



2025/2026 ANNUAL REVIEW

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PRESIDENT'S FOREWORD



Seka Sairan,
President, IMOA

Strong market fundamentals drive growth

In an era of unprecedented global volatility and complexity, I am pleased that IMOA continues to create value for the industry, while also ensuring that molybdenum continues to play an essential role in a more resilient, sustainable, and technologically-advanced world, now and in the future.

I remain encouraged by the opportunities emerging as the world transitions towards a more sustainable and energy-secure future. Molybdenum plays a critical role in renewable energy technologies, nuclear power infrastructure, and modern transportation. While some countries have modified their electric vehicle ambitions, the growing emphasis on hybrid vehicles may prove positive for molybdenum demand, given its use in high-strength, lightweighting steels.

We are also seeing the expansion of artificial intelligence and data center infrastructure, which is expected to drive investment in energy generation and transmission, creating further demand for molybdenum-containing materials.

Navigating global challenges

Despite the positive long-term outlook, we operate in a complex geopolitical environment. Ongoing regional conflicts and trade disruptions have the potential to impact economic confidence, investment decisions, and industrial activity. While long-term supply fundamentals remain stable, uncertainty in global energy markets and transportation routes can create volatility and affect demand. Investment and access to reliable energy supplies will remain critical factors influencing future market growth.

IMOA delivers value for the industry

I am proud of the value IMOA continues to deliver for its members and the wider industry. Through scientific evidence-based dialogue, regulatory engagement, market development initiatives, and global outreach, we work to preserve and expand demand while ensuring access to markets.

In HSE, a major milestone was the decision by the US EPA not to mandate regulation of molybdenum in drinking water – this reflects the importance of robust scientific data and sustained engagement with regulators and policymakers.

Across market development, our efforts are evident in the growing use of molybdenum-bearing stainless steels in water loss prevention and construction projects, driven by outreach to architects, engineers, authorities and standards bodies. Our communications activities ensure members are informed, engaged, and aligned.

This progress is made possible by IMOA's committed team and respected experts, whose proactivity and combined efforts continue to deliver impactful results. I would like to thank them, and our members, for their continued support and engagement.

Strength through dialogue and engagement

The growth in IMOA membership over the past few years is a testament to the value the association provides. By proactively driving molybdenum demand, addressing regulatory challenges, and facilitating dialogue and engagement, we help ensure members are well positioned in a complex and evolving global landscape.

Equally important is the strength of our community. Through active participation in committees and knowledge-sharing, members contribute to shaping the industry's future.

As we move towards operating in a more sustainable and technologically-driven economy, I am increasingly confident that molybdenum will be recognized as one of the metals enabling that future. By working together, we can continue to unlock its potential and ensure long-term success.



SECRETARY- GENERAL

Overview 2025/2026



Eva Model
Secretary-General



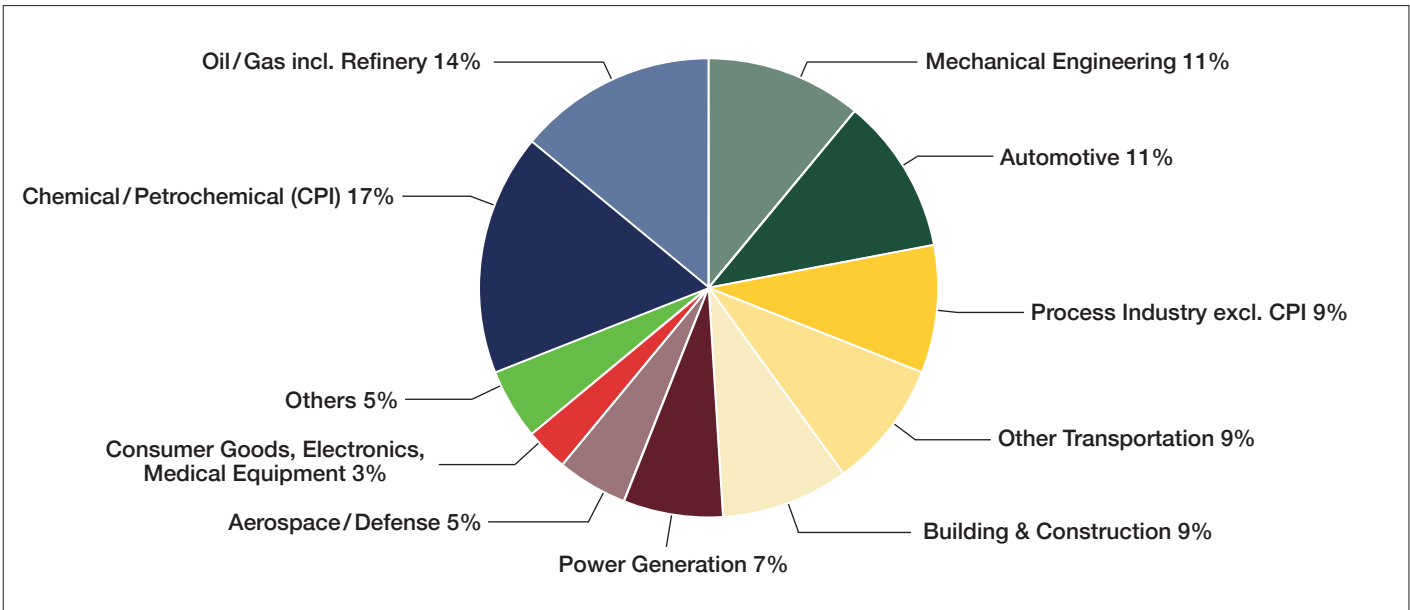
Despite global geopolitical disruption and economic uncertainty, the molybdenum industry continues to demonstrate resilience and long-term growth potential. This is underpinned by its diverse end-use markets, the enduring demand for molybdenum's essential properties, including strength, durability, and corrosion resistance, and being increasingly sought after in new technological solutions.

Stable growth outlook

According to SMR's update in May 2026, global conflicts, particularly in Iran, have impacted the global economy, compounded by the hike in oil prices. While there has been strong GDP growth in China and India, the US and Europe trail behind. Yet, despite this macro-economic picture, molybdenum's first use and end use remains very diversified across the many individual market segments, leading to six years of consistent, be it moderate, market growth. Particularly strong growth has been recorded in aerospace, defense, and power generation.

Global end use demand for molybdenum, including molybdenum contained in scrap, reached 423 kt in 2025, an increase of 2% compared with 2024. Over the same period, global mine production grew by 5%, while global first use consumption, excluding scrap, increased by 4%. End use consumption, representing underlying market demand, grew by only 2%. The differences between these growth rates reflect changes in inventory levels at each stage of the supply chain. Our market research consultants continue to forecast molybdenum use growth in all first use segments.

Molybdenum end use sectors 2025



Molybdenum-in-scrap study

I am delighted to report that the molybdenum-in-scrap study, conducted by our consultants, was well received by members. In 2024, the industry re-used circa 129 kt of secondary molybdenum, and the average scrap ratio in molybdenum-containing materials was 29%. The study is available exclusively for our members in the 2024 SMR report, which is available on request.

Responsible Sourcing update

The *Molybdenum Profile for Supply Chain Due Diligence and Responsible Sourcing* update was published in December 2025. Developed in collaboration with TDi Sustainability, this resource gives a detailed overview of the molybdenum supply chain with a focus on ESG considerations. It is designed to support materials specifiers, steelmakers, and standards-setters in making informed decisions about responsible sourcing. I am also pleased to report that our continued collaboration with Copper Mark has now resulted in 30 sites being awarded the internationally-recognized Molybdenum Mark, with a further two having signed a letter of commitment to participate.



Results through robust science

Our work in Health, Safety, and Environment (HSE) continues to be imperative to maintaining our members' access to markets.

Over the past year, the value of robust science, developed by IMOA, contributed to significant regulatory decisions. Most notably, I am delighted to report that the US Environmental Protection Agency (EPA) issued a final determination under the Safe Drinking Water Act, concluding that molybdenum does not require regulation in drinking water. In parallel, Canada continues to advance a federal water quality standard for molybdenum to protect aquatic life, drawing directly on IMOA-supported data. These high-quality datasets have supported independent regulatory assessments and are expected to inform future decisions internationally.

Sustainability efforts progressed through life cycle assessment (LCA) initiatives, improving the availability of molybdenum data in major software platforms and advancing incorporation into the UNEP-supported USEtox model. I am pleased to report that within the EU, the Molybdenum Consortium (MoCon) successfully completed the update of our 12 REACH dossiers, including our conclusions on the new CLP hazard classification classes for endocrine disruption, namely that no robust or reliable data has been identified indicating that molybdenum substances have endocrine disrupting properties.

In Memoriam

July 2026: It was with profound sadness that we shared the passing of one of our longest-serving technical experts, Dr Philip Mitchell. A Leverhulme Emeritus Professor at the University of Reading, Philip brought an unparalleled breadth and depth of expertise in molybdenum chemistry, and at almost 92 years of age, remained unwavering in his commitment to IMOA. Having worked with the Association almost from its inception in 1989, he made an extraordinary contribution over nearly four decades. His scientific insight, generosity, and dedication were instrumental in advancing IMOA's work, and we remain deeply grateful to have benefited from his exceptional knowledge and counsel for so many years. His loss will be keenly felt across the Association.



Driving education, standards and demand

IMOA's market development strategy centers on driving demand by educating key stakeholders on the properties and sustainability benefits of molybdenum.

Our educational approach continues to deliver results. For example, our IMOA-developed high-performance alloying concepts are now being used in automotive and industrial applications. The water loss reduction project using molybdenum-containing stainless steel service lines has seen successful large-scale trials in Italy with around 700 installations completed across Brescia, Ancona and Belluno, with trials also beginning in Modena. I am pleased to say this project is attracting growing international interest and has the potential to contribute meaningfully to global water conservation efforts.

IMOA consultants have contributed to progress in global standards development, including contributions to major US and European design codes and a six-part series of new specifications for duplex stainless steel in bridges. The first two, on Design and Plate Materials, were published in April 2026. These efforts support the adoption of molybdenum-containing stainless steels.

Communicating with impact

Our communications program continues to play a vital role in engaging members on relevant issues and promoting the value of molybdenum across a wide range of applications.

Underway this year is a new initiative highlighting the range of decarbonization activities undertaken by our members. This work will underline the industry's collective commitment to the use of green technologies. The initiative originated from discussions during the development of the current IMOA strategic plan. When published later this year, it will represent a meaningful step in demonstrating the industry's progress in this space.

We have continued to raise awareness of molybdenum's role in sustainable technologies. A new infographic on concentrated solar power was published this year, that illustrates how molybdenum enables low-carbon technologies. IMOA-authored articles were also featured in leading international trade publications, including *Stainless Steel World*, *Edelstahl Aktuell*, and *Stainless Steel World Americas*. Feedback on *MolyReview* remains highly positive, reflecting the quality and dedication invested in its production.

Our sustained focus on social media is delivering strong results with LinkedIn followers increasing by 15% and WeChat by 12% over the year. The introduction of standardized social media templates has further strengthened IMOA's brand identity.

Providing timely, relevant, and high-quality information to members on IMOA activities and developments within the molybdenum industry remains at the core of our communications effort.

Membership, stronger together

The value of IMOA membership lies in its unique ability to unite stakeholders across the molybdenum supply chain around a shared objective: growing demand for molybdenum while addressing emerging challenges. At our 2026 AGM, we will welcome two new members, bringing our total membership to 81. Membership represents approximately 92% of mined molybdenum production and nearly all conversion capacity outside China, CIS, Iran, and Mongolia alongside significant production within China, and strong representation from downstream users, assayers, traders, recyclers, and logistics providers. Over the coming year, I will continue to encourage further organizations to join and strengthen our Association across the supply chain.

Engagement with members remains strong, with networking opportunities consistently highlighted as highly valued. The breakfast briefing event held during our Spring meetings in London was particularly well attended, with excellent feedback on the market-focused presentations. Members also thoroughly enjoyed the busy drinks reception kindly hosted by our member Glencore.

IMOIA continues to achieve a remarkable amount with a small but highly effective core team. I am pleased to welcome Dr Ruth Danzeisen as our incoming HSE Executive and look forward to working with her to build on the strong foundations established by the HSE Committee. As Sandra Carey prepares to retire at the end of the year, I would like to express my sincere thanks for her outstanding dedication and work supporting our global membership throughout her tenure over the past two decades. Her leadership has been instrumental in strengthening our regulatory engagement and developing robust scientific datasets. We wish her every happiness in her retirement as she enjoys more time with her family, especially her grandchildren.

Finally, I would like to thank our IMOA team, expert consultants, and Committee members for their continued expertise, dedication, and commitment. I am also grateful to our members for their ongoing support and engagement, and I warmly welcome your ideas and feedback as we continue to strengthen and evolve IMOA.





HIGHLIGHTS 2025/2026

Membership

Value-led benefits see growing global membership

IMOA now has **81** members across the global molybdenum supply chain from production to downstream users, assayers and logistics providers.



92% Existing membership represents of mined molybdenum production outside China, CIS, Iran, and Mongolia.

Exclusive **In Focus webinar** on the Indian stainless steel market available on demand for members.



Well-attended **breakfast briefing** event, with market-related presentations, and member-hosted drinks reception at the London Spring meetings.

SMR scrap study carried out and integrated into the annual end use report.

Communications

Raising awareness of molybdenum's unique properties and sustainability credentials



Updated **Molybdenum Profile for Supply Chain Due Diligence and Responsible Sourcing** published.

IMOA-authored articles in trade media reached an audience of **~75,000**.



2,192 followers on LinkedIn, **15% increase** since June 2025.



8,300 followers on WeChat, **12% increase** since June 2025.

Health, Safety & Environment

Securing access to markets with rigorous scientific evidence to support appropriate regulation and chemical management



MoCon: all **12** **Lead Registrant technical dossiers** were updated and submitted in April 2026.

Molybdenum was used as the pilot study to incorporate tox datasets into UNEP-sponsored USEtox software for calculating **Life Cycle Impact Assessments (LCIA)**.



IMO's **RMC and FeMo carbon footprint values** are now available in the automotive sector Catena-X LCIA database.

Definitive 2nd species PNDT study conducted in February 2026 identified **no** findings to indicate that molybdate is a prenatal developmental toxicant.



IMO's regulatory engagement and robust scientific studies resulted in the federal **US EPA final decision not** to regulate molybdenum as a contaminant in drinking water (Safe Drinking Water Act).

Market Development

Promoting the advantages of molybdenum-containing alloys in a range of applications

4,600 attended **43** webinars, workshops and conference presentations.



600 attended the **Molybdenum in Steels Symposium** in China, co-organized with JDC and the Chinese Society of Metals.



IMO's sponsored research supports **automotive** implementation of **2,000 MPa** press-hardened steel using a **Mo-Nb alloy concept**.

New project on **flue gas desulfurization** materials launched with **SUEP** in **China**.

IMO consultants helped develop AASHTO material and structural design **specifications** for **duplex stainless steel bridges**.



Italian water service line project surpasses **700 connections** and expands to additional trial areas.



HEALTH, SAFETY AND ENVIRONMENT

Key Activities and Achievements in 2025/2026



Sandra Carey
IMOA HSE Executive



IMOA HSE Committee activities

IMOA continues to prioritize regulatory dialogue about the setting of appropriate health and environmental quality standards for molybdenum as one of its core Committee activities. Key enablers for well-founded discussions are IMOA’s high-quality toxicological and ecotoxicological datasets about any possible adverse effects of exposure to molybdate.

US Safe Drinking Water Act (SDWA)

In March 2026, the US EPA announced its federal regulatory assessment final decision not to mandate regulation

This *final* determination is the outcome of the EPA’s January 2025 *preliminary* determination, for which IMOA also made a supportive submission during the public consultation period in March 2025. At a global level, the US EPA decision will likely be precedent-setting when other countries in the future are considering whether or not to regulate Mo in drinking water.

Canada Mo water quality standard (WQS) setting

Over the USA border in Canada, the authorities are also developing a federal level Mo water quality standard. In this instance, it is for the protection of aquatic life in Canadian river and lake surface waters. Their federal

“IMOA’s high-quality data sets are key enablers for well-founded discussions.”

of molybdenum in drinking water. The US Federal Gazette confirmed the ‘negative determination’, meaning EPA’s Office of Water assessed the molybdate toxicology data and the generally low occurrence levels of Mo in drinking water across the US, and decided no regulation of molybdenum as a contaminant is necessary.

Over the past 18 years, IMOA has commissioned, and subsequently peer-review published, a suite of toxicology studies about repeated dose exposure, genotoxicity, reproductive toxicity, and prenatal developmental toxicity of molybdate (all are mandatory endpoints for chemicals management regulatory compliance globally). The IMOA-facilitated existence of those high-quality datasets enabled the US EPA to assess molybdate effects for key human health endpoints and draw their independent conclusions. It is a prime example of how gold standard scientific data generated by IMOA contributes very significantly to key decisions by the regulatory community.

Molybdenum was first nominated onto the SDWA Candidate Contaminant List (CCL) in 2008, and is now one of a small number of substances for which it has officially been decided at US federal level that regulation in drinking water is not required.

authorities proactively reached out to IMOA mid-2025, requesting access to IMOA’s molybdate effects datasets for both freshwater and marine environments for their independent assessment. The overall timeframe for water quality standard development and completion is approximately two years. In May 2026, IMOA was invited to peer-review their imminent draft regulatory proposal, which will also be subject to public consultation.

It is also noteworthy that two Canadian provinces already scrutinized IMOA datasets prior to updating their molybdenum standards in recent years, also for the protection of aquatic life, as shown in the table below.

Canadian Province updates to their molybdenum standards for the protection of aquatic life

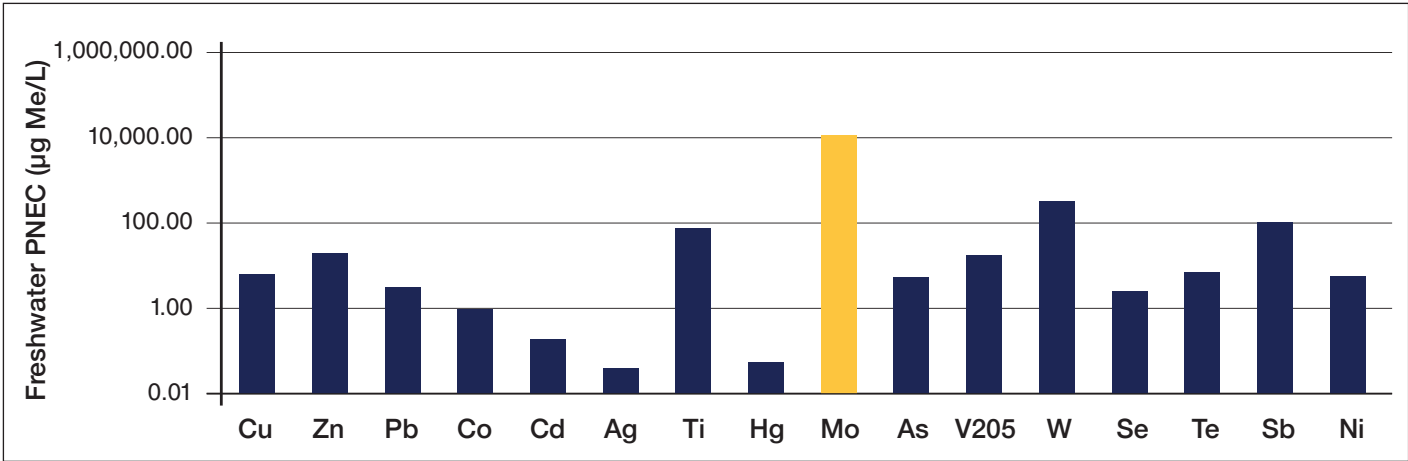
Canadian province	Previous Mo WQS (aquatic life)	Current Mo WQS (aquatic life)
British Columbia	0.073 mg Mo/L	7.6 mg Mo/L (established 2021)
Saskatchewan	0.073 mg Mo/L	31 mg Mo/L (established 2018)

Molybdenum, in the form of molybdate, is an essential trace element in a range of specific biological functions for humans, plants and animals, meaning none survive without absorbing trace amounts through their source of nourishment. Aquatic toxicity testing in compliance with internationally-accepted test protocols – most often those specified by the Organization for Economic Cooperation and Development (OECD) – demonstrates the more minimal aquatic toxicity of molybdate compared to metals that usually feature in global regulatory compliance frameworks, as exemplified in the charts below. The logarithmically scaled y-axis of each chart is noteworthy.

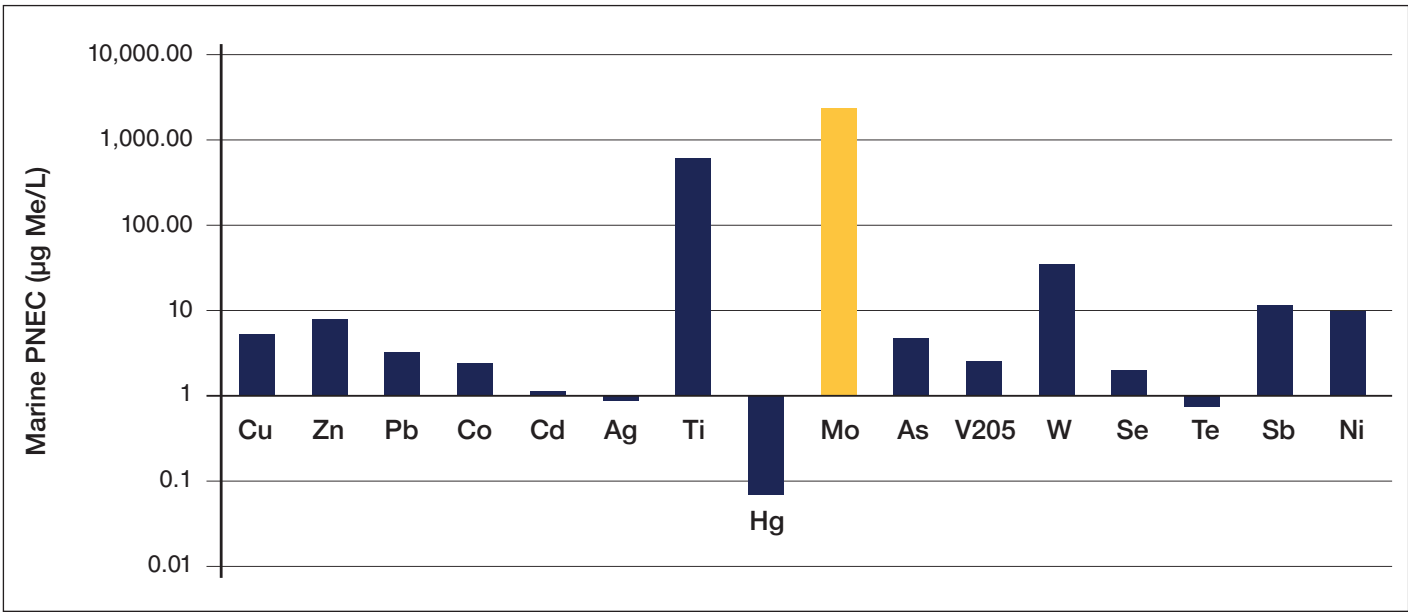
Predicted No Effect Concentrations (PNEC) for molybdate in the environment

Compartment	PNEC (i.e. safe level)
Aquatic compartment – freshwater	11.9 mg Mo/L
Aquatic compartment – marine	2.28 mg Mo/L
Sediment compartment – freshwater	21.2 g Mo/kg dw
Sediment compartment – marine	2.37 g Mo/kg dw
Terrestrial compartment	9.9 g Mo/kg dw
Sewage treatment plant	21.7 mg Mo/L

Freshwater PNEC (safe level) comparisons with other metals



Marine PNEC (safe level) comparisons with other metals



Occupational Exposure Limits

The International Council of Mining and Metals (ICMM), of which IMOA is a member, is developing a workplace occupational exposure protection-level database. Data input contributions were received from IMOA members across four continents. The database is intended as a knowledge-sharing tool to promote and maximize awareness about which substances and other factors industry protects against in the workplace (e.g. noise), and the corresponding exposure protection levels.

US ACGIH Molybdenum Review

IMOIA made three submissions to the American Council of Governmental Industrial Hygienists (ACGIH) during public consultation periods about their review of the threshold limit value (TLV) for soluble molybdenum in workplace air. This topic is particularly relevant for the awareness of corporate industrial hygienists. ACGIH's scientific opinion concluded that the TLV should be reduced from 0.5 to 0.2 mg Mo/m³. At the same time, they withdrew the TLV for insoluble Mo compounds, and maintained the ACGIH lowest ranking of A3 carcinogen for soluble Mo forms.

The ACGIH is not a US government regulatory body, and its scientific opinions are not mandatory in themselves, but they are a respected source of data used and adopted by many governments globally.

Life Cycle Assessment

Two LCA activities are currently ongoing. The first is working to ensure that our current global average LCI data is available not only on request via IMOA's website, but is also embedded into well-known commercial LCA software packages used by life cycle practitioners. To-date, we have secured its visibility and availability with three of the major software providers. An invitation by Catena-X (a non-profit organization) to provide the global average carbon footprint data for roasted molybdenite concentrate in powder and briquette forms, and for ferromolybdenum, was accepted and duly processed. Catena-X serves the global automotive industry with sustainability data.

The second and more technically challenging project is to update the human health data in the USEtox software, which is a UNEP-sponsored Life Cycle Impact Assessment (LCIA) modeling tool. Achieving this goal matters because USEtox is now cited in regulatory contexts e.g. the EU Ecodesign for Sustainable Products Regulation, as a comparator tool to calculate the environmental and human health impacts of substances in existing products, and for product development. For the latter, LCIA can either act as a market access facilitator or barrier, depending on the accuracy of the data it uses to calculate impacts.

For those reasons, we are keen to ensure that IMOA's human health robust molybdate effects dataset is used for such calculations. Regulatory acceptability is one of the key criteria for USEtox to take on board new data. For IMOA's dataset, that acceptance is proven and amply demonstrated. The key numeric outcome of IMOA's toxicological dataset is the 17 mg Mo/kg/day No Adverse Effect Level (NOAEL), which is already used in several, recent, worldwide regulatory assessments:

Year	Regulatory assessment
2020	ATSDR toxicological profile, intermediate duration Minimal Risk Level
2022	Flanders health-based Groundwater Standard (in the context of site-specific permitting / soil remediation)
2024	EPA Region 8, Colorado, health reference dose for molybdenum table value standard (TVS) for surface waters
2024	Wisconsin: proposed molybdenum groundwater standard
2025	Illinois Pollution Control Board, health-based groundwater quality standard
2025	US EPA CCL5 determination, health reference level (HRL) for drinking water

Since 2023, the *environmental* effects data for molybdenum are being used in the USEtox model, thanks to an earlier IMOA HSE project. Now, via an ongoing multi-metal project, several metals Associations (Al, Co, Cu, Mo, Mg, Ni, Zn) are working to secure the incorporation of reliable *human health* toxicity data into the USEtox model. The molybdenum dataset was the pilot case that went through the USEtox data-selection/verification process. Project completion is scheduled for mid-2026. The datasets will be incorporated into the upcoming Version 3 of the publicly-available USEtox software, which in turn is embedded into commercial software packages for deriving life cycle impact assessments.

What's new on the horizon

An outreach project is in its early stages to consolidate and share with the global regulatory community IMOA's accumulated experience and know-how in relation to setting water quality standards for molybdenum in the aquatic environment. A searchable database on IMOA's website will provide two categories of data. Firstly, it will provide information about all the cases in which IMOA has participated with its datasets; the key technical submissions and outcomes. Secondly, it will list all known Mo water quality standards in force globally, and their source documentation. The intention is to make it easier for regulators to locate and assess this information and decisions implemented about appropriate levels of regulation.

Likewise, IMO A members involved with local permitting issues can save time and resources by pointing their local authorities towards the database.

Another project starting imminently is the development of a 'Gold Standard Human Health Risk Assessment for Molybdenum', as an alternative assessment to the existing, vastly outdated (1992) US IRIS risk assessment dataset, which is still frequently the 'go to' source of data for both US and other global regulators. The aim is for IMO A's robust datasets to be assessed and used, by an independent third party, to derive an updated Reference Dose (RfD). The RfD is an estimate of daily oral exposure to a chemical substance that humans – including sensitive groups like children – can experience over a lifetime without significant risk of adverse, non-cancer health effects. The 1992 IRIS RfD is 5 micrograms Mo/kg/day but that value was derived using none of the recent science developed over the last 30+ years.

Also ongoing is the HSE Executive role handover to Ruth Danziesen in preparation for my retirement after 20 years managing IMO A's HSE and Molybdenum Consortium functions. Ruth comes into the role with much relevant experience, from previous years at both the copper and cobalt Associations, plus direct industry experience, so IMO A is well-placed for a seamless transition.



The HSE and MoCon activities featured in this Annual Review are selected and driven forward by the corporate members of the HSE Committee and the MoCon Technical Working Group, the HSE Executive and our invaluable team of special technical service providers including Lindsay Aveyard (reproductive toxicology), Ing. Dagobert Heijerick (ecotoxicology), Dr Sue Hubbard (regulatory toxicology), Dr Kevin Klipsch (human health toxicology), Professor Len Levy (workplace toxicology), Professor Philip Mitchell (chemistry), and Dr Jay Murray (reproductive toxicology). We are immensely grateful for their continuing dedication and professionalism.

EU REACH Molybdenum Consortium (MoCon)

Looking to the future, the task load for MoCon will depend significantly on whether the revision of the EU REACH Regulation No. 1907/2006 actually materializes. First announced back in 2022, a draft proposal was making the rounds at EU Commission level in 2025, but it was not approved by their Regulatory Scrutiny Committee. A revised proposal has not yet emerged by mid-2026.

It was however announced in May that the full legal text of REACH will definitely not be re-opened and that any changes will be made via an alternative Comitology Committee route. MoCon, via European Metals, participates in the work of formulating and communicating to the EU Commission meaningful revision proposals for the non-ferrous metals sector, as industry awaits what the future will bring for this regulation.

In the meantime, the MoCon Technical Working Group has focused on meeting the following challenges:

Dossier updating in early 2026

All 12 Lead Registrant technical dossiers were updated and successfully submitted to the European Chemicals Agency (ECHA) in April/May 2026. MoCon also communicated a summary of changes and the updated Chemical Safety Report to all registrants. The compelling driver for the update was to submit our conclusions on the new CLP hazard classification classes for endocrine disruption (ED), which is done via updates of the REACH dossiers.

For both ED human health and the environment, MoCon submitted that:

- Currently, no existing robust or reliable data has been identified that would indicate that (MoCon) molybdenum substances have endocrine disrupting properties.
- There is high-quality data to support the conclusion of no adverse molybdate effects on estrogenic, androgenic, and steroidogenic endpoints (EATS). For thyroid there is a data gap. This set of primary hormonal and endocrine endpoints are collectively known as the EATS modalities.
- There are some EATS data-gaps for molybdate effects in the environment.

If a future revision of the REACH Regulation mandates ED testing, MoCon workstreams in the future will adopt an ED focus.

MEED Project: Comparison of Predicted Environmental Concentration (PEC) values for molybdate in water and sediment

RWC-ambient regional PEC	Data reported from 2010	Outcome of the MEED 2022-2025 program
Aquatic freshwater compartment	2.30 µg Mo/L	1.35 µg Mo/L
Sediment freshwater compartment	3.77 mg Mo/kg dw	3.24 mg Mo/kg dw

MEED project completion

The conclusions of the Metals Environmental Exposure Data (MEED) project were finalized in 2025. It was a multi-metal initiative primarily to gather and analyze the most recent available EU-wide exposure monitoring data for aquatic and sediment environments.

The table above compares the recent regional PEC values for molybdate in water and sediment with earlier reported 2010 data. This overview encouragingly reflects that regional PEC levels both in freshwater and sediment have decreased over time, pointing towards anthropogenic activities over recent years not increasing emissions to those environmental compartments.

2nd species prenatal developmental toxicity (PNDT)

In 2023, as the result of two ECHA processes, namely an Assessment of Regulatory Needs and a Compliance Check, MoCon was mandated to generate and submit test data on this PNDT endpoint by early 2027. To comply with this legal requirement MoCon commissioned

the necessary scientific work, completing the multi-year process by mid-2026.

The test substance was sodium molybdate, a highly soluble and bioavailable molybdenum salt, to generate the most precautionary testing outcome, i.e. worst-case toxicity scenario. Assessment of the data generated in the OECD test protocol-compliant study identified no findings to indicate that molybdate is a prenatal developmental toxicant. This excellent result will be written up and duly submitted to ECHA in the prescribed REACH IUCLID software format, in fulfilment of their reporting requirements.

Dossier updating in late 2026

Reporting the 2nd species PNDT outcome to ECHA triggers a second round of mandatory Lead Registrant technical dossier updating. Scheduled to take place during the last quarter of 2026, once submitted, it will mean that MoCon has achieved the goal of submitting high-quality test data for all the standard information endpoints currently required by the REACH Regulation, unless and until the regulatory goalpost-positioning undergoes further changes in the future by ECHA.

MoCon EU REACH Lead Registrant per substance

	Substance	Lead registrant	EC No.	CAS No.
1	Roasted Molybdenite Concentrate (tech oxide)	Molymet Belgium NV	289-178-0	86089-09-0
2	Molybdenum Trioxide (pure)	Climax Molybdenum BV	215-204-7	1313-27-5
3	Molybdenum Metal	Plansee SE	231-107-2	7439-98-7
4	Sodium Molybdate	Climax Molybdenum BV	231-551-7	7631-95-0 & 10102-40-6
5	Ammonium Dimolybdate	Climax Molybdenum BV	248-517-2	27546-07-2
6	Ammonium Heptamolybdate	Climax Molybdenum BV	234-722-4 & 234-320-9	12027-67-7 & 12054-85-2
7	Ammonium Octamolybdate	Climax Molybdenum BV	235-650-6	12411-64-2
8	Ferromolybdenum	Not needed as Mo & Fe are separately registered		
9	Ferromolybdenum slags	Molymet Belgium NV	282-217-2	84144-95-6
10	Molybdenum Dioxide	Molymet Germany GmbH	242-637-9	18868-43-4
11	Calcium Molybdate	Climax Molybdenum BV	232-192-9	7789-82-4
12	Iron Molybdate	Clariant Prodotti S.p.A. (formerly Süd-Chemie Catalysts Italia S.r.l.)	237-389-3	13769-81-8
13	Chemically-produced Molybdenum Disulfide	Grace GmbH	235-721-1	12612-50-9



MARKET DEVELOPMENT

Key Activities and Achievements in 2025/2026



Dr Nicole Kinsman
IMOA Technical Director



Market development at IMOA thrives on collaboration. Working with partners across the value chain and with peer associations across our industry, we help develop new and higher-performing steels, advance the standards and guidance that drive wider adoption, and demonstrate the lasting performance molybdenum delivers in demanding applications. Since June 2025, we have hosted 43 events attended by 4,600 people. This includes 15 webinars and 28 in-person functions and presentations.

Carbon steel development

About a third of all molybdenum is used to improve the properties of carbon steel, which is produced in far greater quantities than any other metal. IMOA supports steel

“About a third of all molybdenum is used to improve the properties of carbon steel.”

producers in adopting molybdenum alloying concepts that improve performance and manufacturing efficiency.

Advanced HSLA (High-Strength Low-Alloy) steels

The global automotive industry is interested in cold-rolled advanced HSLA steels, including Super-HSLA steels, with strengths of 500 to 800 MPa. These advanced HSLA steels, which typically contain 0.1–0.2% molybdenum, offer attractive properties for specific applications. They are also easier to produce than competing multiphase steels. Cold-rolled advanced HSLA steels can be used for rails or beams in seat structures, storage racks, or battery casings. Super-HSLA steels can be produced in comparably large gauges and offer outstanding weldability. A further new automotive application is clutch discs, which benefit from the excellent punching behavior of advanced HSLA steels.

The advantages of these steels were promoted at in-house seminars at steel producers, and presentations at conferences in North America, China, and Europe. The metallurgical role of molybdenum was further explored in several peer-reviewed publications.



Queenscliff Ferry Terminal, Victoria, Australia © Veronika Matheson



Press-hardened (hot stamped) steels

Past IMOA-sponsored projects have established molybdenum alloying as a solution for hydrogen-delayed-cracking in press-hardened steels of the 2000 MPa strength class. Carmakers have started implementing this steel grade, with the Maserati Grecale spearheading the application, and a German OEM currently qualifying a press-hardened steel with 0.15% molybdenum for mass production. IMOA's technical expert is assisting the qualification process based on sophisticated material characterization of pre-production trials.

Standard press-hardened components with a tensile strength of up to 1500 MPa typically use steel sheets up to 2 mm thick that are based on a manganese-boron (Mn-B) alloy concept. However, defense applications require much thicker sheets where Mn-B steels do not offer sufficient hardenability. A position paper, presented at the 2026 Conference on Hot Stamping Technology, argued that Mo-B alloy concepts can efficiently provide the necessary hardenability and additional fringe benefits.

Collaborative research

IMOA's collaboration with CEIT, Dillinger Hüttenwerke, and the Nickel Institute to develop ultrahigh strength extra-heavy gauge plate products was successfully completed, concluding that alloying 0.5% molybdenum provides strong hardenability at all relevant cooling rates, including a synergistic hardening with boron at cooling rates above 5 K/s. The results of the project have been published in two peer-reviewed journals.

A collaboration with ArcelorMittal Industeel to produce plates up to 250 mm thick for plastic injection molding steels has progressed according to schedule. Sample analysis indicated that steel containing 2.0% molybdenum performs better than 0.7% molybdenum and achieves the targeted hardness range. Small-angle neutron scattering analysis performed at the Laue Langevin facility in Grenoble provided detailed insights into the constitution of molybdenum in these steels.

Findings from the project will also be presented at the Thermo-Mechanical Processing conference (TMP) in October 2026, organized by the Austrian Society for Metallurgy and Materials (ASMET). This conference builds on the successful Mo4Steel event held in Vienna in 2024.

Advancing structural stainless steel

IMOA is a member of Team Stainless (TS), an informal alliance of organizations with interests in stainless steel. Pooling resources through TS leverages our contribution fourfold, funding most of our structural stainless steel work, including standards development.

Standards development

Our structural stainless steel consultants are continuing their work on the next revision of the American Institute of Steel Construction's design standard for hot-rolled structural stainless steel, ANSI/AISC 370-21. The new

edition broadens the scope to include all cross-section shapes, enabling greater flexibility and optimization in structural design.

Our consultants are also involved in the revision of the cold-formed structural stainless steel standard SEI/ASCE 8-22 and the revision of AISC 313, the fabrication code for both ANSI/AISC 370 and ASCE 8. The 2025 versions of both AISC documents were published earlier this year. These documents are in the International Building Code (IBC), which is the model code for over 50 countries.

Structural stainless steel is widely used in the nuclear industry for safety-related structures because its durability and low maintenance needs offer significant long-term savings. Having drafted a new structural stainless steel Appendix for AISC standard N690 *Specification for Safety-Related Steel Structures for Nuclear Facilities*, IMOA is now supporting its incorporation into the standard's next edition.

In April 2026, the American Association of State Highway and Transportation Officials (AASHTO) and AISC's National Steel Bridge Alliance published the bridge plate materials and structural design specifications for duplex stainless steel bridges. These are the first two documents in a suite of six specifications. Drafts of the bolt and fabrication specifications have been completed by our technical consultants, while the drafts of the welding and construction specifications remain under development. Together, the six specifications will apply to the use of duplex stainless steel in highway, pedestrian, and rail bridges.

Duplex stainless steel is ideal for bridges because its high strength reduces structural weight and its corrosion resistance minimizes maintenance needs, especially in demanding environments such as rail crossings, waterways,

and coastal areas. Although developed for the US market, the specifications are expected to have broad international relevance.

Authored by TS experts, the new AISC Design Guide 41 *Structural Joints Using Stainless Steel Bolts* was published at the start of 2026, addressing a long-standing gap in guidance on specifying and installing connections for both



building structures, and bridges. Promotion of the guide is now underway. With the rollout of the Second Generation Structural Design Eurocodes, adopted across Europe and increasingly used worldwide, TS consultants are preparing the 5th Edition of the *European Design Manual for Structural Stainless Steel*. This edition is fully aligned with the Second Generation Stainless Steel Eurocode, EN 1993-1-4, and will help designers understand and apply the new, more comprehensive design rules.



The rotating Nybron bridge in Härnösand, Sweden, was completed in 2026 with 2205 duplex stainless steel ©The Municipality of Härnösand



Sculpture by Anish Kapoor; 56 Leonard Street, NY, US © Nicole Kinsman

Buildings and infrastructure must withstand environments that are getting more corrosive and natural disasters that are intensifying. Structural stainless steel can be an important part of the solution because it provides sufficient resilience in these circumstances. Our technical consultants are promoting structural stainless steel via workshops and conferences in Asia and the US, complemented by recorded webinars available globally.

Stainless steel in architecture, building, and construction

Australia's strong fabrication capability and challenging environmental conditions present opportunities for broader use of molybdenum-containing stainless steels in architecture. Our Australian-based architectural consultant translates research into practical guidance for architects and specifiers through targeted 'Lunch & Learn' presentations and case studies. By demonstrating the lifecycle value of stainless steel, including reduced maintenance and strong long-term performance, we promote its use while our technical guidance helps specifiers draft more complete and robust specifications. Examples such as Melbourne's stainless steel street furniture show how stainless steel can save resources compared to other materials. Engagement with fabricators and designers provides project-based data and practical insights that support these efforts.

Market development in China

China is the world's largest producer and user of molybdenum and molybdenum products. This market share, coupled with the country's manufacturing capacity and dynamic research environment, creates many opportunities for increasing molybdenum usage.

IMOA's consultants engage with stakeholders where market potential aligns with IMOA's technical expertise: ABC, engineering, and water distribution. They also monitor other rapidly emerging sectors with potential for significant molybdenum usage, such as renewable energy.

Architecture, building, and construction (ABC)

Our ABC market development activity in China includes monitoring projects that use significant quantities of molybdenum-containing stainless steels. One example is the Suzhou Museum of Contemporary Art, which uses 900 tonnes of pattern-finished Type 316L stainless steel sheet for its dramatic roofing. In discussions with the project's fabricator and façade design team, we shared

technical insights on finish performance, including the better corrosion resistance of pattern-finished surfaces, which are smoother than conventional ground No. 4 finishes. More broadly, our participation in industry conferences and our technical guidelines have raised awareness of stainless steel in architecture, and our technical content is increasingly consulted by architects, designers, and fabricators when selecting materials and finishes.

Engineering and corrosion

IMOA is partnering with Shanghai University of Electric Power (SUEP) to advance the use of molybdenum-bearing alloys in Flue Gas Desulfurization (FGD) scrubbers. Building on their comprehensive survey conducted in 2019, the project will test and evaluate the performance of molybdenum-containing stainless steels and nickel-based alloys in flue gas environments. IMOA member Jinduicheng Molybdenum Group, Qingshan Research Institute, and the Nickel Institute are partners and results will be published and presented at industry events.

Water distribution

High-rise apartment buildings often rely on a secondary water supply system to lift municipal water to the upper floors, in many cases by pumping it to a rooftop tank from which it flows down to each apartment. In China, IMOA's promotion of stainless steel service lines has contributed to an initiative to upgrade these systems, and stainless steel has emerged as a leading material. This effort is estimated to require more than 300,000 kilometers a year of stainless steel water pipes between 2026 and 2031, approximately 12% of which are expected to be molybdenum-containing grades, mainly Type 316L.



Secondary water supply system, Shenzhen, China © Fabio Ries



Communication and media

IMOIA's WeChat channel, which contains educational technical content created for IMOIA's Chinese language website, grew to 8,300 followers, a 12% increase year on year. Similarly, the Chinese website registered around 99,000 visits with 19,500 unique visitors.

The 4th International Symposium on Molybdenum and Steel 2026

Nearly 600 experts, scholars, and senior executives from major steel enterprises across the country and around the world attended this seminal molybdenum-focused conference in Xi'an, held from 18–21 May 2026. The event was organized by Jinduicheng Molybdenum Group together with the Chinese Society for Metals, with support from IMOIA.

Presentations discussed the role of molybdenum in a range of steels and molybdenum metal and its alloys.



Team Stainless

In addition to our structural projects, IMOIA also pools resources with TS partners for the following initiatives.

Stainless steel service lines

Over 35% of the world's drinking water is lost through leaking distribution systems, according to data from the World Bank and the International Water Association. However, some Asian cities, including Tokyo and Taipei, achieve substantially lower leakage rates, in part through the use of Stainless Partially Corrugated Tube (SPCT) service lines, which connect the water main to the water meter at each building. The combination of Type 316L stainless steel's corrosion resistance and the flexibility of the corrugated design helps these tubes withstand ground movement, pressure fluctuations, and temperature changes without leaking, even during earthquakes. TS promotes SPCT as a solution for utilities actively trying to reduce their water loss.

Italy

Italy faces major challenges in drinking water availability due to frequent droughts and the dramatic retreat of Alpine glaciers. Earthquakes, landslides, and an aging infrastructure pose additional threats to the country's water supply. SPCT's potential to save water has attracted interest from 20% of Italy's largest utilities, which together serve around two-thirds of the population. Nicole and IMOIA's technical consultants are delivering this initiative.

In 2021, more than €2 billion was allocated to restore and modernize Italy's water systems under the National Recovery and Resilience Plan (PNRR). This funding allowed Vivaservizi, the water utility serving Ancona, to begin replacing leaking service lines with SPCT. PNRR funds also supported three pilot installations in Belluno, Brescia, and Modena. Additionally, we have conducted more than 20 trial deployments across 10 different utilities in Italy and Malta.

Now that PNRR funding is closed, we have adapted our approach to address cost concerns from utilities. We focus on the progress of ongoing digitalization and on the asset management frameworks of utilities considering the adoption of SPCT technology. In doing so, we have developed a "hybrid approach": SPCT where required, HDPE where sufficient. A local supply chain has also been active since early 2024, listing SPCT in their catalogue along with the necessary fittings.

Other trials

Two trials are planned in Australia for 2026 to 2027. Consultants are also actively promoting SPCT in Singapore, North America, the UK, the UAE, and New Zealand.



Fenix Museum, Rotterdam, The Netherlands © Nicole Kinsman

Driving sustainability standards at ASTM E60

IMOA's US-based ABC consultant serves on the ASTM International Committee E60 on Sustainability, representing TS and the Specialty Steel Industry of North America (SSINA). Because there are no internationally-accepted standards for assessing the use stage of a product's life cycle, we are leading the development of two new life cycle assessment (LCA) standards. One standard will establish a scientifically based approach for assessing and reporting human and environmental risks during normal service and resilience events. The other will define how service environments should be evaluated to improve estimates of service life and maintenance requirements. Both standards will incorporate resilience and climate change considerations alongside normal operating conditions.

These standards will improve the accuracy of cradle-to-cradle LCAs, enabling more meaningful material comparisons and better recognition of stainless steel's long service life, which can offset its higher extraction and production carbon footprint compared to some alternative materials such as carbon steel or plastics. Our ASTM consultant has also contributed to the revision of the only international circular economy standard and is revising a standard on reporting material use risks in buildings.

We also provide technical input on sustainability and resilience to US government agencies, serve on the US Technical Advisory Group (TAG) to ISO/TC 59/SC 17 and contribute to ASTM committees on homeland security, building performance, and environmental risk.

Technical experts

The market development activities outlined in this Annual Review are led by IMOA's Technical Director, with the support of IMOA's Market Development Committee and a team of internationally-recognized technical experts, including Nancy Baddoo (structural stainless steel, standards), Chen Chao (market development in China), Catherine Houska (ABC, ASTM, standards), Veronika Matheson (ABC), Dr Francisco Meza (structural stainless steel, standards), Professor Hardy Mohrbacher (carbon steels), Fabio Ries (market development in China), Dr Gaetano Ronchi (Italian water project), Chen Wenlei (communications in China), and John Wu (ABC China). We gratefully acknowledge their invaluable contribution, knowledge and commitment, which continue to underpin the success of these initiatives.



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* Member to be ratified at the 2026 AGM.

List of members correct as of 10th August 2026.



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