



AT THE CENTRE  
OF AN EVOLVING  
**INDUSTRIAL  
WORLD**

ANNUAL  
REPORT **2011**



**ERAMET**  
ALLOYS, ORES AND PEOPLE.







Interview with the Chairman	• 01
Board of Directors & governance	• 04
Management	• 06
Key figures	• 10
Map of operations	• 12
Manganese activity	• 14
Nickel activity	• 16
Alloys activity	• 18

## CONTENTS

---

### AT THE CENTRE OF THE INDUSTRIAL WORLD'S ISSUES

• 20

How can we build  
a strategic materials offering?

• 22

How can we develop recycling,  
a real "secondary mine"?

• 24

How can environmental impacts  
and risks be managed  
when mining new deposits?

• 26

How can newly available ores  
be processed more effectively?

• 28

How can we offer new,  
more effective products to  
major industrial groups?

• 30

### AT THE CENTRE OF THE INDUSTRIAL WORLD'S DYNAMICS

• 32

Focusing activity  
on the customer

• 34

Fostering engagement at ERAMET

• 38

Building responsible development  
with stakeholders

• 42

### ECONOMIC AND FINANCIAL INDICATORS

• 46

### GLOSSARY

• 54

---

Top to bottom: nickel,  
manganese and geologists  
at work

# A MINING GROUP SPECIALISED IN ALLOYING METALS

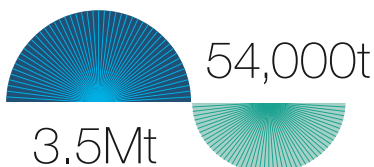
#6 WORLD PRODUCER OF  
**NICKEL**

#1 WORLD PRODUCER OF  
**FERRONICKEL**

#2 WORLD PRODUCER OF  
**HIGH-GRADE MANGANESE ORE  
AND MANGANESE ALLOYSE**

---

Annual production data



**ERAMET produces manganese in Gabon and nickel in New Caledonia. The Group turns those ores into metals and ferroalloys that are used in steelmaking, but also in the chemical industry (batteries, fertilisers, pigments, etc.). ERAMET implements a policy of diversification in terms of both geography and new metals: titanium, zirconium, lithium and other strategic metals such as niobium, tantalum and rare earths.**

- Manganese ore and manganese alloys
- Ferronickel





---

Top to bottom: ERAMET supplies alloys to the electronics and aerospace industries, but also cutlery such as Déglon in Thiers, France.

# AN UPSCALE METALLURGIST

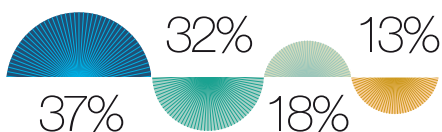
## SERVING STRATEGIC INDUSTRIAL SECTORS

#2 WORLD PRODUCER OF HIGH SPEED STEELS AND HIGH POWER CLOSED-DIE FORGED PARTS

#1 WORLDWIDE IN ALLOYED POWDER METALLURGY

---

**Breakdown of strategic capital expenditure in 2011**  
(€126 million)



- Titanium forging (France)
- Vacuum production of superalloys (France)
- Aluminium forging (France)
- Atomisation tower/powder metallurgy (Sweden)

The ERAMET Group is active in every high value-added segment of alloys, from the design of “grades” – produced by conventional metallurgical techniques or powder metallurgy – to the manufacture of forged or closed-die forged parts. Its main customers are the aerospace, power, tooling, transport and medical equipment industries.



---

Top to bottom: Two examples of the Group's recycling activity: batteries and oil catalysts.

# A GLOBAL PLAYER FROM MINING TO RECYCLING

WORLD LEADER  
IN OIL CATALYST RECYCLING

#3 WORLD PRODUCER  
OF TITANIUM DIOXIDE SLAG  
FOR PIGMENTS

---

**ERAMET is active throughout the alloying metal value chain: mining, conversion, alloys, semi-finished products, forged parts and recycling. This strategy adds high value both financially and in terms of research, development and know-how, with synergies in cutting-edge technologies like hydrometallurgy and powder metallurgy. These skills make ERAMET the partner that enables strategic sectors to meet the challenges of growth and sustainable development.**





---

Top to bottom, left to right:  
Group employees in mainland  
France, Sweden, New  
Caledonia, China, Indonesia  
and Gabon.

# PRESENCE ON FIVE CONTINENTS

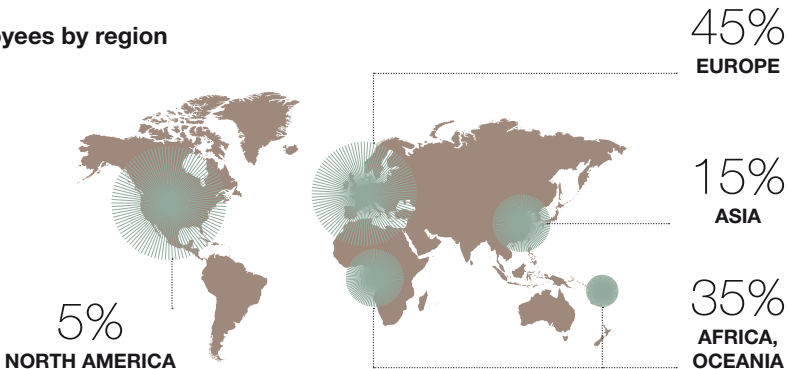
10 OFFICES  
WORLDWIDE FOR ERAMET  
INTERNATIONAL

ALMOST 100 PEOPLE  
TASKED WITH COMMERCIAL  
NEGOTIATIONS FOR THE GROUP'S  
DIVISIONS

With 47 industrial sites in 12 countries across five continents and strong sales presence in its three main markets – Europe, North America and Asia – ERAMET is a global player. The Group draws on the diversity of its people, close relations with customers and the determination to contribute to sustainable development wherever it is based.

---

## Employees by region







---

Whether on production sites or in research centres, ERAMET's men and women work to improve product quality and innovate.

# SHARP GROWTH IN RESEARCH & DEVELOPMENT

€124M  
**RESEARCH & DEVELOPMENT  
BUDGET IN 2011\***

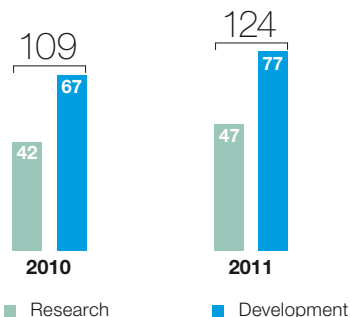
over 300  
**PEOPLE DEDICATED TO R&D**

\* Including external research costs and development expenditure for the Weda Bay Nickel, Maboumine and lithium projects.

**ERAMET Research, the Group's research centre in Trappes, near Paris, is host to 150 researchers, engineers and technicians covering a wide range of areas: mining, mineralurgy, pyrometallurgy, non-ferrous metal production, special alloys and steels. With ERAMET Ingénierie, based on the same site, it forms a cluster that can take on industrial projects from definition through to start-up. Other research centres, based on production sites, mainly work on new products.**

---

## Growth in R&D spending







A portrait of Patrick Buffet, the Chairman and Chief Executive Officer of Eramet. He is a middle-aged man with short, graying hair, wearing glasses, a dark gray suit jacket, a white shirt, and a red patterned tie. He is smiling slightly and looking directly at the camera. The background is a blurred outdoor setting with green trees and a clear sky.

**INTERVIEW**  
WITH THE CHAIRMAN

---

**PATRICK BUFFET**  
CHAIRMAN & CHIEF EXECUTIVE OFFICER, ERAMET



# “ ERAMET CONTINUED TO IMPLEMENT ITS DEVELOPMENT PLAN IN 2011”

---

47  
INDUSTRIAL SITES

15,000  
EMPLOYEES  
WORLDWIDE

3.6 billion  
EUROS TURNOVER  
IN 2011

---

## How would you sum up 2011 and what were the main points of progress?

In 2011 our results were affected in the second half by the slump in the economic environment, particularly through a fall in nickel and manganese prices. Our current operating income held out well, however, at €554 million for the year.

We reached important milestones in the implementation of our development plan, which has two main goals: preparing the future of our historical activities in nickel, manganese and alloys, and transforming ERAMET by expanding into new metals, regions and technologies.

We should also congratulate ourselves on the financial health of the Group, which succeeded in increasing capital expenditure, stepping up research & development efforts and gaining a foothold in new businesses, while maintaining net cash of more than €1.1 billion as at the end of 2011.

Furthermore, the Group's robustness also depends on the quality of our risk management and on constant dialogue with our stakeholders. The fundamental work done in 2011 on those issues is very satisfactory.

## What essential points would you take away from 2011?

In nickel, the continuation of the competitiveness improvement plan, the modernisation of the Doniambo plant and the definition of an ambitious strategic project for Société Le Nickel - SLN in New Caledonia. Thanks to modernised governance at SLN, dialogue with our New Caledonian partners now runs deeper, allowing us to plan for the future effectively. Finally, the highly satisfactory progress made on studies for the Weda Bay Nickel project in Indonesia (the final investment decision for the first phase is scheduled in 2013) should be noted, as well as the Japanese company Pamco's involvement in the project alongside Mitsubishi Corporation.

...

# “ WE’LL CONTINUE OUR OPERATING IMPROVEMENT PROGRAMMES ”

•••

In manganese, our major projects are moving ahead, particularly in Gabon: increase in ore production capacity, modernisation of the Transgabonais railway and the Moanda Metallurgical Complex.

In ERAMET Alloys, we commissioned four strategic new facilities in France and Sweden, giving us a position in fast-growing sectors such as titanium, powder metallurgy and vacuum fusion.

### **What’s the situation on your development projects in new metals?**

The Group’s expansion made major progress in 2011 with our new “Grande Côte” project in Senegal, which should make ERAMET, through a 50/50 partnership with the Australian company Mineral Deposits Limited, a world leader from 2013 in ilmenite and zirconium, two markets with high growth potential.

### **What are your challenges for 2012 and what goals are you setting?**

In 2012, the global crisis will weigh on markets in developed countries. But consumption of our metals in emerging countries is a long way off their full

potential and our very favourable medium and long-term vision is unchanged.

We’ll keep up our operating improvement programmes, ramp-up of recent facilities and completion of the capital projects in progress. Our total capital expenditure will be high compared with 2011, if the global economic situation remains in line with current forecasts.

We will also continue to step up our research and development programmes. If the development of a specific relevant process is conclusive, in particular, the Mabounié project in Gabon could eventually make the Group a world leader in rare earths and niobium.





---

# GOVERNANCE

## ALIGNED ON THE PRINCIPLES OF THE AFEP/MEDEF CODE

**The ERAMET Group's governance is in line with the general trend of a greater role for directors and the Committees that support the Board in its decision-making.**

In accordance with the shareholders' agreement of June 17<sup>th</sup>, 1999 and its amendment on May 29<sup>th</sup>, 2008 between Sorame and CEIR on one hand, and AREVA on the other, the Board of Directors is comprised of 15 members appointed for a four-year term.

**The director's Charter** is binding on each of them, whether they are appointed on a personal basis or represent a corporate entity. It defines directors' missions and obligations with an emphasis on competence, the right and duty to be informed, the need to attend Board and general meetings and independence of mind. The members of the Board must make

sure they are not in any conflict of interest, whether direct or indirect, between ERAMET and another company in which they hold an office. Any such situation must be revealed to the Board, resulting, as the case may be, in rejection of the appointment or resignation (structural conflict) or abstention (non-recurring conflict). The Charter reminds directors of the obligation to observe professional secrecy and refrain from trading in the company's stock in the event they hold any non-public information that may have an effect on share prices.

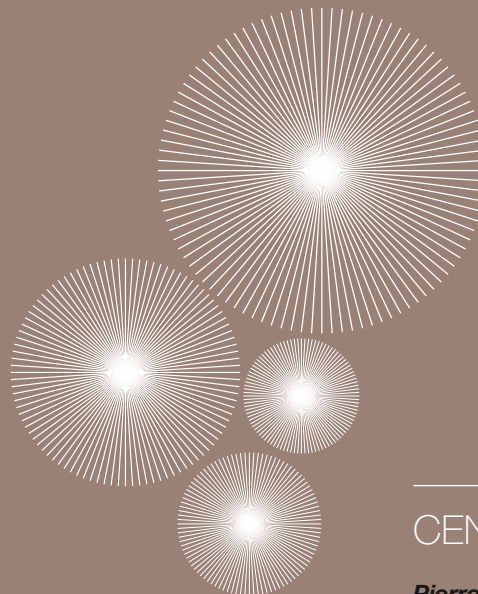
**The audit committee**, of which the workings and mission are also defined by a regularly updated charter, checks the relevance and correct application of the accounting methods used. It examines internal audit plans and findings, analyses the half-yearly and annual financial statements, and monitors major lawsuits and the policy

for managing exchange rates, raw materials, hedging and investments. It examines the Chairman's report on the work of the Board and internal control procedures.

**The compensation committee**, in particular, submits to the Board of Directors for approval the fixed and variable compensations of the corporate officers according to the goals set and the results achieved. It is assisted by the Group Vice-President Human Resources.



## COMPOSITION OF THE BOARD OF DIRECTORS AS OF DECEMBER 31<sup>ST</sup>, 2011



**Patrick Buffet,**  
Chairman & Chief Executive Officer, ERAMET

### DIRECTORS

**Claire Cheremetinski,**  
Deputy Director, energy and other capital interests, Agence des Participations de l'État

**Sorame, represented by Cyrille Duval,**  
Manager, Sorame, General Secretary, ERAMET Alloys

**Édouard Duval,**  
Vice-Chairman of the Board, ERAMET, Chairman of the Management Board, Sorame, Chairman, ERAMET International

**Georges Duval,**  
Manager, Sorame, Delegate CEO, ERAMET Alloys

**CEIR, represented by Patrick Duval,**  
Chairman, CEIR

**Gilbert Lehmann,**  
Advisor to the Management Board, AREVA

**Manoelle Lepoutre,**  
Executive Vice-President Sustainable Development and Environment, TOTAL

**Jean-Hervé Lorenzi,**  
Member of the Economic Analysis Council, Economics Lecturer at Paris-Dauphine University (independent director)

**Louis Mapou,**  
Chairman, STCPI (New Caledonia)

**AREVA, represented by Sébastien de Montessus\***

**Michel Quintard,**  
Technical Advisor, New Caledonia chamber of Commerce & Industry

**Michel Somnolet,**  
Former director, Deputy Chairman and Chief Financial Officer, L'Oréal (independent director)

**Antoine Treuille,**  
Chairman, Chairman, French American Foundation and Altamont Capital Partners LLC (independent director)

**Frédéric Tona,**  
Former Advisor to the Chairman & CEO, AREVA

### CENSORS

**Pierre Lescot**  
**Daniel Signoret**

### GROUP WORKS COUNCIL DELEGATES

**Louis-Pascal Aussedat**  
**Claudine Grossin**  
**Philippe Laignel**  
**Guillaume Pareyt**

### HONORARY CHAIRMAN

**Yves Rambaud**

\*Until March 31<sup>th</sup> 2012

---

# LIGHTWEIGHT, RESPONSIVE MANAGEMENT STRUCTURES

**To manage the Group's activities in an increasingly fluctuating and competitive environment, ERAMET set up a lightweight structure that fulfils two key requirements: efficiency and responsiveness.**

ERAMET is headed by a Chairman & Chief Executive Officer who chairs the Board of Directors – which deliberates on all of the company's major strategic, economic, financial and technological orientations – and carries out the Group's executive management.

## **The Executive Committee (Comex)**

assists him in this task. The main decision-making centre for the Group, it is comprised of the head of the three Divisions, (ERAMET Nickel, ERAMET Manganese and ERAMET Alloys), who are also Delegate CEOs, the Chief Financial Officer, the Executive Vice-President Human Resources, Health & Safety and the Executive Vice-President Communications and Sustainable Development. The Comex, which meets every two weeks, has a dual function: it oversees the activity of the Group and its main subsidiaries and sets changes in momentum.

## **It is supported by an International Management Committee (IMC),**

which groups together the managers of the main subsidiaries, the Vice-President R&D, Innovation, Engineering and Purchasing and the LEADERS Programme Director. This lightweight organisation in relation to the Group's size, complex structure and diverse businesses is a definite advantage for flexible, efficient and responsive management.



## EXECUTIVE COMMITTEE

AS OF DECEMBER 31<sup>st</sup>, 2011

**Patrick Buffet,**

Chairman & CEO, ERAMET  
and Société Le Nickel-SLN

**Georges Duval,**

Vice-Chairman, Delegate CEO, ERAMET Alloys

**Bertrand Madelin,**

Delegate CEO, ERAMET Nickel

**Philippe Vecten,**

Delegate CEO, ERAMET Manganese

**Jean-Didier Dujardin,**

Chief Financial Officer

**Catherine Tissot-Colle,**

Executive Vice-President Communications  
and Sustainable Development

**Michel Carnec,**

Executive Vice-President Human Resources,  
Health & Safety



“In 2012, we’ll keep up our operating improvement programmes, ramp up recent facilities and complete the capital projects in progress. Our total capital expenditure will be high compared with 2011, if the global economic situation remains in line with current forecasts. We will also continue to step up our research and development programmes.”

**Left to right:**

- Georges Duval
- Michel Carnec
- Jean-Didier Dujardin
- Catherine Tissot-Colle
- Patrick Buffet
- Bertrand Madelin
- Not pictured: Philippe Vecten



**Patrick Buffet,**

Chairman & CEO, ERAMET



## Performance

---

“We work for very demanding customers in areas where product quality is crucial. But in a context of high international competition we must also be efficient in terms of costs and lead times, as well of course as ethical areas: safety, health and the environment. To meet our customers’ needs and remain leaders, we need to stay a step ahead and, to do so, enable all of our employees to contribute to improvement.”

---

**Georges Duval,**  
Vice-Chairman, Delegate CEO,  
ERAMET Alloys

## Engagement

---

“The engagement we expect from ERAMET’s employees goes hand-in-hand with the Group’s long-term commitments: improving safety and working conditions; fostering professional development by organising relevant training and offering career opportunities; proposing motivating, fair and competitive compensation; continuing to allow all employees to benefit from the company’s performance; and maintaining the quality of industrial dialogue.”

---

**Michel Carnec,**  
Executive Vice-President,  
Human Resources, Health &  
Safety

## Future

---

“The past year and the current one are both decisive for the future of the Nickel Division: in New Caledonia, with the continued improvement of productivity and a strategic plan to safeguard SLN’s long-term activity; and in Indonesia, with teams dedicated to the success of the Weda Bay Nickel project in the field and in the laboratory. Everything has to be ready so that the final decision on the first 35,000 tons per year phase can be made in early 2013.”

---

**Bertrand Madelin,**  
Delegate CEO,  
ERAMET Nickel



## Responsibility

---

“Sustainable development, stakeholder relations, listening: our Group’s determined approach aims for dialogue and transparency, both in host countries and for its new projects. The goal is to build and maintain a reputation based on clear commitments and verifiable actions. For ERAMET this is a constant ambition that depends on everyday action.”

---

**Catherine Tissot-Colle,**  
Executive Vice-President,  
Communications and  
Sustainable Development

## Grasp

---

“Like other companies, we’re facing an uncertain, competitive situation. To win market shares, our goal is to keep up the Group and Division’s development efforts to further improve our grasp of production processes, the quality of our products and compliance with specifications. Our competitiveness depends on it.”

---

**Philippe Vecten,**  
Delegate CEO,  
ERAMET Manganese

## Soundness

---

“2011 confirmed the Group’s financial soundness. This good health guarantees our future as it enables us to finance our development, particularly the major growth projects to be carried out in the coming years. We’re also continuing to implement our programmes to reduce costs – in operations as well as purchases – and working capital requirements.”

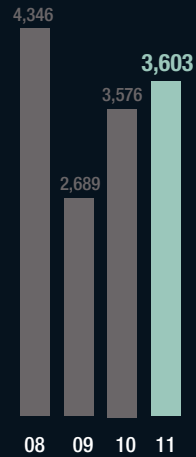
---

**Jean-Didier Dujardin,**  
Chief Financial Officer

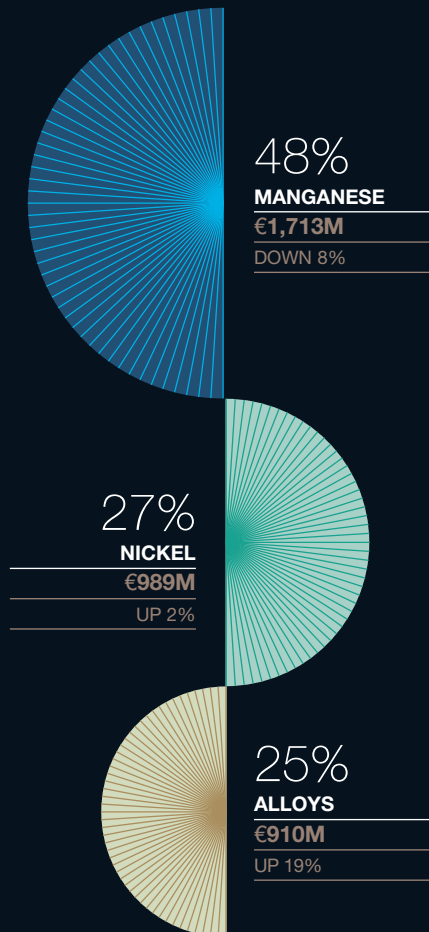


# 2011: A GOOD YEAR

Healthy results in 2011 and high cash at year-end mean the Group can consider selective acquisitions.

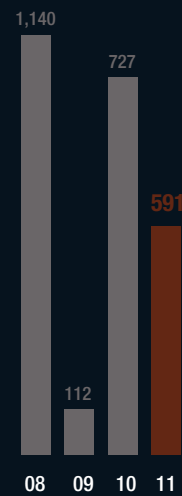


## TURNOVER BY DIVISION



## TURNOVER (millions of euros)

Turnover in 2011 was up slightly on 2010, reaching €3,603 million.



## NET OPERATING CASH FLOW (millions of euros)

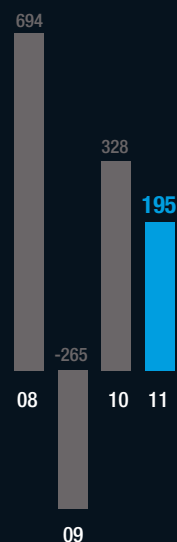
€591 million in net cash flow from operating activities, compared with €727 million in 2010.



CURRENT  
OPERATING INCOME

(millions of euros)

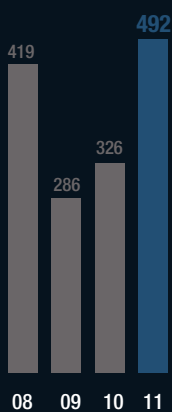
Slight decrease in current operating income due to the fall in manganese prices and to external costs, particularly energy.



NET INCOME,  
GROUP SHARE

(millions of euros)

Relative decrease in net income greater than in COI.



CAPITAL  
EXPENDITURE

(millions of euros)

An almost 51% increase in capital expenditure.



CONSOLIDATED  
NET CASH

(millions of euros)

A very sound financial situation that enables the Group to fund its strategic development project.

# CLOSE TO OUR CUSTOMERS WORLDWIDE

## KEY

- Nickel sites
- ▲ Manganese sites
- Alloy sites
- \* GROUP:  
Paris HQ /  
ERAMET Research and  
ERAMET Ingénierie  
in Trappes
- ◎ ERAMET International

### UNITED STATES

- ▲ Erachem COMILOG  
Baltimore (manganese chemistry)
- ▲ BMC Butler (ferromolybdenum  
and ferrovanadium)
- ▲ GCMC Freeport (oil catalyst  
recycling)
- ▲ ERAMET Marietta  
(manganese alloys)
- ▲ Erachem COMILOG  
New Johnsonville  
(manganese chemistry)
- Erasteel Boonton  
(high speed steels)
- Erasteel service centre  
in Romeoville

### CANADA

- ▲ GCMC Fort Saskatchewan, Alberta  
(oil catalyst recycling)

### MEXICO

- ▲ Erachem Mexico Tampico  
(manganese chemistry)





**GABON**

- ▲ COMILOG: Moanda mine and sintering plant
- ▲ Owendo logistics centre
- ▲ SETRAG: Transgabonais railway concession

**SENEGAL**

- ▲ TiZir Grande Côte Opérations (titanium dioxide)

**GERMANY**

- Aubert & Duval Stahlschmidt (distribution centre)

**BELGIUM**

- ▲ Erachem COMILOG Tertre (manganese chemistry, copper solution recycling)

**FRANCE**

- ▲ COMILOG Dunkerque (manganese alloys)
- ▲ Valdi Le Palais plant (catalyst recycling)
- ▲ Valdi Feurs plant (battery recycling)
- Eurotungstène Grenoble plant (metal powders: cobalt, pre-alloys, tungsten, etc.)
- ERAMET Sandouville plant (high-purity nickel, cobalt)
- Erasteel Champagnole (high speed steels)
- Erasteel Commentry (high speed steels)
- 6 Aubert & Duval plants: Firminy, Gennevilliers, Imphy, Issoire/Interforge, Les Ancizes, Pamiers/Airforge (closed-die forged parts, forged parts, long products, tooling)
- UKAD plant (titanium ingots)
- Aubert & Duval distribution centre: Heyrieux
- Erasteel service centre: Chalons-sur-Saône

**SPAIN**

- Metallied Iron plant (powder metallurgy)

**ITALY**

- Aubert & Duval ADES (distribution centre)

**NORWAY**

- ▲ 3 ERAMET Norway plants (manganese alloys): Porsgrunn, Sauda, Kvinesdal
- ▲ TiZir ETI Tyssedal (titanium dioxide)

**UNITED KINGDOM**

- Erasteel Stubs Warrington (high speed steels)

**SWEDEN**

- 3 Erasteel plants: Langshyttan, Söderfors, Vikmanshyttan

**CHINA**

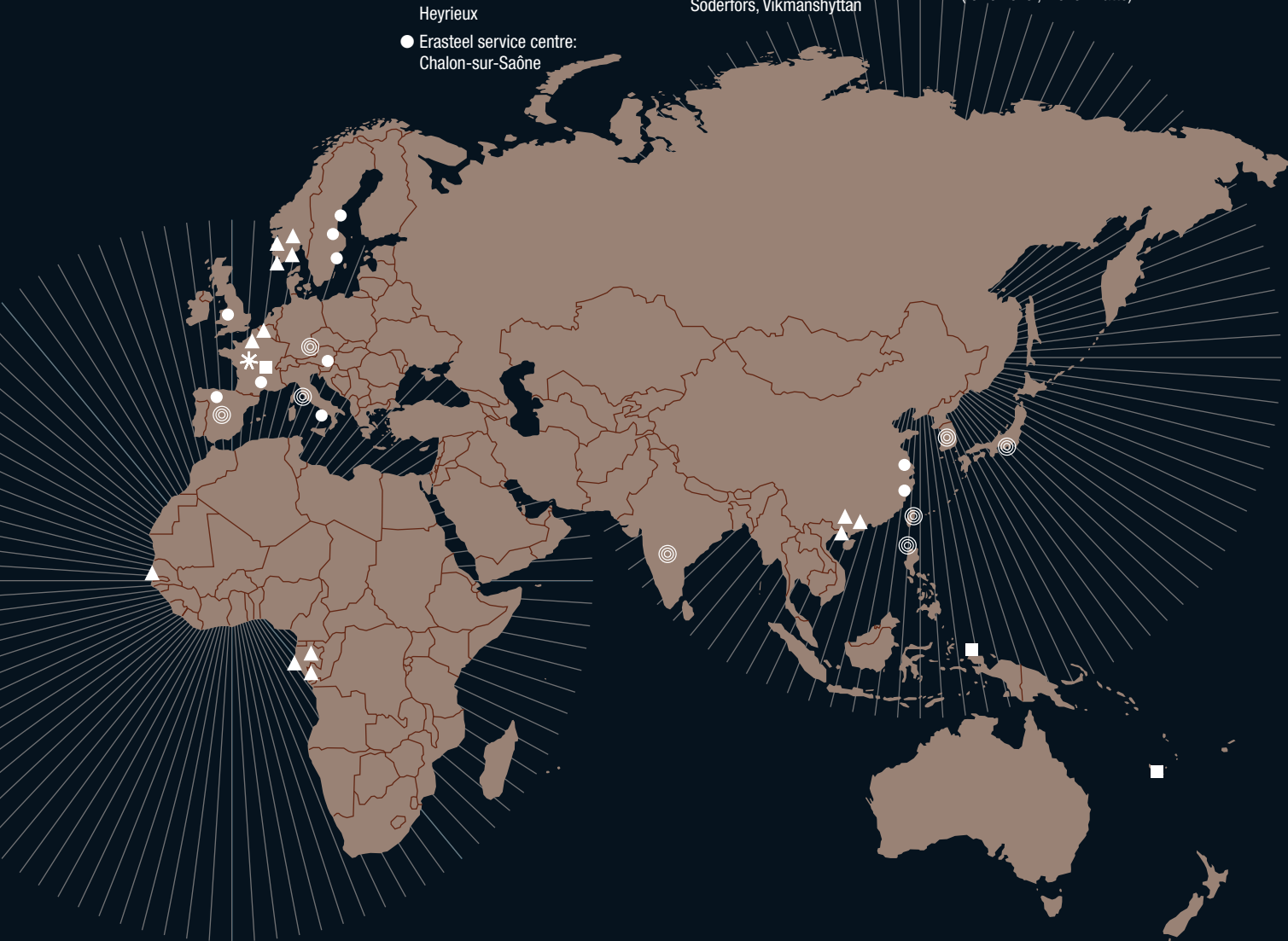
- Aubert & Duval Wuxi (distribution centre)
- Erasteel Tianjin (high speed steels)
- ▲ COMILOG Guilin (manganese alloys)
- ▲ COMILOG Laibin (manganese alloys)
- ▲ GECC Chongzuo (manganese chemistry)

**INDONESIA**

- PT Weda Bay Nickel Halmahera island (nickel deposit)

**NEW CALEDONIA**

- Société Le Nickel-SLN
- 5 mines: Kouaoua, Népoui, Poum, Thio, Tiébaghi
- Doniambo metallurgical plant (ferronickel, nickel matte)



---

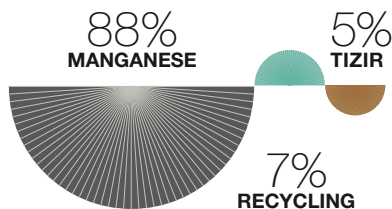
# ERAMET

# MANGANESE

**Despite the effects of a decrease in steel production in the second half, the Division's income totalled €388 million.**

---

## TURNOVER BY SECTOR



### Production up, prices down

3.4 million tons of manganese ore were extracted from Gabon's mines, compared with 3.2 million in 2010. The production ramp-up plan continues, with the aim of 4 million tons in output on an annual basis by the end of 2012. As for the economic environment, while the firm conditions of 2010 held out in the first half, the market was then affected by the downturn in world steel production, which did however rise 6% over the year. Combined with an increase in supply leading to the build-up of inventory, the fall in demand

drove down manganese prices.

As a result, although the market for chemistry sector products benefited from good economic conditions, the Division's current operating income was approximately 30% lower than in 2010.

### Capital expenditure for growth

Civil engineering work has begun for the construction of Moanda Metallurgical Complex (CMM). The two plants should start producing during the second half of 2013. The construction of New Guillin, China, is also nearing completion. This

manganese alloy plant will come on stream in the second half of 2012, with an annual goal of 165,000 tons, of which 70,000 tons of refined alloys. Among the Division's other activities, TiZir, the joint venture founded by ERAMET and the Australian group Mineral Deposits to mine titanium and zirconium in Senegal, was finalised on October 1<sup>st</sup>. It includes the Tyssedal, Norway, titanium dioxide plant, which will consequently have access to an integrated supply (see also page 22).



### Forward-looking projects

- Erachem COMILOG, the world leader in manganese chemical derivatives, launched production of high-purity manganese sulphate for the production of lithium-ion batteries.
- The Manganese Division is also conducting a pilot for the Mabounié project, with the primary goal of developing a specific method for processing niobium, tantalum and rare earths in Gabon (see page 23).

1.7 billion  
EUROS TURNOVER

388M  
EUROS CURRENT  
OPERATING INCOME

6,400  
EMPLOYEES

## INNOVATION



### Five-month pilot project for the future Moanda complex

Moanda metallurgical complex, designed in particular for the local beneficiation of ore mined in Gabon to produce silicomanganese and manganese metal by a hydrometallurgical process (see page 29), will have to process different ore grades. It is essential, therefore, to make sure upstream that industrial processes are relevant. To do so, a pilot facility was set up near

Shanghai, China. In operation for five months, it also enabled the Division to test new processes for capturing electrolysis gases and automating metal recovery on the cathode in order to improve workplace health and safety.



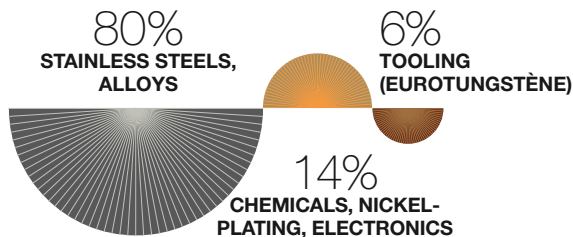
---

# ERAMET NICKEL

**On a market with a positive long-term outlook thanks to emerging countries but subject to price fluctuations, the Nickel Division maintains its goals: improving its productivity and safeguarding its future activity, with development prospects in New Caledonia and the study of the Weda Bay Nickel project in Indonesia, on which a final investment decision for the first phase is planned in 2013.**

---

## TURNOVER BY SECTOR



### A full year

2011 was a successful year for nickel, thanks to rising demand in emerging countries, particularly China. Economic expansion requires new metal, whereas in some industrialised countries up to 70% of metal comes from recycling. But we should remain cautious over the short term as, while prices remained high in the first two quarters of 2011, they slumped in the second half. The same phenomenon was observed for the tungsten and cobalt powders produced by

Eurotungstène. The Sandouville plant also enjoyed a year full of technical improvements and new products.

### Planning ahead

The competitiveness improvement plan undertaken in New Caledonia in 2010 is more necessary than ever in the current context. In 2011 it continued to bear fruit, even if exceptional rainfall made its results less visible. Le Nickel-SLN is also preparing for the future with projects to open new mines, including by hydrometallurgical processes. Finally,

the future means Weda Bay Nickel (see also page 27), which is in the home straight leading to the final investment decision in 2013 on the first phase of the project (35,000 tons of annual output).



### New product development

- The ramp-up of new carbonate and salt products at Sandouville, France continued in 2011. New markets are being prospected.

989M  
EUROS TURNOVER

189M  
EUROS CURRENT  
OPERATING INCOME

3,000  
EMPLOYEES

## INNOVATION



### Research close to the ground

In parallel to progress on hydrometallurgy, pyrometallurgy is also evolving to adapt to different, more difficult-to-process ore grades to ensure a consistent end product. That's why ERAMET Research worked this year on a new design for pilot furnaces to reproduce more accurately the phenomena that occur in the industrial furnaces used to make ferronickel. The pilot campaign will take place in 2012. The new facilities are part of a

€12 million capital expenditure plan in the finalisation process to extend the pilot furnace room at ERAMET Research in Trappes, France.



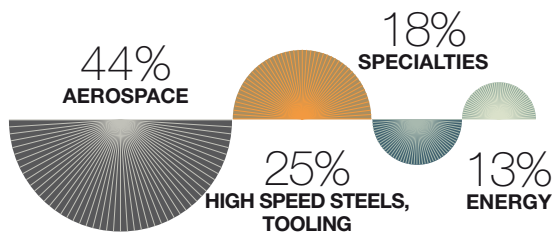
---

# ERAMET ALLOYS

**Comprised of Aubert & Duval and Erasteel, the Alloys Division posted a 19% rise in turnover, thanks to a favourable economic climate, although production was not at a maximum on some sites.**

---

## TURNOVER BY SECTOR



### Favourable overall conditions

The upturn observed in mid-2010 continued and even intensified in 2011, particularly in aerospace with a burst of orders at the Paris and Dubai trade shows. The high speed steel market also continued to grow in the first half, before stabilising at a high level. The situation is obviously more problematic for the nuclear industry after the Fukushima accident. However, the additional precautions that will be required for the maintenance of existing facilities and the extension of their lifespan are favourable factors for

Aubert & Duval, which has a good position for the supply of steam generator components.

### Strategic capital expenditure

In 2011, ERAMET brought several strategic facilities on stream for total expenditure of approximately €120 million, including a new aluminium-forging press in Issoire and the UKAD titanium ingot conversion unit in Saint-Georges-de-Mons (see page 22), both in Auvergne, France, as well as a new atomisation tower in Söderfors,

Sweden. This approximately €20 million investment will enable Erasteel to strengthen its world leadership in alloyed powder metallurgy (see page 31) and broaden its product range, particularly in oil and gas drilling.

### A more efficient organisation

Erasteel continued to reorganise its production sites to specialise them more and simplify flows, while synergy between the Division's two entities was enhanced, particularly through the creation of a single industrial department.





### China and India – new horizons

- In July 2011, Erasteel signed an agreement to acquire a 10% stake in Heye Special Steel, a Chinese high speed steel specialist, from 2012. The partnership includes the distribution of Heye products by Erasteel and industrial cooperation in China.
- In India, Aubert & Duval made a 33% contribution to the creation of SQuAD, a joint venture for the production of closed-die forged parts for the fast-growing local market.

**910M**  
EUROS TURNOVER

**16M**  
EUROS CURRENT  
OPERATING INCOMET

**4,900**  
EMPLOYEES

## INNOVATION



### High-flying partnerships for research

A highlight of 2011 was the launch of new research programmes in the framework of competitiveness clusters and Corac, the aerospace R&D part of the Investissements d'Avenir investment programme, in partnership with the major principals. They concern innovative closed-die forging tools, control of furnace thermodynamics, economic and technical savings in the manufacture of large titanium alloy parts, and greater use of very

hard-wearing stainless steels in landing gear. The research is also intended to eliminate pollutant surface treatments and reduce maintenance operations through the widespread use of new hard stainless steels in parts that undergo fatigue and friction.







---

# AT THE CENTRE OF THE INDUSTRIAL WORLD'S ISSUES

- How can we build a strategic materials offering? • 22
- How can we develop recycling, a real “secondary mine”? • 24
- How can environmental impacts and risks be managed when mining new deposits? • 26
- How can newly available ores be processed more effectively? • 28
- How can we offer new, more effective products to major industrial groups? • 30





---

## ISSUE #1

# HOW CAN WE BUILD A STRATEGIC MATERIALS OFFERING?

---

**Long viewed as commodities, metals are now recognised as strategic. Metals are essential to fast-growing applications (wind farms, flat screens, low-energy light bulbs), but their supply tends to be concentrated in a few, often complex countries. Moreover, the physical-chemical characteristics of ores require the use of innovative processes, an entry barrier that limits supply.**

**The European Union** has established a policy in this area, identifying 14 critical substances. Under the same rationale, in 2011 France set up a committee for strategic metals. Positioned on high value-added alloying metals, the ERAMET Group, which is studying projects in these types of metal, is well placed to meet the needs of sectors related to titanium, zirconium, niobium, tantalum, lithium and rare earths. ERAMET's ambition is to be present at various stages, including recycling.

**ERAMET was thus behind the creation of a European titanium stream.** On September 19<sup>th</sup>, Aubert & Duval and its Kazakh partner UKTMP inaugurated UKAD, their titanium ingot conversion unit in Auvergne. This €47 million investment benefits from the support of Airbus and EADS, through the signing of a contract guaranteeing €1.2 billion in business over 10 years. Furthermore, outside Europe, TiZir, a joint venture by ERAMET and the Australian company Mineral Deposits, will extract titanium and zirconium from mineral sands in

Senegal to supply its Tyssedal, Norway plant, one of three titanium dioxide slag specialists worldwide. This product is used in the production of white pigments for paint, while zirconium is a component in coatings for ceramics.

**Finally, the creation of a lithium channel** in cooperation with the Bolloré group, particularly intended for the manufacture of electric vehicle batteries, remains the focus of extensive research by ERAMET, which has formed a team of geologists to explore potential deposits in Argentina. The Group took part in two seabed exploration campaigns off Wallis and Futuna, where hydrothermal fields could represent a potential mineral resource.

ERAMET mines, produces, converts, recycles or develops a very wide range of metals, most of which are seen as

critical or important in France and Europe, including manganese, niobium, molybdenum, vanadium,

aluminium, rhenium, zinc, cobalt, niobium, rare earths, tantalum and tungsten.



14 METALS HAVE BEEN DECLARED "CRITICAL" BY THE EU\*, INCLUDING COBALT, NIOBIUM, TUNGSTEN, TANTALUM AND RARE EARTHS.

# CLOSE-UP ON... MABOUNIÉ DEPOSIT



**MABOUMINE**, a 60% COMILOG subsidiary, holds the mineral exploration license to the Mabounié polymetallic pyrochlore deposit in Gabon. The deposit is rich in niobium (used for steels and superalloys), rare earths (a group of 17 metals used in hybrid cars, wind farms and oil catalysts, etc.), tantalum (used in electronic components) and uranium. For this long-term project, ERAMET is developing a new hydrometallurgical process for separating metals (see page 29). A pilot facility came on stream in 2011 and laboratory studies continue.



\* European Union

---

## ISSUE #2

# HOW CAN WE DEVELOP RECYCLING, A REAL “SECONDARY MINE”?

---

**The Earth still holds many minable metallic metal deposits but they are not infinite. Increasing demand from emerging countries, geopolitical problems and, above all, the demands of sustainable development lead us to factor in the conservation of those resources from now on and develop the recycling of “secondary raw materials”.**

**Like all raw materials,** metals are in limited quantities in the earth's crust. It is therefore important to control their extraction in order to avoid any wastage in the lifespan of deposits. That's the issue in the techniques that are being or will be implemented to mine deposits with low metal content (see page 28), going as far as the recovery of beneficiation plant tailings containing residual nickel in New Caledonia.

**But there are other extensive resources:** industrial process scrap and end-of-life products! Because, unlike fossil fuels, metals are almost infinitely recyclable. In the most developed countries, this resource is already used, to the extent that it sometimes accounts for the main supply for industry (e.g. 70% of nickel). But we can and should do more to save mining resources, limit the build-up of unrecovered waste, and reduce energy (recycling consumes less than ore conversion) under a sustainable development rationale. Recycling is also an important factor in securing supply for downstream manufacturers.

**Already active in recycling** (see opposite), ERAMET intends to develop metal waste recycling and on-demand remelt production for the needs of the Alloys Division as well as external customers. It also plans to create channels for strategic metals, demand for which is growing sharply. This development requires extensive R&D work upstream.





As part of its research into the lithium stream, ERAMET Research began work on recycling the metal

from electric vehicle batteries and used mobile phones.

**93%**  
**OF THE RAW MATERIALS THAT GO INTO ERASTEEL COMMENTRY'S FURNACES ARE FROM RECOVERED SOURCES.**

# CLOSE-UP ON... **ERAMET AND RECYCLING**



**TWO ERAMET SUBSIDIARIES** are entirely dedicated to recycling. In the United States, GCMC produces molybdenum, vanadium, cobalt and nickel from oil refining catalysts. In France, Valdi processes batteries and other non-ferrous waste. Erachem COMILOG has also developed a copper recycling activity on its Tertre, Belgium site. Copper is recovered in the form of salts and oxides from electronics industry waste. Moreover, the Group's alloy plants incorporate recovered metals into their processes. In Söderfors, Sweden, for example, a new process increases the recycling of raw materials for special steel production.



---

## ISSUE #3

# HOW CAN ENVIRONMENTAL IMPACTS AND RISKS BE MANAGED WHEN MINING NEW DEPOSITS?

---

**The Group's activities are likely to have different types of environmental impact. Today those impacts are identified, avoided whenever possible and reduced thus enabling mining, industry and sustainable development to be reconciled.**

**Wherever it operates,** ERAMET has set ambitious goals for health, risk prevention and sustainable development. For new deposit mining projects, sustainable development concerns are factored in from upstream stages. International standards are used as benchmarks and internal documents are being produced on best practices. These will then be gradually rolled out Group-wide. Since 2010, the Group has stepped up the sharing of experience between units in operation and new projects. Best practices are being pooled in this way on topics such as water management or tailings storage techniques.

**On health and safety,** ERAMET makes an active contribution to scientific developments on metals and the identification of measures to manage potential health and environmental risks, under REACH (European regulations on the

Registration, Evaluation, Authorisation of Chemicals). Through the Weda Bay Nickel project, in October 2011 the Group joined the Business & Biodiversity Offsets Programme (BBOP), which aims to share experience and expertise between industry, NGOs and authorities. In this way ERAMET is structuring its actions on biodiversity and taking part in studies on avoiding, reducing and offsetting ecological impacts.



Reforestation trials have been carried out on the site of the first mine test. To date they have shown a 90%

survival rate in a plantation of more than 7,000 saplings from 19 species.



90%  
SUCCESS IN  
REPLANTING  
A 15-HECTARE  
MINE SITE WITH  
19 DIFFERENT  
TREE SPECIES



# CLOSE-UP ON... WEDA BAY NICKEL

**IN ITS NICKEL MINING AND CONVERSION PROJECT** on Halmahera island, Indonesia, ERAMET's subsidiary Weda Bay Nickel (WBN) has made biodiversity a core issue. WBN is carrying out initial environmental characterisation studies with acknowledged Indonesian and international experts. The appraisal of the project's impact is now being finalised. WBN also strengthened its partnerships in 2011 with the Indonesian national science institute (LIPI), the Missouri Botanical Garden and NGO Burung Indonesia (the Indonesian branch of Birdlife). In parallel, restoration programmes are continuing with two nurseries in plain and foothill areas, potting tests and monitoring of the 15-hectare zone restored after the 2008 mining tests.





---

## ISSUE #4

# HOW CAN NEWLY AVAILABLE ORES BE PROCESSED MORE EFFECTIVELY?

---

**Emerging countries' metal needs are constantly growing. Despite increasing exploration work, high-grade deposits are seldom discovered. Mining companies therefore have to process deposits with lower and lower content. The only response to the challenge is innovation. ERAMET's solution is hydrometallurgy. The aim is to extract metals by chemical processing, which does away with energy-intensive furnaces.**

### **Mined for over 130 years,**

New Caledonia's nickel deposits have evolved over time. Within a few years, some of those deposits will require the new processes under development. Weda Bay in Indonesia is one of the most attractive deposits in the world but nickel content is even lower. The long-term beneficiation of these raw materials under satisfactory profitability conditions therefore entails technological innovations, particularly the switch from pyrometallurgy, which will still be used for the richest deposits, to hydrometallurgy.

### **Hydrometallurgical processes**

are used on the lower-grade ores, which cannot be economically processed by pyrometallurgy.

They also have the advantage of consuming less energy. Moreover, the development of a hydrometallurgical process is one of the keys to the feasibility of the Mabounié project (see page 23) for mining niobium, tantalum and rare earths in Gabon. The R&D workforce assigned to the project was doubled in 2011.

Control of liquid and gas emissions and the storage of solid residues to avoid any pollution are of course factored into hydrometallurgical

facility projects. ERAMET's R&D is also working to develop an automated system for recovering metals on the

electrolysis cathode to improve workplace safety.



# 80 HYDROMETALLURGICAL ENGINEERS IN 8 PLANTS AND 5 COUNTRIES

## CLOSE-UP ON... HYDRO- METALLURGY



**HYDROMETALLURGY** consists of dissolving the metals contained in an ore in order to extract them separately. There are three phases in the process: leaching (or dissolution), purification, and electrolysis or precipitation and crystallisation. Leaching uses sulphuric or another acid, or an oxidant (usually chlorine), to obtain a solution of metals in ionic form. Purification, which separates the different dissolved metals, calls on various techniques depending on the element to be separated and its quantity, i.e. solvent extraction, cementation or precipitation. Finally, in solutions containing a single element, electrolysis is used to recover it in metal form, or precipitation to obtain a concentrated compound.



---

## ISSUE #5

# HOW CAN WE OFFER NEW, MORE EFFECTIVE PRODUCTS TO MAJOR INDUSTRIAL GROUPS?

---

**Cutting-edge industries such as aerospace, power generation and tooling need increasingly high-performance materials in terms of mechanical properties (wear, corrosion and fatigue resistance, etc.), weight reduction (to cut energy consumption) and reliability – all at a competitive price. To meet those demands, ERAMET constantly invests in its people's expertise and in research & development.**

**For an industrial group such as ERAMET**, innovation is not an end in itself. It has to meet its customers' needs and the market's expectations. That's why its sales engineers are first and foremost engineers who are close to their customers' design departments, with which the Group's R&D sometimes cooperates on new product development.

**ERAMET Alloys develops new products** and invests more than 2% of its turnover in R&D, putting it in the front rank of companies in its sector. In addition to the resources of ERAMET Research, the Group's R&D centre in Trappes, France, the Division has research clusters on production sites for superalloys (Les Ancizes), surface treatment, powder metallurgy (Söderfors), closed-die forged parts (Pamiers). ERAMET Research also works with the Sandouville nickel refinery to develop new, high value-added specialty products (nickel chlorides, nickel carbonates, cobalt chlorides) for the electronics and catalysts industries.

**The Group has acquired extensive skills in powder metallurgy** (see opposite), enabling it to make particularly consistent steels and alloys that could not be produced with conventional metallurgy, and to produce semi-finished products using this technology in its subsidiaries Aubert & Duval, Erasteel and Eurotungstène. In 2011, the opening of a new atomisation tower for high speed steel and alloy powders in Söderfors, Sweden doubled Erasteel's production capacity from 6,000 to 12,000 tons per year. It also enabled the Division to create new products to meet high demand from the gas and oilfield market.



MLX17, a stainless steel created by Aubert & Duval, has been added to MMPDS, the global materials handbook. It stands out

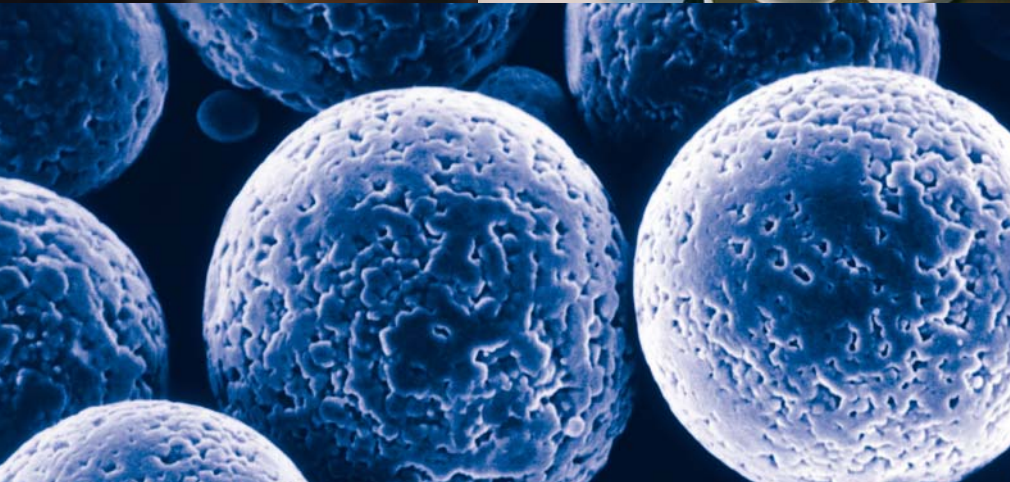
through mechanical properties that are 20% superior to other steels.

50%  
INCREASE IN  
ERASTEEL'S  
PRODUCTION  
COMPARED  
WITH 2010

# CLOSE-UP ON... POWDER METALLURGY



**ERAMET CAN OBTAIN POWDERS IN TWO WAYS**, either by hydrometallurgy (see page 29), a process used by Eurotungstène, or by atomisation. This process first entails heating the metal to melting point. The flow is then dispersed in a tower by a jet of neutral gas (nitrogen or argon), forming small droplets that quickly solidify. The powders are then put into an airtight, deformable metallic container and densified by compression. ERAMET Alloys uses hot isostatic pressing: 1,000 times atmospheric pressure at 1,000°C! This gives a product that combines dimensional precision similar to that achieved by casting with mechanical properties that are at least equivalent to a closed-die forged part.







---

# AT THE CENTRE OF THE INDUSTRIAL WORLD'S DYNAMICS

**Focusing** activity on the customer • 34

**Fostering** engagement at ERAMET • 38

**Building** responsible development  
with stakeholders • 42



---

# FOCUSING ACTIVITY ON THE CUSTOMER

---

**Customers are at the centre of any ambitious business policy. ERAMET instils a customer-oriented mindset in all its employees, from research centres to production sites. Listening, partnership, product and service quality are the keywords.**

---

## QUALITY

# 300

**ORE ANALYSES CARRIED OUT EVERY DAY AT COMILOG'S LABORATORY IN MOANDA (GABON).**

## PROCESS

# 70%

**OF EMPLOYEES AT THE BALTIMORE (USA) FACILITY HAVE TAKEN PART IN AT LEAST ONE LEAN MANAGEMENT PROJECT.**

### **A customer-oriented Group**

Developing highly technical industrial know-how must not make us lose sight of every customer's goal: satisfying its customers. For ERAMET, customers range from a few major steel producers for ores to hundreds of companies for some alloys or products for chemicals, via the main industrial groups in the transport and energy sectors. But all of them demand constant quality, efficient service and innovation ideas. For the Group, meeting those expectations first involves keeping pace with the geographic growth of customers and markets. To do so, it can draw on the expansion of the ERAMET International sales network and the installation of new facilities close to customer sites.

### **Forging long-term relations**

*"We build long-term relations with our customers, however big or small they are," explains Charles Nouel, Manganese Division ore market manager. "We meet them regularly and they are always interested in our market trend analyses. And even if it's difficult to change the nature of our raw material, adaptations are possible according to customers' wishes."*

This is all the more true for derivatives and alloys, of course. R&D teams not only have to work on extending



## A PLATFORM FOR ORGANISATION

On the engine platform at Aubert & Duval's Pamiers (France) plant, a single employee now manages production and sales administration. This means a more rewarding job for the new supply chain technicians that customers appreciate as their primary contacts. *"The first feedback has been very positive,"* comments engine market manager Pierre Rega.



the range and developing new products that maintain the Group's edge over the competition at competitive prices, but also meet specific demands in terms of products as well as applications and processes. *"We often file joint patents with some customers for products that we've developed together,"* says Alloys Division CEO Georges Duval. The same logic applies at the Sandouville, France plant where the sales department also works with its customers' design departments and with ERAMET Research engineers in Trappes, France to improve its nickel chlorides and carbonates. Aubert & Duval has also developed know-how in technical support and assistance to provide its customers with the best advice, whether for the difficult choice of materials or decisions on manufacturing processes or heat treatments. This expertise has been built up through partnerships and dialogue with customers, enabling engineers and technicians to take action in any area of application, support innovative projects or help to solve non-recurrent problems.

### A quality process and more effective organisation

Winning both customer loyalty and market share depends on quality and above all its consistency. Delivering unchanging quality in ores, alloys and



## AIRBUS

Aubert & Duval is our biggest supplier of forged and closed-die forged parts. It made the right strategic move to become one of the world's big three titanium forging specialists. We have excellent relations that go back a long way.

### Our teams are constantly in touch

We value attentiveness and responsiveness. These qualities are more necessary than ever as we're shifting up a gear in terms of both order volumes and part sizes, which has led to a few delays. We know that the transition from small to large runs isn't easy. Problems are being identified and understood, our teams are constantly in touch and we're convinced that the reorganisation in progress will soon lead to shorter lead times.



Éric Zanin,  
Senior Vice President and  
Head of Materials and Detail Parts  
Procurement, Airbus




---

#### **CLUBS FORMED WITH CUSTOMERS**

To spread understanding of how important nickel and cobalt are to contemporary society, and meet demands concerning their use, ERAMET has created clubs for each metal with some of its customers.

•••

powders requires not only research on the reliability of industrial processes, but also operator know-how and excellent control protocols. That's why ERAMET places great importance on training and on sharing and passing on knowledge. On its production sites it implements lean management, which aims to make processes simpler, not only for the sake of productivity, but also to give customers better value for money. In parallel, in 2011 Aubert & Duval began setting up a new organisation in its units by grouping together all the services working on the same market segment or for the same customer - production management, quality, methods, logistics, sales administration, etc. - on a single platform. These small, fully customer-focused teams have an overview of orders that enables them to monitor orders closely and so provide more accurate information faster. Their motto is "*responsiveness, proactiveness and meeting commitments,*" as Aubert & Duval key account manager Mohamed Bouzidi puts it.



# SEIZING OPPORTUNITIES ARISING FROM **SUSTAINABLE DEVELOPMENT FOR CUSTOMERS' BENEFIT**

**ERAMET products support innovation and contribute to sustainable development** as they help to reduce the weight of steel and extend its lifespan. But the Group also keeps its customers informed about its research on identifying and controlling any risks relating to its products.

**Factoring sustainable development into the company's innovation and business diversification policy**

To integrate these issues upstream, sustainable development teams take part in project management committees. ERAMET is also working on defining standards for best practices in health and environment management and in risk prevention.

**Leveraging the environmental benefits of using products and reducing the risks**

Whether in metallurgy or chemicals, ERAMET's products are essential to modern technologies. Identifying possible hazards and implementing the resources needed to make sure products do not impair health, safety or the environment are priorities for the Group, which meticulously observes every stage under Europe's REACH (*Registration, Evaluation and Authorization of Chemicals*) programme.

More than **90**  
**EMPLOYEES TOOK PART**  
**IN AN INTERNATIONAL EHS**  
**SEMINAR IN 2011.**



---

# FOSTERING ENGAGEMENT AT ERAMET

---

**Engagement means having and conveying a positive image of the company. Above all it means being motivated to make the efforts needed to achieve the expected results and contribute to success.**

---

9 initiatives  
AND 1 INNOVATION WERE  
REWARDED THIS YEAR  
UNDER THE GROUP INITIATIVE  
CHALLENGE.

More than 160  
INITIATIVES WERE SUBMITTED  
BY EMPLOYEES FROM ALL  
SUBSIDIARIES.

#### **Developing continuous improvement culture**

The Group-wide LEADERS programme is designed to develop management culture and the sense of responsibility and initiative to mobilise all ERAMET's employees in a managerial excellence process. It is embodied in lean management, a technique and corporate philosophy that aims to reduce waste and increase the value of time. In other words, eliminating anything that consumes resources without creating value, promoting simpler processes, more efficient and reliable processes. LEADERS programme director Benoît Bied-Charreton sums up the approach as *"a burning obsession with simplicity"*.

Guided by the overriding idea that we can always do better, lean management cannot only be imposed from the top down. It has to become a state of mind for all employees who buy into it, as they take part in improvement decisions and are sometimes their source.

#### **Capitalising on skills and knowledge**

In 2011 the LEADERS programme went into greater depth on two major topics, knowledge management and benchmarking. Knowledge management has become a crucial business issue. *"Employees have years of knowledge stored in their heads,"* explains Philippe



## MEETING EMPLOYEES' EXPECTATIONS

The Group carried out the first engagement survey of its managers in 2011. Participation was high at 75%. The findings, presented on different Group sites, show very high satisfaction in terms of job interest, work environment, communications and relations with management. To meet expectations, actions have to be taken on working processes (particularly cooperation between Divisions), career opportunities, performance management and compensation. Workgroups have been set up to take these issues further.

Panier, Manganese Division knowledge manager. *"It can vanish when they leave the company. The first problem is that people who hold the knowledge don't always realise it."* So the first step is to take an inventory of knowledge, identify strategic items, formalise them in writing and, finally, share them. The urgent need for knowledge mapping is often felt when experts, but also highly qualified plant technicians, retire. But the process has to become systematic through feedback and dialogue. Communities of dispersed specialists are excellent vectors for sharing knowledge. ERAMET has set up International Competence Groups (ICG) in the Manganese Division and profession clubs in the Alloys Division. International inter-division meetings are also held on topics such as mining. Knowledge management is especially important for innovative major projects that both consume and generate knowledge. These projects need to benefit from existing expertise but also capitalise on the lessons learned in pilot stages in order to pass on the knowledge generated by the project to other activities in the Group.

### Improving by learning from others

The process also involves benchmarking, which consists of analysing other people's or organisations' performance



## LEADERS

Benchmarking is the first stage in continuous improvement: comparisons enable the enterprise to know where it stands and step up the pace if needed. It's also the first stage in knowledge management: making internal comparisons means sharing knowledge. And sharing is the only way to create value from knowledge, which is worthless if it's hidden away. For ERAMET, 2011 will go down as the year of benchmarking.

## 2011, the year of benchmarking

Our training was followed by 150 employees. It consists above all of sharing best practices – on how to pool experience! The number of profession-based communities has also soared. We can build on that work to develop external communities to share non-strategic data with other companies on industrial relations, safety, the environment or stakeholder relations. Many plant managers have already applied benchmarking without knowing! It's a practice that puts us on the continuous improvement track.



Benoît Bied-Charreton,  
LEADERS Programme Director






---

#### **IMAGE: THE ERAMET GROUP CREATES ITS OWN MANAGEMENT INSTITUTE**

Maintaining, enhancing and passing on skills is an essential component of human resources strategy. With the creation of IMAGE, the ERAMET Group management institute, the aim is to offer all managers and experts targeted training tracks. These are mainly designed to bolster key skills, consolidate group culture and disseminate best practices.

•••

in order to improve. In many cases, this is the first stage in continuous improvement, which requires listening, an open mind and modesty. Beyond just observing, benchmarking entails sharing practices and experience in a mutual learning process – starting inside the company itself. Before the Alloys Division created its profession clubs, production site tours were organised and the results presented in various workshops. A cross-Group internal training cycle also focuses on this approach to pooling best practices.

#### **Mutual commitment**

Taking ownership of improvement processes is the key to engagement. But it's not just up to employees. The company has to commit too. The competitiveness plan launched in 2009 at SLN in New Caledonia was supported by an €8.5 million safety and working conditions improvement plan. Tangible results followed in terms of both productivity and accident reduction. Because better organisation also leads to better working conditions.

# PROTECTING AND DEVELOPING EMPLOYEES

**A company's sustainable development policy isn't restricted to its environment. It also focuses on the workforce, covering health, safety, career development and industrial dialogue, with the aim of making every employee an active participant.**

## **Protecting our employees' health & safety**

The great importance the Group places on health and safety is reflected in the steady decrease in its workplace accident rate. In 2011 ERAMET addressed the prevention of handling risks, monitoring of hazardous substance use, psychosocial risk awareness and the identification and monitoring of occupational diseases.

## **Fostering industrial dialogue and career development**

ERAMET has a rich tradition of industrial dialogue. A large number of negotiations were held on the Group and subsidiary levels in 2011. In mainland France, for example,

a Group agreement setting up a time savings account was signed. Talks began on preventing arduousness and on promoting gender balance in the workplace, an issue that gave rise to an agreement at Aubert & Duval. The agreements signed in 2010 were put into practice; topics including the collective pension plan and psychosocial risk prevention.

## **Involving everyone in ERAMET's results**

In 2011 for the third year running, the Group continued its policy of involving employees in the company's capital with the renewal of the ERASHARE free share grant programme.

**21.5**  
**HOURS' TRAINING**  
**PER EMPLOYEE ON AVERAGE**



---

# BUILDING RESPONSIBLE DEVELOPMENT WITH STAKEHOLDERS

---

## 64%

OF ENVIRONMENTAL CAPITAL  
EXPENDITURE CONCERNS AIR  
PROTECTION.

## 28%

OF ENVIRONMENTAL CAPITAL  
EXPENDITURE CONCERNS  
WATER PROTECTION.

---

**Drawing on the relations forged over time in New Caledonia and Gabon, but also in Europe, Asia and the United States, ERAMET implements a policy that respects communities and their cultures and needs.**

### **New issues**

Mining and metallurgical activities have long been away from the spotlight. These highly industrial and technical businesses had no direct contact with the general public. The media took little interest and the companies seldom communicated. This is no longer true for several reasons. On one hand, awareness of sustainable development issues – not just environmental concerns but also social and economic aspects – has grown beyond industrialised countries, as reflected in greater expectations from public authorities and populations. On the other hand, the strategic importance of access to raw materials in economic competition, especially for the growth of new technologies, has been highlighted. Operators and manufacturers have to think in terms of their licence to operate. NGOs, neighbours or public authorities have occasionally challenged the Group in recent years over its social and environmental responsibilities. These cases may be amplified worldwide through the internet: a local event can become global news.

### **Trust born of meeting commitments**

In its host countries, for example New Caledonia and Gabon, the Group has built up strong relations with local stakeholders over time, contributing to economic, ●●●



# MANAGING RISKS AND IMPACTS ON PEOPLE AND THE ENVIRONMENT

**Aware of the potential environmental impacts of mining and metallurgical activities, ERAMET believes its conduct must be exemplary. This entails implementing the resources needed to protect health, safety and the environment and to foster recycling.**

**Reducing energy consumption and fighting climate change**

ERAMET has assessed the carbon footprint of its activities and factors the findings into its new projects, in the same way as energy efficiency, and applies European directives on greenhouse gas emission criteria.

**Making better use of natural resources and developing recycling**

The Group is setting up a community of practice for the mining environment. This will be formalised as a Group-wide standard. In addition to recycling activities (see page 25), it plays an active part in national and European work on the subject, particularly through the trade federations or institutions of which it is a member.



26  
SITES CERTIFIED ISO 14001

100%  
OF SITES COVERED  
BY ERAGREEN





### **ERAGREEN, AN ESSENTIAL INFORMATION TOOL**

Managing environmental policy entails anticipating and assessing both progress and difficulties. Eragreen (ERAMET Group Environment Exchange Network) provides accurate knowledge on the impact of the Group's activities. Now covering all sites including mines, Eragreen has been overhauled, with the number of indicators reduced from 3,000 to 300 for clearer, more operational output.

•••

health, social, educational and cultural development. In Indonesia, the decision to create a Foundation that mobilises local players reflects an approach that values communities and their needs, under a rationale of sustainable development and respect for cultural heritage, with the support of expert NGOs.

### **Progress and dialogue**

Social and environmental responsibility does not, of course, only concern big projects in remote countries. In the United States, France and other European countries, the Group's plants have just as many obligations to act on the environment and build dialogue with stakeholders. The process was enhanced in 2011 with specific mapping programmes, on biodiversity aspects in particular. Moreover, a seminar on relations between industrial groups and stakeholders in the United States brought together all of the Group's North American players.

# BUILDING RELATIONS OF TRUST TO CREATE VALUE FOR ALL

**An industrial unit isn't an ivory tower. It is rooted in a natural and human environment. In its host regions, the ERAMET Group strives to listen to authorities and populations in order to meet their expectations as far as possible.**

**Meeting our stakeholders' expectations more fully**

To develop good relations, the partners first have to get to know each other. For that purpose ERAMET set up a policy for structuring units' relations with their stakeholders and redefining an action strategy, starting with Aubert & Duval's Firminy (France) site. It also organised a tour of the Sandouville (France) nickel refinery for representatives of the French Ministry of the Environment, Sustainable Development, Transport and Housing.

**Making a transparent contribution to regions' economic and social development, ensuring good operations governance**

The Group guarantees the compliance of its subsidiaries' practices with the principles of the Extractive Industries Transparency Initiative (EITI), an organisation that works to improve governance in host countries.

**Targeted sponsorship actions**

The Group's companies allocated almost €5 million to sporting, cultural and charity sponsorship actions. For example, Société Le Nickel (SLN) was one of the six official partners for the Pacific Games held in New Caledonia from August 27<sup>th</sup> to September 10<sup>th</sup>, 2011.

**\$200,000**

**DONATED TO THE JAPANESE  
RED CROSS FOLLOWING THE  
MARCH 2011 EARTHQUAKE**







ERAMET in Shanghai

---

# ECONOMIC & FINANCIAL INDICATORS

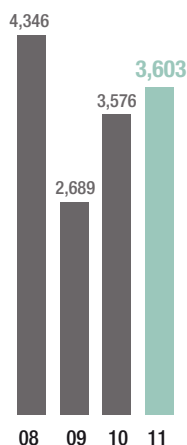
# CONSOLIDATED FINANCIAL ACCOUNTS

The Group's consolidated assets as on December 31<sup>st</sup>, 2011 totalled €6,301 million compared with €6,103 million as on December 31<sup>st</sup>, 2010.

This €198 million increase mainly results from:

- **assets:** the increase in intangible assets and property, plant and equipment, particularly due to capital expenditure (€492 million) and the rise in inventory (€97 million) and receivables (€22 million), mainly because of activity and the decrease in active Cash items (€202 million);

- **liabilities:** the increase in shareholders' equity (+ €105 million), mainly due to income and the rise in working capital liabilities (€52 million).



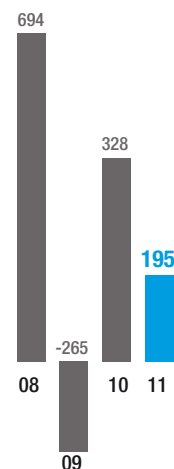
## TURNOVER (millions of euros)

The ERAMET Group's turnover grew in 2011 compared with 2010, totalling €3,603 million. This increase is mainly due to ERAMET Alloys' activities, which benefited from the upturn in demand from aerospace sectors and, to a lesser extent, firm nickel prices in the 1<sup>st</sup> half of 2011.



## CURRENT OPERATING INCOME (millions of euros)

The Group's current operating income totalled €554 million, compared with €739 million in 2010. This change is mainly due to external factors, i.e. lower manganese prices and higher external costs, especially for energy.



## NET INCOME, GROUP SHARE (millions of euros)

Net income amounted to €195 million, compared with €328 million in 2010, after €108 million for minority interests' share.



# ALL-INCLUSIVE INCOME STATEMENT

(millions of euros)	2011	2010	2009
<b>Turnover</b>	<b>3,603</b>	<b>3,576</b>	<b>2,689</b>
Other income	81	31	(35)
Cost of products sold	(2,674)	(2,437)	(2,414)
Administrative & selling costs	(174)	(155)	(142)
Research & development expenditure	(47)	(44)	(39)
<b>EBITDA</b>	<b>789</b>	<b>971</b>	<b>59</b>
Fixed asset amortisation and depreciation	(230)	(225)	(210)
Depreciation expense, provisions	(5)	(7)	(12)
<b>Current operating income (expense)</b>	<b>554</b>	<b>739</b>	<b>(163)</b>
Other operating income and expense	(63)	(19)	(104)
<b>Operating income (expense)</b>	<b>491</b>	<b>720</b>	<b>(267)</b>
Net cost of debt	22	3	11
Other financial income and expense	8	(15)	(12)
Share in earnings of affiliates	1	1	-
Income tax	(219)	(255)	7
<b>Net income (loss) for the period</b>	<b>303</b>	<b>454</b>	<b>(261)</b>
- share of non-controlling interests	108	126	4
- share of parent company owners	<b>195</b>	<b>328</b>	<b>(265)</b>
Net (loss) income per share (EUR)	7.42	12.43	(10.16)
Net (loss) income per share fully diluted (EUR)	7.39	12.40	(10.16)
<b>Net income (loss) for the period</b>	<b>303</b>	<b>454</b>	<b>(261)</b>
Translation adjustments on financial statements of subsidiaries in foreign currency	7	63	109
Change in financial instrument reappraisal reserve	(51)	(20)	135
Change in fair value of financial assets intended for sale	(10)	3	21
Income tax	21	6	(53)
<b>Other all-inclusive income items</b>	<b>(33)</b>	<b>52</b>	<b>212</b>
- share of non-controlling interests	4	8	20
- share of parent company owners	<b>(37)</b>	<b>44</b>	<b>192</b>
<b>Total all-inclusive income (loss)</b>	<b>270</b>	<b>506</b>	<b>(49)</b>
- share of non-controlling interests	112	134	24
- share of parent company owners	<b>158</b>	<b>372</b>	<b>(73)</b>

# BALANCE SHEET

(millions of euros)	31/12/2011	31/12/2010	31/12/2009
<b>ASSETS</b>			
Goodwill	210	172	161
Intangible assets	612	521	432
Property, plant and equipment	2,119	1,903	1,795
Equity accounted companies	23	22	21
Other non-current financial assets	87	86	100
Deferred tax	25	30	68
Other fixed assets	5	5	5
<b>Total fixed assets</b>	<b>3,081</b>	<b>2,739</b>	<b>2,582</b>
Inventories	1,093	996	824
Trade receivables	664	642	514
Tax receivables	33	12	43
Financial derivatives	46	128	90
Other current financial assets	473	359	405
Cash and cash equivalents	911	1,227	812
<b>Total current assets</b>	<b>3,220</b>	<b>3,364</b>	<b>2,688</b>
<b>Total ASSETS</b>	<b>6,301</b>	<b>6,103</b>	<b>5,270</b>
<b>SHAREHOLDERS' EQUITY AND LIABILITIES</b>			
Share capital	81	81	80
Share premiums	372	371	341
Change in fair value of assets intended for sale	-	7	6
Financial instrument reappraisal reserve	(24)	10	24
Translation adjustments	28	24	(32)
Other reserves	2,579	2,465	2,116
Share of parent company owners	<b>3,036</b>	<b>2,958</b>	<b>2,535</b>
Share of non-controlling interests	1,043	1,016	970
<b>Shareholders' equity</b>	<b>4,079</b>	<b>3,974</b>	<b>3,505</b>
Personnel commitments	129	123	128
Provisions	379	360	314
Deferred tax	406	342	297
Borrowings – long-term portion	151	203	199
Other non-current liabilities	37	33	36
<b>Total non-current liabilities</b>	<b>1,102</b>	<b>1,061</b>	<b>974</b>
Provisions – short-term portion	29	29	29
Borrowings – short-term portion	80	88	72
Current trade payables	833	731	590
Tax payables	77	149	74
Financial derivatives	101	71	26
<b>Total current liabilities</b>	<b>1,120</b>	<b>1,068</b>	<b>791</b>
<b>Total SHAREHOLDERS' EQUITY AND LIABILITIES</b>	<b>6,301</b>	<b>6,103</b>	<b>5,270</b>

# CASH FLOW STATEMENT

(millions of euros)	Financial 2011	Financial 2010	Financial 2009
<b>Operating activities</b>			
EBITDA	789	971	59
Elimination of non-cash or non-business items	(155)	(201)	(101)
Cash flow	<b>634</b>	<b>770</b>	<b>(42)</b>
Net change in operating assets and liabilities	(43)	(43)	154
<b>Net cash flow from operating activities</b>	<b>591</b>	<b>727</b>	<b>112</b>
<b>Investing activities</b>			
Capital expenditure	(492)	(326)	(286)
Net financial investments (divestments)	(65)	76	11
Disposals of long-term assets	3	5	3
Changes in accounts payable and liabilities on long-term assets	12	4	(11)
Consolidation adjustments and financial loans	17	(11)	(10)
Dividends from equity accounted companies	-	-	-
<b>Net cash flow used in investing activities</b>	<b>(525)</b>	<b>(252)</b>	<b>(293)</b>
<b>Financing activities</b>			
Dividends paid	(186)	(152)	(164)
Capital increases	1	31	74
Net change in working capital with respect to financing activities	(2)	-	19
<b>Net cash flow used in financing activities</b>	<b>(187)</b>	<b>(121)</b>	<b>(71)</b>
Currency translation adjustments	(21)	(5)	65
Increase (decrease) in net cash position	<b>(142)</b>	<b>349</b>	<b>(187)</b>
<b>Opening cash (debt) balance</b>	<b>1,295</b>	<b>946</b>	<b>1,133</b>
<b>Closing cash (debt) balance</b>	<b>1,153</b>	<b>1,295</b>	<b>946</b>



## FINANCING

**The Group's net cash amounts to €1,153 million** as on December 31<sup>st</sup>, 2011, compared with €1,295 million as on December 31<sup>st</sup>, 2010. This decrease results from the following movements:

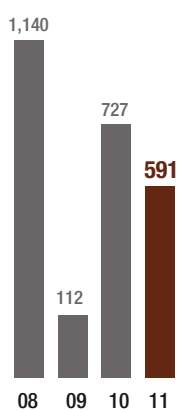
- €591 million in net operating cash flow (€727 million in 2010);
- €(525) in net cash flow used in

investing activities, mainly comprised of €(492) million in capital expenditure, €52 million in divestments of securities (COMILOG divestments) and €(58) million in financial investments with respect to the TiZir operation;

- €(187) million in cash flow used in financing activities, of which €(186) million in dividends paid (of

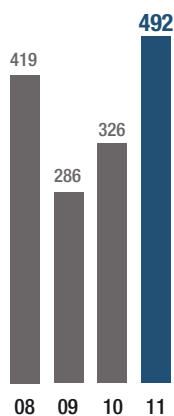
which 92 M€ to ERAMET shareholders and 94 M€ to minority shareholders in consolidated companies);

- €(21) million negative impact of exchange rate fluctuations.



NET OPERATING  
CASH FLOW  
(millions of euros)

Net cash flow from operating activities totalled €591 million, compared with €727 million in 2010.



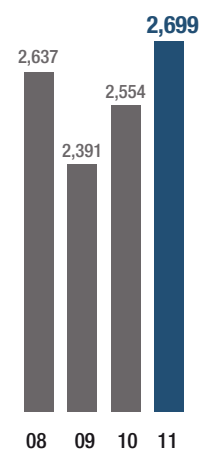
CAPITAL  
EXPENDITURE  
(millions of euros)

Capital expenditure amounted to €492 million in 2011.

# STATEMENT OF CHANGES IN SHAREHOLDERS' EQUITY

(millions of euros)	Number of shares	Share capital	Premiums	Reserves/ assets intended for sale	Reserves / financial instruments
<b>Shareholders' equity as on December 31<sup>st</sup>, 2009</b>	26,369,813	80	341	6	24
Net income (loss) for the period	-	-	-	-	-
Translation of financial statements of subsidiaries in foreign currency	-	-	-	-	-
Change in financial instrument reappraisal reserve	-	-	-	-	(14)
Change in fair value of financial assets intended for sale	-	-	-	2	-
<b>Other all-inclusive income (loss) items</b>	-	-	-	2	(14)
Total all-inclusive income (loss)	-	-	-	2	(14)
Dividends paid (€1.80 per share)	-	-	-	-	-
Share capital increases	143,653	1	30	-	-
Treasury shares	-	-	-	-	-
Payments in shares	-	-	-	-	-
Changes in percentages of interests in subsidiaries	-	-	-	-	-
Other adjustments	-	-	-	(1)	-
Total transactions with shareholders	-	1	30	(1)	-
<b>Shareholders' equity as on December 31<sup>st</sup>, 2010</b>	26,513,466	81	371	7	10
Net income (loss) for the period	-	-	-	-	-
Translation of financial statements of subsidiaries in foreign currency	-	-	-	-	-
Change in financial instrument reappraisal reserve	-	-	-	-	(34)
Change in fair value of financial assets intended for sale	-	-	-	(7)	-
<b>Other all-inclusive income (loss) items</b>	-	-	-	(7)	(34)
Total all-inclusive income (loss)	-	-	-	(7)	(34)
Dividends paid (€1.80 per share)	-	-	-	-	-
Share capital increases	5,650	-	1	-	-
Treasury shares	-	-	-	-	-
Payments in shares	-	-	-	-	-
Changes in percentages of interests in subsidiaries	-	-	-	-	-
Other adjustments	-	-	-	-	-
Total transactions with shareholders	-	-	1	-	-
<b>Shareholders' equity as on December 31<sup>st</sup>, 2011</b>	26,519,116	81	372	-	(24)

Currency translation adjustments	Other reserves	Share of parent company owners	Share of non-controlling interests	Total shareholders' equity
(32)	2,116	2,535	970	3,505
-	328	328	126	454
56	-	56	7	63
-	-	(14)	1	(13)
-	-	2	-	2
56	-	44	8	52
56	328	372	134	506
-	(47)	(47)	(105)	(152)
-	-	31	-	31
-	(5)	(5)	-	(5)
-	5	5	-	5
-	67	67	17	84
-	1	-	-	-
-	21	51	(88)	(37)
24	2,465	2,958	1,016	3,974
-	195	195	108	303
4	-	4	3	7
-	-	(34)	1	(33)
-	-	(7)	-	(7)
4	-	(37)	4	(33)
4	195	158	112	270
-	(92)	(92)	(94)	(186)
-	-	1	-	1
-	(41)	(41)	-	(41)
-	12	12	-	12
-	41	41	9	50
-	(1)	(1)	-	(1)
-	(81)	(80)	(85)	(165)
28	2,579	3,036	1,043	4,079



CAPITAL

EMPLOYED

(millions of euros)

Capital employed was higher than in 2010.



---

# GLOSSARY

---

## PROCESSES

### **Alloy metallurgy**

- **Air metallurgy:**

melting takes place in an arc furnace and is followed by metallurgical treatment to add alloying metals, eliminate impurities and obtain the required chemical analysis.

- **Powder metallurgy:**

production of superior alloys by pulverising a stream of liquid metal, resulting in powder that is then compacted at very high pressure and high temperature.

- **Remelting:**

essential for some critical parts intended for the aerospace and power markets, this process is used to purify metal in order to improve its qualities, particularly mechanical reliability.

- **Vacuum metallurgy:**

used for alloys withstanding higher constraints (nitrogen content, oxygen-reactive alloying elements, etc.), this process is carried out in vacuum induction melting (VIM) furnaces.

### **Closed-die forging**

Shaping a piece of metal by hot pressing it between two engraved dies to produce complex forms, in one stroke and at a slow speed.

### **Forging**

Plastic deformation of metal between two flat tools to produce parts with simple shapes.

### **Hydrometallurgy**

Separation of metals and/or metallic salts by chemical processes (dissolving, solvent extraction, electrolysis or precipitation). These techniques are used to separate the different metals in polymetallic rocks and process low-grade ores.

### **Ore beneficiation**

This innovative technology sorts particles by size and density to improve ore grade in order to use a larger share of a deposit and so extend the lifespan of reserves.

### **Press**

Industrial tool used for closed-die forging (cf. definition above). A press's power is measured in thousands of tons.

### **Pyrometallurgy**

Metal oxide reduction and metal-oxide separation by melting in a blast furnace or electric furnace.

### **Rolling**

An operation that reduces the thickness of an ingot, a bar, a sheet, etc. by passing it between the rollers of a mill.

## PRODUCTS

### High speed steels

Steels with high wear resistance and high hardness whether hot or cold, used principally in the manufacture of cutting tools (drills, taps, milling cutters, saws, etc.) for machining metals.

### Alloys

Metallic substances composed of various metals, each with specific properties and meeting specific requirements, e.g. resistance to wear or corrosion, mechanical strength at high temperatures.

### Electrolytic Manganese Dioxide (EMD)

Active agent in alkaline batteries.

### Ferroalloys

Alloys containing iron and at least one other metal that is

added to liquid steel to adjust its composition according to the desired properties.

### Manganese

In alloy form (ferromanganese, silicomanganese), this metal is a 6-7% component of steel that improves its hardness, abrasion resistance, elasticity and surface state in rolling. It is also used in the steel production process for deoxidation/desulphurising. Other applications include chemistry, batteries, electronic circuits, fertiliser and aluminium hardening.

### Nickel

An essential alloy element, this metal gives steel a number of properties, e.g. resistance to air corrosion in combination with chrome (stainless steel), high

temperature resistance, ductility, mechanical resistance, ductility, mechanical strength, electrical resistivity and magnetic properties.

### Nuances

Different qualities of steel obtained by varying the alloys of their component metals to obtain specific characteristics. Each grade is suited to particular needs.

### Cobalt and tungsten powders

Powders that are mainly used to manufacture cemented carbides for use in metal machining and diamond tools for cutting stone and building materials.

### Long products

Semi-finished alloy products with advanced characteristics, intended for conversion.

### Superalloys

Alloys of several metals, with high mechanical strength at elevated temperatures and are resistant to corrosion. Superalloys are used in aerospace parts manufacturing, power generation and the chemical industry.

### Titanium

A lightweight, robust and corrosion-resistant metal used as a component in alloys that are valued in the aerospace industry, but also in the manufacture of medical equipment, eyewear, etc. Titanium oxide is used as a white pigment in paint.

Photo credits: ERAMET media library, SLN, Erasteel, COMILOG, Weda Bay Nickel, Aubert & Duval, TiZir, David Becker, Antonin Borgeaud/ Interlinks Image, Joël Damase, Cyrille Dubreuil, Patrick Dumas, Kenneth Gunnarsson, Martin Jalkotzy/Golder Associates Ltd, Gabriel Liesse, Melbourne, Romuald Meigneux/Sipa, Julie Simidoff, Dag Solberg, Christophe Thillier, Jacques Witt/Sipa, Fotolia, Getty. With kind permission of Déglon, cutlery since 1921. Design & production:  Translation: Marcus Goddard. Printing: Technic Imprim, ZAC de Villejust-Courtabœuf, 15, avenue des Deux-Lacs, 91942 Les Ulis Cedex, ISO 14001 certified. Imprim Printed without alcohol using plant-based inks on paper from sustainably managed forests.







**ERAMET**

ALLOYS, ORES AND PEOPLE.

TOUR MAINE-MONTPARNASSE  
33, AVENUE DU MAINE  
F-75755 PARIS CEDEX 15  
TEL.: (33) 01 45 38 42 42

[www.eramet.com](http://www.eramet.com)