

International Zinc Association

2016 Annual Report



Adding Value to Zinc Producers and their Customers

25th ANNIVERSARY

IZA Vision Statement

“A world where zinc is recognized as sustainable and essential for modern life.”

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Rodrigo Daud
Chairman, *International Zinc Association*
Chief Commercial Officer, *Votorantim Metais*

Chairman’s Letter

The theme for the 25th year Anniversary for the International Zinc Association is very appropriate “IZA: Adding Value to Zinc Producers and their Customers”. At the end of the day, continued growth in zinc consumption is critical to optimize the mining and refining assets that we all operate.

The role of IZA has evolved over the years but the basic vision and mission remain the same—to ensure we all have a “license to operate” and to sustainably grow and protect zinc markets.

In my first year as Chairman of IZA I am amazed at the diverse range of high-impact projects in market development, environment, and sustainability and communications programs. Key to their success is the relevance to zinc customers and end-users. IZA has partnered with steel mills, general galvanizers, alloyers and diecasters, zinc sheet producers, oxide producers and fertilizer companies to help them capitalize on growth opportunities and/or to defend present markets.

IZA’s sustainability programs have also been critical to our Industry as well as to our customers. Zinc Saves Kids in support of UNICEF and the Zinc Nutrient Initiative have raised the awareness of zinc’s value and also reinforced the zinc industry’s commitment to initiatives that benefit society.

Working with our customers provides more than cost sharing benefits; their input helps prioritize IZA’s programs and ensures that results are adopted in the marketplace. As this Annual Report showcases, this value chain focus has enabled IZA to deliver some remarkable returns on a relatively modest investment from its zinc producing members. In fact, customers and other IZA partners account for 55% of the funds under IZA management.

These partnerships would not be possible if IZA had not built a reputation of effectively and efficiently managing highly relevant programs with a very knowledgeable staff. Their expertise and energy is second to none—we are very fortunate to have them.

IZA has been focused on being as effective and efficient as possible. All projects have key performance indicators (KPI’s) to measure operational and financial parameters. Additional revenue opportunities continue to be a high priority; IZA will organize the first annual Zinc Conference in Europe in 2017. IZA continues to move towards being the global voice of the industry.

I would like to take this opportunity to thank existing members for their support, especially the Executive and Advisory Committees, the Board and the functional Committee members whose time investment adds real value.

Our industry has real challenges and opportunities ahead of it. But we also have an organization with a 25-year history of remarkable achievements. I am confident that IZA will succeed in achieving its vision of creating a world where “zinc is recognized as sustainable and essential for modern life.”



Stephen Wilkinson

Stephen Wilkinson
Executive Director
International Zinc Association

Executive Director’s Message

Adapting to Changes in the Industry

25 years ago IZA was formed by 18 zinc companies with the mission to grow and protect the global markets for zinc.

What have we seen in 25 years?

A more consolidated Zinc Industry. More environmental regulation requiring sound science and communication with key regulatory authorities and thus a growing requirement that companies need a “license to operate”. More competition to zinc products such as aluminum in auto bodies. A need to develop and expand new uses for zinc. The need for more product information, education and technology transfer in emerging markets. Less product research and market development resources in Member companies. More demand for proper sustainability assessments of zinc’s environmental footprint for key designers and specifiers. A need to assume social responsibility. These are all just to name a few.

What has IZA achieved during this time?

- recognition as the sole global voice and advocate for the zinc industry
- a strong and shared vision where “zinc is recognized as sustainable and essential for modern life”

In Environment: ensure market access

- successfully fought European Zinc Risk Assessment in part by developing new scientific tools
- completed all dossiers for the REACH initiative in Europe
- kept zinc off the EU prioritization list—but the battle continues
- prevented zinc from being on regional hazardous lists such as in Washington State

In Market Development: grow and defend markets

- manage program of 23 steel companies and an automaker to keep galvanized steel autobodies competitive. Also used this data to develop markets in China and India.
- developed market for zinc in fertilizers which now accounts for 2% of global demand
- developed market for galvanized rebar in China and USA
- developed two new zinc die cast alloys that have opened new markets and defended existing ones
- developing thermal spraying markets for offshore wind energy installations, ships and rails
- intensely educating designers and specifiers in India, China, Latin America, Russia, and Asia through seminars and conferences

In Sustainability: show environmental and social benefits of zinc

- developed global Life Cycle Information for key decision makers and specifiers
- developed key recycling database for regulatory authorities
- initiated the Zinc Saves Kids program in support of UNICEF which had huge impact on children’s health in Peru and Nepal, and which facilitated the Government of Peru to spend \$ 9 million annually. Facilitated similar health programs with Member companies in India, Mexico and the DRC.

In Communications: highlight zinc as an essential material for modern life

- held 25 successful Annual Zinc Conferences
- updated world leading www.zinc.org website which gets over 700,000 hits annually
- produced first-class technical brochures, fact sheets, databases and training tools to support IZA programs
- provided program updates to members and issued press releases on major developments
- held 12 successful Zinc Colleges—the first one in Golden, Colorado and the most recent one in Lima, Peru

In Organizational Structure: effectiveness and efficiency

- established solid network of experts in market development, environment, sustainability and communications
- rationalized regional zinc associations and merged ILZRO into IZA for more effectiveness and efficiency
- grew number of Affiliate Members including zinc consumers who contribute financially to IZA programs
- grew third party financing
- IZA Member fees account for 45% of total programs under IZA management

The Next 25 years?

IZA will tackle new challenges and opportunities that will arise. The key to future success will be the continued strong support from the Member companies as well as having a talented, passionate and dedicated staff as we do today.

“As a major zinc producer, we appreciate IZA’s highly professional staff effectively leading initiatives that increase global zinc consumption long-term and ensure our industry’s “License to Operate”. The benefits of IZA to its members are simply captured in “higher quality at lower costs” compared to individual member initiatives.

Patrick Ammerlaan
Director—Raw Materials
Boliden Smelters





General Galvanizing

IZA works closely with Regional Galvanizing Associations on targeted market development programs aimed at specific markets such as the use of galvanized rebar in bridge decks. In partnership with the American Galvanizers Association, a new galvanized rebar marketing group was formed in 2016 along with a new website and market brochure. Galvanized rebar is a promising new market for zinc.

In developing countries, IZA's general galvanizing initiatives have focused upon promoting and educating key decision makers about zinc's advantages in corrosion protection and other applications. To ensure long-term sustainability of these markets, this education also involves training galvanizers on modern and efficient galvanizing.



IZA leadership has been instrumental in combating the constant barrage of attacks against the galvanizing industry for environmental concerns, specifically storm water run-off.

The Zinc Nutrient Initiative has provided opportunities for a bigger outlet for galvanizing's secondary materials and acid recycling by-products. The Zinc Saves Kids program is truly changing lives. IZA's continued support in the Bridge & Highway markets as well as rebar provides an opportunity for growth for AZZ Inc., our employees, and our stockholders.

Tim Pendley
Sr. Vice President
AZZ Metal Coatings
AZZ Galvanizing Services and AZZ Inc.



AGA and IZA have a very solid partnership of common interests. We rely on IZA's sphere of influence and muscle to be our voice protecting our position in various markets, to lead the charge in environmental science with NGOs and governmental agencies, and to consult with us on necessary research to expand our markets.

As the involvement of zinc companies in the areas of research and galvanized steel market development has lessened in the past decade, IZA has stepped up and made an overall greater impact due to their unified vision and expertise. The general galvanizing industry in North America would not be experiencing the growth and profitability we are without the assistance of the professionals at IZA.

Philip G. Rahrig
Executive Director, American Galvanizers Association



Since IZA's presence in India, the country has seen lot of new initiatives and regularization of standards for protection of steel against corrosion. IZA has been instrumental in providing necessary skills/advice to the industry emphasizing the importance of Galvanization and need of Zinc in Human Health. The Technical experts from IZA are highly respected by zinc consumers and government officials alike and we have been able to use IZA tools to help grow the general and continuous galvanizing markets at a much faster pace.

Vijay Murthy
Dy. Chief Marketing Officer
Hindustan Zinc Limited



The IZA has played an important role in Valmont Coatings global growth. Their support in marketing, regulatory compliance, product innovation and professional education has greatly advanced our industry around the world.

Leadership and support in efforts such as "Zinc Saves Kids" has enhanced how people view the critical role we play in protecting the planet's infrastructure. Passion and professionalism is the hallmark of their team in all they do. IZA is a strategic partner to Valmont Coatings.

Richard Cornish
Group President, Global Coatings
Valmont





IZA's Galvanized Autobody Partnership (GAP) is a coalition of zinc, steel and auto companies aligned to retain and grow steel use in the auto sector through technical innovations in advanced high strength steels and ensuring these evolving steel grades can be galvanized. Automotive is an important market, consuming 600,000 tonnes of zinc in 2015. Further development of the markets in China (350,000 TPY) and India (150,000 TPY) is poised to add an additional 500,000 TPY zinc consumption to this sector.

Galvanized Steel in Automotive

All global automakers, including GM, are continually challenged to develop vehicles that meet feature, performance and safety demands of consumers while at the same time complying with increasingly stringent fuel economy and emission standards. Vehicle light-weighting plays an important role in addressing these challenges and the steel industry has been successful in developing advanced grades of steel to meet these demands while facing competition from alternative materials.

Lightweight high-strength steel is now widely used in structural components throughout the car and will likely find even more use in the near future. For example, the steel-intensive body of the 2016 Chevrolet Malibu is comprised of over 65% high strength and advanced high strength steel which enabled it to shed 300 lbs. in weight over its predecessor. With over 75% of the body-in-white requiring supplemental corrosion protection in the form of sacrificial galvanized coatings, coatings will remain relevant well into the future and as down-gauge potentials are explored with the implementation of new, higher strength steel grades.

IZA's Galvanized Autobody Partnership has been a key ally by addressing the processing and performance issues required to ensure these newer steels can be galvanized for long-term corrosion protection.



Jason J. Coryell, P.E.
Technical Integration Engineer and Steel Applications, Advanced Technology & Welding
GM Body Manufacturing Engineering

Zinc coatings enable steel to perform its best in automobiles and GAP is leading the way on zinc coatings research.

Dr. Jody N. Hall
Vice President of Automotive
Steel Market Development Institute



GAP research has been instrumental in helping maximize quality and efficiency in our galvanizing line operations and membership in this program is seen as essential by the whole technical organization of TataSteel.

Marga Zuiderwijk
Tata Steel



IZA has been a key partner in Baosteel's efforts to raise awareness with Chinese automakers of the need to galvanize auto bodies, which has led to the ratio of zinc-coated sheet steels used in Chinese auto increasing year by year.

Wang Li
Boasteel



Zinc Die Castings

IZA's market development program for die castings has two primary goals. One is to increase awareness of zinc casting alloys at the designer, specifier and engineering levels. This entails developing and disseminating essential user property data, including mechanical and finish properties and educating design and engineering students about zinc castings and their capabilities. The second area involves the development of new technologies (such as thin wall castings) or new alloys with improved properties to open new markets and applications.



From organizing the highly successful International Zinc Die Casting Conference in Italy to partnering with Initiative Zinc at the biennial EUROGUSS 2016 (the largest European trade fair for die-casting with over 12,000 visitors), IZA has been at the forefront of educating engineers, designers and potential end users on the merits of zinc die casting products. The sponsorship of design competitions has also generated good press coverage.

IZA also has a wealth of information on all aspects of zinc die castings and makes this information available to our customers and end users through its website and print materials. Through its work in developing new alloy's, green finishes and engineering properties, IZA helps to ensure zinc die castings remain a viable and competitive choice in the market.

Didier Rollez
Sales and Technical Service Zamak
Grillo-Werke AG



IZA is a vital part of the die casting industry. They lead the way in research and partnerships with companies to promote zinc die casting's ability to cast ultra-thin wall applications and in improved creep resistance.

Through IZA's efforts, die casting companies throughout the world are realizing the opportunities that exist to further compete with other materials and processes including aluminum die casting, plastics, sintered metals, etc.

Ryan Winter
VP Engineering Services
Eastern Alloys, Inc.



IZA is a strong proponent for zinc die castings and their work on alloy development and zinc die casting technology has greatly contributed to the North American Die Casting Association's zinc related research.

Stephen P. Udvardy
Director of Research, Education & Technology
North America Die Casting Association



Zinc in Fertilizers



It has been realized that despite strong growth of NPK fertilizers, many soils have become ‘mined’ of essential micronutrients, particularly zinc. This has led to reduced yield responses to N-based fertilizers as well as lower levels in food crops causing extensive human and animal health problems.

These effects have become particularly pronounced in Asia-Pacific, South America, and Sub-Saharan Africa, with WHO placing zinc deficiency fifth, two places above vitamin A deficiency, in their ranking of global risks.

IZA’s Zinc Nutrient Initiative has been at the fore-front of increasing awareness and use of zinc fertilizers to address zinc deficiency affecting soils, crops, human and animal health globally.

The strong market growth in zinc fertilizers has created a very sound platform for IZA members to develop sustainable business strategies within global agriculture and to make a profound contribution to both food—and nutrition—security in future.

Dr. Kevin Moran
Honorary CTO
Kingenta International



The Zinc Nutrient Initiative (ZNI) was launched to address zinc deficiency in crops and humans by adding zinc-fortified fertilizers to soils. Adding zinc to soils significantly increases crop yield, boosts zinc nutritional value in humans and improves farmer incomes. ZNI works closely with companies, governments and NGOs to address policy issues and to promote the benefits of zinc fertilizers to the farming community. Zinc in fertilizers now accounts for 2% of the world market for zinc consumption and one analyst predicts this market will reach 400,000 tonnes per annum by 2018.



IZA has done an amazing job of bringing global awareness to one of the most critical public health issues in the world: malnutrition from micronutrient deficiencies. IZA’s impact will save hundreds of thousands of lives and improve the quality of life of millions.

IZA has worked diligently to advocate government officials, public health professionals and agricultural professionals to help fight the devastating effects of micronutrient deficiencies and malnutrition. We are very proud to work closely with such a fine organization of true professionals.

Taylor Pursell
Principal
New Fertilizer Technologies, LLC.



The International Zinc Association has played a critical role in the promotion of zinc fertilizer in China for food and nutrition security, where more than 10 million farmers have been impacted and over 35 million children are benefitting from improved nutrition. This has been a great example of the impact a successful private-public partnership can have in a country.

Dr. Gao, Xiangzhao
Chief Scientist
*National Agricultural Technology Extension Service Center
The Ministry of Agriculture, China*



Environment & Regulatory Affairs

IZA maintains a core program on zinc-related environment and health issues. The primary focus of this program is to provide a global and regional framework to assess regulatory challenges to zinc use and to coordinate industry responses. IZA produces and communicates the critical information needed for the regulatory agencies to base their decisions on sound science.

IZA's ability to bring the resources, research capability and expertise of the global zinc industry to deliver a sound scientific basis for environmental regulations for zinc is appreciated by general galvanizers and other first-tier zinc users worldwide. Our collaboration with IZA is our most valued partnership.

Murray Cook
Executive Director
European General Galvanizers Association



IZA's support and representation have been crucially important in Nyrstar's efforts to mitigate the impacts of the European Emission Trading System (ETS). Of particular value, IZA successfully represented the European Zinc Industry in its petition for special consideration under the ETS delivering costs savings for Nyrstar's smelters in France, Belgium and the Netherlands"

Sven Verwimp
European Energy Coordinator
Nyrstar Europe



IZA was able to help the industry respond to the new Annex IV–MARPOL procedure related to management of wastes at sea by developing a tool to define the toxicity levels of the concentrates based on the range of each metal content. This practical approach was an important achievement for our industry.

Murillo Rennó Ayres
Commercial Operations & Logistics Manager
Votorantim Metais



Compliance with Environment, Health and Safety (EHS) regulations is mandatory to maintaining the zinc industry's license to operate, and also to retain market access for our products. The monitoring and research activities of IZA are critical as an "early warning" function concerning new upcoming issues, which happens quite often. IZA's ongoing dialog with regulatory agencies is also important in achieving sensible outcomes.

Two main issues in this context in Europe are REACH, which is the European chemicals management policy, and the Water Framework Directive. In REACH, IZA functions as the secretariat for the Zinc Consortium, which includes almost 100 companies producing or importing zinc, zinc compounds and zinc containing intermediates. IZA drafted the files that allowed successful registration of these substances, and continues to keep the files updated.

In the Water Framework Directive, zinc was shortlisted for the Priority Substances List, which would have stigmatized zinc as a substance with widespread risks for EU waters, possibly with dire consequences for the use of zinc products. Thanks to intense technical and advocacy work by IZA, zinc was not prioritized in the first update of the Priority Substances List, and it looks like it will also not be prioritized in the second update.

IZA regulatory programs will remain very important in the future, as the pressure of EHS regulations is expected to increase.

Dr. Marianne Schönnenbeck
Department Head, R&D/Environment
RHEINZINK GmbH & Co. KG



Sustainable Development

Environment and sustainability programs are integral to the future of the zinc industry.

Through the Zinc for Life initiative, recycling programs and other activities, IZA continues to develop and update information on the sustainability aspects of zinc and zinc products and communicates this information to the key markets and stakeholders.



As a long-time member of the International Zinc Association, Teck has seen firsthand how they have worked to continually build the profile of zinc as a sustainable and environmentally-responsible building material of choice worldwide.

Marcia Smith

Senior Vice President, Sustainability & External Affairs
Teck Resources Ltd.

Teck



IZA with its engaged and high skilled staff plays a strategic role to keep zinc business sustainable. I congratulate IZA for the achievements reached this year both in Europe and in the USA towards adverse regulations which have been positively modified, resulting in the preservation of our markets.

Christophe Bissery

Head of Research & Environmental
Applications Department
VM Zinc

VMZINC



I had the privilege of working with IZA on its ground-breaking Zinc for Life Program. Zinc for Life combined robust life cycle data with communications and outreach to end use markets and other stakeholders on the sustainability benefits of using zinc. Through the program, IZA demonstrated a better way to tell the sustainability story of not only Zinc, but also metals in general.

Kevin Brady

Director
Sustainable Enterprise Consulting

 **SUSTAINABLE
ENTERPRISE
CONSULTING**



Since 2010, the alliance of UNICEF and IZA has contributed to significantly improve the nutritional status of children under five in Peru. These funds have helped strengthen the national policy against chronic malnutrition and micronutrient deficiencies, especially of zinc and iron.

We wish to express our sincere thanks to you and all IZA members. Without your contribution it would not have been possible for UNICEF to provide technical support to the MoH [Ministry of Health] to achieve these results.

Paul Martin
Former Representative
UNICEF Peru



Health

Zinc deficiency is a major global health problem affecting 30% of the world's population. It is mainly related to an inadequate intake of zinc through the diet, affecting especially people in countries across South-East Asia, Africa and Latin America. Young children are most impacted due to the adverse effect of zinc deficiency on their immune system, growth and brain development.

IZA has successfully advocated for programs aimed at addressing zinc deficiency. From its early support for the International Zinc Nutrition Consultative Group (IZiNCG); to its Zinc Saves Kids initiative in support of UNICEF in Nepal and Peru; and partnerships with the Clinton Health Access Initiative (CHAI), the Bill & Melinda Gates Foundation and collaboration with the Mining Compact for Child Health in support of the UN's Every Woman, Every Child campaign.

IZA member companies have also engaged in similar initiatives as part of their corporate social responsibility programs. The most recent engagement is a partnership with UNICEF in Mexico.

The International Zinc Association is to be applauded for its leadership, partnership and strategic investments in zinc for population health. Not only has the IZA and its member companies pioneered partnerships with the United Nations, governments and civil society to treat more children with zinc tablets and reduce the death toll from infectious diseases like diarrhea and pneumonia, but they have been at the forefront of zinc fortification of soil that will also reduce zinc deficiency—still a risk for one in five people on the planet.

I have been honored to work with the IZA on several initiatives in countries across Asia and Africa. With a new global goal that requires both the ending of preventable child deaths and the elimination of child malnutrition by 2030, there is an urgent need for wide scale zinc fortification of soil and staples, for preventive zinc supplementation, and for routine zinc treatment for children recovering from diarrhea.

Leith Greenslade
Founder & CEO, *JustActions*
Former Vice-Chair, *United Nations*
Special Envoy for Health



Wiegel has been passionate supporters of the Zinc Saves Kids initiative. This initiative has saved and improved the lives of hundreds of thousands of young children in Peru. We are happy to continue our support for the Zinc Saves Kids program. It is a fantastic opportunity for our group to support this initiative; our staff has been extremely excited to work in an industry that cares.

Zinc is beneficial to life and growth itself and has an extremely broad range of uses including the corrosion prevention of steel, which is our job as galvanizers. With Zinc Saves Kids we can support all these beneficial aspects of zinc. And all of this is why we have contributed over \$180,000 to this program.

Alexander Hofmann
Board of Directors
Wiegel Verwaltungs GmbH & Co. KG



Peñoles is a socially responsible company and founding member of IZA. Together we are very proud to sponsor and support the program "Zinc Saves Kids" in Mexico in support of UNICEF. With this and other programs we appreciate the great value of IZA for the zinc industry.

Manuel Medina
Vice President of Commercial
Industrias Peñoles





International Zinc Association

contact@zinc.org • www.zinc.org