

# Zinc: A Critical Material for the Low Carbon Economy

**ZINC** | international  
zinc association



# IZA Locations and Members



47

Regular Members

145

Affiliate Members

66

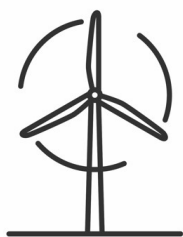
Associate Members

# Enabling the Energy Transition

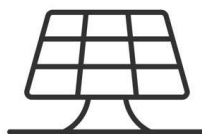
Zinc use in this sector is projected to surpass 652,000 MT by 2030. <sup>1</sup>



Zinc coatings extend the life and durability of electrical grids.



Zinc coatings ensure that wind turbines meet their intended design life.



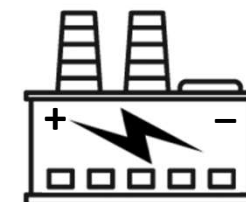
Zinc coatings support solar structures and co-products Ga, Ge and In provide power.



Zinc batteries supply grid backup, long-duration storage, and mobility applications.



Most mass production EV's rely on zinc-coated steel for safety, longevity and low cost.



Zinc electrolyzer capacity could be adapted to deliver significant battery capacity for 6 or more hours daily.

1.Source: McKinsey, CRU, International Zinc Association



# Zinc Batteries Pass \$1 Billion in Investments



Eos wins \$400M DOE loan guarantee to build manufacturing capacity

Koch Industries invests in zinc battery energy storage company Eos

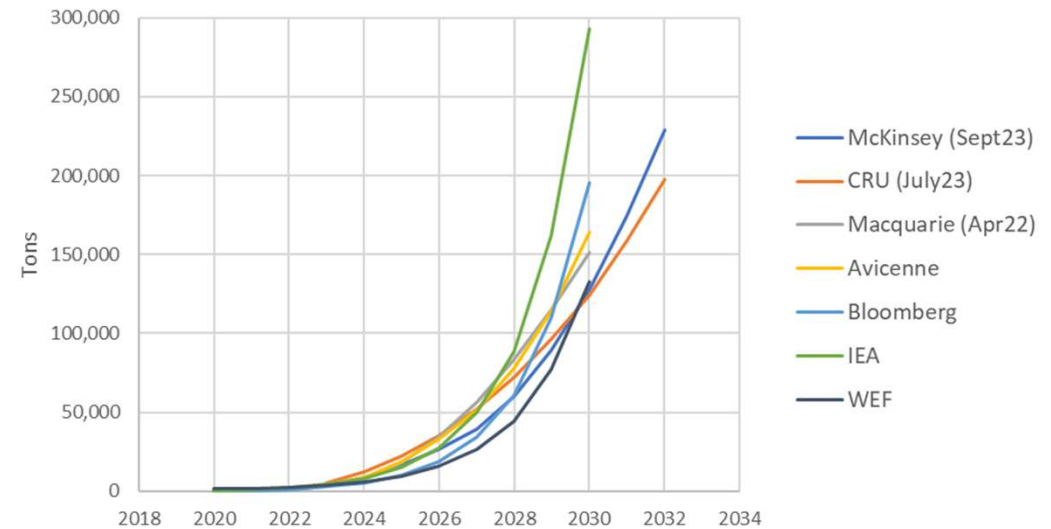
DoE LDES demonstration projects - grants for 9 projects (total \$325M) of which 3 in Zn by Eos, Redflow & UEP

Zn Battery Funding announcements

ZincFive secures loan with Orion Infrastructure Capital (OIC)

Zinc8 receives \$68M tax credits for manufacturing facility

Forecast Total Zinc Deployed in BESS (10% market share by 2030)





# Zinc Battery Initiative (ZBI)

**ZINC** | international zinc association

## ZINC BATTERY INITIATIVE

### Powering the Future

Meet Zinc, a safe, scalable, and sustainable energy storage solution offering high performance at a low-cost.

Zinc powered the world's first battery in 1799; zinc serves as the dominant chemistry in modern primary batteries; and now zinc plays a critical role in storing energy generated by renewables for the energy transition.

The International Zinc Association launched the Zinc Battery Initiative in 2020 to promote the remarkable story of rechargeable zinc batteries and encourage further product and market adoption.

### The Zinc Battery Advantage

- Winning Combination:** low-cost & high performance
- Safe:** nonflammable & no thermal runaway
- Sustainable:** non-toxic & recyclable
- Flexible:** operates in a wide range of temperatures
- Long-lasting:** operates 20 years & up to 100 hours
- Scalable:** sized to power a home or entire microgrid
- Secure:** worldwide sustainable and conflict-free supply chain

#### Forecast for Demand for Zinc Rechargeable Batteries (Billion USD)

| Year | Demand (Billion USD) |
|------|----------------------|
| 2024 | 6,300                |
| 2025 | 10,000               |
| 2026 | 16,000               |
| 2027 | 20,000               |
| 2028 | 27,000               |
| 2029 | 34,000               |
| 2030 | 43,000               |

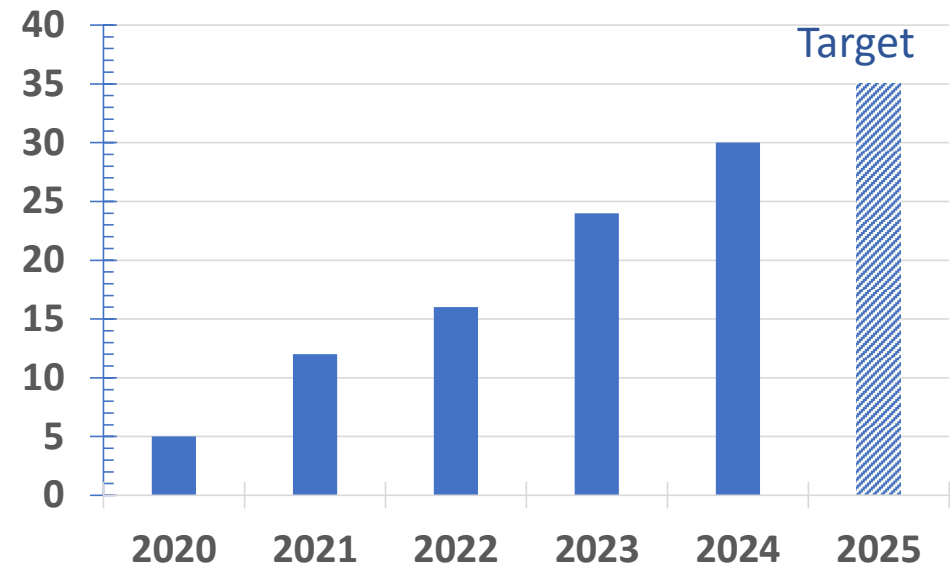
Sources: McKinsey & Company, CRU, Macquarie, and Avicenne

#### Global Energy Storage Growth (Gigawatts)

| Year | Growth (Gigawatts) |
|------|--------------------|
| 2024 | 75                 |
| 2025 | 85                 |
| 2026 | 90                 |
| 2027 | 100                |
| 2028 | 110                |
| 2029 | 120                |
| 2030 | 140                |

Source: BloombergNEF

ZBI Members



Starting with 5 members in 2020, the ZBI grew to 30 in the span of 4 years



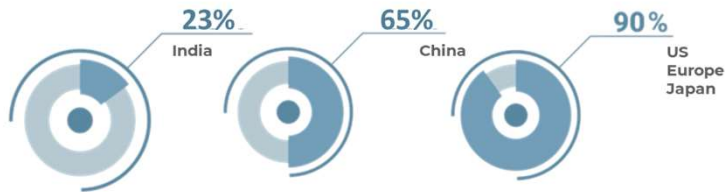
# Zinc in Automotive

*Zinc in Automotive Bodies Growing by 140,000 Tonnes by 2030*

*Annual Demand for Zinc in xEVs will increase by 5X from 2022 to 2030, from 53,500 to 306,000 Tons Annually*



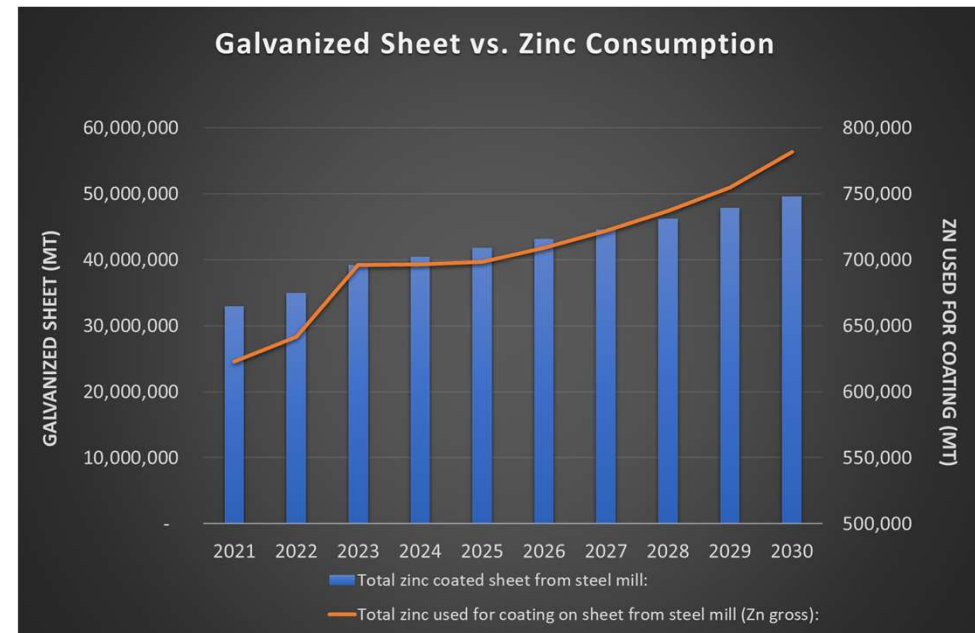
Growing Middle Class in India and China



Growth Galvanized Steel Intensity in India and China



Adoption of Galvanized Steel by all Electric Vehicle Manufacturers



## NTSB Report Says 10,000 Bridges at Risk for Corrosion



Pittsburgh, PA, 22 January 2022

## Chlorine Corrosion May Have Contributed to Partial Bridge Collapse in Germany

The last tram crossed the span just 18 minutes before the collapse.



Dresden, 11 Sept 2024

## Zinc Coatings

- ✓ Infrastructure
- ✓ Solar
- ✓ Offshore Wind
- ✓ Smart Cities



# Clean Energy Steel Construction Center

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## New AGA/IZA Initiative



Solar



T&D



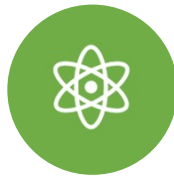
Wind



Battery Storage



Natural Gas



Nuclear



Hydropower



Hydrogen



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# Promoting Security and Defense

- ③ Zinc powers the batteries in submarines and fighter jets.
- ③ Zinc galvanizes steel in military vehicles, ships, and other equipment, protecting against corrosion and ensuring a long service life.
- ③ Zinc plating enhances corrosion resistance in aircraft components, vehicular parts, naval hardware, and weapons systems.
- ③ Zinc in high-strength alloys in military applications.
- ③ Zinc oxide plays a critical role in the tires of all military vehicles.
- ③ Zinc's co-product germanium is used in night goggles.



# US Tariffs Advocacy



Most zinc products currently under Annex II and exempted from tariffs



Section 232 investigation on critical minerals, including zinc, underway



IZA working with US Department of Commerce to provide information



Coordinating with Members, Affiliates and downstream customers/associations

# Zinc Enables Decarbonization

Quantifying and monetizing the positive impact protecting steel with zinc has on decreasing life-time costs, decreasing carbon emissions, and increasing safety.



Residential  
Construction



Automotive

Results coming soon



Energy

Results coming soon



Infrastructure

Results coming soon

<https://www.zinc.org/zinc-enables-decarbonization/>



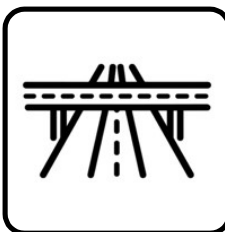
**ZINC** ENABLES  
DECARBONIZATION

**ZINC** | international  
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# Increasing Value While Decreasing CO2 Emissions

## Galvanized Rebar in Roadways

- \$1M/km Net Value with zinc
- 3,000 tCO2e abated per kilometer



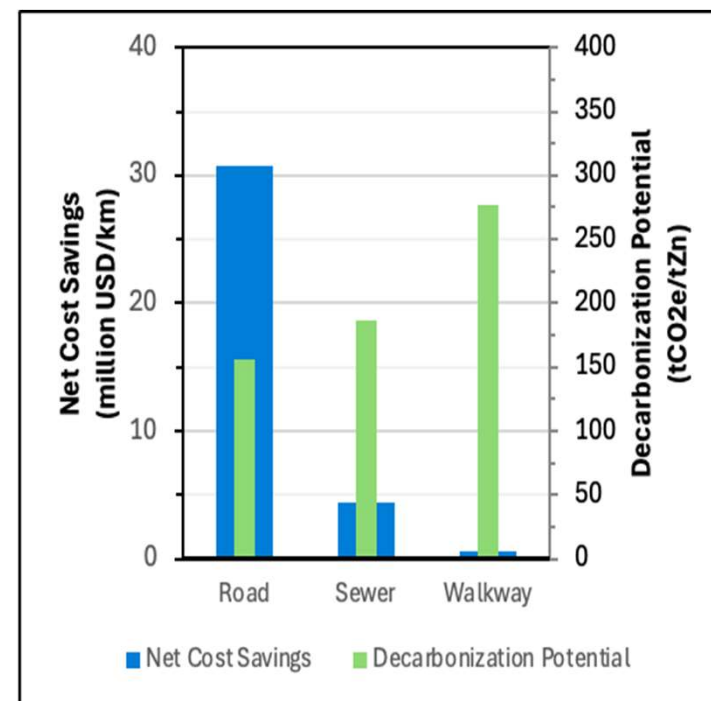
## Galvanized Rebar in Sewer Mains

- \$150,000/km Net Value with zinc
- 130 tCO2e abated per kilometer



## Galvanized Rebar in Walkways

- \$80,000/km Net Value with zinc
- 310 tCO2e abated per kilometer



## Global Steel Rebar Market

- 1% rebar market = Annual 80-265 Kt Zn installed
- 1% rebar market = Annual 50-250 Mt CO2e avoided

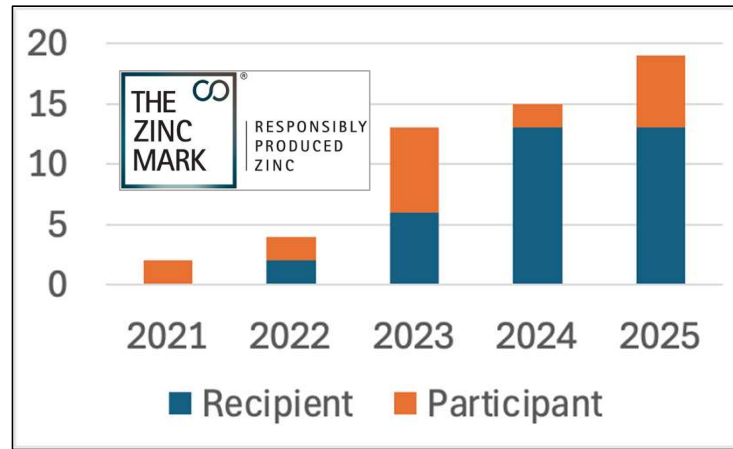


# Sustainable Development

## Zinc Mark Status



Engaged in CMSI  
via Copper Mark  
and ICMM



[https://www.zinc.org/responsible\\_sourcing/](https://www.zinc.org/responsible_sourcing/)

## Life Cycle Assessment

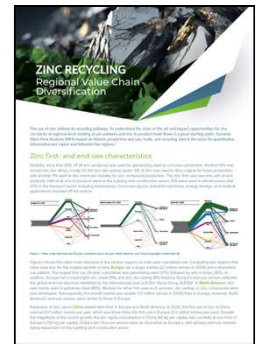
- Internalized LCA services in 2024
- EU ZAMAK submitted to ecoinvent (Apr 2025)
- Remelt zinc, SHG, galvanizing, ZnO, and sheet demands being prioritized
- LCA WG, EPDs, PCFs, and carbon footprint 3.0 in 2025

<https://www.zinc.org/life-cycle-assessment/>

<https://www.zinc.org/circularity-2/>



## 4 New Circularity Fact Sheets



EU Task Force formed in March to  
address policy impacts on zinc  
recycling tradeoffs

# Environment & Health

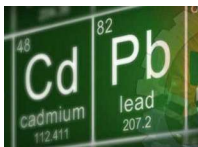


- IZA estimates 61% lower global Hg load from zinc concentrates and 79% reduced air emissions from smelting in new survey (Apr 2025)
- UNEP thankful for industry initiative and transparency



- USEPA CRADA (new data requests)
- Best Practice in California: Guidance sent for peer-review (May 2025)
- ANZ implementation workshop (Aug 2025)

<https://www.zinc.org/compliance/>

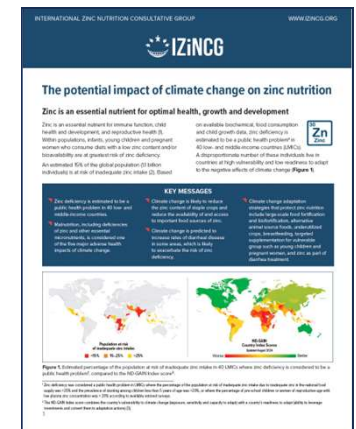


- Pb ENV classification -successfully concluded no impact on Zn classification
- Collated a new Cd Observatory on air and water plant emissions

- REACH Evaluations: Defend ZnO-nano and ZnS
- Update Zn EQS for EU Risk
- Protect water assessment position in WFD
- EU Commission thanked Zinc expert contribution to new Soil Health Law



- IZA-supported IZiNCG report on impacts of climate change on zinc malnutrition
- 40 vulnerable countries; food security, diarrheal disease, adverse birth outcomes
- National-level advocacy and communication in 2025



# *Zambia Partnership to Protect, Empower, and Save Lives with Zinc*



## **What is needed to address national zinc deficiency?**

- ✓ World Health Organization call to action (2019)
- ✓ National data on zinc deficiency (Zambia is #2 at 37%)
- ✓ National “Essential Medicine” policy (2021)
- ✓ National infrastructure for distribution
- ✓ Governmental endorsement



# Saving lives with Zinc & Kit Yamoyo

- Combining life-saving Oral Rehydration Salts (ORS) and Zinc
- Simple, affordable (<\$0.60 USD), and easy-to-use
- Treats diarrhea effectively and prevents future episodes
- Multisectoral product available through both public and private channels



Kit contains:

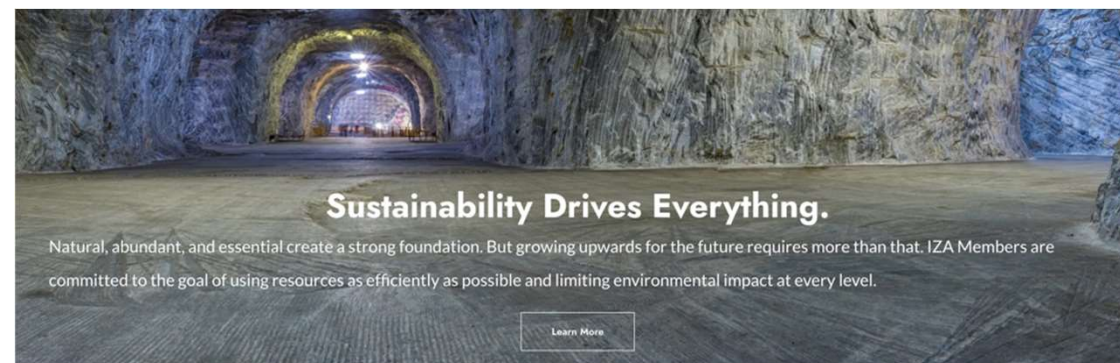
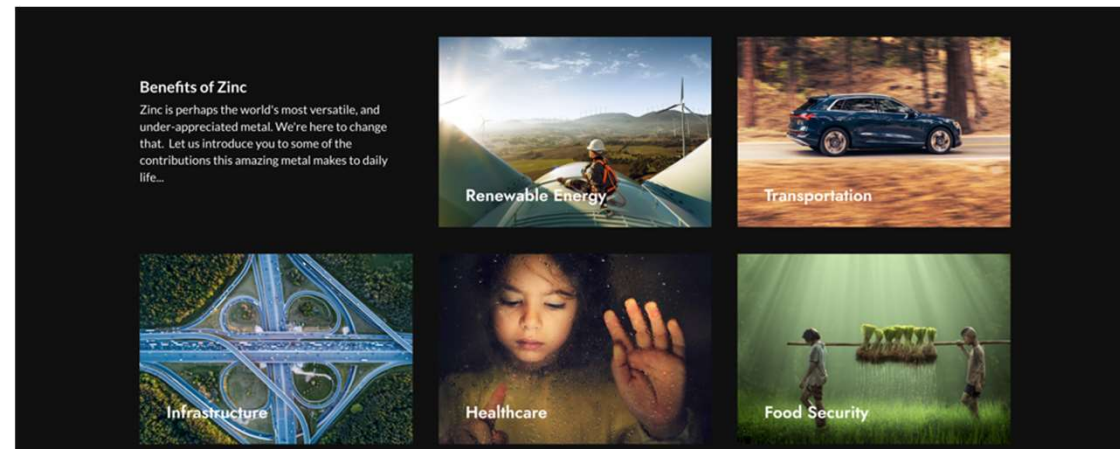
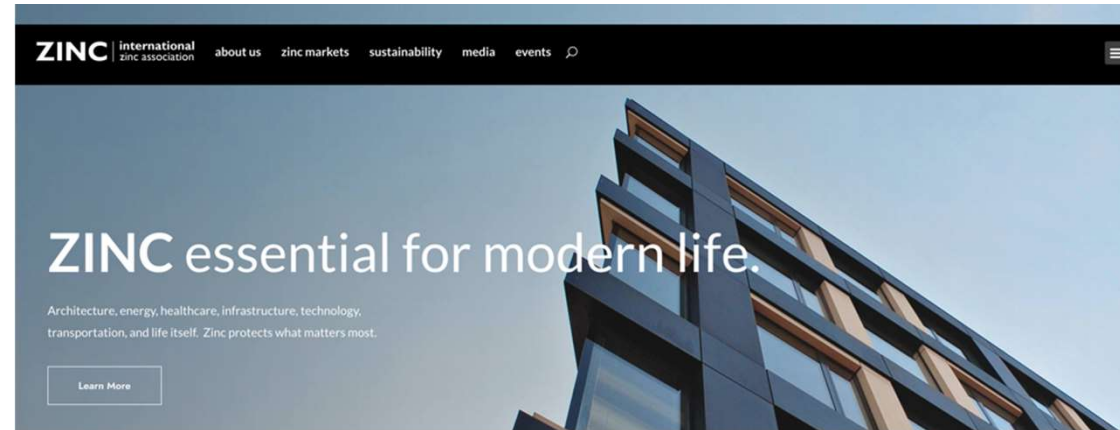
- Instructional leaflet
- 10 zinc tablets
- 4 sachets of ORS
- 200ml pouch for delivery



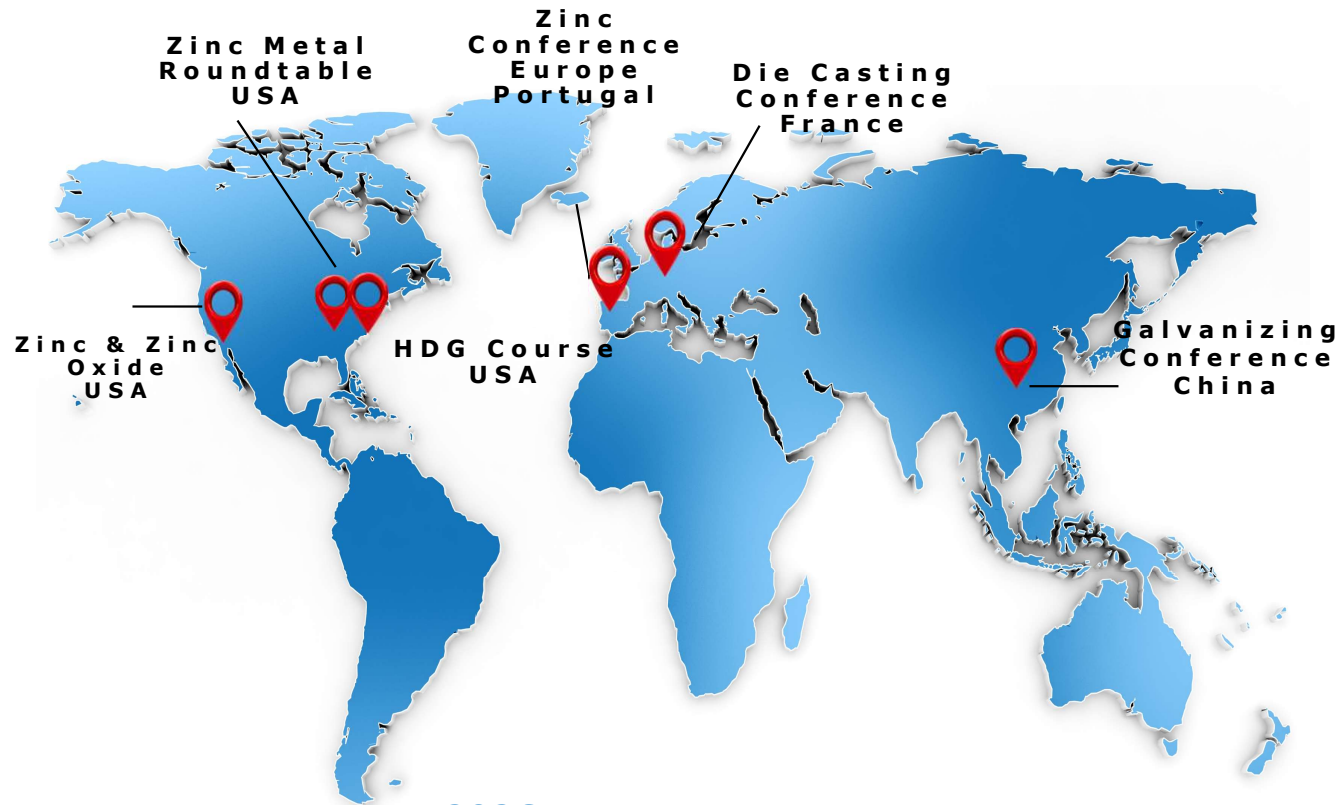


# Communications

- Print, TV and Social Media coverage
- Public + Member Websites
- Conferences



# Conferences: Global Networking



## 2026 Events

- International Zinc Conference, Orlando, USA
- European Zinc Conference, Italy
- Zinc College, TBD
- Latin Galva, Brazil
- Zinc Metal Roundtable, Nashville, USA
- Zinc in Food & Nutrition Security, Bangkok



# IZA Full Members

**BEFESA**

**BOLIDEN**



**CZ circularzinc Recycling**

**DK RECYCLING & ROHEISEN**

**everZINC+**

**GLENCORE**



**Global Steel Dust**

**GRILLO**

**Grupo México**

**GRUPO Oxy**

**H.K.C.**

**Hecla MINING COMPANY**

**vedanta**  
transforming elements

**Hindustan Zinc Limited**

**HCM SA**

**BOLESŁAW**

**IEQSA**



**HOLDING KCM 2000**



**Bruggemann**

**lundin mining**

**METAENTERPRISES**

**PEÑOLES**

**METALSIDER2**



**MITSUI KINZOKU**

**MMG**

**Newmont™**

**nexa**



**NORZINC**  
A PREMIUM MINE DEVELOPER



**NUOVA EUROZINCO S.p.A**

**nyrstar**



**Pontenossa**

**rezinal**



**SAN CRISTOBAL MINING**

**Silox**



**SUMITOMO METAL MINING CO., LTD.**

**Teck**

**Terrafame**

**Trafigura**

**VM BUILDING SOLUTIONS**

**VOLCAN**  
VOLCAN COMPAÑÍA MINERA S.A.A

**ZHIVI**  
志亿

**ZN ZINC NACIONAL**

**Zinc Resources LLC**

**ZinCol Ossidi S.p.A**

**Zochem**

