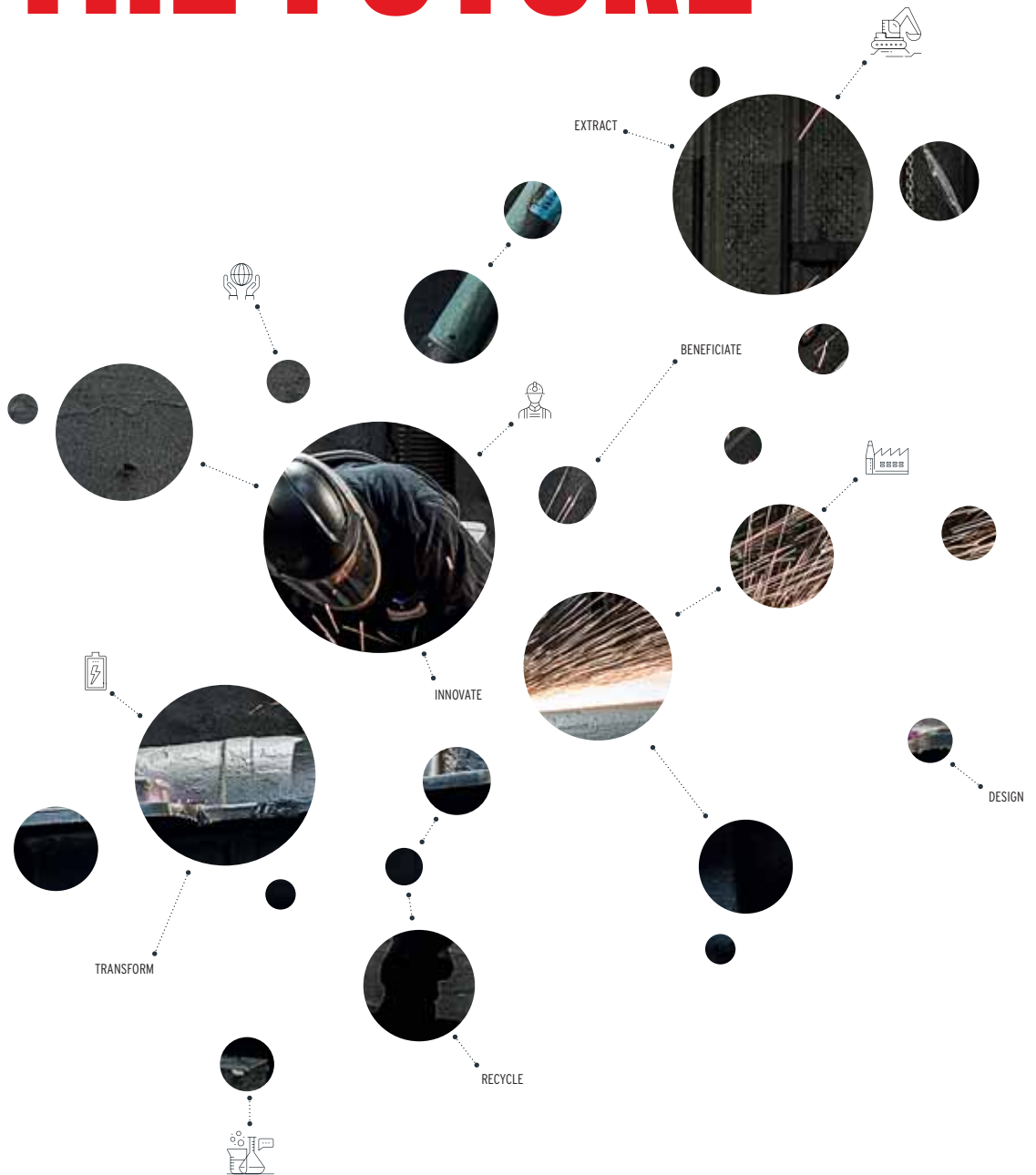




# PREPARING FOR THE FUTURE

Annual Report 2016





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CHAIN WORLDWIDE**

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GOVERNANCE

Today, in a more and more complex and demanding environment, ERAMET develops strategic metals and alloys and increasingly effective products, carries out activities with high growth potential and meets customers' expectations over the long term. In this way, the Group is positioned on promising markets to meet the needs of the modern world. Making this future possible means preparing for its own future: the future of those who make ERAMET, worldwide, and of its shareholders, stakeholders and customers. Faithful to the values that created and continue to drive the Group, ERAMET works with a firm focus on the future.



## INNOVATION & RESEARCH

Developing new processes for mining, processing and beneficiating raw materials and alloys to meet the needs of tomorrow's world.

**220**  
employees dedicated to R&D

**150**  
products in the portfolio

# WORKING THE METALS CHAIN



## MINING & BENEFICIATING

Operating world-class deposits and beneficiating raw materials through unique know-how in metallurgy.

**World no. 1**  
producer of nickel chloride and ferronickel

**World no. 1**  
producer of refined manganese alloys

# ACROSS VALUE WORLDWIDE

Thanks to its unique know-how and innovative technologies, ERAMET masters every stage in the metals value chain.

**World no. 1**  
in gas-atomised metal  
powder metallurgy



## DESIGNING & TRANSFORMING

Supply cutting edge industries with alloys and superalloys, but also build positions in promising markets like additive manufacturing.

Goal:  
**20,000**  
tons of batteries  
recycled on the Valdi  
site



## RECYCLING & REUSING

Managing and beneficiating our own waste and marketing the resulting secondary raw materials.

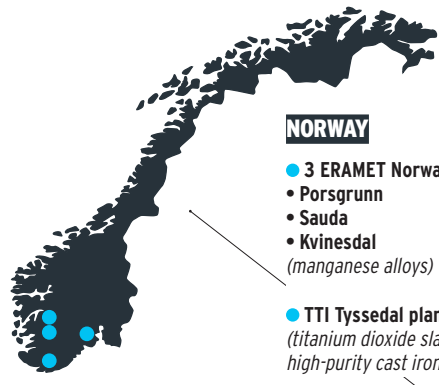
**1st**  
European recycling  
channel for aviation  
grade titanium  
(on stream 2017)

**PROFILE**



**UNITED KINGDOM**

- Erasteel Stubs Warrington  
*(high speed steels)*
- ERAMET Alloys UK  
*(sales office)*



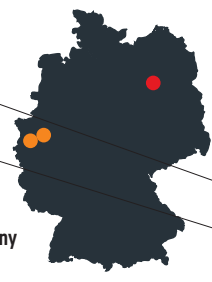
**NORWAY**

- 3 ERAMET Norway plants:
  - Porsgrunn
  - Sauda
  - Kvinesdal  
*(manganese alloys)*
- TTI Tyssedal plant  
*(titanium dioxide slag and high-purity cast iron)*



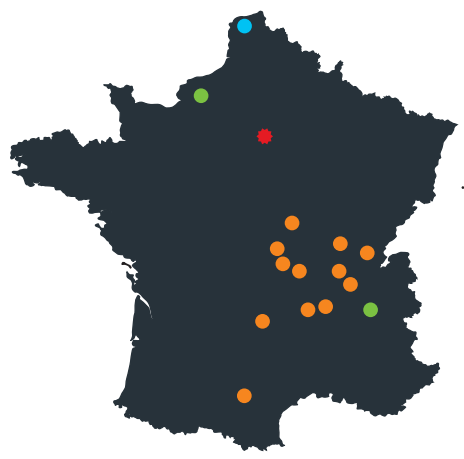
**BELGIUM**

- ERACHEM COMILOG Tertre  
*(manganese chemicals, copper solution recycling)*



**GERMANY**

- Erasteel GmbH Germany  
*(distribution centre)*
- Aubert & Duval Special Steels  
*(distribution centre)*



**FRANCE**

- COMILOG Dunkerque  
*(manganese alloys)*
- Eurotungstene Grenoble plant  
*(metal powders: cobalt, pre-alloys, tungsten, etc.)*
- ERAMET Sandouville plant  
*(high-purity nickel, nickel and cobalt salts)*
- Erasteel:
  - Champagnole  
*(high speed steels)*
  - Commentry  
*(high speed steels and recycling)*
- Brown Europe  
*(wire drawing)*
- Forges de Monplaisir  
*(toll forging)*
- Aubert & Duval - La Pardieu  
*(support services)*



**SPAIN**

- Metallied Iron plant  
*(powder metallurgy)*

- Aubert & Duval - TAF  
*(heat treatments)*
- Erasteel Chalon-sur-Saône  
*(service centre)*
- Aubert & Duval Heyrieux  
*(distribution centre)*
- 6 Aubert & Duval plants:
  - Firminy
  - Imphy
  - Issoire
  - Interforge
  - Les Ancizes
  - Pamiers  
*(closed die-forged parts, forged parts, long products, tooling)*
- UKAD plant  
*(titanium processing)*
- EcoTitanium  
*(titanium recycling)*
- MKAD  
*(titanium part machining)*



**ITALY**

- Aubert & Duval ADES  
*(distribution centre)*



**SENEGAL**

- TIZir Grande Côte Opérations  
*(ilmenite and zircon)*

# BENCHMARKS

Our locations and what they mean



## EUROPE/AFRICA



## GABON

- **COMILOG:**
  - Moanda mine and sintering plant (CIM)
  - C2M: Moanda metallurgical complex
- Owendo logistic centre
- **Setrag:** Transgabonais railway concession operator
- **Maboumine** (polymetallic deposit)

## NICKEL

The world's no. 7 producer of nickel and no. 1 ferronickel producer, ERAMET Nickel is a front-rank historical supplier of stainless and special steels.

SLN (Société Le Nickel) operates five nickel mines in New Caledonia (Kouaoua, Népoui, Poum, Thio and Tiébaghi) that it processes into ferronickel (FeNi) locally in its Doniambo metallurgical plant.

## MANGANESE

ERAMET Manganese is the world no. 2 producer of high grade manganese ore. In Gabon, ERAMET manganese's activity is structured around COMILOG for ore mining and beneficiation, and Setrag for its transport.

COMILOG is based in Moanda, where it mines and processes manganese in the first metallurgical complex for the ore in sub-Saharan Africa, C2M. Setrag operates the Transgabonais rail line which connects the mine to Owendo port at Libreville over more than 710km.

## KEY GROUP

### GROUP

Headquarters in Paris | ERAMET Research and ERAMET Ingénierie in Trappes | Shared service centre in Clermont-Ferrand

### MANGANESE

### NICKEL

### ALLOYS

### ERAMET INTERNATIONAL

Brazil | Germany | India | Italy | Japan | South Korea | Spain | Taiwan | United Kingdom | United States



## ALLOYS

ERAMET Alloys, the world no.2 producer of closed die-forged parts, designs and produces cutting-edge metallurgical solutions in high-performance steel, superalloys, titanium and aluminium as parts, long products and powders for the most demanding industries, including aviation, energy, industrial tooling, motor racing and medical equipment.

In India, Aubert & Duval operates a plant in Karnataka state that forges and closed die-forges parts for the aviation and energy sectors, which it holds under its joint venture SQuAD. With Erasteel, positioned on the high speed steel market, the Division also has international presence in the United States, United Kingdom, China and Sweden.

## FUTURE TERRITORIES

### ARGENTINA

With its subsidiary ERAMINE SUDAMERICA, the Group operates in Argentina, where it is looking into the feasibility of producing battery-quality lithium carbonate from brine in the Salta province salt flats. Demand for this product is set to grow due to the boom in hybrid and electric vehicles.

### SENEGAL AND NORWAY

Located in Diogo between Dakar and Saint-Louis du Sénégal, TiZir operates a mineral sand deposit to extract ilmenite and zirconium in its plant. Ilmenite is sent to Tyssedal's pyrometallurgical plant in Norway and used as a raw material by customers in pigments for paint and the high-purity cast iron used to manufacture wind turbines.

### AMERICAS



### UNITED STATES

- **ERACHEM COMILOG Baltimore**  
(manganese chemicals)
- **BMC Butler**  
(ferromolybdenum and ferrovanadium)
- **GCMC Freeport**  
(oil catalyst recycling)
- **ERAMET Marietta**  
(manganese alloys)
- **ERACHEM COMILOG New Johnsonville**  
(manganese chemicals)
- **Erasteel Boonton**  
(high speed steels)
- **Erasteel Bolingbrook**  
(distribution centre)

**MEXICO**

● ERACHEM Mexico Tampico  
(manganese chemicals)



**ARGENTINA**

● ERAMINE SUDAMERICA  
(lithium deposit)



**ASIA/OCEANIA**



**INDONESIA**

● Weda Bay Nickel, Halmahera island  
(nickel deposit)

● Weda Bay Nickel (Jakarta)



**NEW CALEDONIA**

● Société Le Nickel (SLN)

- 5 mines:
  - Kouaoua
  - Népoui
  - Poum
  - Thio
  - Tiébaghi

● Doniambo metallurgical plant  
(ferronickel)



**CHINA**

● ADMDT Wuxi  
(distribution centre)

● Erasteel Tianjin  
(high speed steels)

● COMILOG Guilin  
(manganese alloys)

● GECC Chongzuo  
(manganese chemicals)

● COMILOG Far East Development Ltd  
(Shanghai)

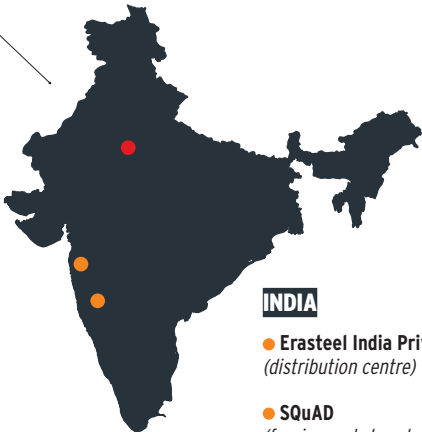
● COMILOG Far East Development Ltd  
(Hong Kong)



**INDIA**

● Erasteel India Private Ltd  
(distribution centre)

● SQuAD  
(forging and closed die-forging)



INTERVIEW WITH  
**PATRICK BUFFET**  
Chairman & CEO

# A RECOVERY STRATEGY THAT IS DELIVERING THE EXPECTED RESULTS: STRONG IMPROVEMENT IN THE ERAMET GROUP'S PERFORMANCE IN 2016

## AFTER SEVERAL YEARS OF SEVERE CRISIS IN METALS, HOW DID THE MARKET BEHAVE IN 2016?

**Patrick Buffet:** 2016 was a year of great contrasts for the prices of our metals. It started in line with 2015, with prices at 15-year lows. This unprecedented sector crisis hit every player on the market heavily. In the second half of 2016, manganese ore prices gradually rose, buoyed by the upturn in major construction projects in China. For the year as a whole, LME nickel prices averaged 19% lower than in 2015, while manganese ore prices went from USD3.11/dmtu in 2015 to USD4.30/dmtu in 2016. As for the Alloys division, its activity continued to be supported by the aviation sector, where demand for high value-added parts for aircraft structure and engines remains high. For the entire Group, the price effect remained significantly unfavourable in our 2016 results compared with 2015.

## IN THIS CONTEXT, HOW DID ERAMET PERFORM?

**P. B.:** Our results recovered firmly with a sharp rise in EBITDA in 2016, at €375M compared with €92M in 2015. Current operating income for the year totals €84M, compared with -€207M in 2015. It's worth pointing out that current operating income for the 2<sup>nd</sup> half totalled €175M and free cash flow was €226M, enabling us to reduce net debt substantially, by €327M in the 2<sup>nd</sup> half. As of year-end 2016, net debt was lower than at the end of 2015 and our net debt/EBITDA ratio improved significantly, from 9.5 at the end of 2015 to 2.2 at the end of 2016. ERAMET's balance sheet structure also improved, thanks in particular to the success of our undated bond convertible into new shares and/or cash, which increased the Group's equity by €100M. We also extended the maturity of its revolving credit facility by two years in early 2017. Finally, we

completed most of our asset disposals programme in 2016, with a favourable impact of €142M on the Group's net debt. At year-end 2016, the ERAMET group's financial liquidity remained high at €1.7 billion.

## HOW DO YOU EXPLAIN THIS RECOVERY?

**P. B.:** This performance is largely due to the success of the very ambitious, Group-wide cost reduction and productivity improvement plan. I should emphasise that the various performance plans we have implemented confirm the high quality of

**€2,984M**  
sales

ERAMET's industrial results:

- SLN's performance plan has already enabled us to cut our cash cost by 16% over 2016, to USD5.06/lb, in line with the target of USD4.5/lb on an annual basis as of the end of 2017. Beyond 2017, the goal is to reduce SLN's cash cost further over 2018-2020. Furthermore, the new electric plant should make a substantial contribution to the reduction of cash cost from its startup, planned for 2021.
- The improvement in performance of our Moanda manganese mine and the modernisation plan for Setrag in Gabon should enable us to confirm our annual production and transport



capacity of 4 million tons. ERAMET aims to continue reducing cash cost, both in mining and for manganese alloys, particularly for refined alloys, an upscale product in which the Group is the world leader.

- In the mineral sand sector, the achievement of an industrial production level for ilmenite and zirconium, and the successful switch of titanium slag production process from chloride to sulphate-based, led to positive EBITDA for TiZir, despite prices that remain low in mineral sands and an incident on the furnace in Norway, which quickly resumed production.

- Finally, ERAMET Alloys continues to roll out its performance plans. Aubert & Duval is bolstering its leadership in special alloy-making with the setup of a European supply chain for aviation-grade titanium, including recycling. Powder metallurgy, particularly for 3D printing and for aviation, will also contribute to this sector.

#### WHAT'S THE OUTLOOK TODAY?

**P. B.:** 2017 will be a crucial year in many respects. By stepping up the cost reduction and productivity improvement plans rolled out across the Group, we can raise the target from €360M to €400M recurrent savings on ERAMET's current operating income as of year-end 2017 on an annual basis.

I'll also mention:

- The start of production at EcoTitanium, which will complete our aviation-grade titanium channel, the industrial startup of Erasteel's battery and catalyst recycling activity, the adaptation of Sandouville's production process to a new matte, and the start of Setrag's modernisation programme.
- A new stage in our Lithium project, and the implementation of the frame agreement for the beneficiation of our nickel deposit in Weda Bay, Indonesia, with the Chinese steelmaking group Tsingshan.

#### A NEW CHAPTER IS BEGINNING FOR THE GROUP'S GOVERNANCE. WHAT MESSAGE DO YOU HAVE?

**P. B.:** The great uncertainties over the years ahead, particularly in terms of Chinese economic trends, mean we have to keep up

**“The great uncertainties over the years ahead mean we have to keep up our discipline and vigilance in continuously improving our performance .”**

our discipline and vigilance in continuously improving our performance. This is the essential condition for ERAMET to keep getting stronger in response to more and more aggressive competition, in a fast-changing international environment. ERAMET's recovery in 2016 was only possible because all our teams, who I personally want to thank, rose to the challenge. This mobilisation fully justifies my confidence in our future successes, under the new management, following the General Meeting of May 23<sup>rd</sup>, 2017, of Mrs. Christel Bories, to whom I wish every success in the exciting mission of overseeing ERAMET's destiny.

# HIGHLIGHTS

2016 was a dense, contrasting year for ERAMET, which in the 1<sup>st</sup> half had to address the lowest metal prices for 15 years. In this context, the Group rallied on every level to improve its results and prepare for the future. With encouragingly high performance towards the end of the year.

## LAUNCH OF THE POWDER ATOMISATION TOWER

**JANUARY 2016** - A major partner to the aerospace industry, Aubert & Duval is investing jointly with Safran and France's Auvergne - Rhône-Alpes region to build a superalloy atomisation powder in Les Ancizes. This facility adds to the Group's existing capacity in Imphy (France) and Irun (Spain) and serves the aerospace market, particularly Rafale engines. This €15M investment also strengthens the French additive manufacturing sector. It is intended to come on stream in 2017, with ERAMET Ingénierie the project manager.



## 9<sup>th</sup> GROUP INITIATIVE CHALLENGE

**MAY 2016** - Designed to encourage everyone to push their limits, show creativity and create value for ERAMET, the Initiative Challenge attracted 230 internal initiatives. Seven of them won Group awards. The Quinoa project won the Sustainable Development category. This initiative is intended to enable indigenous communities in the high plateaus of the Andes in Northeast Argentina to grow quinoa at almost 4,000 metres. The project is centred on the setup of five pilot farming areas near ERAMET's lithium deposit. It includes extensive training for local communities.



## LAUNCH OF SLN PERFORMANCE PLAN 2018

**JANUARY 2016** - A real corporate project, SLN 2018 is designed to reduce production costs by 25% as of the end of 2017<sup>(1)</sup> by rallying all SLN employees around nine projects that will turn around the subsidiary's competitiveness on a lasting basis by overhauling its processes. This ambitious performance plan is critical to regaining its financial balance. It is supported by a funding plan approved by ERAMET's Board of Directors on May 9<sup>th</sup>, 2016.

(1) compared with average production cost for 2015.



## VOLUNTARY SUSPENSION OF MANGANESE ORE PRODUCTION

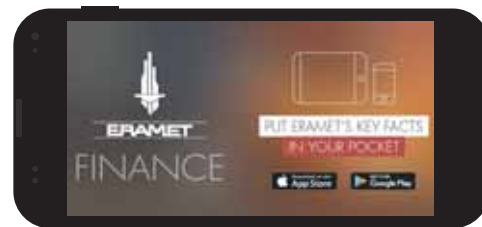
**MARCH 2016** - Given a slump in market conditions in the first quarter of 2016, production of manganese ore in COMILOG's Moanda, Gabon mine was suspended in March 2016. The subsequent upturn in prices enabled COMILOG to resume normal production levels.





## FRENCH PRIME MINISTER VISITS DONIAMBO

**APRIL 2016** - The Doniambo plant and SLN's teams were honoured to welcome Manuel Valls on April 29<sup>th</sup>, 2016. On that occasion, the Prime Minister announced a €200M loan to enable the company to roll out its performance plan over a period of very low nickel prices. The Prime Minister also announced the contribution of a state guarantee to fund the construction of the new Doniambo electricity plant, under a framework that doesn't weigh on ERAMET's accounts, via a New Caledonian governmental structure.



## LAUNCH OF ERAMET FINANCE APP

**JULY 2016** - At the crossroads of digitisation and transparency programmes, ERAMET has developed a mobile app for the financial community. From a smartphone or a tablet, users have access anywhere to all of ERAMET's real-time financial information in just a few clicks.

## OPENING OF MOANDA MINING AND METALLURGY SCHOOL

**JUNE 2016** - Inaugurated on June 6<sup>th</sup>, 2016 by the President of Gabon, Ali Bongo Ondimba, and Patrick Buffet, Chairman & CEO of the ERAMET group, Moanda Mining and Metallurgy School is the fruit of an exemplary public-private partnership. For the start of its first university year, it took in 29 future technicians and engineers who will go through practical training in prospecting, ore extraction and metallurgy. The school expands the training capacities of this region of Africa.



**ISSUE OF AN UNDATED  
BOND CONVERTIBLE  
INTO CASH  
AND/OR NEW SHARES**

**SEPTEMBER 2016** - To strengthen its equity, ERAMET successfully completed an issue of hybrid bonds for €100M. The 2 main shareholders, the French State and the Duval family, confirmed their support for the Group by subscribing for at least their share of ERAMET's equity.



**PRODUCTION OF NICKEL  
MATTE DISCONTINUED  
AT SLN**

**AUGUST 2016** - On August 10<sup>th</sup>, 2016, the Bessemer workshop was closed down. SLN used to produce nickel matte there for processing into nickel salts and high-purity nickel metal in the Sandouville, France plant. The French unit will now be supplied with nickel matte under a partnership with a European producer. ERAMET Ingénierie is managing the necessary industrial changes at Sandouville. SLN is now focused on the production of ferronickel SLN®25, in which it is the world leader.



**OPERATING INCIDENT  
AT TIZIR NORWAY PLANT**

**AUGUST 2016** - On August 15<sup>th</sup>, 2016, a fire damaged the furnace at the Tyssedal, Norway plant, where ilmenite is processed into titanium slag and high-purity cast iron. The damage led to the plant being idled while the furnace was repaired. It resumed production in January 2017.



**OPENING  
OF MKAD**

**OCTOBER 2016** - On October 14<sup>th</sup>, 2016 in Varilhes (Ariège, France), the MKAD plant, which specialises in finishing aviation-grade titanium parts, started production. This joint venture by Aubert & Duval and Mecachrome will create a supply chain with significant capacity that is optimised for forged titanium parts. It will support aircraft manufacturing customers by improving buy-to-fly and the competitiveness of these products. With MKAD, Aubert & Duval and Mecachrome are bolstering their expertise in the hard metal machining market, as well as their positioning on the latest global aviation programmes.



**ETHICAL  
COMPLIANCE  
PROGRAMME**

**NOVEMBER 2016** - To implement its new Ethics Charter, the ERAMET group defined its ethical compliance system, centred on an ethics officer, a monitoring committee, application charters, online training and an alert procedure. The aim is greater vigilance and exemplarity.





## SAFETY: "ESSENTIAL REQUIREMENTS"

**NOVEMBER 2016** - To ensure the safety of employees carrying out critical activities - lifting, electrical risk, confined spaces, etc. - ERAMET set down the Essential Requirements that define the minimum precautions to take for each task. They include specific audits, management commitment and communication campaigns.



## QUADRUPLE RENEWAL OF QHSE CERTIFICATIONS

**NOVEMBER 2016** - From quality, health and safety to environment and energy, Aubert & Duval Pamiers, ERAMET Sandouville, Erasteel Commentry and Eurotungstene obtained the renewal of their certifications, rewarding their people's efforts to maintain and improve performance. In March 2016, SLN was certified ISO 14001 for its entire scope, covering nickel mines and ore processing plant.



## AUBERT & DUVAL JOINS SoFIA RESEARCH PROGRAMME

**NOVEMBER 2016** - In powder metallurgy, the SoFIA programme brings together industrial and academic partners including Michelin, Safran, Zodiac, Aerospace, CNRS and Aubert & Duval. Its mission is to develop all the technological components needed for metal additive manufacturing on an industrial scale, with the aim of supplying the aviation industry with robust, competitive parts.



## KICK-OFF FOR LEAD BUYING DAYS

**DECEMBER 2016** - Cross-Group working was the keyword for buyers, who structured their organisation into a network to create value. Their efforts bore fruit in 2016 as €17 million in purchasing savings was secured across all lead buying segments. On December 12<sup>th</sup> and 13<sup>th</sup>, they met the main industrial principals to improve relations with internal customers and share best practices.



## COMPLETION OF ASSET DISPOSAL PROGRAMME

**DECEMBER 2016** - ERAMET:

- signed an agreement with Umicore for the sale of Eurotungstene (France), which specialises in the development, production and sale of metal powders and pre-alloy powders;
- closed the sale of ERACHEM, which specialises in manganese chemicals, to the US company PMHC for USD193 million. ERACHEM's activities, located in the United States, Belgium, China and Mexico, serve the battery and agrochemical sectors and a range of other applications (electronics, pigments, etc.);
- completed the divestment of Somivab (forestry in Gabon), Bear Metallurgical (vanadium and molybdenum alloy production in the USA);
- suspended activity at the Guilin plant in China (manganese alloys).





project

# BECOMING A KEY PLAYER IN THE LITHIUM INDUSTRY

Since 2010, ERAMINE SUDAMERICA has been testing the feasibility of producing battery-quality lithium carbonate from brine from Argentina's salt flats. The salt will be used to make cathodes and phone, computer and electric car batteries. We take a look at progress in this promising project on a fast-growing market.

**From Trappes to Salta**  
ERAMET Research has developed around 10 patents to produce battery-quality lithium carbonate from brine in Argentina's salt flats. On site at 3,850 metres in the Salta region of the Andes, around 30 wells have been dug to explore the deposit and check the deposit's resources. In Trappes, ERAMET Research and partners are using pilot facilities to study production processes on a pre-industrial scale.

## **On course for the final development phase**

In 2016, the teams confirmed that the site holds over 7 million tons of lithium carbonate equivalent (LCE), as well as enough industrial water to run correctly.

In December, ERAMET Research conducted a pre-industrial pilot programme on the upstream part of the process for extracting lithium from the Argentinean deposit. This work follows on from a similar programme on the downstream stages in the Lyon, France region with brine from Argentina.

In parallel, the pre-feasibility study was carried out by ERAMET Ingénierie and an Argentinean firm. Following tests to check the industrial process was repeatable, the project is set to enter its final development phase, the feasibility study, prior to industrialisation.

On the regulatory front, in late 2016 the Group applied to local authorities for an environmental permit. 2017 will be given over to semi-industrial pilot tests, detailed engineering studies and technical-economic appraisals on a possible industrial facility.

"ERAMET is developing this forward-looking project in an agile way, thanks to the combination of various capacities and joint work by different teams in the Group, from geologists and hydrogeologists in Argentina and researchers at ERAMET Research, to ERAMET Ingénierie's teams and ERAMET's project management team."

**Jean-Jacques Reverdy,**  
Lithium project Director

**20,000 tons**

of lithium carbonate for several decades: ERAMET's production target if the project goes ahead.



**\$350M-380M**

Estimated capital expenditure.



**200-350m**

The depth below the surface of Centenario and Ratones salt flats at which the lithium deposit studied by ERAMET is located.



**2010**

Start of project.



**35 people**

Project workforce.

### Major stages in the project:

- 1 Identification of potential
- 2 Study of framework
- 3 Pre-feasibility study
- 4 Detailed engineering study
- 5 Industrialisation

## DID YOU KNOW?

1

*In 2016, the lithium market was vibrant with a sharp rise in demand, driven by a lithium-ion battery market growing in line with the boom in electric mobility. Lithium price trends were due to undersupply.*

2

*Over the next 10 years, growth in demand for lithium is estimated at 11% per year, mainly driven by battery applications (17% annual growth in this segment).*

*In 2025, the lithium-ion battery market will account for more than two-thirds of global lithium demand. The lithium market will grow from 180,000 tons of lithium carbonate equivalent (LCE) in 2015 to more than 500,000 tons in 2025, according to most analysts and studies.*



# TiZir FROM THE COAST OF SENEGAL TO THE FJORDS OF NORWAY

TiZir Ltd is a 50/50 joint venture by ERAMET and its Australian partner Mineral Deposits Limited. Together they operate a mining concession for mineral sands on the coast of Senegal to produce titanium-bearing minerals (ilmenite, leucoxene and rutile) and zirconium. A large share of the ilmenite is then processed into titanium dioxide slag in Tyssedal, Norway.

Since 2014, TiZir has operated a mineral sand deposit by continuous dredging, through its subsidiary Grande Côte Opérations SA in Senegal. The world's biggest mineral dredger works on an artificial basin, moving 7km per year along a 106km strip of dunes. A rotary blade, immersed in the sandy water, sucks in sand 24 hours a day. The 2% of heavy minerals is then concentrated, separated and dried. The extracted ilmenite is sent to the Tyssedal plant in Norway, where it is turned into titanium dioxide slag and high-purity cast iron.

2016 was a contrasting year. In Senegal, after a difficult start to the year, significant progress was made on engineering, management organisation, costs and safety. The year then went smoothly without the slightest lost-time accident and production increased to a record amount in the last quarter. In Norway, the processing plant's ramp-up was suddenly interrupted by the operating incident that occurred on the TTI plant furnace on August 15<sup>th</sup>, 2016. This led to the total shutdown of the plant to repair the furnace's refractory p-walls. It came back on stream in 2017 and resumed its ramp-up.

**613,000** tons  
of mineral sand concentrate  
extracted in 2016.

**3 million**  
hours worked.

**0**  
lost-time accidents.



## DID YOU KNOW?

1

**After recoverable fractions are extracted, 98% of the sand is put back in its place.** A few months later, the dunes are shaped back into their original topography and replanted to limit the risks of erosion and restore the baseline environment. By the end of 2016, 140 hectares have already been restored.

2

**In addition to the creation of local jobs, Grande Côte is funding infrastructure for drinking water, education, healthcare and agriculture.**

In 2016, it helped to finance Ouakam maternity clinic and donated medical equipment and two ambulances. It also fully funded construction and facilities for Ngouye Beye and Darou Beye primary schools.

3

**With rising global living standards and growing urbanisation, demand for titanium dioxide to make the materials needed to equip and decorate housing will grow over the long term.** Titanium dioxide is used as a pigment for paint, paper and plastic for its whiteness and opacifying properties. Zirconium is especially appreciated for its refractory and opacifying properties as well as its glossiness and whiteness. It is used, in particular, in ceramics, investment casting, nuclear power and jewellery.



# Valdi

## AN OUTSTANDING CHANNEL FOR RECYCLING BATTERIES, CATALYSTS AND METAL OXIDES

The Valmet project, undertaken in late 2014, is coming to fruition. It involves the industrial redeployment needed to revive the Group's recycling channel on a promising European market.

In Europe, regulations encourage the rollout of highly structured industrial recycling channels from waste collection and processing through to the marketing of new products. This is the case for batteries, catalysts (refinery diesel purifiers) and metal oxides, with the eventual aim of zero landfilling and 100% recovery in Europe. ERAMET, a recognised player for its know-how in pyrometallurgy of metal waste alloys through its subsidiary Valdi, overhauled its industrial assets to create an exemplary circular economy loop while reviving its battery recycling activity.

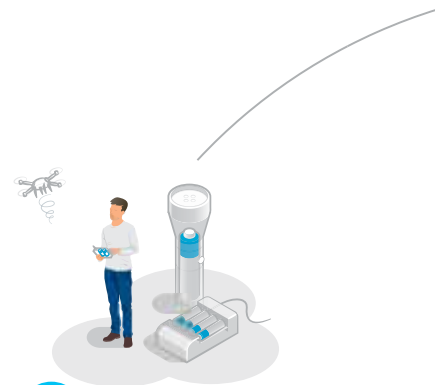
2016 was a year of intense activity for Valdi, which redeployed its activities to achieve industrial synergies. The metal waste recycling activity, historically based in Palais-sur-Vienne (Haute-Vienne, France) was transferred to Commentry (Allier, France) to create the only facility of its kind in Europe. The roasting furnace - a 32-ton tube, 14 metres long and 3.5 metres wide - used to recover oil catalysts travelled the 173km between the two sites.

In addition to the construction of an outstanding recycling channel, the new setup improves competitiveness at the Commentry steelworks, where the furnace has been adapted to alkaline and saline batteries for more cost-efficient use of melting and refining furnaces. The furnace can now refine high speed steels and recycle batteries. In early June, the first truck of batteries for recycling arrived on site. The first melting run will take place in February 2017.

**“Sorting and recycling batteries is easy and useful. With Valdi, France now has a European-level industrial asset that can meet the challenge of 100% recovery, zero landfilling!”**

**Stéphane Chorlet,**  
VP Sales & Marketing, Valdi

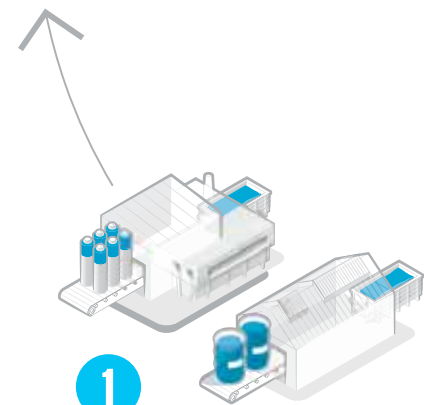
**38,000 tons** of batteries, spent oil catalysts and metal oxides can be recycled in Commentry from 2017.



**2**

### CONSUMPTION

- Use of batteries by consumers
- Use of refinery catalyst



**1**

### PRODUCTION

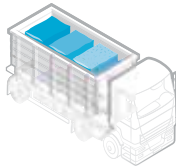
### A model project

ERAMET assigned 40% of the €24 million invested in the Valmet project to the environmental performance of new facilities on the Commentry site. Major work was done to install a setup for capturing fumes from recycling alkaline and saline batteries and the doghouse, the huge structure built around the arc furnace to reduce noise and capture at least 99% of the dust from the melting process. The Group supported the employees concerned by the transfer of activity to make moving easier and maintain skills. Out of 70 employees on the Feurs and Le Palais sites who were offered a new position, 14 joined Commentry. Moreover, the partnership with the social integration centre was stepped up with the creation of 7 additional battery sorting jobs.

3

#### RECOVERY

- Recovered and sorted spent batteries
- Recovered spent catalysts



#### NEW FACILITIES

Gas filtration  
Slag chain  
Continuous feed  
Doghouse

4

### ERAMET Commentry plant

#### TRANSFERRED FACILITIES

Storage building

Electric slag furnace

Roasting and calcination furnaces

#### RECYCLING

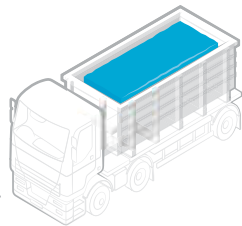
- Recovering batteries to extract all their metal content
- Recovering catalysts to extract metals (Mo, Ni) and metal oxides ( $Al_2O_3$ )

5

#### RESOURCE CREATION

- Reuse of metals
- Creation of other consumer products

Recycling rate > 85% by mass for batteries



# ERAMET RESEARCH & ERAMET INGÉNIERIE: BRINGING TOMORROW'S PRODUCTS AND PROCESSES TO LIFE

ERAMET's world-class R&D and engineering teams develop new processes to meet future needs, with a constant focus on performance and value creation.

**150**  
patents  
in the portfolio

**220**  
employees  
dedicated to R&D

## HIGH-LEVEL APPLIED RESEARCH

The Group's research and development plays a central role in the current and future performance of its processes and products. The key features of ERAMET's R&D are:

- **partnerships with customers**, particularly in aerospace or energy, often resulting in prototypes.
- **the industrial vision of its work for a practical use of ideas and innovations.** Iterative work and the mutual challenge between research and engineering teams are a source of profitability and continuous improvement. With ERAMET Research and Ingénierie both located on the

Trappes, France site, complete projects can be carried out from the scientific design of a process through to creation of the industrial asset.

- **the quality of its facilities**, particularly pilot units that test processes continuously on a pre-industrial scale, smoothing and speeding up industrial implementation. The work done for the Lithium project is a good example.

## OUTWARD-LOOKING RESEARCH

While the Group has kept investing in R&D despite the crisis, it has also taken a more open approach by sharing some capital expenditure and identifying new areas of activity that are a good fit with its own.

## Partnerships

Since 2013, ERAMET has taken part in collaborative European R&D projects with academic and industrial partners. Beyond shared resources, these partnerships enrich the group's knowledge and processes. For instance, it leads the SOLSA project in geology. The aim of this 4-year programme is to develop a high-performance, productive core drill rig that enables ore to be characterised instantly on site. R&D teams are contributing to another collaborative project, Go-4-0, with Arcelor Mittal. This work concerns the beneficiation of manganese and steel industry waste. The partners in Go-4-0 are looking into the feasibility of compacting furnace slurry and dust into tablets to be fed back into the same furnaces. Another major collaborative project in which ERAMET is a stakeholder is SoFIA, an applied research programme in metal additive manufacturing (see pages 32-33).



1.



2.

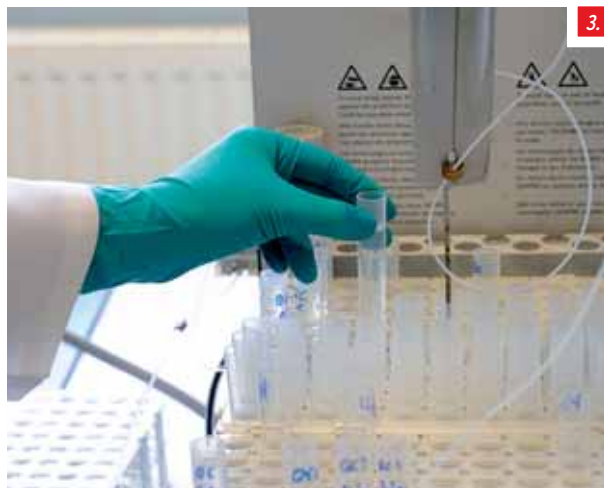


• **External customers**

ERAMET makes its tools and know-how available to manufacturers in its areas of expertise. In 2016, ERAMET Research worked for the Luxembourg engineering firm, Paul Würth, which develops treatment and energy recovery processes for blast furnace dust (iron oxide and carbon materials) that separate out impurities (lead and zinc). ERAMET Research tested and verified the relevance of its blast furnace slurry processing methods through several weeks of tests on pilot facilities. ERAMET Ingénierie was then brought in to verify the sizing hypotheses for the transition to industrial scale. ●

**“Working with external customers lets us tackle new subjects and work on other metals, interactively and responsively.”**

**Yves Le Quesne,**  
ERAMET Research Programmes  
Director



3.



4.

1. Casting on a pyrometallurgy pilot at the Trappes, France research centre.

2.-3. Lab tests

4. Mineralurgy pilot.

**ERAMET's areas of R&D expertise**

- Mineralogy/Mineralurgy/Hydrometallurgy and Pyrometallurgy
- Alloy making and processing metallurgy/Creation of new alloy grades
- Powder metallurgy
- Closed die forging
- Heat treatments
- Recycling



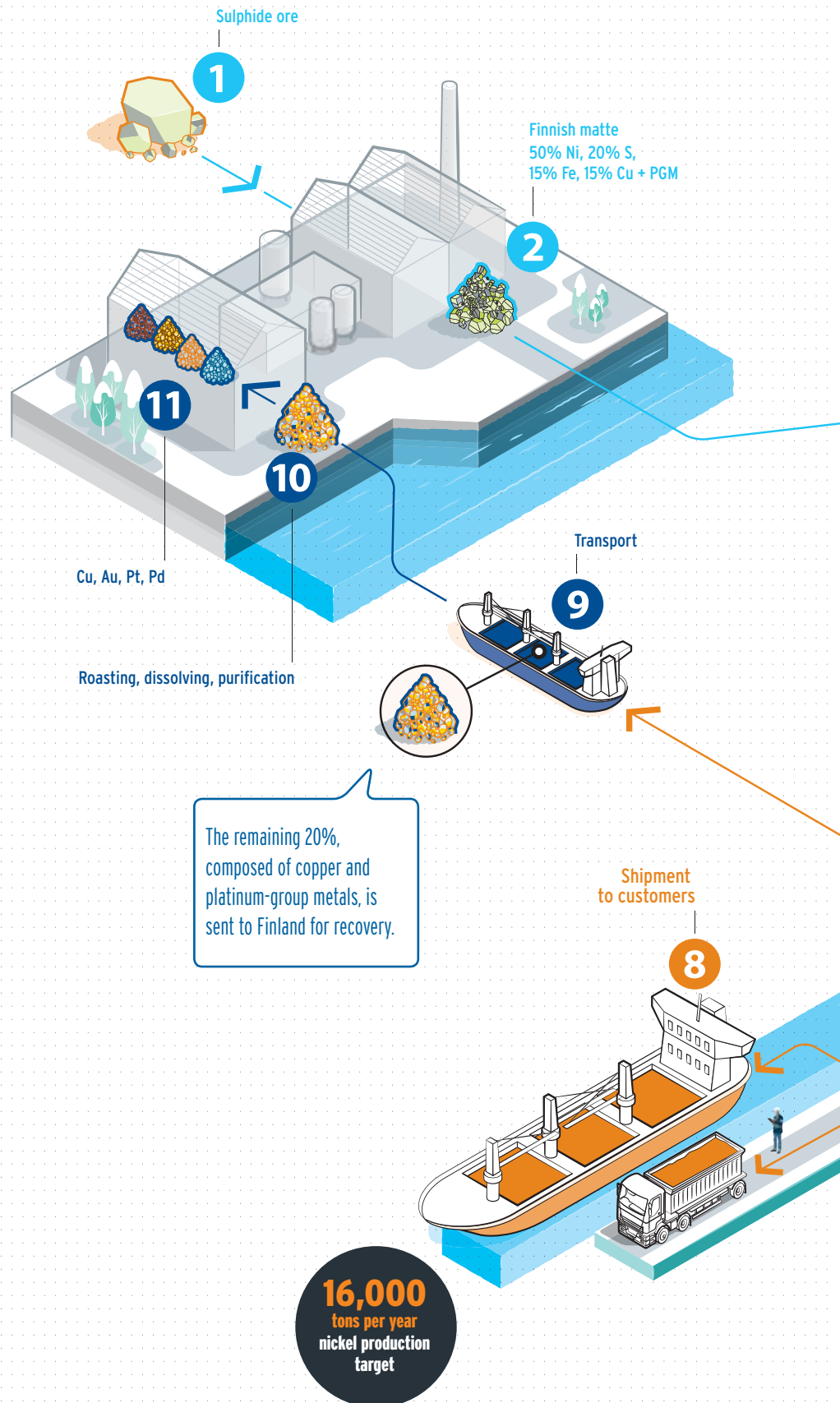
# INNOVATING TO ADAPT INDUSTRIAL PROCESSES

ERAMET benefits from several decades of industrial experience through the innovations it has set up in production plants. This is the foundation for the Group's reputation in process research. The strength of its research capability stems from this feedback, the match between R&D and engineering teams and the ability to develop industrial scale pilots on time and within increasingly tight budgets. In 2016, some of those teams rallied round two critical projects for the Group: adapting the Sandouville plant to a new source of nickel matte and the Lithium project in Argentina. Both projects have reached major milestones.

## NEW MATTE AND A NEW START FOR SANDOUILLE

In September 2016, ERAMET Sandouville received its last shipment of nickel matte produced in Doniambo, New Caledonia. In 2017, it will be supplied by a European partner. The change of source is intended to improve competitiveness at SLN, which is specialising in ferronickel production while developing the Sandouville site's activity. The new nickel-cobalt matte also contains copper, more iron and platinum-group metals. So the plant's processes had to be adjusted to the specificities of the new matte's composition. Part of this R&D programme was carried out under NewEco, a two-year European partnership in which the new matte supplier and Liège and Aalto universities are also taking part.

In late 2016, the new matte processing method was validated for the production of nickel salt, nickel metal and very high-purity nickel, as well as copper concentrate. Sandouville's new workshops are being redesigned under ERAMET Ingénierie's supervision and will come on stream in mid-2017. The R&D teams, who developed and tested the new process on a pilot in Trappes, will assist shift teams on site with the new unit's start-up.



# ERAMET Sandouville's new Finnish supplier

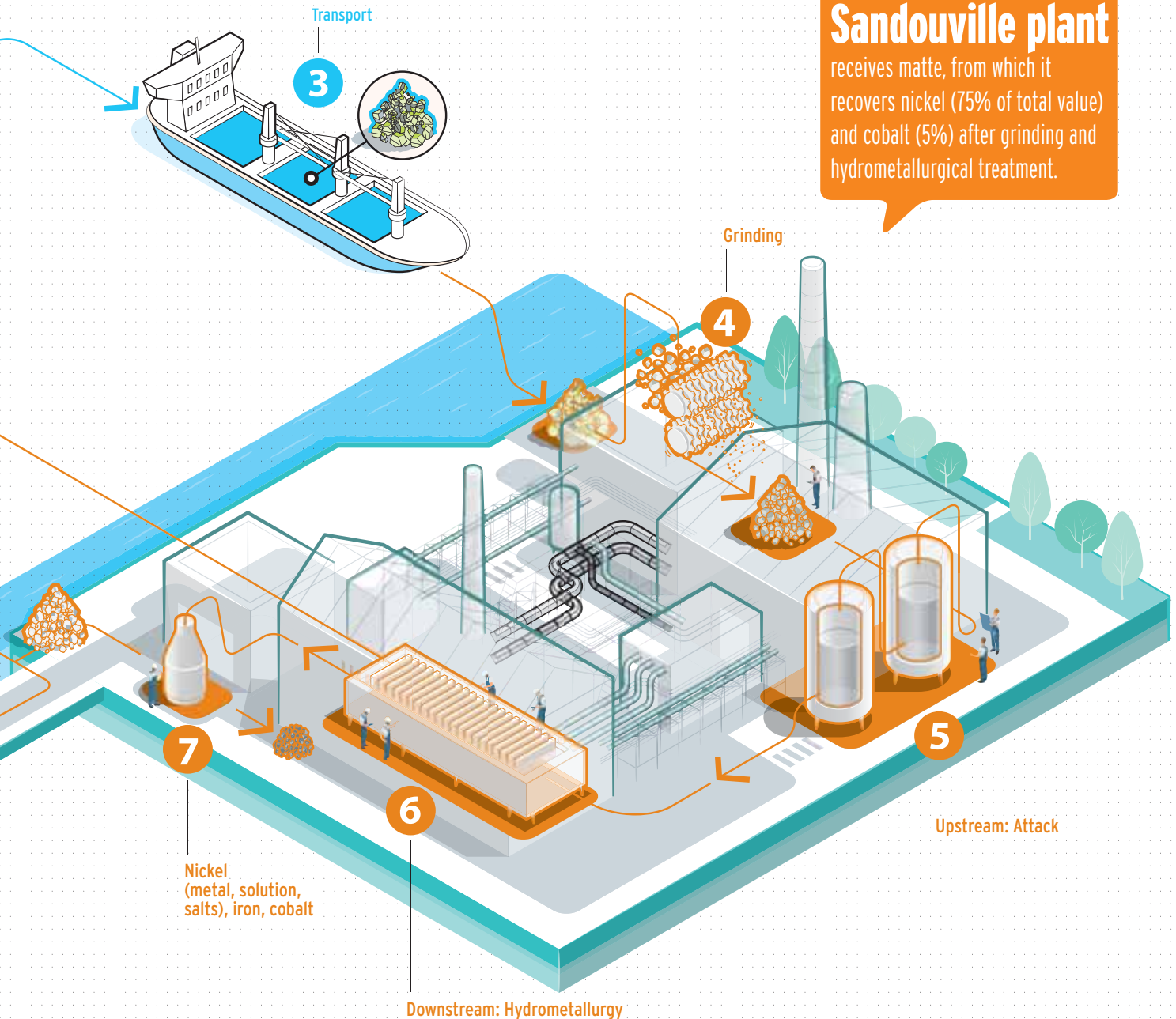
produces a nickel concentrate that required changes to the plant's processes.



**€35**  
million  
capital expenditure  
in Sandouville

# ERAMET Sandouville plant

receives matte, from which it recovers nickel (75% of total value) and cobalt (5%) after grinding and hydrometallurgical treatment.



# ERAMET NICKEL: RALLYING TO EMERGE STRONGER FROM THE CRISIS

Supported by its shareholders and fully committed to its recovery, SLN now has a clear view ahead.

## A WIDELY CONTRASTING 2016

The nickel industry has been disrupted by the emergence of low cost nickel-producing countries.

In early 2016, the nickel crisis was acute with the lowest prices for almost 15 years, but the rest of the year was slightly more favourable. After a first quarter with prices in a trough that meant 80% of the sector was manufacturing at a loss, nickel prices picked up. From USD3.93/lb on average in the 1<sup>st</sup> half, prices gradually recovered to around USD5/lb in December 2016. Nickel inventory on the LME and SHFE remains high, totalling 466,000 tons as of the end of 2016. This represents almost half a year of global consumption, taking producer and distributor stocks together.

As regards stainless steel demand, 2016 was boosted by the firm Chinese economy, which accounts for more than half of global demand. In addition, nickel supply remains abundant with high sensitivity to ore availability, from both Indonesia and the Philippines (22% of global nickel production). In early 2017, Indonesia relaxed its ban on non-processed nickel ore exports, which came into force in 2014. The Philippines conducted environmental audits in the mining sector, with operations suspended at several mines as a result.

## STRONGER TOMORROW

In this environment, SLN, which mines nickel in New Caledonia, stepped up its efforts in 2016 to come out of the crisis stronger than before. In addition to the €80M cost reduction plan, SLN began an unprecedented performance plan. The aim is to reduce production costs by 25% (compared with the 2015 average) to achieve a cash cost of \$4.50/lb by the end of 2017, at the economic conditions for the start of 2016. The plan is structured around 9 key projects, including the discontinuation of nickel matte production previously processed at the Sandouville plant,

**“Thanks to everyone’s commitment, we’re on course for clear, shared performance goals.”**

**Jérôme Fabre,**  
CEO, SLN



**World no. 1**  
producer of nickel  
chloride  
and ferronickel

ERAMET Nickel sales

**€595M**



1.



2.



3.



4.

### Closure of Bessemer workshop

To restore its competitiveness and shore up its position as the world's leading producer of SLN® 25 ferronickel - a quality label for a global product - SLN discontinued the production of nickel matte, formerly processed at the Sandouville plant, on August 10<sup>th</sup>, 2016.

### Divestment Eurotungstene

As part of the Group's asset disposal programme, with the aim of focusing on its core business, on December 9<sup>th</sup>, 2016, ERAMET announced the signing of an agreement for the sale of Eurotungstene, a French company specialising in the production and marketing of metal and pre-alloy powders, to Umicore.

to specialise in ferronickel production. Other examples include installing ring grinders at rotary furnace exits to reduce energy consumption and increase furnace yield, the inauguration of a new pulverised coal workshop and using digital tablets to improve efficiency and reporting quality on operators' rounds.

The plan also led to the revision of the deposit map in New Caledonia, with the aim of optimising mining and reducing production costs at the Doniambo plant.

### Targeting a 25% lower production cost by the end of 2017 at USD4.5/lb



### FRENCH STATE REASSERTS SUPPORT FOR SLN

The visit of French Prime Minister Manuel Valls on April 29<sup>th</sup>, 2016 to Doniambo in New Caledonia resulted in several major announcements for SLN's medium and short-term future:

- pledge of a €200M loan;
- a state funding guarantee for the construction of the new Doniambo electricity plant through a New Caledonian public structure under a framework that makes it an asset for all New Caledonians, including SLN.

This financial backing is in addition to ERAMET's funding

of SLN. The Group decided to make a further loan of €135M, on top of the €190M granted in the 1<sup>st</sup> half of 2016.

Together, these decisions make the future much clearer for SLN. ●

1. The Bessemer workshop teams at the last production campaign on August 10<sup>th</sup>, 2016.
2. Stacker at Camp des Sapins (Thio Mine, New Caledonia).
- 3.-4. Coal workshop in Doniambo.

# NICKEL MARKETS & APPLICATIONS

Nickel is valued for its hardness, malleability and high corrosion resistance. It is especially used to make stainless steel, an essential material with a bright future.

**55,200**

tons of nickel produced in 2016



## ENGINEERING

Nickel stainless steel is used to design infrastructure for clean and waste water treatment and distribution. Its durability and corrosion resistance make leaks impossible and maintenance unnecessary, while ensuring suitability for food use. Stainless steel is also widely used in industrial applications that demand corrosion resistance, particularly at high temperatures, including the chemical, pharma and petrochemical sectors.



## CONSTRUCTION

Nickel is used in building decoration and fittings, and in lifts, handrails and street furniture.



## **ELECTRIC CARS**

A material with a great future, nickel is an essential component of the hybrid and electric vehicle batteries that reduce the automotive industry's environmental impact.



## **MEDICAL**

Because it can be sterilised and reused indefinitely, nickel stainless steel is universally used to make medical equipment.



## **MOBILE ENERGY**

Nickel is essential to the production of mobile electronic devices (smartphones, tablets, computers, etc.).



## **EVERYDAY OBJECTS**

Because it delivers shine, flexibility and strength, stainless steel is used in multiple applications and objects in daily life. It is a part of tableware, sinks and domestic appliances. The food industry values its long life and hygienic qualities, and its lack of effect on the taste of products. Stainless steel, for example, is widely used to make cooking utensils (dishes, pans) and vats for winemaking or milk on dairy farms.



## **CHEMICALS AND NICKEL-PLATING**

Nickel-plating is an historical application of the metal that protects the surface of objects. It is widely used in decoration and jewellery. Nickel is an essential component of several catalysts in the chemical industry, with applications including agriculture and food.

# ERAMET MANGANESE: HOLDING OUT WELL IN THE CRISIS

Further competitiveness efforts  
on a highly competitive market.

**World no. 1**  
producer of refined  
manganese alloys

ERAMET  
manganese sales  
**€1,439M**

## HIGH PRICE VOLATILITY

Gross world production of carbon steel, the main outlet for manganese, decreased very slightly compared with 2015 (approx. - 0.25% year-on-year). The two halves of 2016 were very different. In the first six months of 2016, carbon steel production fell, due to high inventory and low consumption, particularly in China. However, a sharp upturn in carbon steel production was observed during the second half, as access to credit was made easier in China, leading to the resumption of major building programmes and a fall in

producers' steel inventories. In this environment, CIF China 44% manganese ore prices (source: CRU) also varied widely in 2016. In the 1<sup>st</sup> half, prices reached an historical low (USD1.83/dmtu in February 2016). At those levels manganese ore producers are reckoned to be selling at a loss. Many producers then reduced their output or even stopped their operations. In the second half of 2016, the upturn in carbon steel production in China on one hand, and production adjustments by manganese ore producers on the other hand, rapidly drove up manganese ore prices. In December 2016, manganese ore prices totalled USD8.83/dmtu, i.e. a more than fourfold increase from the February low. Prices averaged USD4.30/dmtu in 2016, compared with USD3.11/dmtu in 2015. Since the summer of 2016, manganese alloy prices have followed the same upward trend.

## FIRM MANGANESE ALLOY PRICES

On this market, ERAMET continued to focus on refined alloys, which add the most value, while reducing costs from mining to processing and improving its units' competitiveness. In Europe, manganese alloy prices rose in 2016. ERAMET continued the optimisation and compliance work on its industrial assets, including Marietta in the USA. In Norway, plants achieved good production levels against a backdrop of cost reduction. In addition, the Group is studying an energy recovery system on Sauda's furnaces to improve the Norwegian unit's performance.

**ERAMET continued to focus on the highest value-added alloys**



1.



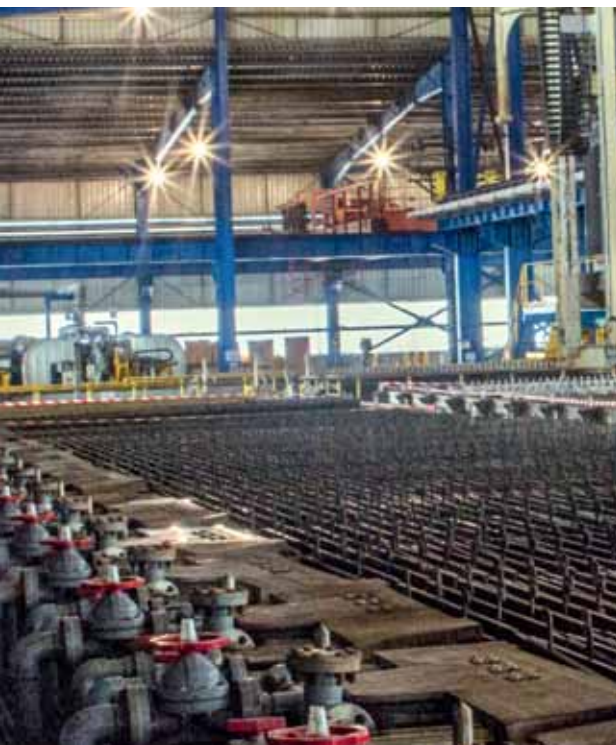
3.





### Agreement for the divestment of ERACHEM

On December 30, 2016, ERAMET completed the divestment of its subsidiary ERACHEM to the US company PMHC II for USD193 million. Specialising in manganese chemicals, ERACHEM, which serves the battery and agrochemicals markets and a range of other applications (electronics, pigments, etc.), has bases in the United States, Belgium, China and Mexico.



### SUBSTANTIAL ASSETS

On the manganese market, which is structured around a few major players, ERAMET mines a world-class deposit in Gabon. The site is renowned for the quality of its high-grade manganese ore, making ERAMET one of the most competitive producers in the sector. Despite the strengths of the mining asset, its subsidiary COMILOG now has to cope with more complex operations due to the evolution of some deposits. COMILOG now operates on the edges of Bangombé mine, which is very rich in manganese but more demanding as it requires stoping. COMILOG has to meet a challenge on both the technical and competitiveness fronts to maintain its market position.

### DEFENDING POSITIONS, LOOKING AHEAD

While COMILOG is constantly defending its positions by keeping up its performance improvement actions, the ERAMET subsidiary is also looking to the future. ERAMET Manganese is examining several options for its long-term industrial setup, with the aim of a smooth transition between Bangombé plateau, currently being mined, and Okouma plateau, which is set to take over.

### THE SKILL CHALLENGE

ERAMET Manganese's future, particularly that of its subsidiary COMILOG, also depends on the issue of skills and passing on knowledge.

• **C2M: ramp-up continues**  
Inaugurated in June 2016, Moanda Metallurgical Complex (C2M) is the first manganese ore processing plant in

sub-Saharan Africa. Its two plants - silicon-manganese and manganese metal - continued to ramp up in 2016. One challenge for COMILOG is to transfer knowledge and enhance skills for the 400 local employees, most of whom are in their first job.

### • First school year starts at Mining and Metallurgy School

The first class of 29 future technicians and engineers entered the brand new Moanda Mining and Metallurgy School in September 2016. Tomorrow, this practice school, the result of an exemplary partnership between the Gabonese state, the ERAMET group and its subsidiary COMILOG, will host up to 120 students trained in prospecting, ore mining and metallurgy. ●

**"COMILOG's people stepped up their actions in 2016 in response to an increasingly demanding market environment."**

**Hervé Montegu,**  
CEO, COMILOG

**World no. 2**  
producer  
of manganese  
alloys

**World no. 2**  
producer of high-grade  
manganese ore

1. Overview of CIM (foreground) and CMM (background).
2. Operator on press filter in CMM's electrolytic manganese metal (EMM) workshop.
3. Electrolysis pots at CMM.



# MANGANESE MARKETS & APPLICATIONS

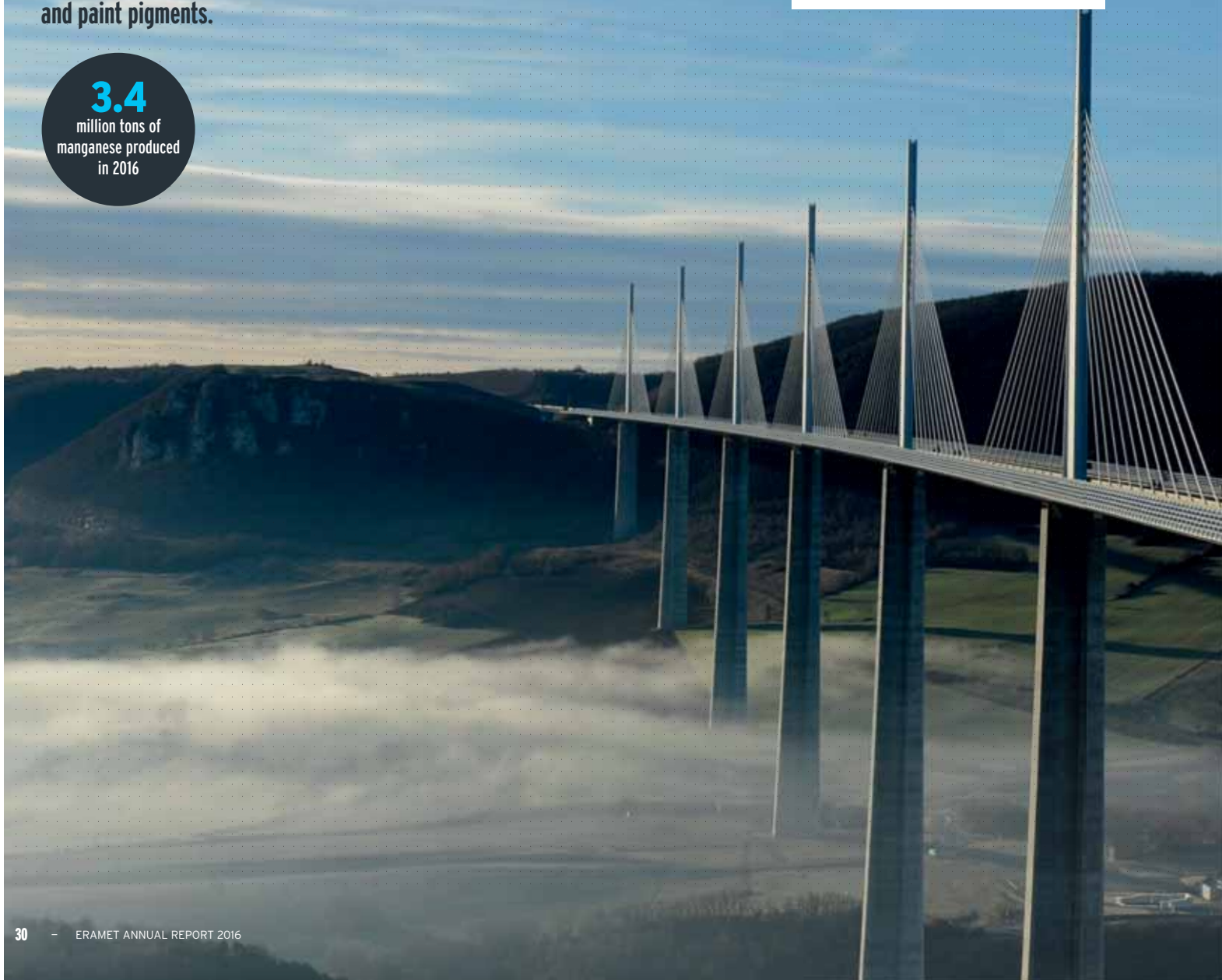
ERAMET is the world's second-biggest producer of manganese ore. Manganese makes steel harder, more elastic and more wear-resistant. It is widely used in the construction and automotive sectors. The chemical industry also uses the metal for applications in batteries, fertiliser and paint pigments.

**3.4**  
million tons of  
manganese produced  
in 2016



## CONSTRUCTION

Manganese's main outlet is carbon steel, a key component of all modern buildings. It is used to make reinforced concrete rods stronger and stiffer, and to make high speed steel for cutting tools for construction sites. 7kg of manganese is needed to make every ton of steel as the element cannot be replaced.





## FOOD AND BEVERAGES

Added to aluminium, manganese makes beverage cans stronger. It is also used in human and animal feed as a valuable trace element.



## BATTERIES

Manganese is used to make alkaline batteries, for which it is the main raw material. It is also a key component in cathodes for lithium-ion batteries.



## AGRICULTURE AND CHEMICAL SPECIALTIES

Manganese chemicals are used to make consumer goods, as well as fertiliser and animal feed. Manganese chemical specialties have applications in metal surface treatment and pigments.



## TRANSPORT

Manganese steels are valued for their great wear and distortion resistance. They are used to make a range of rail infrastructure parts as they can withstand the weight of trains and keep tracks straight. Vehicle manufacturers use them for the same properties. In this area, some high-tech applications use closely alloyed manganese steels.

# ERAMET ALLOYS: ON COURSE FOR PERFORMANCE AND INVESTMENTS

Positioned on profitable markets such as aerospace, for which it develops high-tech metallurgical solutions, ERAMET Alloys continues to optimise its industrial assets and invest in technologies for the future.

## AVIATION MARKET CONTINUES TO DRIVE ACTIVITY

An historical partner for major aircraft manufacturers, ERAMET Alloys achieved more than 60% of its sales on this vibrant market. The Division supplies manufacturers with high-performance steels, superalloys and aluminium or titanium alloys for structure parts such as landing gear and engine parts. Its subsidiary Aubert & Duval holds excellent positions on major programmes, including the new Airbus A320neo, Airbus A350, Dassault's Rafale fighter and Safran's LEAP engine, used by Boeing, Airbus and the Chinese aircraft maker Comac. This market's buoyancy contrasts with the flat oil and gas sector, which is affected by prices, while the gas turbine segment is firm, as is the high speed steel (cutting tools) market, where ERAMET Alloys is active through its subsidiary Erasteel.

## CONTINUED INDUSTRIAL OPTIMISATION

For several years, Aubert & Duval's teams have worked on every level to gain competitiveness and improve customer service quality with a 90% OTIF target. Time to market is increasingly short in the aerospace sector. In each workshop, production processes are reviewed in depth and adjusted to reduce costs and smooth flows. To contain the losses recorded by its high speed steel activity, Erasteel undertook a recovery plan and restructured operations on its Commentry site. This struggling unit has begun its transformation by taking in the battery and catalyst recycling activity from the Valdi Palais-sur-Vienne unit, which has been shut down. More than €24 million has been invested to adapt the steelworks. 38,000 tons of batteries and catalysts will eventually be recycled at the unit every year. These actions are combined with the dynamism of Erasteel's sales teams on the high speed steel market, supported by new grades from R&D.

## ATTACKING THE POWDER METALLURGY MARKET

Atomising metal into powder consolidated by hot compacting is a process that gives the resulting steel unique properties. These make it ideal for rotating aircraft parts or very high performance cutting tools. ERAMET Alloys has long been active on this market through a whole range of high speed steels derived from powder metallurgy. On the fast-growing additive manufacturing market, which is still in the structuring



1.



2.

**World no. 1**  
in gas-atomised  
metal powders

**World no. 2**  
producer  
of high-power closed  
die-forged parts

ERAMET Alloys sales

**€949M**



process, ERAMET Alloys has multiple advantages:

- acknowledged expertise in metallurgy, particularly powder metallurgy;
- cutting-edge facilities: in partnership with Safran and the Auvergne - Rhône-Alpes region, Aubert & Duval has invested in the construction of an atomisation tower for superalloy powders in Les Ancizes, France. From 2017, the unit will produce high-tech products for the Rafale aircraft engine made by Snecma;
- world-class R&D: for example, Aubert & Duval is taking part, with MetaFensch, in a new state-owned platform for industrial research in Lorraine, France, in a research programme on titanium powders, and the SoFIA programme, which aims to develop a full range of technological steps from powder production through to the manufacture of robust and competitive finished parts.

**MKAD STRENGTHENS TITANIUM CHANNEL**

*"We dreamt it, you did it..."*. These words, spoken by Olivier Cauquil, Airbus parts and materials supply procurement manager, at the inauguration of the MKAD plant in October 2016, mean a great deal. Resulting from a partnership between Aubert & Duval and Mecachrome, the plant in Varilhes, Ariège, France has facilities for the machining and surface treatment of finished titanium parts for delivery to the aviation market. Just nine months after the launch of the work, the first product specifications have been industrialised. MKAD is one of the links in a fully integrated

chain for aviation-grade closed die-forged parts, from titanium mining through to the shipment of parts. The final link will be EcoTitanium, the first European channel for aviation-grade titanium recycling, scheduled to start up in 2017. ●

**"In our actions, we must have these simple words in mind at all times: care, discipline and compliance with high standards."**

**Denis Hugelmann,**  
Delegate CEO ERAMET Alloys

1. Forging press.
2. Grinding workshop.
3. Bar heat treatment furnace.
4. Flat bar inspection.

## ALLOY MARKETS & APPLICATIONS

ERAMET Alloys designs and produces cutting-edge metallurgical solutions in the form of parts, long products or powders for the most demanding industries, including the transport, energy, medical and tooling sectors.

**20%**  
of ERAMET Alloys' sales are achieved with products under 5 years old



### MEDICAL

Aubert & Duval makes steels and cobalt alloys for the medical sector. They are mainly used for surgical instruments and prosthetics.

### AVIATION

Manufacturing of large closed die-forged titanium, steel, superalloy or aluminium parts for the design of critical aircraft parts such as landing gear, engine disks or turbine shafts, and helicopter rotors. These materials are sought after for their extreme resistance to mechanical constraints, high temperature and corrosion. Titanium is also used by the space industry, for instance to deliver airtightness, longevity and corrosion resistance for propellant gas tanks on satellite launchers.





## TOOLING

Production of high-performance tool steels that meet each industry's requirements, e.g. tool steels for hot and cold working, plastics conversion or glassmaking.



## ENERGY

Aubert & Duval provides essential parts for manufacturing gas or steam turbines for oilfields, particularly to meet the new requirements of deep water drilling, but also for the nuclear industry.



## ATOMISED POWDERS

Erasteel and Aubert & Duval produce gas-atomised powders with multiple industrial applications. They are used in the additive manufacturing of complex metal parts in a single stage. Aubert & Duval is also investing in superalloy powders for Rafale and other aircraft engines.



## OTHER TRANSPORT

Aubert & Duval supplies manufacturers in the rail (bearings, springs, etc.) automotive and marine (valve steel, diesel engine injector components, etc.) sectors, as well as motor racing (Formula 1, rallies, motorcycle grand prix).





# SOCIAL AND ENVIRONMENTAL RESPONSIBILITY

Despite the crisis, ERAMET is upholding its high standards on CSR. Because its future, its performance, the value of its assets and the health of its people depend on it.

## ANTICIPATING AND CONTROLLING RISKS

ERAMET's future partly depends on its ability to prevent and anticipate the risks relating to its activity. Controlling these risks calls for collective commitment, constant efforts and sufficient resources. ERAMET has identified four types of risk: social and environmental acceptability, technological and industrial risk, tighter regulations and environmental incidents. The underlying philosophy is based on identifying and anticipating risks and on a continuous improvement programme for behaviour and processes. In 2016, the Group began re-energising its industrial risk process along three lines:

- diagnosis and anticipation
- action plan
- audit and monitoring.

## DEFENDING PRODUCT CLASSIFICATION

Product characteristics - ores, metals, alloys, etc. - are appraised in line with progress in scientific knowledge. For an objective assessment of products, ERAMET tasks independent organisations with studies to promote relevant risk management. This knowledge feeds into the assessment of chemical risks on the workstation and the safety data sheets that provide transparent information and traceability across the value chain. In 2016, the emphasis was on monitoring the classification of nanomaterials and updating workstation chemical risk assessments.

## PROMOTING RESPONSIBILITY AND EXEMPLARITY

The Ethics Charter and Responsible Purchasing Charter contribute to the Group's long-term performance and, consequently, its future.

### • Rollout of Ethics Charter

In 2016, to implement the principles of the new Ethics Charter, the Group's Executive Committee adopted an ethical compliance programme. This is based on the appointment of an ethics officer who vouches for its application

and facilitates a network of ambassadors to share best practices everywhere, on all levels. An online learning programme, built around real-life situations, has been produced to help everyone grasp the principles.

### • Updated Responsible Purchasing Charter

The Responsible Purchasing Charter is intended to optimise purchasing practices and provide a framework for requirements with respect to suppliers. It was updated to specify the Group's expectations along three lines: Human Rights and Working Conditions, Environment and Products, and Best Business Practices.

## SUPPORTING PROJECTS

ERAMET manages all the health, safety & environment (HSE) and CSR aspects of its projects to prevent risks and make sure actions are compliant on the ground. In 2016 this was the case for the modernisation programme at Setrag, COMILOG's rail transport subsidiary in Gabon, when battery recycling activities were transferred from Valdi to Commentry, and in the implementation of the Lithium project on the Andes plateaux in northeast Argentina. This is where

ERAMINE SUDAMERICA is rolling out major social initiatives in close relation with local populations, including growing quinoa, community training and local jobs. The pilot quinoa plantation won an award in the Group's 2016 Initiative Challenge. ●

**“Our CSR\* approach fully serves the improvement of the Group's performance.”**

**Catherine Tissot-Colle,**  
Executive VP, Communications  
and Sustainable Development  
\* Corporate Social Responsibility

**86%**  
of sites are certified  
ISO 14001



## A busy year for Quality, Health, Safety & Environment (QHSE) certification



- **In New Caledonia**, SLN completed ISO 14001 certification for its entire scope, i.e. nickel mines and ore processing plant. This certification rewards the long-term work begun in 2012 and concerns six sites.
- **In mainland France**, four units renewed their QHSE accreditation: ERAMET Sandouville, Eurotungstene, Aubert & Duval Pamiers and Erasteel Commentry.
- **Two sites have quadruple Quality, Health, Safety & Environment-Energy certification (QHSE-E).**



**In 2016, another site (COMILOG Dunkerque) obtained ISO 50001 certification, bringing the total to six sites: three ERAMET Norway units, TiZir Titanium & Iron Tyssedal and ERAMET Sandouville.**



Revegetation work.





# HUMAN RESOURCES: MOBILISATION TO SAFEGUARD THE FUTURE

To restore its competitiveness, ERAMET continued its restructuring measures in a spirit of constructive dialogue with personnel representation bodies, without any compromise on the fundamentals.

## A UNITED FRONT

In the difficult context ERAMET is going through, in 2016 the Group stepped up its cost reduction and performance improvement plans. All HR teams are mobilised to:

- **Support divestments in the best conditions**

2016 saw the implementation of the job-saving plans in 2015. It was also a year of preparing for asset disposals. In late 2016, agreements were signed for the



sale of ERACHEM (manganese chemicals/USA, Belgium, China and Mexico, 575 employees) to PMHC II, INC and Eurotungstene (127 employees/France) to UMICORE. ERAMET also divested Bear Metallurgical (USA, vanadium metallurgy, 27 employees) and SOMIVAB (Gabon, rail cross-tie production, 200 employees). These operations were carried out in a spirit of transparency and dialogue with personnel representation bodies, and the will to protect as many jobs as possible.

#### • Adapt organisations

Several industrial restructuring programmes were carried out in 2016 to improve competitiveness. At SLN the Bessemer workshop was shut down with the placement of 62 employees, the bad weather agreement was renegotiated in New Caledonia, the Sandouville plant was made a subsidiary with the signing of a jobs charter and Valdi's battery and catalyst recycling activities were transferred from Palais-sur-Vienne (Haute-Vienne, France) to Commentry (Allier, France).

These programmes took place with high quality industrial dialogue, thanks to all parties' commitment and sense of responsibility. This was especially the case at SLN, where the focus was on performance optimisation and a consensus was reached to specialise the company in SLN®25 ferronickel production.

#### SHARED SERVICE CENTRE AT CRUISING SPEED

The Shared Service Centre opened in July 2015 and ramped up throughout 2016. In Clermont-Ferrand (France), it brings together a team of 71 employees who provide

support services for pay, training and accounts for 21 sites in the Group, as well as the management of IT infrastructures worldwide. As a platform of in-house services, the centre helps to make practices more consistent, optimise the quality of financial information within the Group and reduce costs by around 20%.

#### NO REST ON SAFETY

Safety is a major issue for ERAMET given the nature of its activities. There are three types of risk relating to the Group's activities:

- technological risks, the least common kind, for which prevention involved hazard studies based on the expertise build up by personnel;
- critical activities, which are secured by equipment, working methods and operators' qualifications;
- the human factor, which is addressed by having management on the ground to help employees systematically make the safe choice.

2016 was a contrasting year for safety results. After a poor first half, to restore the situation, ERAMET's top management and line managers reasserted the goal of zero accidents and made a full, personal commitment. The later part of the year was better, with a period of three months with no lost-time accidents for ERAMET Manganese, two months without lost time for SLN, and an historically low accident rate in the last quarter for ERAMET Alloys. The frequency rate worked out at 5.2 as of the end of 2016, a slight increase from the previous year.

#### SECURITY: AWARENESS, PROCEDURES AND DRILLS TO ANTICIPATE CRISES AND RESPOND EFFECTIVELY

The Group organised awareness-raising sessions in France and emergency drills in countries including Senegal and Mexico. In a sensitive general framework, the emergency response procedure was revised, enhanced and adopted by the Group.

#### WORKPLACE HEALTH: ERAMET TAKES THE INITIATIVE

With a scarcity of corporate physicians in France, ERAMET chose to create a self-contained service around three regional centres and hired four corporate physicians and 10 nurses specialising in workplace health. They will provide individual medical monitoring for the Group's employees in France and set up actions to improve working conditions in liaison with the HSE network. ●



### Essential Requirements for safe habits

*For critical activities (lifting, electrical risk, confined spaces, maintenance jobs, subcontractor management, work at heights, machine protection, etc.), the Group launched the Essential Requirements process, supported by internal communication campaigns. It sets down mandatory instructions for each critical activity. Rolled out over several years, this process will undergo a specific audit to measure application and compliance with rules and more than 2,000 employees will follow specific training.*

**“Defining and setting Essential Safety Requirements is a major step towards our goal of zero accidents.”**

**Georges Niktly,**  
Group VP Safety

# SOCIAL AND ENVIRONMENTAL INDICATORS

## HUMAN RESOURCES

### REGISTERED EMPLOYEES BY STATUS AND BY REGION AS OF 31/12/2016

	FRANCE	EUROPE EXCLUDING FRANCE	AMERICAS	AFRICA	ASIA	PACIFIC	TOTAL
Workers	2 483	865	387	1 675	186	1 380	6 976
Supervisors	1 849	263	87	1 547	143	582	4 471
Managers	804	159	133	567	78	155	1 896
Total	5 136	1 287	607	3 789	407	2 117	13 343
% managers	16%	12%	22%	15%	19%	7%	14%

### REGISTERED EMPLOYEES BY DIVISION AND BY REGION AS OF 31/12/2016

	FRANCE	EUROPE EXCLUDING FRANCE	AMERICAS	AFRICA	ASIA	PACIFIC	TOTAL
Holding company	352	10	50	0	29	0	441
Nickel	321	0	0	0	96	2 117	2 534
Manganese	140	830	523	3 789	246	0	5 528
Alloys	4 323	447	34	0	36	0	4 840
Total	5 136	1 287	607	3 789	407	2 117	13 343

TRAINING (1)	FRANCE	EUROPE EXCLUDING FRANCE	AMERICAS	AFRICA	ASIA	PACIFIC	TOTAL
Training hours	98 637	13 830	30 810	112 460	4 439	42 060	302 236
Hours per employee	19	12	95	30	18	20	24

(1) Data from annual HR CSR reporting - data declared by the Group's sites.

## ENVIRONMENT

SUBJECT	DEFINITION	2016 RESULTS	TREND
Operating permit	Number of operating permits obtained at Group sites.	174	Stability
Environmental reporting	Percentage of sites included in environmental reporting.	100%	Reporting consolidation and stability
Site certification	Percentage of industrial and mining sites that have obtained ISO 14001 certification.	86%	+ 50% in 4 years
Mining site remediation	Aggregate remediated hectares over all of our mining sites.	234 ha	More than 550 ha over 3 years
Air emissions	Number of channelled air emission treatment facilities.	361	In line with trends in consolidated scope

## ENERGY

SUBJECT	DEFINITION	2016 RESULTS	TREND
Energy consumption	Energy consumption (electricity, gas, fuel oil, coal, etc.).	16.5 TWh	Energy consumption has been stable for 3 years
Energy efficiency process	Number of sites that developed the energy-saving process, based on ISO 50001 standard principles, in 2016.	21 sites	1 site certified ISO 50001
Carbon footprint	CO <sub>2</sub> volume in millions of tons emitted by all of the Group's sites.	4.341 Mt	Stable overall since 2010

## SAFETY <sup>(2)</sup>

SUBJECT	DEFINITION	2016 VALUE	TREND OVER ONE YEAR
Frequency rate 1	Number of lost-time accidents per million hours worked.	5.3	+ 11%
Severity rate	Number of lost days (in addition to the day of the accident) resulting from lost-time accidents per thousand hours worked.	0.37	+ 38%
Frequency rate 2	Number of declared accidents with or without lost time, per million hours worked.	13.2	- 3%

(2) Statistics take agency workers into account.

# EXECUTIVE COMMITTEE

as of 31/12/2016



**Patrick BUFFET**  
Chairman & CEO, ERAMET

**Philippe VECTEN**  
Delegate CEO ERAMET Manganese  
and ERAMET Nickel

**Denis HUGELMANN**  
Delegate CEO ERAMET Alloys

## COMPOSITION OF THE BOARD OF DIRECTORS

as of 31/12/2016

### DIRECTORS

**Michel ANTSELEVE**

Special Advisor to the President of the Gabonese Republic, Head of the Mining, Fuel, Energy and Hydraulic Resources Department

**CEIR, represented by Nathalie DE LA FOURNIÈRE,**

Chief Financial Officer, Agence d'Urbanisme et d'Aménagement Toulousaine Métropolitaine

**Édouard DUVAL**

Chairman, Sorame and CEO, CEIR

**Georges DUVAL**

CEO, Sorame and CEIR

**Sorame, represented by Cyrille DUVAL**

CEO, Sorame, Chairman, CEIR

**FSI-Equation<sup>(1)</sup>, represented by Alexis ZAJDENWEBER,**

Director, Energy Investments, Agence de Participations de l'État

**Marie-Axelle GAUTIER**

Public law cluster manager - Mining law -

Director representing employees

**Jean-Yves GILET**

Chairman, Gilet Trust Invest

(1) FSI-Equation is held by the French State (APE).



**Thomas DEVEDJIAN**  
Delegate CEO in charge of Finance



**Catherine TISSOT-COLLE**  
Executive Vice-President of Communications  
and Sustainable Development



**Michel CARNEC**  
Executive Vice-President of Human  
Resources, Health, Security and Safety

**Philippe GOMES**

Member of Parliament for 2<sup>nd</sup> constituency, New Caledonia

**Manoelle LEPOUTRE**

Senior Vice President Civil and Society Engagement, TOTAL  
(independent director)

**Miriam MAES**

Chairman, Foresee, Sustainable Development and Enterprise  
Energy Management Consultancy (independent director)

**Pia OLDERS**

Insurance Portfolio Manager - Director Representing Employees

**Ferdinand POAOUTETA**

Special Advisor on Mining Matters to the Chairman of Northern  
Province, New Caledonia

**Catherine RONGE**

Chairman, Weave Air (strategy consultancy)  
(independent director)

**Sonia SIKORAV**

Has held executive, strategic and purchasing management offices  
in various industrial groups (independent director)

**Claude TENDIL**

Chairman, Generali Group France (independent director)

**Frédéric TONA**

Independent Mining Consultant (independent director)

**Antoine TREUILLE**

Chairman, Charter Pacific Corporation (independent director)

**CENTRAL WORKS COUNCIL DELEGATE**

**Philippe LAIGNEL**

**HONORARY CHAIRMAN**

**Yves RAMBAUD**

CONSOLIDATED FINANCIAL STATEMENTS <sup>(1)</sup>

**THE GROUP'S RESULTS**

**2016: sharp upturn in the Group's results**



The ERAMET group's results recovered significantly in 2016, with a sharp improvement in EBITDA at €375 million, net current operating income that was positive once again at €84 million and a return to positive free cash flow in the second half of 2016. Sales, at €2,984 million, decreased 4% in 2016 compared with the previous year.

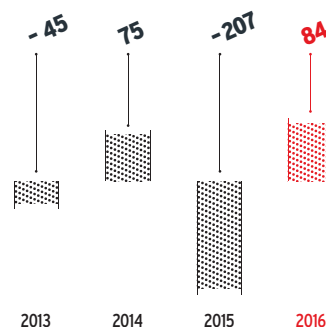
This performance is largely due to the continued successful implementation of the highly ambitious cost reduction and productivity improvement plan across the Group, the completion of our asset disposal programme and, finally, the upturn in manganese prices in the second half. The 2014-2017 cost reduction and productivity improvement performance plan has achieved €306 million in total gains since 2014 in terms of annual impact on current operating income compared with 2013. The goal was increased to €400 million at an annual rate as of the end of 2017. The asset disposal programme completed in 2016 had favourable impact of €142 million on the Group's net debt. It particularly concerned ERACHEM (manganese chemicals).

ERAMET's balance sheet structure also improved, notably thanks to the successful issue in September 2016 of net share settled undated bonds convertible into new shares and the two-year maturity extension to our revolving credit facility.

The Group's share of net income totalled -€179 million for 2016, with net debt divided by 4 compared with 2015. Capital expenditure decreased 19% to €217 million and was restricted to safety and strict maintenance of industrial assets, as decided in 2015.

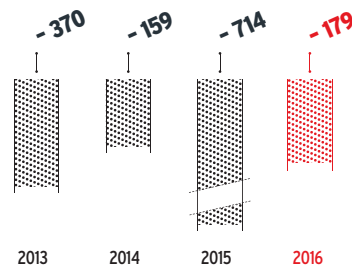
Net debt, at €836 million as of December 31, 2016, decreased from 2015. The net debt to equity ratio was 47% and net debt to EBITDA worked out at 2.2. ERAMET maintained substantial financial liquidity of €1.7 billion as of December 31, 2016. ●

**CURRENT OPERATING INCOME**  
(€ MILLIONS)



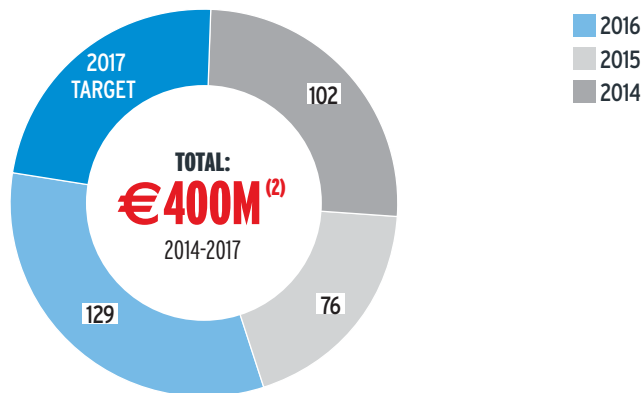
Substantial increase in current operating income in 2016.

**NET INCOME, GROUP SHARE**  
(€ MILLIONS)



The Group's share of net loss was divided by 4 compared with 2015.

**COST REDUCTION AND PRODUCTIVITY IMPROVEMENT** (€ MILLIONS)



Goal revised upward to €400 million <sup>(2)</sup>.



Find out more in our ERAMET Finance app

(1) The consolidated data shown is adjusted data resulting from Group reporting, in which joint ventures are accounted for using proportionate consolidation. See 2016 consolidated financial statements on the ERAMET website ([www.eramet.com](http://www.eramet.com)).

(2) As annual impact on current operating income compared with 2013.

# INCOME STATEMENT

## Sharp improvement in EBITDA and current operating income from 2015 to 2016



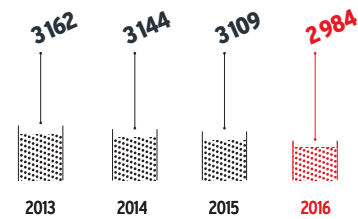
The ERAMET group's sales decreased 4% from 2015 to 2016. ERAMET Manganese held out well with a slight rise (1%), thanks to the upturn in manganese ore prices in the second half of the year and its competitive positioning, despite production being idled for almost one month in the first half of 2016. On the other hand, ERAMET Nickel's sales decreased 13% in 2016 compared with 2015, mainly due to the slump in LME nickel prices (down 19% on average vs. 2016). ERAMET Alloys' sales fell 4% over 2016.

The sharp improvement in EBITDA and current operating income from 2015 to 2016 is mainly due to:

- productivity efforts at SLN (ERAMET Nickel), where cash cost was reduced by 16% in 2016 compared with the 2015 average, at identical economic conditions;
- the performance of ERAMET Manganese in the second half of the year, with manganese prices rising sharply towards the end of the year.

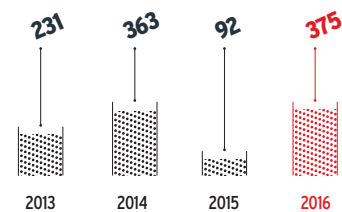
Operating income factors in the costs of studies on major projects, restructuring costs and impairment of assets. Net income for the period includes financial income and income tax. The Group's share of net income totalled -€179 million in 2015, after taking into account €58 million attributable to minority interests in net income for 2016. ●

**SALES**  
(€ MILLIONS)



Sales down 4% to €2,984 million.

**EBITDA**  
(€ MILLIONS)



Sharp increase in EBITDA in 2016 compared with 2015.

€ MILLIONS

	FY 2016	FY 2015
<b>SALES</b>	<b>2 984</b>	<b>3 109</b>
<b>EBITDA</b>	<b>375</b>	<b>92</b>
Amortisation and depreciation of non-current assets	(268)	(307)
Provisions for liabilities and charges	(23)	8
<b>CURRENT OPERATING INCOME</b>	<b>84</b>	<b>(207)</b>
Impairment of assets	(110)	(474)
Other operating income and expenses	(69)	(132)
<b>OPERATING INCOME</b>	<b>(95)</b>	<b>(813)</b>
Financial income	(79)	(90)
Share of income from associates	(2)	(1)
Income tax	(61)	(8)
<b>NET INCOME FOR THE PERIOD</b>	<b>(237)</b>	<b>(912)</b>
• attributable to minority interests	(58)	(198)
• attributable to the Group	(179)	(714)
Basic/diluted earnings per share (€)	(6.79)	(27.11)

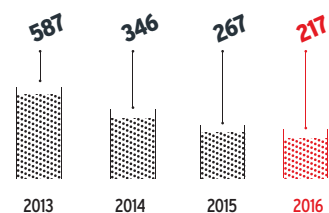


# NET FINANCIAL DEBT VARIATION

The Group's net financial debt totalled €836 million as of December 31<sup>st</sup>, 2016 compared with €878 million as of December 31, 2015. This change results from the following movements:

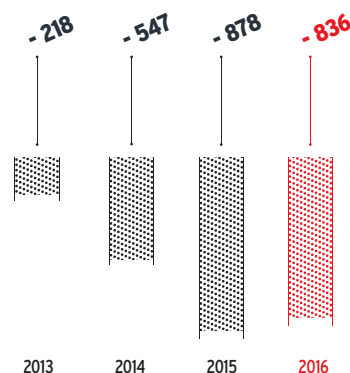
- €121 million net cash generated by operating activities (- €7 million in 2015):
  - + €147 million in cash generated from operations compared with - €160 million in 2015 because of the improvement in results in 2016 vs. 2015;
  - - €26 million in working capital variation due to the increase in activity in late 2016;
- - €187 million in net cash used in investing activities, of which mainly:
  - - €217 million in industrial capital expenditure;
  - - €97 million relating to the exercise of Mitsubishi's put option on Strand;
  - + €142 million impact of divestments (particularly ERACHEM, manganese chemicals).
- €100 million resulting from the bond issue (ODIRNAN);
- €8 million in exchange rate impact. ●

## INDUSTRIAL CAPITAL EXPENDITURE (€ MILLIONS)

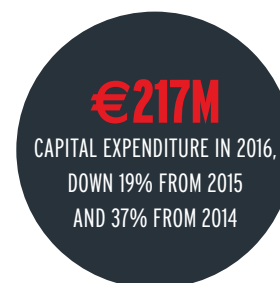


Industrial capital expenditure limited to €217 million, down 19% from 2015.

## NET DEBT (€ MILLIONS)



Net debt amounted to €836 million as of December 31<sup>st</sup>, 2016.



€ MILLIONS	FY 2016	FY 2015
<b>OPERATING ACTIVITIES</b>		
EBITDA	375	92
Cash impact of items below EBITDA	(228)	(252)
<b>Cash generated from operations</b>	<b>147</b>	<b>(160)</b>
Working capital variation	(26)	153
<b>Net cash generated by operating activities</b>	<b>121</b>	<b>(7)</b>
<b>INVESTING ACTIVITIES</b>		
Industrial capital expenditure	(217)	(267)
Other investing activity flows	30	(16)
<b>Net cash used in investing activities</b>	<b>(187)</b>	<b>(283)</b>
<b>FINANCING ACTIVITIES</b>		
ODIRNAN issue	100	-
<b>Net cash used in financing activities</b>	<b>100</b>	<b>-</b>
Exchange rate impact	8	(41)
<b>(Increase)/decrease in net financial debt position</b>	<b>42</b>	<b>(331)</b>
<b>Opening (net financial debt) position</b>	<b>(878)</b>	<b>(547)</b>
<b>Closing (net financial debt) position</b>	<b>(836)</b>	<b>(878)</b>



Find out more in our ERAMET Finance app

# BALANCE SHEET

**€1.7 BILLION**  
IN FINANCIAL LIQUIDITY AS OF  
DECEMBER 31<sup>ST</sup>, 2016

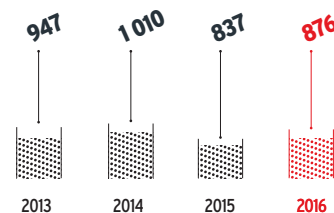
The Group's assets, as of December 31<sup>st</sup>, 2016 totalled €3,538 million compared with €3,704 million as of December 31<sup>st</sup>, 2015.

The €166 million decrease mainly results from:

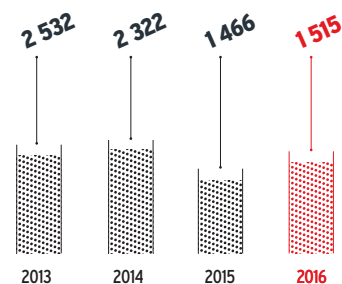
- **on the one hand**, a €185 million decrease in non-current assets, mostly because asset impairments were greater than capital expenditure, which was partly offset by a €19 million total increase in working capital,
- **on the other hand**, the decrease in provisions (- €72 million), financial derivatives (- €68 million) and net financial debt (- €42 million), with shareholders' equity stable from 2015 to 2016 at €1,776 million, while the Group's

share of shareholders' equity increased €49 million over the year to €1,515 million. The Group's market capitalisation amounted to €1,506 million as of December 31<sup>st</sup>, 2016. ●

## SIMPLIFIED WORKING CAPITAL (€ MILLIONS)



## SHAREHOLDERS' EQUITY, GROUP SHARE (€ MILLIONS)

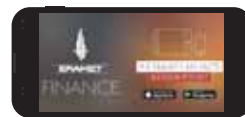


€ MILLIONS	31/12/2016	31/12/2015
<b>Non-current assets</b>	<b>2 818</b>	<b>3 003</b>
Inventories	933	974
Trade receivables	333	293
Trade payables	(390)	(430)
<b>Simplified working capital</b>	<b>876</b>	<b>837</b>
Other working capital items	(156)	(136)
<b>Total working capital</b>	<b>720</b>	<b>701</b>
<b>TOTAL</b>	<b>3 538</b>	<b>3 704</b>

€ MILLIONS	31/12/2016	31/12/2015
Shareholders' equity - Group share	1 515	1 466
Shareholders' equity - minority interests	261	313
<b>Shareholders' equity</b>	<b>1 776</b>	<b>1 779</b>
Cash and cash equivalents and other current financial assets	(1 698)	(630)
Borrowings	2 534	1 508
<b>Net financial debt</b>	<b>836</b>	<b>878</b>
Net financial debt/shareholders' equity (gearing)	47%	49%
<b>Provisions and employee-related liabilities</b>	<b>740</b>	<b>812</b>
<b>Net deferred tax</b>	<b>142</b>	<b>123</b>
<b>Derivatives</b>	<b>44</b>	<b>112</b>
<b>TOTAL</b>	<b>3 538</b>	<b>3 704</b>



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



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**Design and production:** MEANINGS

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**Translation:** Marcus Goddard

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**ERAMET**

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ALLOYS, ORES AND PEOPLE.