

Think Zinc! WHY ZINC?

Dr. Josef Daniel-Ivad

NAATBATT Sodium-Zinc Workshop
Nov. 30 – Dec. 1, 2023
Houston, TX





International Zinc Association (IZA)

- 41 full members
- 185 affiliate and associate members
- Offices in North Carolina, Brussels, Delhi, Shanghai

IZA represents the global zinc industry (mining, production, first use production and recycling)



IZA Full Members

BEFESA

BOLIDEN

 **ANTAMINA**

everZINC+

GLENCORE



Global Steel Dust

GRILLO



GRUPO MEXICO



GRUPO



Hecla
MINING COMPANY



Brüggemann

 **vedanta**
Transforming elements



lundin mining



ZGM
BOLESLAW

ME
METAENTERPRISES

 **PEÑOLE**



**MITSUI
KINZOKU**

MMG



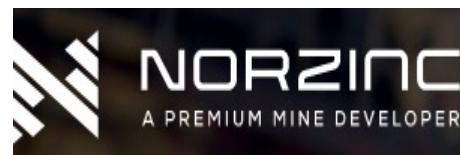
**NEW CENTURY
RESOURCES**

NEWMONT

nexa



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

 **NORZINC**
A PREMIUM MINE DEVELOPER

Teck

 **nyrstar**

Terrafame



rezinal

Trafigura

 **VM**
BUILDING
SOLUTIONS

 **ZINC**
NACIONAL

 **Zinc**
Resources LLC

 **ZinCol Ossidi**
SpA

 **Zochem**


Responsible



Life Saving



Durable



Sustainable



Why Zinc ? – Essential for Modern Life

- ✓ **Sustains Life, Strengthens Immune System**
- ✓ **Helps Plants Grow**
- ✓ **Protects Infrastructure**
- ✓ **Enables Lower Cost Autobody Parts**
- ✓ **Provides Shelters, Building Material**
- ✓ **Die Castings for Fixtures & Faucets etc.**
- ✓ **Helps Power Our World → Batteries**
- ✓ **Recyclable, Sustainable**
- ✓ **Low Carbon Footprint**



International Zinc Association



Addressing Zinc Deficiency in Humans

2 Billion

people are classified as zinc deficient globally.

116,000

children die each year from zinc deficiency related issues.

400,000

children under the age of five have growth retardation, impeded intellectual development and other serious health issues.

Zinc and Vitamin A identified as the most cost-effective solution to malnutrition.

Zinc fertilizer increases the nutritional value of crops, resulting in increased zinc nutrition in the diet.

[According to the Copenhagen Consensus](#)

A Large-scale food fortification (LSFF) with zinc can halve the proportion at risk of inadequate zinc intake globally. <http://www.izincg.org/>

Zinc Saves Kids

An International Zinc Association Initiative in Support of
Addressing Zinc Deficiency

The Zinc Saves Kids Foundation supports zinc initiatives that promote supplementation, fortification and treatment programs to improve the survival, growth and development of young children.



ZINC | international
zinc association

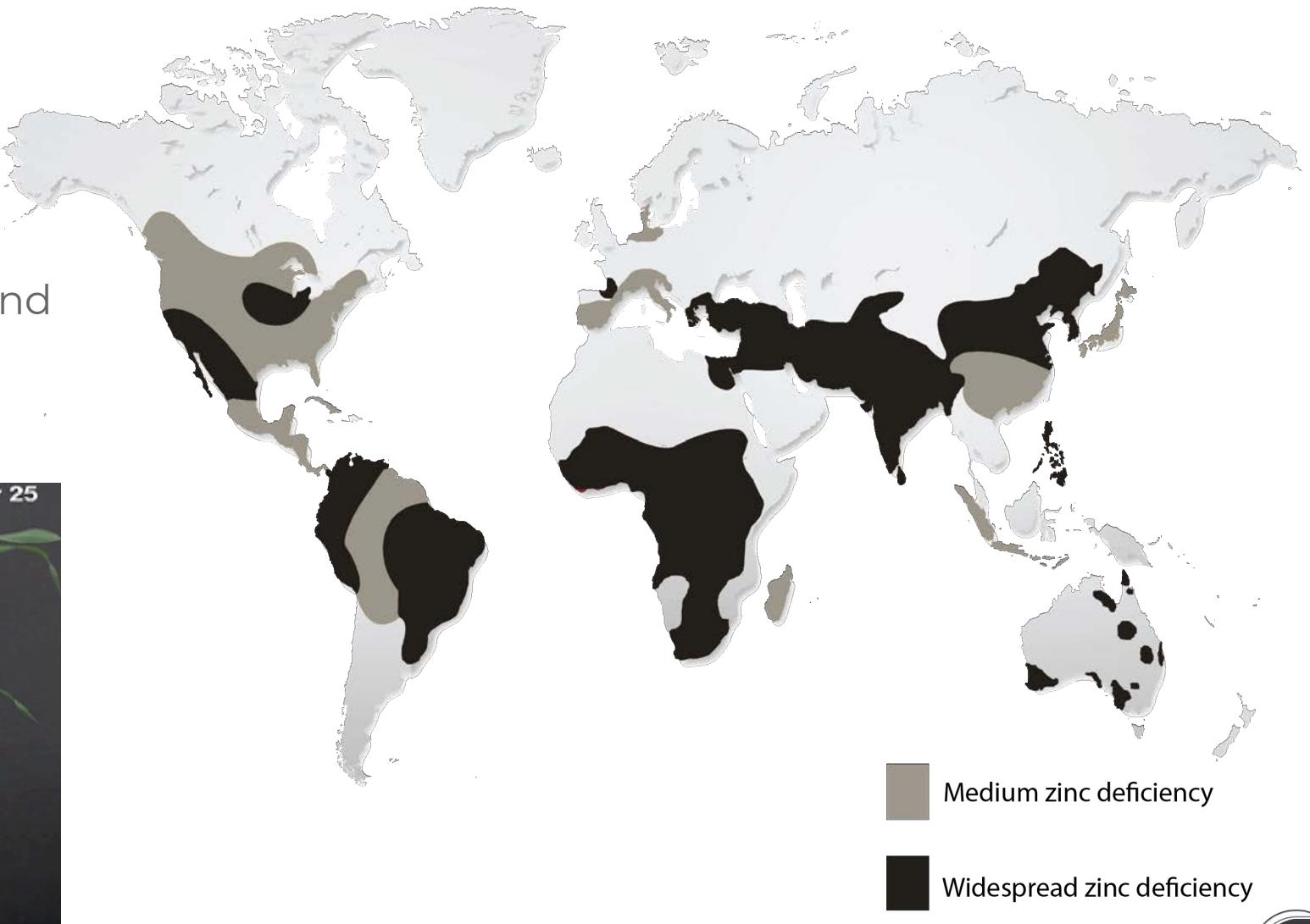
International Zinc Association



Addressing Zinc Deficiency in Soils

Zinc deficiency is the most common micronutrient deficiency, **affecting more than 50%** of the world's agricultural soils.

Zinc fertilizer increases crop yield and improves water uptake, resulting in healthier, stronger crops.



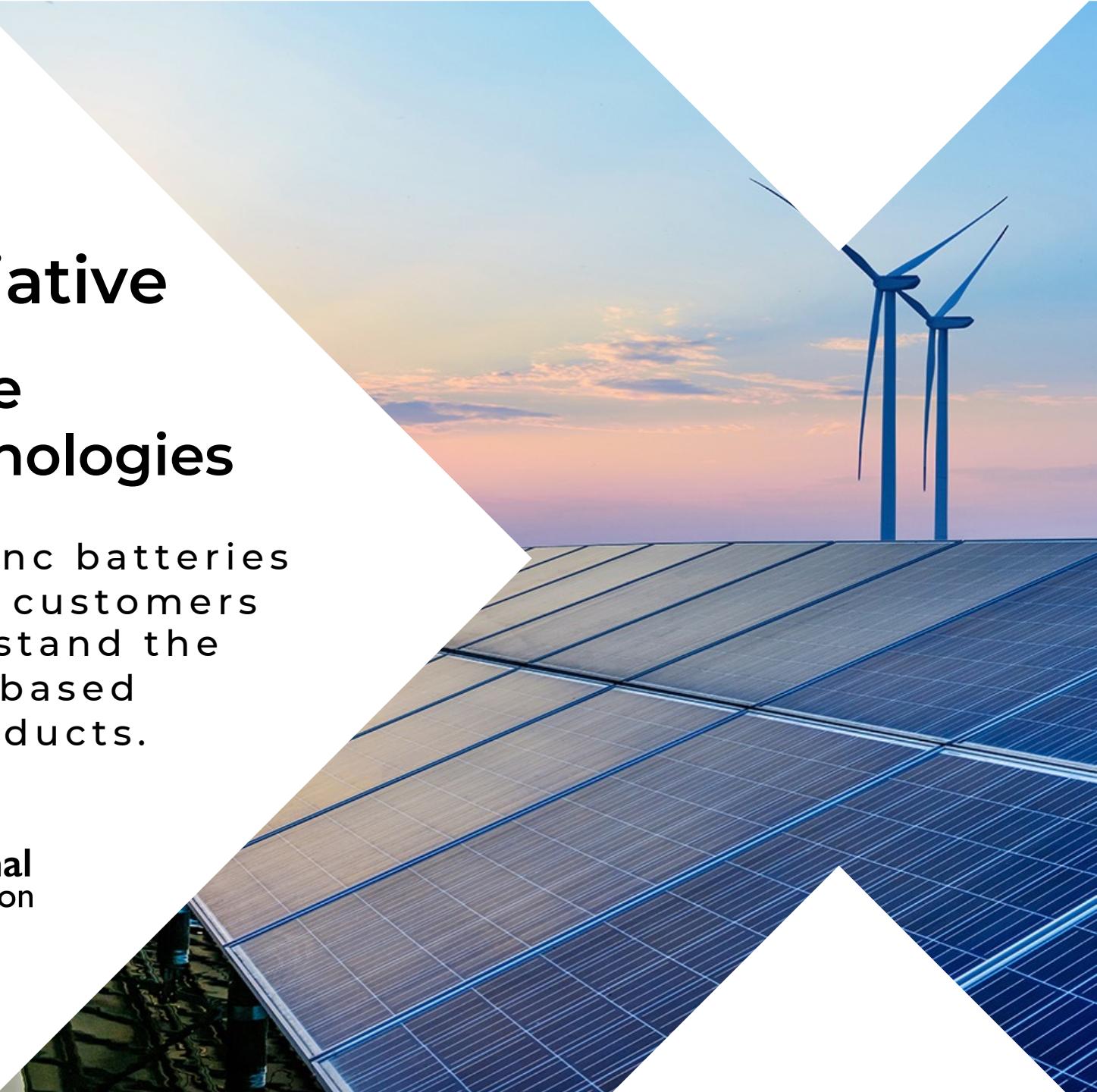
ZBI - Zinc Battery Initiative

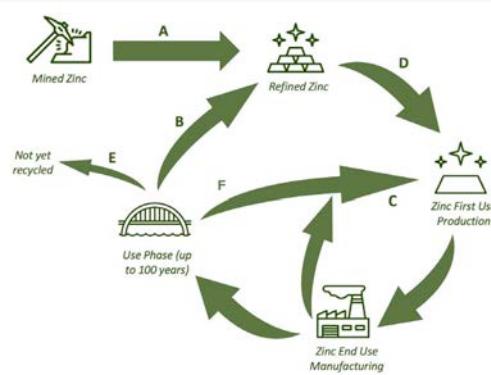
A Partnership to Advance Zinc-based Battery Technologies

The ZBI serves to champion zinc batteries and ensures that all potential customers and other stakeholders understand the value and advantages of zinc-based power and energy storage products.



ZINC | international
zinc association





Why Use Zinc for Batteries ?

- ✓ High specific capacity at 820Ah/kg, 5820Ah/L
 - ✓ Better volumetric capacity than Li at 2060Ah/L
- ✓ Versatile, powerful anode material, can be combined with several cathodes
 - ✓ Silver
 - ✓ Nickel
 - ✓ Manganese
 - ✓ Intercalation cathodes, MnO_x , VO_x , PBA, etc...
 - ✓ Bromine
 - ✓ Air
- ✓ Fire-safe, water-based electrolytes
- ✓ Low-cost, abundant, sustainable commodity raw material available around the world



ZBI – Members as of 11-2023



Joplin, MO



Joplin, MO



Alameda, CA



Richmond, CA



Tempe, AZ



ZincFive

Tualatin, OR



Pearl River, NY



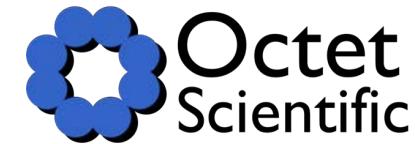
San Francisco, CA



Turtle Creek, PA



San Leandro, CA



Cleveland, OH



Dartmouth, NS, CAN
Oakland, CA



Toronto, CAN



Stockholm,
Sweden



Vancouver, BC, CAN
Ulster, NY



Rottenburg,
Germany



Bruxelles,
Belgium

Suppliers



Houston, TX



Duisburg,
Germany



Heilbronn,
Germany



Dickson, TN



Taiwan



Tokyo, Japan



Velden, Austria



Availability of Zinc



Mt = million tons

1. "Zinc resources – a state of knowledge" by Eric Pirard, 2021
(5 km mineable depth scenario)
2. IZA and Fraunhofer ISI 2021 zinc stocks and flows update
(based on 2019 data)
3. U.S. Geological Survey, 2021
4. International Lead Zinc Study Group. 2019
5. IZA and Fraunhofer ISI 2021 update, post- and pre-consumer scrap
6. IZA and Fraunhofer ISI 2021, zinc entering first use stage

Accessible crustal content
198,000,000 Mt¹

Zinc currently in use
247 Mt²

Extractable global resources
63,000 Mt¹

Proven and Probable reserves
250 Mt³

World zinc use/y
20 Mt⁶

Mined zinc/y
12.8 Mt⁴

Zinc recycled/y
7.6 Mt⁵



CALL FOR MEMBERSHIP!

Join IZA's ZBI – the voice of the zinc battery industry

Thank You!

PLEASE VISIT OUR WEBSITES

www.ZincBatteryInitiative.com
www.zinc.org

Dr. Josef DANIEL-IVAD

jdanieldivad@zinc.org

