

IMnI Annual Review 2017

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The International Manganese Institute (IMNI) is a not-for-profit industry association that represents manganese ore and alloy producers, manufacturers of metallurgical products or chemical compounds, trading houses, industry service providers, companies involved in Mn business development, universities and research organizations around the world.

Founded in 1975, with headquarters in Paris, France, IMNI's mission is to provide vision and guidance to the Mn industry by promoting economic, social and environmental responsibility and sustainability to all stakeholders.

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Message from the Chairman



“2017 was a year of transition for the IMnI”

A new office, a new Executive Director, a new HSE & Regulatory Affairs Manager, and 11 New Members: 2017 proved to be a year full of changes for IMnI!

During this year, Anne Tremblay, who has been Executive Director of IMnI for 17 years, decided to retire and enjoy a different life style. We greatly appreciate her unparalleled commitment to IMnI and her contribution to driving our organisation to where it is today. We welcome Aloys d’Harambure as the new Executive Director, and we are sure that he will contribute with new ideas and renewed energy to the success of IMnI.

At the end of 2017, IMnI represents 70 major companies from the manganese industry. Our Members benefit from the best market research available, as our figures are collected directly from the world’s biggest producers of manganese.

Recently we started collecting and publishing manganese metal production figures on a monthly basis, and forecasts for manganese alloy and ore demand, in collaboration with CRU. In September 2017 we hired Brandon Cline as Health, Safety & Environment (HSE) and Regulatory Affairs Manager, to better defend you vis-a-vis regulators and government officials. Our events are also the undisputed industry get-together, thanks to a fine line-up of speakers, good timing, attractive locations and large turnouts.

In 2018, we plan on further improving IMnI’s “value-proposition” by publishing more statistics on manganese chemicals, organising a new technical event in Asia, and improving our HSE service with new studies.

All this to better serve IMnI Members in this new cycle of our industry, and of our Institute.

Pedro Larrea
IMnI Chairman

Message from the Outgoing Executive Director



“After 17 years of heading up the IMnI, Anne Tremblay retired in July 2017. We thank her for her long-standing commitment and wish her a good retirement.”

Anne’s farewell message:

I am now off to start a new and exciting part of my life, commonly referred to platitudinously as retirement. While I believe I am leaving the IMnI in a better state than that in which I found it, there is still plenty to do. I am confident that my successor, Aloys d’Harambure, will continue to develop and grow the Institute to meet your current and future needs.

My job has been challenging, fulfilling and fun, and I am grateful for having had the privilege to do it. But the biggest “perk” were the many exceptional people I met and worked with over the years. And some of you became friends. Thank you for having been there and given your time and support on so many occasions. Without you, the IMnI would not exist.

Again, many thanks for everything,

Anne Tremblay
IMnI Outgoing Executive Director

Message from the Incoming Executive Director



“A new cycle for the manganese industry and for IMnI”

IMnI entered a new cycle in 2017, as Anne Tremblay retired in July after having developed the Institute for 17 years. I feel honored to have been appointed by IMnI Members to continue developing IMnI as Executive Director, and to work with the 3 dedicated professionals of the IMnI staff.

In 2017, the International Manganese Institute continued to develop, gaining new Members, publishing new market research information, hiring new staff and continuously supporting the manganese industry.

As China is now entering a period of slower growth, focusing on the service sector and environmental protection, the manganese industry is also entering a new cycle. No comparable growth engine will replace China in the short term, but India and South East Asia are rapidly developing, and their needs in industrialisation and urbanisation are tremendous.

Over the last few months, we have seen 3 IMnI Members starting manganese alloys furnaces in Malaysia, and we have decided to organise the 2018 IMnI Annual Conference in Kuala Lumpur, with a technical tour in Borneo Island to visit these 3 plants, OM Sarawak, Pertama and Sakura.

We look forward to welcoming you to Kuala Lumpur in June 2018!

Aloys d’Harambure
IMnI Executive Director

IMnI in 2017

January – March

- IMnI hosts its 14th EPD (Electrolytic Products Division) Conference in Changsha, China, on Monday, March 20th, with its 3 Chinese industry organization partners and the help of CITIC Dameng. The event is a major success once again, as it remains the premier global Mn Metal and Mn Dioxide Conference.
- IMnI is again well represented at the Metal Bulletin's 18th Asian Ferroalloys Conference held in Hong Kong. The Mn session, moderated by Executive Director Anne Tremblay, features Guohong Deng, President of Mengfa Ferroalloys, Xiaoguang Jin, Vice General Manager for Minmetals Development Co., Ltd, Erwin Schaufler, General Manager Marketing for South32, James Jin Shik Choi, CEO & Chairman for Simpac Metals and IMnI Market Research Manager Aloys d'Harambure.
- IMnI's Annual China Banquet attracts over 70 representatives from Chinese Mn companies came to meet Western producers in Hong Kong. This yearly event aims to improve ties between Members and allows IMnI to send a special message to the Chinese. This edition is hosted jointly by Asia Minerals, Autlan, Eramet Comilog Manganese, Glencore AG, OM Holdings, Ore & Metal Company, South32, Tshipi é Ntle and United Manganese of Kalahari.
- Dameng Resources Limited (China) join as Affiliate Member.

April – June

- IMnI's 43rd Annual Conference takes place in Miami. Structured around the theme "O Brave New World – Where to From Now", main speakers include: Robert Ward, Editorial Director for The Economist Intelligence Unit, Michael Van Hoey, Partner at McKinsey & Company, Patrick McCormick from World Steel Dynamics, Rafael Rubio, Manager Director for ALACERO. Generous sponsors include Georgian American Alloys, Autlan, Asia Minerals Ltd and Eramet Comilog.
- IMnI moves to new offices in Paris, rue de Londres.
- Hascor Group (USA) join as Ordinary Member, Oldendorff Carriers (Singapore). One of the world's largest dry bulk shipping companies, Shaanxi Sinian Metal & Mining Co., Ltd., one of the biggest manganese ore trading companies in China, Guangxi Steel Raw Material Trading Co. Ltd. and Galmet S.p.A. join as Affiliate Members.

July – September

- Anne Tremblay retires after 17 years as IMnI Executive Director.
- Aloys d'Harambure, former IMnI Market Research Manager, succeeds Anne Tremblay as IMnI Executive Director.
- Aloys d'Harambure, IMnI Executive Director, moderates the “manganese round-table” at Metal Bulletin’s North American Ferroalloys Conference 2017 in Chicago.
- Brandon Cline, Phd, replaces Dr Doreen McGough as IMnI HSE and Regulatory Affairs Manager.
- Grupo Maringa (Brazil) join as Ordinary Member, while Arizona Mining Inc. (USA) and Harcan Engineering (China) join as Affiliate Members.

October – December

- Aloys d'Harambure, IMnI Executive Director, visits IMnI Members and meet potential Members in Malaysia, Singapore, Japan, South Korea and China.
- Aloys d'Harambure, IMnI Executive Director, moderates the Manganese session at Metal Bulletin’s 33rd International Ferro-Alloys Conference in Lisbon.
- Dr Brandon Cline, IMnI HSE & Regulatory Affairs Manager, visits environmental regulators in Canada to discuss the environmental assessment of Mn.



Manganese in 2017

January – March

- OM Holdings begins ferro-manganese production in Malaysia.
- China fights steel overcapacity by hiking power cost for companies operating outdated plants.
- Heavy rains hit South African manganese ore output, leaving spare logistics capacity.
- India's Dharni Sampda plans to increase Mn ore production at its Bondoukou mine in Ivory Coast.
- Indian private-sector company Shyam Sponge and Power (SSPL) to build new Mn alloy furnace.
- Ukraine's Nikopol plant to restart idled SiMn furnace.
- Brazil Manganese Corp. (BMC) project ramps up ore output.
- India's Electrosteel seeks approval for new plant with 35Kmtpy FeMn or 25Kmtpy SiMn capacity.
- Afarak switches second SiMn furnace to ferro-chrome production at Mogale in South Africa.
- Kramatorsk Ferroalloys Plant (KFP) in Ukraine's Donetsk region affected by rail blockade.
- Canadian firm Maxtech Ventures forms a joint venture to develop the Buritirama Mn mine in Brazil.
- Tshipi expected to attract global interest as investment bank approaches manganese players.

April – June

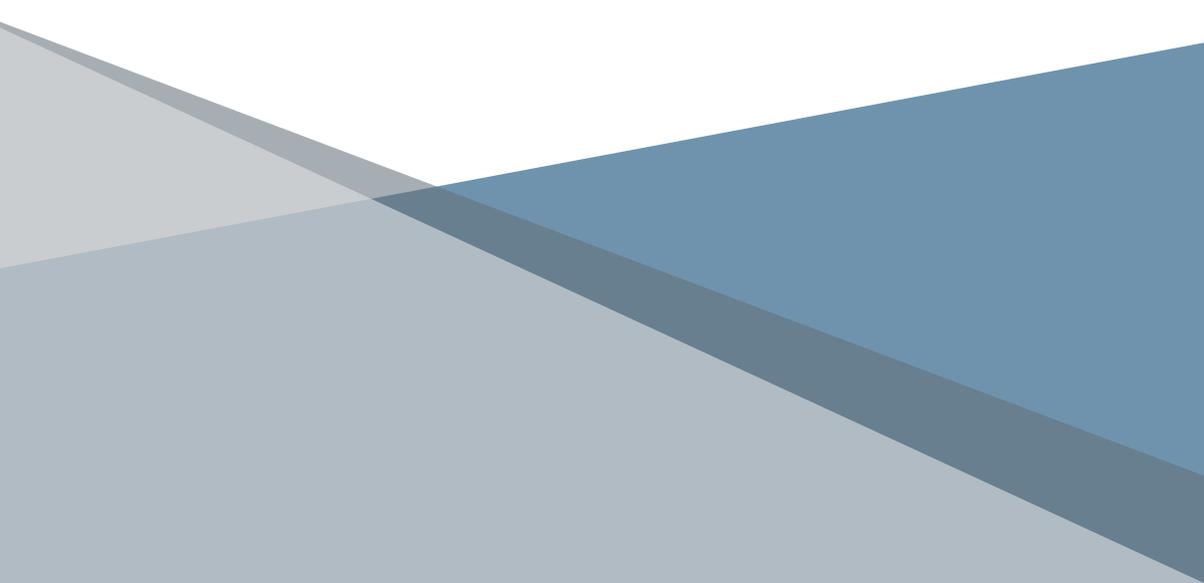
- China's Ningxia Tianyuan to build 400Kmtpy electrolytic manganese metal plant in Ningxia province.
- Giyani targets Mn deposits in Botswana & Zambia to supply electrolytic Mn flake to battery market.
- Gulf Manganese aims to run 8 furnaces to produce low and medium carbon FeMn in Indonesia.
- OMH restarts Australian Bootu Creek manganese ore mine.
- Tshipi manganese mine attracts at least ten offers.
- Maxtech forms strategic partnership to expand Mn exploration into Morocco.
- India's Berry Alloys to boost Mn alloy capacity.
- Low-grade manganese ore volatility reflects fragmented market.
- OM Holdings starts up a fourth manganese alloys furnace in Malaysia
- Surface sampling confirms Giyani's thesis of high-grade manganese in South-Eastern Botswana.
- India's Abhijeet plans to ramp up SiMn output.

July – September

- India's Godawari Power to double production capacity at its manganese-alloy plant in Chhattisgarh.
- France to stop selling gasoline and diesel-fuelled cars by 2040, supporting electric vehicles demand.
- India's Real Power targets manganese alloy production in Chhattisgarh.
- Russia plans investment in country's largest manganese field to reduce dependence on imports.
- Chinese stainless steelmaker Tsingshan Steel to build a manganese metal plant in Indonesia.
- Positive sentiment in Chinese steel market helps manganese ore prices to move higher.
- China's TMI injects A\$30m into Woodie Woodie manganese restart.
- China's Ningxia Tianyuan (TMI) to restart operations at the Woodie Woodie Mn mine in Australia.
- A scientific finds that adding manganese atoms increases solar cell energy conversion by 300% on solar panels.
- Ghana government to exploit manganese deposits in Western & Northern regions of the country.
- Government-owned MOIL in India to increase manganese ore output to 3 Mt/y by 2030.
- Gulf secures ore supply for Kupang smelter in Indonesia.



October - December

- A quiet market in China dictates steady prices.
 - Maxtech and Sarawagi start strategic cooperation in India.
 - Meridian Mining (formerly Brazil Manganese Corporation, BMC) boosts its Mn ore capacity in Brazil.
 - Montezuma Mining Company upgrades Butcherbird manganese resource in Australia.
 - Transnet works on port recovery in Richards Bay after storms.
 - Ore prices move lower following declines in the Chinese port market.
 - Tshipi shareholders cancel sale process; Jupiter considers its own strategic future.
 - Ferroglobe buys Glencore's European manganese alloy plants.
 - Nigeria seeking to develop ores and alloys, including manganese.
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Market Overview

“2017 marked the recovery of the manganese industry”

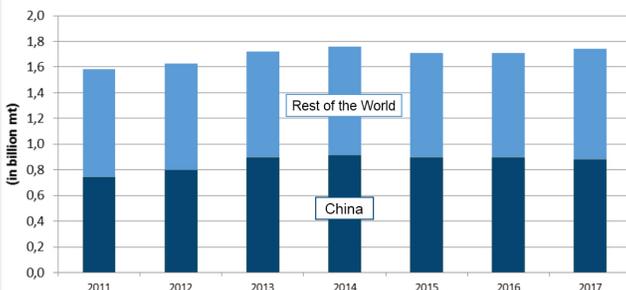
Steel: China finally curbs overcapacity in steel industry, and steelmakers in the rest of the world increase production.

Global crude steel production continued increasing in 2017 for the second consecutive year, according to preliminary estimates. It reached 1.73 billion mt, up by 1.1% from 1.71 billion mt in 2016, but still below the 2014 peak of 1.76 billion mt. With 873 million mt produced according to a first estimate based on CRU data, China remains by far the world's biggest producer, although its output continued to contract in 2017 for the third consecutive year. It was 2.4% lower than the 895 million mt produced in 2016. China is finally fighting overcapacity, due to international pressure to reduce its steel exports, and also to reduce environmental pollution.

China's government plans to cut steel capacity by 100 to 150 million mtpy by 2020. In 2017, we saw government-ordered curbs on heavy industry to tackle air pollution and winter smog in northern China, and the elimination of old induction furnaces (more than 500 steel producers were using induction furnaces in 2016, and according to local sources they stopped all production in 2016 and 2017). Because of trade actions in Western countries, and as Chinese steelmakers focused more on their domestic market, exports from China dropped by 30% YoY in the first 10 months of 2017, to 64.5 million mt. These lower shipments from China obviously benefited steelmakers in the rest of the world, where output increased by 5% in 2017, to 857 million mt.

Monthly steel production statistics by country are available [here](#) (for IMnI Members only).

Steel Production in China vs the rest of the World
2011 - 2017

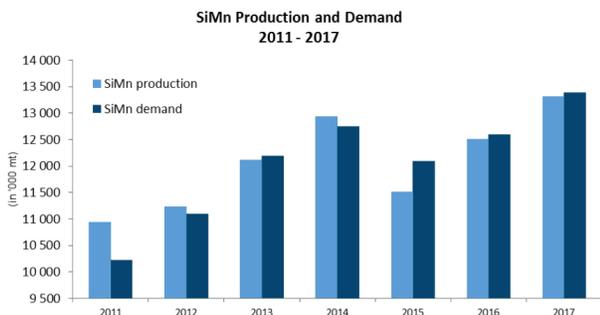


Source: World Steel Association, CRU, IMnI

Steel Production (in billion mt): 1.7% higher YoY in 2017, to 1.74 billion mt: lower production in China was compensated by rising output in the rest of the world

Source : World Steel Association, CRU, IMnI

Silico-manganese: production reached a new record high in 2017, on rising output in Asia



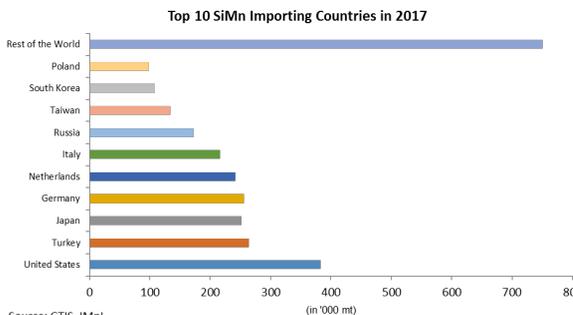
Silico-manganese production (in '000 mt): up by 6.5% in 2017 to 13.3 million mt, a new record high, driven by increasing demand from steelmakers

Source: IMnI

The world's output of SiMn totaled 13.3 million mt in 2017 according to preliminary estimates, up by 6.5% from 2016 and reaching a new record high.

China's production was 8.2 million mt, up by 2.5% from 2016 and representing 62% of total output. India and Malaysia also increased production dramatically in 2017.

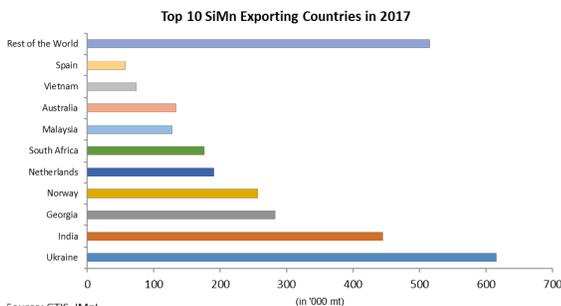
Statistics for production, demand, inventory and trade of Mn ore & alloy are available by region [here](#) (for IMnI Members only), and by country [here](#).



Source: GTIS, IMnI

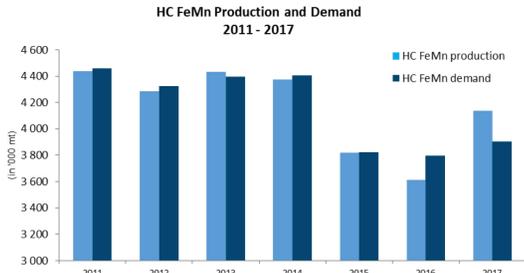
Biggest SiMn Importers (in '000 mt): the USA remains the biggest importing country in 2017, followed by Turkey and Japan

Biggest SiMn Exporters (in '000 mt): Ukraine is the biggest SiMn exporting country in 2017, in spite of the 26.35% anti-dumping duty imposed by Russia in 2016



Source: GTIS, IMnI

High-carbon ferro-manganese: production recovered in 2017 on rising China output

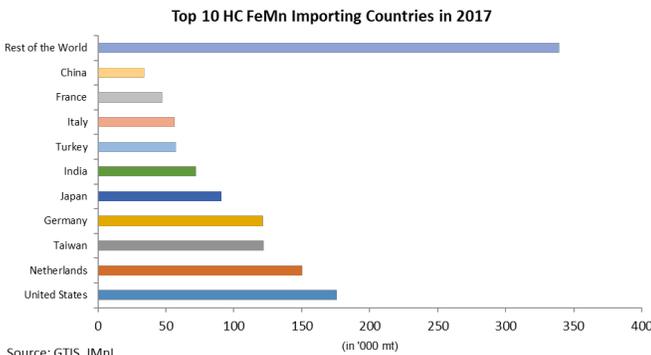


Source: IMnI

High-carbon Ferro-manganese Production (in '000 mt): 4.1 million mt in 2017, up by 14.5% YoY

Global high-carbon ferro-manganese production increased to 4.1 million mt in 2017 according to preliminary estimates, up by 14.5% from 3.6 million mt in 2016. China's production was 1.6 million mt, up by 22% from 2016 and now representing 38% of total output.

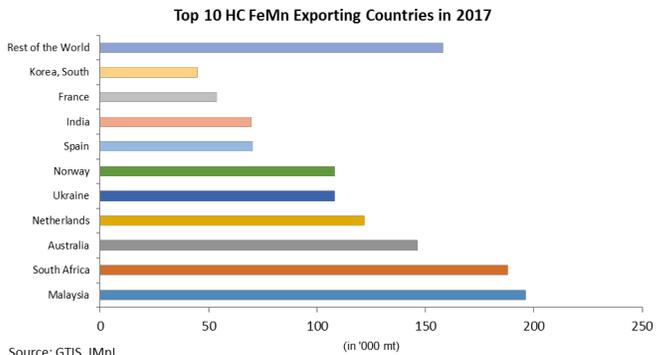
Statistics for production, demand, inventory and trade of Mn ore & alloy are available by region [here](#) (for IMnI Members only), and by country [here](#).



Source: GTIS, IMnI

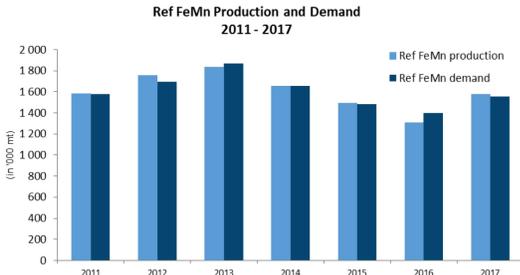
Biggest HC FeMn Importers (in '000 mt): the USA remains the biggest importer in 2017, followed by the Netherlands and Taiwan

Biggest HC FeMn Exporters (in '000 mt): Malaysia became the world's biggest HC FeMn exporter in 2017, followed by historical suppliers like South Africa, Australia, Europe, Ukraine and India



Source: GTIS, IMnI

Refined ferro-manganese: rising output in 2017

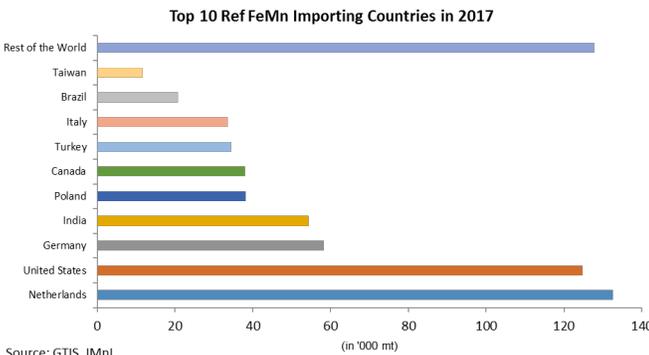


Source: IMnI

Refined Ferro-manganese Production (in '000 mt): 1.6 million mt in 2017, up by 20% YoY

Refined ferro-manganese production increased in 2017 after contracting from 2014 to 2016. It reached 1.6 million mt in 2017 according to preliminary estimates, up by 20% from the previous year. China's production was around 0.7 million mt, up by 22% YoY.

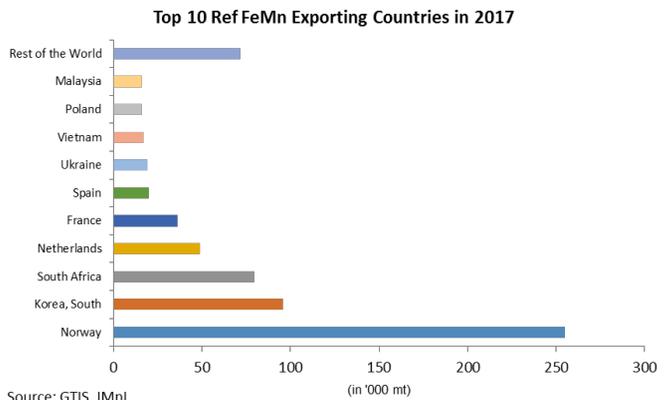
Statistics for production, demand, inventory and trade of Mn ore & alloy are available by region [here](#) (for IMnI Members only), and by country [here](#).



Source: GTIS, IMnI

Biggest Ref FeMn Importers (in '000 mt): Europe was the biggest importer in 2017, followed by the USA

Biggest Ref FeMn Exporters (in '000 mt): Norway is the world's biggest exporting country in 2017, followed by South Korea and South Africa

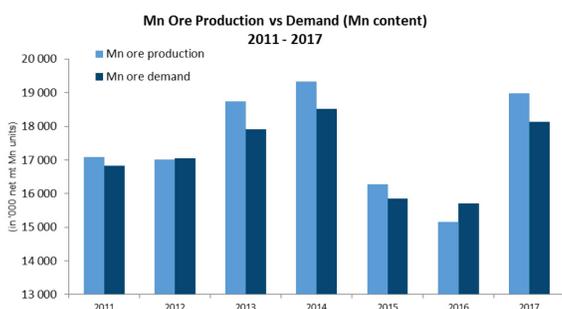


Source: GTIS, IMnI

Manganese Ore: 2017 production almost back to the record high of 2014

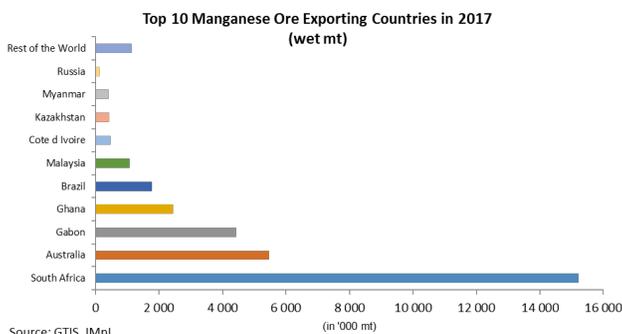
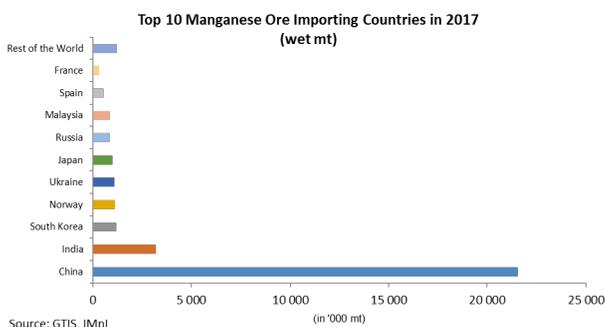
After widespread production cuts in 2015 and 2016, marked by a volatile market, the manganese industry recovered in 2017, and the market stabilised. Global production was around 19 million mt Mn units, up by 25% from 2016, and just under the 2014 record of 19.3 million mt. Most of the output growth in 2017 came from Africa, where miners increased production by 49% YoY according to preliminary estimates, especially in South Africa, Gabon and Ghana. Georgia and Ukraine also increased production significantly in 2017. This sharp rise in global manganese ore output was due to growing demand from the manganese alloy sector, in Asia and the CIS especially.

A database of manganese producers and future projects is available [here](#) (for IMnI Members only).



Manganese ore production (in '000mt Mn units): up by 25% to 19 million mt Mn units, on rising production in Africa to meet the growing needs of Asia and the CIS

Biggest Manganese Ore Importers (in '000 wet mt): China remained the biggest consumer of seaborne ore, and its imports increased to 21 million mt in 2017 according to preliminary statistics (up by 23% from 17 million mt in 2016), on falling low-grade domestic output

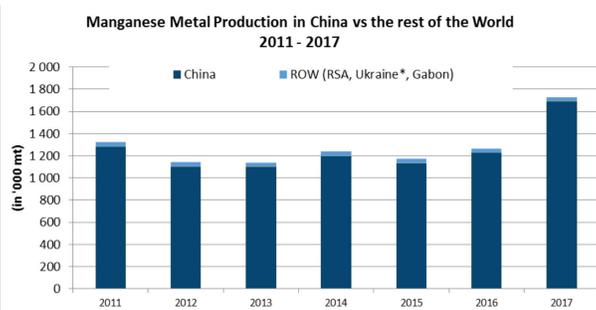


Biggest Manganese Ore Exporters (in '000 wet mt): South Africa's share of global Mn ore trade increased to 46% in 2017 (from 42% in 2016), as shipments rose 38% to 15 million mt according to preliminary statistics, on rising demand from China

Manganese Metal: Rising production driven by growing stainless and special steel output

Global manganese metal production reached 1.73 million mt in 2017, rising sharply (+37%) from 1.26 million mt in 2016, because of a rise in Chinese production, now representing 98% of the world's manganese metal output. Production in China expanded by 38% in 2017, to 1.7 million mt, as Ningxia Tianyuan started its new 300,000 mtpy production line in Ningxia province in October 2016. In the rest of the World, Privat in Ukraine and Eramet in Gabon increased production by 30% and 7%, respectively, while output remained stable for MMC in South Africa.

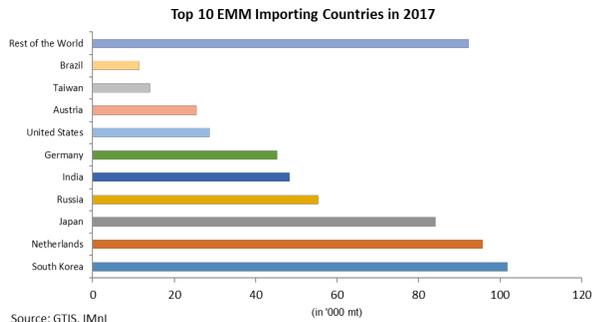
Monthly EMM production statistics are available [here](#) (for IMnI Members only):
 - by country in IMnI Monthly Manganese Metal Production Data
 - by province in China in IMnI Monthly Data - China



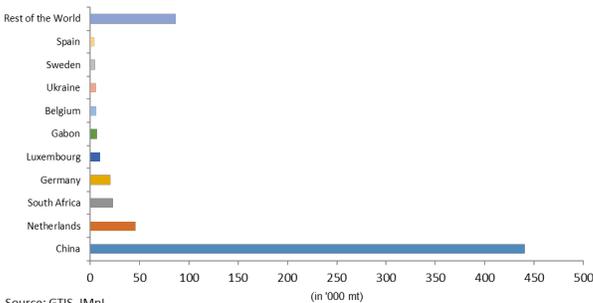
Manganese Metal Production (in '000 mt): 37% higher YoY in 2017, to 1.73 million mt, due to a rise in production by Ningxia Tianyuan in China

* Manganese metal produced at Privat's plant Zaporozhye in Ukraine is aluminothermic manganese metal, not electrolytic

Manganese Metal Biggest Importers (in '000 mt): South Korea, Europe and Japan are the biggest EMM importers in 2017



Top 10 EMM Exporting Countries in 2017



Manganese Metal Biggest Exporters (in '000 mt): China is by far the world's largest EMM exporting-country, followed by the Netherlands and South Africa

IMnI Market Research

IMnI provides the most comprehensive manganese industry market research available

Circulated on a monthly basis, IMnI's reports (<http://www.manganese.org/market-research/monthly-reports>) examine both production and consumption, and the balance between the two, looking at the industry from both sides of the supply demand equation. The primary objective of these reports is to offer an analysis of the immediate past, which can provide the basis for Members to develop a greater understanding of their business.

IMnI Executive Director Aloys d'Harbure examines manganese ore and alloy consumption as they relate to the steel industry with the application of an industry model. This systematic approach provides increased accuracy to better understand and anticipate changes in the industry. A detailed analysis of IMnI data is also published on a monthly basis.

Our China and Rest of the World Weekly Reports summarise the most important news of the industry. Accessible [here](#) (for IMnI members).

IMnI also issues monthly trade matrices for Mn Ore, Alloys, EMM and EMD <http://www.manganese.org/market-research/trade-data-and-information>, a steel production report <http://www.manganese.org/market-research/extra-information>, and a database of current and future manganese producers <http://www.manganese.org/market-research/extra-information/world-mn-projects>. All IMnI data is available via our website www.manganese.org



Message from the Statistics Committee Chairman

“The quality of IMnI market research keeps improving, with new information published for IMnI Members”



Guillermo Recio

IMnI Statistics Committee Chairman

IMnI statistics and market research reports represent one of the most important services IMnI Members benefit from. Our statistics are considered the most accurate in the manganese community, as they are based on data collected on a monthly basis from major manganese ore, alloy and metal producers. Confidentiality for producers is ensured with a 6-month time-lag in production data by country, but production figures by region are published with a data time-lag of only 1 month (i.e. in January, December's data is published). IMnI reports analyse production, demand, but also inventory and trade for all manganese products.

In 2017, we have improved IMnI market research reports with new information. Manganese metal production and trade figures have been added to the Annual Report. Forecasts for Mn alloy and ore demand in the coming 5 years are now published twice a year, in collaboration with market research company CRU, based in London. An IMnI Booklet has been published for the first time in 2017, with a summary of IMnI's figures for silico-manganese, ferro-manganese, manganese ore and manganese metal. For the first time, electrolytic manganese dioxide (EMD) figures have been published by grade (alkaline, lithium manganese oxide, and carbon-zinc grade).

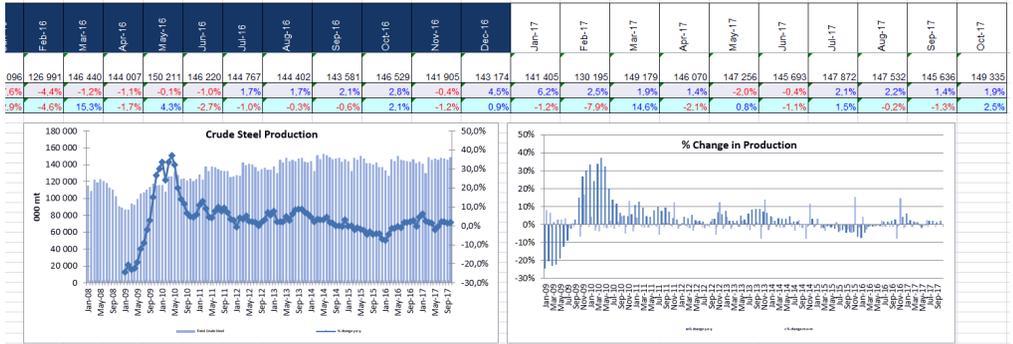
In the future, we plan to continue improving the quality of IMnI reports by publishing more information on manganese chemicals, a sector of the industry that is developing rapidly with the growth of battery needs.

Objectives of the IMnI Statistics Committee

- *Represent IMnI Members in their expectations regarding market research and statistics.*
- *Identify best market research report formats and practices.*
- *Standardize units of measure for reporting metrics.*
- *Support the IMnI Staff by validating estimates of production and demand for some countries.*

Statistical packages are available for non-Members: enquire at stats@manganese.org

Market Research



Manganese Companies Around the World

(for any questions or comments please contact stats@manganese.org)

Product Type	Country	Region	Company	Current capacity (in '000 mtpy)	Production Status	Details	If stopped, date of closure	Submits Production Figures or Estimates	Contact
Mn Ore	China	Asia	Other mines in China	23 500	active	Songtao Miao Autonomous County in the province of Guizhou		estimated	
Mn Ore	Australia	Oceania	Groote Eylandt Mining Company (GEMCO) (South32)	5 600	active	South32 owns a 60% interest in this open-pit mine		submit stats	http://www.manganese.org
Mn Ore	Gabon	Africa	Eramet - Moanda	4 680	active			submit stats	http://www.manganese.org
Mn Ore	South Africa	Africa	United Manganese of Kalahari (Pty) Ltd (UMK)	3 800	active	is a wholly owned subsidiary of Russia's Renco Group		estimated	
Mn Ore	South Africa	Africa	South 32 - Mamatwan (mine + sinter plant)	3 800	reduced	South32 owns a 44.4% interest	2016	submit stats	http://www.manganese.org
Mn Ore	Ghana	Africa	Ghana Manganese (subsidiary of Consolidated Minerals)	3 000	active			submit stats	http://www.manganese.org
Mn Ore	Indonesia	Asia	Bracklen	3 000	active	average grade 48%Mn		estimated	
Mn Ore	South Africa	Africa	Assmang - Black Rock	3 000	active	situated in the Kalahari ore belt in South Africa		submit stats	http://www.manganese.org
Mn Ore	South Africa	Africa	Tshipi & Nile Manganese Mining (subsidiary of OMI)	2 500	reduced	Tshipi Borwa manganese mine	2016	submit stats	http://www.manganese.org
Mn Ore	South Africa	Africa	Kalagadi	2 400	active	only a sinter plant, they do not mine Mn ore as owned by TrPoint Group, stopped 2014 & 2015		estimated	
Mn Ore	Kazakhstan	CIS	Keregetas (& other mines)	2 300	active			estimated	
Mn Ore	Ukraine	CIS	Marganetsky Ore Mining & Processing Complex	2 004	active	ramped up manganese ore concentrate production		submit stats	http://www.manganese.org
Mn Ore	Brazil	South America	Vale - Azul	1 727	active	high grade		submit stats	http://www.manganese.org
Mn Ore	Ukraine	CIS	Ordzhonikidze Ore Mining & Processing Complex	1 596	active	resumed output of manganese ore pellets in February 2017		submit stats	http://www.manganese.org

IMnI offers the most comprehensive and detailed statistics available on manganese.

Manganese production, demand and inventory statistics collected directly from IMnI Members on a monthly basis

Monthly import and export data by country for manganese ore, silico-manganese, high-carbon and refined ferro-manganese, manganese metal and manganese dioxide.

Steel production report, country-by-country every month

Complete database of manganese producers by product and by country (with capacity, current production status etc.) and future projects.

II - SiMn



Global SiMn production increased for an 8th consecutive month in October, to 1.38 million mt (up 1% MoM and 32% YoY), a new record high. January to October production was almost 7% higher YoY, as rising output in Asia and the CIS offset lower production in Europe and the Americas.

- **Asia & Oceania:** output increased in October in China (to 941,000 mt, record high) and Malaysia (new record high). YTD output in the region was 7% higher YoY.
- **CIS:** production was up by 5% MoM and 10% from October last year. YTD output increased by 9%, as all countries except Ukraine ramped up output in the first 10 months of the year.
- **Europe:** rising production in October in France and Slovakia was offset by lower output in Norway.

	SiMn Supply & Demand in October 2017						
	(in '000 mt)	Supply	MoM % Change in Supply	YoY % Change in Supply	Demand	YoY % Change in Demand	Supply & Demand Balance
Asia & Oceania	1 158	1%	40%	7%	1 095	1%	63
C.I.S.	323	5%	10%	9%	64	4%	259
Europe	44	-2%	-6%	-5%	102	8%	-58
Americas	31	-3%	-13%	-1%	72	4%	-41
Africa & Middle East	20	2%	-16%	21%	25	3%	-5
World	1 577	1.0%	31.2%	6.7%	1 357	1.9%	220

Source: International Manganese Institute (IMnI)

Health, Safety & Environment (HSE) Committee

Always up-to-date with the latest science and Regulatory Affairs

Mn in the Environment: Environmental exposure has taken center stage in the past years with Mn gaining a prime seat. North American regulators have spear-headed projects related to Mn in the environment with the U.S. Environmental Protection Agency, as well as multiple Canadian authorities working hard to review and identify Mn environmental safe limits.

Reducing environmental limits will have a direct impact on IMnI Members and their businesses, says IMnI HSE Committee. To this light, the IMnI has been involved through monitoring and contributing towards the environmental assessments carried out by the North American authorities – work continues with anticipated draft limits to be published starting in 2019 and up to 2021.

Suggested link to Mn and child neuro-development: In the same vein as Mn in the environment but with a possible health implication, many studies have been published suggesting a negative link between Mn environmental exposure and poor neurodevelopment in children. To face this storm, an IMnI collaborative project with the Manganese Interest Group (MIG) in the USA was started. This project seeks to understand if the insinuated link is valid. While the project made giant steps forward, it was later halted by a series of peer-reviewed literature being published in 2017 which needed to be included in the review. The final outcome of this project is anticipated for publication in a peer-reviewed journal by Q4 2018.

Manganese-based slags: IMnI HSE Committee identified that Mn slags have the potential to increase profitability within and without the Mn business. To this end, Risk & Policy Analysts (RPA), based in the UK, was contracted to identify those key properties within Mn slag that make them unique to different applications. It was clear from their analysis that the cement, brick and glass industries heavily rely on Mn slags as raw materials. With newly identified wider uses for Mn slags, 2017 focused its efforts on understanding any potential human health or environmental impact that could arise from the expanded use of Mn slags - work on hazard characterization of Mn slags is on-going and expected to be completed in Q2 2018. The project continues to move forwards on schedule and Members can expect to have a workshop around the 2018 Annual Conference with the aim of having manganese-based slags reclassified globally as a non-hazardous by-product suitable for use in identified industries.



Manganese & Neurodevelopment

A possible threat for the whole manganese industry

The possible negative effect of environmental Mn exposure and neurodevelopment is a concern that had increased intensity in 2017. As such, Mn will be assessed by various governments around the world, with the USA and Canada taking the lead. While Canada is currently focused purely on environmental limits, the USA is considering re-assessing air concentration limits. Although the bulk of the literature is suggesting a negative link between Mn and neurodevelopment, it is important to note that 2017 also saw an uptick in studies demonstrating a positive effect of Mn on neurodevelopment.

Together with the Manganese Interest Group in the USA, IMnI has commissioned a systematic review of the most relevant literature insinuating a negative effect of Mn for neurodevelopment. This review will critically assess the soundness of these studies and address issues of statistical analysis, biomarkers used, and incomplete data reporting found in these studies. Regardless of the outcome of this review, and future studies commissioned by the IMnI, it is vital to heed that the potential for Mn to be neurotoxic will always be a major concern and that it is imperative for the Mn industry to actively curb all fugitive environmental release.

The best available science dictates that Mn is only neurotoxic under conditions consisting of high levels at prolonged periods of time. Despite this, some environmental activists insist on decreased environmental limits and even banning Mn which not only will significantly impact the Mn industry but will also have a direct impact on industries dependant on Mn including steel, automotive and renewable energy.



Message from the HSE Committee Chairman



“Tackling complex sensitive issues while maintaining value”

I joined the HSE committee in June as a representative from Ore & Metal Company and was honored to be appointed as HSE Committee Chairman in September. I am lucky to have taken over from the outgoing Chairwoman Sophie Le Pennec (Eramet), who has done a phenomenal job during her term. Our first major task was to recruit a new HSE & Regulatory Affairs Manager to take over Dr Doreen McGough, who was leaving the Institute after 8 years. To this effect, the IMnI HSE department welcomed Dr. Brandon Cline into the role of HSE & Regulatory Affairs Manager in September.

2017 was a challenging year for the IMnI HSE department, not only because of the staff changes but also largely due to the proliferation of published literature suggesting a negative link between environmental Mn exposure and poor childhood neurodevelopment. Although the Committee has made some progress in tackling this issue via the initiation and participation in a number of technical reviews and studies, the Committee still believes that these environmental exposure issues will be the main bottleneck for the Mn industry in the short to medium term and have thus placed it at the top of their agenda.

As I see it, the major threats for the manganese industry are centered around environmental pollution and its effects (both actual and perceived) on the community. Therefore, as the HSE Committee Chairman, I plan to address those issues that impact our industry's image by working in tandem with downstream Mn users such as the steel and electronics industry, as well as creating a platform for discussions with regulators, authorities and academia. To this end, improving industry's image from an environmental perspective will be at the forefront and will thus be included in all future HSE Committee projects as a key focus.

Misconceptions affect image which could result in an indirect negative effect on profitability. Therefore, as first steps, we aim to publish peer-reviewed papers which can significantly impact and address these Mn toxicology misconceptions. I believe such clarifications can be of immense benefit not only to IMnI members, but to the manganese industry as a whole.

Rocklin Reed
IMnI HSE Committee Chairman

Rocklin Reed joined the Ore & Metal Company as Group Senior Manager for Safety Health Environment Risk & Quality (SHERQ) in 2017. After initially studying and qualifying in the field of Analytical Chemistry, Rocklin has fulfilled various HSE Specialist, Project and Leadership roles within BHP Billiton (Aluminium) and Rio Tinto (Titanium and Heavy Minerals) over a period of 21 years.

HSE: Social Responsibility

The mission of the HSE Committee is to develop the IMnI as the platform for providing the Mn industry with guidance, tools and information that will allow it to anticipate occupational health, environment and safety demands whilst improving worker safety, sustainability and ensuring industry profitability. To support this mission, the committee answers three main objectives:

- *To identify those HSE topics that can impact on the Mn industry and to provide answers.*
- *To establish and employ a global network that can provide appropriate HSE expertise to IMnI, when necessary.*
- *To provide relevant information and support to members enabling them to promote and proactively ensure their interests when faced with new regulatory demands.*

Electrolytic Products Division (EPD)

The IMnI Electrolytic Products Division (EPD) :

- Focuses on electrolytic manganese metal (EMM), electrolytic manganese dioxide (EMD) and other manganese chemicals (MnSO₄, Mn₃O₄, MnO, etc.)
- Collects production and trade data on electrolytic products
- Provides coverage and weekly analysis of EMM and EMD markets in China through on the ground investigation by IMnI China Representative
- Acts as a forum for discussion of industry matters, particularly those relating to health, safety, environment and regulatory affairs

Global Electrolytic Mn Metal (EMM)

continues to be almost exclusively produced in China, which accounts for over 97% of total world production. China produced an estimated 1.7 million mt of the metal in 2017. Much of this output is used within the country to produce the stainless steel 200 series (SS200) and specialty steel. China also exported over 440K mt of EMM in 2017, which is 7% more than in 2016. Other applications for which EMM is a vital ingredient include aluminium, batteries and high-strength steels.

Electrolytic Mn Dioxide (EMD) is a vital ingredient in the production of alkaline batteries, an essential part of our daily lives. The EMD industry is smaller than that of Mn alloys and EMM but no less important. Total annual production capacity is roughly 430K mt. IMnI EMD members are present throughout the world, supplying major battery companies like Energizer and Duracell. Members include Citic Dameng in China, MOIL in India, Prince/Erachem in the USA & China, Quintal in Columbia, and Tosoh in Greece & Japan.

IMnI represents a forum where EMD members can work to strengthen the industry and ensure a sustainable future marketplace. In 2017, IMnI started collecting EMD production figures by grade, available [here](#) (for IMnI Members only)



China Committee

Mr. Li Weijian, Vice Chairman & CEO of CITIC Dameng Mining Industries, has been elected as China Committee Chairman in June 2017, in replacement of Mr. Jin Xiaoguang, Vice General Manager of Minmetals Development Co., Ltd.

With more Chinese companies joining the IMnI in 2017, the China Committee decided to add an additional seat for SPIC Jinyuan Suiyang Industrial Co., Ltd., bringing the Committee to a total of 7 companies.

The Committee aims to assist IMnI in enlarging its membership base in China, to provide IMnI Members with accurate statistics on China, and to support Chinese Members in terms of HSE, market research and technical information.



Annual Conference 2017 Miami

IMnI's 43rd Annual Conference took place in Miami on June 5 – 6, 2017, attracting over 130 delegates from 30 countries.

Structured around the theme “O Brave New World – Where to From Now?”, the main speakers included: Robert Ward, Editorial Director for The Economist Intelligence Unit, who presented a global overview 2010-2017 How Did We Get Here and Where to From Now?; Mark Seibel, Chief of Correspondents for McClatchy, Washington DC Bureau provided a National/Regional Overview on the New Administration, Trade Agreements; Michel Van Hoey, Partner of McKinsey & Company, presented Major Factors Affecting Metals Industries: Focus on Steel, Overcapacity; Patrick McCormick of World Steel Dynamics presented on the Global Steel Outlook and Steel Demand in North America, followed by Rafael Rubio, Managing Director of ALACERO, who looked at the Latin America Steel Market: Overview and Challenges; Jorn P. de Linde, Senior Vice President of CRU International Inc., Jack A. Levy, Founding Partner of Cassidy Levy Kent (USA) LLP, Inès van Lierde, Secretary General of Euroalliages, Joseph J. Green,



President of the Manganese Interest Group (Kelley Drye & Warren LLP), John Bell, President of S.H. Bell Company, Dr Tomas Guilarte, Dean Robert Stempel College of Public Health & Social Work, Florida International University, Jian Zhou, IMnI China Representative & Regulatory Affairs Manager for Asia, Doreen McGough, IMnI HSE Director & Regulatory Affairs Manager and Aloys d'Harambure, IMnI Market Research Manager, rounded out the roster of speakers.

For the second year in a row, a panel discussion was included in the conference program. This time it featured Robert Ward, Michel Van Hoey, Mark Seibel, Patrick McCormick and Rafael Rubio and was moderated by Anne Tremblay, IMnI Executive Director.

Georgian American Alloys generously sponsored the Banquet Dinner at the waterfront restaurant Seaspace.

Autlan sponsored the welcome cocktail, while Asia Minerals and Eramet Comilog Manganese offered the lunches and South32 the boat cruise.

After the conference, a technical tour was organised to visit the Big River Steel Mill in Arkansas.





Annual Conference 2018 Kuala Lumpur

IMnI 44th Annual Conference will be held in Kuala Lumpur, Malaysia, on June 18-21, 2018.

Theme "South East Asia, A New Driver for the Mn Alloys Industry"

A full day of technical visits after the conference will be organised in Samalaju Industrial Park, Bintulu to visit:

- Pertama Ferroalloys Sdn Bhd,
- Sakura Ferroalloys Sdn Bhd,
- OM Materials (Sarawak) Sdn Bhd.

These 3 companies and/or their main shareholders are members of the IMnI and support the conference.

Sponsors for this event include Asia Minerals, Assore, Autlán, Ferroglobe, OM Holdings, Sakura Ferroalloys, Tshipi é Ntle Manganese Mining, United Manganese of Kalahari and the Malaysian Convention Centre.

For more information about the IMnI and its Annual Conference, please contact:

events@manganese.org

Sponsored by:



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EPD Conference

14th Electrolytic Products Division (EPD) Conference in Changsha (Hunan province, China), on March 20, 2017.

It was the largest global EPD conference of the year with some 110 delegates attending.

Major topics covered included:

- the effects of manganese-aluminium alloy on electrolytic manganese metal (EMM)
- the battery market: how the EMD industry is developing
- an analysis of overseas manganese mines development.

Our 15th EPD China Conference will be held on Friday, March 16, 2018 at the Ming Du Lakeside Hotel in Nanning (Guangxi Province, China), with a technical tour at CITIC Dameng operations on Saturday, March 17.

For more information about IMnI conferences, contact us at: events@manganese.org

IMnI Committees

The life of the Institute is regulated by the work done by its committees. There are three standing committees: Health, Safety and the Environment (HSE), Statistics and the China Committee. They meet on average between two and four times a year, and are open to both Ordinary and Affiliate members. Each committee is chaired by a member, while the secretariat is handled by a permanent IMnI staff.

The China Committee has three Sub-Divisions: statistics, technical issues and regulatory affairs.

The Electrolytic Products Division (EPD) operates like a committee and is formed of producers of electrolytic manganese metal and electrolytic manganese dioxide.

Committees are the lifeblood of the IMnI, providing vision, ideas and direction to nourish its fundamental missions.

Statistics Committee



Guillermo Recio
Chairman
Autlán



Juan Bosco Alvarez
Autlán



Jay Cho
Asia Minerals



Arnaud Vigier
Eramet Comilog
Manganese



Antonio Salinas
Ferroglobe



Toshiaki Abe
Japan Ferroalloy
Association (JFA)



Thembelani Gantsho
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Andreas Schüssler
L & M Rohstoffhan-
dels



Leslie Li
South32



Carel Marlan
Tshipi é Ntše Man-
ganese Mining



Martin Levčík
OFZ, a.s.



Aloys d'Harambure
IMnI

Health, Safety & Environment Committee



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Chairman
Ore & Metal Company Ltd.



Laurent Corbier
Vice-Chairman
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Athena Keene
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Patrick Scheel
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Jenny Cronje
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Brandon Cline
IMnI HSE Director



Aloys d'Hambure
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Electrolytic Products Division (EPD)



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Ferroglobe - Spain
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Glencore International AG - Switzerland
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Ukrainian Ferroalloys Association (UkrFA) - Ukraine
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Sibelco Europe MineralsPlus - Netherlands
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Zhejiang Fuchun Corporation - China

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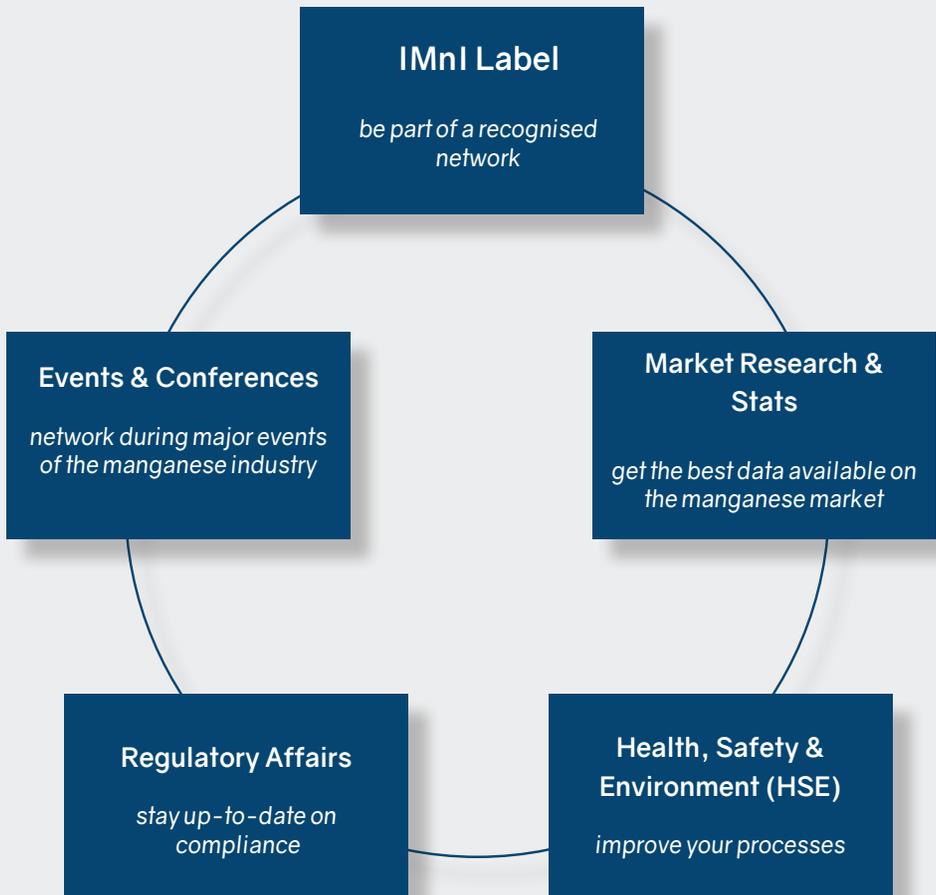
CITIC Dameng Mining Industries Ltd. - China
Manganese Metal Company (MMC) - South Africa
Quintal - Colombia
Tosoh Corporation - Japan

CHEMICAL PRODUCTS DIVISION

Carus Corporation - USA
Elkem a.s. - Norway
Kimpe SAS - France

International Manganese Institute

IMnI provides vision and guidance to the manganese industry by promoting economic, social and environmental responsibility and sustainability for all stakeholders.



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