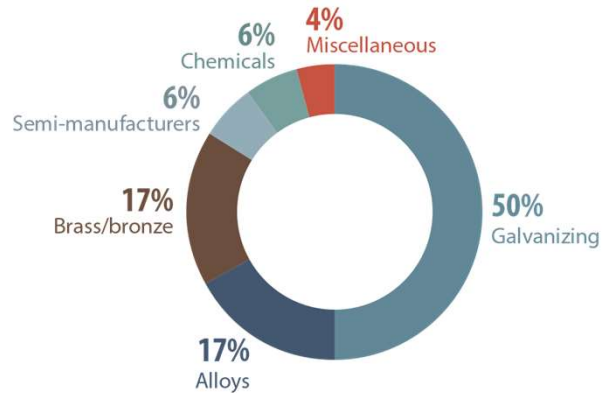




# ZINC 101 ON RENEWABLE ENERGY



## ZINC IS AN ESSENTIAL METAL WITH MANY APPLICATIONS



Zinc is the **fourth most used** metal in the world.

Zinc is **abundant and inexpensive**, without any geopolitical risk and significant North American supply.

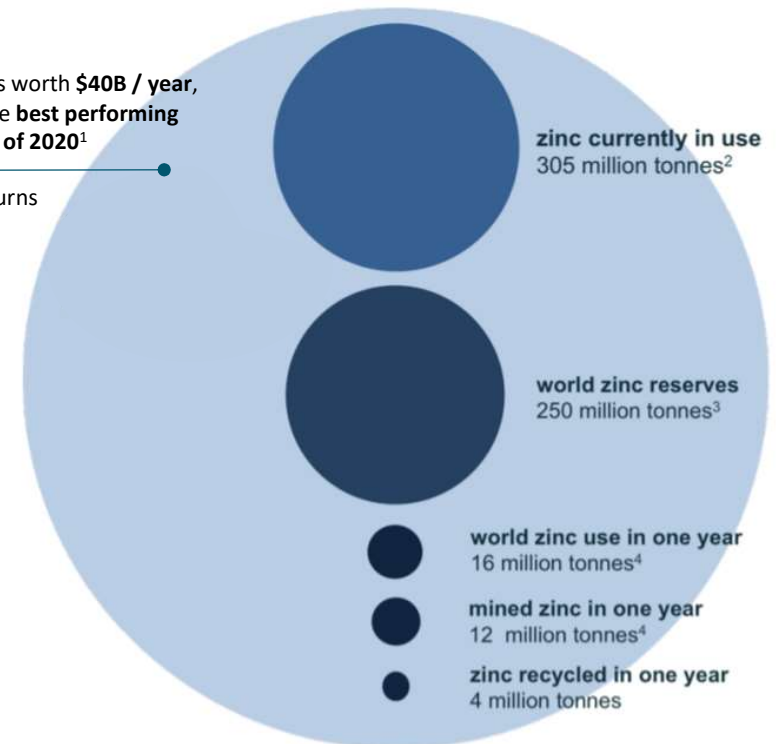
Zinc utilizes the only battery chemistry that uses **earth-abundant, recyclable materials** with chemistry that is **robust and safe**.

Scaling the **zinc battery technology** can be accomplished by simply **increasing the size** of the energy storage tank and **quantity of the recharged zinc particles**.



Zinc market is worth **\$40B / year**, and one of the **best performing commodities of 2020**<sup>1</sup>

2020 zinc returns **19.73%**





## THE ROLE OF ZINC BATTERIES IN THE GREEN TRANSITION

Zinc-air batteries have become more prominent in the emerging storage sector because of their high specific energy density compared to other storage options, such as Li-ion batteries. Zinc-air batteries have emerged as the leading mineral-air battery type because they are safe, environmentally friendly, and potentially cheap and simple. The potential advantages of the technology can be seen in a comparison of the practical energy density of different battery technologies.

Zinc-air batteries are an attractive energy storage option for a number of reasons, including safety, ease of recyclability, and greater global availability.



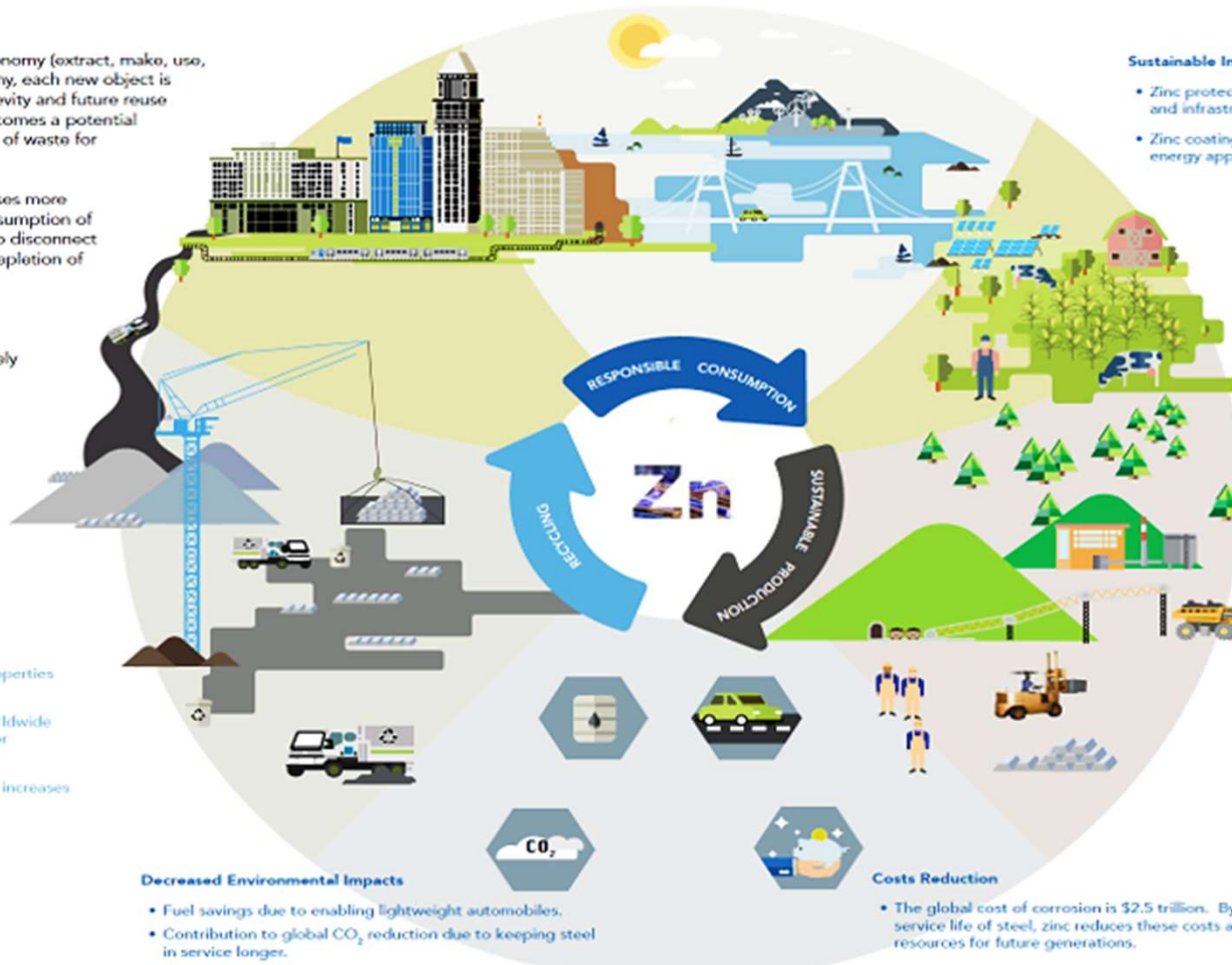


# ZINC CONTRIBUTES TO A CIRCULAR ECONOMY

Unlike a traditional linear economy (extract, make, use, dispose), in a circular economy, each new object is designed for maximum longevity and future reuse and, at the end of its life, becomes a potential resource, rather than an item of waste for disposal.

Circular economy encompasses more than the production and consumption of goods and services; it aims to disconnect economic growth from the depletion of natural resources.

Given its many attributes, including being essential, versatile, durable, and infinitely recyclable, zinc contributes to a circular economy in numerous ways.



## Sustainable Increased Service Life

- Zinc protects steel from corrosion in transportation and infrastructure.
- Zinc coatings extend the service life of solar and wind energy applications.
- The service life of many zinc products exceeds 50 years:
  - Zinc metal roofs and facades have a product life of 100 years or more.
  - Hot-dip galvanizing provides protection from 10 to 170 years.

## Sustainable Improved Profitability

- In addition to improving nutritional value, zinc increases crop yields which improves farmer's income.

## Abundant Natural Resources

- Zinc is the 25th most abundant natural element.
- Zinc is essential for all living organisms.

## Sustainable Production

- IZA members have adopted a set of commitments to sustainability as set out in the Sustainability Charter.<sup>1</sup>
- Increased energy efficiency of zinc production. Since 2005, zinc producers have achieved a 24% reduction in primary energy needs.

## Efficient Zinc Recycling

- Zinc keeps its physical properties across its life cycle.
- 40% of zinc produced worldwide originates from recycled or secondary zinc.
- The level of zinc recycling increases each year.

## Decreased Environmental Impacts

- Fuel savings due to enabling lightweight automobiles.
- Contribution to global CO<sub>2</sub> reduction due to keeping steel in service longer.

## Costs Reduction

- The global cost of corrosion is \$2.5 trillion. By significantly increasing the service life of steel, zinc reduces these costs and protects valuable steel resources for future generations.