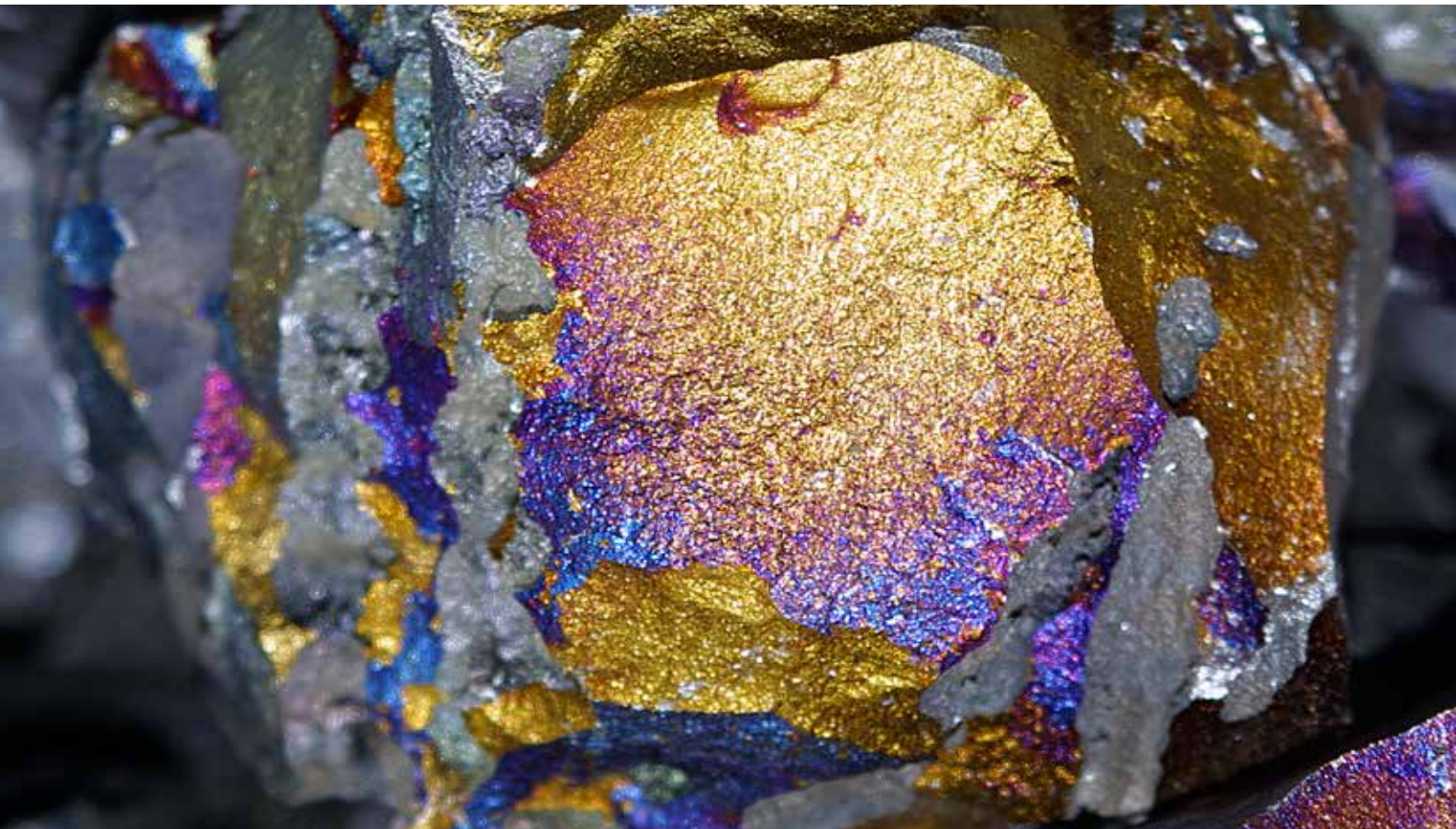




**ERAMET**  
NORWAY

# ENVIRONMENTAL REPORT

# 2012











# ERAMET EVERYWHERE, EVERY DAY

Iron and steel are important building materials in modern society.

Just as the body's bone structure needs calcium for strength, manganese is necessary to make steel ductile and durable. Approximately 10 kg manganese alloy is used in one tonne of steel.

## TABLE OF CONTENTS

Freedom with responsibility .....	5	Increased emphasis on energy economizing .....	18
About Eramet Norway .....	6	The Kvinesdal plant .....	20
Product and process .....	8	Emission figures Kvinesdal .....	21
Research and development .....	11	New exhaust system .....	22
The Sauda plant .....	12	Safety work in major projects...	23
Emission figures Sauda .....	13	Kvinesdal won the safety prize .....	23
Zero emissions in 2020 .....	14	Energy efficiency and recycling .....	20
Record low copper emissions in Sauda .....	14	Finances and key figures .....	29
The Porsgrunn plant .....	16	HES-policy .....	30
Emission figures Porsgrunn .....	17		



**Focus on customers  
and other interested parties**

**Sustainable development  
and performance**

**Initiative and team spirit**

**Integrity and courage**

**Respect for,  
and development of,  
personnel**

**5**

**ERAMET NORWAY  
VALUES**



“ Everyone going in the door must be well aware of why they are here and must know what they are required to contribute in order for us to succeed.

*Bjørn Kolbjørnsen, CEO Eramet Norway.*

Our management concept in Eramet Norway:

# FREEDOM WITH RESPONSIBILITY

■ Eramet Norway shall be among the world's most efficient producers of manganese alloys. This is what forms the foundation of our company, but efficiency alone is not enough.

We must keep our focus on our customers who are going to purchase our products and on other interested parties around us such as neighbours, the society at large, property owners, and contractors in order to substantiate our *raison d'être*. If this foundation is in place, and we have the equipment required for production, it is how we work together that determines efficiency. The end result is provided through coordination between personnel, technology, and organization. The organization's most important tool at hand is a competent workforce.

## THE MOST IMPORTANT JOB OF MANAGEMENT

When we are sure that we have employees with a proper and excellent competency, and who identify with the company's goals, then we give the individual and the teams their freedom to operate. The most important task for our management is to arrange for the employees to get their job done. Clear goals, in which the rationale for the objectives is understood, good communication, and respect are the keys to success in this.

## CLEAR GOALS

Clear goals and adequate competency contribute to sustainable development and performance. The correct competencies, as well as showing respect and confidence through freedom, allow individuals to show integrity and courage – and to take responsibility on their own. Clear goals, correct competencies, and freedom make it possible for initiatives to be taken which carry the company forward.

## TEAM SPIRIT IN PRACTICE

When we have a work environment with competent employees who know what we are striving to achieve and to whom freedom is given, then the conditions are also in place for them to help each other to achieve the goal. They then can see what is needed and can offer help or come up with good advice. This is what is meant by team spirit in practice. This supports an organization climate that promotes creativity and flexibility.

## LESS MANAGEMENT CONTROL

Insofar as freedom is concerned, there are limits. It is based on the fact that an individual would take responsibility and that the standards and rules within the organization are clear – in other words, that we have a framework in addition to direction and goals. When this is clearly defined, there is less need for management control and management resources can instead be used for problem-solving and development of employees, technology, and organization –

which, together, produce improvements and carry us forward.

## SELF-DIRECTED WORK CREWS

An organizational measure that we have taken that clarifies our management concept is that we in all three plants maintain a self-directed team on 5 shifts. The managers for the competent shift crew work day-time and consequently, production proceeds more than 2/3 of the time without management being physically present at the plants.

## IMPROVED INTERNAL RESULTS

We also have improvement to point to. A lower operational profit in 2012 than in 2011 was primarily due to weaker market prices and an unfavourable currency exchange situation. Internally, we improved by 75 MNOK in 2012 compared with 2011. The three largest contributors are: Reduced production costs for LC SiMn, increased refining of FeMn, and reduced handling costs for HC slag. In this year's Environment Report, good examples are also found of other improvements.

**We shall continue to work together to ensure a sustainable development for the environment and to operation within a working environment characterized by initiative, involvement, and job satisfaction.**

*Bjørn Kolbjørnsen, CEO Eramet Norway.*



# ERAMET IS A WORLD LEADER IN THE PRODUCTION OF MANGANESE ALLOYS.

The French industrial group Eramet is the world's second largest producer of manganese ore and manganese alloys, and the world's leading producer of refined manganese alloys.

The company's business areas are manganese, nickel and special steel. The group has about 15 000 employees in 20 countries throughout the world and had a turnover of NOK 26 billions in 2012. Eramet's most important markets are the steel industry, aerospace industry, energy, the transport sector and the tools industry.

## 15 000

EMPLOYEES IN 20 COUNTRIES  
THROUGHOUT THE WORLD

## 26 MRD NOK

TURNOVER IN 2012

## ERAMET NORWAY

■ Eramet Norway is 100% owned by the French group Eramet and comprises smelting plants in Kvinesdal, Porsgrunn and Sauda, along with a development group in Trondheim. All of these carry on the traditions and competence that the Norwegian ferro-alloy industry has accrued since industrialization made headway in Norway beginning in the early 1900s.

### INTERNATIONAL COMPETITIVENESS

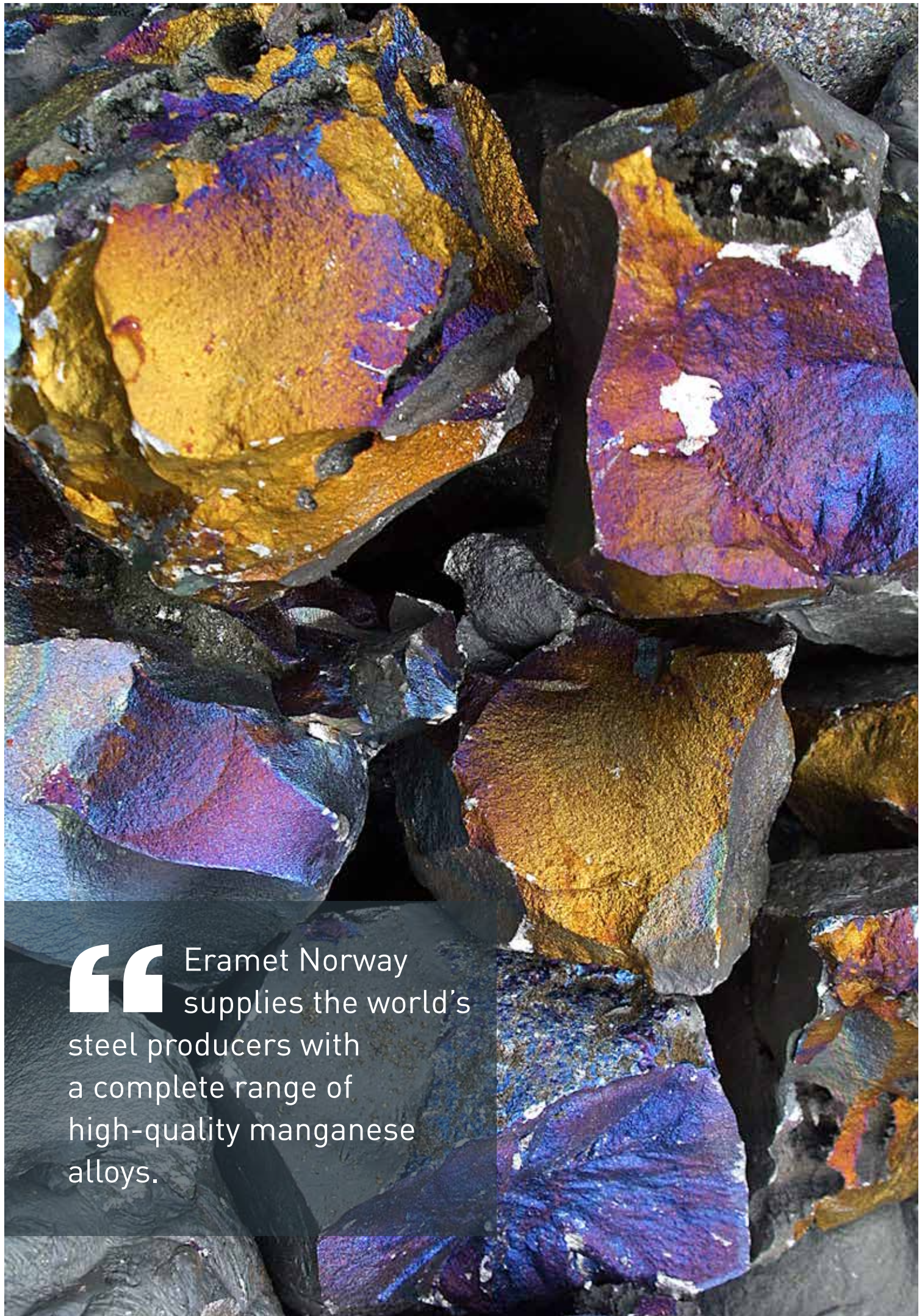
One challenge in operating and developing business in Norway is that, in cooperation with Norwegian authorities, we need to adapt our framework conditions so as to create the basis for strengthening our international competitiveness.

### ORGANIZATIONAL STRUCTURE

The company operates with an extremely horizontal organizational structure built on a strong contribution-based philosophy and the Norwegian model of collaboration. Eramet is a development-oriented company that offers our employees good international career opportunities.







“ Eramet Norway supplies the world’s steel producers with a complete range of high-quality manganese alloys.



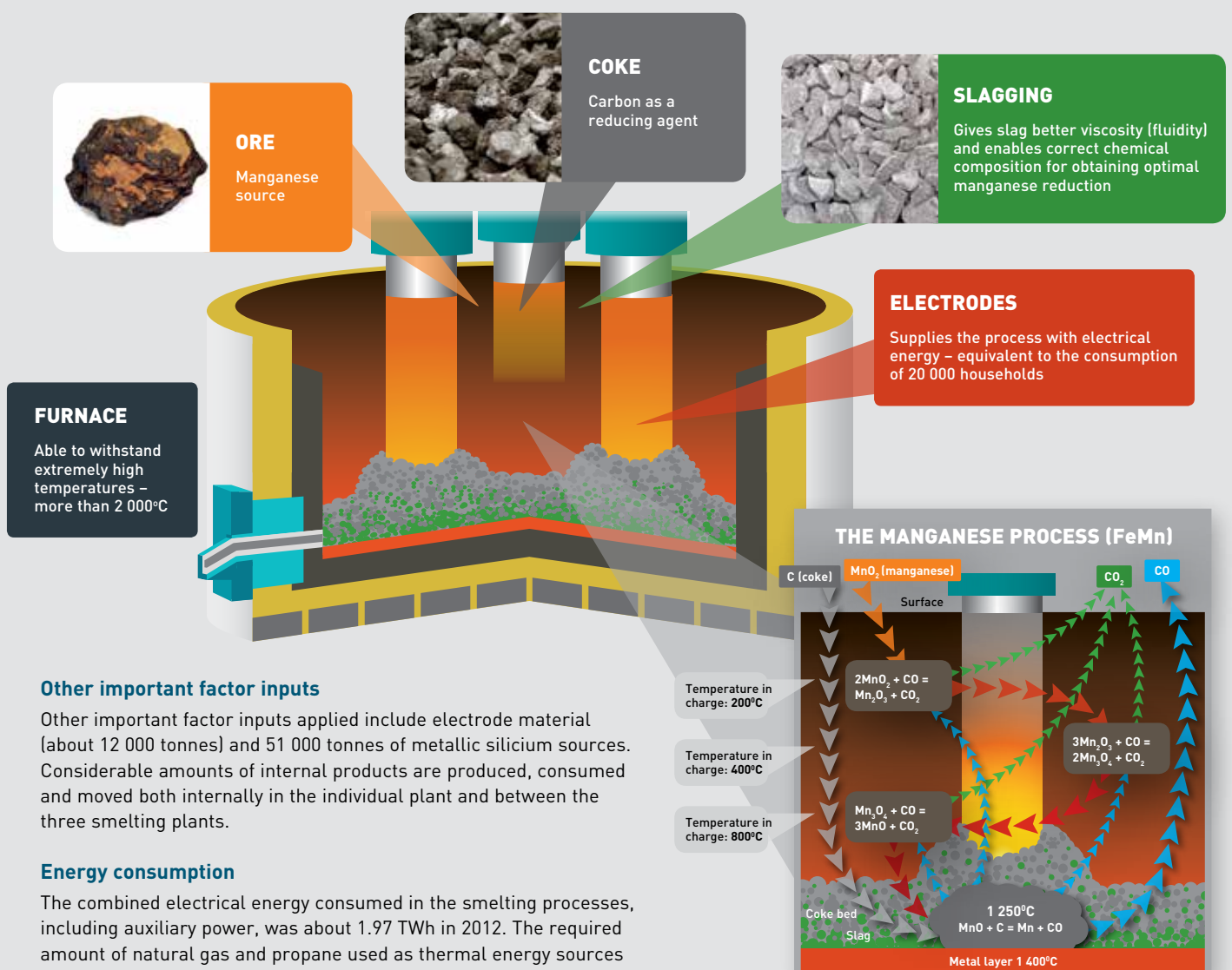
# PRODUCTION OF MANGANESE ALLOYS AND CONSUMPTION OF RAW MATERIALS

Eramet Norway handles significant amounts of raw materials in its production processes. The three smelting plants consumed the following materials supplied by Norwegian and foreign suppliers in 2012:

**916 000** TONNES OF MAGANESE ORE

**236 000** TONNES OF METALLURGICAL COKE

**83 000** TONNES OF QUARTZ



## Other important factor inputs

Other important factor inputs applied include electrode material (about 12 000 tonnes) and 51 000 tonnes of metallic silicon sources. Considerable amounts of internal products are produced, consumed and moved both internally in the individual plant and between the three smelting plants.

## Energy consumption

The combined electrical energy consumed in the smelting processes, including auxiliary power, was about 1.97 TWh in 2012. The required amount of natural gas and propane used as thermal energy sources amounted to almost 1 200 tonnes.

Eramet Norway is also one of the country's largest consumers of industrial gases, particularly liquid oxygen, in production processes.

**12 000**  
TONNES OF ADDED ELECTRODE MATERIAL

**1.97 TWH**  
TOTAL CONSUMPTION OF ELECTRIC ENERGY / AUXILIARY POWER

**1 200**  
TONNES NATURAL GAS AND PROPANE





“ We develop  
processes,  
equipment, and  
personnel continuously  
in order to maintain our  
position at the top of  
our sector.



A vibrant, close-up photograph of a waterfall. The water is clear and white as it cascades over dark, wet rocks. The surrounding area is heavily covered in bright green moss and small plants, creating a lush, natural environment. The lighting is bright, highlighting the textures of the moss and the movement of the water.

“ Our company goal is to become experts within the field of work-related applied research, and shall contribute strongly to the firm’s strategy for ensuring sustainable development.



## Eramet Norway's R&D group in Trondheim:

# RESEARCH AND DEVELOPMENT FOR A BETTER ENVIRONMENT

■ In accordance with the firm's strategy, Eramet Norway is banking on Research and Development (R&D) to ensure a sustainable future.

Two important factors in this approach are Eramet Research, the firm's research centre in Paris with approx. 150 employees and facilities engaged in metallurgy and mining operations, and Eramet Norway's development group in Trondheim which consists of three researchers with access to equipment and competence associated with NTNU and SINTEF.

The goal of the Development Group in Trondheim is to become experts within the field of work-related applied research. The group is working closely with smelting plants to analyse and solve technical and process-related challenges. This collaboration is based on necessary agreements on realistic innovation proposals. The group is supported through a network of professional experts from the universities, research institutes, consultants, and other industries.

### ERAMET NORWAY SUPPORTS NATIONAL AND REGIONAL INITIATIVES

Eramet Norway supports both national and regional initiatives through the sector association, Ferrolegeringsindustriens Forskningsforening (FFF) (The Norwegian Ferroalloy Producers Research Association), extensive collaborations with NTNU and SINTEF, Eyde-Nettverket,

Teknova, and Tel-Tek. The Forskningsrådet (Norwegian Research Council) provides important funding toward carrying out R&D projects, as well as supports to internal research efforts through the SkatteFUNN scheme. Important knowledge in the area of charcoal has been developed through the FFF, both through earlier research efforts and in a present initiative to develop a metallurgical charcoal (FFF application to the Norwegian Research Council).

### FOCUS ON IMPROVED PROCESS STABILITY

R&D focuses on improving process stability by raw materials processing, metallurgical process development, environment, and safety, among others. All these activities promote a more efficient use of both raw materials and energy, which, in turn, has a very positive effect on the environment.

### REDUCTION OF EMISSIONS AND IMPROVED USE OF BY-PRODUCTS

Environment-related projects are aimed at reducing emissions to both the internal and external environment, as well as at utilizing by-products from our processes. All these activities take place in total transparency and in cooperation with government authorities (especially, Klif (Norwegian Climate and Pollution Agency)) and industries having similar problems.

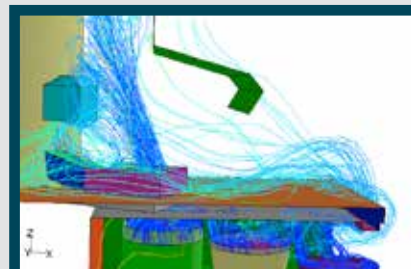
### SMART DESIGN USING CFD

For emissions to the air, use is made of the digital tool, CFD (Computational Fluid Dynamics) for finding a smart design for an effective collection of production-generated dust and smoke in a cost-effective man-

ner. After validation of the models against measurements in the production rooms, a number of ideas for the solution can be tested through computer simulations before a final solution is selected. This methodology has resulted in significant improvements in the effluent situation associated with tapping and casting of metal.

### FUTURE USE OF SLUDGE

Every year, large amounts of sludge from scrubbing exhaust gases are disposed of. The properties and chemical composition of the sludge make recycling or reuse in other industrial processes a challenge. Through a structured and long-term research initiative, Eramet Norway has compiled data on the sludge and has carried testing projects aimed at qualifying processes and equipment to be used in a future reuse of such sludge.



Modelling of smoke distribution in the tapping area using CFD.

# SAUDA

"We will be 100 years old in 2015. Our over-riding goal is that we will be there for an additional 100 years with smelting operations in Sauda."

*Kåre Bjarte Bjelland, Plant Director, Sauda.*



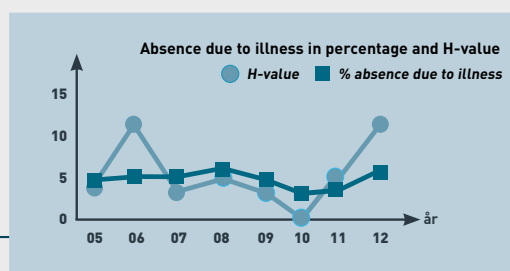
**THE SAUDA SMELTING PLANT WAS ESTABLISHED IN 1915. ERAMET ACQUIRED THE COMPANY FROM ELKEM IN 1999. TODAY THE PLANT HAS TWO SMELTING FURNACES (40 MW EACH) AND A REFINING STATION.**

The total furnace capacity is 265 000 tonnes per year, of which about half is further processed into higher-grade products.

The Sauda smelting plant is a classical cornerstone company that has been very important for the development of the region. This is in no small part due to the company's having assumed, from the outset, responsibility for establishing infrastructure in the form of hospitals, homes, roads and sports facilities. Upwards of 1300 people have been employed by the plant. With 200 employees

currently, the smelting plant is well prepared to meet future challenges associated with competitiveness and sustainable development. Work is being done on a grand scale to increase energy recovery from the processes, and an effort is being made to find partners who can make use of the excess energy, primarily waterborne heat. Over many years, the company has participated actively in local commercial development, and a separate industrial park has been established on the plant's premises. The smelting plant has also been involved in local projects such as heating for sports facilities, winter-heated streets in the municipality and contributions to the golf course in order to boost Sauda's attractiveness as a place to visit and a place to live.

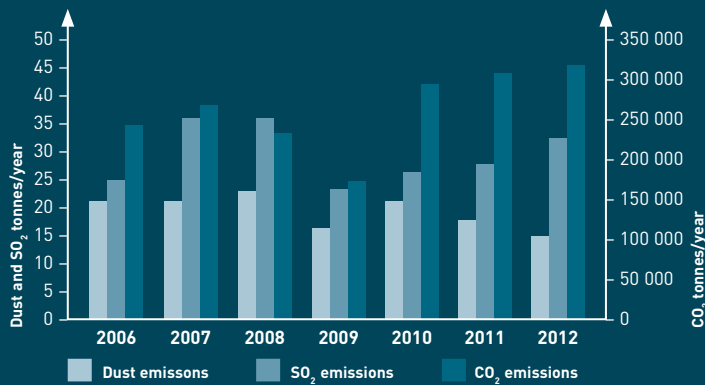
## INJURY FIGURES H1 AND ABSENCE DUE TO ILLNESS



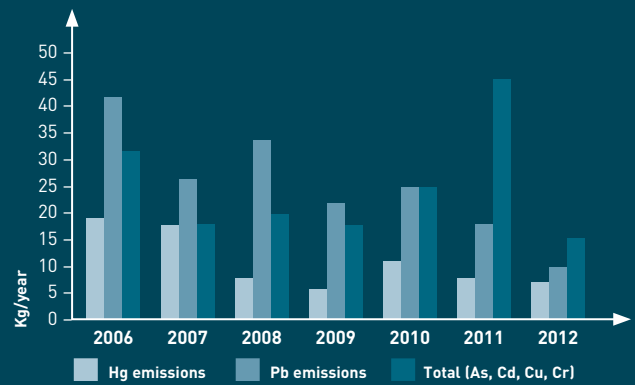
## HES-FIGURES

CATEGORY	2011	2012
Absence due to illness	4.7 %	5.8 %
Injuries w/ absence	2	4
Injury figures H1 (H-figures)	5.6	11.1
Undesirable incidents - environmental	167	152
Complaints from neighbours	55	45
Violation of discharge permit	1	0

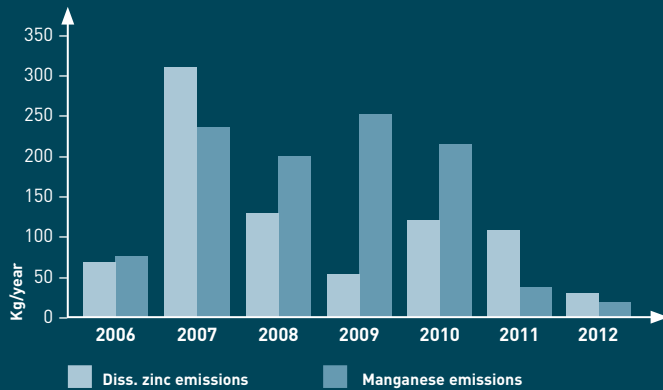


**DUST, SO<sub>2</sub>, CO<sub>2</sub> emissions to the air 2006-2012**

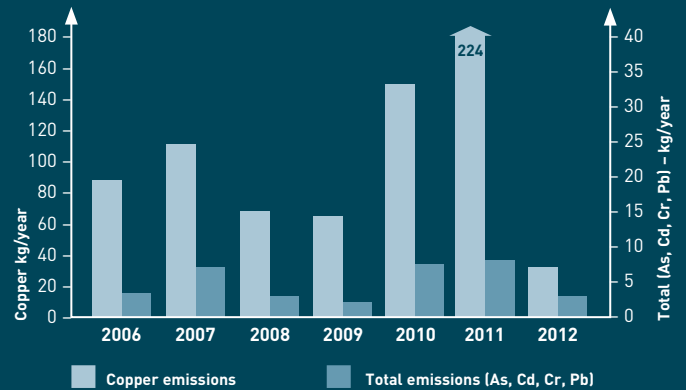
Emission limits:  
Dust = 35 tonnes/year SO<sub>2</sub> = 50 tonnes/year

**Hg/Pb/Total (As, Cd, Cu, Cr) emissions to the air 2006-2012**

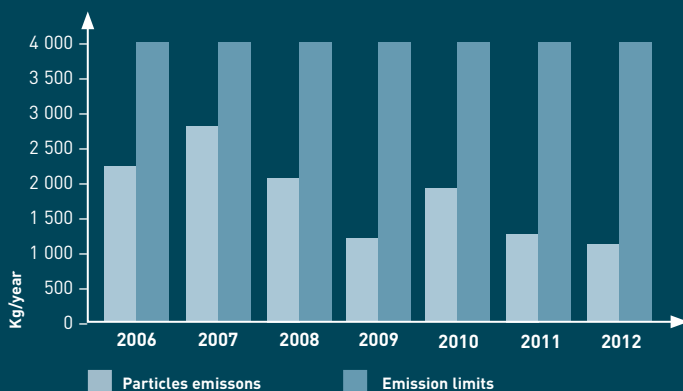
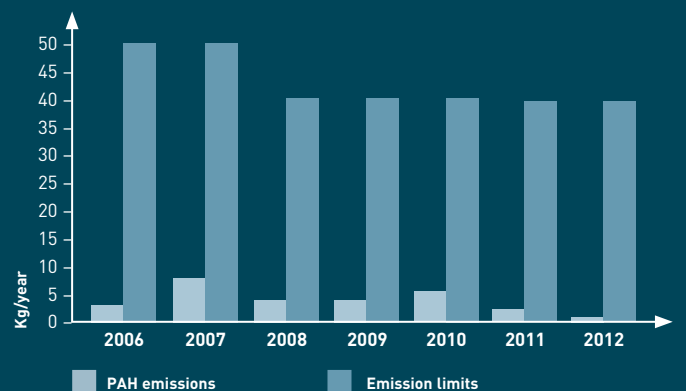
Emission limits:  
Hg = 36 kg/year Pb = 100 kg/year Total (As, Cd, Cu, Cr) = 50 tonnes/year

**ZINC/MANGANESE emissions to Saudafjorden 2006-2012\***

Emission limits: Dissolved zinc = 400 kg/year Manganese = 400 kg/year

**COPPER/TOTAL (As, Cd, Cr, Pb) emissions to Saudafjorden 2006-2012\***

Emission limits: Copper = 150 kg/year Total (As, Cd, Cr, Pb) = 20 kg/year

**PARTICLES emissions to Saudafjorden 2006-2012\*****PAH emissions to Saudafjorden 2006-2012\***

\*Emissions from purifying plants.

**WASTE**

CATEGORIES	2011	2012
Slag	0 tonnes	0 tonnes
Sludge and dust (landfill)	5 550 tonnes	4 745 tonnes
Residual waste	204 tonnes	123 tonnes
Metal waste	405 tonnes	366 tonnes
Special waste	85 tonnes	266 tonnes

CATEGORIES	2011	2012
Paper and cardboard	10 tonnes	15 tonnes
Wood waste	240 tonnes	154 tonnes
Plastic	3 tonnes	3 tonnes
Asphalt	16 tonnes	22 tonnes

Collaboration with leading environment specialists for reduction of diffuse emissions.

# AMBITIOUS GOALS CAN YIELD ZERO EMISSIONS BY 2020

■ During recent years, there has been much work done to reduce diffuse emissions from the smelting plant at Sauda. We have high ambitions for our environmental performance, which we feel is necessary if we are to reach the generational goal of zero discharges by 2020.

Systematic efforts toward reduction of dust emissions also constitute an important element in the improvement of the plant's internal working environment. Eramet Norway is a member of the Ferrolegeringsindustriens Forskningsforening (FFF) (The Norwegian Ferroalloy Producers Research Association), and is working with leading environmental experts in the sector on the FUME-project (Fugitive Emissions of Materials and Energy). In this project, specialists from SINTEF and Eramet Norway's

Research and Development Department in Trondheim, are working along with local professionals at the smelting plant in Sauda. The goal is to find satisfactory solutions for capturing the smoke emissions. We also are trying to develop automatic monitoring of diffuse emissions in such a way that we can react quickly to dust emissions and have the best possible control over the amount of dust that escape to our surroundings.

## REDUCTION IN EMISSIONS FROM THE FURNACES

In 2012, the main focus of our plant at Sauda was equipment upgrading related to tight furnace door seals on both furnaces. Locally, a new design for electrode through-conduits has been developed which have reduced emissions from the furnaces at Sauda to a significant degree.

## START-UP OF DEVELOPMENT PROJECTS

In 2012, two important development projects were started up in cooperation with

Sintef and the FUME project. The first project involved installing and field-testing the use of laser meters and air-speed meters to quantify emissions over the roofs of the plant's two smelting s. So far, this project is showing promising results, and the goal now is to test laser meters from two suppliers in order to install the meters on both furnaces this autumn. The other project involves the development of a CFD model (Computational Fluid Dynamics) for the furnace house in Sauda which would allow one to simulate, for instance, how a planned renovation would affect ventilation and air circulation. Optimizing of the model will continue in 2013 with special focus on corridor winds which, to a large extent, are influenced by open/closed gates.

*Refer also to the article on Eramet Norway R&D Department in Trondheim on page 11.*

# RECORD LOW COPPER EMISSIONS

■ The process involving water purification is complex and requires an advanced knowledge and strict monitoring.

In 2011, ENS exceeded the licensing conditions for copper emissions to the sea. In order to deal with this situation, a number of initiatives were taken, among them the testing of a number of polymers aimed at precipitating heavy metals at various pH

levels and the reduction of surface runoff which could enter the complex. Various methods were also assessed for reducing the pH.

## pH REDUCTION WITH THE AID OF CO<sub>2</sub>

We chose pH reduction with the aid of CO<sub>2</sub>. This approach is not much used in the process industry, but it was deemed to be the best safest alternative. A simple full scale test with CO<sub>2</sub> additions was first carried out in order to observe the effect at various pH levels. Afterwards, process operators and

specialists involved in the carrying out of a risk analysis for to cover any potentially hazardous conditions associated with CO<sub>2</sub> addition. Permanent CO<sub>2</sub> additive units were designed and constructed during 2012. This process gave us the possibility of being able to add carbonic acid in controlled forms. Along with increased focus on the operational monitoring and systematic maintenance of critical equipment components, this led to record copper emissions to the sea in 2012.





“ We have high ambitions for our environment-related performance and are working systematically to reach our goals.



# PORSGRUNN

"This year, we are celebrating our 100-years anniversary as a world-leader in the field of refined manganese alloy production. Through continuous improvement, we, together with Grenland region's strong expertise environments, will further develop our performance".

Rodney Ishak, Plant Director, Porsgrunn.



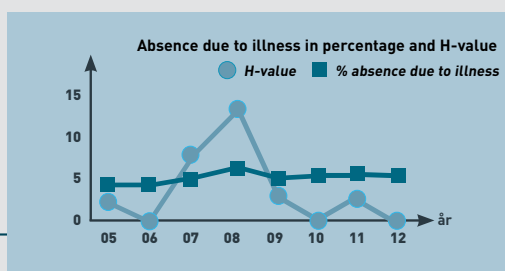
**THE SMELTER PLANT IN PORSGRUNN WAS ESTABLISHED IN 1913. ERAMET TOOK OVER THE OPERATION FROM ELKEM IN 1999 AND AT PRESENT EMPLOYS 160 PERSONS.**

Eramet Norway Porsgrunn, with its two furnaces and refinery, produces some 65 000 tonnes of silicomanganese and 115 000 tonnes of refined ferromanganese. The company consumes 570 Gwh of electrical energy annually, of which the company recovers about 200 Gwh of thermal energy through delivering CO gas to Yara's ammonia factory at Herøya.

Beginning next year, energy recovered from the cooling water used in the processes will also be utilized.

The main customers for the plant's products are steel mills that produce for, among others, the construction, aircraft and automotive industries. For many years, the manganese smelting plants were partially self-supplied with smelting quartz from Kragerø for their production of silicomanganese. Beginning in 2012, these supplies will come from Georg Tveit AS, a company in which Eramet became majority shareholder in 2011.

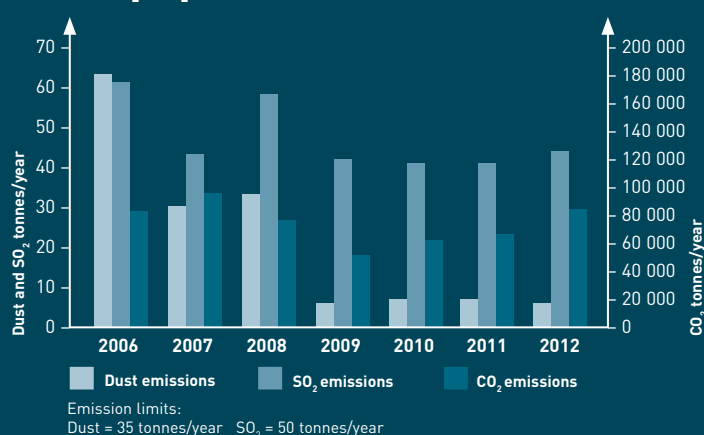
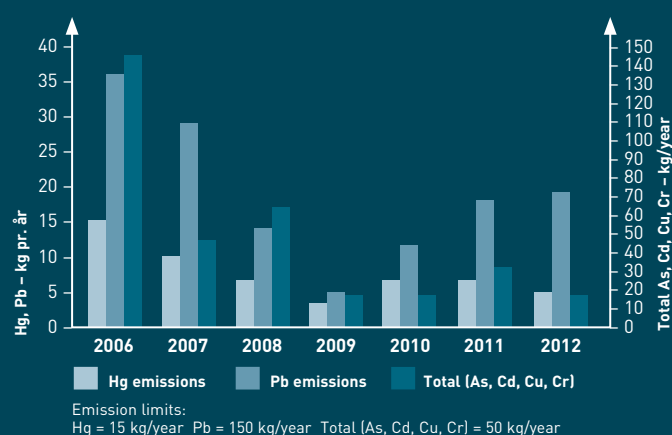
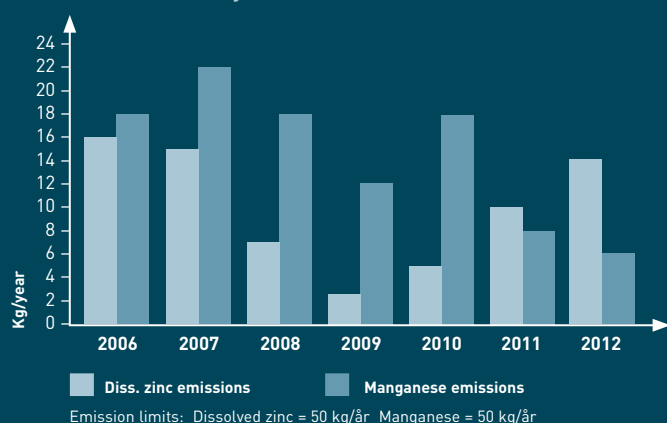
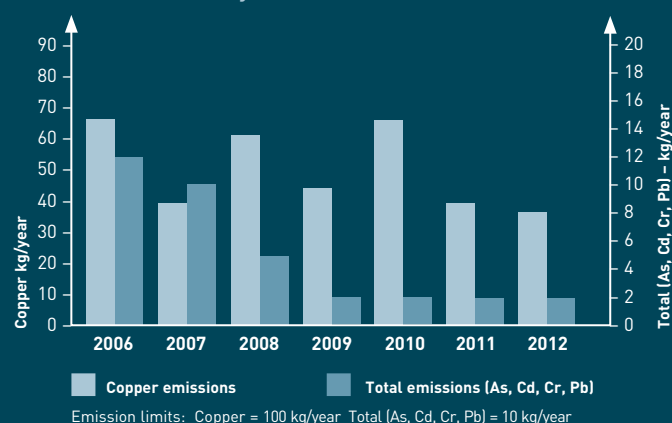
## INJURY FIGURES H1 AND ABSENCE DUE TO ILLNESS



## HES-FIGURES

CATEGORY	2011	2012
Absence due to illness	5.6 %	5.3 %
Injuries w/ absence	1	0
Injury figures H1 (H-figures)	3.3	0
Undesirable incidents - environmental	78	59
Complaints from neighbours	15	11
Violation of discharge permit	1	0



**DUST, SO<sub>2</sub>, CO<sub>2</sub> emissions to air the 2006-2012****Hg/Pb/Total (As, Cd, Cu, Cr) emissions to air the 2006-2012****ZINC/MANGANESE emissions to Frierfjorden 2006-2012\*****COPPER/TOTAL (As, Cd, Cr, Pb) emissions to Frierfjorden 2006-2012\*****PARTICLES emissions to Frierfjorden 2006-2012\*****PAH emissions to Frierfjorden 2006-2012\***

\*Emissions from purifying plants.

**WASTE**

CATEGORIES	2011	2012
Slag	86 823 tonnes	89 203 tonnes
Sludge and dust (landfill)	4 339 tonnes	3 398 tonnes
Residual waste	177 tonnes	130 tonnes
Metal waste	81 tonnes	73 tonnes

CATEGORIES	2011	2012
Hazardous waste	49 tonnes	50 tonnes
Paper and cardboard	6.0 tonnes	5.0 tonnes
Wood waste	164 tonnes	132 tonnes
Plastic	15 tonnes	20 tonnes

\* Demolition activity.

## Three new compressors installed in 2012

# INCREASED EMPHASIS ON ENERGY ECONOMIZING IN PORSGRUNN

■ In order to cover our needs for compressed air, three new compressors were installed at ENP in 2012. An important criterion in the selection of suppliers was how well the energy accounting was dealt with in the bid solutions.

The maximum combined power of the compressors selected was 400 kW, while in normal operation, the demand will be covered at 168 kW. By using heat exchangers, up to 70 % of the heat in the compressors' cooling water can be recovered and thus, we normally have up to 118 kW available.

We have set up a "heat central facility" which takes in and heat-exchanges the hot cooling water to the hot-water tanks (water / water) and for use in the ventilation complex (water / air) in our wardrobe building.

In future, we intend to work further on the distribution of how water in such a way that it is used in the laboratory, offices, mechanical workshops, and storage buildings with canteens. This is a part of the steadily increasing energy-economizing consciousness and valuation at Eramet.

### SAVINGS - ELECTRICITY:

We invested 275 MNOK and from May 2012 to January 2013, we have saved approx. 60 MNOK.

#### Savings:

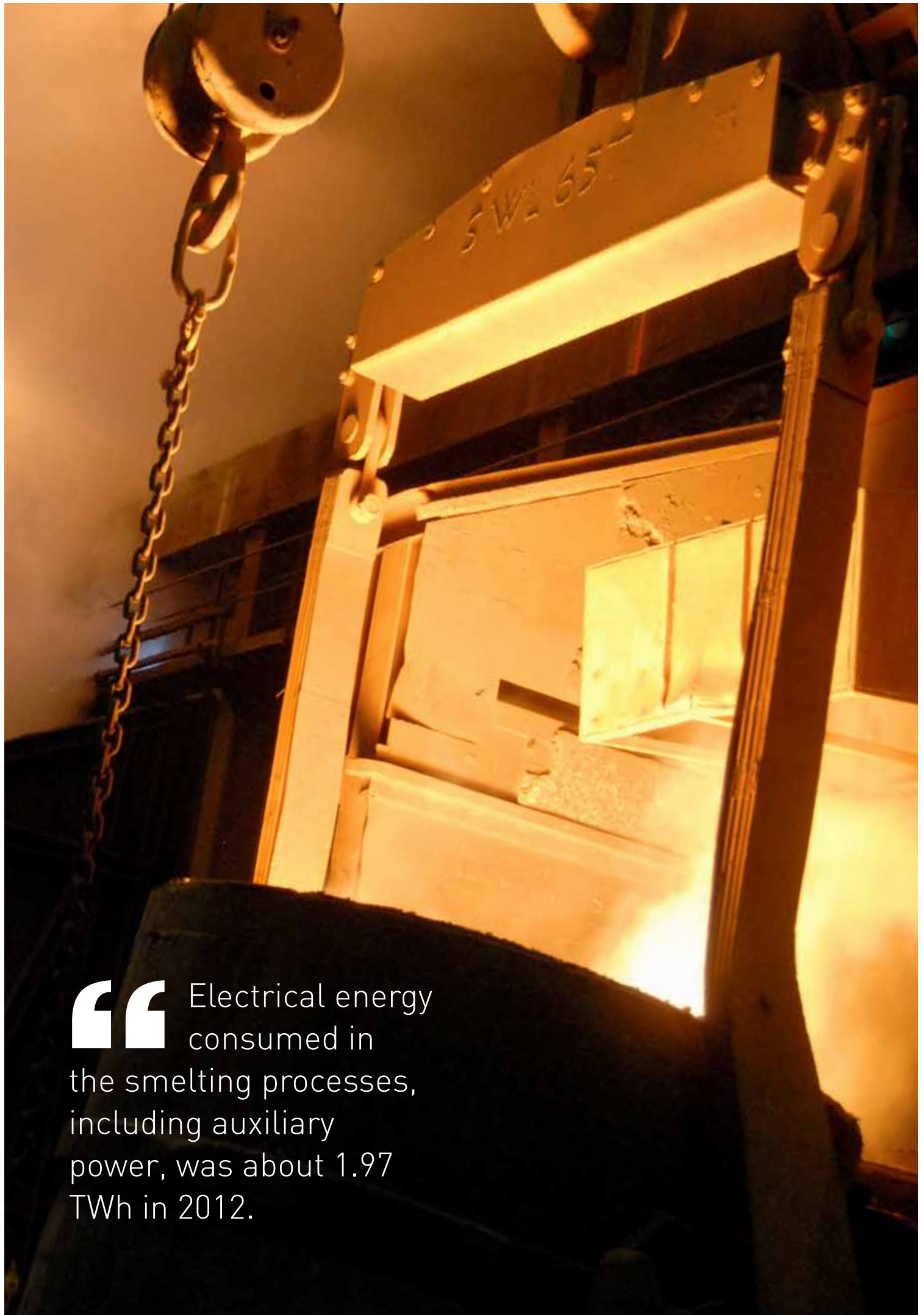
- › Hot water for showers in the wardrobe building: 10.9 kW
- › Warm air for ventilation in the wardrobe building: 8.4 kW
- › Heating of "fire station" (garage): 7.3 kW
- › Heating of ladle repair workshop: 8.2 kW

**Total: 34.8 kW**



*The new "Heating Central" that will receive and heat-exchange the hot cooling-water destined to both the hot-water tanks and to the ventilation system in our wardrobe building*





“ Electrical energy consumed in the smelting processes, including auxiliary power, was about 1.97 TWh in 2012.

# KVINESDAL

"Environment and energy considerations are important for Eramet Norway Kvinesdal. Our systematic efforts have yielded good results for us. We use approx. 20 % of the assigned licence and are in the driver's seat insofar as energy recovery is concerned".

*Trond Magnar Unhammer, Plant Director Kvinesdal.*

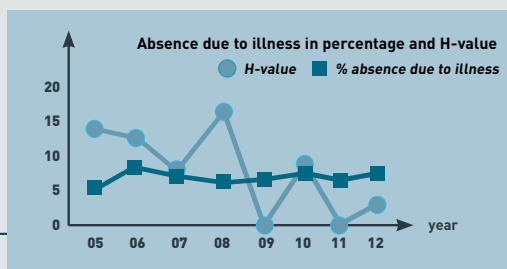


**THE KVINESDAL SMELTING PLANT WAS ESTABLISHED IN 1974 AND WAS ACQUIRED BY ERAMET IN 2008. THE PLANT HAS JUST OVER 200 EMPLOYEES.**

In the early 1970s, Tinfos, which had produced ferro-alloys at Notodden since 1916, was looking to expand its manganese production. The choice was made to build a new plant in Kvinesdal. The plant was completed in 1974, and Eramet acquired the company in 2008. The company currently has just over 200 employees and an annual production of 60 000 tonnes of silicomanganese and 120 000 tonnes of low-carbon silicomanganese produced in three modern 30 MW smelting furnaces.

The main market for the plant's specialized products are producers of stainless steel. The company consumes 750 GWh of electrical energy per year and has been heavily committed to energy recycling. A separate thermal power station produces 90 GWh annually for the central network, while the cooling water is used both internally in the plant and by external customers, including among others a turbot hatchery. The company contributes actively in developing the local community through, for example, its participation in the realization of a golf course, an ice-skating rink and an artificial grass court. The employees' competence is another important factor in local clubs and associations.

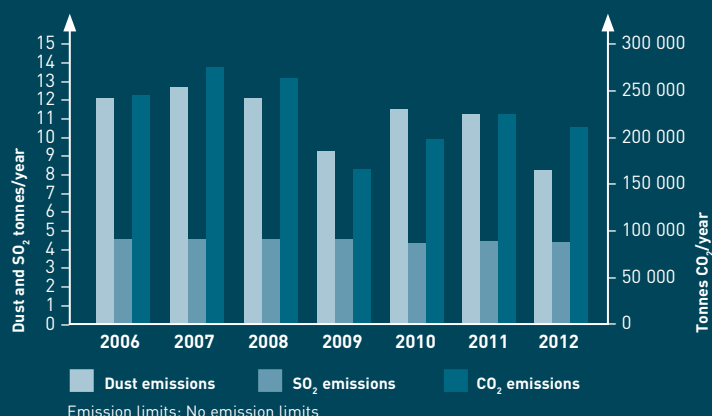
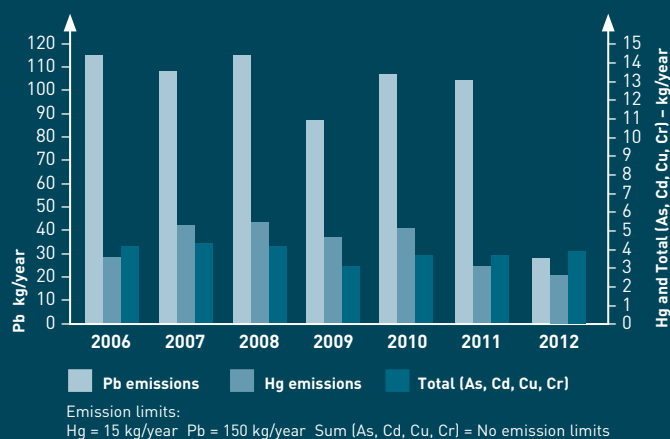
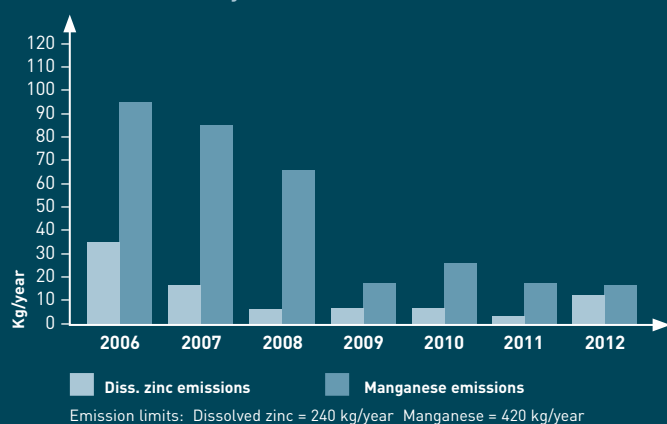
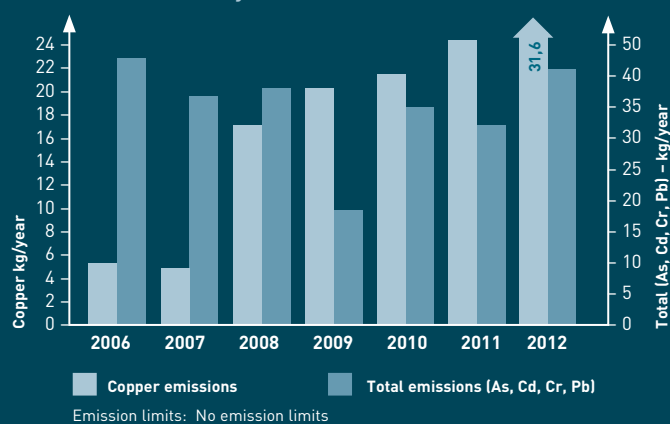
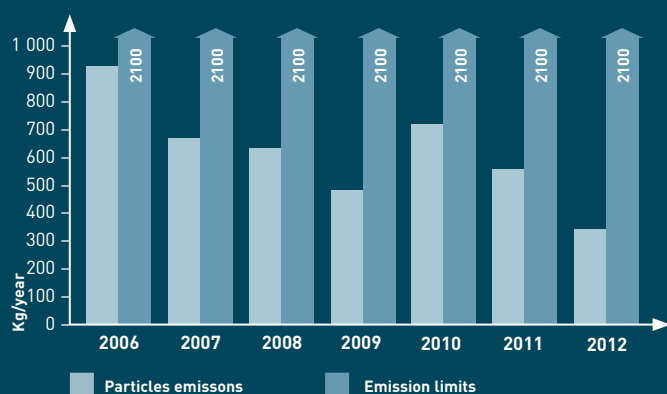
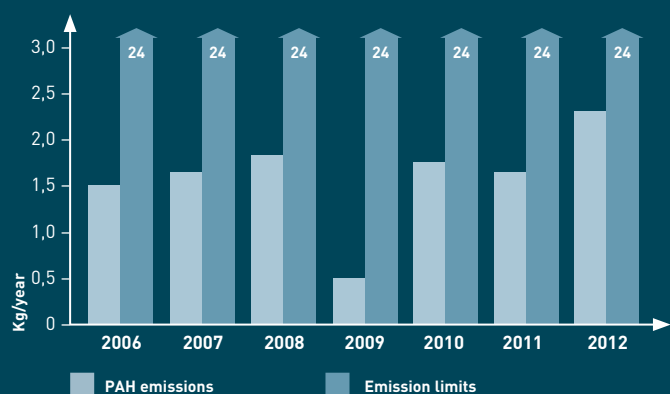
## INJURY FIGURES H1 AND ABSENCE DUE TO ILLNESS



## HES-FIGURES

CATEGORY	2011	2012
Absence due to illness	5.5 %	6.2 %
Injuries w/ absence	0	1
Injury figures H1 (H-figures)	0	2.7
Undesirable incidents - environmental	12	3
Complaints from neighbours	2	0
Violation of discharge permit	0	0



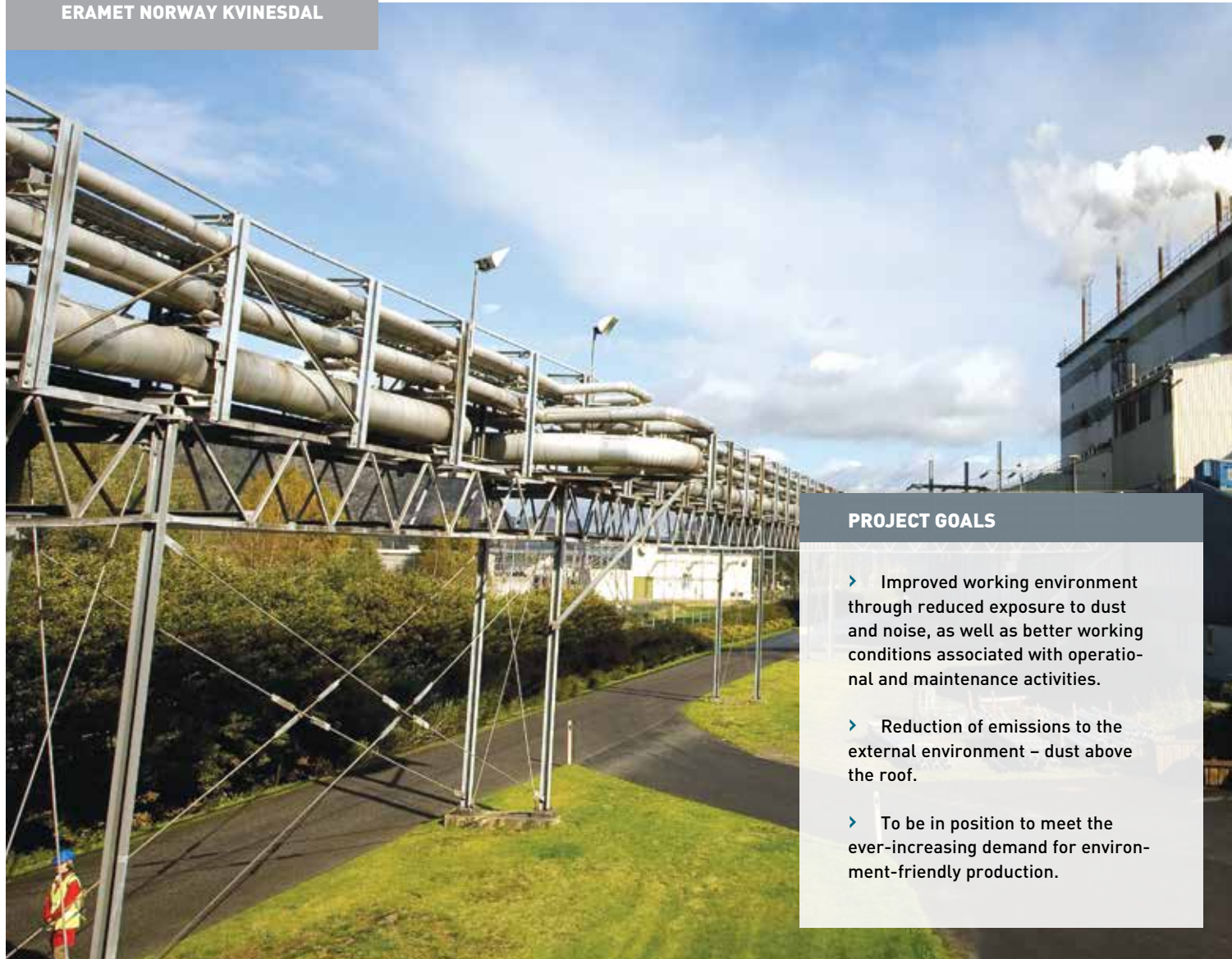
**DUST, SO<sub>2</sub>, CO<sub>2</sub> emissions to the air 2006-2012****Hg/Pb/Total (As, Cd, Cu, Cr) emissions to the air 2006-2012****ZINC/MANGANESE emissions to Fedafjorden 2006-2012\*****COPPER/TOTAL (As, Cd, Cr, Pb) emissions to Fedafjorden 2006-2012\*****PARTICLES emissions to Fedafjorden 2006-2012\*****PAH emissions to Fedafjorden 2006-2012\***

\*Emissions from purifying plants.

**WASTE**

CATEGORIES	2011	2012
Slag	96 480 tonnes	87 430 tonnes
Sludge and dust (landfill)	10 622 tonnes	13 322 tonnes
Residual waste	275.4 tonnes	127.7 tonnes
Metal waste	23.9 tonnes	82 tonnes

CATEGORIES	2011	2012
Hazardous waste	27.9 tonnes	19.9 tonnes
Paper and cardboard	7.2 tonnes	7.2 tonnes
Wood waste	34.4 tonnes	4.2 tonnes
Plastic	4 tonnes	4 tonnes



#### PROJECT GOALS

- Improved working environment through reduced exposure to dust and noise, as well as better working conditions associated with operational and maintenance activities.
- Reduction of emissions to the external environment – dust above the roof.
- To be in position to meet the ever-increasing demand for environment-friendly production.

## Metal and slag processing

# NEW EXHAUST SYSTEM AT KVINESDAL

■ The goal of Eramet Norway Kvinesdal is to be an enterprise that takes the environment seriously. Both what is seen from outside the plant and, equally important, to maintain a satisfactory working environment for our employees. The ongoing project to install better exhaust and filtering systems for our metal- and slag-handling will serve to improve both of these aspects.

The design phase that took place in 2012 covered the improvement points and has sketched out good solutions. The goal of the project has at all times been to eliminate visible smoke. In the project, we focused on applying the “Best Available Technology”. We made use of one of the country’s leading companies within this field. We garnered experience from similar projects carried out in Sauda and Porsgrunn, and last but not least, we drew heavily on our R&D Department in Trondheim which contributed with advances modelling tools. These tools allowed us to test out solutions without first having to build them. This spared us both time and resources.



# SAFETY WORK IN MAJOR PROJECTS

■ In connection with major projects, we have experienced an increase in injuries. This has a lot to do with the projects' special character, such as the fact that many persons are involved, it is necessary to work along with other firms, one has to perform tasks that normally are not carried out on a frequent basis, and also the fact that time deadlines must be kept.

Because of this, it was decided by the company that more resources must be assigned to the major projects insofar as monitoring of safety during the project execution is concerned. As a result of this, it was decided that safety representatives should be used for the daily safety monitoring during the project execution. Eramet Norway Sauda had introduced this practice and we have learned much from their experience.

## ACTION PLAN

Whenever a major project is planned, the on-site safety representative (where the actual project is to be carried out) will be contacted by the Project Manager / HES Coordinator. The safety representative and his/her supervisor are informed as to when the project is to be carried out, and that the safety representative is assigned to the project during the execution phase.

### The safety representative's set job tasks during the project execution:

- If necessary, put a stop to any dangerous work of which the safety representative becomes aware (all safety representatives have this authority). Make daily safety rounds.
- As needed, assist in the filling-out of job safety analysis reports (SJA).
- Participate in the morning meetings and present reports on the safety rounds carried out. Be the resource person for the hired contractors (provide information and assistance).
- Carry out "minor jobs" when time permits.

### What we have achieved:

- We have not had any injuries leading to job absences on our major projects since the "new arrangement" was put in place.
- Both the contractors and our own employees are pleased with the arrangement.
- The experience that the safety representatives acquire during the project can be of great benefit when these persons return to their own department / section

## KVINESDAL WON THE SAFETY PRIZE



**At the Annual Conference on HES in the Smelting Industry, sponsored by Norsk industri (Norwegian Industry) on May 23, 2012, Eramet Norway Kvinesdal was awarded the safety prize for 2011.**

The company received the prize in competition with 16 other smelting plants in Norway. Some of the factors assessed by the jury were: Injury statistics, injury reporting (synergy reports), sickness-related absences, training, safety work, working environment committee, management's HES focus, order / tidiness, organization, and division of responsibility.

**The finalists were: Elkem Bjølvfossen, Saint-Gobain Lillesand, and Eramet Norway Kvinesdal.** We will not be content with the safety prize, but will continue our continuous improvement path within safety-related issues. The safety prize can, in this way, be regarded as a confirmation that we are on the right path.

## SIGNIFICANT ENVIRONMENT ASPECTS

- Noise from fixed installations and vehicles
- Emissions into the air:
  - heavy metals, PAH, dust particles, CO<sub>2</sub> og energy spillage
- Emissions into the ocean: metals and PAH
- The company's visual impression

## COLLABORATION WITH BELLONA

The Environmental Foundation Bellona and Eramet Norway have entered into a formal collaboration for which the objective is to mutually avail ourselves of one another's expertise in order to improve the company's environmental performance.

## FRAMEWORK AGREEMENT WITH ENOVA

Eramet Norway in Porsgrunn and Sauda have framework agreements with Enova involving financial support to carry out energy-efficiency measures in the plants (2009-2011). Total settlement for the 3 years will be done in the beginning of 2013.



## TRANSPORTING THE PRODUCT

Eramet Norway exports all of its production of manganese alloys primarily to Europe and North America. The plants in Sauda and Porsgrunn transport 98% of their production by boat and the remaining percentage by land vehicles.



## SOCIAL OBLIGATIONS IN ERAMET NORWAY

**Eramet Norway attends to it's social obligations through:**

- The owners receive an expected return on invested capital.
- Employees enjoy security for themselves and for their families.
- Suppliers have a demanding client.
- The customers receive their products at the agreed time, as well as high quality.
- The environment is minimally affected.
- We take the initiative to adapt our activities in relationship to the surroundings.
- We produce, in an environmentally friendly manner, useful products that the world needs.

Eramet Norway is concerned with contributing to build up robust industrial regions in Telemark and Western Norway. By developing arenas that contribute to community development where we are located, Eramet Norway's competitiveness is strengthened.

**A robust region is characterized by:**

- An equal and stable welfare program.
- A competitive, profitable and adaptable business sector.
- Good access to competency.
- Varied employment market, residential and service infrastructure.

### SUPPORT OF LOCAL CULTURAL ORGANIZATIONS

Eramet Norway supports clubs, organizations, cultural activities and individual events at the local level. It is important that the local community around our company continues to provide opportunities for cultural and leisure activities.

## WASTE DISPOSAL SITES

Process-produced wastes are disposed in Kviå in Sauda, to the national disposal site in Langøya for Porsgrunn, and in Fosseland in Kvinesdal.

## COLLABORATION WITH INDUSTRY

Through the Norwegian Ferroalloy Producers Research Association (FFF) we have participated in an important collaborative project between industry, Sintef and The Norwegian University of Science and Technology (NTNU).



# 81 GWh

GROSS PRODUCED ELECTRICAL ENERGY

# 412 GWh

THERMAL ENERGY SOLD TO CUSTOMERS

# 56 GWh

THERMAL ENERGY USED INTERNALLY

## ENERGY- ECONOMIZATION AND RECOVERY

Eramet Norway's activities use recovered energy internally (for heating buildings and for refractory processes) and supply cost-free remote heating externally in Sauda.

The combined income for:

- sale of recovered thermal energy to Yara in Porsgrunn
- sale of recovered electrical power in Kvinesdal
- sale of recovered thermal energy for district heating and fish-farming in Kvinesdal

amounted to a total of MNOK 84.

### SAUDA



**Preparations for energy management certification have begun, and the goal is to have ISO 50001 implemented and in place during 2013.**

With the installation of the new heating furnace and appurtenant infrastructure for utilizing internal furnace gas to heat buildings, a total of MNOK 7.3 of all investment funds have been allocated to energy recovery. New burners for refractory activities have been procured in order to reduce dependence on propane, which can then be replaced by internal furnace gas.

Pre-project work is underway to arrange for investment in pilot-test equipment designed to produce electrical power and thermal energy from the substantial volume of furnace gas available at the plant.

### KVINESDAL



**The plant was certified in compliance with NS 16001 at the end of 2010. In 2013 the plant was recertified to NS 5001.**

As a management tool, the standard requires continual attention and reporting on follow-up of comprehensive activities.

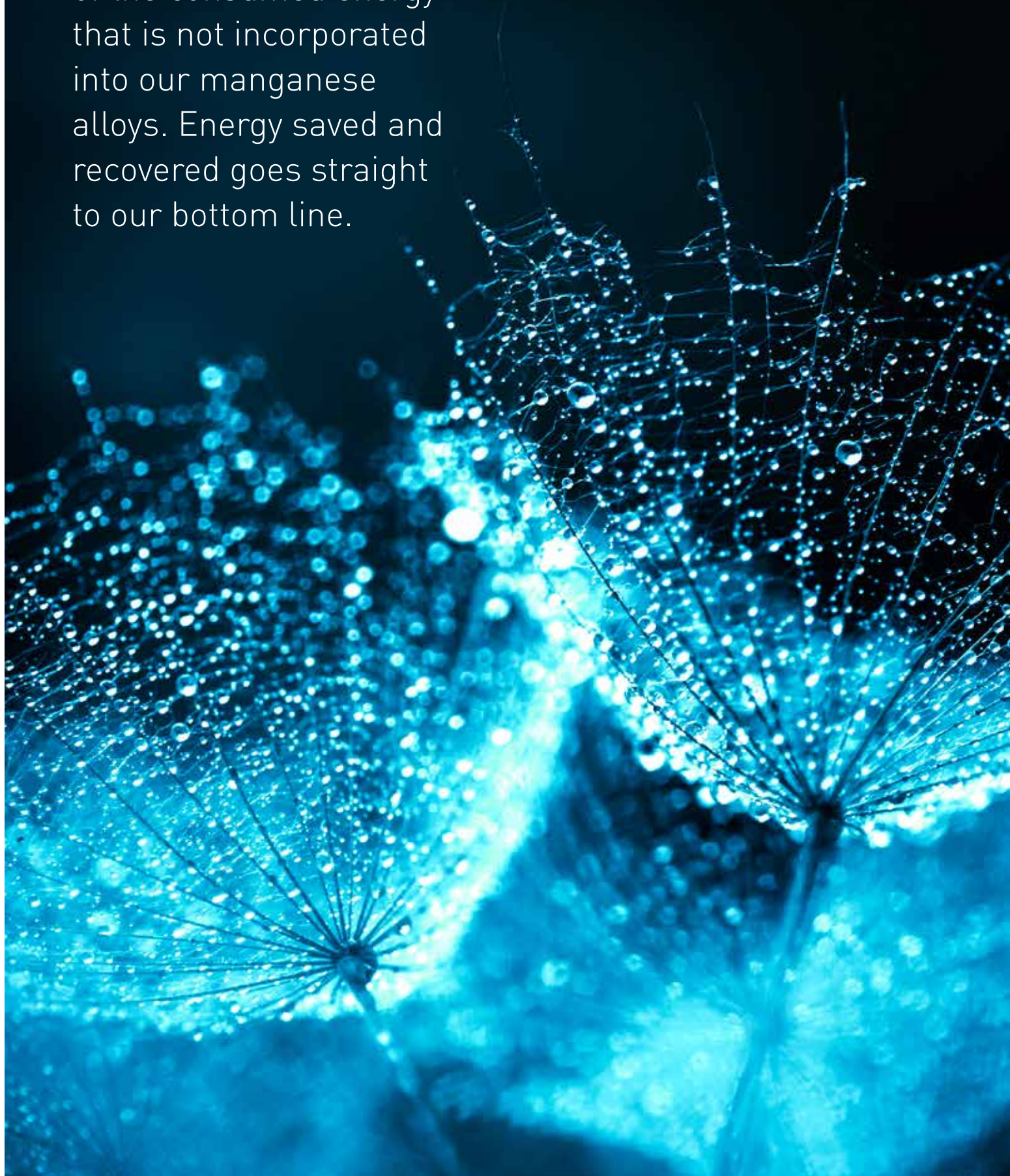
### PORSGRUNN



**The plant is not yet energy management certified. The plan is to make a parallel run with Sauda for certification in 2012.**

Procurement of new pressurized equipment was funded in 2011, and arrangements have been made to use cooling water for heating purposes. Recovered energy will primarily be used in the welfare building, as well as rooms near the new compressor installation in furnace house 2.

“ We make efforts  
to recover most  
of the consumed energy  
that is not incorporated  
into our manganese  
alloys. Energy saved and  
recovered goes straight  
to our bottom line.





# FINANCES AND KEY FIGURES 2012

■ Our three manganese-smelting plants had in 2012 an energy consumption of almost 2.0 TWh, of which 94 % was related to smelting and the remainder, to auxiliary power.

Furthermore, a minor amount of energy-rich gases (natural gas and propane) was purchased, as well as petroleum products. The installed energy-recovery system provided a significant added value creation both for external sale as well as for internal use. In volume, this amount was more than 80 GWh of electrical energy and around 470 GWh of thermal / chemical energy. Electrical energy production at Kvinesdal and deliveries of furnace gas to Yara's ammonia plant in Porsgrunn represented, in total, an income sum of close to 60 MNOK.

Other external sales of recovered energy totalled at least 1 MNOK, while the value of the internally consumed heat and water is estimated at around 31 MNOK. When the estimated value of delivered hot water which is offered

free in Sauda is taken into account, then the total value reaches 93 MNOK. Gas deliveries to Yara in this year are estimated at around 65 % of the entire year's production.

## TOTAL OPERATIONAL COSTS FOR THE RECOVERY SYSTEMS

Total costs to operate the recovery systems amount to at least 8 MNOK most of which is associated with electrical energy recovery. We therefore ended at a net result of around 84 MNOK for these activities.

The company's total operating result was 311 MNOK in 2012.

## CO<sub>2</sub> EMISSIONS

A rough estimate of the saved CO<sub>2</sub> emissions, based on the principle that the recovered electrical and thermal / chemical energy either would have to be new-produced or purchased in the market, produces a volume of at least 360 000 tonnes. Eramet Norway's 3 smelting plants had a gross CO<sub>2</sub> emission of 739 000 tonnes this year (before subtraction of the furnace gases emissions sold to Yara's ammonia plant).

## ENVIRONMENTAL INCOME 2012

Environmental income is based on sale of CO<sub>2</sub> gas to Yara's ammonia factory at Herøya in Porsgrunn for just under MNOK 36, and sale of manganese dust for MNOK 51.

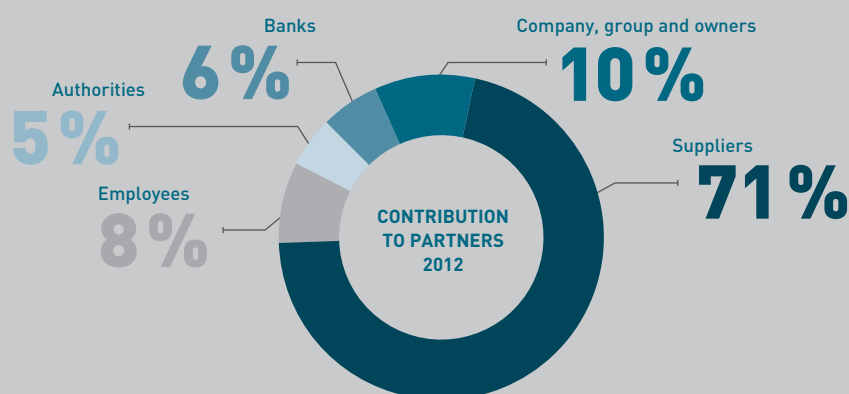
**36 MNOK** **51 MNOK**  
SALES OF CO-GAS TO YARA SALES OF MANGANESE DUST

## CONTRIBUTION TO PARTNERS 2012

Simplified presentation of contribution to partners:

	MNOK	%	Comments
Suppliers	2 519	71 %	Purchase values excluding value added tax
Employees	299	8 %	Amount paid to employees deducted income-taxes transferred to authorities
Authorities	191	5 %	Employer's contributions + employees' taxes + property tax + environmental tax + corporate taxes + consumer tax on energy + customs
Banks	208	6 %	Financial items net (including foreign exchange items)
Company, group and owners	361	10 %	Reflects profit/dividend, corporate costs, depreciation, etc.
<b>TOTAL</b>	<b>3 578</b>	<b>100 %</b>	

**3 578 MNOK**  
CONTRIBUTION TO PARTNERS 2012

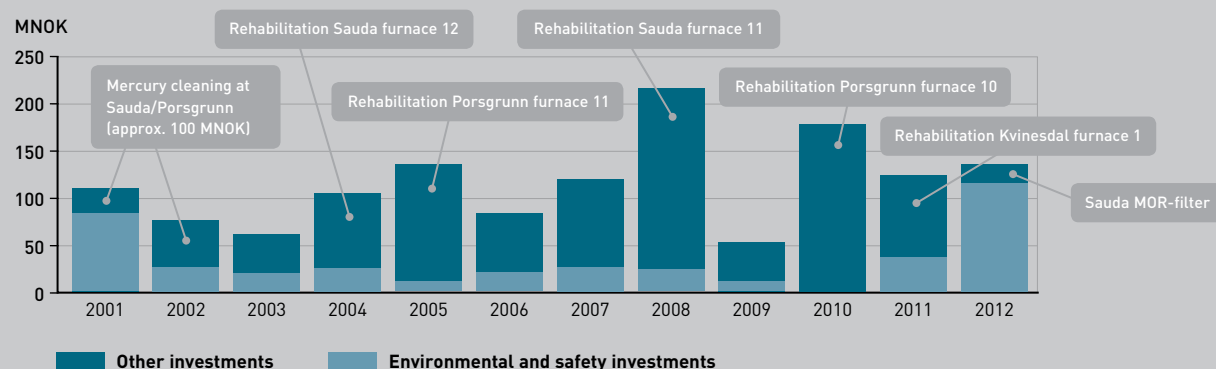


## INVESTMENTS 2001-2012

Yearly investments for Porsgrunn and Sauda during the period 2001–2012, and Kvinesdal for the period 2010–2012.

2 PLANTS (PORSGRUNN AND SAUDA)										3 PLANTS			
Year:	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	TOT*
Environment and Safety investm.	83	29	20	27	11	24	27	25	11	18	43	113	468
Other investments	29	46	37	75	132	61	86	192	40	166	81	144	1 123
TOTAL INVESTMENTS	112	75	57	102	143	86	113	217	51	184	123	257	1 591

\*) The total figure includes the year 2000.

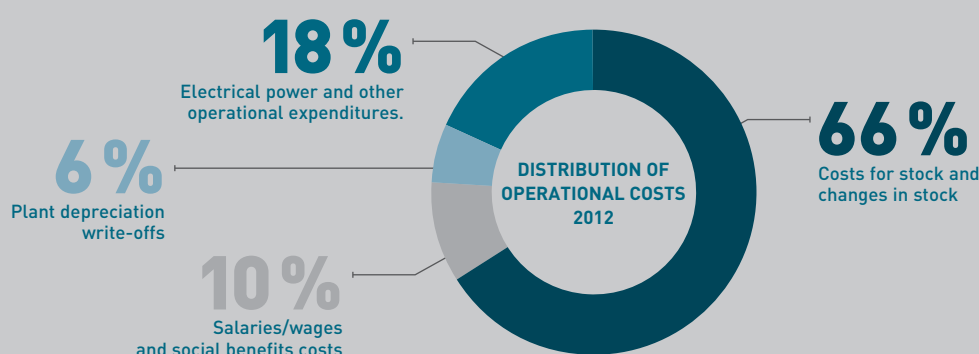




## PROFIT & LOSS STATEMENT FOR 2011 AND 2012

History of the Sauda, Porsgrunn and Kvinesdal plants. Figures are in MNOK. MNOK → Billion NOK

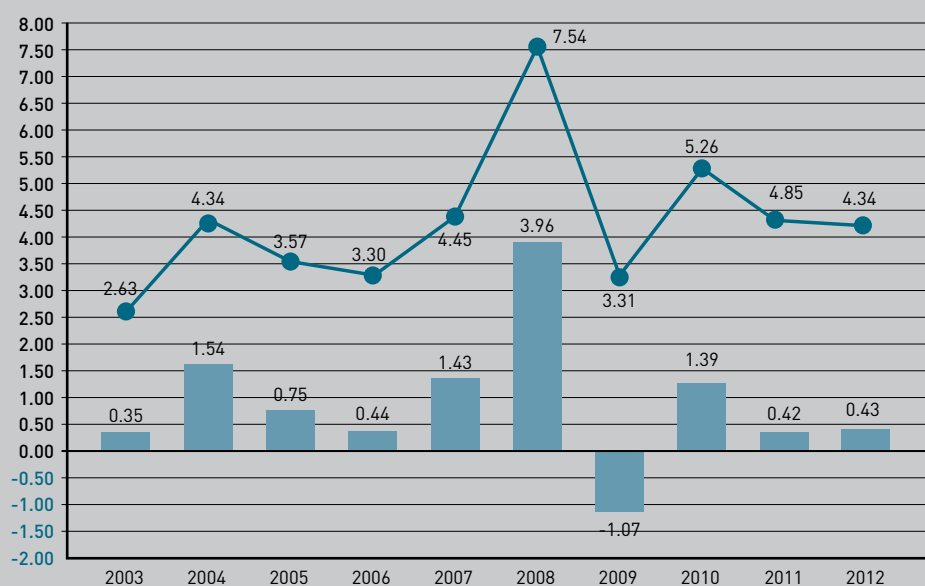
	Last year 2012			Previous year 2011			Change	%
<b>GROSS INCOME</b>	<b>4 336</b>			<b>4 854</b>			<b>-518</b>	<b>-11%</b>
Cost of used materials and inventory change	-2 659		66 %	-3 086		70 %	427	14 %
Wages-, salaries and social cost	-398		10 %	-407		9 %	8	2 %
Depreciation of assets	-259		6 %	-244		6 %	-15	-6 %
Electric energy and other operating cost	-708	-4 025	18 %	-698	-4 435	16 %	-10	-1 %
<b>OPERATIONAL RESULT</b>		<b>311</b>			<b>419</b>		<b>-108</b>	<b>-26 %</b>
Interest-/financial cost		-208			-255		46	18 %
Corporate taxes		-29			-45		17	37 %
<b>NET RESULT</b>		<b>74</b>			<b>119</b>		<b>-45</b>	<b>-38%</b>



## TURNOVER AND OPERATING RESULT

History of the Sauda, Porsgrunn and Kvinesdal plants.  
Figures are in Billion NOK.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Accumul. 2002-2012
Operational result	0.35	1.54	0.75	0.44	1.43	3.96	-1.07	1.39	0.42	0.31	9.48
Turnover	2.63	4.34	3.57	3.30	4.45	7.54	3.31	5.26	4.85	4.34	45.84
Operating margin	13 %	35 %	21 %	13 %	32 %	52 %	-32 %	26 %	9 %	7 %	21 %



Operating results ● Turnover

**311**  
**MNOK**  
OPERATING RESULTS 2012

**4 336**  
**MNOK**  
TURNOVER 2012

# ERAMET NORWAY HES-POLICY

## OBJECTIVE

Eramet Norway shall conduct its business activity in such a manner that the potential harms to health, environment and safety will be as low as possible throughout the entire value chain. The manufacture of metals, materials and other products will be completed via resource-effective processes that take into account health, the environment and safety. Eramet Norway shall be an environmentally conscious company, with a safe working environment that protects its employees, its facilities and assets. Planned, continual improvement in HES achievements and prevention of environmental harms will be the basic goal for all activity in the company.

## PRIORITIZATION

Health, environment and safety activities will be an integrated part of the operation. Our highest concern is to protect our employees and others who are affected by our business activity from accidents in the workplace and other harms to health. All pertinent laws and regulations governing the field, as well as other requirements the company adopts, will be observed. Environmental and safety aspects shall always be evaluated and weighed whenever decisions involving investments, operating methods and changes are to be taken.

## RESPONSIBILITY

Managers at all levels have total responsibility for HES within their respective areas of responsibility. They are responsible for planning, organizing, training and for conducting health, environment and safety procedures, and for ensuring that practices comply with laws, public regulations and other decisions within their areas of responsibility. In their plans, managers shall set specific goals for improvement and seek the

cooperation of the employees to attain these goals. All co-workers have the responsibility to create a safe internal work environment, to protect the external environment and to protect the company's resources and equipment. Each employee has a personal responsibility to protect himself/herself and to follow established instructions and guidelines for safely completing work tasks.

## IMPROVEMENT

Health, environment and safety are integrated in Eramet Norway's management system. Potential undesired incidents as well as suggestions for improvement shall be carefully considered and form the basis for continual improvement. Reporting of undesired incidents will provide the basis for implementing and carrying out corrective and preventive measures, and thus shall be the object of close attention.

## PREVENTION

Risk assessment shall be the basis for HES procedures and practices and shall be a basic preparatory measure prior to any proposed change, as well as in planning and investment. Potential hazards shall be identified and assessed. Undesired incidents such as near mishaps, accidents, injuries to health and harms to the environment shall be registered and investigated to determine the root cause and to prevent recurrence.

## FOLLOW-UP

In order to ensure compliance with laws and public regulations as well as respect for Eramet's own environmental goals, policies and guidelines, a system must be in place for continual registration, reporting and review.

*Eramet Norway shall publish an annual HES report.*







“ Eramet Norway shall be an environmentally conscious company, with a safe working environment that protects its employees, its facilities and assets.



## The Manganese Source ®



ISO 9001/ISO 14001/ISO 50001  
SERTIFISERT BEDRIFT



**ERAMET**  
NORWAY

### Sauda

PO. Box 23 - NO-4201 Sauda,  
tel: +47 52 78 50 00/fax: + 47 52 78 50 02

### Porsgrunn

PO. Box 82, NO-3901 Porsgrunn,  
tel: +47 35 56 18 00/fax: +47 35 55 36 10

### Kvinesdal

Øyesletta 61, NO-4484 Øyestranda  
tel: +47 38 35 72 00/fax: +47 38 35 11 28

Organization number: 980 518 647 | E-mail: [eramet@erametgroup.com](mailto:eramet@erametgroup.com) | [www.eramet.no](http://www.eramet.no)