Sarroch Refinery
Environmental and Safety Report 2007

SARAS


SARAS

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Presentation

The Environment and Safety Report provides a summary of our operations in this area and is an important means of internal and external communication. We consider safety and the environment to be crucial in carrying out our day-to-day corporate and industrial activities. Once again, in 2007 our aim was to ensure that good financial results and industrial growth went hand-in-hand with environmental sustainability, and the progress recorded in all three areas will act as a springboard for further goals and targets.

Our strategy of continual improvement is based on concrete achievements and specific results: for example, in 2007 we succeeded in reducing our SO_2 emissions significantly to 7,390 tons, versus 9,690 in 2003, a decrease of 24%; we also increased the proportion of twin-hulled ships used from 73% in 2003 to 96% in 2007.

In other areas we achieved results that have enabled us to set new targets. We reduced production of CO_2 across the whole site, to 429 tons per thousand tons of crude processed, from 449 tons in 2003. This was despite increased output of gasoline and gasoil, the quality of which has improved considerably since the introduction of new European standards in 2005.

In the area of safety we have stabilised our results at higher levels than in previous years, but we believe that we must build on this with further efforts and initiatives to reduce the number of accidents. The total accident frequency rate fell to 12.3 for Saras staff and 10.8 for external staff in the three-year period 2005-2007, from 16.0 and 14.5 respectively in the two-year period 2003-2004.

This report also contains other information that highlights the company's constant and wide-ranging efforts in the area of environment and safety. We strongly believe that dialogue with the local community and all our other stakeholders must be founded on clear and transparent information about our industrial activities.

Against this backdrop of ongoing improvement and verification of the results obtained, we are still working towards obtaining EMAS certification in 2008, and the release of environmental and safety data is just one of the initiatives undertaken with this goal in mind. On the safety front, we will continue to focus and intensify our efforts as we have in the past few years, through a continuous training programme: for 2008 we are preparing an initiative in partnership with a leading company in the sector, to ensure that we match up to international standards, and to identify areas for improvement.

In implementing these projects, which are of fundamental importance in consolidating and increasing the environmental sustainability and safety of our activities, we can count on the support of all Saras staff, who represent the lifeblood of our company.

General Manager Saras S.p.A.

Dario Scaffardi

The Sarroch site

The Saras Group and the Sarroch plant

The Saras Group

The Saras Group, established in 1962 by Angelo Moratti, is one of the leading operators in the refining of crude oil and sale of oil products in Italy and Europe; at the end of 2007 the group had over 1,800 employees, of which more than twothirds are based in Sardinia.

It operates in the following areas:

- the refining of crude oil and sale and distribution of a wide range of oil products (including gasoline, diesel, naphtha, diesel, LPG and aviation fuel) on the domestic and international markets
- the distribution and sale of products on the Italian market and abroad, via Arcola Petrolifera in Arcola (La Spezia) and Saras Energia, based in Spain
- the generation and sale of power through Sarlux and Parchi Eolici Ulassai
- IT services through Akhela and industrial-engineering services and scientific research for the oil, petrochemical, energy and environmental sectors through Sartec.

With sales at end-2007 of over EUR 6.6 billion (+11% versus 2006), a comparable[1] gross operating margin of EUR 587 million – up by 3% – and an adjusted[2] net profit of EUR 250 million, an increase of 3% compared to end – 2006 – Saras is a constantly growing company that can remain highly competitive even when times are tough for the global economy. For these reasons, in May 2006, the Group was listed on the stock market, in the blue chip segment of the electronic share market of Borsa Italiana.

Group companies

Saras SpA – a subsidiary of Angelo Moratti S.a.p.a. – is the parent company, with its registered office in Sarroch. It was established in 1962 to carry out refining activities, and today owns the Sarroch production plant. It has shareholdings in a number of subsidiaries in Italy and abroad, which are briefly described below.

Arcola Petrolifera sells oil products on the domestic wholesale market, in Sardinia and through various bases in northern and central Italy. The company also provides transit services to oil operators for retail and bunker activities from its logistics centre in Arcola (near La Spezia).

Sarlux was established to build the refinery's IGCC (Integrated Gasification Combined Cycle) plant.

Saras Energia SA distributes oil products in the Spanish retail and wholesale market.

[1] Gross operating margin: profitability indicator calculated as profit from ordinary operations, gross of interest (financial management), taxes (fiscal management), depreciation and amortisation. Comparable: calculated by valuing inventories using LIFO and adjusted for non-recurring items.

[2] Adjusted net profit: net profit adjusted for the difference between inventories valued using LIFO (Last in First Out – oil stocks at historical values) and inventories valued using FIFO (First in First out – oil stocks at current values), after taxes, non-recurring items after taxes, and changes in the fair value of derivatives after taxes.

Sardeolica (100%-owned by Parchi Eolici Ulassai) generates power from wind farms in the Sardinian region. Sardeolica built and manages a wind farm in the municipality of Ulassai (in Ogliastra) with installed capacity of 72 MW. This wind farm, which began operating in 2005, is one of the largest in Italy and has been perfectly integrated with its surroundings.

Akhela is an IT company with extensive experience in managing the Sarroch refinery's IT systems: it provides services and solutions in the information, communication and technology sectors related to logical security in the IT environment and to physical security in industrial environments, offers consultancy for the reorganisation and rationalisation of IT infrastructure, and develops cutting-edge tools and applications in the embedded sector for the automotive (engine management), audio processing and avionics industries.

Sartec-Saras Ricerche e Tecnologie provides industrial engineering and scientific research services nationally and internationally. It has created a joint venture in China with a local partner, and has installed an environmental monitoring network in the city of Shou Zou in the Yangtze area. Sartec also designs, manufactures and implements modular package plants installed on skids to identify environmental emissions.

A large manufacturing centre in the heart of the Mediterranean

The Saras refinery at Sarroch is one of the biggest by size and processing capacity in Italy and Europe. It is also one of the largest refineries in the Mediterranean region in terms of production capacity, and the second most complex of the six European super-sites, with petrochemical activities also carried out onsite.
The Saras refinery today accounts for around 15% of Italy's total refining capacity. It has processing capacity of 15 million tons of crude oil per year (around 300,000 barrels a day), catalytic conversion capacity of 9.6 million tons per year (FCC + 2 MHC), thermic conversion capacity of 2.4 million tons per year and an integrated gasification combined cycle (IGCC) plant with processing capacity of 1.2 million tons per year, which is, in all respects, a conversion plant.
Located around 20km south of Cagliari, the site boasts an excellent geographical and strategic position in relation to the entire western-central Mediterranean region, encompassing both European and north African countries, while its proximity to Polimeri Europa and Sasol Italy enable it to add petrochemical production to its refinery operations.
Its large processing capacity and structural complexity make the Sarroch plant a focal point of production activity in the Mediterranean region, through its separation and conversion operations, and modulation of the different stages of the production cycle based on the characteristics of the crude oil which is processed to obtain oil products of high commercial and environmental quality.

History of the refinery

Saras' connection with Sarroch dates back to 1962, when Angelo Moratti identified it as a strategic location for an oil refinery. Construction of the refinery facilities began in 1963, starting with the first atmospheric distillation unit, the first three desulphurisation plants and the marine terminal. Refining activity began in 1965.
Over the years that followed, the Saras refinery acquired an increasingly important position in the Mediterranean basin, thanks to continuous upgrades to its production facilities to keep up with market developments and continually improve its environmental performance in line with new regulations.
Until the end of the 1980s, Saras mainly provided refining services for third parties (i.e. it refined crude oil owned by other oil companies that provided Saras with the raw materials to produce oil products), and the refining of crude oil acquired directly by Saras was a secondary activity. In the mid-1990s, following a significant downturn in demand for high-sulphur fuel oil, Saras launched a major industrial project to build an integrated gasification combined cycle (IGCC) plant to generate

electricity from a heavy fraction (TAR) derived from the refining process, using highly efficient technology with a low environmental impact.
The project was carried out through Sarlux (100%-owned by Saras), and today the Sarroch refinery is an energy hub that generates enough power to meet over 30% of Sardinia's requirements; furthermore, the full integration of the oil production cycle with the power cycle allows for the complete conversion of raw materials into finished oil products and electricity.
In subsequent years, the company continued to invest in and update technology for its production plants and to improve the environmental impact of fuels, partly to comply with increasingly stringent quality standards established by new regulations.
These initiatives led to a progressive reduction in the percentage of sulphur in the refinery's oil products and to an improvement in the quality of middle distillates and gasoline: between 1997 and 2001 investment of approximately EUR 1.2 billion was made to achieve these objectives.

Strategy and investment

The Group's investment is still strongly focused on continuously upgrading the Sarroch refinery, and aims to achieve organic growth that is increasingly geared towards sustainable development. The objective of the investment plan launched in 2006 (2006-2009 plan) totalling EUR 600 million is to optimise operations at the Sarroch refinery. As part of this programme, Saras started two big maintenance operations in 2007: one in the second quarter and the other in the fourth quarter. Some of the most significant investment in 2007 related to the ongoing building of two new processing units that will enable the refinery to increasingly comply with the best information on environmental performance and product quality:

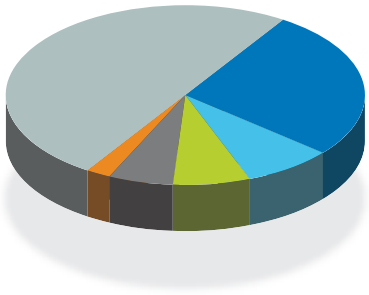
- the new **U800 desulphurising unit** will come on stream in the second half of 2008 and will enable the refinery to produce only high-quality gasoline,in line with European specifications which, as of 2009, will require sulphur content to be 10ppm or less
- **the TGTU unit** – a plant that treats gas outflows from sulphur recovery facilities will also be operational in the second half of 2008 and will further reduce sulphur oxide emissions.

Other activities launched in 2007 related to:

- **gas exploration using** seismic tests in Sardinia, which produced encouraging preliminary results; an expansion in onshore exploration, while the start of off-shore testing is planned for early 2008
- **construction of a biodiesel plant** in Spain, with a capacity of 200,000 tons per year, which will be completed for the second half of 2008, with an investment cost of around EUR 35 million.

As part of its plans to expand its operations, especially in the wind energy sector, the Saras Group is also carefully evaluating a strategy of growth through acquisitions.

Graph 1 - Refinery products 2007



Medium distillates	50%
Naphtha and gasoline	27%
TAR and gasification	8%
Fuel oil and other	7%
Consumption and losses	6%
LPG	2%

Table 1 – Raw materials processed by the Sarroch refinery: origin of crude oils (%):

Origin	2003	2004	2005	2006	2007
Africa	53	54	61	61	55
Middle East	25	19	13	13	11
Former Soviet Union	10	11	8	6	15
Europe	12	16	18	20	18
North America					1
Total	100	100	100	100	100

Sarroch refinery oil production

The Sarroch plant has a high output of medium products (diesel) and light products (LPG, naphtha and gasoline), which in 2007 accounted for around 80% of total production, as shown in Chart 1.

The considerable productive potential and skilful management of commercial activities have enabled the plant to maintain high production levels, with an average of 14.36 million tons each year for the last five years.

Furthermore, the refinery's geographical location proved strategically suited for the supply of crude oil from north African countries, the entire Mediterranean region and the neighbouring Middle East.

A variety of processed raw materials can be used due to the flexibility and adaptability of the refinery's production cycle. Table 1 gives a breakdown of the origins of raw materials processed in 2007.

The primary, but not sole destination of refinery products is the central and western Mediterranean basin. During the period 2005-2007, almost a quarter of total production of oil products was absorbed by the regional market.

Overall, in 2007, 9.4% of products were shipped in tanker trucks, of which around 11.6% was transported via pipelines connecting the Saras refinery with the plants of Polimeri Europa, Sasol and the Sarlux IGCC), while the remaining 79% was transported in oil tankers.

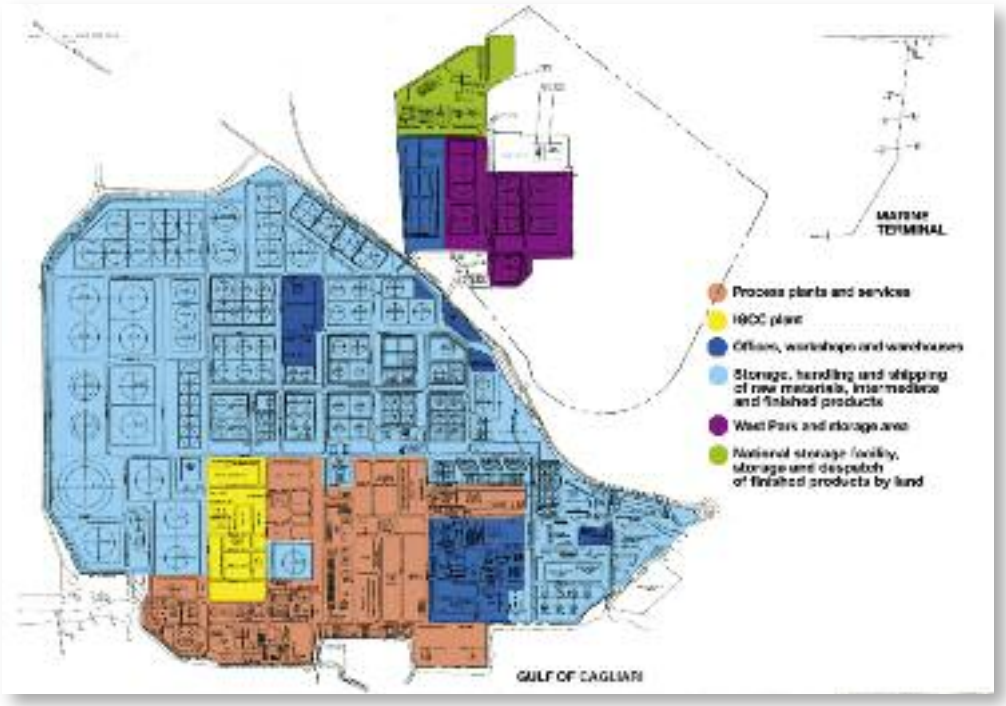
Site layout

The Sarroch site can be divided, by function, into five different sections:

- marine terminal
- production area
- storage area
- handling and shipping area
- auxiliary services.

Marine terminal. The raw materials received and all refinery products shipped to markets outside the region arrive and leave by sea. As mentioned, in 2005-2007, 79% of all oil products dispatched from the site were transported by ship. The marine terminal linked to the refinery has a 1,600-long wharf and a fixed platform connected to it by a 1,200m piling. The terminal has 11 independent docking berths, nine of which are for shipping finished oil products and docking oil tankers of up to 65,000 tons of deadweight capacity. These docking berths contain two platforms which enable ships of up to 300,000 tons of deadweight capacity to dock for the pick-up of crude oils. The various docking berths can operate simultaneously, thus reducing waiting times for anchored ships. Advanced monitoring systems ensure that all loading and unloading operations take place under conditions of the utmost safety: the phases relating to the docking, mooring of ships and their connection to loading/unloading lines to transfer raw materials and finished products from land to ship are carried out under continuous surveillance. In order to be admitted to the Saras marine terminal, all arriving ships must comply with rigorous safety standards that conform to internationally-recognised criteria as well

Figure 1 - General plan of the Saras site



as additional requirements laid down by the Saras Group to provide greater protection for the marine environment; compliance with these requirements is rigorously monitored by Saras staff (page 24).

A dedicated control room, which is manned and operational 24 hours a day, is in continuous radio contact with the ships operating in the terminal, and ensures that all operations fully comply with all safety and environmental protection requirements.

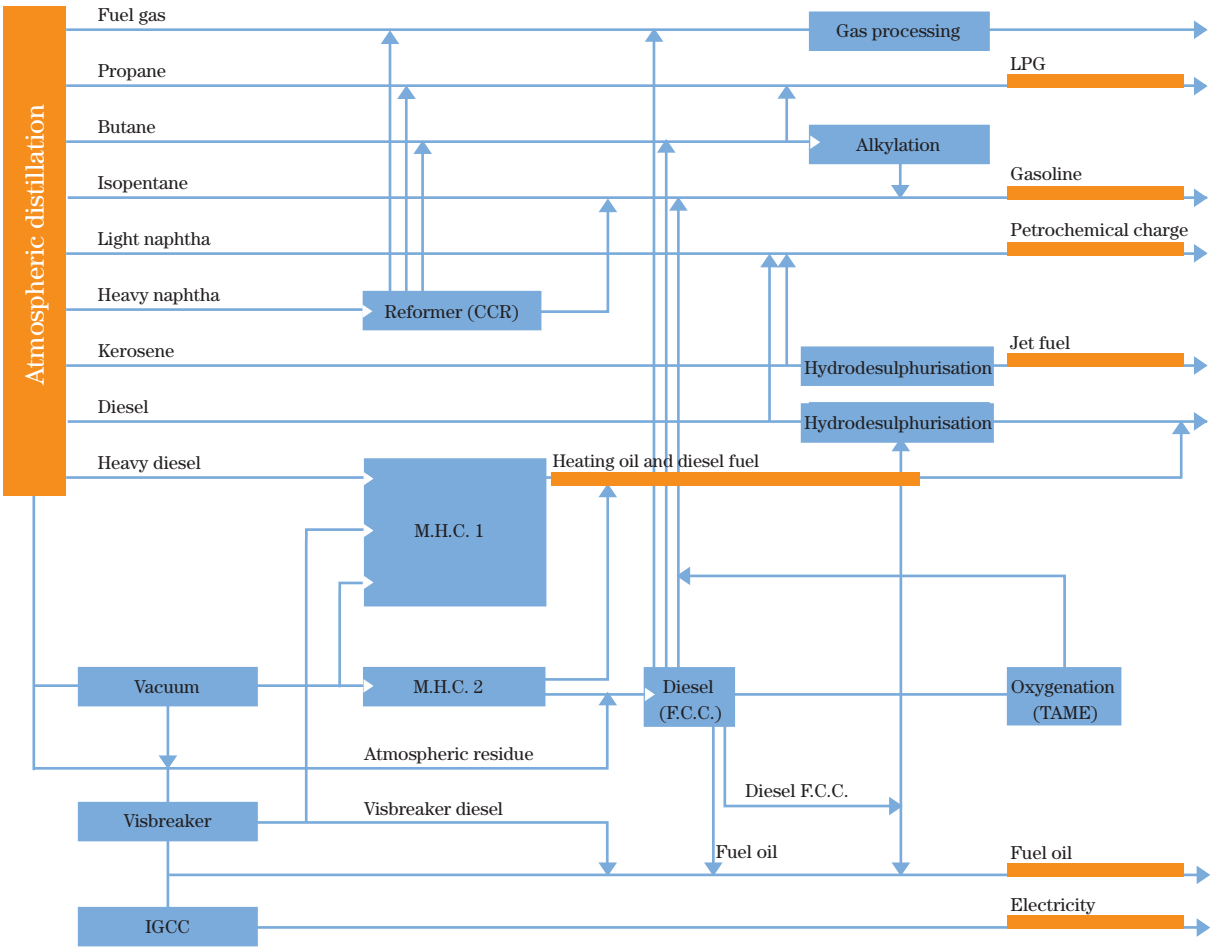
Production area. The production area comprises several oil-processing plants, which can be divided into:

- *distillation plants,* the atmospheric distillation (topping) and vacuum distillation units, which produce the primary fractions from crude oil
- *residue-and heavy-distillate conversion plants*, where conversion (transformation by chemical reaction) takes place to produce medium-light fractions; thermal or catalytic processes are used in the visbreaking, mild hydrocracking 1 and 2 and cracking units for this purpose
- *light-distillate transformation plants* which carry out the catalytic reforming of gasoline, transforming light-distillate fractions (naphtha) into high-octane components; hydrogen, used in desulphurisation treatment is produced at the same time.
  In addition, the ecological characteristics and performance of gasolines are improved at the TAME plant, while the alkylation plant improves their technical qualities
- *middle-distillate treatment plants*, where middle distillates (kerosene and diesel) are treated with catalytic hydrogenation processes to remove sulphur and improve quality. The sulphur removed is recovered as sulphuric acid and transformed into solid sulphur (a commercial product).

Storage area. In addition to crude oil storage tanks, the refinery's storage area also includes tanks to store finished products.

In total, there are 161 tanks located in the refinery and in the nearby customs and excise national storage facil-

Figure 2 - Production cycle at the Saras site



ity (this is located outside the bonded area for the refinery and stores raw materials and finished products for which excise duties have not yet been paid), with an overall capacity of around 3.8 million cubic metres.
All tanks are fitted with permanent fire-prevention systems and containment basins of reinforced concrete, or with earthworks.
For the storage of liquefied petroleum gas (LPG), since it is a gaseous product and therefore very volatile, in order to maximise safety, the fire-prevention system is controlled by a device that, depending on various factors (including wind direction) activates systems to prevent fires and contain any product leakage.

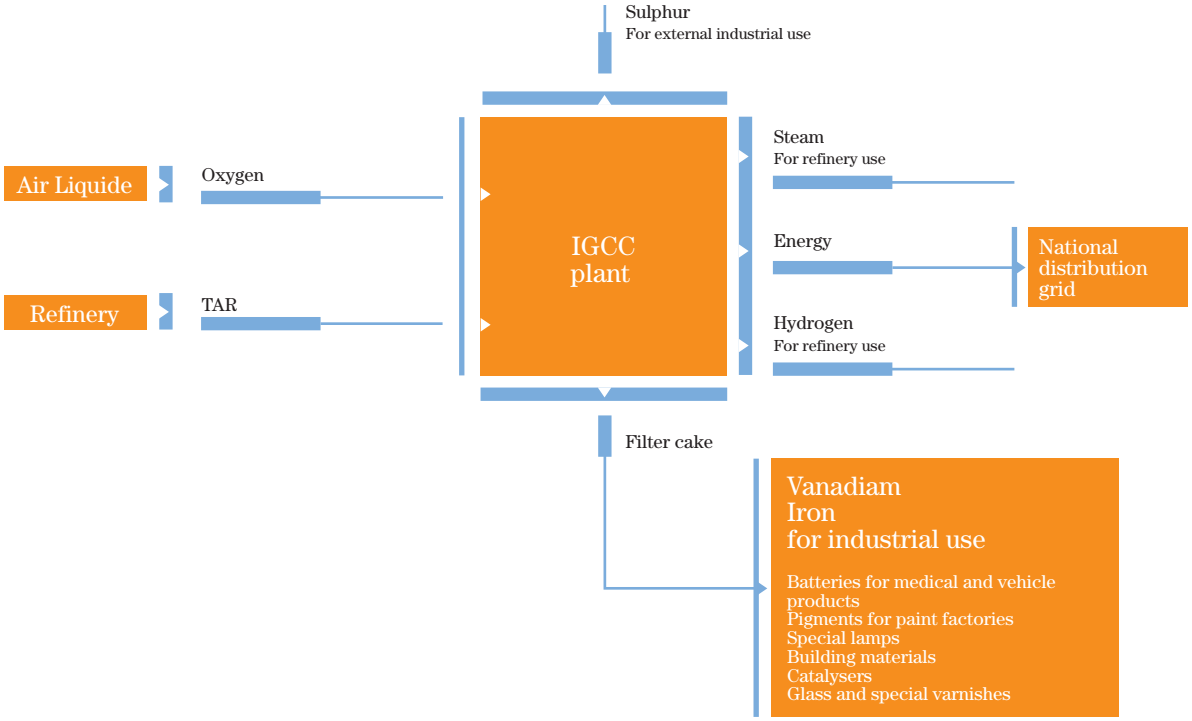
LPG tanks are also equipped with instruments that monitor and protect against unexpected pressure surges.

Handling and shipping area. This area includes all the equipment used to move products and raw materials internally between the various plants and storage areas, as well as the loading of finished products and the delivery of raw materials.

These facilities can be divided into three groups:.

- lines and pumping systems
- land-loading systems
- measurement and additivation systems.

Figura 3 - The IGCC plant: flow chart



Auxiliary services. In addition to the units described above, the plant has equipment used in the production cycle (power/steam supply, waste treatment, environmental services, etc.) and auxiliary services such as fire prevention systems, a medical centre and a staff canteen. The IT system also plays a fundamental role in plant management, enabling basic data and information to be collected, processed and then made available in the appropriate form to the corporate services that use them.

The system, which is continuously updated with new technologies and adapted to the refinery's changing requirements, comprises calculators, communications networks, basic software and all the applications used by Saras staff on a daily basis for their work.

The system architecture is based on four large IT areas:

- the IT production, handling and shipping system, including the management of all environmental data
- the IT management/administration system, including the handling and shipping of raw materials and finished products
- the communications and information management systems (intranet portal, post and document management systems)
- internet portals for external communication (investors, suppliers, contractors, etc.).

Power generation: the Sarlux IGCC plant

The IGCC (Integrated Gasification Combined Cycle) plant, which is fully integrated with the refinery's production processes, generates power, hydrogen and steam, as well as sulphur and metals concentrates, using the heavy components (TAR) derived from the refining process (the source for the generation of power assimilated to renewable sources). The plant, owned by Sarlux and managed by Saras, is located within the refinery in an area previously occupied by storage tanks. In January 2001, after a one-year start-up phase, it commenced commercial operations. Through the gasification of around 150 tons/hour

of TAR and using 165 tons/hour of oxygen, the Sarlux IGCC plant has a net nominal power of 551 MW with a maximum of 575 MW; it produces over 4 million MWh of electricity per year, providing over 30% of Sardinia's power requirements. It also produces 40,000 Nm^3/hour of hydrogen, 100 tons/hour of medium-pressure steam and 80 tons/hour of low-pressure steam, sulphur and 1,300 tons/year of metals concentrates rich in vanadium and nickel ("filter cake"). Filter cake from the IGCC plant is the solid material derived from the gasification of heavy refinery products and is, in turn, the raw material used in the chemical and steel industries.

All of the filter cake from the Sarlux IGCC plant is sold to GfE Gesellschaft für Elektrometallurgie mbH in Nuremberg, Germany, a multinational specialising in the production of metals such as iron, vanadium, carbon and nickel used in the automotive, aeronautics and rocketry, and electronics industries, as well as in the manufacture of high-capacity batteries (made of lithium vanadate). 1,700,370 kg of filter cake was produced in 2007.

Figure 3 shows how the IGCC plant enables the Saras production site to operate virtuous management of incoming and outgoing materials from the manufacturing process that produces high output, maximises the use of feedstocks and minimises waste, as all materials are recovered and recycled in external industrial processes.

The raw materials required for the IGCC plant to operate – TAR and oxygen – are supplied to Sarlux by the refinery, and, under exclusive contract, by external supplier Air Liquide Italia, which produces oxygen at an air-fractioning plant around 2.5 km from the Saras site.

Downstream from the production process, all the power generated is sold to Italy's national grid operator, the GSE. The hydrogen and steam are used by the refinery in its production processes and to reduce the sulphur content of its products, thus reducing the energy required for the oil-processing cycle and therefore the atmospheric emissions. Lastly the sulphur and metal concentrates are sold to industry. In 2005-2007, the Sarlux IGCC plant provided the refinery with around 35% of the hydrogen used in its production processes.

The Sarlux IGCC plant has three production lines, ensuring process continuity in power generation and the production of hydrogen and steam.

The figures recorded to date confirm the effectiveness of the plant processes and technology.

The plant is extremely reliable (an average of over 90%), and in 2006 recorded a service factor of 92.5%, which was its best ever performance and an excellent result, made possible partly thanks to a procedure in place to assess, forecast and schedule all plant monitoring and maintenance operations. This shows that the IGCC has not only confirmed, but often far exceeded the performance forecast when it was designed. Its overall efficiency has also been higher than the planned 51% expected of this technology, recognised as BAT (Best Available Technique) for the refining sector (see Table 2, page 16).

Gasification, combined cycle and cogeneration

The IGCC plant's production process can be divided into two main sections:

- **gasification,** in which heavy distillates from the refining process are transformed into an extremely clean synthesis gas (eliminating metals and sulphur and, as mentioned, used for other external industrial purposes)
- **combined cycle cogeneration,** which generates power through the combustion of the synthesis gas in a turbine.

Gasification, which has been used in the chemical industry for decades, is a chemical transformation process that has significant environmental and energy efficiency advantages compared to a production cycle based on direct combustion typical of traditional thermoelectric power stations.

Combined cycle cogeneration developed in the 1980s, thanks to technological progress in gas turbines, includes all the operations required to produce several types of energy (e.g. electricity and thermal power in the form of steam) from a single energy source.

In the specific case of the IGCC plant, hydrogen production may also be combined in an additional form of cogen-

eration. This technique was developed in the 1950s, and became established in the 1960s due to its extreme reliability and process efficiency.

Environmental and technological advantages of IGCC plants

This type of plant offers particularly significant environmental and technological advantages. These stem from the adoption of the best available technologies, which have delivered one of the highest efficiency ratings (i.e. the ratio between energy produced and raw materials used) among the various production processes (over 50%, see Table 2) and result in extremely low emissions, with a performance superior to ENEL's national average benchmark figure (Table 10, page 49).

A reduction in emissions produced by the Sarroch site as a whole (refinery + IGCC) was achieved following the start-up of operations at the gasification plant.

This result is also due to a series of improvements made to the refinery's equipment, especially as regards sulphur oxide emissions; furthermore reduced fuel oil production has led to a fall in the number of ships crossing the Bay of Sarroch. From a technological viewpoint, the main advantage of IGCC plants is the integration of the oil cycle with the electrical cycle: the overall processing cycle constitutes a complete circuit during which all incoming material is transformed into a finished product or energy. Note that the Sarlux plant's water requirements – which are particularly high for large power plants – are met entirely from sea water, which is desalinated and then demineralised in specific Sarlux and Saras plants; it therefore does not affect Sardinia's water supplies. This water is then returned to the sea and thus fully complies with all environmental quality criteria established by law.

The refinery and the local area

The area most affected by refinery operations from a socio-economic standpoint covers four municipalities: Sarroch, Villa San Pietro, Pula and Capoterra, which form a fairly homogeneous area south-west of Cagliari.

The region has two main economic activities: those connected to the energy and petrochemical centre around Sarroch and the Macchiareddu industrial area, and those relating to the region's natural resources of agriculture, animal farming and tourism, especially in the Pula area.

Saras' predominant position in terms of size and production capacity therefore has a significant effect on employment; since it began its operations, the refinery has increased its workforce from 100 to 1,172, split between the Sarroch plant, which employs the majority (over 90%), and its two offices in Rome and Milan. It also supports the related employment of around 7,000 people.

The refinery's production units are a major development driver for a group of companies and an industrial class, but also for the advanced service sector, which can find a place in sophisticated production and technological processes. Note the important role that the plant fulfils as a supplier of fuel to almost all regional industries, and the active cooperation with the neighbouring chemical companies with which Saras buys and sells many of the raw materials required for production.

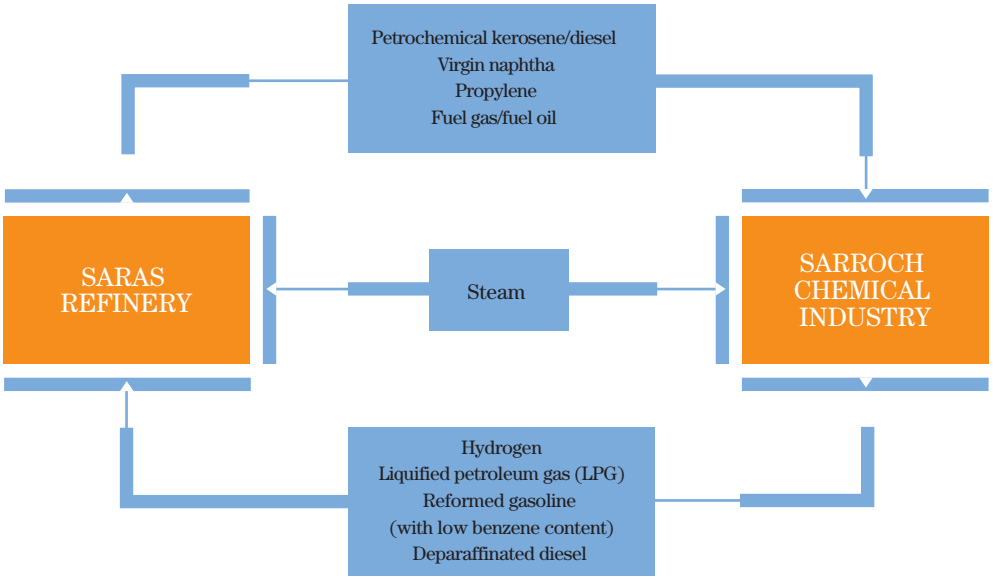
Communication with the local community

We have launched many initiatives and expend continuous effort in building a dialogue and forging relationships within the area: this is the local community's expectation of us, and we have taken it on board as a routine commitment.

Table 2 – Efficiency comparison of power-generating plants

Plant	Overall efficiency (gross)
Natural gas combined cycle	56÷57%
Natural gas conventional cycle (turbogas)	30÷35%
Conventional fuel oil cycle	35÷38%
IGCC Sarlux	51%

Figure 4 - Synergy between the Saras refinery and the nearby chemical industry



For ten years, the Progetto Scuola (Schools Project), aimed at children in class V of the elementary schools in Sarroch and the region's other municipalities, has given us the opportunity to liaise and collaborate with local schools. It is also primarily an opportunity to talk to the children and their families, obtain useful feedback and provide the area's schoolchildren with further opportunities to learn about energy, the environment and the industrial and business activities that take place at the Saras site. We also attach great importance to site visits for older pupils, where meetings with Saras engineers provide an opportunity for mutual discovery and knowledge-sharing.

In October 2007, we launched a special initiative in this regard: the Refinery Open Day.

For the first time, Saras opened the doors of its plant to local residents, welcoming around 4,000 people, who were taken on guided tours of the equipment over a period of two days. Learning centres were created – for adults and children – with information about the site; Saras employees were on hand to answer visitors' questions and provide information about the group as a whole.

The event was a considerable achievement, directly involving over 90 Saras employees from many areas of the company's business. It was also an important exercise in the development of team cohesion and internal motivation for the staff who were closely involved in the planning and implementation of this project.

This crucial step on the route to opening up to the region – a route on which we intend to continue – was in keeping with the objectives and spirit of EMAS registration, one of Saras' key objectives.


SARAS

Policies

Environmental management and protection of natural resources

Environmental certification

Saras has always been aware of the various aspects of the plant's activities that have an impact on the environment, and as part of a long-held commitment to environmental protection, in 2001, it implemented measures to obtain Environmental Management System (EMS) certification for the refinery in accordance with International Standard ISO 14001.
Firstly, on 23 May 2002, the company officially issued its Environmental Policy Declaration to all its staff. In the document, the company defined the guiding principles and commitments undertaken to guarantee that its operations become increasingly environmentally-friendly.
The preparation of the Environmental Management Manual and definition of the associated procedures established a code of conduct for all company staff, making each employee personally responsible for its implementation; auditing activities were subsequently established to regularly check that divisions are applying EMS procedures correctly. Based on environmental analysis, annual objectives for improvement are established by the Management Committee and General Management.
In June 2004, Saras obtained EMS approval pursuant to ISO 14001:1996. Following continuous monitoring of EMS and its implementation, on 4 May 2006, a revised version of the Environmental Policy (see page 21) was issued to all direct employees and contractors working at the refinery. In May 2006, the refinery's EMS was approved pursuant to the update of ISO 14001:2004. Subsequently, in June 2007, the three-yearly check of the EMS was carried out in accordance with ISO 14001:2004 (See page 23).
Saras is now in the second cycle of the EMS.

As stipulated by law, the certifying body Lloyd's Register Quality Assurance carries out an inspection of the site every six months. In order to harmonise the company's auditing activities, Saras has now combined all its audits, encompassing environmental, health and safety, and quality issues, as well as safety measures for the prevention of major accidents.
Continuing in this direction, the refinery's new objective is to obtain EMAS (the European Eco-management and Audit Scheme) registration for the site (EC Regulation 761/2001).
The registration process, involves the following activities:

- initiating a procedure to disclose information on the company's environmental performance to the public
- continuing to disclose information on environmental performance and the safety of the site with respect to the surrounding region
- increasing the involvement of internal staff and contractors
- launching verification procedures provided for by EMAS regulations.

POLITICA AMBIENTALE SARAS

SARAS ENVIRONMENTAL POLICY

Saras considers respect and protection of the environment to be of primary importance in the pursuit of its growth objectives and for the proper integration of its activities in the region in which it operates. The criteria that provide the basis for the management of Saras' operations envisage the preventive evaluation of the possible environmental consequences of new activities and products; the adoption of the principles, standards and benchmark solutions indicated in the "Refinery BREF" (best available techniques reference documents), prepared in accordance with Directive 61/96/EC (the IPPC Directive – Integrated Pollution Prevention and Control); full transparency and co-operation with the community at large and the authorities; and the involvement of, and creation of a sense of responsibility in, its staff and plant visitors concerning the issue of environmental protection.
Via the introduction and maintenance of the Environmental Management System applied to the refining and power generation activities of the Sarroch refinery, Saras intends to ensure efficient and proper management of the plants and on-site activities, and to achieve – also in compliance with current regulations – the objectives of continuous improvement in environmental performance and pollution prevention.

Saras specifically undertakes to:

- continue activities to reduce atmospheric emissions, to ensure they have a minimum impact on air quality
- continue activities to prevent sea pollution, taking action on seafaring cargo vessels and on the waste water treatment system
- minimise use of fresh water from external sources
- improve the waste management cycle, promoting recycling
- develop its own system for monitoring emissions and environment quality
- improve the accessibility and usability of data collected and studies carried out
- mitigate the impact of its activities perceivable by the surrounding community

Saras firmly believes that achievement of the above objectives is possible only with the active contribution of all staff, and has developed a continuous information and training system with regard to these issues.
Each member of staff at Saras is directly responsible, during the performance of his/her activities, for implementing the environmental policy. Conduct consistent with these matters is one of our individual and group objectives.
The management bodies are those, first and foremost, responsible for this policy. Saras has undertaken to communicate its environmental policy to contractor companies, suppliers and any other person working on behalf of the company, and requests that is applied by these parties. Responsibility, conduct and attitudes to environmental issues are also significant factors in the
assessment of the quality of service rendered by these parties, who should be provided with suitable
training and information on these issues. Saras undertakes to ensure the human and technical resources necessary to achieve and maintain the environmental policy at the Sarroch site.

Sarroch, 4 May 2006 Saras SpA
General Manager

Quality certification

Before obtaining environmental certification, the company took steps to adopt a Quality Management System (QMS),
which defined procedures for managing a series of internal areas/processes in the refinery. Presently, the company activities in the following areas are certified according to the ISO 9001:2000 Quality Standard:

- **Product movement**, which entails the preparation of products according to customers' contractual specifications
- **Shipping**, which regards the distribution by land and sea of products requested by customers
- **Operational and medium-term scheduling**, which involves supervising the arrival of crude oil and feedstocks, their processing, and the preparation and dispatch of finished products requested by customers
- **Engineering**, which regards the design of new plants and improvements to existing plants
- **Construction**, which entails the building of new plants and modifications to existing facilities.

Furthermore, the following processes, although not certified, are carried out within the QMS framework in accordance with Reference standard ISO 9001:2000 and QMS procedures, to protect customers and the market in which Saras operates:

- **Reception**, which supervises the loading/unloading of products and crude oil and feedstocks at the marine terminal
- **Analytical control of production**, by means of the chemical laboratory, which is responsible for verifying and monitoring the hydrocarbons produced
- **Purchasing and Tenders**, which issues and schedules orders for materials and tenders according to requests received, and selects and evaluates suppliers
- **Human Resources and Organisation**, which ensures that employees meet company requirements, through careful staff selection and hiring, and the acquisition, development and transfer of professional expertise
- **Supply and Trading Management**, which draws up contracts for the supply of crude oil and feedstocks (through both purchasing and processing contracts) and the sale of products
- **Maintenance**, which is responsible for activities necessary to keep the infrastructure and equipment used to make the products ordered by customers functioning and running efficiently.

Air quality safeguards

The constant monitoring of air quality is a key element in a strong environmental protection policy. Over the years, Saras has therefore acquired the tools and adopted the management procedures to do so.
Air quality outside the Sarroch refinery (emissions) is checked by three monitoring networks, comprising a total of 14 control units of which four belong to Saras and six to Polimeri Europa, while the other four are managed by the Province of Cagliari[1] (data on page 63).
The Saras network – managed with those of the local authorities and other companies in the region – provides data on changes in parameters relevant to air quality in real time, to ensure that pollution is kept below the minimum levels laid down by the laws in force and that immediate steps can be taken when necessary.
Each of the four Saras control units (Villa d'Orri, Sarroch, Porto Foxi and the national storage facility) is equipped with analysers that continuously gauge levels of the following pollutants in the air: SO_2, NO_2, CO, H_2S, PM10, ozone and hydrocarbons.
The control unit located in the national storage facility area also has a weather station. The Province of Cagliari network records average hourly concentrations of pollutants: SO_2, NO_2, dust, H_2S and PM10 at all control units;

[1] On 18 February 2008, the management of the control units was transferred from the Province of Cagliari to ARPA Sardegna

CERTIFICATO DI APPROVAZIONE

Si certifica che il Sistema di Gestione Ambientale di:

Saras S.p.A.
Galleria De Cristoforis, 8 (MI)
Strada Statale 195 Sulcitana - Km. 19.500 - Sarroch (CA)

è stato approvato dal Lloyd's Register Quality Assurance per conformità alla seguente norma di Sistemi di Gestione Ambientale:

ISO 14001:2004
EN ISO 14001:2004
UNI EN ISO 14001:2004

Il Sistema di Gestione Ambientale si applica a:

Produzione di prodotti della raffinazione del petrolio, programmazione, preparazione e spedizione di prodotti finiti, produzione di energia elettrica. Gestione della progettazione, ingegnerizzazione e costruzione di impianti interni.

La validità di questo certificato è abbinata al certificato dello stesso numero che elenca le ubicazioni oggetto dell'approvazione.

Certificato di Approvazione N.: LRC 180526/14

Approvazione Originaria: 1 Giugno 2004
Certificato Attuale: 30 Luglio 2007
Scadenza Certificato: 1 Giugno 2010

Firmato da: Lloyd's Register Quality Assurance Italy S.r.l.

CERTIFICATE OF APPROVAL

This is to certify that the Environmental Management System of:
Saras SpA
Galleria De Cristoforis 8 (MI)
Strada Statale 195 Sulcitana – km 19.500
Sarroch (CA)

has been approved by Lloyd's Register Quality Assurance
to the following Environmental Management System Standard:
ISO 14001:2004
EN ISO: 14001: 2004
UNI EN ISO: 14001: 2004

The Environmental Management System is applicable to:
Production of refined oil products, planning, preparation and dispatch of finished oil products, power generation. Design, engineering and construction of internal plants.

Approval
Original Approval: 1 June 2004
Current Certificate: 30 July 2007
Certificate Expiry: 1 June 2010
Certificate No: LRC 180526/14
Issued by: Lloyd's Register Quality Assurance Italy Srl

ozone and benzene at three units and CO at one unit.
A dedicated monitoring system constantly checks emissions from the IGCC plant for the following: SO_X, NO_X, PTS, CO and smoke load, guaranteeing a high degree of reliability, as shown by the data availability index (the ratio between the analyser's operating hours and normal plant operating hours), which in 2006 was on average higher than 90%. There is a similar system to monitor emissions from the refinery's centralised stack, which collects approximately 40% of total emissions (Topping 1 and thermoelectric plant, TES) and monitors the same parameters described above. The remaining emissions are monitored periodically with samples taken manually.

Water quality safeguards

Aware of the problem of scarce water resources in the region, Saras adopted specific measures to reduce the use of primary water sources by:

- procuring water from different sources
- installing a first desalinator in 1994 with a capacity of 300 m^3/hr, followed by the installation of six desalination modules for the IGCC in 1999, with a total capacity of approximately 600 m^3/hr
- implementing measures to maximise the recycling of purified water from the refining process, following improvements to the treatment process and increased filtering capacity.

The desalination plant allowed for a significant reduction in the use of fresh water from the CASIC water system (Cagliari Industrial Development Area Consortium, responsible for managing the water system in the Sarroch industrial area) without disrupting the marine ecosystem by the refinery.
In terms of water treatment systems, the refinery is equipped with a process-water purification (PWP) plant and a ballast water treatment (BWT) plant for oil tankers transporting crude and products to and from the refinery. They were both built with the best technology available, and equipped with pollutant-monitoring systems; both process water and ballast water are subject to an oil extraction process that separates hydrocarbon particles from the water, which is then treated. Furthermore, part of the water treated with the PWP system (approximately 400 m^3/hr) is reused for industrial purposes in the refinery, thereby reducing the amount of water taken from primary sources such as the water system and the seawater desalination system.

Measures to protect the sea and coastline

Since the beginning of the 1990s Saras has launched various initiatives to protect the sea and coastline.
The most significant are:

- the adoption of **Saras Minimum Safety Criteria** to screen and accept ships. This comprises a list of minimum safety requirements ships must have before they may be examined and authorised to operate at the Saras marine terminal
- the implementation of the **Safety Service**, which involves the presence of qualified personnel on board ships throughout operations to verify that equipment is adequate and used correctly in accordance with anti-pollution and safety regulations. This measure is intended to mitigate and minimise the greater risk to the marine environment due to ships transporting particularly heavy and polluting products (such as crude oil, fuel oil and some types of diesel) and in recent years has been extended to all incoming single-hull ships that are twenty years old or more.
  An average of 300 ships are inspected every year, corresponding to more than 38% of maritime traffic
- the implementation of the automatic **ESD system (Emergency Shut Down)**, to prevent the spilling of products by automatically stopping the loading pumps and closing the interception valves of oil products in the event of a pressure surge
- a **ban on the discharge** of **segregated ballast** (sea water that does not come into contact with oil products) into the sea at night applied to ships carry-

ing particularly polluting and dirty products
- an agreement with a **specialised company** for the continuous presence of anti-pollution staff and equipment.

The quality of the sea water off the coast near the refinery is tested twice a year (see page 70). In the event of a spill, vehicles and equipment are available to deal quickly with the accident following procedures laid down in the Internal Emergency Plan, which includes the Marine Pollution Prevention Plan (see page 38).

The Sarroch Refinery has four vessels that operate 24 hours a day:
- the "**Nettuno**", an anti-pollution motorboat equipped with systems to recover and store heavy hydrocarbons
- the pilot boat "**Pegaso**" to transport people and equipment and to assist in the positioning of floating booms
- the working boat "**Proteo**" to position floating booms and carry out operations in shallow water
- the motorboat "**Tripesce**" to position floating booms and carry out operations in shallow water.

A multi-faceted system guarantees that the plant is able to respond immediately and fully to contain and remove any product spills, using the following equipment:

- three skimmers to collect spillage floating on the surface of the water with a recovery capacity of up to 27 m^3/hour
- five floating tanks, each with 5m^3 capacity, to collect any product recovered from the sea
- three motor pumps to recover products with a capacity of up to 48 m^3/hour
- 1,950 metres of floating booms to contain floating product, equipped with inflating systems (three compressors and two blowers)
- three radio buoys connected to the GPS system
- absorbing systems.

Saras has also decided to increase the use of twin-hull ships to transport crude oil and oil products.
Currently, on the basis of international agreements, all ships transporting heavy crude oil and heavy fuel oil (high density) must have twin hulls. To further guarantee protection of sea and coastline, Saras committed to using at least 97% twin-hull ships to carry light crude oil as well (low density, not bound by the aforementioned agreements) in 2006; it also decided on a target of at least 90% of double-hull ships to transport gasoline, kerosene and diesel oil.
A check of these commitments showed that 100% of the ships used to carry light crude oil were twin-hulled and 93.9% of ships used to transport gasoline, kerosene and diesel oil were twin-hulled: therefore in 2008, as part of its objective of constant improvement, a goal of 98% was set for twin-hulled ships for crude oil transport and 95% for gasoline, kerosene and diesel oil (see Table 3).
To further guarantee protection of sea and coastline, all leasing contracts stipulated by Saras for the supply of crude oil and feedstocks and products contain clauses prohibiting any ship from passing through the Bonifacio Straits.

Waste management

Waste management at the Saras site (see data on page 68) focuses primarily on minimising waste production, and thus on a process of collection that recovers and then properly disposes of waste.

Table 3 – Commitments and results relating to the protection of the marine environment from shipping traffic 2007

	Commitment for 2007	Result for 2007	Commitment for 2008
Twin hull for light crude oil	At least 97%	100%	At least 98%
Gasoline/kerosene/fuel oil	At least 90%	93.9%	At least 95%

The first step involves the selection of waste products, the quantity and type of which are recorded. Procedures to recover or dispose of it are then followed, according to the characteristics of the waste, as determined by analyses carried out by specialist external laboratories in accordance with legal provisions.
There is a specific internal procedure to deliver waste from different phases of the production cycle to specialist waste treatment companies.
In 2007, the refinery, together with the municipality of Sarroch, continued separated waste collection of glass, aluminium, paper and plastics from office and catering activities at the plant, registering an increase compared to 2006, the year that separated waste collection began (as shown in Table 18 on page 68). It collected and sent 84.5 tons of paper, 11.5 tons of plastic and 4.3 tons of glass and aluminium to be recycled.

Noise monitoring

In 1999, Saras planned and implemented regular controls of sound levels in the local area, by means of phonometric investigations to establish the acoustic characteristics of the surrounding environment.
Control units to measure noise levels have been set up along roads close to the refinery, on roads leading to Sarroch city centre and in the city centre itself.
These areas are marked on the aerial photographic map (Figure 5). Phonometric measurements show that the refinery emits constant steady noise, with fluctuations of ± 2.5 dB around the average. In the city centre, the noise level fluctuates more markedly, as it is affected by noise from vehicle traffic and other noises unrelated to the refinery. The noise level of L90 attributable to the plant (which allows traffic noise to be excluded), measured at night, is considerably less than the recordings taken in Sarroch city centre.
The latest measurement samples taken in 2007 confirm this trend, as shown in Graphs 2 and 3. Saras did not only assess noise levels outside the Sarroch plant. As part of the measures to provide protection from physical agents, the company repeated a series of assessments regarding the exposure of staff to noise, in accordance with Heading Vbis of Legislative Decree 626/94 (as amended by Legislative Decree 195/96) and continued its phono-

Figure 5 – Aerial map

metric measurement programme, which was launched in 2006 with the T2-V2 plant, and which will enable the whole area around the plant to be acoustically mapped.
In 2007, the group mapped the FCC-COBo-V1 and CTE plants and the New Chemical Laboratory, measuring noise levels and the sound spectrum in the various operational areas and the control units accessible by operators.
This mapping has the following objectives:

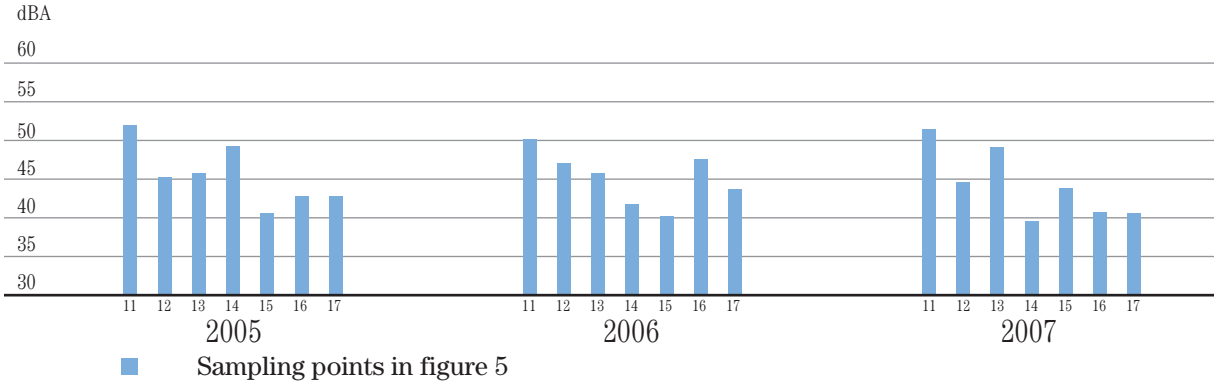
- to precisely define the noise levels to which staff are exposed
- to identify higher-risk areas and outline appropriate preventive measures
- to select appropriate ear protectors and identify measures to reduce loud noises at source.

An analysis of the phonometric data enabled the company to quantify the potential acoustic effects of the noise in the working environment under normal operational conditions.

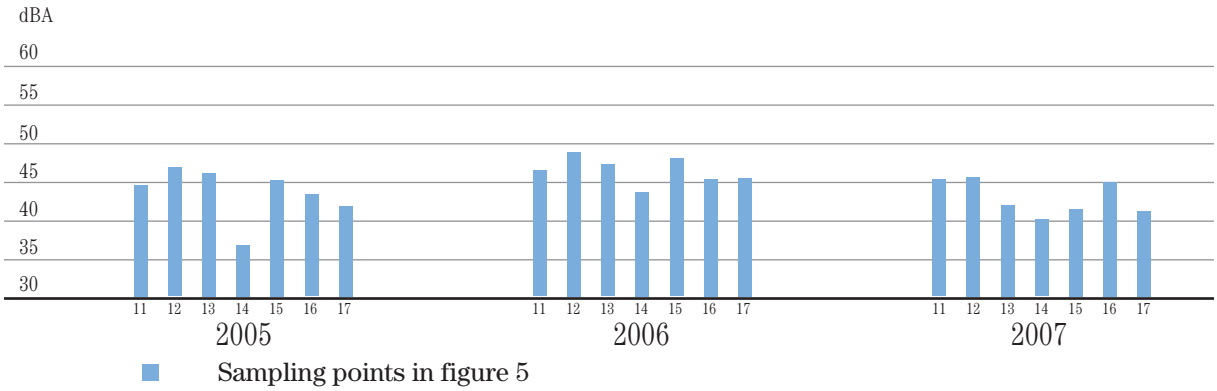
Soil, subsoil and underground water

In compliance with the provisions of Ministerial Decree 471 of 25 October 1999 and subsequent amendments (regulations containing criteria, procedures and methods for the safety, reclamation and environmental restoration of polluted sites), Saras, pursuant to Article 9 of the Decree, presented the competent authorities with its Site Characterisation Plan on the state of the terrain

Graph 2 - External environmental noise emissions – L90 levels – day (Sarroch city centre)



External environmental noise emissions – L90 levels – night (Sarroch city centre)



and the layers of water beneath the refinery. Subsequently, in 2004, in conjunction 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, the company defined the procedures for implementing the Site Characterisation Plan, which set out a series of surveys to be carried out and proposed the measures needed to protect the environment and safeguard public health.

In July 2004, characterisation activities were initiated at the site using the following techniques:

- **surveys of the terrain** by extracting core samples from 5 to 10 metres deep to establish the subsoil stratigraphy, ascertain whether any contaminants are present and measure their concentrations
- **piezometry**, special surveys of the terrain by extracting core samples from 10 to 20 metres deep that can monitor the surface layers of water. This type of survey not only takes a stratigraphy of the subsoil and its quality (as in the surveys), but also makes it possible to verify the condition of the water in the subsoil. Piezometry is carried out with a tube made of transparent glass inserted in the area where the water flows that periodically takes samples of water to check its quality
- **gas surveys,** a technique to verify the presence of hydrocarbon gas in the soil interstices.

In the first phase – which included approximately 490 surveys, 109 piezometry readings and 500 gas survey control units, the following situations were recorded:

- **results of the surveys of terrain** beneath the refinery showed that the situation complied with the limits set out in regulations for industrial sites; only at some limited and non-adjoining areas did concentrations of contaminants in the soil exceed the limit, which confirmed that these were isolated cases, rather than a widespread problem
- **water samples** taken with piezometers identified a "supernatant" product (hydrocarbon phase) in certain clearlydefined areas floating above the groundwater, in the form of a thin layer in the soil interstices

Figure 6 – Location of physical and dynamic barrier under construction

- **the gas survey** showed no gas present in the terrain.

Based on the results described above, reclamation work was begun immediately (April 2005) to extract the supernatants from the contaminated piezometers (at 14 of the 90 control units). At the same time studies into the design of a decontamination project started, and work on the Site Characterisation Plan continued, and to date has included approximately 520 surveys and 120 piezometer readings. The project was submitted to the Ministry for the Environment, and, after appropriate amendments, was approved in April 2007.

During the authorisation process, works commenced on the first phase of the proposed project: a dynamic barrier made up of wells to extract the groundwater and recover the supernatants. The final project is for a combined system comprising a dynamic barrier along three axes and a physical barrier along the refinery's boundary on the sea side as shown in Figure 6.

The physical barrier will confine the surface groundwater that flows slowly seawards, while the dynamic barri-

er (consisting of water-extracting wells) will keep the level of the groundwater constant while at the same time removing and recovering the supernatants. Investment of approximately EUR 15 million will be required to build this system.
The dynamic barrier along the main axis will be completed by 2007, while the other two parts upstream from the plant and on the sea side are currently being completed. "Field tests" are currently in progress for the physical barrier, as these are necessary to establish with precision how it will be completed.

Measurement of electromagnetic pollution

In 2001, in order to determine the possible existence of risk situations, Saras launched a study to analyse and assess this phenomenon within and outside the refinery area. The first phase of the study was completed in October 2001 with the aid of a rigorous measurement system. The results were completely satisfactory, confirming that the magnetic fields generated inside the plant are well within the legal limits established to protect the population.
In addition, it was found that no such fields existed outside the company perimeter. This study was followed by a further survey, completed in 2004, which assessed the exposure of staff to electromagnetic fields while working: in this case too, levels were much lower than those allowed by law.
A study was conducted in July 2007 to check the results obtained in 2001. Magnetic fields were again monitored, using the same criteria adopted in the 2001 study.
Figures came out in line with those of the previous study, confirming that the magnetic fields generated by the plant are well below the legal limits established to protect the population.
A new internal survey is due to be conducted in 2008 on the exposure of staff to electromagnetic fields during their work, in accordance with the regulation in force (Legislative Decree 257 of 19 November 2007).

Improving the internal and external visual impact

The company has also made a commitment to improving the plant's visual impact, which has been stepped up since 2000. Particular attention has been focused on perception of the environment and structures as seen from both inside and outside the plant, with the aim of providing a more pleasant working environment and improving the refinery's relationship to its surroundings.
To achieve the first aim, the internal area was renovated through improvements to spaces and structures, painting, upgrading of green areas, graphics to raise awareness about environmental protection and safety, and new signs. Also, several sculptures, created following suggestions from employees and external companies, and made of scrap metal and other materials used in plant operations, were installed.
Improvements were made to structures and spaces comprising areas of direct contact with the outside, with green areas established to provide continuity between the plant and its surroundings. In particular, the junction on S.S. 195 road was rebuilt, the green areas in the parking area were improved and a green hill was built on the Sarroch side of the plant.
The green hill – recovered from part of the plant's storage area – allowed a strip of green with earth and trees to be created as a buffer between the plant and Sarroch.
Finally, in 2007, in the IGCC power generation plant (boiler U702), the new condensation circuit to reduce the plumes of smoke emitted into the atmosphere resulting from steam emissions came into service.
The new installation eliminated the visual impact of the plumes of smoke, and also enabled heat to be recovered for use in activities related to the process.
A similar circuit will be installed at the other two boilers of the IGCC by the end of the first half of 2008.

Environmental training

In order to achieve ongoing improvements to the environment it is essential to provide ongoing training to personnel, both to bring them up to date and to raise awareness of the importance of their individual roles. This is particularly true in complex systems with over 1,000 employees, which is why Saras has launched specific training courses relating to environmental protection in relation to the activities carried out at the Sarroch site. Following the environmental awareness course for all staff directly employed at the refinery which formed the basis for a multimedia course in CD-Rom format to be used for self-instruction by staff working for contractors, specific courses on atmospheric emissions and the treatment, recovery and reduction of waste water were also launched.

In 2006, the training plan was expanded with in-depth sessions on atmospheric emissions. 32 classroom-based training sessions were held (each lasting 2.5 hours) for both shift workers and day personnel.

In November 2006, a "Week for the Environment and Health" was organised, including conferences and debates held by refinery personnel and experts from the Province of Cagliari, the University of Cagliari, Legambiente (the most influent enviromental NGO in Italy) and other specialist consultants.

Special training programmes were held for the environmental auditors' group, new recruits and staff changing jobs, in addition to ongoing training for all employees.

In 2007 as part of the training programme for new staff on the Environmental Management System, nine classroom sessions (each lasting two hours) were held, which involved a total of 58 shift workers and day personnel.

Safety policy

The Safety Policy Declaration

On the basis of increasingly stringent legislative guidelines for safety management in industrial activities and the protection of staff and local area, Saras also began making ongoing improvements to standards and results, recognising that safety is of strategic value to its corporate activities.
The company introduced a specific safety policy in 1996 (page 33), and since then has achieved positive results in safeguarding both its staff and the environment.

The Health and Safety at Work System

In December 2007, Saras obtained certification for its Health and Safety at Work System based on the OHSAS 18001:2007 standard (page 36).
Safeguarding people's health and preventing any form of accident or mishap (involving both its own staff and those of other companies working at the site) are considered core values, and in this regard, the Health and Safety at Work System is an essential document in the management of its activities (page 35).
The implementation of a Health and Safety Management System introduced the performance measure, the missing link of Legislative Decree 626/94, establishing that the organisation sets itself precise objectives and targets, taking into account company performance in compliance with the policy adopted.
The Health and Safety Management System was created by supplementing the Management System for the Prevention of Major Accidents, implemented in accordance with the Ministerial Decree of 9 August 2000, to exploit synergies from the two systems. The objective of integrating the Safety Management System with the Environmental Management Systems remains.

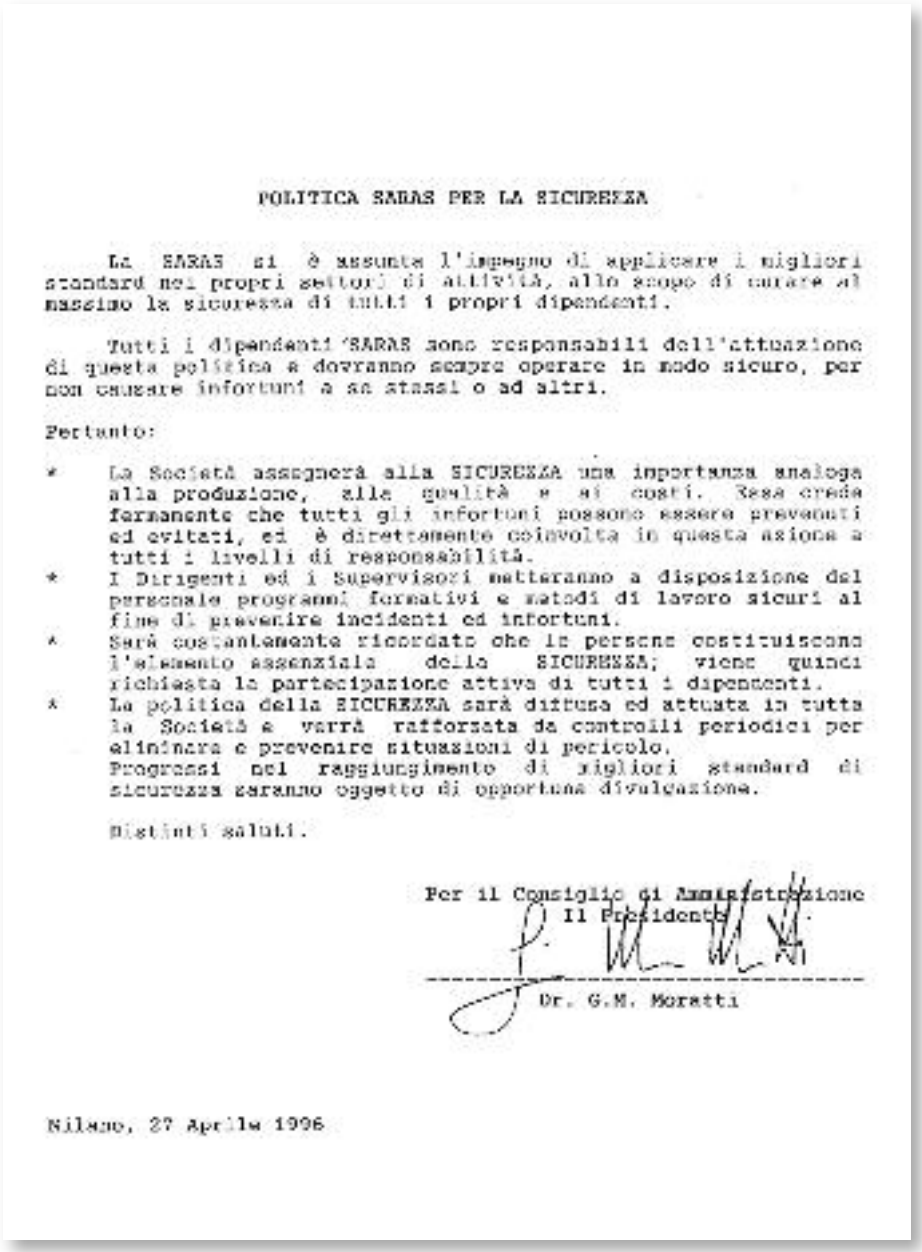
The Safety Management System for the Prevention of Serious Accidents

The main objectives of Saras' commitment to safety management have always been prevention, as well as research into the most effective methods of reducing the probability of accidents. This approach was already in step with regulations established by Legislative Decree 334/99 (Seveso II), which defined a Safety Management System (SMS) for the prevention of major accidents.
In April 2000, acting promptly to implement these regulations, the company drew up the following documents and instruments to manage safety on the Sarroch site, which are periodically reviewed and updated:

- Major Accident Prevention Policy, issued in 2004 and revised in 2006 (see page 37)
- Safety Management System Procedures
- Safety Management System Manual

The SMS for the prevention of major accidents is the logical development of the safety management instruments, defined in Presidential Decree 175/88 (Seveso I), which identified important safety standards in those industrial activities at a high risk of major accidents. The main management instruments referred to are:

- the Safety Report
- the Internal Emergency Plan (IEP)
- the External Emergency Plan (EEP)



POLITICA SARAS PER LA SICUREZZA

La SARAS si è assunta l'impegno di applicare i migliori standard nei propri settori di attività, allo scopo di curare al massimo la sicurezza di tutti i propri dipendenti.

Tutti i dipendenti SARAS sono responsabili dell'attuazione di questa politica e dovranno sempre operare in modo sicuro, per non causare infortuni a se stessi o ad altri.

Pertanto:

* La Società assegnerà alla SICUREZZA una importanza analoga alla produzione, alla qualità e ai costi. Essa crede fermamente che tutti gli infortuni possono essere prevenuti ed evitati, ed è direttamente coinvolta in questa azione a tutti i livelli di responsabilità.
* I Dirigenti ed i Supervisori metteranno a disposizione del personale programmi formativi e metodi di lavoro sicuri al fine di prevenire incidenti ed infortuni.
* Sarà costantemente ricordato che le persone costituiscono l'elemento essenziale della SICUREZZA; viene quindi richiesta la partecipazione attiva di tutti i dipendenti.
* La politica della SICUREZZA sarà diffusa ed attuata in tutta la Società e verrà rafforzata da controlli periodici per eliminare e prevenire situazioni di pericolo.
Progressi nel raggiungimento di migliori standard di sicurezza saranno oggetto di opportuna divulgazione.

Distinti saluti.

Per il Consiglio di Amministrazione
Il Presidente

Dr. G.M. Moratti

Milano, 27 Aprile 1996

THE SARAS SAFETY POLICY

SARAS is committed to applying the best standards in its sectors of activity, in order to dedicate the utmost attention to the safety of all its employees.

All SARAS employees are responsible for implementing this policy and must always work safely, so as to avoid causing injury to themselves or others.

Therefore:

- The Company will assign to SAFETY an importance similar to that assigned to production, quality and costs. It firmly believes that all accidents can be anticipated and prevented, and is directly involved in achieving this at all levels of responsibility.
- Managers and supervisors will provide staff with training programmes and safe methods of working in order to prevent accidents.
- It will be remembered at all times that people are the key component of SAFETY, and therefore the active participation of all employees in following the SAFETY policy is required.
- The SAFETY policy will be circulated and implemented throughout the Company, and will be reinforced by regular checks to anticipate and eliminate dangerous situations.
- Progress made in achieving better standards of safety will be appropriately communicated.

On behalf of the Board of Directors
GM Moratti
Chairman

Milan, 27 April 1996

The Refinery's Safety Report

The Saras refinery drew up its first Safety Report in 1989 and since then, the document has been constantly updated to reflect all changes made to the plant over the years, which had to be dovetailed to the existing system.
Currently, an analysis of potential accident scenarios excludes the possibility that they could have significant consequences outside the plant; if an accident did occur, it would be in the direction of the S.S. 195 road, an uninhabited area.
For the purposes of the site's Safety Report, the company conducted a detailed analysis of the risks attached to its activities in relation to the refining process, the materials used and all the procedures involved in running a complex operation such as an oil refinery.
In 2005, the Safety Report was revised and sent to the competent authorities in October. The revised version included an in-depth analysis of the situation at the plant and its management: risk scenarios and hypothetical accidents were reviewed, together with the possible consequences for staff inside the plant and the surrounding area. The analysis was carried out with the active involvement of operational and service personnel (processes, maintenance, engineering, engineering maintenance, etc.), who all contributed their expertise to assist in achieving the prevention targets.
The Safety Report is therefore an important tool for preventing risk situations from arising, through the examination of all possible prevention measures, and for identifying and adopting the technological solutions, equipment and safety systems that will enable any accident to be dealt with effectively, thereby minimising the impact on people, the environment and the plants.
In 2006, pursuant to Legislative Decree 238/2005, the Safety Report and the documents required for the External Emergency Plan (the "Notice" and "Information Sheet" for the general public) were updated.
Subsequently, in July 2007, the Regional Technical Committee for Fire Prevention completed its examination of the Safety Report and issued its "final technical evaluation". The Safety Report and the above-mentioned process refer to the Sarroch site as a whole.
The conclusions, reported by the Committee in its detailed minutes, indicate a positive outcome for the evaluation and endorse the continuous improvement activities under way. In relation to continuous improvement, the Committee suggested a number of areas for further examination and possible implementation.

POLITICA SALUTE E SICUREZZA SUL LAVORO

SARAS considera la salute e la sicurezza sul lavoro come valore primario e si impegna la salvaguardia nello svolgimento delle proprie attività produttive.

SARAS, oltre al rispetto degli obblighi di legge, si pone come obiettivo il miglioramento continuo e per questo si impegna ad adottare principi, standard e soluzioni che costituiscono le "best practices" del settore.

SARAS si impegna a gestire le proprie attività con l'obiettivo di prevenire incidenti, infortuni e malattie professionali ed in particolare a:

- Garantire che la progettazione, realizzazione e manutenzione di impianti, macchine e attrezzature, destinate al proprio sito proteggano la salute e la sicurezza dei lavoratori;
- Predisporre metodi operativi ed assetti organizzativi sempre più efficaci al fine di preservare la salute e la sicurezza dei lavoratori, dei terzi che accedono al sito e dei componenti della comunità di cui è parte;
- Comunicare ai dipendenti e ai rappresentanti dei lavoratori i programmi di monitoraggio di igiene industriale e i relativi risultati ottenuti;
- Assicurare a tutti i dipendenti l'informazione e la formazione sui rischi specifici della posizione ricoperta, garantendone l'aggiornamento in occasione di cambio di posizione;
- Attribuire ai terzi che accedono al sito l'informazione e la formazione sui rischi specifici delle attività svolte all'interno dello stabilimento;
- Coinvolgere e responsabilizzare i dipendenti ed il personale delle imprese d'appalto affinché cooperino nel perseguimento degli obiettivi di tutela della salute e della sicurezza;
- Sviluppare un rapporto di costruttiva collaborazione, improntato sulla massima trasparenza e fiducia sia al proprio interno che con la collettività esterna relativamente alle problematiche della salute e della sicurezza.

Ulteriori iniziative di prevenzione a tutela della salute e della sicurezza dei lavoratori saranno attuate anche se non direttamente collegate all'attività del sito.

L'azienda definisce e mantiene attive le modalità per rendere il personale consapevole dell'importanza delle proprie azioni rispetto alla politica ed ai requisiti del Sistema di Gestione della Salute e Sicurezza, evidenziando le conseguenze dell'attività di ogni lavoratore sulla salute e sicurezza.

Gli organi direttivi sono i primi responsabili dell'attuazione di tale politica.

SARAS si impegna a diffondere ai dipendenti, ai fornitori, agli appaltatori e a chiunque accede al sito la presente politica e a garantire tutte le risorse necessarie (umane, strumentali ed economiche) per perseguirla operando.
L'attuazione dei suddetti principi, attraverso il Sistema di Gestione della Salute e Sicurezza, ed il comportamento ad esso conforme è obiettivo e responsabilità di tutti i dipendenti dell'organizzazione, ciascuno secondo il proprio ruolo e le proprie responsabilità.

Sarroch, 19 luglio 2007

Il Direttore Generale

SARAS HEALTH AND SAFETY AT WORK POLICY

SARAS considers health and safety at work to be of primary importance and ensures that employees are protected when carrying out their activities.
In addition to complying with the law in this area, SARAS pursues an ethos of continuous improvement and is therefore committed to adopting principles, standards and solutions that constitute sector best practice.
In the course of running its operations, SARAS is committed to preventing accidents, injury and ill health in the workplace, and specifically undertakes to:

- ensure that the design, construction and maintenance of its plants, machines and equipment do not endanger the health and safety of its employees;
- strive to continually improve operating procedures and organisational structures with the aim of protecting the health and safety of its employees, third parties visiting or working at the site and the local community, of which it forms a part;
- inform its employees and employee representatives of occupational hygiene monitoring programmes and the results obtained;
- provide all employees with information and training on the risks specific to their particular roles, ensuring that this is updated if a staff member transfers to a new role;
- provide third parties visiting or working at the site with information and training on the risks specific to the activities carried out at the site;
- devolve responsibility to employees and the staff of contractors, thereby fostering involvement and compliance with the health and safety policy;
- develop a relationship of constructive co-operation, transparency and trust with personnel and third parties so that health and safety issues can be resolved effectively.

Further health and safety initiatives, with a broader scope rather than solely site-related, will also be implemented.
The company defines and updates procedures to make staff aware of the importance of their own actions in relation to the policy and to the requirements of the Health and Safety Management System, highlighting the possible consequences of the activities of each employee in relation to health and safety.
The management holds ultimate responsibility for implementing this policy.
SARAS undertakes to inform all employees, suppliers and contractors and other persons visiting or working at the site of this policy, and to provide all the resources necessary (i.e. people, equipment, funds) for its implementation.
All employees must comply with the above-mentioned principles, via the Health and Safety System, according to their particular roles and responsibilities.

General Manager
Sarroch, 19 July 2007

CERTIFICATO DI APPROVAZIONE

Si certifica che il sistema Occupational Health & Safety Management System di:

Saras S.p.A.
Direzione: Galleria De Cristoforis, 8 - Milano
Impianti: Strada Statale 195 Sulcitana,
km. 19,500 – Sarroch (CA)

e' stato approvato dal Lloyd's Register Quality Assurance per conformita' a:

OHSAS 18001:2007

Il sistema Occupational Health & Safety Management System si applica a:

Produzione di prodotti della raffinazione del petrolio, programmazione, preparazione e spedizione di prodotti finiti, produzione di energia elettrica. Gestione della progettazione, ingegnerizzazione e costruzione di impianti interni.

La validità di questo certificato è vincolata al certificato dello stesso numero che elenca le ubicazioni oggetto dell'approvazione.

Certificato di Approvazione N.: LRC 8180526

Approvazione Originaria: 9 Gennaio 2008
Certificato Attuale: 9 Gennaio 2008
Scadenza Certificato: 9 Gennaio 2011

Emesso da: Lloyd's Register Quality Assurance Italy S.r.l.

Questo documento è soggetto alle condizioni riportate sul retro.

CERTIFICATE OF APPROVAL

This is to certify that the Occupational Health and Safety Management System of:

Saras SpA
Management: Galleria De Cristoforis 8, Milan
Site offices: Strada Statale 195 Sulcitana – km 19.500
Sarroch (CA)

has been approved by Lloyd's Register Quality Assurance
and complies with:

OHSAS 18001:2007

The Occupational Health & Safety Management System is applicable to:

Production of refined oil products, planning, preparation and dispatch of finished products, power generation. Design, engineering and construction of internal plants.

The validity of this certificate is subject to the certificate bearing the same number that lists the locations covered by the approval.

Approval
Original Approval: 9 January 2008
Certificate No: LRC 8180526

Current Certificate: 9 January 2008
Certificate Expiry: 9 January 2011

Issued by: Lloyd's Register Quality Assurance Italy Srl

POLITICA DI PREVENZIONE DEGLI INCIDENTI RILEVANTI

Nel quadro generale della propria politica in materia di Sicurezza, Salute e Ambiente il Gestore della Raffineria SARAS S.p.A. di Sarroch si impegna:

- a perseguire la massima sicurezza dei propri dipendenti e di ogni persona presente all'interno del Sito;
- a mettere in atto ogni azione ed iniziativa utile a prevenire incidenti rilevanti ed a ridurre al minimo le eventuali conseguenze per le persone, l'ambiente e le proprietà;
- a rispettare la specifica normativa nazionale in tema di controllo dei pericoli di incidente rilevante;
- a garantire il rispetto dei propri regolamenti, standard e procedure di sicurezza interni, periodicamente verificati, aggiornati ed adeguati ovunque ritenuto necessario per migliorare la prevenzione degli incidenti rilevanti;
- a promuovere il miglioramento continuo con l'utilizzo di nuovi e più avanzati standard di sicurezza;
- a garantire che tutti i dipendenti e il personale della ditte d'appalto, nell'ambito della propria competenza ed attribuzioni, siano informati, formati e addestrati ad operare con piena cognizione dei rischi potenziali connessi con le attività, sia in condizioni operative ordinarie, anomale e in caso di emergenza;
- a diffondere la sua politica tra i fornitori, appaltatori e qualsiasi altra persona terza che accede al Sito per motivi di lavoro;
- a diffondere la politica a tutti i dipendenti ed a coinvolgere attivamente nella Gestione della Sicurezza l'intera organizzazione del Sito, dirigenti, preposti, lavoratori e loro Rappresentanti per la Sicurezza, ciascuno nell'ambito delle proprie competenze ed attribuzioni;
- a valutare periodicamente i rischi di incidente rilevante connessi con la propria attività, individuando gli obiettivi di sicurezza e definendo i conseguenti programmi per il miglioramento continuo;
- ad assicurare il controllo di ogni eventuale emergenza, mediante l'attuazione degli specifici piani interni ed in stretto coordinamento con le autorità competenti, anche in relazione alle necessità di informazione della popolazione e per l'attuazione della Pianificazione Esterna di Emergenza;
- ad attuare il Sistema di Gestione della Sicurezza valutandone periodicamente l'efficacia e l'efficienza, e provvedendo alle necessarie revisioni ed aggiornamenti;
- a mantenere un rapporto di massima collaborazione e trasparenza con la collettività esterna e con le sue istituzioni.

Per il raggiungimento di quanto sopra esposto è necessario il contributo attivo di tutto il personale e l'attuazione della politica sarà uno degli obiettivi individuali e di gruppo.

Il Gestore

Sarroch, 5 aprile 2006

MAJOR ACCIDENT PREVENTION POLICY

As part of its general health, safety and environmental policy framework, SARAS S.p.A., the operator of the Sarroch refinery, undertakes to:

- make the safety of its employees and any other person visiting or working at the site its top priority;
- put in place procedures aimed at preventing major accidents and minimising the impact of major accidents on people, the environment and property;
- comply with the law on minimising the risks of a major accident;
- ensure that its internal safety regulations, standards and procedures are regularly monitored, and revised where necessary to improve protection against major accidents;
- promote continuous improvement through the use of new and more advanced safety standards;
- ensure that all employees and staff of contractors are fully aware of the risks attached to the activities carried out, and receive training on this according to their particular competencies and duties, both under routine and non-routine operating conditions, and in emergencies;
- inform suppliers, contractors and any other persons working at the site of this policy;
- inform all employees of this policy, and provide for the active involvement in safety management for the entire site of senior management, heads of department, employees and their safety representatives, in respect of their particular competencies and duties;
- evaluate from time to time the major accident risks related to activities carried out at the site, identifying safety objectives and designing continuous improvement programmes;
- ensure that any emergency is quickly brought under control through the implementation of specific internal plans and in close coordination with the competent authorities, for example, with regard to informing the local community and implementing the External Emergency Plan;
- implement the Safety Management System, monitoring it from time to time to check its efficiency and effectiveness, and making any changes necessary;
- building highly cooperative and transparent relationships with organisations and institutions in the local community.

The successful application of this policy requires the active contribution of all employees, and its implementation shall be a key objective of each individual and of the group.

Sarroch, 5 April 2006
The Refinery Operator

Internal Emergency Plan (IEP)

After defining the risk scenario for the internal plant area, the company drafted its Internal Emergency Plan (IEP), which includes the procedures to be adopted and action to be taken in the event of an accident, with the aim of managing any such occurrence with maximum efficiency and minimum impact via co-ordinated intervention. The objective of the IEP is to ensure the company reacts as effectively as possible to accidents by:

- preventing and limiting injury and providing assistance to anyone hurt
- bringing accidents under control and limiting their effects
- preventing and minimising environmental damage
- preventing and minimising damage to company property.

As mentioned on page 25, the IEP, which is regularly revised to take account of changes in operating and plant conditions, also includes the Marine Pollution Prevention Plan, drawn up to deal with emergencies resulting from oil discharges into the sea or other critical events that could occur at the site's marine facilities.
Based on the content of the refinery's Safety Report, the IEP defines three categories of reportable accident, in terms of the level of emergency (see page 78):

- localised emergency
- general emergency
- near accident.

A localised emergency refers to an accident affecting a distinct area of the plant that can be quickly handled using locallyavailable resources. This generally means that a fire is not involved. A general emergency is an accident that due to its nature or because of particular environmental conditions risks spreading to other parts of the plant or areas outside the refinery. Lastly, near accidents are situations that could have led to an accident. Analysis of such events is essential to the continuous improvement of site safety.
To ensure that accidents are dealt with quickly and efficiently, reliable procedures for raising the alarm and alerting all personnel concerned are crucial. Another important requirement of the IEP is to have clear and direct lines of communication to alert those involved in executing the plan, all personnel located at the plant, the emergency services and the general public.
Communication and alarm devices (push-button fire alarms, telephones, fixed and mobile intercom units at various plant locations or in the possession of key personnel) are widely distributed throughout the refinery, so that personnel and equipment can be mobilised immediately. Following a list of priorities, the refinery's Emergency Co-ordination Centre (see Figure 7 on page 32) distributes information and updates on the management of accidents to certain organisations, as appropriate to the nature of the accident:

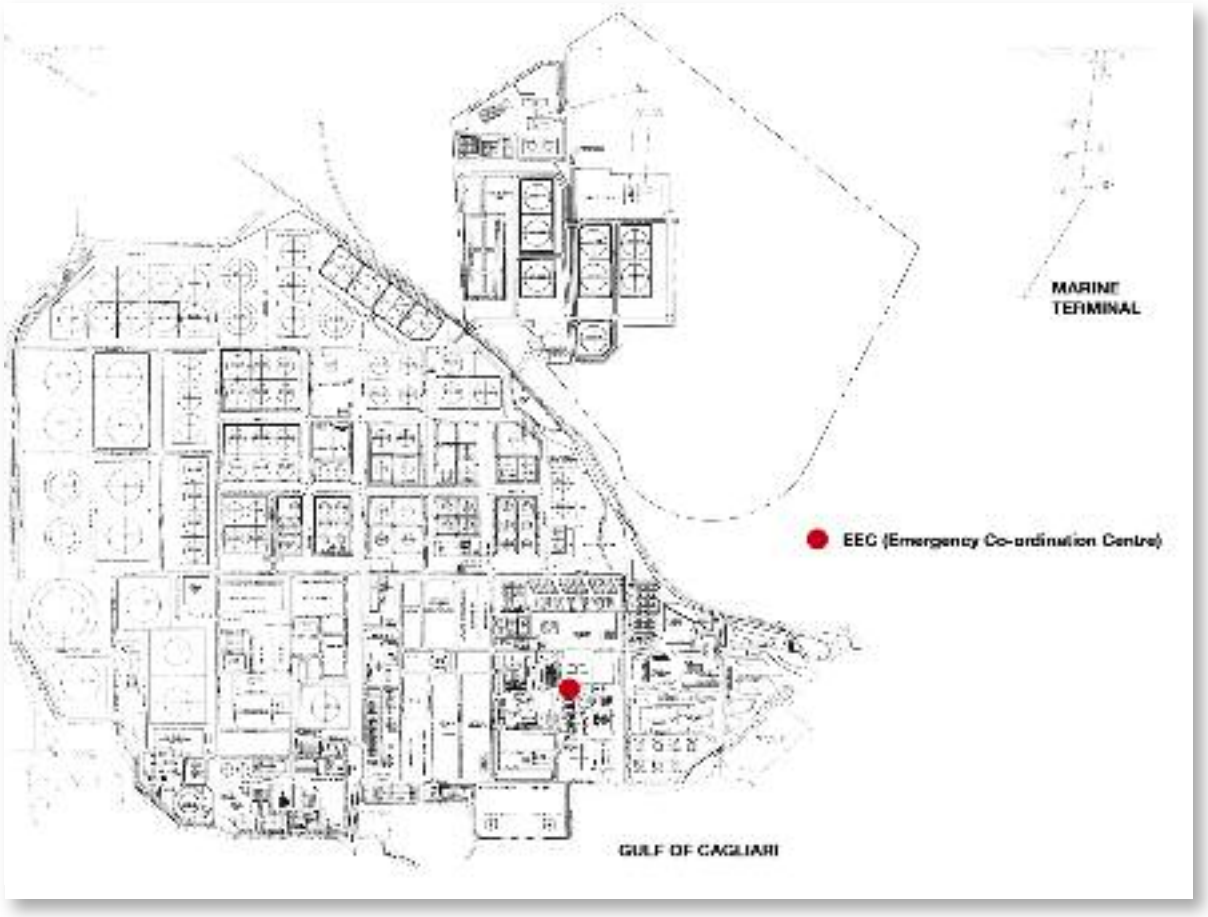
- fire service
- prefecture
- nearby industrial sites.

Other relevant organisations include the municipality of Sarroch, the Sarroch Carabinieri, the police and the harbour authority. Continuous updates are provided to these organisations until the emergency has ended, so that local communities can be kept informed.

External Emergency Plan (EEP)

The Internal Emergency Plan and External Emergency Plan (EEP) are closely related. The EEP is drawn up in conjunction with the Prefecture of Cagliari following a consultation phase involving numerous local bodies, law enforcement agencies and emergency services, including the regional and provincial authorities, the municipality of Sarroch, the fire service and the local health authority. The plan concerns the Sarroch industrial complex as a whole, and considers hypothetical accidents concerning sites belonging to the various companies located there (Saras, Polimeri Europa, Sasol Italy, ENI, Liquigas, Air Liquide Italia) that could result in harmful consequences for the area outside the facilities.
In addition, the safety reports for the various production facilities and analyses of hypothetical accident

Figure 7 – Location of the refinery's emergency co-ordination centre



scenarios (study of the local area, especially populated districts and infrastructure) are used to plan the best way of managing accidents given the potential effects on people living nearby.

Procedures have been defined for executing and managing the EEP, from raising the alarm to intervention by company personnel and third parties with related responsibilities, such as direct management of accidents at the site, accident control in the surrounding area, dissemination of information and assistance for local residents (road management, health services, media, etc.).

The organisations concerned (prefecture, police headquarters, fire service, traffic police, carabinieri, guardia di finanza, forestry authority, harbour authority, health authority, Sardinian regional environment agency, regional and provincial authorities, municipality of Sarroch) will be involved in various ways to ensure that accidents are managed quickly and effectively, and contained within the site if possible.

The effectiveness of the EEP and its implementation is monitored via accident response exercises involving the companies and organisations responsible. The EEP currently in place was last reviewed in September 2005.

Safety systems at the refinery

The Sarroch refinery has a complex safety system designed to detect potentially dangerous situations immediately. The water distribution system for fires comprises an extensive network that covers the whole plant. All the storage tanks are protected by cooling systems; the most important of these are activated automatically if a tank overheats. Similar systems are installed on

all the pressure tanks, LPG storage and loading equipment and any other piece of equipment for which a rise in temperature could compromise safety.
The refinery also has seven fast and easily manoeuvrable fire trucks carrying powder and foam extinguishers, which can be operated quickly in emergencies and act as a backup to the installed systems. Safety equipment and systems are regularly checked, and carefully and routinely maintained.

Safety training

The role of each employee is essential to achieving the objectives of increasing reliability and safety, so Saras attaches great importance to ongoing staff training, especially in safety matters.
All staff attend the training programme, which offers different modules depending on the role of each staff member. Employees attend training, which consists of both theory and practical sessions, when they join the company and throughout their time at Saras. In addition, staff assigned to firefighting teams participate in a series of special training exercises.
Overall, in 2007 more than 10,000 hours of safety and emergency management training took place, involving all personnel, with specific modules for new recruits and people changing jobs. A total of 154 courses were held, which included classroom and fieldwork.
Furthermore, staff from other companies who work with the refinery attended the safety training course on their first visit to the plant. This course is computer-based and includes a test, and is supplemented by a further onsite test given by safety training managers from the Prevention and Protection Department.
Specific courses were run for staff in certain jobs, such as those working at the alkalisation plant, while others covered areas such as work permit management procedures. A total of 2,937 staff from other companies were involved in 6,041 hours of classroom training.
Ongoing safety training is an essential part of the continuous improvement process, and focuses on the role of each employee. Saras has therefore developed a course on risk evaluation for each job, and on the company's Health and Safety System, which is based on the OHSAS 18001 standard.
The training of 498 personnel which began in 2006 continued in 2007, involving a total of 1,245 training hours.

Data

Production

The plant's energy balance

Energy arrives at the site in the form of raw materials (crude and semi-processed oil) and electricity (Table 4). Crude oil is used in refining to obtain fuels for internal use and feedstock for the IGCC plant, while the imported electricity is needed to supplement energy requirements for processing.
The refinery and IGCC plant complex produces energy in the form of oil products, which are in daily use throughout the region and beyond, as well as electricity from the thermoelectric and IGCC plants (Table 5). The thermoelectric energy produced is used internally for refining, while all power from the IGCC plant is put onto the national grid.
In 2007 the Saras plant recorded an energy requirement of 1,051,553 TOE.

Figure 8 - The Sarroch site: flow chart

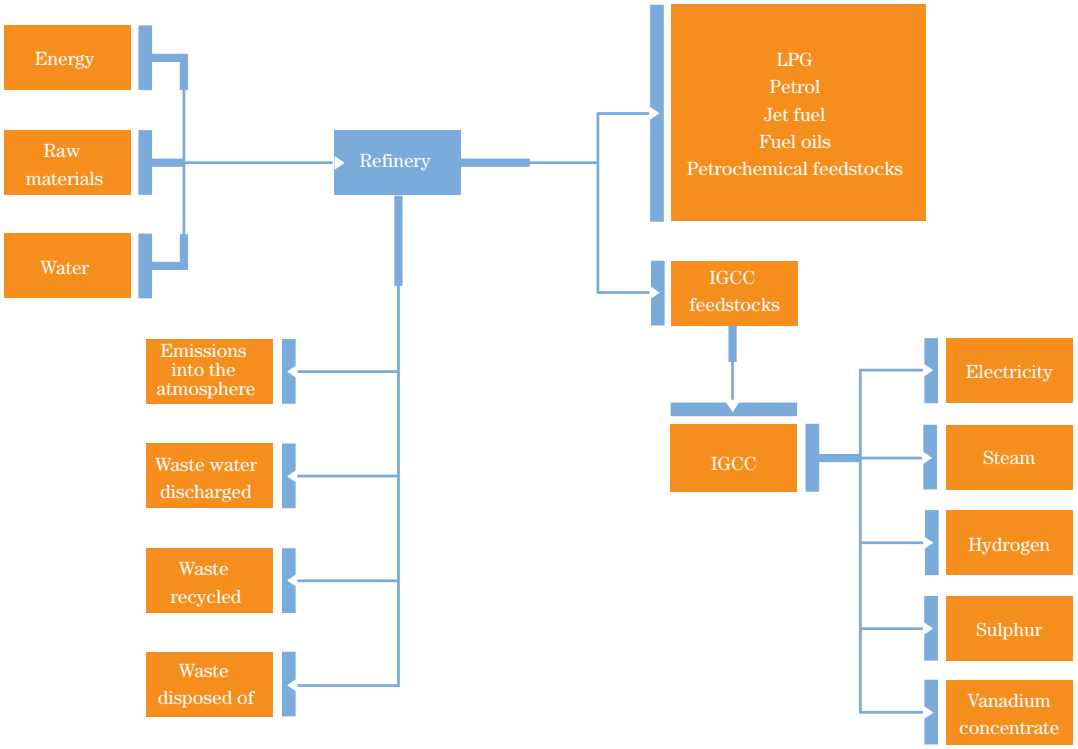


Table 4 – Energy in (TOE)

	2007
Crude and fuel oil	14,561,670
Power from external sources*	283,520
Total	14,845,190

*Converted into TOE using AEEG figures

Table 5 – Energy out (TOE)

	2007
Finished products	12,955,164
Electricity sent to the grid	823,870
Fuel gas	50,305
Total	13,829,339

Refining

In 2007 the Sarroch refinery processed approximately 14.6 million tons of raw materials (crude oil and fuel oils), the highest figure for the last five years. Between 2003 and 2007, a total of 72 million tons of raw materials were processed, an average of 14.4 million tons per year (Graph 4).
In the last few years more light products have been produced, with fuel oil being reduced to the minimum and heavy residues from refining (tar) being used to produce electricity.

Graph 4 - Crude processing

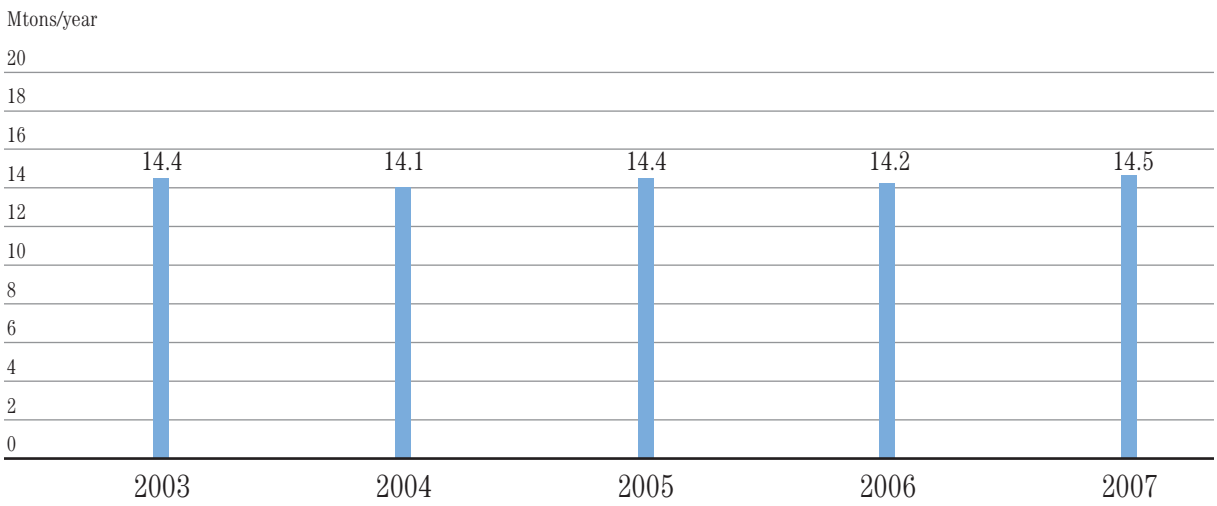


Table 6 – Products from the Saras plant (tons/year)

	2003	2004	2005	2006	2007
LPG	471,000	360,000	363,000	341,000	323,000
Gasoline	2,967,000	2,890,000	3,036,000	2,945,000	3,110,000
Virgin Naphtha	1,111,000	789,000	873,000	936,000	916,000
Kerosene	546,000	290,000	449,000	388,000	467,000
Diesel	6,192,000	6,174,000	6,423,000	6,713,000	6,813,000
Fuel oil	1,156,000	1,567,000	1,149,000	1,033,000	788,000
Vanadium concentrate	1,732	1,231	1,690	1,227	1,700
Electricity (TOE)	813,149*	804,883*	801,490*	821,819*	823,870*
Sulphur	122,000	114,000	106,000	111,000	112,000
IGCC feedstock	1,240,182	1,250,769	1,172,874	1,217,391	1,190,195

*Figures recalculated on the basis of the real efficiency of the plant and the national coefficient (withdrawn in 2006).

Environmental quality of products

Sulphur content is a key factor in assessing the environmental quality of refinery products, and in recent years, regulations have been introduced to set limits. A low sulphur content means that fuel oils perform better during combustion and have less of an impact on the atmosphere. The plant's sulphur balance (Figure 9) provides useful information on how much sulphur enters the refining cycle and how the output is distributed. The data show that the amount of sulphur coming in with raw materials is falling.
It is also interesting to note that from 2003 to 2007, and especially in 2007, the amount of sulphur in products entering the market fell (Graph 5), while the percentage of sulphur sold as a product increased substantially (Graph 6).
This indicates a steady improvement in the plant's desulphurisation capacity, together with a slight reduction in the amount of sulphur released into the atmosphere.

Figure 9 – Plant sulphur balance: 2007

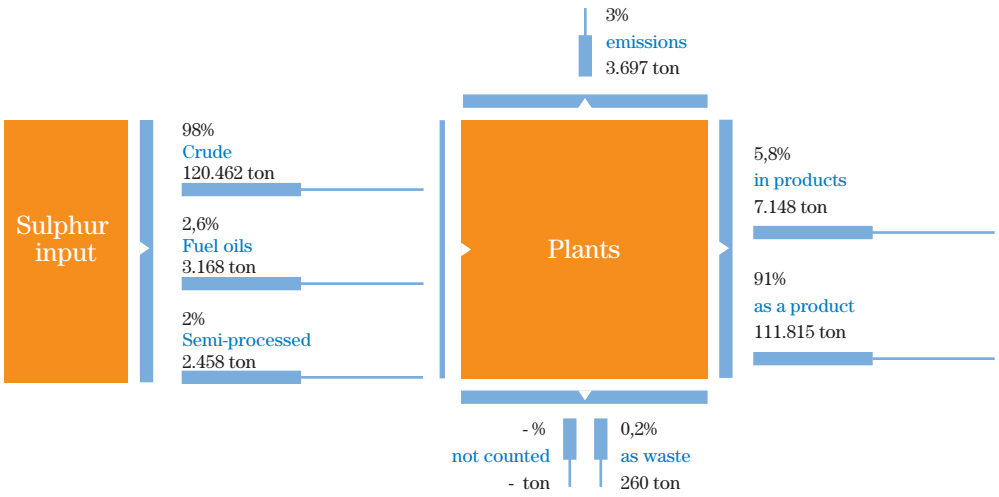
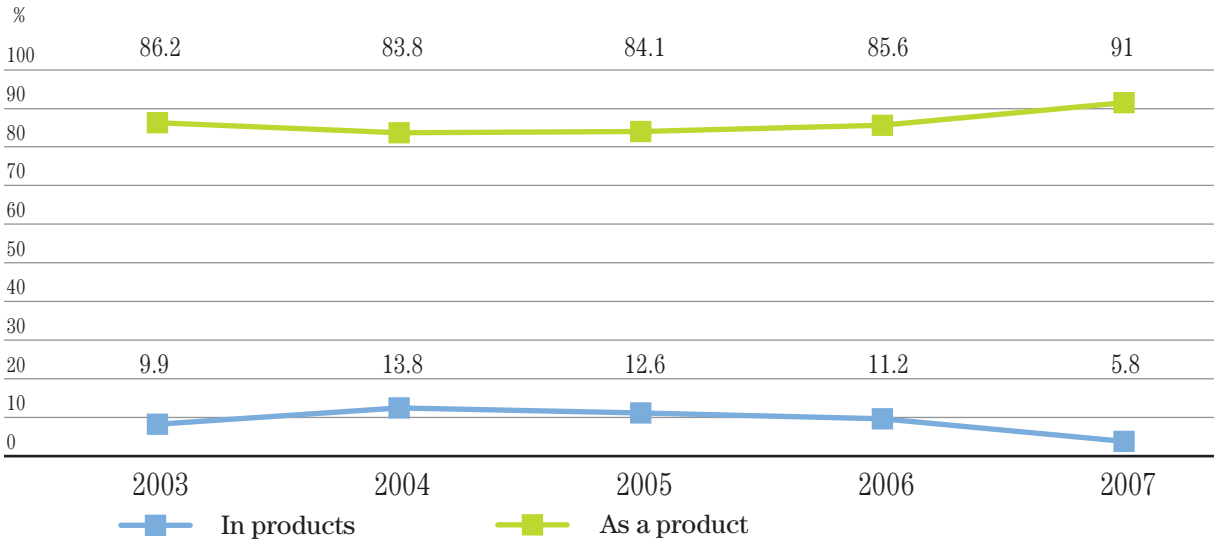


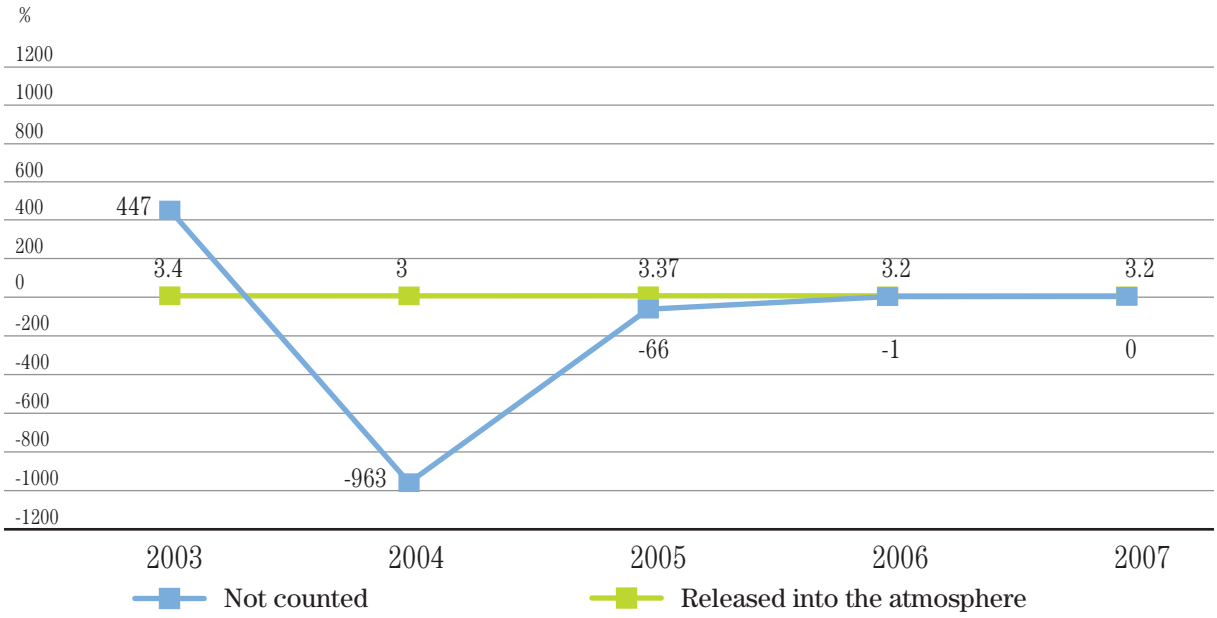
Table 7 – Plant sulphur balance (tons/year)

	2003		2004		2005		2006		2007	
	tons	% of total	tons	% of total	tons	% of total	tons	% of total	tons	% of total
Sulphur input										
Raw materials	144,502	100.0	135,801	100.0	125,952	100.0	120,747	100.0	122,920	100
Sulphur output										
Atmospheric emissions	4,845	3.4	4,091	3.0	4,250	3.37	3,897	3.2	3,697	3.2
In products	14,328	9.9	18,675	13.8	15,869	12.6	13,512	11.2	7,148	5.8
As pure sulphur	124,582	86.2	113,738	83.8	105,879	84.1	103,312	85.6	111,815	91
As waste	300	0.21	260	0.19	21	0.02	27	0.02	260	0.2
Amount not counted	447	0.3	-963	-0.7	-66	-0.05	-1	-0.0008	-	-

Graph 5 - Outgoing sulphur



Graph 6 - Other outgoing sulphur



Electricity production

Since 2003, the IGCC plant has operated extremely effectively, producing a large volume of electricity in the last two years, while exchanges with the refinery have also remained at significant levels.
Tables 8 and 9 show figures for 2007 and a comparison with the four previous years. Table 10 shows the main emission types associated with electricity generation (g/kWh); the comparison with the ENEL national figure attests to the positive performance of the Sarlux plant.

Table 8 – IGCC consumption (tons/year)

	2003	2004	2005	2006	2007
Tar load	1,240,182	1,250,769	1,172,874	1,217,391	1,190,195
Syngas (from gasification)	3,806,573	3,768,059	3,827,000	3,943,410	3,942,542
Gasoil	18,793	20,072	10,797	10,256	7,068
Power from external sources (MWh)	365,553	372,964	372,357	379,463	368,962

Table 9 – IGCC products (tons/year)

	2003	2004	2005	2006	2007
Power from external sources (MWh)	4,410,201	4,357,642	4,346,187	4,473,702	4,417,843
Medium-pressure steam	732,632	623,804	695,994	688,413	568,651
Low-pressure steam	597,044	586,864	596,386	597,339	556,828
Hydrogen (kNm^3)	298,531	300,595	285,651	360,220	307,083
Sulphur	48,397	47,892	53,768	48,184	42,589
Vanadium concentrate	1,732	1,231	1,690	1,250	1,700

Table 10 - IGCC* environmental performance (g/kWh produced)

	2003	2004	2005	2006	2007	Enel national data**
SO_2	0.07	0.10	0.07	0.07	0.07	0.93
NO_x	0.09	0.16	0.15	0.15	0.16	0.58

* Production of hydrogen, medium-pressure steam, low-pressure steam and sulphur taken into account
**ENEL national production data, published on page 140 of the 2006 Sustainability Report

Environment

Commitment to continuous improvement

The following pages provide detailed up-to-date data on all environmental factors, which directly or indirectly, concern the environment both inside and outside the plant. Some of these, such as atmospheric emissions or waste water, are more immediately obvious because they relate to the environment in which people live and work every day; others, such as energy and water consumption and carbon dioxide (CO_2) emissions, relate to problems of more general concern, and have a more global impact without significant direct effects on the local environment.
The graphs and tables provide site performance data, highlighting the contribution of the refining and electricity generation plants (the generation of electricity is a major factor in the overall operations carried out at the site).
The data illustrate the high productivity and low environmental impact of the IGCC technology used in power generation.
The trend in emissions over a five-year period shows a picture of general improvement, with the exception of some small fluctuations that may occur from year to year because of external environmental factors unrelated to refinery operations (such as weather conditions), plant changes and extraordinary maintenance.
The improvement in environmental data is due to a series of technical and management measures, which have gradually equipped the refinery with increasingly efficient technology and resources to operate in a more environmentally-friendly manner. A comparison between the last five years and the average performances of the 1990s is particularly significant: sulphur dioxide (SO_2) emissions have been reduced by around 50% for example.

2007: consolidation of tools, processes and concrete results

In summary (which will help to clarify the large quantity of detailed information and data set out in the following pages), 2007 can be considered a year in which Saras consolidated its management policy and the measures adopted with the aim of achieving environmental sustainability of its operations in the local area. The results for 2007 also confirm the effectiveness of the management and technological decisions made in the past few years, which were rationalised and formalised in the Environmental Management System. As regards transparency towards the local area and full and prompt compliance with the law, the 2006 Environmental and Safety Report for the site was published and distributed in 2007 to key local organisations: institutions, politicians, technical supervisory bodies, industry associations, unions, environmental associations and the press. In addition, the Report was made available on the company's website, and a copy was given to all participants at the refinery open day held in October. Key environmental data for the site was also provided to INES (the National Inventory of Emissions and their Sources) on a regular basis. This information is sent to the Italian Environment Ministry which in turn sends it to the European Commission, where it is entered on the European Pollutant Register (EPER). The declaration concerned levels of water and air emissions based on various parameters relating to the activities carried out.

Energy consumption

The company has a major commitment to rationalising and optimising its energy consumption, which is closely related to the plant's environmental performance, both now and in the future. In the late 1970s and early 1980s, Saras invested heavily in energy conservation in the wake of the energy crisis. Today, energy saving and efficiency are still strategic objectives and part of the improvement of the plant's overall environmental performance.

Table 11 and Graph 7, which show the consumption of liquid and gaseous fuels (the latter produced by the refinery itself) and the quantity of electricity from external sources, illustrate that energy consumption remained broadly stable over the period under review, with decreasing reliance on fuel oils in favour of gas produced by the plants known as "refinery gas" (fuel gas). This is a substitute for methane, a resource not available in Sardinia, which is not connected to the national gas grid.

Table 12 (page 52) shows the site's power requirement. The quantity of electricity generated by the refinery's thermoelectric plant (CTE) is shown under "Internal production", while external supply is provided by the national grid.

Table 11 - Total energy consumption (refinery + IGCC; TOE)

	2003	2004	2005	2006	2007
Power	189,518	185,811	186,071	189,603	193,917
Fuel oil	232,358	225,309	237,435	198,546	192,254
Fuel gas*	373,181	379,849	389,156	414,855	452,451
Flue gas*	154,572	137,521	156,955	161,908	166,124
Total	949,629	928,490	969,617	964,912	1,004,746

*Flow produced from FCC catalyser regeneration and used to fuel the recovery boiler, known as the CO boiler.

Graph 7 - Total energy consumption (refinery + IGCC)

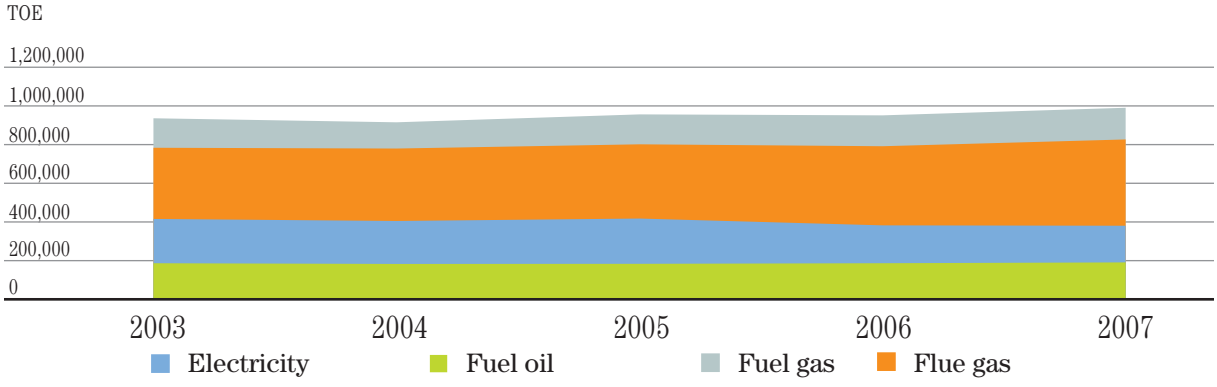
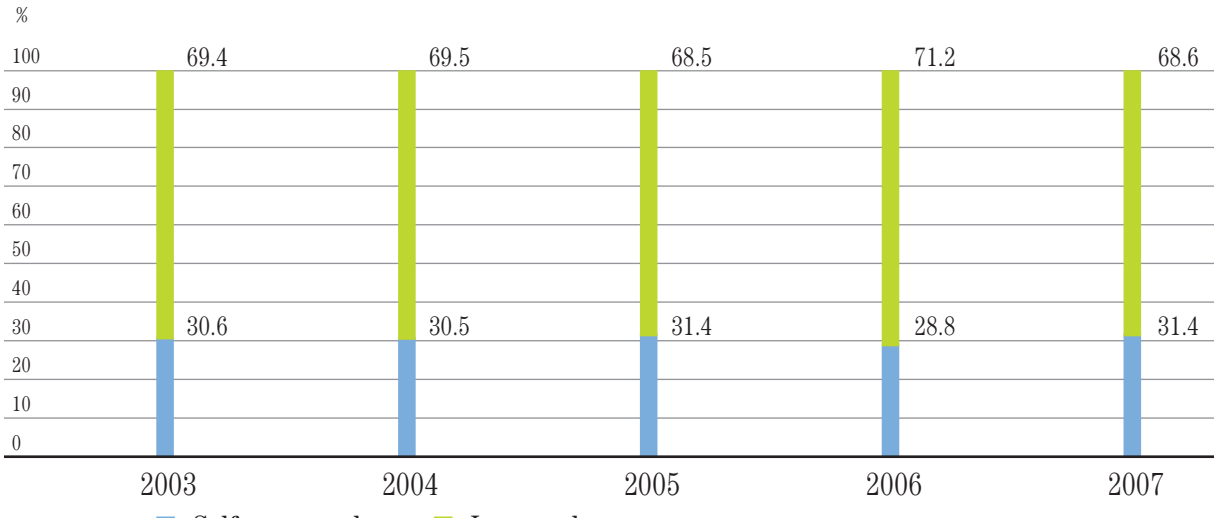


Table 12 – Power requirement and supply (refinery + IGCC; MWh)

	2003	2004	2005	2006	2007
Total demand	1,141,519	1,119,418	1,122,363	1,104,148	1,166,208
- from internal production*	349,128	341,529	351,995	318,438	366,242
- external	792,391	777,889	770,368	785,710	799,966

*Flow produced from FCC catalyser regeneration and used to fuel the recovery boiler, known as the CO boiler.

Graph 8 - Power requirement and supply (refinery + IGCC)



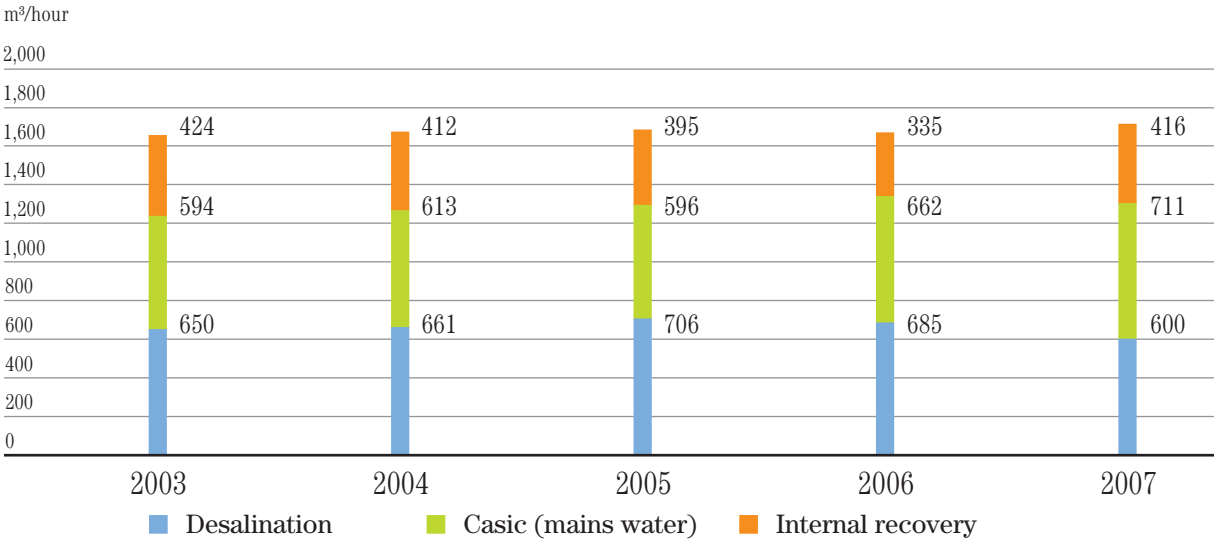
Plant water consumption

Water is a precious resource for the Sarroch plant, and its use is constantly monitored to optimise consumption and to promote recovery and desalination, instead of using fresh water supplied by CASIC (consortium for the Cagliari industrial development area), which manages the water supply to the Sarroch industrial district. The water used for industrial purposes mainly supplies the boilers that produce steam for technological use (steam stripping, heat exchangers and power generation), to supply the fire prevention system, to replace cooling cycle losses and for civil use.
The water consumption data provided also include the quantity required for the IGCC plant which, however, does not affect the site's total fresh water requirement: for its own production the IGCC plant uses only water from dedicated desalinators and sea water, which is used in the cooling tower. The quantity of water used for refining remains broadly stable. Supply sources in 2007 were in line with previous years, as shown in Table 13 and Graph 9.
In the period under review, internal recovery met an average of approximately 25% of the total annual requirement, and desalination was the main source of supply, accounting for 40% of the total. Desalination and recovered water met approximately 60% of the requirement in 2007. This is a significant result for the plant, particularly since there is now an ongoing water crisis in Sardinia. It indicates that the best path to follow in future is rationalisation of consumption and increased recycling.

Table 13 - Total water consumption per supply source (Refinery + IGCC; m^3/hour)

	2003	2004	2005	2006	2007
Desalination	650	661	706	685	600
CASIC	594	613	596	662	711
Internal recovery	424	412	395	335	416
Total	1,668	1,686	1,697	1,682	1,727

Graph 9 - Total water consumption (refinery + IGCC)



Atmospheric emissions

Saras' commitment to reducing atmospheric emissions has seen it implement a series of initiatives over time, aimed at improving the plant and at defining management procedures and systems that ensure its operations are environmentally friendly. These have reduced pollutant emissions, despite the increase in processing volumes and a more complex cycle. Against this backdrop, the gasification plant has made a substantial contribution to reducing atmospheric emissions, as described on page 16. Other major projects that have had a positive effect on cutting emissions include the increase in sulphur recovery from fuel gases and improvements in furnace combustion, partly through the replacement of burners. Another important measure was the reduction of emissions from various sources, by equipping floating-roof tanks with double-seal systems.

Table 14 – Total atmospheric emissions (000 tons/year)

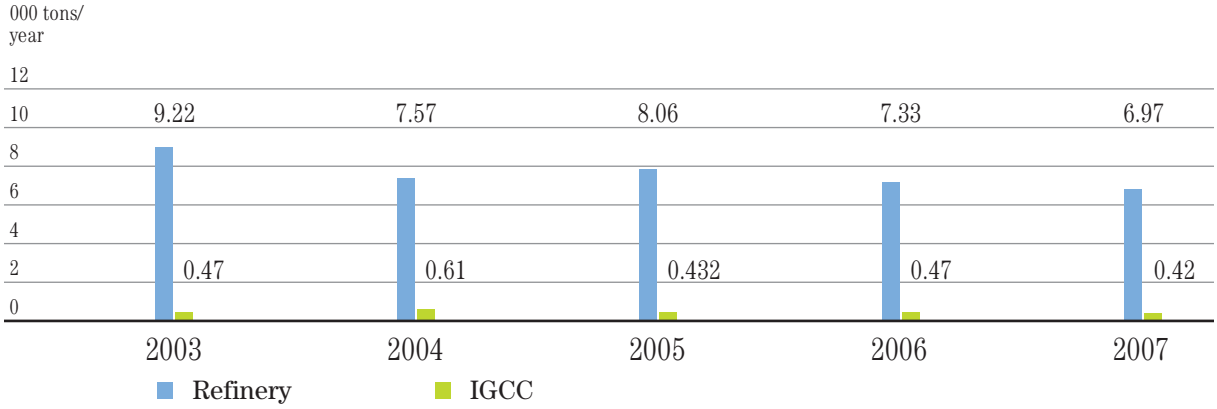
	2003		2004		2005		2006		2007	
	Ref.	IGCC	Ref.	IGCC	Ref.	IGCC	Ref.	IGCC	Ref.	IGCC
SO_2	9.22	0.47	7.57	0.61	8.06	0.43	7.33	0.47	6.97	0.42
NO_X	4.16	0.59	3.43	0.99	3.96	0.93	3.80	0.98	3.16	1.00
Dust	0.47	0.008	0.52	0.020	0.53	0.007	0.45	0.003	0.52	0.005
CO	1.31	0.097	1.24	0.084	1.24	0.086	1.26	0.110	0.72	0.14
CO_2*	2,555	3,929	2,373	3,963	2,606	3,718	2,349	3,878	2,508	3,751

*According to the declaration pursuant to the Emissions Trading Directive.

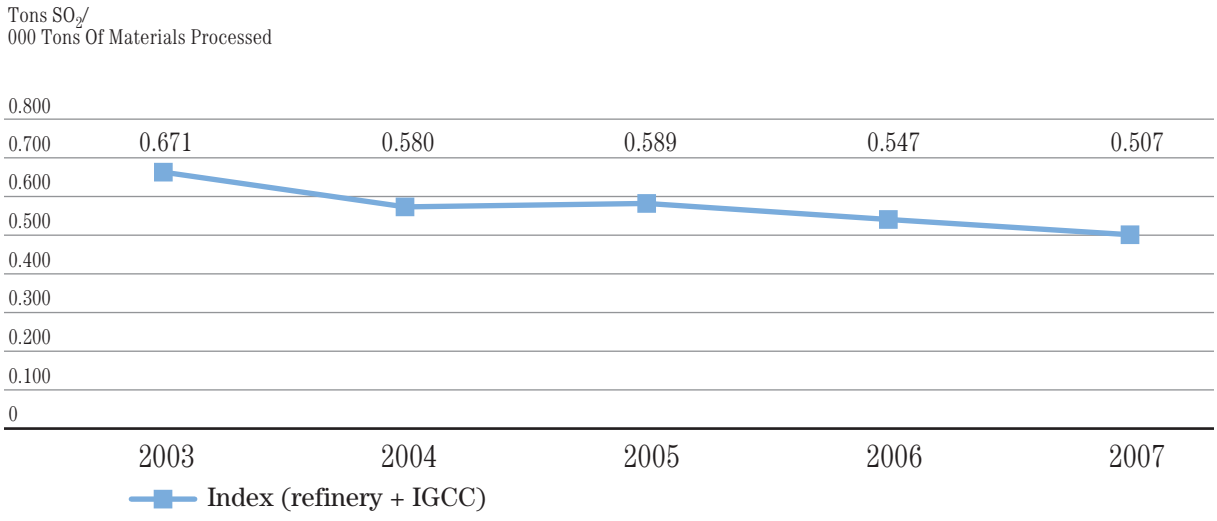
Sulphur dioxide (SO_2)

The site recorded its best ever year for SO_2 emissions in 2007, confirming the downward trend under way for the past few years. This performance was due to constant improvements in the quality of the fuels used (fuel oil, fuel gas and flue gas), in which the sulphur content has been steadily reduced (see Graph 12).
The emissions rate per ton of raw material processed (Graph 11) shows a reduction, despite the fact that processing volumes are trending upwards, a clear sign that efficient action has been taken to improve processing performance. Compared with 2003, SO_2 emissions were down by more than 24% in 2007.
The 2007 figures, confirmed by the monitoring of the refinery stacks and the IGCC, show that all the values recorded were well below the legal limits for the refinery (Graph 13) and those set for the IGCC during the authorisation stage (Graph 14).

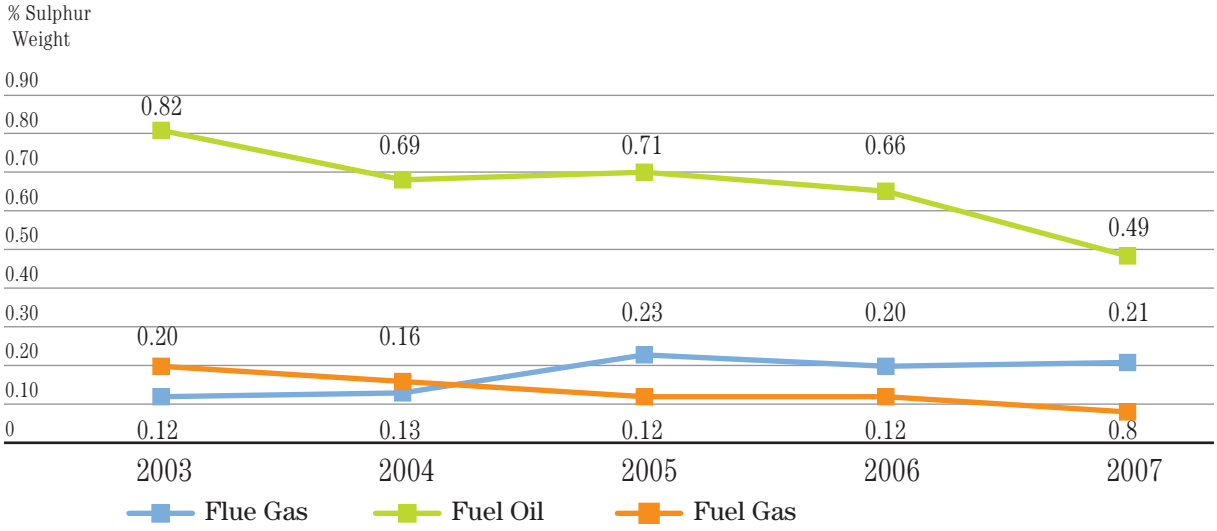
Graph 10 - Emissions of SO_2



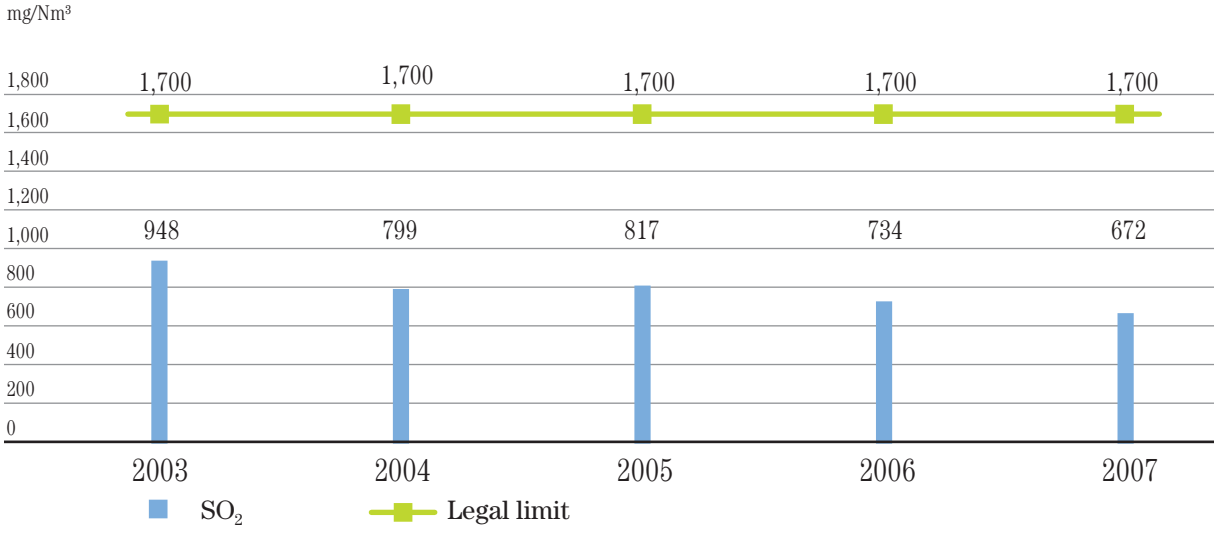
Graph 11 - Production index SO_2



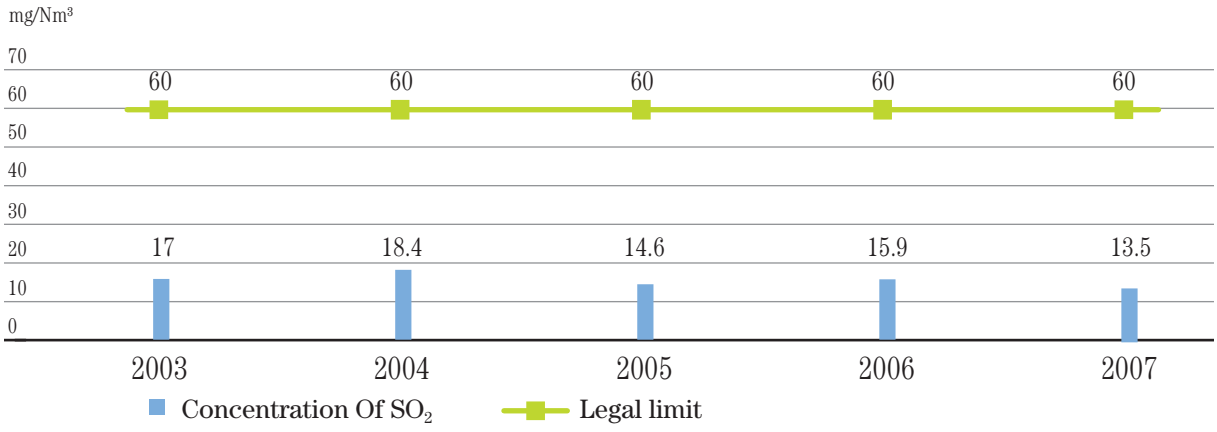
Graph 12 - Sulphur content of fuels



Graph 13 - Concentration of SO_2 from refinery stacks



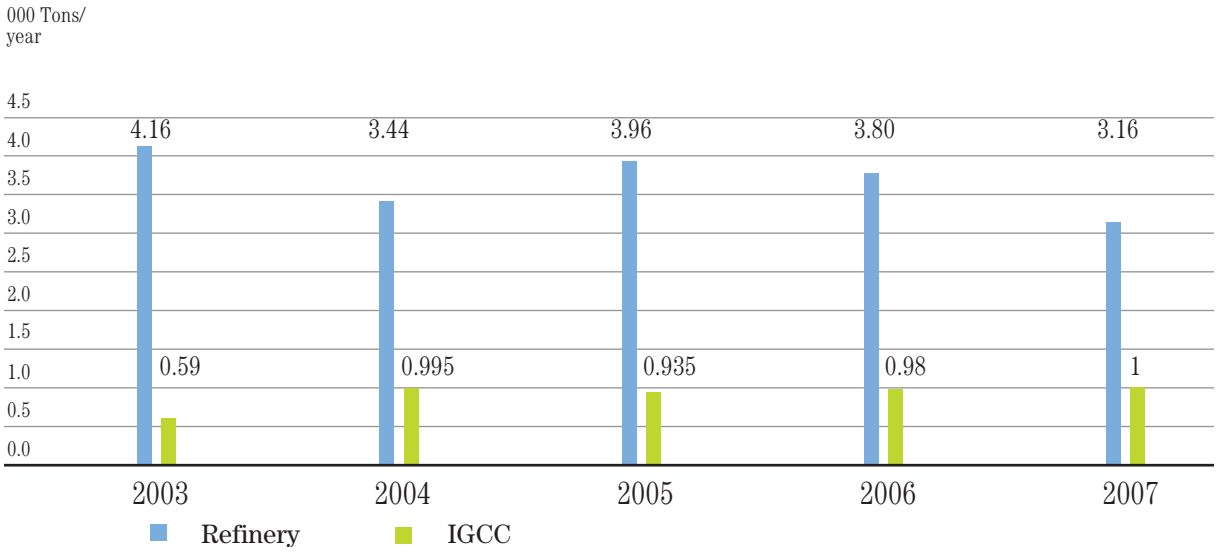
Graph14 - Concentration of SO_2 from IGCC stack



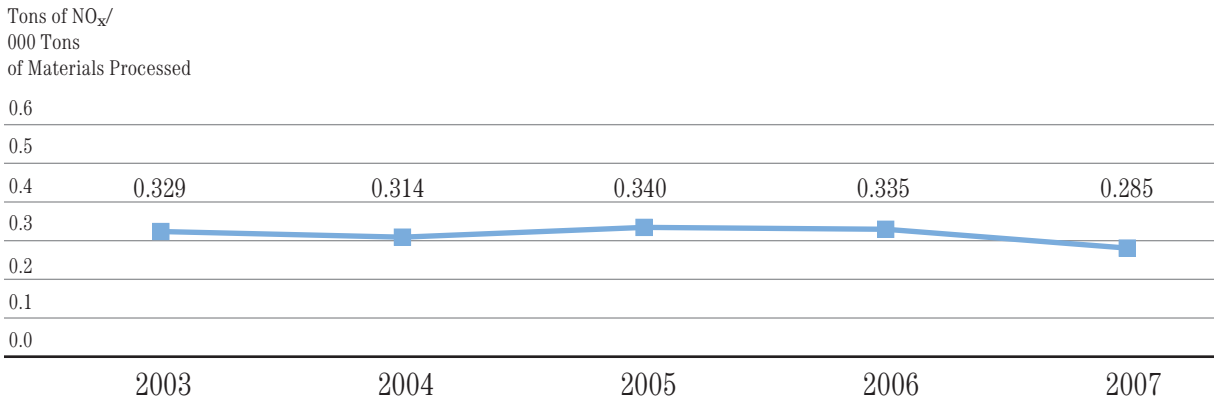
Nitrogen oxide (NO_X)

Overall, the Saras site has continued to curb its nitrogen oxide emissions.
These are only marginally affected by fuel quality, and largely depend on combustion techniques, which in turn are related to structural factors such as burner type. The introduction of new, low-NO_X burners to replace the old ones at the Topping RT2 and the visbreaking units led to a sharp reduction in emissions.
In addition, following the entry into operation of the IGCC plant, NO_X emissions remained broadly unchanged in 2003-2007 (see Graph 15). The figure for 2007 was the lowest of the past five years (Graph 16).
A comparison of concentration with the regulatory limits confirms that the results are very positive and well below the limit (Graphs 17 and 18).

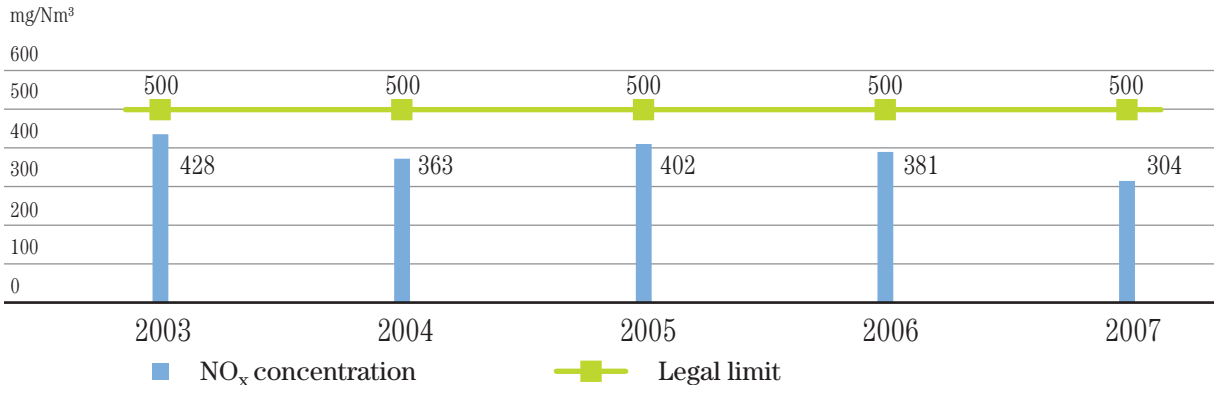
Graph 15 – NO_X emissions



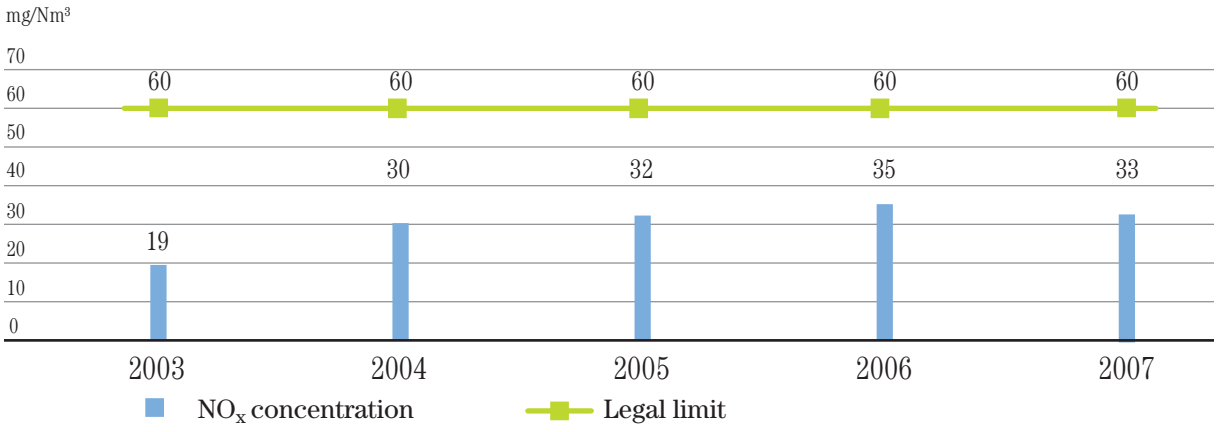
Graph 16 – NO_X production index



Graph 17 – Concentration of NO_x from refinery stack



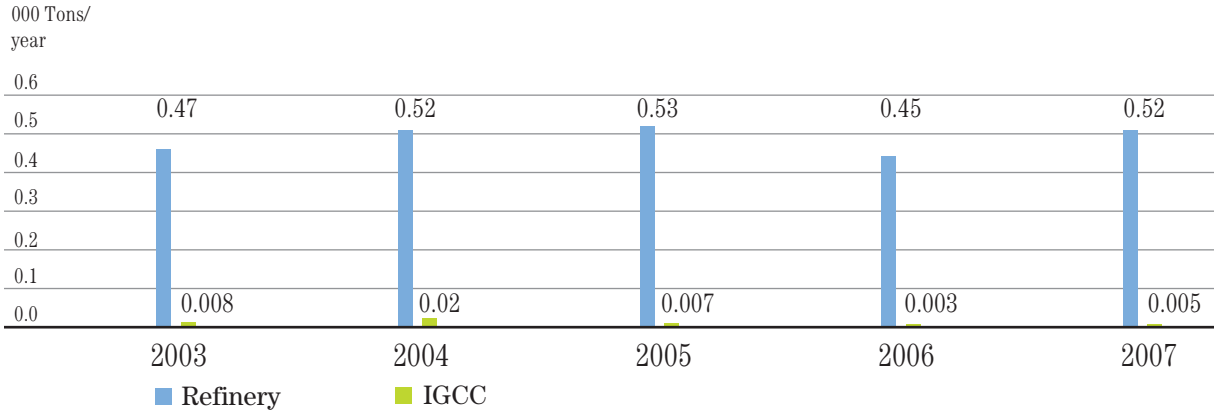
Graph 18 – Concentration pf NO_x from IGCC stack



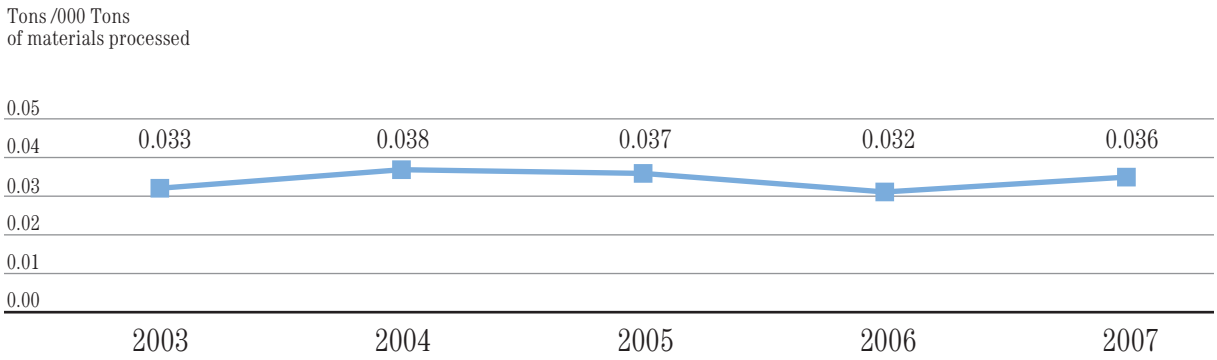
Dust

The refinery's exclusive use of fuel oil with a low sulphur content (BTZ) since 2000 has kept dust emissions at low levels, and consistently below legal limits (Graphs 21 and 22).
The trend can also be seen in the positive performance of the IGCC plant, which has negligible dust emissions, as shown in Graph 19, which shows total emissions. Overall, levels at the site have been largely constant (Graph 20).

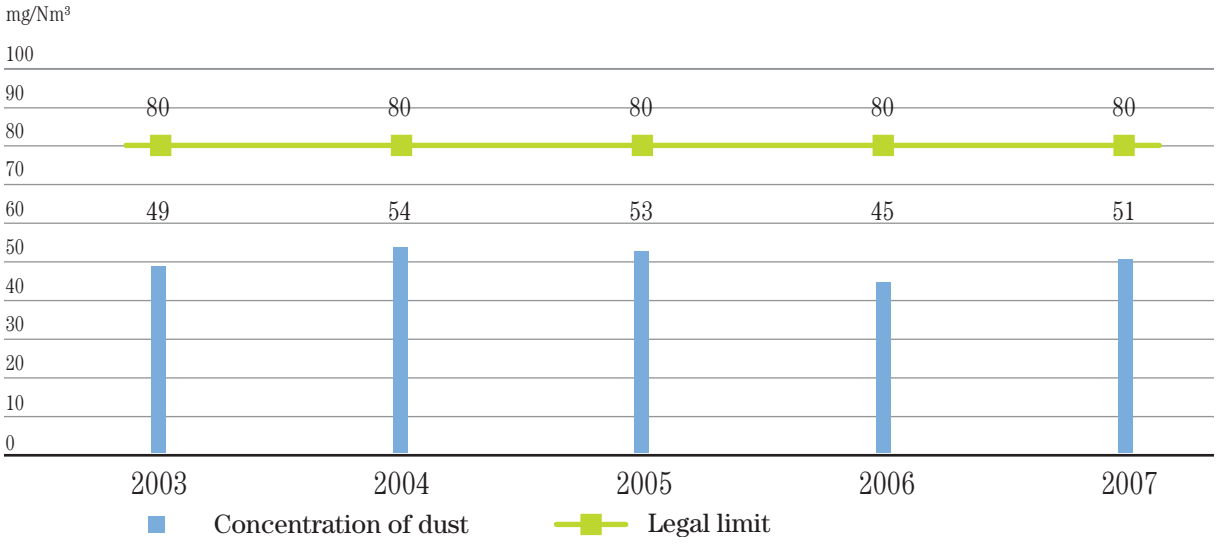
Graph 19 – Dust emissions



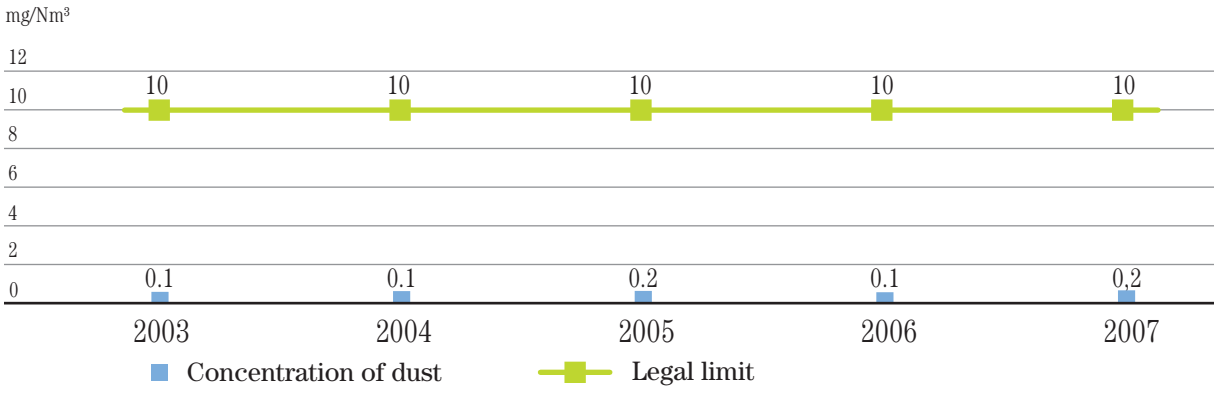
Graph 20 – Dust production index



Graph 21 – Concentration of dust from refinery stacks



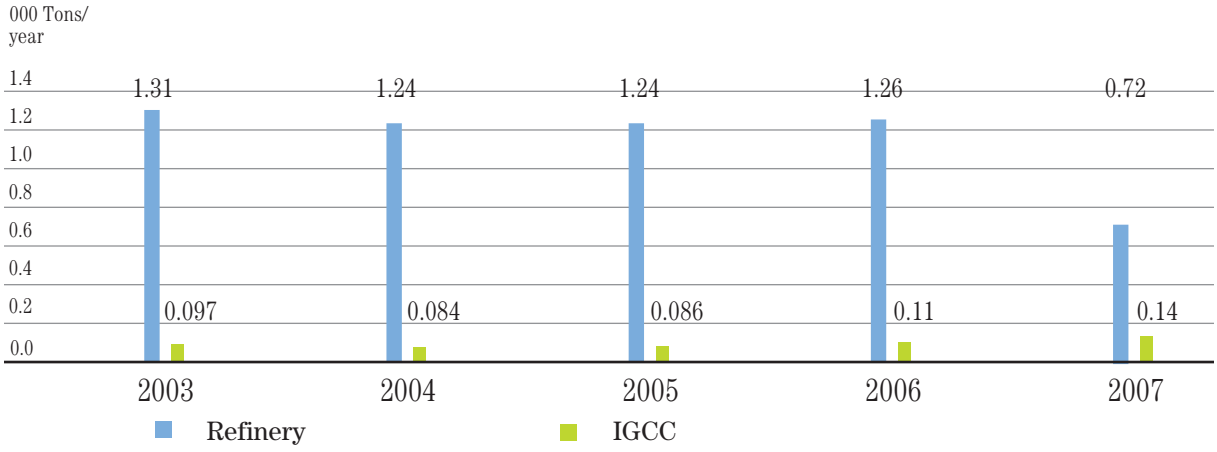
Graph 22 – Concentration of dust from IGCC stacks



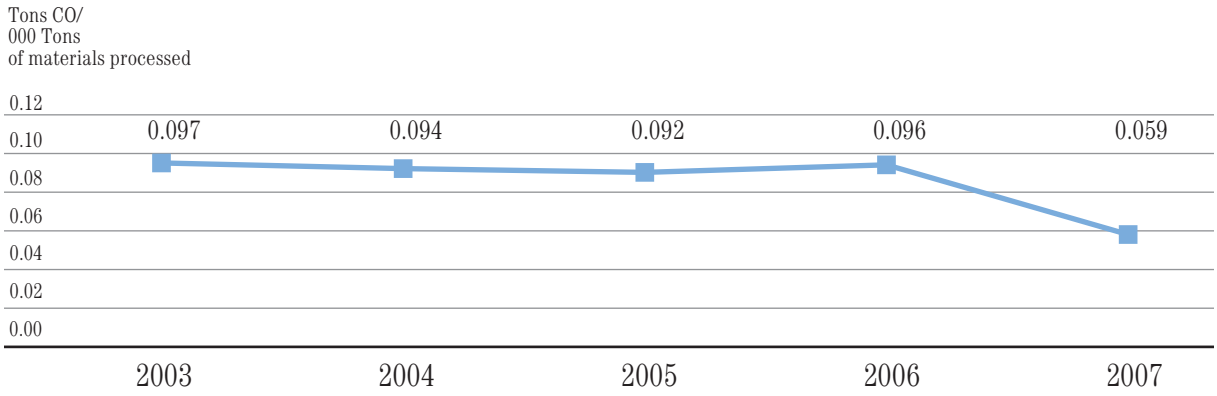
Carbon monoxide (CO)

Carbon monoxide emissions also showed a positive trend: the figure for the IGCC was broadly steady, while that for the refining plants fell sharply, thanks to the optimisation of the combustion process for some furnaces (Graph 23).
All figures recorded were well below the legal limits: specifically, the refinery's CO emission concentrations were around 50% of the limit (Graph 25), and emissions at the IGCC plant were about ten times lower than the benchmark limit (Graph 26).

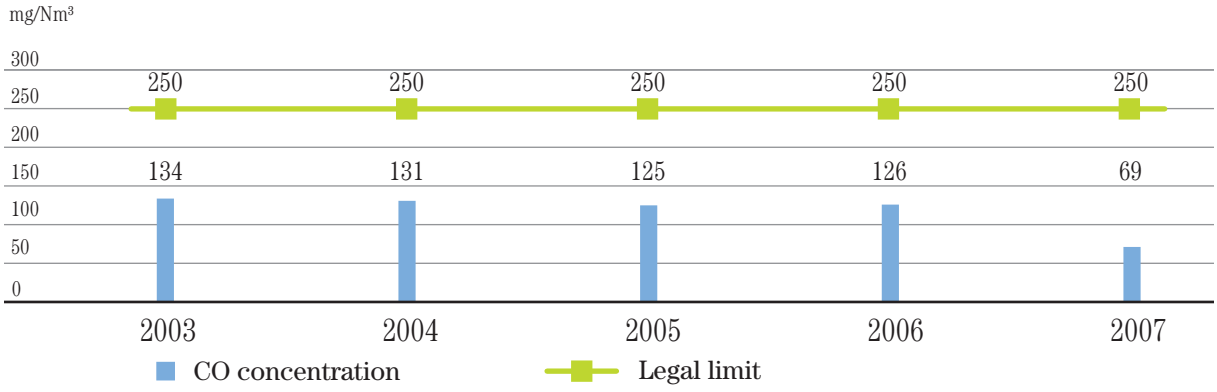
Graph 23 – CO emissions



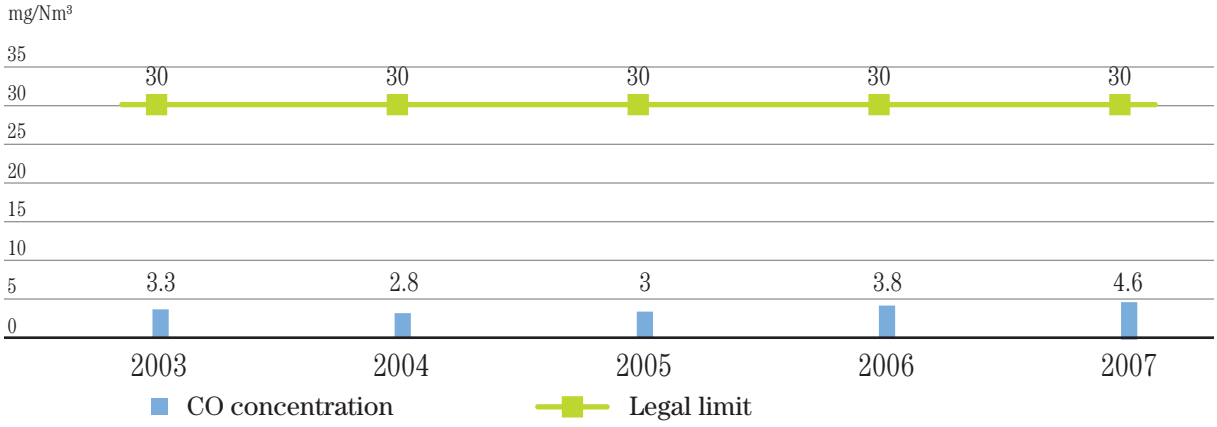
Graph 24 – CO production index



Graph 25 – Concentration of CO from refinery stacks



Graph 26 - Concentration of CO from IGCC stacks



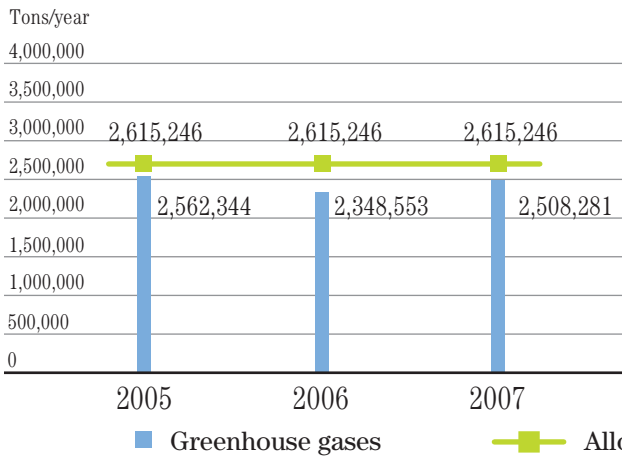
Greenhouse gas emissions

The Sarroch plant's two areas of operation, the refinery (refining sector) and the IGCC plant (thermoelectric sector) fall within the field of application of the European Emissions Trading Directive. The directive was introduced across Europe to control and reduce carbon dioxide emissions as part of the fight against climate change. Carbon dioxide emissions do not have a direct impact at local level on the quality of the area surrounding the site, but are connected to the global greenhouse effect. The emissions trading scheme was introduced in 2005, to help member states comply with the requirements of the Kyoto Protocol. It works by assigning each individual plant falling within the directive's field of application an emissions allowance established by the member state through a national allocation plan. Surplus allowances may be traded and/or stockpiled, and any deficit must be covered by acquiring emissions allowances on the market. Allocation is decided for each of the reference periods set by the Directive: the first covers the three-year period 2005-2007, while the following ones relate to the subsequent five-year periods 2008-2012, 2013-2018, etc.).
The Directive's first period of application came to an end in 2007, while subsequent periods envisage tougher allowances based on the objectives set out in the Kyoto Protocol. The emissions trend of the first period was typical of the site's normal performance, with slight fluctuations caused by maintenance, for example (Graphs 27 and 28). Saras keeps a register that records, calculates and monitors CO_2 emissions. The calculation system is certified by accredited independent bodies in accordance with European guidelines. Controlling and reducing emissions is mainly achieved by rationalising energy use and adopting efficient energy-generating systems, initiatives to which Saras has always been heavily committed.

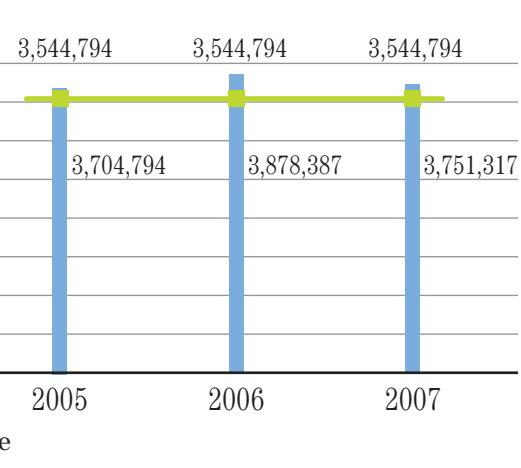
Table 15 - Greenhouse gas emissions from the site (refinery + IGCC; tons/year)

	2005	2006	2007
Refinery	2,562,344	2,348,553	2,508,281
IGCC	3,704,404	3,878,387	3,751,285
Total	6,266,748	6,226,941	6,259,565
Allowance	6,160,040	6,160,040	6,160,040

Graph 27 – Greenhouse gas emissions from the refinery



Graph 28 - Greenhouse gas emissions from the IGCC plant



The National Emissions Trading Register, which is available for consultation (www.epec.ec.europa.eu), records both the allowances assigned and the annual CO_2 emissions in Italy; Saras has been assigned a single position grouping the total emissions from its operations at the Sarroch plant.

Air quality

As described on page 22, a three-level monitoring system constantly checks the main air quality parameters in the area around the Saras plant and more widely in the Sarroch industrial area (Figure 10). The tables below show data on the concentrations of the main parameters as measured by the Saras control units compared with the limits set under current legislation. As can be seen from Figure 10, the control units of the three-level monitoring system are located in compliance with the provisions of previous legislation (Presidential Decree 203/88).
Current legislation (Ministerial Decree 60 of 2 April 2002) requires sampling points for the protection of human health to be located so as to "provide data on areas within zones and built-up areas which contain the highest levels to which the population is likely to be exposed, either directly or indirectly". It is therefore necessary to relocate some monitoring stations to ensure adequate monitoring of air quality in inhabited areas or to take into account the performance of several monitoring stations. The data show that the quality standard is met for all the pollutants monitored; the values measured by the monitoring stations are all below emission limits (page 64, Table 16). This result is highly significant as it is closely connected with health and environmental quality in the region, and is achieved thanks to specific plant upgrades and constant monitoring of production processes as regards environmental performance.

Figure 10 - The Sarroch industrial area control unit network

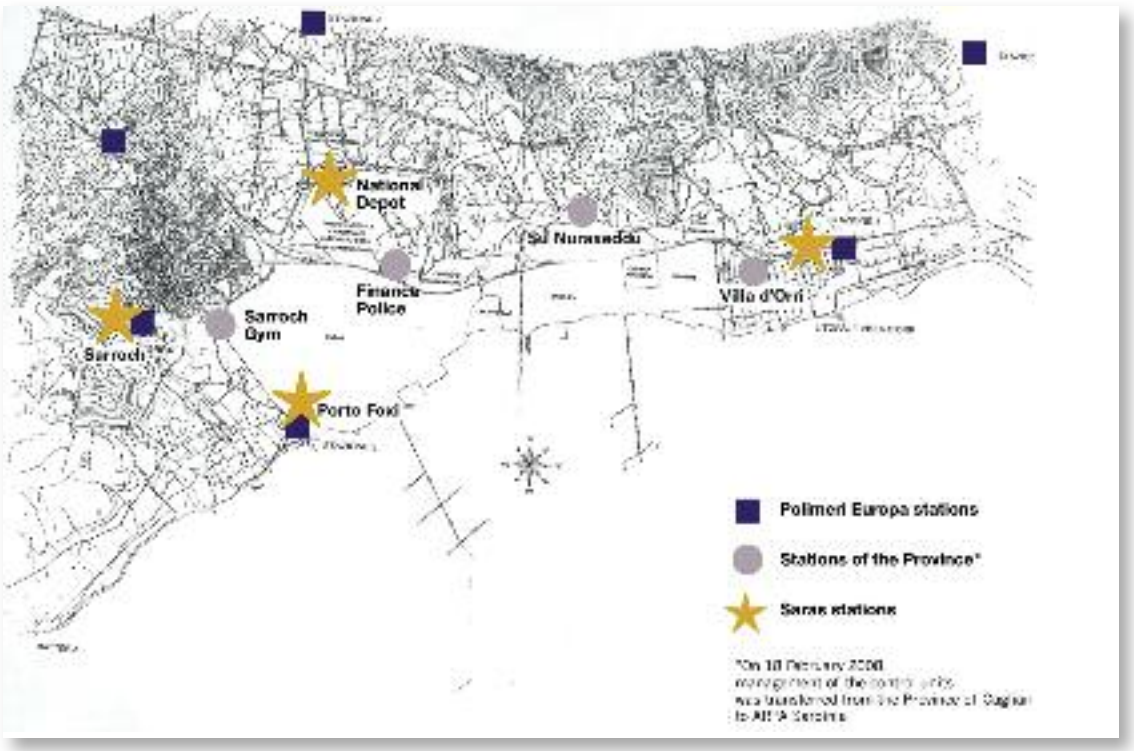


Table 16 – Data from monitoring network and comparison with legal limits pursuant to ministerial decree 60/02 (μg/m^3)

SO_2	Number of episodes							
	In excess of hourly limit**			In excess of 24-hour limit***			In excess of limit for ecosystems****	
	2005	2006	2007	2005	2006	2007	limit	2007
Villa d'Orri	0	0	0	0	0	0	20	3
Porto Foxi*	9	6	21	4	1	5	20	16
Sarroch	4	8	8	0	0	0	20	13
National storage facility	0	4	1	0	0	0	20	8

* The Porto Foxi control unit is located in an area designated for use as a "working area"

** Hourly limit must not be exceeded more than 24 times per calendar year (350 μg/m^3 since 2005)

*** 24-hour limit must not be exceeded more than 3 times per calendar year (125 μg/m^3).

**** Limit for the protection of ecosystems

NO_X	Number of times the hourly limit was exceeded*			2005		2006		2007	
	2005	2006	2007	Amount recorded***	limit**	Amount recorded***	limit**	Amount recorded***	limit**
Villa d'Orri	0	0	0	9	50	4	48	6	46
Porto Foxi	0	0	0	5	50	10	48	9	46
Sarroch	0	0	0	6	50	7	48	6	46
National storage facility	0	0	0	6	50	8	48	10	46

* Hourly limit must not be exceeded more than 18 times per calendar year (250 μg/m^3 in 2005; 240 μg/m^3 in 2006; 230 μg/m^3 in 2007).

** Annual limit

*** Annual average on an hourly basis

PM10	Number of times the 24 hour limit was exceeded*			2005		2006		2007	
	2005	2006	2007	Amount recorded**	limit	Amount recorded**	limit	Amount recorded**	limit
Villa d'Orri	2	n.d	n.d	22	40	n.d	28	n.d	40
Porto Foxi	6	4	15	26	40	19	28	24	40
Sarroch	3	0	14	24	40	24	28	27	40
National storage facility	0	n.d	n.d	16	40	n.d	28	n.d	40

* 24-hour limit must not be exceeded more than 35 times per calendar year (50 μg/m^3 since 2005).

** Arithmetic mean of average concentrations over 24 hours during 1 year

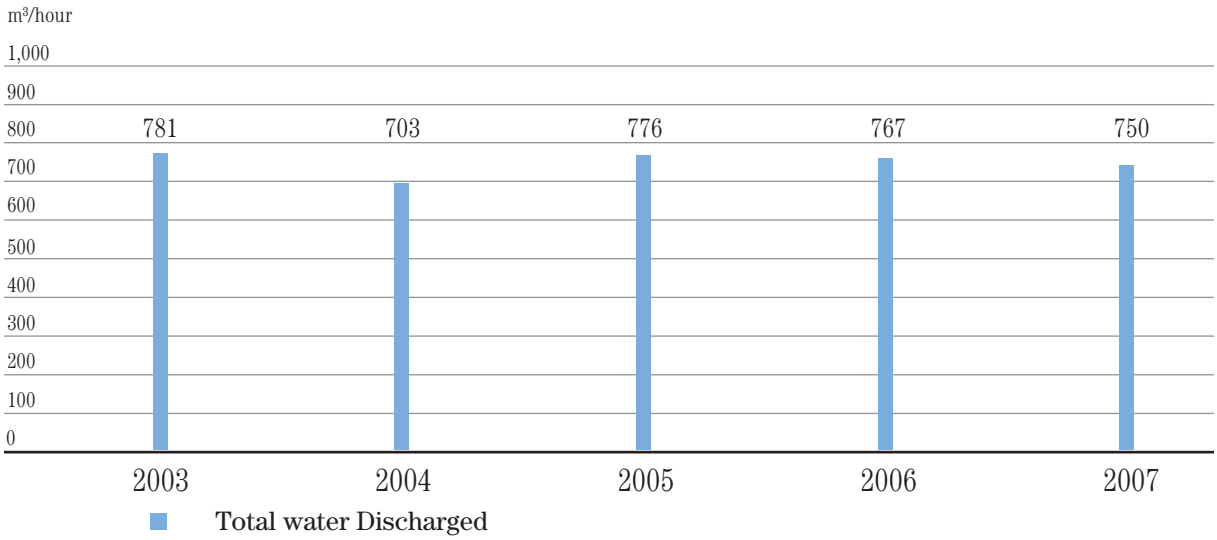
CO	Number of times the maximum daily average was exceeded*		
	2005	2006	2007
Villa d'Orri	0	0	0
Porto Foxi	0	0	0
Sarroch	0	0	0
National storage facility	0	0	0

* Maximum daily average over 8 hours (10 μg/m^3 dal 2005)

Waste water

Between 2003 and 2007 the site registered a routine performance, with slight fluctuations linked to maintenance of the processing plants, a trend confirmed by the broadly stable index values in relation to processing. To measure the environmental quality of waste water, COD (a general index of water quality) and hydrocarbon (mineral oils) indicators were adopted as processing benchmarks (see Table 17, page 66). In accordance with regulations established by the Province of Cagliari regarding the discharge of waste water into the sea, monthly samples are taken by an accredited external laboratory, and the results of the analysis are sent to the provincial authority each quarter. Graphs 35 and 36 (page 67) are based on the COD and on information obtained from continuous hydrocarbon analysis. They show that all the concentration values measured during the period under review are consistently below the limits set by existing legislation.

Graph 29 – Total water discharged



Graph 30 – Index of total water discharged

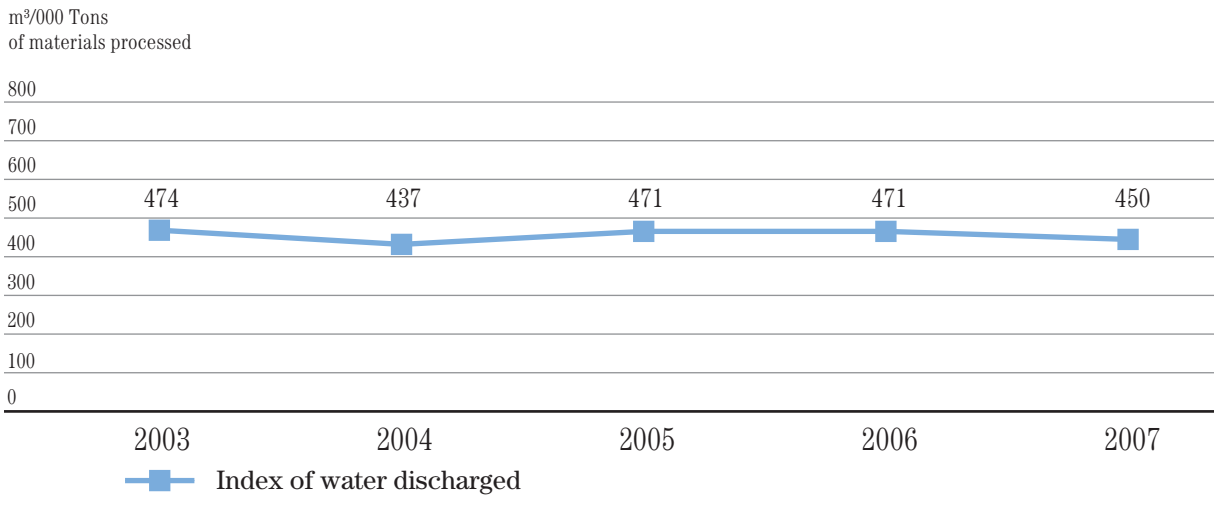
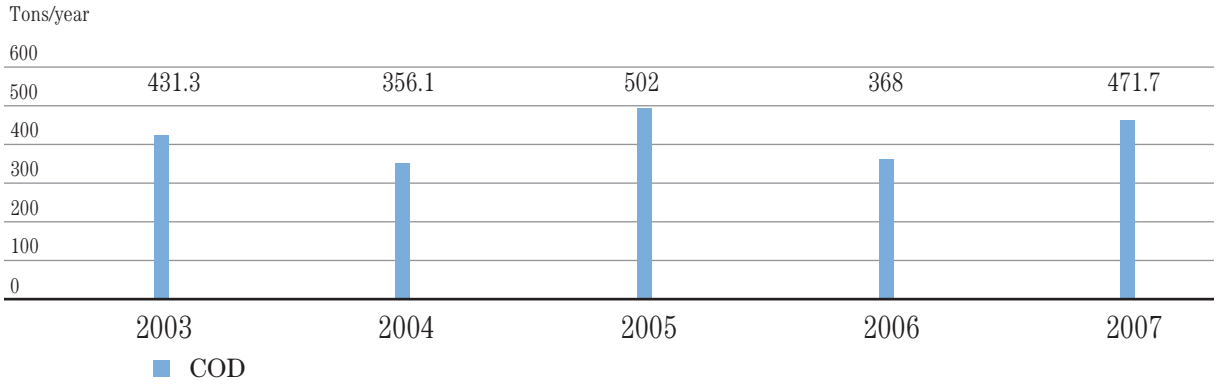


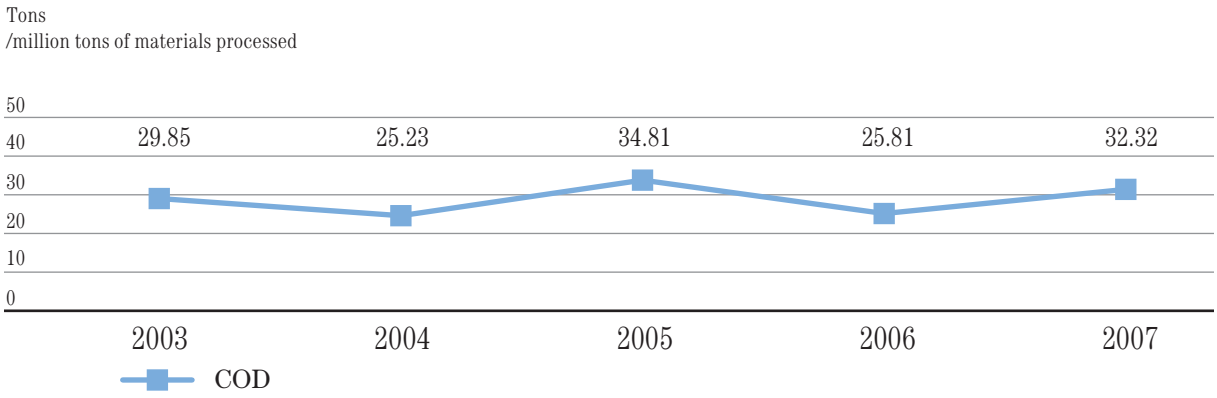
Table 17 – Main substances detected (tons/year)

	2003	2004	2005	2006	2007
COD	431.3	356.1	502.0	368.0	471.7
Mineral oil	12.5	10.2	11.8	10.1	10.1

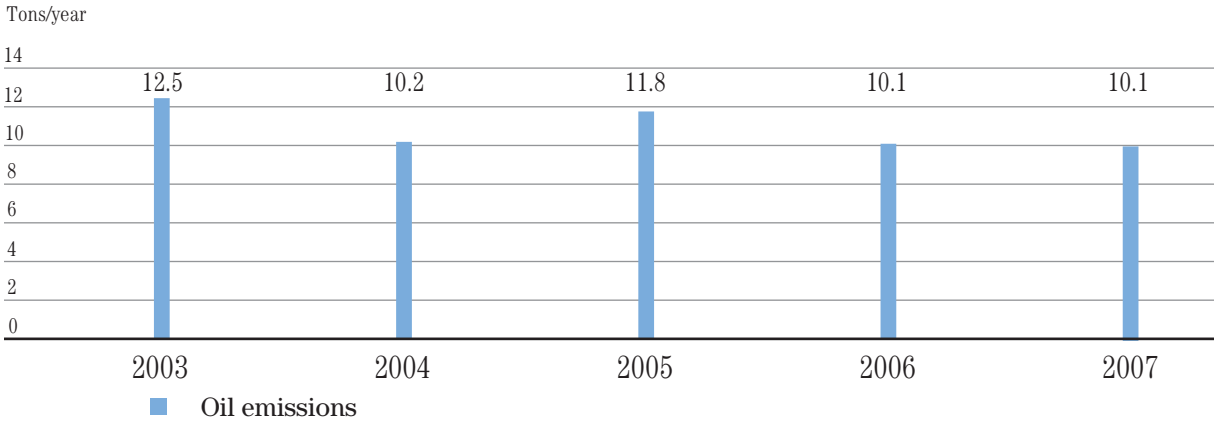
Graph 31 - Cod emissions



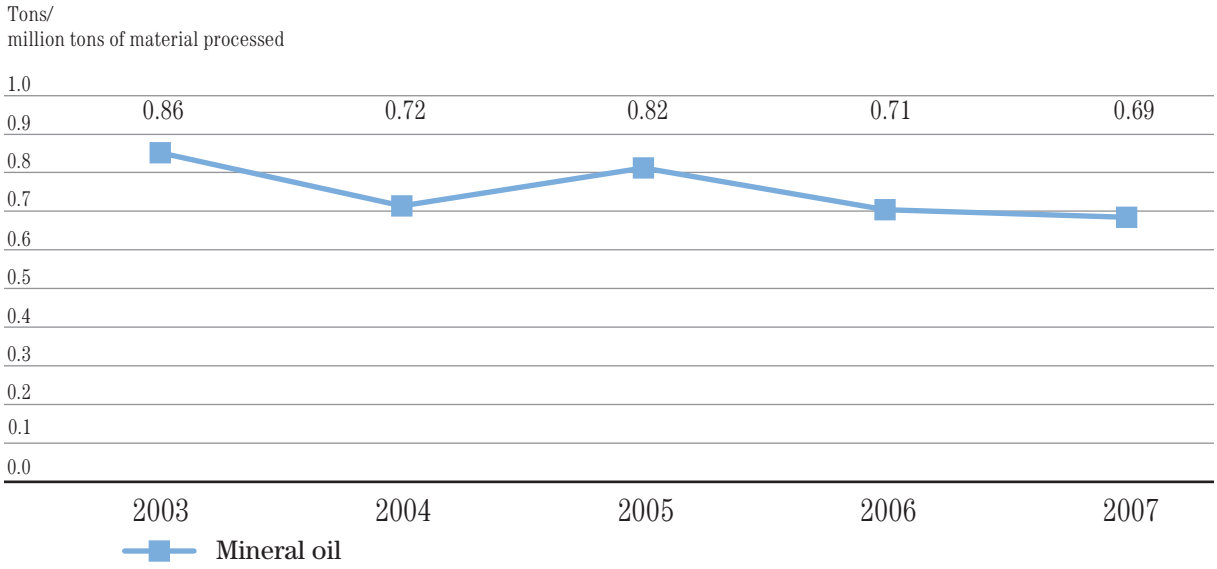
Graph 32 – Cod emission index



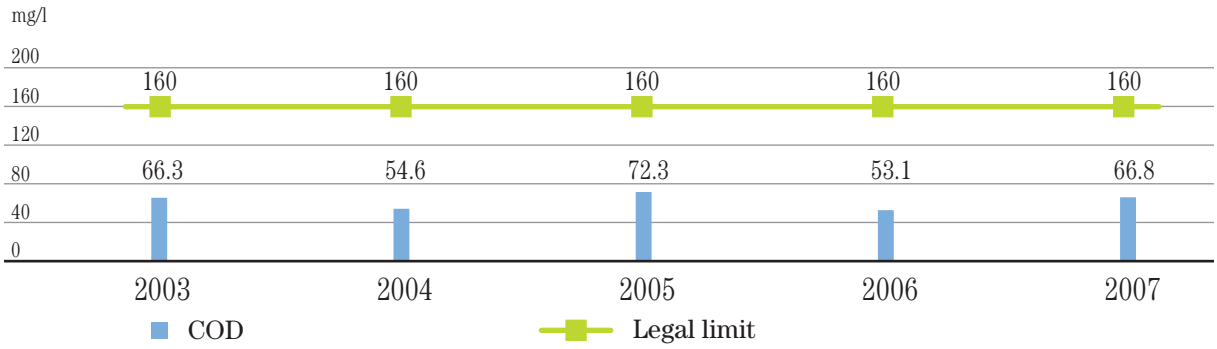
Graph 33 – Mineral oil emissions



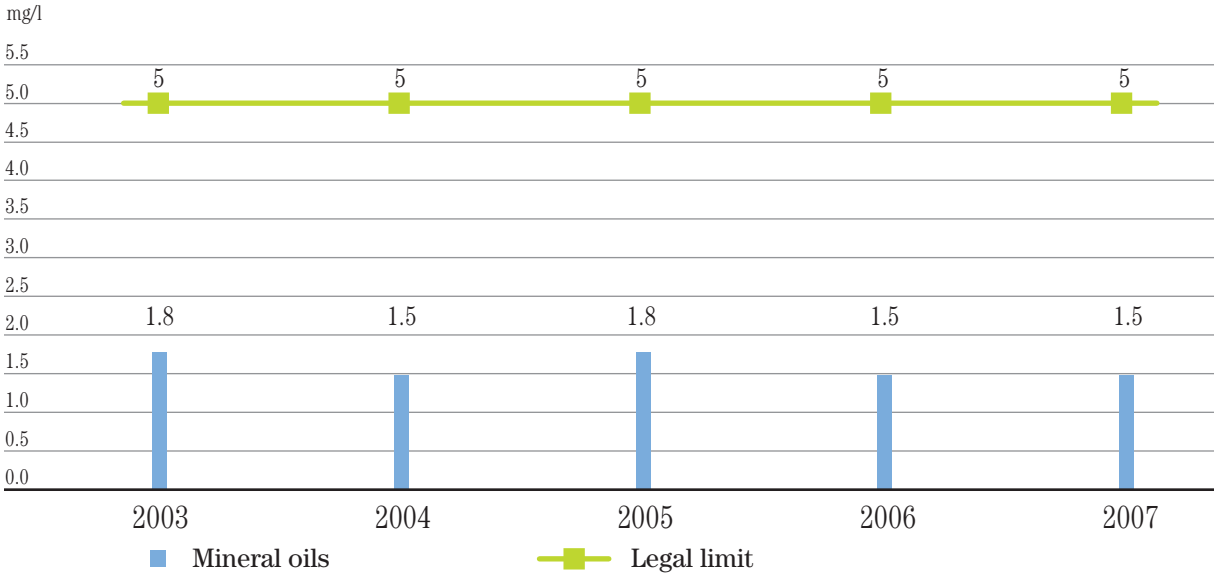
Graph 34 – Mineral oil emission index (tons/million tons of materials processed)



Graph 35 – COD concentration and comparison with legal limit



Graph 36 – Mineral oil concentration and comparison with legal limit



Waste

The refinery manages waste according to its objectives of minimising the quantity produced and increasing the quantity recovered. Total production in 2007 was broadly similar to that of previous years when work began on removing the top layer of soil in the reservoirs, which was necessary to lay cement floors in order to comply with environmental requirements for improved subsoil protection.
In 2007, around 22,000 tons of waste were recovered or recycled, an increase of 60% versus 2006. The rise was due to the sending of used catalysts from the desulphurisation process to companies specialising in the recovery of metals (Co, Mo, Ni). At the same time, the quantity of waste sent to landfill fell by more than 24% (Table 20). Waste for chemical/physical treatment is processed on Saras' behalf by ECOTEC, a specialist company working within the plant.
The company was selected and is continually monitored in accordance with the internal evaluation procedures used for all contractors. Treated waste is transformed into non-hazardous waste that can then be sent to landfill.

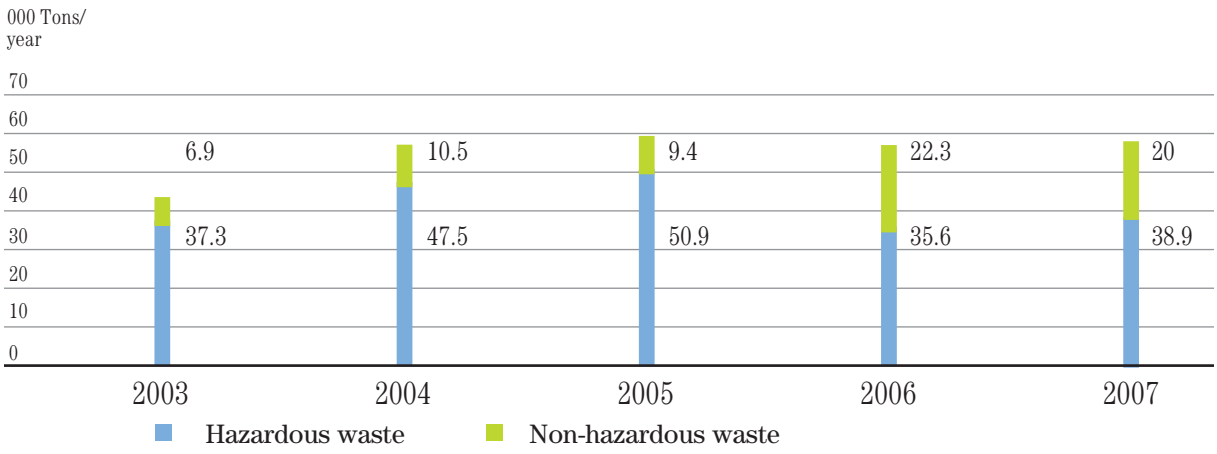
Table 18 – Separated waste sent for recycling (tons/year)

	2006	2007
Paper	43.2	84.5
Plastic	3.8	11.5
Glass	3.9	4.3

Table 19 – Waste produced by the plant (thousand tons/year)

	2003	2004	2005	2006	2007
Hazardous waste	37.3	47.5	50.9	35.6	39.1
Non-hazardous waste	6.9	10.5	9.4	22.3	19.8
Total	44.2	58.0	60.3	57.9	58.9

Graph 37 – Waste produced by the plant



Excavated earth from new operations and from the containment basins was sent to the ECOTEC plant in Macchiareddu, thus eliminating hydrocarbons and allowing them to be reused. In 2007 the ECOTEC plant sent 13,668 tons of waste that had been rendered inert to controlled landfill on behalf of Saras. Separated waste from the offices and canteen is carried out by agreement with the municipality of Sarroch. Table 18 shows the quantity of materials sent for recycling in 2007.

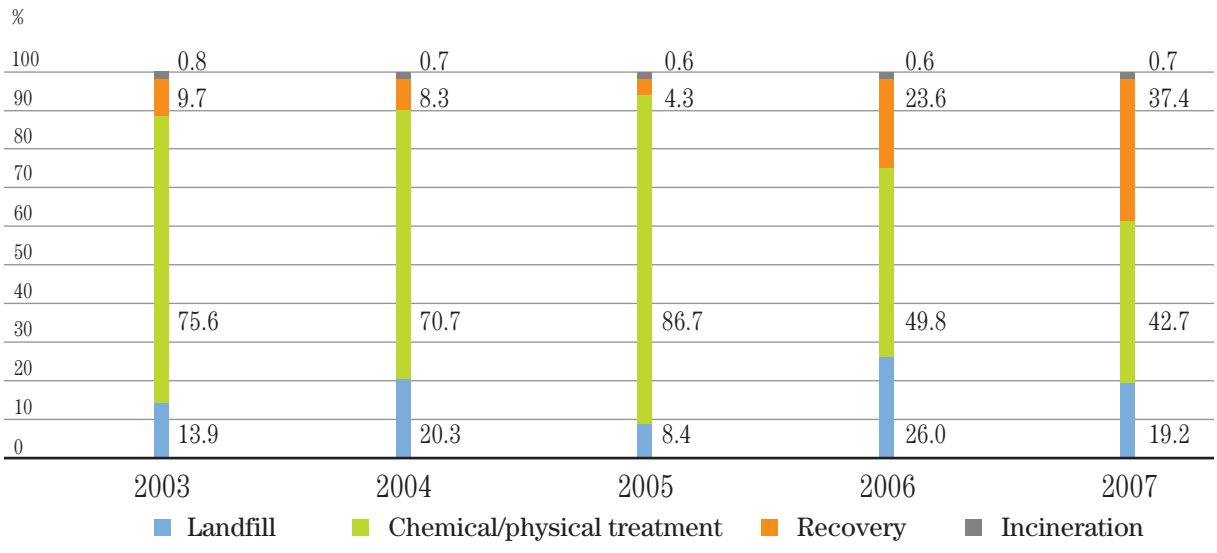
Table 20 – Final destination of waste (thousand tons/year)

	2003	2004	2005	2006	2007
Landfill	6.14	11.75	5.09	15.04	11.32
Recoveri	4.27	4.80	2.58	13.63	22.06
Incineration	0.37	0.41	0.37	0.37	0.42
Chemical/physical treatment	33.41	41.00	52.23	28.77	25.16
Totale	44.19	57.96	60.27	57.81	58.96

Table 21 – Chemical/physical treatment of waste – ecotec (thousand tons/year)

	2003	2004	2005	2006	2007
Chemical/physical treatment	33.41	41.00	52.23	28.77	25.16
of which:					
Rendered inert and sent to landfill	18.96	21.67	24.54	14.83	13.67
Internal recycling	14.45	19.33	27.69	13.94	11.49

Graph 38 – Final destination of waste



Monitoring of the marine environment

For Saras, safeguarding the marine environment is an ongoing and vital commitment, which is carried out mainly by constantly checking the quality of waste water and by monitoring the environmental parameters of the marine environment on a six-monthly basis. The area covered by the surveys is shown in Figure 11, and includes monitoring points from which surface and underwater samples are taken. These monitoring points, positioned along five lines perpendicular to the coastline, remain constant, to ensure that the results of the various surveys conducted over time are fully comparable.
The parameters, monitored continually, make it possible to trace the trophic state of the sea close to the Sarroch plant. This is the main tool used to evaluate the water quality, shown by the data on the following characteristics:

- hydrology (transparency, temperature, salinity, dissolved oxygen, pH balance)
- nutrients (nitrogen compounds, phosphorous)
- state of vegetation (chlorophyll, phytoplankton, characteristics of posidonia oceanica, macroalgae)
- state of fauna (zooplankton and fouling)
- monitoring of sediment particles (deposited during the study period) and surface sediment
- monitoring of heavy metals in the sediment

Table 22 summarises the results of the trophic state of the sea water based on surveys of the quality of the water off the coast near the refinery carried out over the past five years. Assessment of the trophic state is given for both surface and bottom water.

Figure 11 - Sea water quality survey area

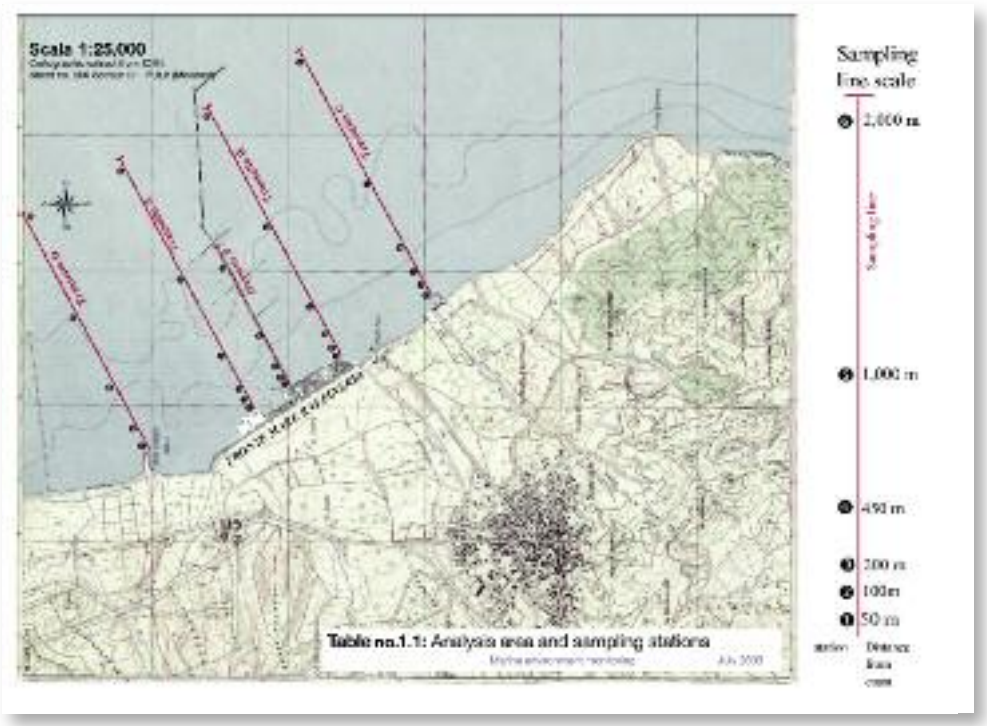


Table 22 – Trophic state of sea water off the coast near the plant (surveys 2003-2007)

	surface water	bottom water
January 2003	good	high
July 2003	good	good
January 2004	good	good
July 2004	high	high
January 2005	good	good
July 2005	high	high
January 2006	good	good
July 2006	high	high
January 2007	**high**	**high**
July 2007	**high**	**high**

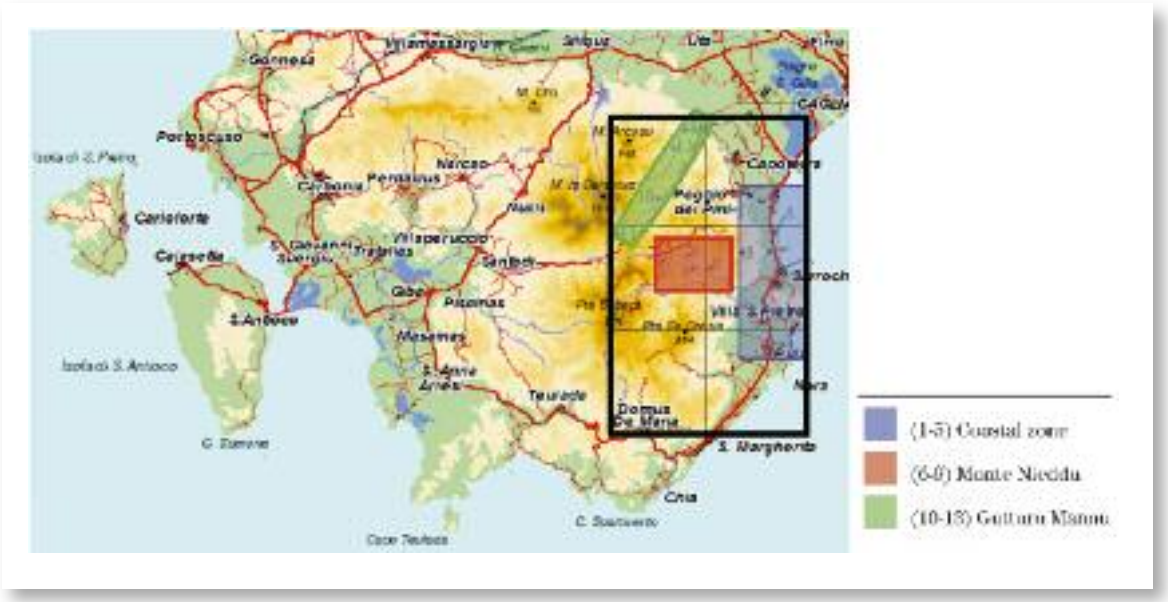
Vegetation biomonitoring

Another particularly important part of environmental monitoring near the Saras plant is vegetation biomonitoring, which is carried out in two ways:

- monitoring the health of vegetation by visual checks of various plant species located in specific areas, as shown in Figure 12
- monitoring the bioaccumulation of pollutants using moss bags.

Moss bags are permeable bags containing mosses and liverworts, which are particularly useful in showing the absorption of pollutants. They are placed on vegetation in the areas being studied and analysed after a set exposure time. According to the results of these field measurements, there is no critical threat to the health of the vegetation in the area studied.

Figure 12 - Vegetation biomonitoring areas



Investment in the environment

Saras' commitment to continually improving environmental performance can also be measured and evaluated in terms of the financial investment devoted to this purpose. The data shown in Table 23 show the company's strong commitment on this front, with total investment of over EUR 37 million in the past five years.
In 2007, the main investments were:

- ongoing work on the dynamic groundwater control barrier
- installation of an ultrafiltration plant to increase water recovery
- thermal recovery programme for the FCC plant
- ongoing installation of double seals on gasoline-handling pumps
- ongoing tank and pipeway paving
- ongoing installation of double bottoms in tanks

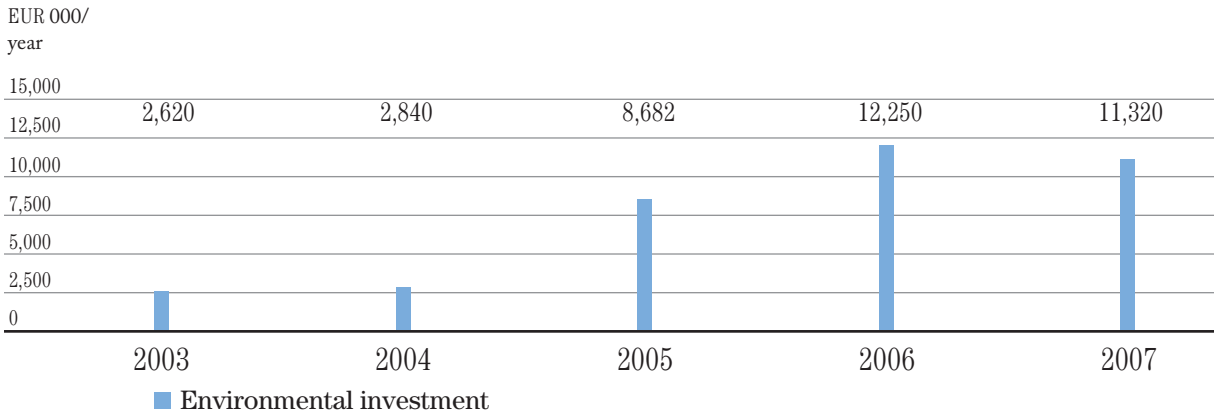
Of particular importance was the start of works to build the treatment plant for tail gases emitted by the Claus units for reducing SO_2 emissions, which will require a total investment of more than EUR 52 million in the period 2006-2008.

Table 23 – Environmental investment (eur thousand/year)

	2003	2004	2005	2006*	2007**
Investments	2,620	2,840	8,682	12,250	11,320

* added to the investment for the TGTU plant (EUR 52,700 thousand), the total is EUR 64,950 thousand
** added to the investment in thermal recovery for the FCC plant (EUR 22,700 thousand), the total is EUR 34,020 thousand

Graph 39 – Environmental investment



Safety

Technology, investment and staff training

One of the company's key priorities is to constantly foster a culture of safety, by creating working conditions appropriate to the needs of employees, in order to achieve a progressive reduction in the number of emergencies and accidents. As is the case with other measurable objectives, such as product quality and competitiveness, the promotion and maintenance of high safety standards are shown in this part of the 2007 report using precise and detailed data. In order to assess whether the decisions made are taking the company in the right direction, and to compare the work performed and the results achieved in this area with those of other organisations in the same sector, appropriate index data is required.
The indices considered confirm that a great deal of progress has been made in the continual improvement of staff safety, but also show that further improvement can still be made, mainly in relation to external firms working with the company.

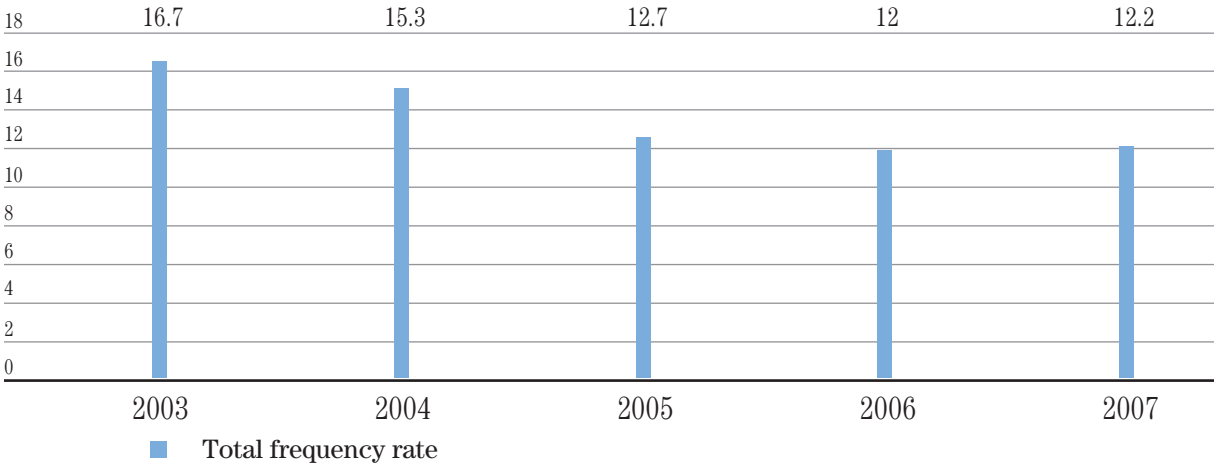
Accidents

Saras personnel. The accident record for 2007 shows the results of the major efforts made by the Management Committee in recent years. The frequency and severity of accidents remained stable, while the average duration of accident leave fell. In 2007 this major commitment to monitoring the management of contractors' activities and building sites continued, with the specific aim of raising the safety awareness of all staff working at the site. The causes of the accidents recorded, which were mainly due to human error, confirm the need to continue to involve staff in safety at work issues. This will include an intensive training and information programme, in accordance with the principles established in the company's safety policy and management system some time ago. In 2007 the total frequency index and the INAIL (national work accident compensation authority) frequency index were in line with those of previous years. The first, which shows the total number of incidents, has fallen from 16.7 to 12.2 in the past five years, while the second, which records accidents reported to INAIL (i.e. those requiring more than one day's absence from work), has remained broadly steady, if we take account of the fact that two accidents included in the statistics occurred outside working hours (Table 24).
Other particularly meaningful and useful reference parameters for analysing the situation are the accident severity index, which shows the extent of injury and refers to the number of days' sick leave taken, and average duration, which shows

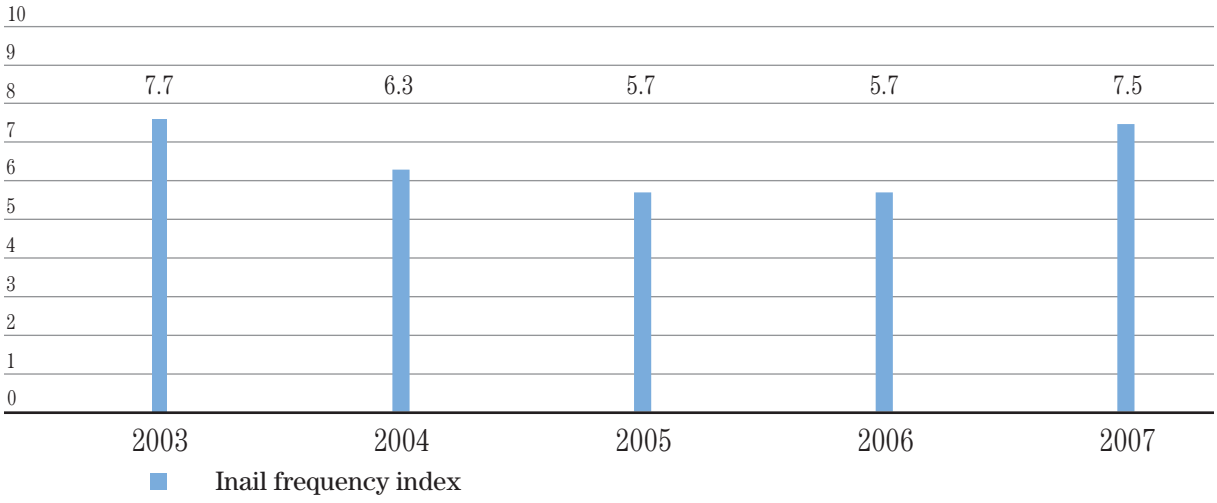
Table 24 – Saras employees – accident indices

	2003	2004	2005	2006	2007
Total frequency index	16.7	15.3	12.7	12.0	12.2
INAIL frequency index	7.7	6.3	5.7	5.7	7.4
Severity index	0.367	0.256	0.129	0.120	0.123
Average duration	47.8	32.9	22.8	21.3	16.5

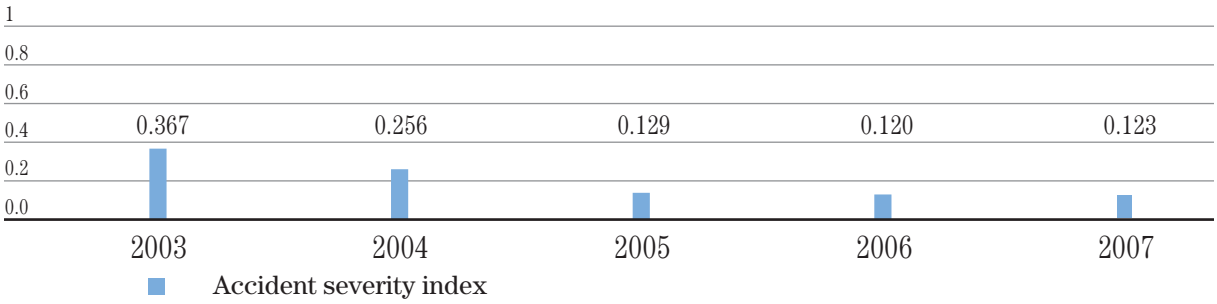
Graph 40 – Saras employees – Total frequency index



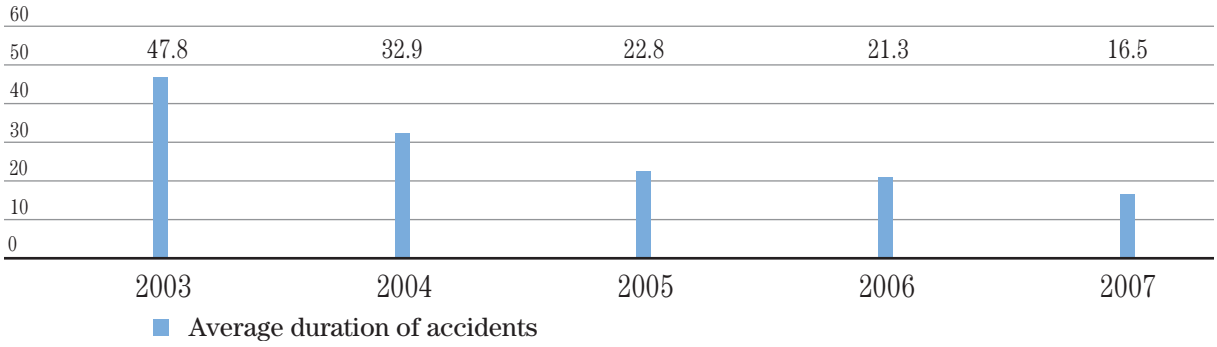
Graph 41 – Saras employees – Inail frequency index



Graph 42 – Saras Employees – Accident severity index



Graph 43 – Saras employees – Average duration of accidents



the average extent of injuries suffered (Table 24, page 74).
These show a slightly declining trend in 2007 versus 2006. In the past few years the severity rate has fallen to 0.120 and has flattened off, while the average duration declined from 21.3 in 2006 to 16.5 in 2007.

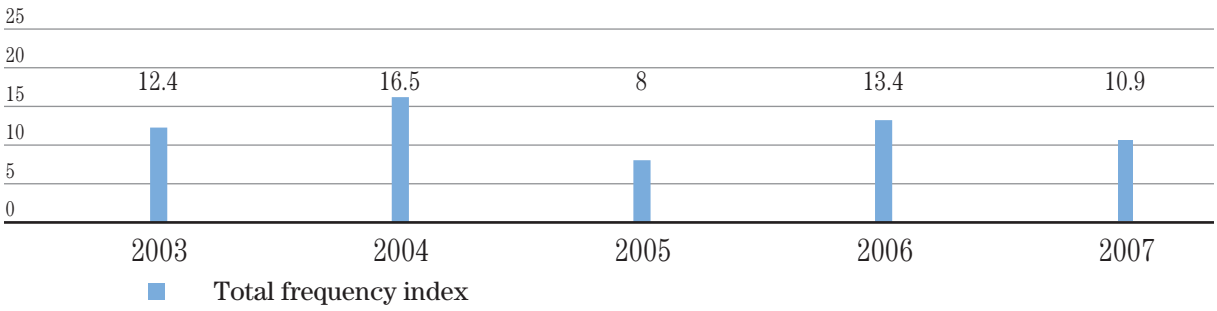
External companies. The refinery also records and analyses data on accidents at work involving those employed by other companies. This has been identified as an area for improvement, through training and motivational initiatives involving the companies themselves. In 2007 there was one fatal accident at the site during an operation to move pipes in the warehouse, which has spurred us on towards further efforts in the area of safety. This serious occurrence resulted in an increase in the indices showing accident severity and average duration. The overall and INAIL frequency indices fell last year, but the severity indices, which show the extent of injuries, rose compared with previous years.
In 2007 work continued with the RLSA (staff representatives for safety and the environment) within Saras, and with the RLS (staff safety representatives) of contractors, which helped reduce INAIL frequency indices.

Tabella 25 – External companies – Accident indices

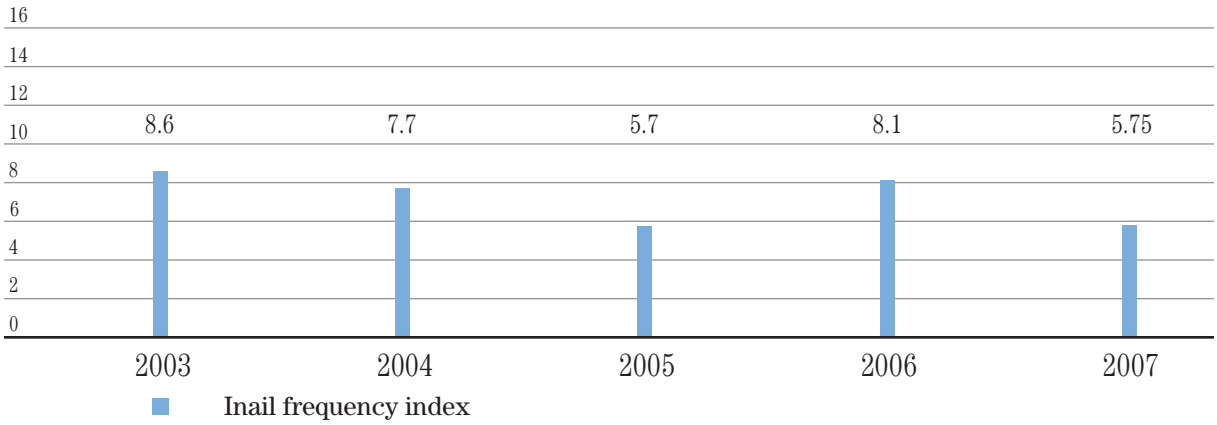
	2003	2004	2005	2006	2007
Total frequency index	12.4	16.5	8	13.4	10.90
INAIL frequency index	8.6	7.7	5.7	8.1	5.7
Severity index	0.418	0.216	0.221	0.170	4.6
Average duration	48.5	27.9	38.7	15.6	39.8*

* This figure does not include the fatal accident that occurred in 2007

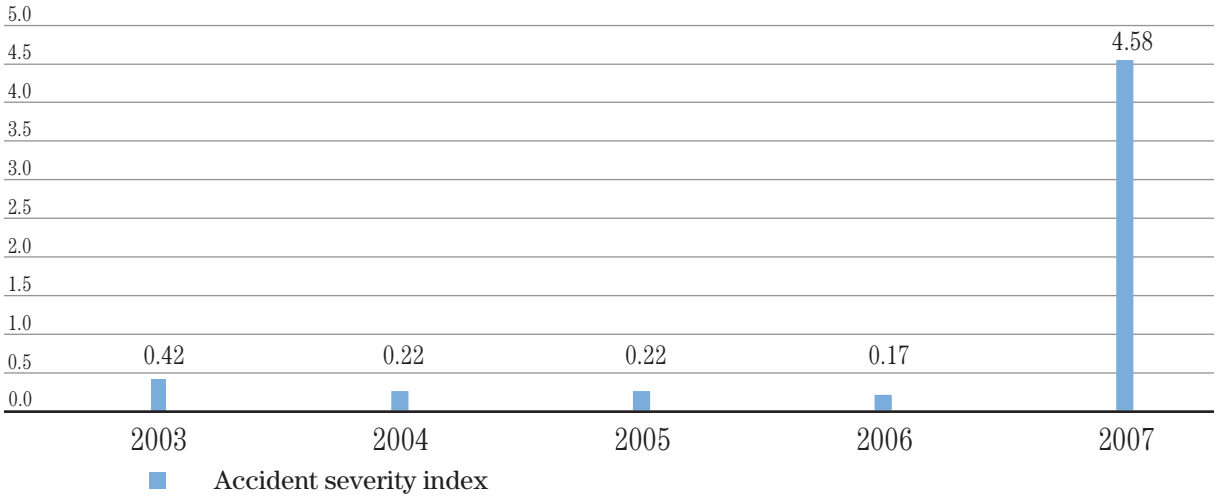
Graph 44 – External companies – Total frequency index



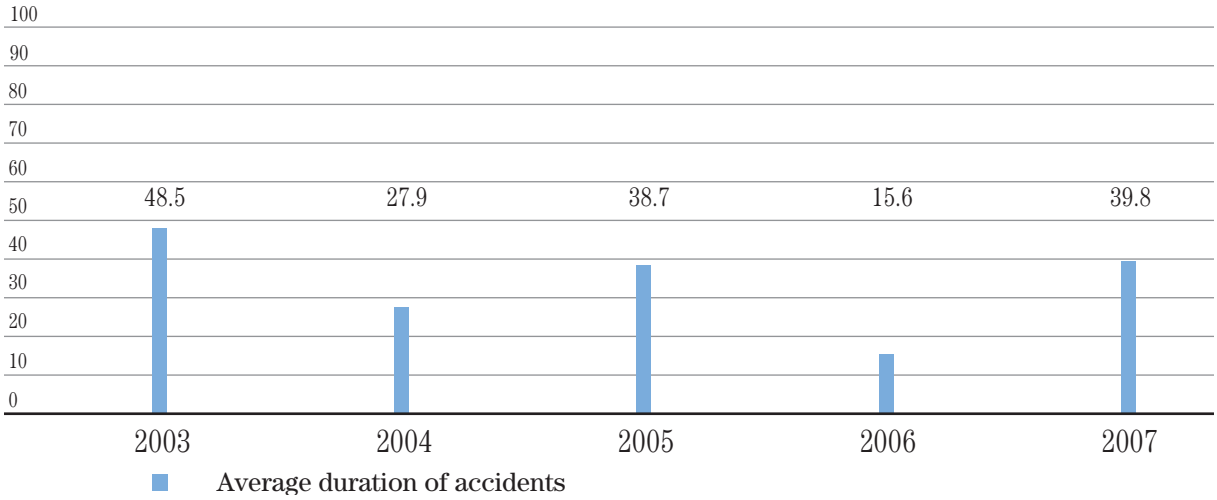
Graph 45 – External companies – Inail frequency index



Graph 46 – External companies – Accident severity index



Graph 47 – External companies – Average duration of accidents



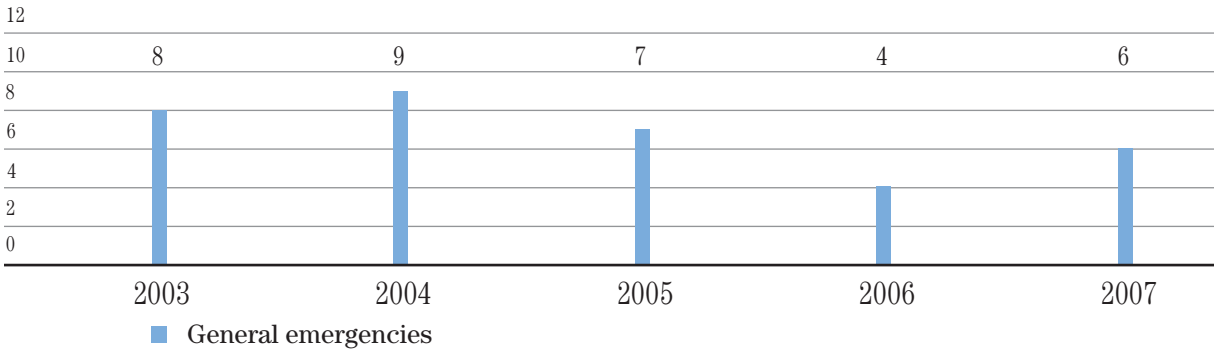
Emergencies

As shown in Table 26, the number of "localised emergencies" recorded in 2007 fell slightly compared with the past three years. The number of "general emergencies" rose slightly, but is still following the downward trend of previous years. "Near accidents" went up compared with previous years. We are making strong efforts to encourage both Saras employees and external staff to report near accidents, and this has led to a reduction in the total number of emergencies to 27, our best result yet. The graphs on pages 80 show the number of plant shutdowns following an emergency and the number of days of shutdown recorded. Graphs 51 and 52 show that there was an improvement in 2007 compared with recent years. In particular, fewer general emergencies mean that the number of plant shutdowns is falling.

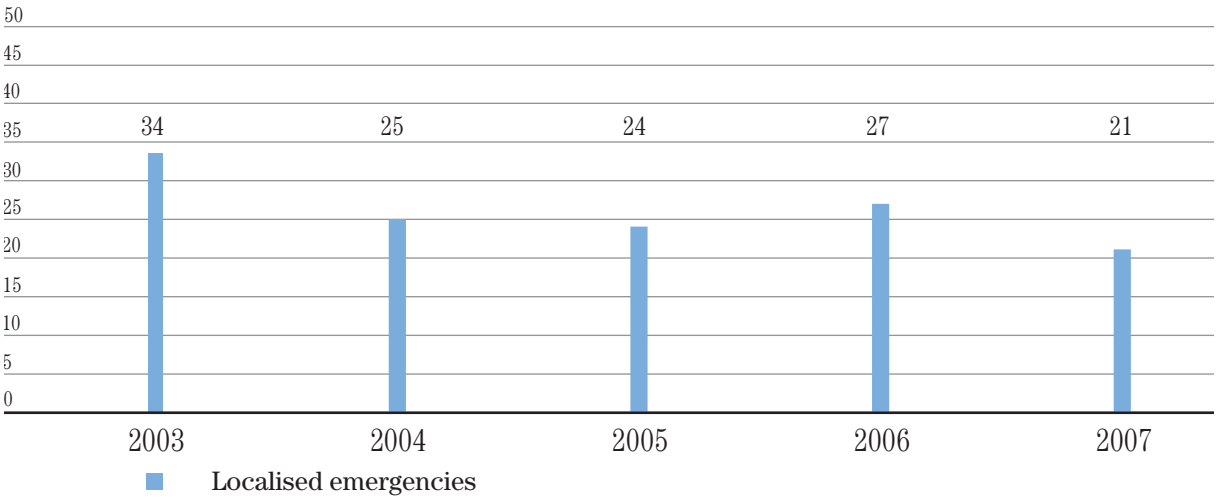
Table 26 – Emergencies – Incidents recorded

	2003	2004	2005	2006	2007
General emergencies	8	9	7	4	6
Localised emergencies	34	25	24	27	21
Near accidents	2	3	1	1	10

Graph 48 – General emergencies



Graph 49 – Localised emergencies



Graph 50 – Near accidents

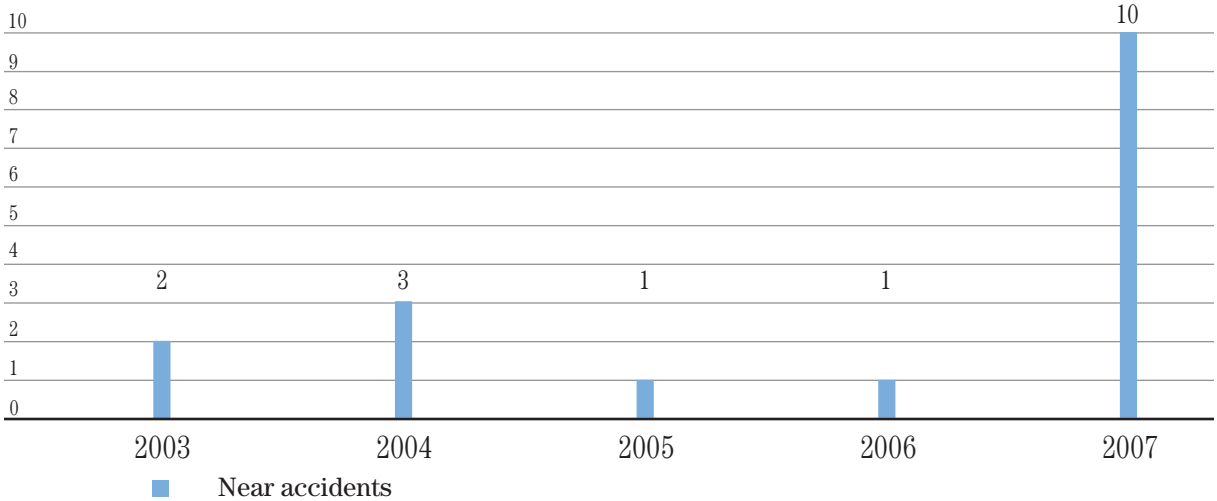
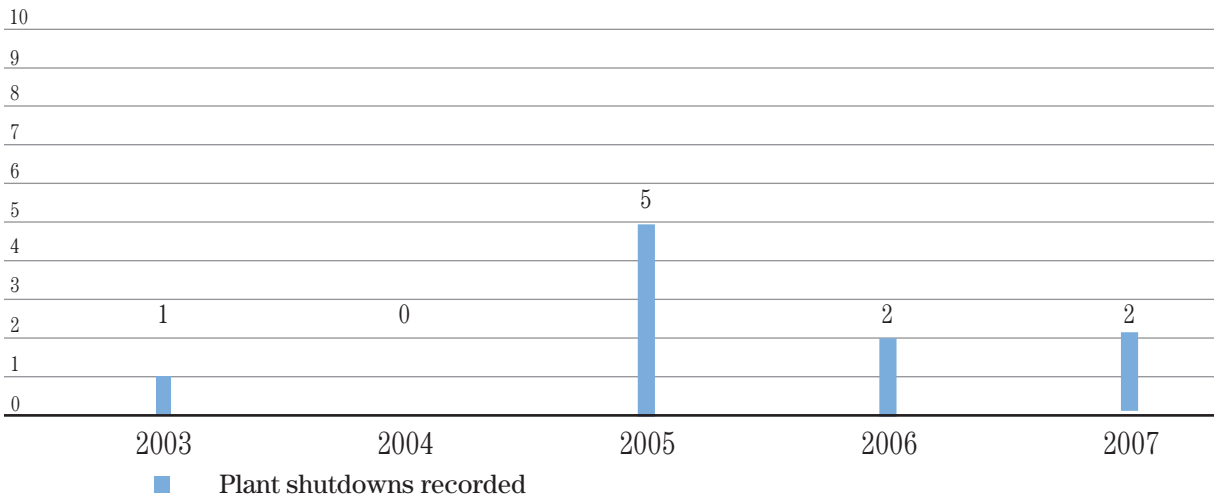


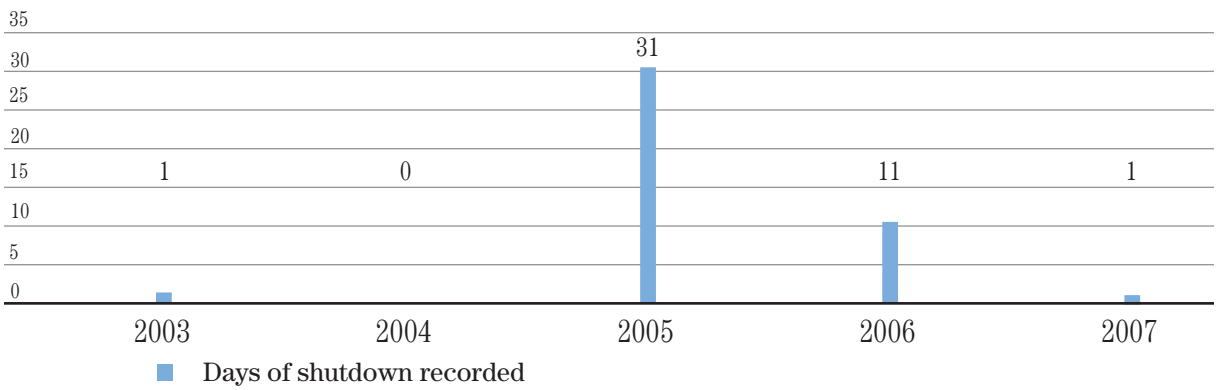
Table 27 – Shutdowns

	2003	2004	2005	2006	2007
Number of shutdowns	1	0	5	2	2
Number of days of shutdowns	1	0	31	11	1

Graph 51 – Plant shutdowns



Graph 52 – Days of shutdown



Investment in safety

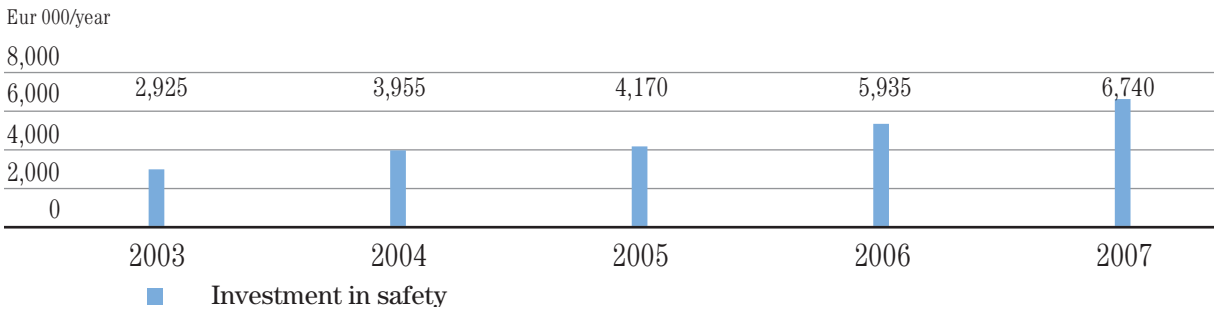
Between 2003 and 2007 Saras invested over EUR 23 million in continually upgrading safety levels at its refinery. The main actions funded in 2007 involved both the improvement of existing safety equipment and modifications to plant and product handling systems, as follows:

- fitting of further product volume interception valves to the RT2 plant
- replacement of glass “Klingers” with magnetic ones in the processing equipment
- upgrading of the fire prevention system and new equipment
- upgrading of the fire detection system
- improvement of monitoring systems (block alarms)
- upgrading of fire protection systems of the T2/V2/V1 plants
- safety improvements within the containment basins
- improvements to the fire prevention systems of islands 1 and 2 (wharf)

Table 28 – Safety investment (eur thousand/year)

	2003	2004	2005	2006	2007
Investment	2,925	3,955	4,170	5,395	6,740

Graph 53 – Investment in safety




SAR

Glossary

Glossary

ARPA: Agenzie Regionali per la Protezione Ambientale (or regional environmental protection agencies). In April 1993 a referendum resulted in the removal of powers from Italy's national and local health services in the area of environmental control and protection. That left a gap which was filled by parliament with Law 61 of 1994 (introduced to enact Decree Law 496/93), which gave these powers to special regional agencies responsible for monitoring and protecting the environment at local level. Law 61/94 also set up ANPA, the national environmental protection agency, today known as APAT, or the agency for environmental protection and technical services. APAT has the task of setting guidelines and co-ordinating the regional agencies and those based in Italy's autonomous provinces. In the years that followed, all of Italy's regions and autonomous provinces set up their own agencies. ARPA Sardinia was created under Regional Law 6 of 18 May 2006.

Audit: word used in various contexts to mean "check", or "review". In the environmental management field it refers to a systematic, documented check to objectively assess an organisation's compliance with set environmental management criteria.

Ballast water: water deriving from the ballasting of empty ships with sea water.

Carbon dioxide (CO_2): an odourless, colourless, flavourless gas produced from the combustion, respiration and decomposition of organic material. Its characteristics include the ability to absorb infrared radiation emitted by the earth's surface, thereby contributing to the greenhouse effect.

Carbon monoxide (CO): a gas produced by the incomplete combustion of fossil fuels. The main source is gasoline engines not equipped with catalytic converters.

COD (Chemical Oxygen Demand): the quantity of oxygen needed to oxidise the organic content of waste, including nonbiodegradable matter.

Cogeneration: process by which two different energy products, such as electricity and heat, can be generated together by a single plant designed specifically for the purpose, resulting in high environmental efficiency.

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

EMAS (EcoManagement and Audit Scheme): established by EC regulation 1836/93, updated by EC regulation 761/2001 (EMAS II), this is a voluntary scheme intended to promote continuous improvement in the environmental efficiency of industrial activities. Under the regulations, participating companies must adopt environmental management systems

at their production sites based on policies, programmes, procedures and objectives aimed at improving the environment, and must publish an environmental declaration. Before a site can be added to the register set up by the European Commission, this declaration must be approved by an inspector accredited by an authorised national body. In Italy this body, operational since 1997, is the Ecolabel and Ecoaudit committee, which works with the technical support of APAT.

Emission: the discharge of any solid, liquid or gaseous substance into the ecosystem from a 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 European 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: from 1 January 2005 no plants 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 return CO_2 allowances equal to those released into the atmosphere to the competent national authority; maximum CO_2 allowances have been set for every plant regulated by the directive; CO_2 emissions effectively released into the atmosphere are monitored in accordance with the requirements of the competent national authority and certified by an accredited inspector.

EPER (European Pollutant Emission Register): the European Pollutant Emission Register was set up by the European Commission with its 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. It is Europe's first and most wide-ranging record of emissions into the air and water from industrial plants.

Filter Cake: the solid formed from the gasification of heavy refinery products. It contains high percentages of metals such as iron, carbon vanadium and nickel.

Frequency index: together with the severity rate, this is a commonly-used performance indicator for health and safety in the workplace. With reference to a given period of time, it expresses the ratio of the number of accidents occurring to the number of hours worked (calculated using the formula: number of accidents x 106/hours worked).

Greenhouse effect: 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 (CFC), carbon dioxide (CO_2), methane (CH_4), nitrogen oxides (NO_x and sulphur hexafluoride (SF_6).

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

INAIL frequency index: calculated using the number of accidents reported by the company to the work accident compensation authority (INAIL) and the number of hours worked (number of accidents reported to INAIL x 106/hours worked).

INES (Inventario Nazionale delle Emissioni e loro Sorgenti, or national inventory of emissions and their sources): national register of emissions set up pursuant to Legislative Decree 372 of 4 August 1999 (implementing Directive 96/61/CE) and to decrees issued by the environment ministry on 23 November 2001 and 26 April 2002. It consists of information on emissions from industrial sites in Italy subject to IPPC regulations. The regulations state that such com-

panies must submit qualitative and quantitative data to APAT 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 environment ministry for forwarding to the European Commission and inclusion in the EPER register.

IPPC (Integrated Pollution Prevention and Control): European directive of 1996 relating to the reduction of pollution from the various places where it is emitted throughout the European Union, implemented in Italy by Legislative Decree 59/2005.

ISO (International Organization for Standardization): 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.

kWh (kilowatt-hour): unit of measurement of electricity produced or consumed, equivalent to the power produced by 1 kW in one hour.

Kyoto Protocol: government agreement approved by the Conference of the Parties in Kyoto, 1-10 December 1997, containing the initial decisions on the implementation of some commitments (the most urgent priorities relating to certain sectors of national economies) of the United Nations Framework Convention on Climate Change (UN-FCCC), which was approved in 1992 and ratified by Italy in 1994. The protocol commits industrialised countries and those with transition economies (eastern Europe) to make overall reductions of 5% in carbon dioxide, methane, nitrogen oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride by 2010.

Major hazard: probability that an event linked to uncontrolled development of an industrial activity could give rise to serious danger, either immediate or in the future, for people and the environment.

Management system: the organisational structure, planning activities, responsibilities, procedures, practices, processes and resources to formulate, implement, obtain, re-examine and maintain control, where possible, over all the internal and external variables of an organisation.

MW (Megawatt): a multiple of kW (kilowatt), the unit of measurement of a power station's energy-generating capacity. It also measures the power consumed by an item of electrical equipment. For example, a light bulb may use 0.1 kW (100 watts). 1 MW = 1,000 kW.

MWh (megawatt-hour): unit of measurement of electricity produced or consumed, equal to the power produced by 1 MW in one hour and equivalent to 1,000 kWh.

Nitrogen oxides (NO_X): 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. In the atmosphere they are the main agents responsible for photochemical smog and, after SO_2, the biggest cause of acid rain.

OHSAS (Occupational Health and Safety Assessment Series): regulations 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 was 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 following a similar procedure to that used for ISOs.

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 piezometry (the line where points with a height equal to that of the body of water are located) at a set point.

ppm (parts per million): unit of measurement of the concentration of a substance present in small quantities in a liquid or gas.

Reliability: the reliability of a piece of equipment is defined as the probability that it will function correctly, for a specific period of time, under certain conditions.

Severity index: expresses, with reference to a given period of time, the ratio of the number of days' sick leave due to accidents to the number of hours worked (calculated using the formula: number of working days lost x 103/hours worked). Sulphur dioxide (SO_2): a colourless gas with a pungent odour released when fossil fuels containing sulphur are burnt. In the atmosphere high concentrations of SO_2 are the main cause of acid rain.

TOE (ton of oil equivalent): unit of measurement conventionally used to determine the energy contained in various sources taking into account their calorific potential.

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

Wholesale: refers to the wholesale market in oil products sold to customers such as industries, consortia and public bodies.

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

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