



IMnI
ANNUAL
REVIEW
2022





INTERNATIONAL MANGANESE INSTITUTE

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



*"Sustainability of the
Manganese value-chain is
paramount for its development"*

2022 was another year full of challenges for the Manganese industry, in China with new lockdowns related to Covid19 in major cities and the slowdown of domestic steel demand, in Ukraine with the invasion by Russia and the temporary closure of the 2 Privat plants, in addition to skyrocketing energy prices and general cost inflation in many countries.

We remain committed to enhancing the sustainability, social responsibility and environmental footprint of the Manganese sector, by better addressing the Carbon dioxide emissions in the Manganese value-chain and promoting best practices to reduce the industry's energy consumption.

This year, the IMnI continued the Manganese life-cycle assessment (LCA) study started at the end of 2021, in collaboration with Sphera. This study will be finalised in 2023 and aims at analysing the environmental footprint of Manganese ore/alloy/metal/dioxide/sulphate production. IMnI Members

will then better understand their environmental performance, both at an individual and industry level, and be able to improve their operations accordingly.

In addition, the IMnI conducted in 2022 a study focussing on environmental, social and governance (ESG) factors of Manganese ore mining, in collaboration with Project Blue, to spread best-practices in the industry and compare Manganese with other commodities in terms of ESG initiatives.

A webinar dedicated to health, safety & environment (HSE) aspects of Manganese took place in November, helping IMnI Members understand the role of LCA in the sustainability debate, the tradeoffs between profits and carbon reduction in the Manganese smelting operations, and what makes Manganese a critical material for many applications.

Meanwhile, most Manganese producers being heavily impacted by skyrocketing energy prices, this year

the IMnI Supervisory Board decided to exceptionally reduce the IMnI membership fees (by 40% from 2021!), while maintaining the same quality of service provided to Members, and starting new ambitious projects, to further support the Manganese industry.

We look forward to welcoming you to Bangalore, India, in June 2023 for a major conference, gathering the entire Manganese community!

Patrick SACCO
IMnI Chairman
Managing Director of Assore
International Holdings



MESSAGE FROM THE EXECUTIVE DIRECTOR



“For the first time in its long history, IMnI represents more than 100 Member-companies”

The International Manganese Institute continued its development in 2022, welcoming a record high 16 additional Members, and starting ambitious new projects to further support the Manganese industry, both in terms of alloys used in steelmaking and of chemicals used in batteries.

A new IMnI Committee dedicated to high purity Mn products used in Lithium-Ion batteries was set up in October 2022, to serve as a platform to promote the use of Manganese in rechargeable batteries.

The IMnI also started new HSE studies, published additional market research reports on various industry topics, and organised several successful events and technical visits of Manganese operations.

For the first time in its long history, the International Manganese Institute (IMnI) represents more than 100 Member-companies, which are major Manganese producers, consumers and industry service providers, committed to develop their industry and promote the benefits of Manganese, while remaining

proactive on compliance. Thanks to the active and dedicated engagement of its 5 Committees - HSE, Statistics, EPD, High purity Mn and China - as well as the valuable involvement of its staff, IMnI continues to be the global voice of the Manganese industry.

The IMnI Annual Conference in Cape Town, South Africa, in June 2022 was a major success, attracting more than 240 international delegates from 20+ countries, who had the opportunity to visit several major Manganese mines (Assmang, South32, Kudumane, Tshipi,

16 New Members joined the IMnI in 2022!	Category	Country
Black Canyon Ltd.	Future Mn producer	Australia
Grindrod	Logistics company	South Africa
McCloskey by OPIS	Market research	UK
Manmohan Minerals and Chemicals Pvt. Ltd.	Mn chemical producer	India
GfE-MIR Alloys and Minerals (Pty) Ltd	Mn producer	South Africa
Inner Mongolia Ruihao	Mn producer	China
Nexus Manganese SA	Mn producer	Brazil
Rajadhiraj Tirupani Vinayak Natraj Private Limited	Mn producer	India
Shyam Sel And Power Limited	Mn producer	India
Carbon Resources (P) Ltd	Mn trader	India
DPRC S.L.	Mn trader	Spain
Bright Point Trading Pte. Ltd.	Mn trader	Singapore
Million Link (China) Investment Ltd	Mn trader	Hong Kong
Modaai	Industry service provider	USA
Vamancore Pte Ltd	Mn trader	Singapore
South Manganese International Trade	Mn trader	China



Kalagadi, United Manganese of Kalahari), in addition to Africa's largest Manganese alloy producer (Transalloys) and the world's largest producer of high purity electrolytic Manganese metal (HP EMM), Manganese Metal Company (MMC). Thanks to the commitment of all IMnI Members, the IMnI Annual Conference has become over the years the world's largest event dedicated to Manganese!

IMnI Members receive the best market research information on Manganese available globally, based on statistics collected directly from Manganese producers all over the world, and aggregated by the IMnI staff to ensure confidentiality. As part of its mission to cover all aspects of the Manganese value-chain, IMnI published in 2022 a new version of the Manganese in Lithium-Ion batteries report, with updated information on production and demand of Manganese chemicals used in batteries, including electrolytic Manganese dioxide (EMD), electrolytic Manganese metal (EMM) and Manganese sulphate (MSM), and a new report on deep-sea Manganese extraction. New technical presentations on furnace optimisation, energy savings and major Manganese producers have also been published for IMnI Members on the IMnI extranet.

In addition, IMnI invests every year in scientific projects to better understand the impact of Manganese on the

environment and find new applications for Manganese products. The IMnI Health, Safety & Environment Committee decided in 2022 to start a study on environmental, social and governance (ESG) factors of Manganese ore mining, in collaboration with consulting company Project Blue. The development of the Manganese life-cycle assessment (LCA) continues, and this project is expected to be finalised by December 2023. It will help IMnI Members better analyse their environmental performance, both at an individual and industry level, and improve their operations. This project analyses Manganese alloy and ore but also several Manganese chemicals (EMM, EMD, Mn sulphate), with case studies in various countries. All IMnI Members will benefit from the results of this LCA.

Finally, the [2023 IMnI Annual Conference](#) is confirmed in Bangalore, India, from Tuesday, June 6 to Thursday, June 8, with technical visits of major Manganese alloy plants on Friday, June 9, on the theme “India, the new driver of the Manganese industry?”. This event is open to non-Members, so do not miss this opportunity to learn from industry experts, connect with the Manganese community and visit several of India's largest Manganese alloy production facilities.

Aloys d'HARBURE
IMnI Executive Director



IMnI 46th Annual Conference
May 31 - June 2, 2022
The Westin Hotel
Cape Town, South Africa

IMnI IN 2022

January – March

• IMnI organizes its Q1 webinar around the theme “New developments for Manganese in Brazil and China”, attended by 100+ participants. Speakers include **Kevin Fowkes**, AlloyConsult, **Luis Pessoa**, Maringá Ferro Liga, **Jian Zhou**, Shanghai Fengri Intl Trading and **Aloys d’Hambure**, IMnI

• **Inner Mongolia Ruihao New Material Technology Co. Ltd.** and **Shyam Sel & Power Ltd.** join as Ordinary Members and **DPRC S.L., Grindrod and South Manganese Group (Shanghai) International Trade Co. Ltd.** join as Affiliate Members

April – June

• IMnI 46th Annual Conference is held in Cape Town, South Africa. With a record atten-

dance of 240+ international delegates from 110 companies based in 20+ countries, the IMnI 2022 Annual Conference is the world’s biggest event of the Manganese industry, and the largest IMnI event ever organized! Structured around the theme “South Africa at crossroads: diversified Manganese producer, or China’s mine?”, main speakers include **Robert Ward**, Director of Geoeconomics & Strategy and Japan Chair, International Institute of Strategic Studies (IISS), **Simon Freemantle**, Senior Political Economist, Standard Bank Group, **Michael Thackeray**, Associate, Argonne National Laboratory, **Teboho Sebetlela**, Senior Research Analyst, Wood Mackenzie, **Jason R. Croy**, Ph.D., Group Leader of Materials Research Group, Argonne National Laboratory, **Steven Verammen**, Steel Market Research Manager, **McKinsey**, **Kevin Fowkes**, Managing Consultant, AlloyConsult, **Rorie Wilson**, Managing Director, Ore & Metal Company, **Rocklin Reed**, Senior Manager SHERQ,

Assore, **Bingbing Song**, Secretary of the CCC Sub-Committee, International Maritime Organisation (IMO), **Aloys d’Hambure**, Executive Director, IMnI and **Dr. Agnieszka Leopold**, HSE & Regulatory Affairs Manager. More than 130 delegates participate to the technical visits of major Manganese operations, including 7 manganese mines (Transalloys, Manganese Metal Company, South32 Mamatwan, Kalagadi, Tshipi, United Manganese of Kalahari, Kudumane, Ore & Metal/Assmang Gloria & Nchwaning). Generous sponsors include Autlán, Cigroup, South32, Tshipi, Transalloys; Manganese Metal Company (MMC), Assore, United Manganese of Kalahari (UMK) and Kudumane

• No EPD Conference could be organized this year because of the lockdowns and travel restrictions in China

• **Black Canyon Ltd., Nexus Manganese SA., Rajadhiraj Tirupani Vinayak Natraj Private Limited, GfE-MIR Alloys and Minerals (Pty) Ltd. and Manmohan Minerals & Chemicals Pvt. Ltd.** join as Ordinary Members and **Carbon Resources (Pty) Ltd., Vamancor Pte Ltd. Mc Closkey by OPIS** and **Million Link Investment Ltd.** join as Affiliate Members

July – September

• IMnI Executive Director Aloys d’Hambure gives a presentation during the 4th Manganese School hosted by Eramet in collaboration with The Southern African Institute of Mining and Metallurgy (SAIMM) in Paris

• IMnI hosts a dinner for its Members in Paris, and organises a technical visit of the Eramet Manganese alloy plant in Dunkirk, France

• **Bright Point Trading Pte. Ltd.** joins as Ordinary Member and **Modaai** as Affiliate Member

October – December

• IMnI High Purity Manganese Products Committee holds its first meeting. 10 companies Member of the IMnI attend

• Miao YU starts as IMnI Market Research Analyst to develop the IMnI Market Research services

• Aloys d’Hambure, IMnI Executive Director, moderates the session “Manganese and Ferromanganese Outlook” at Fastmarkets International Ferro-Alloys Conference in Prague. Keith Saffy, CEO of Ntsimbintle Marketing and Trading, Kevin Fowkes, Director of AlloyConsult and Teboho Sebetlela, Senior Analyst – Steel Alloy Markets at Wood Mackenzie participate in this panel discussion

• IMnI organizes a networking cocktail in Prague for IMnI Members during the Fastmarkets conference, attended by 50+ IMnI delegates, and a dinner for the Members of the IMnI Supervisory Board

• IMnI organizes its first webinar dedicated to health, safety & environment (HSE). Speakers include **Antoinette Volschenk** (Assore), **Dr. Johannes Gediga** (Sphera), **Dr. Joshua Woodruff** (Modaai), **Dr. Nils Blackberg** (Project Blue) and **Dr. Agnieszka Leopold** (IMnI HSE & Regulatory Affairs Manager)

MANGANESE IN 2022

Quarter 1

- Element 25 achieves record daily concentrate output at its Butcherbird project in Western Australia, putting it on track to exceed nameplate production capacity of 365,000 t/yr
- The roll-out of mass Covid-19 testing in the major Chinese port city of Tianjin creates chaos for the area's logistics, which hosts the majority of the country's Manganese ore imports
- Indian ferro-alloy producer Maithan Alloys (MAL) expects to begin commercial production at its newly acquired 49,400 t/yr silico-manganese plant in Bobbili, Andhra Pradesh from late January
- South32 reduces full-year Manganese ore production guidance by 9% to 3.2mn t for its Australian operations because of Covid-19 and weather-related impacts
- India's Sandur Manganese and Iron Ore (Smiore) outlines plans to increase ferro-alloy production capacity at its plant in Bellary, Karnataka state, raising its silico-manganese capacity to 95,000 t/yr from about 48,000 t/yr and its ferro-manganese capacity to 125,000 t/yr from 66,000 t/yr
- Russia's invasion disrupts Ukrainian Mn alloy plants, which supply large volumes of silicomanganese to Europe and Turkey and shipments exports via Black Sea ports halt
- Spanish Mn alloy producer Ferroglobe's shipments in Q1 2022 falls as high energy costs squeeze the demand base and logistical difficulties hamper operations
- China's largest electrolytic Manganese metal flakes producer Ningxia Tianyuan Manganese delays resuming production until April 21, from an initial restart schedule of April 1 on subdued demand
- Poland saw an 82% rise month-on-month in Ukrainian Manganese alloy imports in

March, as Privat reroutes Mn alloy exports to the European Union due to blockade of Russian ports

- Samancor Manganese's planned disposal of Metalloys to the Satka group of Russia collapses as the war in Ukraine throws the Manganese alloys market into turmoil
- Sakura in Malaysia had a transformer failure on March 10 and has been running on just one furnace until a new transformer is delivered to the plant
- Many key Chinese electrolytic Manganese metal producers resume production on March 28 as previously planned after their initiative of a 90-day production suspension from January 1 expired

Quarter 2

- South African Manganese mine Tshipi Borwa increases its output in the March 2021-February 2022 fiscal year to 3.7mn t from 3.4mn t the previous year
- Ferro-alloy producers in India's Andhra Pradesh state are forced to reduce operating rates between April 8-22 as the regional government curtails power consumption, in an attempt to rebalance the electricity market and conserve supply for households and farmers
- Heavy rains lead to flooding and severe disruption for exporters using South Africa's Durban Harbour, while Transnet halts activity and declared force majeure on April 11
- India's SMAL seeks to increase its Manganese-alloy capacity to 250,000 t/yr from 100,000 t/yr by adding three furnaces at its plant in Vizianagaram, Andhra Pradesh
- South32 produces less Manganese ore in South Africa and Australia in the nine months to the end of March compared with

a year earlier, although it remains on track to achieve its output guidance for its July 2021-June 2022 fiscal year

- Sampling and mapping work by Pantera identify several high-grade Manganese targets at the Weelarrana project near Newman in WA's Pilbara region in Australia
- Hydrovolt, the battery recycling joint venture, starts commercial recycling operations at its plant in Fredrikstad, Norway in May
- Indian SiMn export market weakens after a 15% tariff is imposed on the export of steel and several related commodities by the Indian Government in late May
- Floods hits infrastructure, roads, bridges and damaged buildings, mainly in the port city of Durban in May only a month after the floods in April, disrupting logistics service for Mn mining in South Africa
- OM Holdings, in a joint venture with Perth-based mineral exploration firm Bryah Resources, commences drilling for Manganese at its Bryah Basin project in Western Australia on June 16
- Chinese Manganese alloy producers in Inner Mongolia, Ningxia and other provinces cut production in June on unexpectedly slow industry recovery and concerns about the gloomy economic recovery
- A weaker Indian rupee against the US dollar, reaching a record low on June 9, hurts margins of Indian Manganese alloy firms that rely on imported feedstocks to manufacture products

Quarter 3

- Vale concluded the sale of its iron ore, Manganese ore and logistics interests in Mato Grosso do Sul state, central-west Brazil, to J&F Mineracao on July 21
- OM Holdings increases output capacity at its smelting operations in Sarawak, Malaysia, and it plans to double future capacity of Manganese alloys to 330,000-400,000 t/yr
- In August, Arab Alloys establishes the largest industrial complex for ferroalloys in the Suez Canal Economic Zone (SCZone), on an area of 40,000 sqm in southern Ain Sokhna, to produce ferrosilicon and silicon manganese
- Rail freight from the Manganese ore mines in South Africa's Northern Cape province to Port Elizabeth halts while the track is cleared, and repairs made following a derailment on August 16
- European bulk alloys suppliers struggle to cope with a serious heatwave that has dried up inland waterways in the region and affected shipping
- RSA's Afrimat pulls out of purchasing the Gravenhage deposit in the country's Kalahari Manganese field because of questions over the prospect's water license
- Battery-grade Manganese sulphate market loses its momentum, driven by increasing capacity, dropping production cost, and greater adoption of nickel in the cathode
- Transalloys in South Africa is forced to cut production of silico-manganese after a sequential loss of electric transformers leading to a suspension of operations at its largest furnace in August
- European gas prices reached a new record high at August-end, while Gazprom halted all gas flows through Nord Stream 1 pipeline for a three-day maintenance period

Quarter 3 following

- Transnet announces a deadlock in wage negotiations, with two labour unions raising the prospect of a strike that could further cripple the South African logistics in September
- OFZ in Slovakia stops all Manganese alloy production on surging energy prices in September, and calls for urgent government intervention to support a restart of operations forecasted in January 2023
- Ferroglobe in Spain halts virtually all production in the country due to surging energy costs in September

Quarter 4

- Lithium Valley announces that there might be five times more Manganese than lithium in the scalding brine it is pumping up at the south end of the Salton Sea in the U.S
- Privat in Ukraine suspends ferro-alloy production at Nikopol from November due to difficulty securing energy supplies in the midst of the war, while Zaporozhye site was shut in early March
- India's Ramnik Power and Alloys plans to almost triple its Manganese alloy production capacity to 46,800 t/yr of Manganese alloy in Madhya Pradesh
- Monthly sales at China's largest lithium nickel-cobalt-manganese oxide (NCM) manufacturer Ningbo Ronbay New Energy Technology hits a record high of above 11,000t in September
- Manganese X Energy kicks off its high-purity manganese sulphate monohydrate (HPMSM) pilot plant, which begun operations at Kemetco in Richmond, Canada furnace in the country due to expensive energy prices at the end of September

- Euro Manganese plans to perform a scoping study to evaluate a site in Bécancour, Québec in Canada, that would produce Manganese sulphate from metal for the cathode active material (CAM) market

- Indian state-owned Manganese Ore India (Moil) increased Manganese production in April-September by 9% year on year to 563,000t

- Freight rates for South African miners of Mn ore exporting to China fell by around 46% at November-end over the second half of 2022 as global trade for metals shipped in containers is being constrained by weak demand despite lower freight costs and higher availability of boxes

- Canada's Elcora plans to start Manganese mining under the 'Atlas Fox Deposit' licence in Morocco by year-end

- The Indian government ended duties on foreign shipments of steel, pig iron, iron ore pellets and iron ore grading below 58% effective November 19, which was imposed from May 22 with the intention of curbing domestic inflation

- OMH pays Cahya Mata Sarawak US\$120m to fully own Bintulu flagship smelter in Sarawak, Malaysia

IMnI MARKET RESEARCH

"IMnI provides the most comprehensive manganese industry market research available."

Circulated on a monthly basis, [IMnI 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'Hambure 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 summarize the most important news of the industry during the week.

IMnI also issues [monthly trade matrices for Mn Ore, Alloys, EMM and EMD](#), [steel production statistics by country](#), and a [database of current and future manganese producers](#).

All IMnI data is available to IMnI Members via our website extranet.manganese.org

MESSAGE FROM THE STATISTICS COMMITTEE CHAIRMAN



"Manganese producers faced new challenges in 2022, including soaring energy prices, difficult logistics and a slowdown of economic growth"

The Covid-19 restrictions remained strong in China in 2022, and Manganese producers in the rest of the world faced new challenges, including soaring energy prices, difficult logistics and a slowdown of economic growth.

Steel output continued decreasing in China for a second consecutive year in 2022, by 0.6% according to a first estimate, and the production cuts were even greater outside China (-5.2%), for a total "loss" of steel production of 55 million mt in 2022 compared to the previous year. This was due to slowing demand amid economic uncertainty after the invasion of Ukraine by Russia in Q1 2022, and growing tensions between China and the USA, skyrocketing energy prices and difficult logistics, especially in Europe, the semi-conductors under-capacity (impacting cars production in many countries, and in turn, steel output), and the crisis in China's real estate sector, impacting current projects and new constructions. This slowing steel output logically resulted in lower demand for Manganese alloy, impacting smelters and Manganese miners in many countries.

Meanwhile, demand for Manganese from the battery industry (through precursor for cathode active material, or pCAM) continued expanding in 2022, driven by China. Although this segment of the industry only represents 2.5% of total Manganese ore consumption (compared to 96% for steel and 1.4% for agricultural products), the IMnI market research service on high purity Manganese products (used in rechargeable batteries, for electric vehicles and energy storage systems) continued improving, to better meet the needs of IMnI Members.

A new IMnI Committee dedicated to these high purity Manganese products (high purity Manganese metal & sulphate) was set up in October 2022, to serve as a platform to promote the use of Manganese in battery cathodes. This Committee, as all the other IMnI Committees, is open to all IMnI Members. More regular reports on high purity Manganese sulphate, EMD, and Manganese metal are now published, with updated production data on forecasts on demand for Manganese in battery cathodes.



Investments were also made to improve the knowledge on environmental, social and governance (ESG) factors of Manganese mining, with a study finalised by December 2022. This study shows that company governance and societal welfare were deemed the most relevant ESG factor in Manganese mining, while human and workers' rights was deemed the least relevant. Manganese also faces fewer ESG risks than most other metals.

We also improved the IMnI trade matrices, by adding details like the mode of transport or port of origin for South African exports, and published a new report on deep-sea Manganese extraction from polymetallic nodules.

Today, the IMnI is the best source of information available on Manganese, in terms of market research but also in terms of sustainability and environmental impact. Our statistics are the most accurate in the manganese community, as they are based on data collected on a monthly basis from major Manganese producers. IMnI market research reports analyse production, demand,

but also inventory, imports and exports for all major Manganese products (ore, 3 types of alloy, metal, chemicals, etc.). All the IMnI reports are available for [IMnI Members](#) from the [IMnI extranet](#).

In 2023, we plan to continue improving the quality of IMnI reports, by publishing more information on Manganese used in Lithium-ion batteries.

Guillermo RECIO
IMnI Statistics
Committee Chairman

STATISTICAL PACKAGES ARE AVAILABLE FOR NON-MEMBERS:

enquire at stats@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 and future projects, with filter by product and by country, with capacity.

Manganese ore production

Global Mn ore supply picked up by 3% MoM in October, to around 1.86 million mt Mn units (+1% YoY). Production during Jan.-Oct. 2022 declined by 3% compared to the same period in 2021, on slowing demand from China.

- **Africa & Middle East:** October output increased by 4% from September (-5% YoY), on higher supply in South Africa. Supply during Jan.-Oct. edged up from the same period of 2021, as growing production in Gabon compensated for output cuts in Ghana, South Africa and Ivory Coast. High-cost trucking is squeezing some supply out of the market, in spite of the South African Rand devaluation, according to CRU.
- **Asia & Oceania:** October output rose by 2% from the previous month (+38% YoY) on bigger supply in India, Malaysia and Vietnam. YTD supply was 4% lower from the first 10 months of last year, on output cuts in China (as a result of falling EMM production), Myanmar, and Australia, offsetting production increases in India and Malaysia.

Mn Ore Supply & Demand in October 2022									
(in '000 net mt Mn units)	Supply	MoM % Change in Supply	YoY % Change in Supply	YoY % Change in supply since Jan.	Demand	MoM % Change in Demand	YoY % Change in Demand	YoY % Change in demand since Jan.	Supply & Demand Balance
Africa & Middle East	1,172	4%	-5%	0%	42	10%	2%	-2%	1,130
Asia & Oceania	582	2%	38%	-4%	1,307	9%	-1%	-7%	-725
C.I.S.	40	-8%	-61%	-27%	107	-13%	-17%	-7%	-67
Americas	64	-1%	-17%	-22%	55	0%	-39%	-8%	9
Europe	2	-35%	5%	-30%	51	10%	2%	-2%	-49
World	1,860	2.6%	1.0%	-3.1%	1,563	6.9%	-3.8%	-6.7%	297

Source: International Manganese Institute (IMnI)

More details on Mn ore statistics are available [here](#) (for IMnI Members)

MANGANESE MARKET OVERVIEW

"In 2022, the global Manganese industry was heavily impacted by the energy crisis and economic turmoil"

Steel

Global steel production declined in 2022 on weak demand amid economic uncertainty

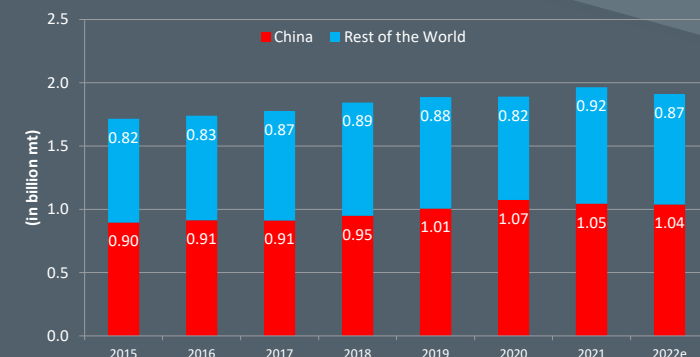
Global crude steel production in 2022 decreased by 3% from 2021, as inflation and energy prices were increased by the war in Ukraine, outweighing the post-pandemic economic recovery. The world's steel output reached 1.91 billion mt in 2022 according to a first estimate by CRU and Worldsteel, down from 1.97 billion mt in 2021. Around 50 million tons of crude steel production have been "lost" globally in 2022 compared to the previous year. This is the first year since 2015 that global steel production contracts, as even during the Covid-19 pandemic in 2020 and 2021, steel output continued rising.

In China, steel production declined marginally in 2022, to an estimated 1.04 billion tons (-0.6%), as the zero-Covid policy slowed production and domestic demand. China now represents 54% of the world's steel output. Sustained Covid-19 measures at the end of 2022 continue threatening China's steel production and logistics. Meanwhile,

domestic demand is bolstered by the gloomy real estate sector amid dismal economic data. Steel exports from China in 2022 showed a 1% increase from the previous year, due to a short stockpiling hike in the second quarter of the year, after Russia invaded Ukraine.

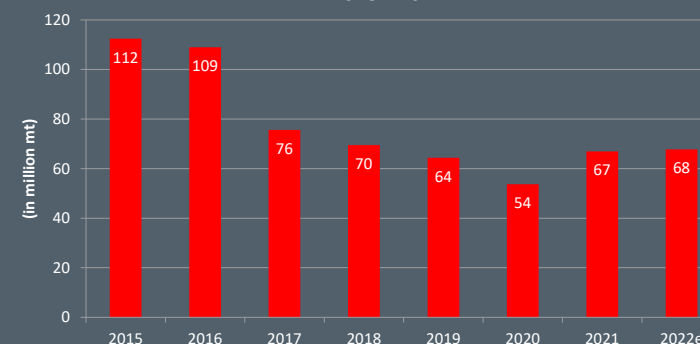
The steel production cuts were more significant outside China, as supply slumped in most regions in 2022, with the CIS region seeing the biggest decrease (-18%) compared to 2021. Steel production in Europe contracted by -8%, by 4% in North America, in South America and in Africa, while Asia exc. China reduced steel output by 2%, and Oceania by -2% as well. The only region with higher steel output in 2022 is the Middle East, which saw an expansion of its carbon steel production of 6% (or 2.6 million tonnes), according to preliminary data released by Worldsteel.

Steel production in China vs the rest of the World
2015 - 2022



Source: World Steel Association, CRU, IMNI; e = estimate

Steel exports from China
2015 - 2022



Source: China Customs, IMNI; e = estimate

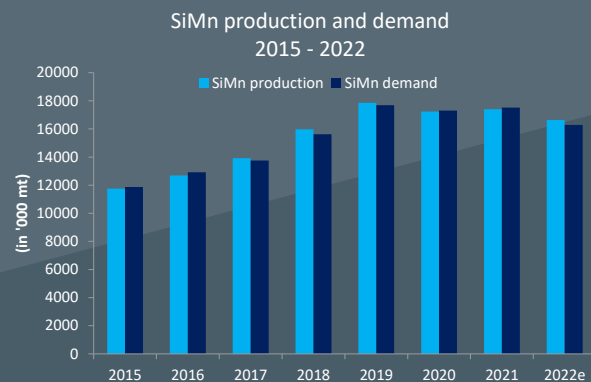
Steel production statistics by country are available [here](#) (for IMNI Members only).

SiMn

High energy prices and slowing steel production heavily impacted the SiMn industry in 2022

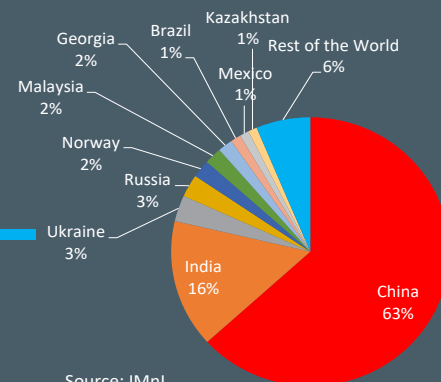
Global SiMn production declined by 4% in 2022, to around 16.6 million mt, on a slowdown of global steel production and skyrocketing energy prices. Around 765,000 mt of SiMn production have been lost in 2022 compared to the previous year, mostly in Europe (-8%), the CIS (-5%), and China (-8%). The strict zero-Covid policy dampened China's domestic demand, which was further aggravated by a gloomy real estate market. China's SiMn output contracted by 946,000 mt from the previous year, and now accounts for 63% of global SiMn supply, down from 66% in 2021 and 72% in 2020. India represents 16% of global SiMn production, and saw its output expand by 13% in 2022 from the

previous year, to 2.56 million mt, driven by strong demand from local steel mills as well as overseas consumers (Italy, Japan, UAE etc). Ukraine saw the biggest decrease of all major SiMn producing countries (-22%), although it remained the world's 3rd biggest producer. It is followed by Russia and Norway, which both saw an increase of their SiMn production, due to lower electricity prices than in the rest of Europe in the case of Norway, encouraging smelters to concentrate their production there rather than in France or Spain. Meanwhile, output in Kazakhstan jumped by 35%, the highest growth rate among the 10 big SiMn producing countries, as Kazakh smelters benefitted from the supply cuts in Ukraine..



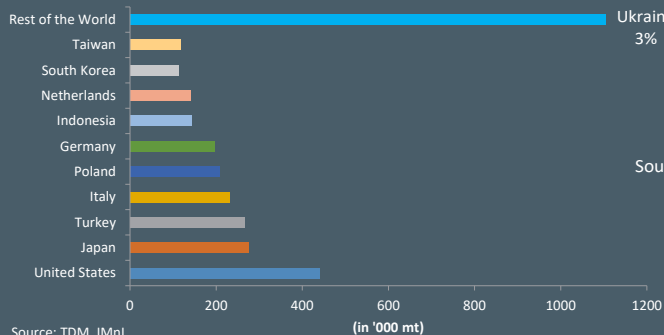
Source: IMnI

Top 10 SiMn producing countries in 2022



Source: IMnI

Top 10 SiMn importing countries in 2022



Source: TDM, IMnI

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

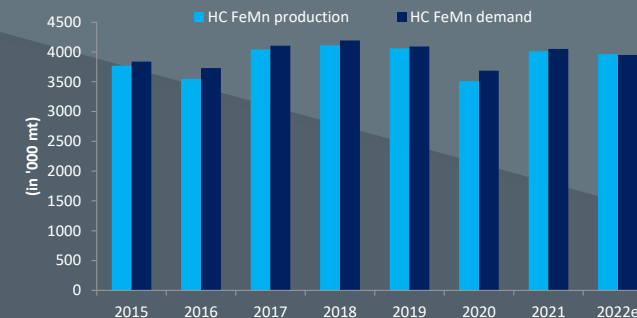
HC FeMn

Global production contracted in 2022

The world's output of high-carbon ferro-manganese contracted in 2022 by 49,000 mt (-1.2%) from 2021, to nearly 4 million mt, on slowing steelmaking demand and rising energy prices. Higher supply in Europe (+8%), Oceania (+36%), and the Middle East (+14%) was offset by lower production in the CIS countries (-15%), the Americas (-5%), and Asia (-1%). Production dropped by an estimated 1% in China in 2022, and China accounted for 40% of global supply in 2022, stable from the previous year. In India, output contracted by 4% on limited overseas

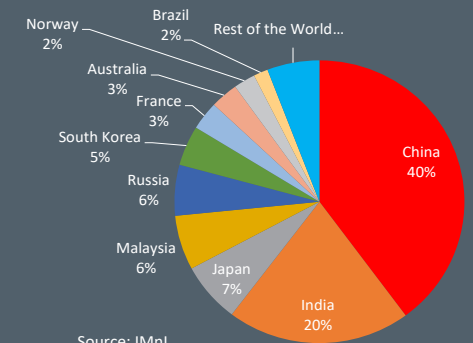
demand: Indian HC FeMn exports dropped by 9% in 2022 as India imposed a 15% duty on steel exports between May and November. India now represents 20% of global HC FeMn production, down from 21% in 2021. Indian HC FeMn is mainly exported to the UAE, Italy, Brazil, etc. Both Japan and South Korea saw a decrease of 15% in HC FeMn output in 2022, while supply expanded in Malaysia, Russia, France, Australia and Norway.

HC FeMn production and demand 2015 - 2022



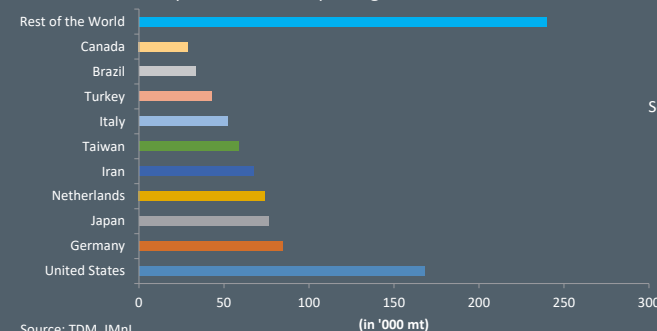
Source: IMnI

Top 10 HC FeMn producing countries in 2022



Source: IMnI

Top 10 HC FeMn importing countries in 2022



Source: TDM, IMnI

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

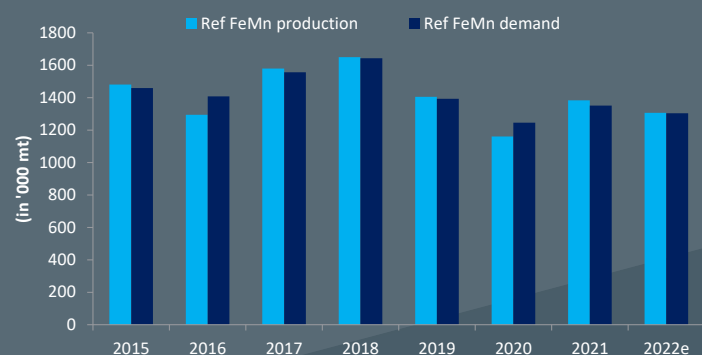
Ref FeMn

Production slashed across major producing countries in 2022, except in India

Global production of refined ferro-manganese contracted by 6% in 2022 to 1.3 million mt, with output decreasing in almost all regions compared with 2021: Europe (-20%), the CIS (-82%), the Americas (-15%) and Africa (-4%). However, supply in Asia moved up by 1% on production ramp-up in India (+34%), offsetting output

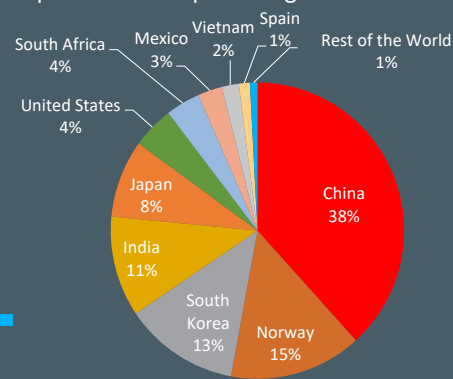
declines in the rest of Asia. All major Ref FeMn producing countries besides India saw a decrease in supply, including China (-1%), Norway, South Korea, Japan, United States and South Africa. China now accounts for 38% of global refined FeMn production, followed by Norway (15%), South Korea (13%), India (11%) and Japan (8%).

Ref FeMn production and demand
2015 - 2022



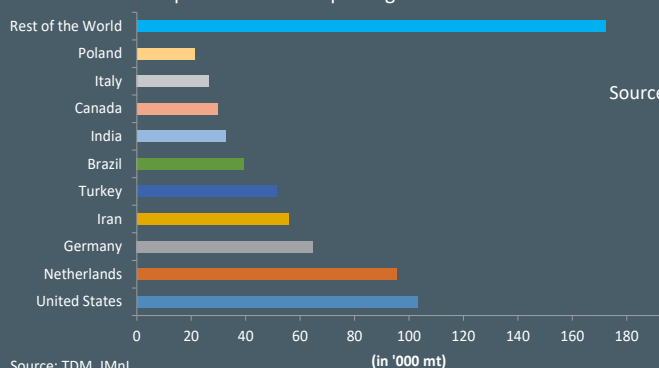
Source: IMnI

Top 10 Ref FeMn producing countries in 2022



Source: IMnI

Top 10 Ref FeMn importing countries in 2022



Source: TDM, IMnI

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

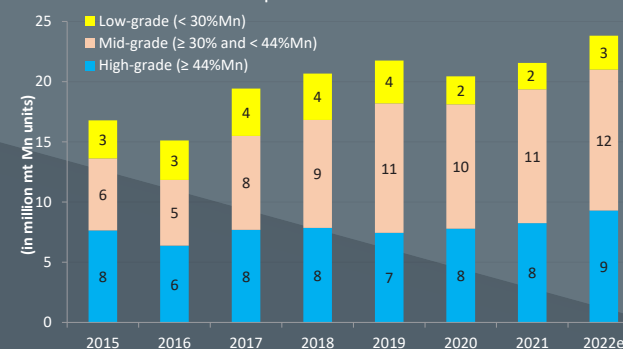
Mn ore

Falling production in 2022 mainly for mid-grade Manganese ore

Global output of Manganese ore declined by 3% to 21.1 million mt Mn units in 2022 from the previous year. Sliding supply of mid- and low-grade ore (-5% and -1% respectively) offset an increase of 1% of high-grade ore output on rising energy costs, as Manganese alloy production requires less energy when using higher grade ore. High-grade Mn ore production (>44%Mn) now represents 40% of total output, while mid-

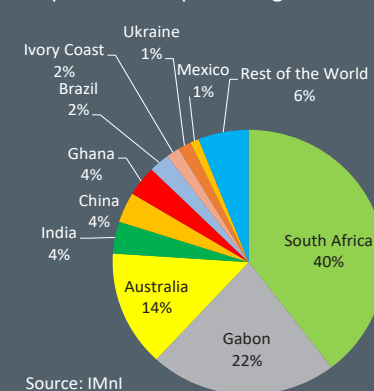
grade ore (>30% and <44%Mn) accounts for 50% and low-grade ore (<30%Mn) makes up for the remaining 10%. Output contracted in 2022 in South Africa, Australia, China, Ghana, Brazil, Ivory Coast and Mexico, while expanding in Gabon and India. South Africa now accounts for 40% of global Mn ore production, marginally up from 2021, followed by Gabon (22%) and Australia (14%).

Global Mn ore production 2015 - 2022



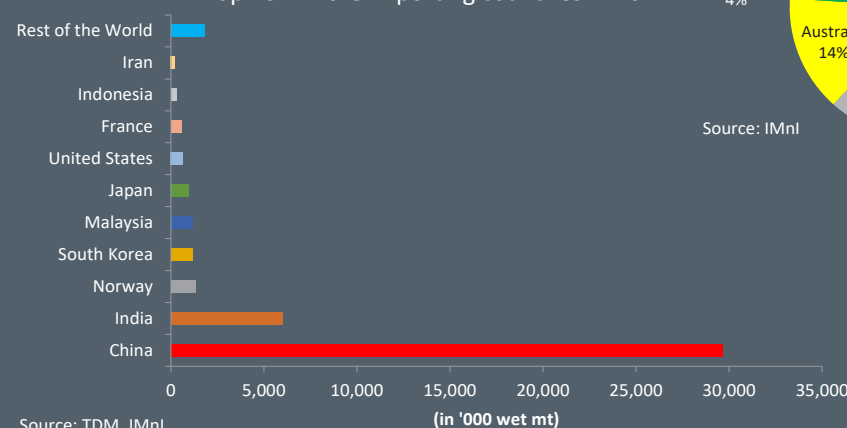
Source: IMnI

Top 10 Mn ore producing countries in 2022



Source: IMnI

Top 10 Mn ore importing countries in 2022



Source: TDM, IMnI

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

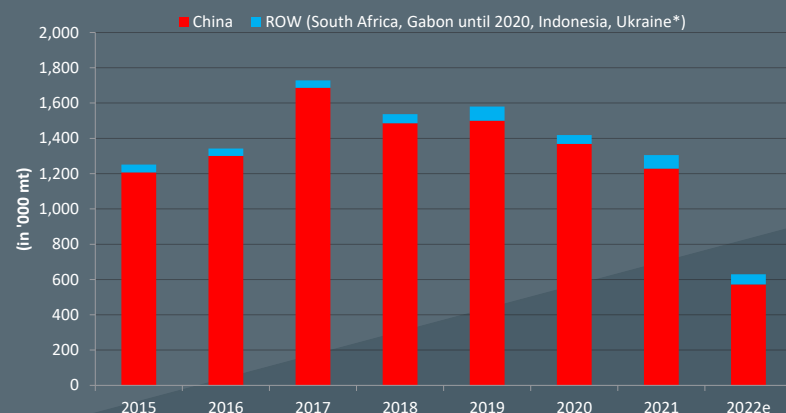
Manganese metal

Lower global production in 2022 because of supply cuts in China

Manganese metal production contracted in 2022 on falling demand and prices, by 52% from 2021 to 620,000 mt. Supply cuts were mainly due to production curtailments initiated by the alliance of Chinese producers between Jan.-Mar. and Aug.-Oct. 2022 in response to suppressed downstream demand. In the rest of the world,

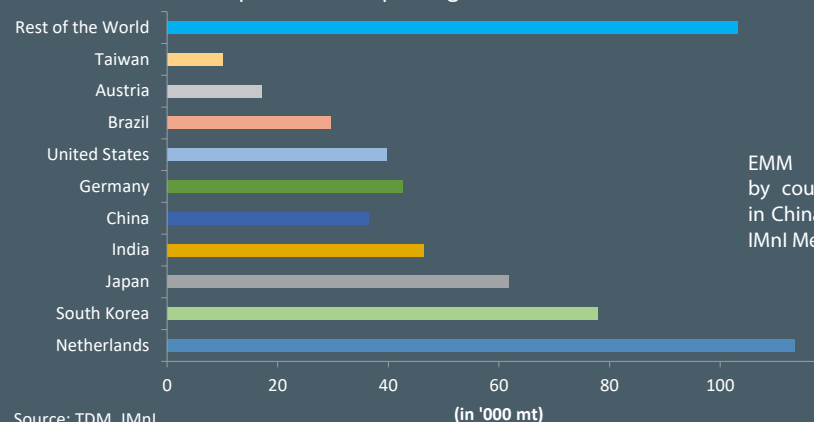
Manganese metal production contracted by 25% in 2022 because Privat's output was stopped in Ukraine after the Russian invasion. China now accounts for 91% of the global output of Mn metal, down from 94% in 2021.

Manganese metal production in China vs the rest of the World
2015 - 2022



* Privat's plant Zaporozhye in Ukraine produces aluminothermic manganese metal, not electrolytic
Source: IMnI

Top 10 EMM importing countries in 2022



Source: TDM, IMnI

EMM production statistics by country (and by province in China) are available [here](#) for IMnI Members only).

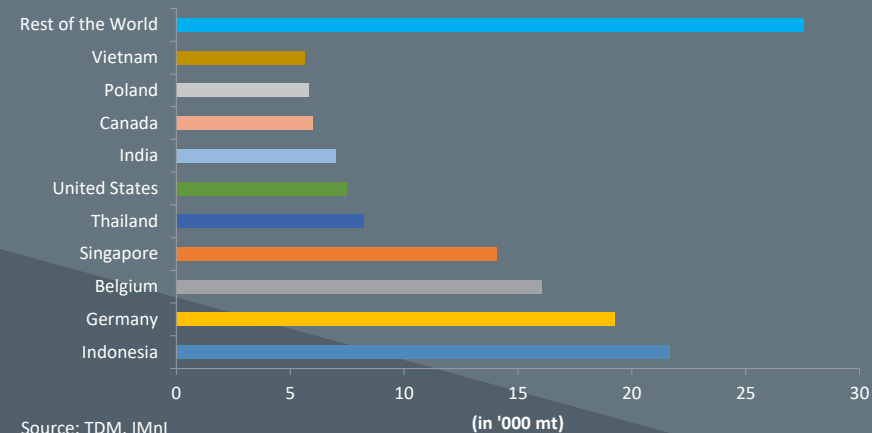
Electrolytic Manganese Dioxide (EMD)

Production increased in 2022 in China, while contracting in the rest of the world

Output of electrolytic Manganese dioxide (EMD) expanded in China in 2022, driven by demand for alkaline batteries, and the industry is progressively consolidating, with only 9 EMD producers now active in China, from 11 the year

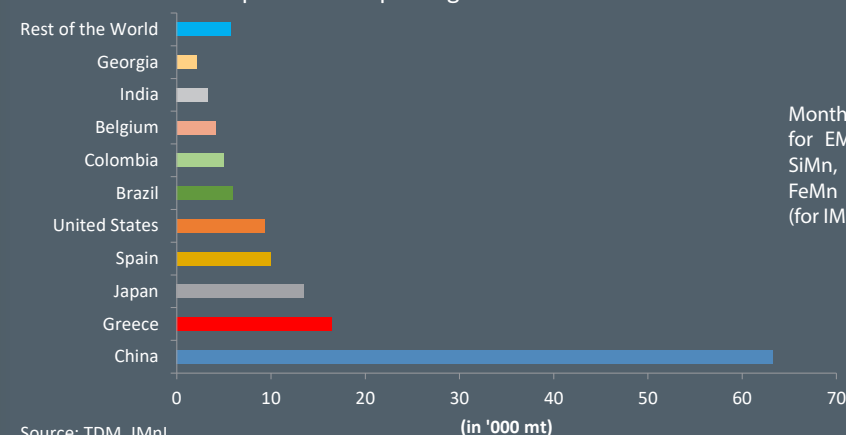
before. In the rest of the world, there is still 8 active EMD producers, in the USA, Spain, Japan, India, Greece and Colombia. There combined production of EMD was lower in 2022 than the year before.

Top 10 EMD importing countries in 2022



Source: TDM, IMnI

Top 10 EMD exporting countries in 2022



Source: TDM, IMnI

Monthly trade matrices for EMD, EMM, Mn ore, SiMn, HC FeMn and Ref FeMn are available [here](#) (for IMnI Members only).

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 pro-actively ensure their interests when faced with new regulatory demands.

2022 HSE COMMITTEE CHAIRMAN'S MESSAGE



"Better understanding the health, safety and environmental impacts of Manganese is the core mission of the IMnI HSE Committee, and 2022 was marked by new achievements"

In 2022, the IMnI Health, Safety & Environment (HSE) Committee continued investing resources on important projects to guarantee the growth of the industry while ensuring its sustainable development, and initiated a number of new scientific studies. Some of the on-going projects have already resulted in interesting preliminary results as well as a few scientific papers published in internationally recognized journals. Most of the on-going projects are expected to be finalized in the first half of 2023, and some of their findings will be documented in Tier1 journals. A new project has been started in 2022 to support IMnI Members in understanding the ESG factors impacting Mn ore mining. Additionally, an IMnI webinar on HSE insights in the Manganese industry was successfully organized in November, with the participation of industry experts.

The cooperation between IMnI and the US Manganese Interest Group (MIG), a coalition interested in the scientifically sound evaluation and regulation of Manganese in the USA, has been strengthened by active participation of the IMnI in two projects directed at US epidemiological studies deemed to be potentially detrimental to the Manganese industry. The IMnI contributed to the debate of whether these studies should influence regulatory reference values related to Manganese.

Risk Sciences International (RSI), the IMnI's partner for the manganism project, is about to complete all deliverables derived from the workshop held in November 2020. The three biomarkers manuscripts as well as the workshop manuscript will provide the Manganese industry with reviewed and refined clinical diagnostic criteria for manganism. The medical panel review and its report will synthesize current knowledge and advice of experts on manganism diagnosis. Resulting findings will serve to provide workers and employers in the Manganese industry with a stronger basis for ensuring occupational health and safety.

In 2022, IMnI participated in the activities of the International Council on Mining and Metals (ICMM) by active involvement in its different working groups. In May 2022, the ICCM launched its new Social and Economic Reporting Framework, through which ICMM commits to consistent reporting on social and economic contribution. In July 2022, ICMM released a report that benchmarks the 2021 safety performance of its members. In September 2022, ICMM published Tailings Reduction Roadmap for reduction of tailings waste from mining and metals processing. Dissemination of these publications for the benefit of IMnI Members was done through the IMnI monthly HSE Newsletter. ICMM will continue working on different initiatives that will help the metals and mining industry follow the path of sustainable development.

The outcomes of two on-going projects by Dr. Ulrike Dydak investigation team from Purdue University in the US, both directed at Manganese exposure in welding fumes, will be very valuable in increasing the health and safety knowledge aspects of Mn exposure. They will provide a significant source of information for all parties interested in Manganese toxicity and be a powerful guideline for the industry, health practitioners and employees. The findings of these projects will be documented in the papers to be published in 2023.

In 2022, the Manganese life-cycle assessment (LCA) project has been focused on recruitment of participating Members and on raw data collection. The reduction of environmental impacts is a priority in the metals and chemicals industry, and the Mn industry will benefit from detailed information on recycling of Manganese and its products, water consumption, land use, gas emissions etc., at an industry level. The findings of the research will help IMnI Members improve the environmental performance of their Manganese activities, in line with the global climate change challenge and energy transition. Additionally, the outcome will help IMnI Members to demonstrate transparency and corporate credibility to their stakeholders and customers.

Environmental, social & governance (ESG) factors in Manganese, throughout the whole value chain, are now in the spotlight, with IMnI receiving more and more requests from Members and third parties referring to this topic. That is why, in August 2022, the HSE Committee started the ESG factors in Manganese ore mining project. The outcome of this study will provide the Manganese industry with a powerful tool to tackle a vast range of ESG issues, including the approach to energy transition and greenhouse gas emissions, working conditions in supply chains, tailings management, worker and community health and safety, and compliance with ever-increasing reporting obligations.

2022 has also been a year of development of some regulatory policies that may prove to be a challenge to the Manganese industry worldwide. The EU Battery Regulation that is to be enforced at the end of 2022 or in early 2023 will definitely impact Mn compounds as active materials of batteries for EU Mn companies and non-EU Mn suppliers working with them. Since January 2022, Manganese dichloride is regarded in France as suspected endocrine disruptor, and this affects French companies working with this chemical or their suppliers. In April 2022, the EU included *Simple Manganese compounds* under EU Restrictions Roadmap, considering them for potential restriction but requiring hazards confirmation. In November 2022, Manganese was included in the US Final Contaminant Candidate List 5, putting it in the mix for development of drinking water standards. Additionally, China is working on several Mn related policies in the framework of its 14th Five-Year Plan, such as regulation for recycling of non-ferrous metals or plan for cutting heavy metals emissions in heavy non-ferrous metal mining and smelting to control Mn pollution, amongst others. Additionally, in October 2022, under the same framework, a technical specification to control Manganese slag pollution was enforced in China.

The HSE Committee is committed to continue providing support to IMnI Members in the future. Several ambitious new projects will be initiated in 2023, aimed at ensuring the Manganese industry becomes increasingly sustainable, while contributing even more to the energy transition through the use of Manganese chemicals in batteries for electric vehicles.

Rocklin REED
IMnI HSE Committee Chairman

2022 UPDATE ON HSE SPECIAL PROJECTS

Can toenail Manganese levels predict brain Manganese levels?

In late 2018, IMnI commissioned Purdue University in the US to study if toenail Mn levels can predict brain Mn levels, following workplace exposure in welders. Previous research in this field showed that Mn concentrations in toenails produced strong correlations with exposures during previous 7-12 months, and that toenail concentrations also correlated with motor function test results. Toenail concentrations from toenail clippings acquired at the same time as the MRI exam did, however, not correlate with brain Mn levels, which only correlated with exposures during the last 3 months. Data acquisition of toenails samples at timepoints 3, 6, 9 and 12 months after the MRI exam was finalized in the first quarter of 2021. Then, the toenails concentrations underwent an analysis process. Based on previous research, the expectation was that toenail Mn levels acquired 6 months after the MRI exam would better predict the brain Mn levels, due to each biomarker representing different past exposure times. Contrary to the expectations, the preliminary conclusions of the study indicate that there is no correlation between brain Mn and toenails Mn at any timepoints. For the sake of confirmation, the project is undergoing recruitment of additional subjects to increase the sample size (for MRI and toenail samples), and the ongoing analysis of new MRI and new toenail samples for metal content.

Between 2021 and 2022, the continuing findings of the research work were presented at numerous international scientific meetings. These findings are expected to be documented in a paper to be submitted for publication in April-May 2023.

Research on metal mixtures exposures in welding fumes

Following the previous investigations of Purdue University, a study on exposure to different metals mixtures profiles contained in steel and aluminum welding fumes and resulting health effects was initiated in August 2021. Welding fumes contain metals other than Manganese several of which have been shown to be neurotoxic in case of very high exposures, just like Manganese. Few studies have taken into account the co-exposure to additional metals when interpreting results of correlations between exposure to Mn contained in welding fumes and health effects. This study aims at addressing the existing wide knowledge gap on effects and synergies of exposure to metals mixtures, where it is not clear that all the described effects are due to Mn. Additionally, this study seeks to evaluate the importance of each metal contribution to a particular effect.

The first part of the study focuses on data analysis of the existing metal mixture data, coming from the older projects, for 8 metals (Mn, Fe, Al, Cu, Ni, Pb, Cr, Zn). Preliminary results show that i) welders show a selective deficit in sustained attention, ii) cumulative exposure to metals in welders is associated with impairment in memory, which is common to all metals.

Data analysis is being done by using two statistical approaches: regression analysis and Bayesian Network Analysis. Currently, the results of the data analysis are being studied with the focus being placed on how the results from each approach may be combined/interpreted.

The second part of the project focuses on analysis of health outcomes of steel welders



(Mn) to aluminium welders (no Mn), which are to be compared for exposure data (personal air samples and toenail clippings), brain MRI and MRS, and neuropsychological testing (cognition and motor). Currently, there is an ongoing recruitment of aluminium welders and exploration of new recruiting strategies. Some preliminary results show that even for small sample size, exposure & toenail data show significant and interesting differences.

The project is expected to be completed by August 2023. The resulting research findings will be described in two peer-reviewed Tier 1 journal articles, which are already under preparation.

Manganism

This project was commissioned to Risk Sciences International (RSI) at the beginning of 2018, with the objective to redefine current diagnosis criteria for manganism, as they appear outdated, given that Mn exposure is far lower nowadays than it was historically. The idea is to provide workers and employers in the Manganese industry with a stronger basis for ensuring occupational health and safety. The first phase of the project, which involved a comprehensive review of criteria

for measuring neurological impairment, was completed in 2019. Subsequent phases of the project that focused on review of Manganese pharmacokinetics and imaging and review of Manganese biomarkers, were completed in 2020. These phases were used as background information for the International Workshop on Diagnosis Criteria for Manganism that took place in November 2020, with participation of an international expert panel on Manganese toxicity. The first deliverable of this project, three papers on biomarkers on Manganese, was submitted for publication in Critical Reviews in Toxicology between June and September 2022. These papers will be published by the end of the first quarter of 2023. The 2nd deliverable of this project, a workshop report on diagnosis of manganism and Manganese neurotoxicity, will be submitted to another journal for publication in the first quarter of 2023. The last deliverable of this project, an "Independent medical panel review of suggested diagnostic criteria for manganism" that aims at converting workshop recommendations into updated diagnostic considerations for manganism and Manganese neurotoxicity, has been recently drafted. Being currently under the experts' review, it is expected to be finalized in the first quarter of 2023.



Manganese Interest Group (MIG)

In 2022, the IMnI continued supporting the US Manganese producers and consumers, focusing mainly on two activities. The first one is directed to complete examination of the Bowler study data, released by the US Environmental Protection Agency (EPA) through a secure data enclave (SDE), on the Mn air exposure in Ohio communities, to assess its scientific completeness and accuracy for further enforcement of more stringent Mn regulations.

The second matter aims at supporting US Manganese producers and users against new Dr. Haynes' research studies. It focuses on the co-development with MIG of a joint letter to be delivered to the authorities and universities that are former and actual hosts and/or sponsors of the investigation works of Dr. Haynes, to alert them about inaccuracies detected in Dr. Haynes' prior research. The draft letter was sent to the targeted institutions at the end of 2022.

In June 2021, the US EPA included Mn in its newly issued draft list of drinking water contaminants for potential regulation under the Safe Drinking Water Act (Draft Contaminant Candidate List 5 – CCL 5). IMnI provided the Manganese Interest Group (MIG) with information and documentation in support of the comments that were submitted to the

EPA in September 2021. Following the period of public comments and consultations, EPA published the Final CCL 5 in November 2022 and included Manganese in it. Listing on the CCL will put Manganese in the mix for development of drinking water standards (which are used as a primary basis for site cleanup standards, among other things).

HSE webinar

In November 2022, an IMnI webinar on HSE insights in the manganese industry was organized. The webinar gathered four expert panelists, who presented about a Manganese mining company's support to South African education, the role of LCA in sustainability debate and benefits for Mn, tradeoffs between profits and carbon reduction in Mn smelting operations, and about what makes Manganese a critical material. These presentations and a video of this webinar are available to IMnI Members.

Life Cycle Assessment of Manganese products

In November 2021 IMnI initiated a new Manganese Life Cycle Assessment. The project is developed by consulting company Sphera,

which has strong experience in performing LCAs for metals. The study aims at assessing the life-cycle environmental profile for the global production of Manganese products, in an effort to provide the interested parties with reliable and representative life cycle data. Based on the input from the IMnI Members, the study focuses on quantifying the environmental impacts of the cradle to gate production of Mn ore, Mn alloys, EMD, EMM and MnSO₄. The target audience for this study includes the IMnI Members, Manganese producers, first and end-users (steelmakers, producers of precursor for cathode active material producers to be used in Lithium-ion batteries, etc.), legislators, academia, LCA practitioners, non-governmental organisations (NGOs), etc. The study is conducted in accordance with the ISO standards. Between December 2021 and February 2022, the recruitment of the participating companies was performed, and 18 companies have decided to participate in this project. These companies then provided their individual raw LCA data to Sphera. Currently, the consultant is preparing company-, site- and Mn product-specific draft LCA models. The project will be completed by the fourth quarter of 2023.

ESG factors in Mn ore mining and beneficiation value chain

Environmental, social & governance (ESG) factors and initiatives in the Manganese industry, throughout the whole value chain, are now in the spotlight, and IMnI Members are interested in this topic. In August 2022, IMnI started a project to study the ESG factors in Manganese ore and beneficiation value-chain. The objective of this research is to compare factors on a regional basis, and gather material on mitigation and best-practices. Studies on Mn alloys value chain and Mn chemicals (EMM, EMD, MnSO₄) are foreseen to be undertaken in 2023. The ESG factors are to be studied using the sustainability schemes for mineral resources developed by Germany's Federal Institute for Geosciences and Natural Resources, one of the most extensive sustainability schemes available to date. This project was completed in December 2022.



2022 REGULATORY HIGHLIGHTS

Quarter 1

- Thailand proposes lower migration limits for heavy metals in plastic food contact materials: the maximum amount of Manganese in the 13 types of plastic to be in contact with food is set at 0.6 mg/kg
- Two counterpoint voices for Manganese listing on the US EPA Contaminant Candidate List: Review of voices for and against of Manganese listing on the CCL provided during a period for public comments and consultations

Quarter 2

- China issues standard for Manganese slag pollution control to be implemented on 1 October 2022
- European Commission includes 15 *Simple Manganese compounds*, including *Simple inorganic salts, oxides and Manganese metal* and *Permanganates*, on its Restrictions Roadmap aimed at banning chemicals under REACH Regulation

- Manganese among India's revised nutrient values for infant foods: the upper limit of Manganese in various standards for infant nutrition is increased 10 fold – from 50 to 500mcg per 100g and from 10.60 to 106.40mcg per 100kcal
- Draft proposal of EU Carbon Border Adjustment Mechanism regulation, expected to come into force on 1 January 2023, shows that ferroalloys are excluded from the scope of the mechanism

Quarter 3

- Manganese included in the Uganda's draft standard related to food contact materials: Manganese can be contained in alloys for food contact and maximum release limits for Manganese from metals and alloys for food contact purposes shall not exceed 1.8 mg/Kg
- Inconclusive SAB's final recommendations to US EPA on listing of Manganese on the Contaminant Candidate List: the report gives US EPA enough arguments to list Manganese on the CCL 5 or to opt not to

Quarter 4

- EU accelerates introduction of new hazard classes for endocrine disruptors (EDs) to the amended Classification, Labelling and Packaging (CLP) Regulation: possibility of MnCl₂ identification as suspected ED according to the CLP classification criteria
- US EPA announces streamlined Toxic Substances Control Act (TSCA) reviews for new mixed metal oxides: benefits for cathode active materials (CAMs) and modified CAMs including Manganese to be applied in new technologies
- Potassium permanganate, Manganese dioxide and Manganese oxide under the scope of the Brazilian procedures for the control and supervision of chemicals subject to control by the Federal Police
- Manganese included in the US EPA Final CCL5
- Manganese among metals affected by Israel's revision of the standard *Safety of toys: migration of certain chemical elements*

- Manganese listed at the US Agency for Toxic Substances and Disease Registry (ATSDR) 2022 Substance Priority List



THE IMnI ELECTROLYTIC PRODUCTS (EPD) DIVISION

- Focuses on electrolytic manganese metal (EMM), electrolytic manganese dioxide (EMD) and other manganese chemicals (MnSO_4 , Mn_3O_4 , 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 our IMnI China Representative
- Acts as a forum for discussion of industry matters, particularly those relating to health, safety, environment and regulatory affairs

The IMnI Annual EPD Conference could not be organised this year, because of the lockdowns and travel restrictions in China.

For more information about the IMnI and its events, please contact events@manganese.org or follow us on [LinkedIn](#).

UPDATE ON THE CHINA COMMITTEE

The China Committee aims to assist IMnI in enlarging its membership base in China, to provide IMnI Members with accurate statistics on China, to facilitate the networking between Chinese companies and IMnI Members from the rest of the world, and to support Chinese Members in terms of HSE, market research and technical information.

Mrs. Eva Yang (evayang@manganese.org), based in Shanghai, is the IMnI China Representative.

With 3 new Chinese companies joining the IMnI in 2022, the China Committee now represents a total of 28 Chinese IMnI Members, including 17 major producers of Mn alloys, 1 producer of electrolytic products and Manganese ore, and 10 prominent trading companies.

The IMnI China Committee, chaired by **Mr. Jian Zhou** (Fengri Trading), met in May, July and November, and each meeting was attended by 30+ IMnI Members with offices in China.

The China Statistics sub-committee also organised several teleconferences, animated by IMnI China Representative Ms. Eva Yang, to discuss the latest IMnI statistics.



THE ANNUAL CONFERENCE

IMnI's Premier Event

IMnI 46th Annual Conference is held in Cape Town, South Africa. With a record attendance of 240+ international delegates from 110 companies based in 20+ countries, the IMnI 2022 Annual Conference is the world's biggest event of the Manganese industry, and the largest IMnI event ever organized!

More than 130 delegates participate to the technical visits of major Manganese operations, including 7 manganese mines (Transalloys, Manganese Metal Company, South32 Mamatwan, Kalagadi, Tshipi, United Manganese of Kalahari, Kudumane, Ore & Metal/Assmang Gloria & Nchwaning).

Structured around the theme "South Africa at crossroads: diversified Manganese producer, or China's mine?", main speakers include **Robert Ward**, Director of Geoeconomics & Strategy and Japan Chair, International Institute of Strategic Studies (IISS), **Simon Freemantle**, Senior Political Economist, Standard Bank Group, **Michael Thackeray**, Associate, Argonne National Laboratory, **Teboho Sebetlela**, Senior Research Analyst, Wood Mackenzie, **Jason R. Croy**, Ph.D., Group Leader of Materials Research Group, Argonne National Laboratory, **Steven Vercammen**, Steel Market Research Manager, McKinsey, **Kevin Fowkes**, Managing Consultant, AlloyConsult, **Rorie Wilson**, Managing Director, Ore & Metal Company, **Rocklin Reed**, Senior Manager SHERQ, Assore, **Bingbing Song**, Secretary of the CCC Sub-Committee, International Maritime Organisation (IMO), **Aloys d'Harambure**, Executive Director, IMnI and **Dr. Agnieszka Leopold**, HSE & Regulatory Affairs Manager.

Generous sponsors include Autlán, Cigroup, South32, Tshipi, Transalloys, Manganese Metal Company (MMC), Assore, United Manganese of Kalahari (UMK) and Kudumane Manganese.

For more information about the IMnI and its Annual Conference, please contact events@manganese.org or follow us on [LinkedIn](https://www.linkedin.com/company/imni/)



COMPANIES THAT ATTENDED THE IMnI 46TH ANNUAL CONFERENCE



African Development Bank
 African Rainbow Minerals
 Afrimat
 Alfred H Knight
 AlloyConsult
 Amar Ferro Alloys Ltd.
 AMG Group Pty Ltd.
 Argonne National Laboratory
 Asia Minerals South Africa (Pty) Limited
 Assore
 AuricMining(Pty)Ltd
 Autlán
 AVEKS AS
 BDG Metal & Power Ltd
 Borman Specialty Materials
 Carbon Resources Pvt. Ltd.
 CCMA, LLC
 Charisma Resources Limited
 ClGroup
 CRU Group
 CRU Group International
 DERA/BGR
 DPRC S.L.
 Eramet Marketing Services
 Felman Trading Americas, Inc.
 Ferroglobe
 Ferromax/Nordic Elements AB
 Forsteel SRL
 Full Comex Trading SA/Bolt Mineração
 Galmet SpA
 GfE-MIR Alloys and Minerals (Pty) Ltd
 Glencore International AG
 Glencore South Africa
 Helvetia Resources AG
 Hira Electro Smelters Ltd
 Ilanga Le Mvelo Trading & Investments (Pty) Ltd.
 IMnI
 Industrial Development Corporation
 Innovation Worldwide DMCC
 International Institute of Strategic Studies (IISS)
 International Maritime Organization (IMO)
 JMD Ltd.
 Jupiter Mines Limited
 Kalagadi Manganese (Pty) Ltd
 Kalahari Minerals Marketing AG
 Kimpe SAS
 Kudumane Manganese Resources (Pty) Ltd
 LCIB
 LPM s.r.l.
 Manganese Metal Company
 Manmohan Minerals and Chemicals Pvt. Ltd.
 Maringá Ferro Liga S.A.
 Marubeni Tetsugen Co., Ltd.
 McCloskey by OPIS
 McKinsey & Company
 MDZ Fleet Solutions (Pty) Ltd
 Medi Carrier Private Limited
 Menar Capital (Pty) Ltd
 Metalleghe SPA
 Micromesh Minerals & Metals
 Million Link (China) Investment Ltd.
 Million Link (India) Smelting Pvt. Ltd.
 Minerals US LLC
 Minerals Council South Africa
 Minmet SAM
 Mitra S K Private Limited
 MUR Shipping RSA (PTY) Ltd
 Newlyn
 NG Global Energy Solutions (Pty) Ltd.
 Noble Resources International South Africa (Pty) Ltd
 Ntsimbintle Holdings (Pty) Ltd
 Ntsimbintle Marketing and Trading Pte. Ltd.
 Ntsimbintle Ukuhweba Pty Ltd
 Ocelot Investment Group
 Omni Industries BV
 Ore and Metal Company Limited
 Oswal Minerals Ltd
 Prince – A Vibrantz Technologies company
 Project Blue
 Rajadhiraj Tirupani Vinayak Natraj Pvt.Ltd
 Rand Merchant Bank
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 Riverbed Pte Ltd.
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 The Swartkops Terminal PTY LTD
 ThyssenKrupp Industrial Solutions (Africa) (Pty) Ltd
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 Traxys Europe S.A.
 Traxys North America
 Tshipi e Ntle Manganese Mining
 Umicore
 United Manganese of Kalahari (Pty) Ltd
 Vamancore Pte. Ltd.
 Vibrantz Technologies
 WMA Resources AG
 Wood Mackenzie
 World Metals & Alloys (FZC)



IMnI 47TH ANNUAL CONFERENCE

will be held in Bangalore, India from Tuesday, June 6 to Thursday, June 8.

The IMnI Annual Conference is a unique global platform for manganese leaders to meet, network and exchange on the development of manganese industry. Hosted by the International Manganese Institute, the conference moves around the world and always includes technical visits to mines and/or plants. The IMnI conference is open to IMnI Members and relevant stakeholders.

After the success of the 2022 edition in Cape Town, where 240+ delegates of the manganese community networked and learned about the latest trends of the industry, Bangalore has been chosen for the 2023 event. The theme will be "India, the new engine driving the Manganese industry?"

The conference will include technical visits to Abhijeet Ferrotech Limited and Hira Ferro Alloys plants.

Sponsors to date include Asia Minerals Ltd. / Kudumane / PFA, Autlán, Eramet, OM Holdings and South32.

For additional information, please email us at events@manganese.org



IMnI COMMITTEES 2022

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 staffer. Each also has about a dozen members.

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.



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Madelein Todd (Vice-Chairwoman), Manganese Metal Company (MMC)
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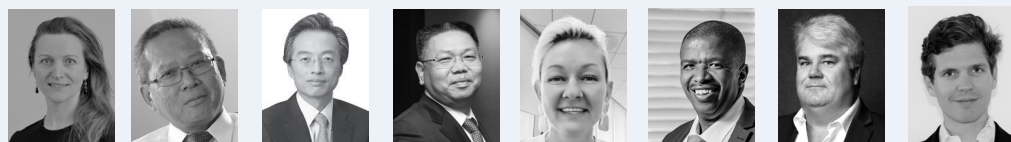
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