	SO_2 emissions in mass flow	t/year
	Specific SO_2 emissions	t SO_2/kt raw materials
	Sulphur content in fuels	% (in weight)
	Integrated Emission Management SO_2 concentration	mg/Nm³
	SO_2 concentration at IGCC	mg/Nm³
	SO_2 concentration at Northern Plants	mg/Nm³
	NOx emissions in mass flow	t/year
	Specific NOx emissions	t Nox/kt raw materials
	Integrated Emission Management NOx concentration	mg/Nm³
	NOx concentration at IGCC	mg/Nm³
	NOx concentration at Northern Plants	mg/Nm³
	Dust emissions in mass flow	t/year
	Dust concentration for IGCC	mg/Nm³
	CO emissions in mass flow	t/year
	Specific CO emissions	t CO/Mt raw materials
	CO concentration for IGCC	mg/Nm³
	Non-channelled emissions	t/year
	Diffuse emissions - fugitive emissions - VOC	t/year
	Burnt gases in the Flares system	kt/year - t/day
	CO_2 Emissions	t/year
	Whole-site specific CO_2 emissions	t CO_2/kt raw materials
	Refinery+Northern Plants specific CO_2 emissions	t CO_2/kt raw materials

Water - consumption/emissions	Absolute site water consumption	m³/year
	Whole-site specific water consumption	m³/t raw materials
	Site water consumption - sources of supply	m³/year - %
	Site water demand - untreated water - seawater	m³/year
	Quantities discharged into the receiving body of water	%
	Process-related discharges - absolute values	m³/year
	Process-related discharges - specific values	m³/t raw materials
	Waste water COD - absolute values	t/year
	Wastewater COD - specific values	t/Mt of raw materials processed
	Wastewater COD - average concentration values	mg/l
	Hydrocarbons and nitrogen - wastewater - absolute values	t/year
	Hydrocarbons and nitrogen - wastewater - specific values	t/Mt raw materials
	Hydrocarbons and nitrogen - wastewater - concentration	mg/l
	Other discharges - absolute values	m³/year
	Other discharges - specific values	m³/kt raw materials
	Discharges from desalinators and IGCC tower - absolute values	m³/year
	Discharges from desalinators and IGCC tower - specific values	m³/t raw materials
	Discharges from the seawater demineralisation plant - absolute values	m³/year
	Discharges from the seawater demineralisation plant - specific values	m³/t processed raw materials
	Discharges from Northern Plants - absolute values	m³/year
	Discharges from Northern Plants - specific values	m³/t processed raw materials
	Suspended solids - discharges from the incoming water primary treatment units - absolute values	t/year
	Suspended solids - discharges from the incoming water primary treatment units - specific values	t/Mt of raw materials processed
	Suspended solids - discharges from the incoming water primary treatment units - concentration	mg/l
	Suspended solids from desalinator discharges - absolute values	t/year
	Suspended solids from desalinator discharges - specific values	t/Mt of raw materials processed
	Suspended solids from desalinator discharges - concentration	mg/l
	Suspended solids from IGCC tower - absolute values	t/year
	Suspended solids from IGCC tower - specific values	t/Mt of raw materials processed
	Suspended solids from IGCC tower - concentration	mg/l
	Suspended solids from Northern Plants - absolute values	t/year
	Suspended solids from Northern Plants - specific values	t/Mt of raw materials processed
	Suspended solids from Northern Plants - concentration	mg/l
	Suspended solids from the seawater demineralisation plant - absolute values	t/year
	Suspended solids from the seawater demineralisation plant - specific values	t/Mt of raw materials processed
	Suspended solids from the seawater demineralisation plant - concentration	mg/l
Waste	Breakdown of waste generated at the site	%
	Waste generated at the site by hazardous and non-hazardous categories	t/year
	Breakdown of hazardous waste - absolute values	t/year
	Outgoing waste from the site - absolute values for hazardous and non-hazardous waste	t/year
	Filter cake waste	t/year
	Specific production of typical refining process waste	kg/t raw materials
	Outgoing waste from the site sent for recovery and disposal	%
	Total waste sent for recovery	t/year
	Destination of outgoing waste from the Sarlux site	%
	Sorted/mixed municipal waste	%
	Sorted/mixed municipal waste - absolute values	t/year

Soil and subsoil	Quantity of product recovered/quantity of water extracted from the wells of the hydraulic barrier	%
Land use in relation to biodiversity	Total land use	%
Noise	Equivalent sound pressure level at site limits	dB(A)

Quality indicators for specific environmental media

Environmental medium concerned	Applicability	Definition of indicator	Unit of measurement
Atmosphere	Sarroch area (surveys by the public air quality monitoring network)	SO_2 - Compliance with the thresholds (three-hourly, hourly and daily measurements of concentration limits	no. of times limit exceeded/year
		SO_2 - annual mean concentration	micrograms/m³
		PM10 - Compliance with hourly concentration limits	no. of times limit exceeded/year
		PM10 - annual mean concentration	micrograms/m³
		NO_2, NOx - annual mean concentration	micrograms/m³
		NO_2 - Compliance with the hourly and daily concentration limits	no. of times limit exceeded/year
	Sarroch hinterland (surveys using bioindicators)	Index of Atmospheric Purity (IAP)	pure no. plus a quality assessment
Seawater	Stretch of sea fronting the site (chemical surveys)	Trophic index (TRIX)	pure no. plus a quality assessment
		CAM Index	pure no. plus a quality assessment
Noise	Sarroch area	L90 statistical indicator of sound pressure at points located in the town of Sarroch	dB(A)

Significant indirect environmental aspects

Environmental medium concerned	Applicability	Definition of indicator	Unit of measurement
External companies	Information for contractors	Number of HSE training hours/number of hours worked by subcontractors	%
	Contractors with certified management systems	Contractors with ISO 9001 certification	%
		Contractors with ISO 14001 certification	%
		Contractors with ISO 45001 certification	%

Glossary

ARERA
The Italian Regulatory Authority for Energy, Networks and the Environment (ARERA) is an independent body, established by Law no. 481 of 14 November 1995 "Rules governing competition and the regulation of public utility services".

ARPA
Acronym for the Regional Environmental Protection Agencies. In April 1993, a referendum removed the National Health Service and Local Health Units powers in the area of environmental control and protection. This created a vacuum of jurisdiction, which was filled by Law no. 61 of 1994, which converted Decree-Law no. 496/93 assigning these tasks to special "Regional Agencies" for local environmental monitoring and control.
Law no. 61 of 1994 also established ANPA (Agenzia Nazionale per la Protezione dell'Ambiente - the Italian Agency for Environmental Protection and Technical Services), now ISPRA, which supervises and coordinates the Regional Agencies and those based in Italy's autonomous provinces. In the following years, all Italian Regions and Autonomous Provinces set up their own agencies. ARPA Sardinia (ARPAS) was created under Regional Law no. 6 of 18 May 2006.

Audit
A term used in various contexts, with the meaning of "verification", "review" In the field of environmental management systems, an audit is a systematic and documented verification to objectively assess the compliance of an organisation's environmental management system with specified criteria.

CAM Index
The Classification of Seawater index is used to monitor the coastal marine environment, interpreting the values measured and placing them in one of three categories of seawater quality, assessed according to the degree of eutrophication of coastal systems and potential health risk:

- high quality: uncontaminated water
- average quality: water with varying degrees of eutrophication, but ecologically intact
- low quality: eutrophic water with evidence of environmental changes that are partly due to human activity.

CO (carbon monoxide)
A gas produced by the incomplete combustion of fuels and fossil fuels. The main source is petrol engines that do not have catalytic converters.

CO_2 (carbon dioxide)
An odourless, colourless, flavourless gas produced from the combustion, respiration and decomposition of organic material. Its properties include the ability to absorb infrared radiation emitted by the earth's surface, which contributes to the greenhouse effect.

COD (Chemical Oxygen Demand)
The amount of oxygen required to oxidise organic matter in waste water, including non-biodegradable matter.

Cogeneration
Process by which two different energy products, such as electricity and heat, can be generated together in a single, specialised plant, resulting in high environmental efficiency.

dB(A)
Unit of measurement of noise expressed in logarithmic units (deciBel) and electronically filtered to take into account the varying sensitivity of the human ear to different sound frequencies (filter "A").

Desulphurisation
The process for treating oil fractions in order to reduce the sulphur content in refined products.

Efficiency
The efficiency of a machine is defined as the ratio between the power supplied (or energy generated) and the power absorbed (or energy consumed) at a given time.
The greater the efficiency, the more efficient is the machine; the lower the efficiency, the more energy is wasted.

EMAS
The EcoManagement and Audit Scheme, established by Regulation (EEC) no. 1836/93, updated by Regulation (EC) no. 1221/2009 (EMAS III), is a voluntary scheme intended to promote continuous improvement in the environmental efficiency of industrial activities.
The Regulation requires participating companies to implement environmental management systems at their production sites, based on environmental improvement policies, programmes, procedures and targets, and to publish an Environmental Statement. Before a site can be included in the register set up by the European Commission, the Environmental Statement must be approved by a verifier accredited by an authorised national body. In Italy, this body is the Ecolabel and Ecoaudit Committee, which has been operating since 1997 with the technical support of ISPRA (Istituto Superiore per la Protezione e la Ricerca Ambientale - Institute for Environmental Protection and Research).

Emission
The discharge of any solid, liquid or gaseous substance into the ecosystem from an industrial plant or any other source, which can have a direct or indirect effect on the environment. Emissions are measured at the point of exit.

Emission Trading
On 13 October 2003, the European Commission published the Directive on emissions trading (Directive 2003/87/EC), better known as the Emissions Trading System. The key points established by the directive are as follows:
- as of 1 January 2005, no plant falling within the scope of the Directive may emit CO_2 (i.e. continue to operate) without appropriate authorisation
- each year, the operators of these plants must surrender CO_2 allowances equal to the CO_2 released into the atmosphere to the competent national authority
- maximum CO_2 allowances have been set for every plant covered by the Directive
- CO_2 emissions actually released into the atmosphere are monitored in accordance with the requirements of the competent national authority and certified by an accredited verifier.

Environmental aspect
An aspect of an organisation's activities, products or services that has or can have an impact on the environment.

Environmental impact
Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services.

EPER
The European Pollutant Emission Register was set up by the European Commission by Decision of 17 July 2000 (2000/479/EC), in accordance with Article 15 of European Council Directive 96/61/EC on integrated pollution prevention and control (IPPC). EPER is the EU's first and most wide-ranging record of emissions into the air and water from industrial plants.

E-PRTR
The European Pollutant Release and Transfer Register is the integrated emission register that the European Union has set up on the basis of EC Regulation (EC) no. 166/2006 ("Regulation on of the European Parliament and of the Council concerning the establishment of a European Pollutant Release and Transfer Register and amending Council Directives 91/689/EEC and 96/61/EC"). The E-PRTR register was created within the framework of the Aarhus Convention (Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters) and replaces the previous EPER register, expanding its information content and bringing together data reported annually by more than 30,000 European industrial plants. Data are collected and reported to the European Commission on an annual basis.

Extrarete (Italian wholesale market)
This is the wholesale market in oil products sold to customers such as industries, consortia and public bodies.

Filter cake
The product from filter presses, called "filter cake" due to its physical consistency, is the solid resulting from the gasification process of heavy refinery products. It contains high percentages of metals such as iron, vanadium, carbon and nickel.

Greenhouse effect
A gradual increase in average atmospheric temperature due to the increased concentration of gases in the atmosphere. Substances that contribute significantly to the greenhouse effect (greenhouse gases) include chlorofluorocarbons (CFCs), carbon dioxide (CO_2), methane (CH_4), nitrogen oxides (NO_x) and sulphur hexafluoride (SF_6).

GSE
The Gestore dei Servizi Elettrici, established by Article 3 of Legislative Decree no. 79/99, is the joint stock company owned by the Ministry of the Treasury that provides incentives for the production of electricity from renewable and equivalent sources and is responsible for the qualification of renewable energy systems and their electricity production.

IEA/AIA (Integrated Environmental Authorisation)
The IEA/AIA (Integrated Environmental Authorisation) is a comprehensive permit authorising operation of an industrial facility, while imposing measures to prevent or reduce emissions into the air, water or soil, including measures relating to waste, in order to achieve a high level of overall environmental protection. The IEA permit replaces all other environmental permits, authorisations, approvals or opinions specified by law and related implementing legislation.

IGCC
Integrated Gasification Combined Cycle.

Immission
The release into the atmosphere or water of a pollutant, which then spreads into the environment.
The concentration of the pollutant is measured at a distance from the point from which it was emitted.

INES
The National Inventory of Emissions and their Sources is the national inventory set up pursuant to Legislative Decree no. 372 of 4 August 1999 (implementing Directive 96/61/EC) and to Decrees of the Ministry of the Environment of 23 November 2001 and 26 April 2002. The register contains information on the emissions of Italian industrial sites that are subject to IPPC legislation.
The legislation states that such companies must submit qualitative and quantitative data to ISPRA each year in relation to a set list of pollutants present in gaseous and aqueous waste from their plants. This information is then submitted to the Ministry of the Environment for forwarding to the European Commission. The register has been replaced by the EPRTR (European Pollutant Release and Transfer Register).

IPPC
The 1996 European Directive on "Integrated Pollution Prevention and Control", now replaced by the Industrial Emissions Directive 2010/75/EU ('IED').

ISO
The International Organization for Standardization is an international non-governmental organisation based in Geneva, to which the standard-setting bodies of around 140 countries belong. It is responsible for examining, drafting and distributing to the international community standards relating mainly to environmental management (ISO 14000) and quality assurance (ISO 9000) for companies in all sectors.

kt
Unit of measurement of mass, equal to 1,000 tonnes.

kWh
Unit of measurement of electricity generated or consumed, equal to 1 kW generated for one hour.

Kyoto Protocol
An international treaty adopted by the Conference of Parties in Kyoto (1-10 December 1997), containing the first decisions on the implementation of certain commitments (the most urgent and priority objectives, relating to specific sectors of the national economies) of the United Nations Framework Convention on Climate Change (UN-FCCC), adopted in 1992 and ratified by Italy in 1994.
The Protocol commits developed countries and transition countries (Eastern European countries) to reduce their emissions of greenhouse gases (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride) by a total of 5 percent by 2010.

L90
Sound pressure level exceeded for 90% of the noise measurement time; a statistical measure often used to assess background noise from continuous sources, such as many continuous-cycle industrial sources.

Major accident hazard
The probability that a specific event, such as a major emission, fire or explosion due to uncontrolled developments and involving one or more hazardous substances as defined by Legislative Decree no. 105/15, will occur during the operation of a site, resulting in an immediate or delayed serious hazard to human health or the environment, inside or outside the site.

Management system
The organisational structure, planning activities, responsibilities, procedures, practices, processes and resources to formulate, implement, achieve, review and control, where possible, all the internal and external variables of an organisation.

MW
Megawatt is a multiple of kW (kilowatt), the unit of measurement of a power station's power, i.e. its energy-generating capacity. It also measures the power consumed by an item of electrical equipment.
For example, a light bulb can absorb 0.1 kW (100 watts). 1 MW is equal to 1,000 kW.

MWh
Megawatt-hour is the unit of measurement of electricity generated or consumed, equal to 1 MW generated for one hour and equivalent to 1,000 kWh.

NOx (Nitrogen oxide)
Gaseous compounds consisting of nitrogen and oxygen (NO, NO_2, etc.), normally released during the combustion of fossil fuels when free nitrogen (N_2) is oxidised.
They are the main agents in the atmosphere responsible for photochemical smog and, after SO_2, the biggest cause of acid rain.

OHSAS
The Occupational Health and Safety Assessment Series is the set of standards developed to replace the previous British Standard 8800 in order to meet the growing demand for a recognised standard on the organisation needed to manage health and safety. OHSAS 18001 certification has been developed to be compatible with ISO 14001 and ISO 9001 and allow for the adoption of an integrated management system. Although not yet an international standard, OHSAS 18001 certification can be obtained by following a procedure similar to that used for ISO.

Piezometer
Small-diameter tube or well inserted into a body of water and used to measure, by means of the water level reached inside the tube, the level of the piezometric line (the line where points with a height equal to that of the body of water are located) at a given point.

PM10
Particulates with a diameter of less than 10 μm (1 μm = 1 millionth of a metre) can pass through the airways and penetrate the lungs, becoming a potential health hazard depending on the substances involved.

ppm
Unit of measurement of the concentration of a substance present in small quantities in a liquid or gas, corresponding to parts per million.

Reliability
The reliability of a piece of equipment is defined as the probability of its operating properly, for a given time, under certain conditions.

SO_2 (sulphur dioxide)
A colourless gas with a pungent odour that is released during the combustion of sulphur-containing fossil fuels. High concentrations of SO_2 in the atmosphere are the main cause of acid rain.

Total frequency index

Together with the severity index, it is one of the most common indicators of health and safety performance in the workplace: over a given period, it expresses the ratio between the number of accidents, the number of medical treatments and the number of hours worked (calculated using the formula no. of accidents + medical treatments x 1,000,000/ no. of hours worked).

TSP (Total Suspended Particulates)

These are tiny solid particulates suspended in the air. Carbonaceous material able to absorb various types of compound onto its surface. Particulates with a diameter of less than 10 μm (1 μm = 1 millionth of a metre) can pass through the airways and penetrate the lungs, becoming a potential health hazard depending on the substances involved.

Data di Emissione corrente: 26/11/2024 Verifica per rinnovo entro il 27/6/2025

Prossima verifica entro il: 27/06/2025
N. Identificativo Dichiarazione:
LRC6003918/EMA/001

DICHIARAZIONE DEL VERIFICATORE AMBIENTALE SULLE ATTIVITÀ DI VERIFICA E CONVALIDA

LRQA Italy S.r.l., verificatore ambientale EMAS accreditato Accredia 0039MS/ Codice EU n° IT-V-0010 per i settori (codici NACE) indicati in calce.

DICHIARA

di aver verificato che il sito indicato nella *Environmental Statement 2022-2024, sixth edition – Rev. 2 of 13 June* 2024 di:

Sarlux S.r.l.
Strada statale 195 Sulcitana, km 19.5
09018 Sarroch (CA), Italia

Registrazione N.: IT-**000995** **Codici Nace: 19.20 (Raffinazione, ricezione, stoccaggio, preparazione e spedizione di prodotti petroliferi), 35.11 (Produzione e vendita di energia elettrica), 20.14 (Fabbricazione di altri prodotti chimici di base organici)**

risponde a tutte le prescrizioni dei Regolamenti n. 1221/2009 e 1505/2017 e 2026/2018 del Parlamento europeo e del Consiglio sull'adesione volontaria delle organizzazioni a un Sistema Comunitario di Ecogestione e Audit (EMAS).

Con la presente dichiarazione si attesta che:

- la verifica e la convalida si sono svolte nel pieno rispetto delle prescrizioni dei regolamenti (CE) n. 1221/2009, 1505/2017 e 2026/2018.
- l'esito della verifica e della convalida conferma che non risultano elementi che attestino l'inosservanza degli obblighi normativi applicabili in materia di ambiente,
- i dati e le informazioni contenuti nella dichiarazione ambientale/dichiarazione ambientale aggiornata dell'organizzazione/sito forniscono un'immagine affidabile, credibile e corretta di tutte le attività dell'organizzazione/del sito svolte nel campo d'applicazione indicato nella dichiarazione ambientale.

I presente documento non è equivalente alla registrazione EMAS. La Registrazione EMAS può essere rilasciata unicamente da un organismo competente ai sensi del Regolamento (CE) N, 1221/2009, 1505/2017 e 2026/2018. Il presente documento non è utilizzabile come comunicazione a se stante destinata al pubblico.

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