Zinc Sector SDG Roadmap
The SDG Roadmap aims to demonstrate how the zinc industry, particularly at the sector level, as well as through individual member company activities, can maximize contribution to the SDGs. This can be done through leveraging Impact Opportunities to support realization of the SDGs either through minimizing activities that have negative impacts, or through scaling up activities that have a positive impact.
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1.0 Executive Summary

1.1 Background

The Sustainable Development Goals (SDGs) outline a plan of action to address the world’s greatest environment, social, and economic challenges by 2030. In order to achieve these 17 Goals, ambitious and concerted efforts from across public and private sectors, wider society, and individuals are imperative.

The private sector in particular can look to the SDGs as a framework for progressive action and leadership towards sustainable development and delivering the 2030 Agenda. The SDGs present the private sector with a new framework that enhances license to operate, opens up new growth markets and helps to manage risks.

1.2 Purpose

The purpose of this Roadmap was to convene representatives from across the zinc industry to bring a combined perspective on where the greatest potential lies for the sector to contribute to the SDGs.

This Roadmap aims to demonstrate how the zinc sector, particularly at the sector level, as well as through individual member company activities, can maximize contribution to the SDGs. This can be done through leveraging Impact Opportunities to support realization of the SDGs either through minimizing activities that have negative impacts, or through scaling up activities that have a positive impact.

By detailing Impact Pathways, this Roadmap aims to inspire collaboration, innovation and action throughout the sector and among peers.

1.3 Methodology

In this Roadmap, the zinc industry has employed the three-step framework outlined in the World Business Council for Sustainable Development (WBCSD) SDG Sector Roadmap Guidelines. In keeping with this framework, participating companies convened to form a shared understanding and agree sector alignment around several key factors including:

- the sector’s current SDG alignment and priority SDGs throughout the zinc value chain;
- the areas in which the sector has the greatest SDG Impact Opportunity; and
- tangible actions or Impact Pathways that the sector can take forward to achieve significant SDG impact.

An in-depth review and assessment of all 17 SDGs was undertaken with the International Zinc Association (IZA) Stewardship Working Group to identify the priority SDGs and Impact Opportunities. Publicly available information and company insights gathered through a series of webinars and questionnaires were reviewed and analyzed to understand current engagement with the SDGs and potential for improvement.

Taking into account the information reviewed and the diversity and complexity of the zinc sector’s value chain, ten SDGs were chosen as priority SDGs for the sector. The sector recognizes the interlinkages between, and importance of, all 17 SDGs and that the ‘priority’ SDGs described in this Roadmap can also have indirect impacts on other SDGs. Due to the complexity of these interlinkages, this Roadmap does not attempt to map, or explore in detail, all potential indirect impacts on all SDGs. SDG 17 was highlighted as a crucial goal but one which can be seen as ‘cross cutting’ across all themes.

Priority SDGs for the Global Zinc Sector

1.4 Impact Opportunities and Actions

This Roadmap highlights ten SDG Impact Opportunities through which the zinc sector can maximize contribution to the ten priority SDGs. A series of corresponding tangible actions – or Impact Pathways – to help the zinc sector to achieve the Impact Opportunities are outlined in the Roadmap alongside an estimation as to the level of impact that can be achieved and the level of effort which is needed to do so. The SDG Impact Opportunities have been grouped into four themes which align with the priority SDGs:

1. Health and Wellbeing;
2. Energy Efficiency and Climate Resilience;
3. Operational Impacts to People and the Environment;
4. Sustainable Cities and Circular Economy.

Impact Pathways have been identified to provide tangible ways that the sector can realize the SDG Impact Opportunities through a series of actions to minimize current negative impact and scale positive impact.

SDG Impact Opportunity Themes for the Global Zinc Sector

Theme 1. Health and Wellbeing

- Zero Hunger
- Good Health and Wellbeing

Theme 2. Energy Efficiency and Climate Resilience

- Affordable and Clean Energy
- Climate Action

Theme 3. Operational Impacts to People and the Environment

- Decent Work and Economic Growth
- Life on Land

Theme 4. Sustainable Cities and Circular Economy

- Industry, Innovation and Infrastructure
- Sustainable Cities and Communities
- Responsible Consumption and Production
1.5 Next steps

This Roadmap articulates the significant potential of the zinc sector to play a role in achieving the 2030 Agenda. Strong partnerships and collaborative efforts are essential to the sector achieving the actions laid out in this Roadmap and the overall achievement of the SDGs. Thus, this Roadmap invites sector peers and stakeholders to draw on the Impact Pathways to help steer strategic decision-making.

The IZA is committed to promoting and furthering the actions detailed in this Roadmap through work programs, identifying metrics and indicators to track sector progress, and encouraging peers to leverage this Roadmap to drive action and enhance engagement with stakeholders.
Positive action for Sustainable Development Goals

The world is now five years into a 15-year effort designed to help UN Member States to reach the UN Sustainable Development Goals (SDGs) set out in the 2030 Agenda for Sustainable Development. The Agenda, adopted by all Member States in 2015, recognizes that in order to achieve peace and prosperity for both people and planet, there must be a focus on health and education, improvement in equality, and a boost in economic growth. These issues have to be delivered alongside tackling climate change, protecting endangered environments and species and working towards an end to poverty.

This is a significant global challenge, and one that should involve a wide range of stakeholders, including business. Businesses around the world could see a significant benefit from the market value unlocked if the SDGs are achieved. The Business & Sustainable Development Commission’s flagship Better Business, Better World report suggests that there could be an additional US$12 trillion of market value released with this achievement.

How it’s working: the zinc market

A useful example of this is the zinc sector, where individual companies active in the sector’s value chain have integrated the relevant SDG goals into their business strategies. This means that all bodies involved in the sector are pulling in the right direction already.

Zinc is used in infrastructure and energy production and storage. The industry already actively interacts with communities and with the environment it works in. The International Zinc Association (IZA) is the voice of the global zinc industry; membership consists of all zinc production and recycling stages worldwide, from mining to smelting and manufacturing of zinc products to recycling. Through the IZA Material Stewardship Working Group and supported by consultants ERM, IZA convened representatives from across the sector to bring a combined perspective and identify key impact opportunities.

The industry’s SDG Roadmap aims to demonstrate how the zinc sector, particularly at the sector level, as well as through individual member company activities, can maximize contribution to the SDGs. This can be done through leveraging Impact Opportunities to support realization of the SDGs either through minimizing activities that have negative impacts, or through scaling up activities that have a positive impact.

The zinc sector Roadmap

In this Roadmap, the zinc sector has employed the three-step framework outlined in the World Business Council for Sustainable Development (WBCSD) SDG Sector Roadmap Guidelines. This framework encourages participants to come to a shared understanding, and to agree key factors, including alignment with the SDG themes that will have the greatest impact on opportunities within the sector. This results in tangible actions and strategies that the sector can work towards as a whole.

Next steps

Analyzing impact opportunities and identifying potential actions is an important first step. Nevertheless, it is the result of an industry internal process. In 2020, to ensure all relevant aspects are covered, the IZA will reach out to industry stakeholders to make sure they have input into refining the roadmap to deliver even better outcomes. The IZA and its members will also identify indicators that allow it to measure and demonstrate collective progress.

This is an excellent example of the way industries can use the SDGs to create a committed pathway that helps to deliver the overall goals, and IZAs Material Stewardship Working group believes that this collective effort using sectoral partnerships can improve both the speed and the impact of an industry-wide approach.
2.0 Introduction

2.1 Background

The United Nations adopted the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs) in 2015. The SDGs present a global consensus on development priorities to tackle challenges including those related to poverty, inequality, climate change, environmental degradation, peace and justice by 2030. It is widely acknowledged that this Agenda can only be achieved with broad uptake and implementation by the private sector.

In its Better Business, Better World report, the Business & Sustainable Development Commission demonstrates that pursuing the SDGs can present new market opportunities in ways that extend prosperity to all. This landmark report advocates how stakeholders in all sectors can benefit from developing detailed ‘roadmaps’ to guide their sector’s shift to sustainable development in line with the SDGs.

As the main global industry body representing the zinc sector, the International Zinc Association (IZA), through its Stewardship Working Group, led the development of this Zinc Sector SDG Roadmap. The IZA is the only organization solely committed to the interests of the zinc sector (including mining, smelting, manufacturing, and recycling) and zinc users. The IZA’s mission is to ensure the zinc industry’s social license to operate while also striving to grow and protect zinc markets. IZA also works in collaboration with government and civil society and has three strategic focus areas in which it seeks to develop innovative programs and deliver value to its members:

- Technology & Market Development
- Environment, Health & Sustainability; and
- Communications.

Zinc is incredibly versatile and is used across a multitude of sectors from healthcare and technology through to transportation and construction. Zinc products improve global health and wellbeing through increasing crop yields and combating zinc deficiency in humans and agricultural soils. Galvanization using zinc increases the durability and longevity of steel infrastructure. Zinc metal is also infinitely recyclable and is able to maintain its physical properties across its life cycle. These unique properties position the zinc industry with a number of opportunities to help enable a global societal transition to a more sustainable, lower-carbon and circular economy.

The SDGs

![Image of the 17 SDGs]

2.2 Purpose and Audience

The purpose of this Roadmap is to support the sector to evaluate where its most significant impacts and opportunities related to SDG contribution lie. The Roadmap aims to help guide the zinc sector in exploring how it can amplify SDG impact, both as a sector as a whole and through its member companies’ activities. It aims to inspire innovation and collaboration, through the articulation of a combined sectoral action plan for achieving maximum SDG impact. Specifically, it aims to facilitate:

1. strategic alignment of IZA’s and the sector’s actions with the UN SDG framework;
2. identification of key opportunities and pathways to accelerate and maximize contribution to priority SDGs; and
3. identification of opportunities for collaboration along the value chain to inspire action from the sector as a whole.

2.3 Approach

This Roadmap applies the SDG Sector Roadmap Guidelines, which were developed by the World Business Council for Sustainable Development (WBCSD). These guidelines provide a framework to take companies of the same sector through a step-by-step process to explore, articulate and realize a common vision for their industry to contribute to the SDGs. This process includes three steps1 as depicted below.

The Roadmap development process brought together IZA member companies representing various parts of the zinc value chain, ranging from mining and smelting companies, to producers of zinc products and those recycling zinc.

Information, data and insights were collected through member engagement, SDG mapping exercises, and reviews of corporate disclosure and literature relevant to the sector and SDGs. The Roadmap content was further refined through a series of interactive member webinars.

Three-step process for contributing to the SDGs

1. Establish current position
   - Map SDG impacts across the sector value chain
   - Prioritize SDGs for the sector

2. Identify key impact opportunities
   - Identify key opportunities to impact the SDGs
   - Assess sector apportionment

3. Call to action
   - Identify barriers, potential solutions and impact accelerators
   - Identify short-, medium- and longterm actions to advance SDG impact opportunities
   - Monitor, measure and report progress

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3.0 The zinc sector and the SDGs – current position

3.1 Zinc usage

Approximately 50% of the 14 million tons of Special High Grade (SHG) zinc produced each year go to protecting steel from rust and corrosion through galvanizing.1 A further 17% of annual zinc smelter production goes into zinc-alloying for example to be used for zinc die casting,2 and another 17% is used in brass and bronze.3 The remainder goes to other manufacturing uses, such as zinc sheet for use in buildings and construction,4,5 and into chemical compounds6 such as zinc oxide, that are used in almost everything from sunscreens to solar cells,7 as well as towards use in zinc additives for food or fertilizers.8

3.2 Existing and previous sustainability activities

IZA members have contributed to a variety of sustainability initiatives such as the IZA’s Zinc-for-Life program in 2008-2010. This program aimed to focus and strengthen the Association’s sustainability activities and strived to establish relationships with zinc users to understand their informational needs. The global zinc mining and smelting life cycle assessment (LCA) and stocks and flows (STAF) analysis were initiated as part of this program, both of which are updated regularly and are the basis for informed decisions in material choices in design and technological developments (e.g. for recycling).

As part of the program, relationships have been established with various stakeholder organizations such as the American Iron and Steel Institute (AISI), Steel Recycling Institute (SRI), the European Steel Association (Eurofer), International Copper Association (ICA), International Council on Mining and Metals (ICMM) and the International Iron and Steel Institute (IISI). As a result of the Zinc-for-Life program, IZA in subsequent years intensified its LCA and STAF activities.

The program also involved an association-wide agreement on a Sustainability Charter, which outlines comprehensive guiding principles for member companies. The principles cover the following cross-cutting issues:

<table>
<thead>
<tr>
<th>Sustainability Charter Issues</th>
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<tbody>
<tr>
<td>Community Consultation</td>
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<td>Employee Health &amp; Safety</td>
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<td>Product Stewardship</td>
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<td>Business Ethics</td>
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<td>Children’s Rights</td>
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<td>Sustainability Reporting</td>
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<td>Mine Closure</td>
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<td>Environmental Management</td>
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<td>Managing Minor Elements</td>
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<td>Climate Change</td>
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<td>Mine Tailings and Residue Management</td>
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Another association-wide sustainability initiative was IZA’s founding of the Zinc Nutrient Initiative (ZNI) in 2013, which seeks to address the complex challenge of zinc deficiency in crops, soils and humans. ZNI provides zinc-fortified fertilizers to improve food and nutrition security, contributing to human health and well-being.

2 Ibid.
3 Ibid.
4 Ibid.
In 2018, IZA outlined how the zinc sector can support each of the SDGs with member and IZA activities – see [https://sustainability.zinc.org/](https://sustainability.zinc.org/) for case studies on contributions to each SDG to date.

### 3.3 Key SDGs for the sector

In order to understand where the sector can have the most SDG impact, a comprehensive review and assessment of all 17 SDGs was conducted with the IZA Stewardship Working Group to determine impact priorities. Various sources of publicly available information and company insights were also reviewed and analyzed to understand sector interactions with the SDGs. This included looking at leading think tanks and insight reports, UN and WBCSD-developed SDG reports, industry reports, and IZA member companies’ corporate sustainability reports. Taken together, the findings allowed the group to identify and group priority SDGs into four themes, which represent where the group believes the zinc sector can make the greatest contribution to the 2030 Agenda:

1. Health and Wellbeing;
2. Energy Efficiency and Climate Resilience;
3. Operational Impacts to People and the Environment; and
4. Sustainable Cities and the Circular Economy.

The sector recognizes the interlinkages between and importance of all 17 SDGs and that the ‘priority’ SDGs described in this Roadmap can also have indirect impacts on other SDGs. Due to the complexity of these interlinkages, this Roadmap does not attempt to map, or explore in detail, all potential indirect impacts on all SDGs. SDG 17 was highlighted as a crucial goal but one which can be seen as ‘cross cutting’ across all themes.
Health and Wellbeing

Zinc is an essential micronutrient and plays a critical role in both plant and human health and development. Zinc deficiency is one of the most common nutrient deficiency problems in the world affecting not only humans, but also soils and crops.

Nearly 50% of wheat-cultivated soils in the world contain low amounts of plant-available zinc.¹ In addition to a higher susceptibility to diseases and environmental stressors such as droughts, zinc deficient soils also have reduced crop yields and nutritional values.² Zinc-deficient soils are most common in developing countries,³ where population growth rates are rising the fastest.⁴ Zinc in fertilizers can contribute to the realization of SDG 2 by ensuring crops are productive and have the appropriate nutrition to nourish the world’s population.

Zinc is also an integral part of human health and the body’s ability to function properly. It assists with producing new cells and enzymes, healing wounds, and processing the nutrients in food.⁵ Zinc deficiency affects about a third of the global population by weakening the immune system and leaving the body vulnerable to infection and disease, and is particularly significant for young children.⁶⁷ Preventative zinc supplements have been shown to improve growth in children in developing countries and reduce total deaths in children under five by 18%.⁸

The zinc sector spearheads initiatives in high-risk regions to address zinc deficiency of people and in the soils. Through improving nutrient content in soils around the world and providing micronutrients needed to keep the population’s bodies balanced and healthy, the zinc sector contributes to SDG 3 and the overall health and wellbeing of the global population. For instance, in 2010, UNICEF and the International Zinc Association (IZA) globally launched the “Zinc Saves Kids” initiative, to improve the survival, growth and development of undernourished children in high-burden areas. Initially the program targeted children in Nepal and Peru, but the success of those efforts, along with increased commitment from the zinc industry, has resulted in an expansion of zinc-supplementation programs globally. Since then, zinc producing companies have not only contributed to this program but have started initiatives with regional or global partners.

Zinc in fertilizers can contribute to the realization of SDG 2 by ensuring crops are productive and have the appropriate nutrition to nourish the world’s population.

Preventative zinc supplements have been shown to improve growth in children in developing countries and reduce total deaths in children under five by 18%.

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Zinc primary production is an energy intensive process. The majority of zinc’s carbon footprint is attributed to energy use, with smelting being the most energy intensive stage of value chain. Most of the energy for zinc smelting is required for the electrolysis where it is used as a feed material (electrons). The energy mix powering each stage of the value chain, and smelting in particular, is a critical part of addressing the zinc sector’s impact on climate and resource efficiency.

Although zinc’s energy intensity is high, the industry has made progress in innovation and development of new, more efficient technologies. Zinc smelters also serve to manage fluctuations in the grid by increasing or decreasing the power consumption in the cell house.

The zinc sector has been an important part of infrastructure for decades now because of zinc’s many inherent, beneficial properties such as its durability and recyclability. These properties are also increasingly important for zinc’s growing role in contributing towards SDG 7 through the provision of critical raw materials, such as silver, indium and germanium to support renewable technologies.

Protecting steel from corrosion is crucial to ensure the reliable long-term functionality of renewable energy infrastructure. For example, galvanized steel is used as a raw material for the support structures of solar PV panel and offshore wind masts are made from zinc thermal sprayed steel. Demand for zinc for use in wind power technologies alone is expected to increase by close to 250% by 2050 under a 2°C global temperature rise scenario. Large zinc-based energy storage systems are increasingly available and help to ensure a constant energy supply from non-constant energy sources (wind and solar).

Rechargeable zinc-air batteries are also a promising power source to support intermittent renewable energy technologies and electric vehicles due to zinc’s natural abundance, a high theoretical energy density, and relatively low production cost.

Zinc, through the galvanization of steel, can also play a role in climate resilience when this material is used instead of other, more vulnerable, materials such as wood. This relates to infrastructure such as electricity transmission towers and transmission poles, electrical substations and for telecommunication poles. The use of galvanized steel in urban infrastructure, particularly in developed countries, has the potential to significantly contribute to the integrity of infrastructure in the face of more extreme weather patterns and to make cities safer for growing urban populations.

2 Ibid.
The zinc sector, in particular through its mining operations, has the power to make a positive contribution to the communities in which it operates due to the job creation and investment it can bring to host countries. However, mining can result in a number of challenges, including environmental degradation, displaced populations, inequality and increased conflict.¹

There is a global focus on improving artisanal and small-scale mining operations (ASM), which are an important driver of inclusive growth in developing countries.² However, ASM operations are largely informal and are often associated with poor safety, human rights and environmental performance. It is estimated that approximately 1% of the global zinc mining production stems from ASM operation whereas the remaining 99% stems from large-scale mining operations.

The sector’s global footprint provides significant employment opportunities, which enable decent work and economic growth for people around the world. It is recognized by the sector that protecting human rights, including particularly vulnerable or marginalized local populations, is central to achieving all of the SDGs, but also that many companies, mining in particular, face challenges in upholding and respecting human rights throughout their value chain. This is a crucial issue that warrants ongoing focus, as it is fundamental to protecting workforces and local communities as well as maintaining the sector’s social license to operate.

As well as contributing directly to SDG 8, the zinc sector, given its role as a major employer and contributor to the local economies of the regions it operates in can also contribute to other SDGs which focus on gender (e.g. SDG 5) and broader economic inequalities (SDG 10). Furthermore, the sector can also contribute to human development in the geographies in which it operates through company initiatives with local communities focusing on local needs, for example addressing educational (SDG 4) or water and sanitation-related (SDG 6), depending on where community needs are most prevalent in any particular location.

Mining and its associated infrastructure by its nature has the potential to adversely affect ecosystems, demonstrating clear links to SDG 15. Zinc mining operations have opportunities to ensure that companies practise responsible sourcing of materials through their supply chains, and management of wastes and materials on site. The mining sector has a strong potential role to play in the sustainable stewardship of the land that it manages, and the people that interact with this land.

Sustainable Cities and Circular Economy

The construction and transportation sectors account for 70% of zinc product applications. Zinc contributes to the longevity of steel infrastructure by protecting it from corrosion and extending the useful life of buildings, cars, public transport, and other types of societal infrastructure that is crucial to everyday life, contributing to SDG 11, Sustainable cities and communities. About 60% of total zinc production is still in use today. The use of hot-dip galvanized steel has been shown to be characterized by lower consumption of resources and less pollution throughout its service life in comparison to an equivalent paint system.

While galvanized steel is used widely in developed countries and across a variety of sectors, there is still considerable growth to be had in new growth economies where the markets are underdeveloped and where significant population growth and subsequent rapid urbanization is expected into 2050. More than three billion people are estimated to be in need of adequate housing by 2030. Without safe, long-lasting infrastructure, some of the world’s most vulnerable people will be further at risk of exposure to increasingly frequent and volatile climatic events. The construction of high-rise buildings typically aims to address population growth by maximizing the use of space, especially in areas of rapid urbanization. Specifically, high-rise buildings classed as skyscrapers are constructed using steel or concrete reinforced with rebar. Rebar, if galvanized with zinc, increases the lifetime of concrete structures – not only in houses – but also in infrastructure, such as ports, airports and bridges.

While zinc contributes to SDGs 9 and 11 by keeping infrastructure standing for longer and more resilient in the face of climatic uncertainty, it also contributes to SDG 12 as zinc has an extremely high recycling potential. Zinc metal can be infinitely recycled without losing its essential properties. About 25% of current zinc production comes from zinc-bearing materials that have come out of use and been recycled. While it is estimated that at a global scale only about 45% of all available zinc at the end of life is actually recovered and recycled, recycling rates vary depending the maturity of recycling networks and regulatory incentives for industrial waste reduction of different regions.

There have been several successes already in the recycling of zinc. For instance, galvanized steel is typically collected and recycled from electric arc furnaces (EAF) flue dust. Almost 100% of the zinc in EAF dusts is recycled in Europe and North America, and rates in developing countries are seeing improvements in the steel and zinc recycling industry as the galvanized steel industry continues to mature in these regions. Zinc metal scrap from zinc sheet or zinc die casting applications are re-melted and reused by the brass and galvanized steel industries. Re-melting zinc requires only 5% of the energy that is needed to produce primary zinc from ores.

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The SDGs cannot be achieved in isolation and the sector recognizes that innovative forms of partnerships and collaborations, founded on principles of cooperation, transparency and accountability, are integral to progressing the SDGs and scaling up action across the globe.

The zinc sector has already mobilized its own members through IZA and has formed strong partnerships with peers such as those with the Galvanized Autobody Partnership (GAP), American Iron and Steel Institute (AISI), Steel Recycling Institute (SRI), the European Steel Association (Eurofer), International Copper Association (ICA), International Council on Mining and Metals (ICMM) and the International Iron and Steel Institute (IISI).

IZA has an important function as a facilitator of partnerships around the SDGs. For example, IZA joined the International Responsible Business Conduct (IRBC) Agreement for the metals sector of the Netherlands and Responsible Steel. Both these initiatives work towards promotion of responsible value chains within which zinc has an important role to play.

The sector regularly engages with regulators and policymakers, downstream zinc users and local communities in which they operate, on sustainability issues.

In recognition of the importance of partnerships in realizing the SDG Impact Opportunities identified throughout this Roadmap, Chapter 4 includes suggested partnerships that could help scale and accelerate contribution to the SDGs.

Forging new partnerships with those seeking to develop new sustainable infrastructure markets in developing countries has the potential to enable scaling of applications for galvanized steel. Increased knowledge sharing and dialogue among peers and stakeholders can contribute to transparency and collaboration around the use of evidence-based data to support increased use of zinc products and infrastructure.
The SDGs cannot be achieved in isolation and the sector recognizes that innovative forms of partnerships and collaborations, founded on principles of cooperation, transparency and accountability, are integral to progressing the SDGs and scaling up action across the globe.
4.0 SDG Impact Opportunities

This Roadmap presents ten SDG Impact Opportunities where the zinc sector and its value chain can focus efforts to maximize the sector’s contribution to the SDGs. These have been identified as the most direct drivers for impact in the context of the sector’s specific challenges and opportunities. Several criteria were used to shortlist and validate Impact Opportunities, for example whether the issue is a core topic for the zinc sector specifically, whether it pushes the sector to advance beyond ‘Business as Usual’ and whether it has the potential to have lasting impact with minimal rebound effects.

**Impact Opportunities by Theme**

**Health and Wellbeing**

**SDG Impact Opportunity 1**
Eliminate zinc deficiency globally

<table>
<thead>
<tr>
<th>Areas of contribution for priority SDGs</th>
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<tbody>
<tr>
<td><strong>2.1</strong> By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round</td>
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<tr>
<td><strong>2.2</strong> By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons</td>
</tr>
<tr>
<td><strong>2.3</strong> By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment</td>
</tr>
<tr>
<td><strong>3.2</strong> By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births</td>
</tr>
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</table>
Energy Efficiency and Climate Resilience

**SDG Impact Opportunity 2**
Increase use of renewable energy and improve energy efficiency along whole zinc value chain in context of alignment with Paris Climate Agreement targets

**SDG Impact Opportunity 3**
Increase uptake of products that contribute sustainably to societal needs

**SDG Impact Opportunity 4**
Contribute to planning for climate resilience

### Areas of contribution for priority SDGs

- **7.1** By 2030, ensure universal access to affordable, reliable and modern energy services
- **7.2** By 2030, increase substantially the share of renewable energy in the global energy mix
- **7.3** By 2030, double the global rate of improvement in energy efficiency
- **7b** By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programs of support
- **13.1** Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries

Operational Impacts to People and the Environment

**SDG Impact Opportunity 5**
Reduce environmental footprint of mining operations

**SDG Impact Opportunity 6**
Embed best practice employment principles and make a positive contribution to local communities

**SDG Impact Opportunity 7**
Enhance gender diversity in zinc related employment at all stages in value chain

**SDG Impact Opportunity 8**
Follow responsible sourcing principles throughout zinc value chain

### Areas of contribution for priority SDGs

- **8.4** Improve progressively, through 2030, global resource efficiency in consumption and production and endeavor to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programs on sustainable consumption and production, with developed countries taking the lead
- **8.5** By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value
- **8.7** Take immediate and effective measures to eradicate forced labor, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labor, including recruitment and use of child soldiers, and by 2025 end child labor in all its forms
- **8.8** Protect labor rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants and those in precarious employment
- **15.1** By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements
- **15.5** Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species
Sustainable Cities and Circular Economy

SDG Impact Opportunity 9
Prolong the life of steel structures through galvanization in developing countries

SDG Impact Opportunity 10
Accelerate and maximize the recycling potential of zinc containing materials (‘close the loop for zinc’)

Areas of contribution for priority SDGs

<table>
<thead>
<tr>
<th>SDG</th>
<th>Description</th>
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<tbody>
<tr>
<td>9.1</td>
<td>Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all</td>
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<td>9.4</td>
<td>By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities</td>
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<tr>
<td>9a</td>
<td>Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States</td>
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<tr>
<td>11.1</td>
<td>By 2030, ensure access for all to adequate, safe, and affordable housing and basic services and upgrade slums</td>
</tr>
<tr>
<td>11.6</td>
<td>By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management</td>
</tr>
<tr>
<td>12.2</td>
<td>By 2030, achieve the sustainable management and efficient use of natural resources</td>
</tr>
<tr>
<td>12.5</td>
<td>By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse</td>
</tr>
<tr>
<td>12.6</td>
<td>Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle</td>
</tr>
<tr>
<td>12a</td>
<td>Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production</td>
</tr>
</tbody>
</table>

Impact Pathways

Impact Pathways have been identified to provide tangible ways that the sector can realize the SDG Impact Opportunities through a series of actions. The following pages outline these Impact Pathways, which highlight potential actions to minimize current negative impact and scale positive impact.
## Health and Wellbeing

### SDG IMPACT OPPORTUNITY 1: Eliminate zinc deficiency globally

<table>
<thead>
<tr>
<th>Actions</th>
<th>Level of potential SDG contribution (Low, Medium, High)</th>
<th>Level of effort needed from sector (Low, Medium, High)</th>
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</tr>
</thead>
</table>
| Scale up projects that deliver zinc (in food or fertilizers) to all those with zinc deficiency. | H | H | • Health sector stakeholders  
• International agencies, e.g. FAO, UNICEF, WHO  
• World Bank Group, development banks, other financial institutions and foundations who fund health projects  
• Research institutes and scientific organizations, e.g. International Society for Zinc Biology (IZSB)  
• Zinc customer industry associations (e.g. fertilizer or food supplements) | 2.1  
2.2  
2.3  
3.2 |
| Target education on the positive effects of zinc for diet. | H | M | • Regulatory bodies (where legislation poses a barrier)  
• Health sector stakeholders  
• International agencies, e.g. FAO, UNICEF, WHO  
• World Bank Group, development banks, other financial institutions and foundations who fund health projects  
• Zinc customer industry associations (e.g. fertilizer or food supplements) | 2.1  
2.2  
2.3  
3.2 |

**Enablers:** Scaling up current initiatives to reach all zinc-deficient regions across the globe is likely to require increased financing and innovative capacity building with health sector stakeholders. Partnerships with organizations such as the World Bank can extend the reach of projects to deliver zinc and the required educational materials to those who need it most. The corporate sustainability strategies of zinc sector organizations must align with this ambition to ensure sector-wide support and mobilization. A supportive regulatory environment (e.g. related to the use of zinc in fertilizers) can minimize barriers to project delivery.
### Energy Efficiency and Climate Resilience

#### SDG IMPACT OPPORTUNITY 2: Increase use of renewable energy and improve energy efficiency along the whole zinc value chain in context of alignment with Paris Climate Agreement targets

<table>
<thead>
<tr>
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</tr>
</thead>
</table>
| Increase use of renewable energy in the zinc value chain. | H | H | • Governments  
• Renewable energy providers  
• Suppliers and customers along zinc value chain | 7.2  
7.3 |
| Scale efforts to improve energy efficiency and carbon footprint of technology and processes related to the zinc value chain (e.g. invest in development of carbon-free zinc recycling methods). | H | H | • Galvanized steel industry  
• Downstream users and their organizations, e.g. EGGA, AGA  
• Governments  
• Technical/metallurgical societies, e.g. the Minerals, Metals & Materials Society (TMS), Gesellschaft der Metallurgen und Bergleute (GDMB), Mining and Metallurgical Institute of Japan (MMIJ) | 7.3 |
| Improve transparency in the sector through open reporting on energy and climate performance, achievements and shortcomings, sharing best practice with peers and working with others to tackle barriers. | M | L | • Peers  
• Governments  
• Financial regulators (e.g. on climate related disclosure) | 7.2  
7.3 |

**Enablers:** A supportive regulatory environment in the regions where the sector operates can help increase the uptake of renewable energy and increase operational energy efficiency. Knowledge sharing and transparent reporting can facilitate a collaborative environment and allow companies to share best practice.
**SDG IMPACT OPPORTUNITY 3:** Increase uptake of products that contribute sustainably to societal needs (e.g. industry 4.0, smart home, electro mobility, production, transport and storage of renewable energy)

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>Expand the use of energy efficient batteries through:</td>
<td>M</td>
<td>M</td>
<td>• Battery and battery-using product manufacturers</td>
<td>7.3</td>
</tr>
<tr>
<td>• building on existing partnerships and research to enhance Zn-C and alkaline traditional batteries; and</td>
<td></td>
<td></td>
<td>• Research institutions</td>
<td></td>
</tr>
<tr>
<td>• further development of ZN-air/Zn-Ag “button cell” batteries.</td>
<td></td>
<td></td>
<td>• Retailers</td>
<td></td>
</tr>
<tr>
<td>Increase availability of batteries for renewables in particular in developing countries.</td>
<td>H</td>
<td>M</td>
<td>• Recyclers</td>
<td></td>
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</tbody>
</table>

**Enablers:** Increased research and development and formation of innovative partnerships are crucial to create a competitive marketplace for zinc batteries and the products that use them. A supportive regulatory environment for renewables and collaboration with key partners such as development banks, institutions and project developers can help to facilitate capital investment aimed at those who could benefit the most from a greater availability of affordable zinc batteries and renewable energy (e.g. those in developing countries). It is important to keep in mind a life cycle approach when expanding markets, for example ensuring that appropriate recycling paths are developed for new growth in the battery market.

**SDG IMPACT OPPORTUNITY 4:** Contribute to planning for climate resilience

<table>
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<th>Contribution to priority SDG targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale up the use of galvanized products in critical infrastructure and clean energy production.</td>
<td>H</td>
<td>M</td>
<td>• Galvanized steel sector</td>
<td>13.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Construction sector</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Governments/sub-national governments</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>• Policy makers/regulators</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>• Investors</td>
<td></td>
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</table>

**Enablers:** Policies that require specifications for climate resilience in design of critical infrastructure may help bolster the use of galvanized products in critical infrastructure. Knowledge sharing and dialogue regarding the advantages of galvanized steel for certain infrastructure over other materials could improve widespread support for the use of galvanized steel.
### Operational Impacts to People and the Environment

**SDG IMPACT OPPORTUNITY 5:** Reduce environmental footprint of mining operations

<table>
<thead>
<tr>
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</thead>
</table>
| Develop mining site selection planning technologies to reduce impacts on terrestrial and inland freshwater ecosystems and their services (e.g. use of Artificial Intelligence to map and resources and minimize direct impacts). | M | L | • Academic institutions/research institutes  
• SMEs/Start-ups  
• Mining sector, peers and other trade associations  
• Governments/policy makers/ regulators  
• Investors | 15.1  
15.5 |
| Strengthen watershed level management and develop technologies to reduce water requirements in mining. | H | M | • ICMM  
• Academia  
• Multi-stakeholder Initiatives  
• NGOs  
• Sector peers | 15.1  
15.5 |

**Enablers:** Research initiatives and finance can assist in the development of cutting-edge technologies that can support this opportunity. Knowledge and data sharing among sector peers could also improve technology uptake and the spread of best practices. Collaboration with other sectors operating in similar geographies can provide for a platform taking actions at the watershed level.
### SDG IMPACT OPPORTUNITY 6: Embed best practice employment principles and make a positive contribution to local communities

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Scale shared value business models that bring employment and other benefits to communities (e.g. addressing education, water, supplier local content or other local priorities).</td>
<td>H</td>
<td>M</td>
<td>• Peers across the value chain (e.g. contractors and suppliers) • Local communities • Other industries also operating in region • Mining industry associations • NGOs</td>
<td>8.5 8.7 8.8</td>
</tr>
<tr>
<td>Strengthen processes to ensure continuous improvements in health, safety (including tailings safety) and wellbeing for employees, contractors and communities.</td>
<td>H</td>
<td>H</td>
<td>• Local communities • Contractors and suppliers • Governments /policy makers / regulators • Industry associations • Labor organizations (e.g. ILO) • Sector peers • NGOs</td>
<td>8.5 8.7 8.8</td>
</tr>
</tbody>
</table>

**Enablers:** Embracing new shared value business models across the sector alongside the strengthening of policies and processes can enable improved health, safety and wellbeing for employees, contractors and communities. Partnerships are essential to scale such initiatives through the zinc value chains.

### SDG IMPACT OPPORTUNITY 7: Enhance gender diversity in zinc related employment at all stages in value chain

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<th>Contribution to priority SDG targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase numbers of women in the workforce at entry, management and board level through strengthening of policies that support workforce diversity and inclusion.</td>
<td>M</td>
<td>H</td>
<td>• Sector peers • Labor associations • Industry associations</td>
<td>8.5 8.8</td>
</tr>
</tbody>
</table>

**Enablers:** Policy support for gender equality in the work place, employer and management training on gender biases in the work place and creating inclusive environments, and knowledge sharing and dialogue among peers on innovative programs or strategies, all work together to drive greater gender diversity and inclusion in the workplace at all levels.
**SDG IMPACT OPPORTUNITY 8:** Follow Responsible Sourcing principles throughout zinc value chain

<table>
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<th>Key partners</th>
<th>Contribution to priority SDG targets</th>
</tr>
</thead>
</table>
| Implement responsible sourcing principles including due diligence across businesses that are part of the zinc value chain. | H | H | • Galvanized steel sector  
• London Metal Exchange  
• Other metals commodity associations  
• Users groups, e.g. the Responsible Minerals Initiative (RMI)  
• NGOs  
• Organization for Economic Cooperation and Development (OECD)  
• Dutch International Responsible Business Conduct (IRBC)  
• Investors and stock exchanges | 8.4  
8.8 |

**Enablers:** Central to the successful realization of this opportunity will be the development and drive of industry led voluntary initiatives, which mandate broad uptake of responsible sourcing standards by organizations at all stages along the zinc value chain. The role of the financial sector in driving supply chain due diligence and disclosure is also expected to be a key enabler to accelerate progress.

The sector’s global footprint provides significant employment opportunities, which enable decent work and economic growth for people around the world.
## SDG IMPACT OPPORTUNITY 9: Prolong the life steel structures through galvanization in developing countries

<table>
<thead>
<tr>
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<th>Key partners</th>
<th>Contribution to priority SDG targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify regional and/or infrastructure—specific opportunities to scale use of galvanization to improve climate resilience.</td>
<td>M</td>
<td>M</td>
<td>• Galvanized steel sector, e.g. GAP and others, Galvauto</td>
<td>9.1 9a</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Organizations focusing on machine construction / renewables / building sectors</td>
<td>11.1</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Industry associations</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Academic institutions / research initiatives</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Investors</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Governments / policy makers / regulators</td>
<td></td>
</tr>
<tr>
<td>Maximize use of zinc products in potential high impact applications including:</td>
<td>M</td>
<td>L</td>
<td>• Zinc sector value chain peers</td>
<td>91 9.4</td>
</tr>
<tr>
<td>• galvanized rebar to enhance lifetime of concrete structures;</td>
<td></td>
<td></td>
<td>• Cross-sector initiatives</td>
<td>11.1</td>
</tr>
<tr>
<td>• rolled zinc (zinc roofs and facades are extremely long-lived, maintenance-free and can be dismantled and recycled/reused very easily); and</td>
<td></td>
<td></td>
<td>• SMEs / start ups</td>
<td>12.2</td>
</tr>
<tr>
<td>• modular steel constructions that can be re-used and repaired when damaged.</td>
<td></td>
<td></td>
<td>• Academic institutions / research institutes</td>
<td>12.5 12a</td>
</tr>
</tbody>
</table>

**Enablers:** Forging new partnerships with those seeking to develop new sustainable infrastructure markets in developing countries has the potential to enable scaling of applications for galvanized steel. Increased knowledge sharing and dialogue among peers and stakeholders can contribute to transparency and collaboration around the use of evidence-based data to support increased use of zinc products and infrastructure.
### SDG IMPACT OPPORTUNITY 10: Accelerate and maximize the recycling potential of zinc containing materials (“Close the Loop for Zinc”)

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>Identify more categories of zinc-containing materials that can be recycled.</td>
<td>H</td>
<td>H</td>
<td>Industry associations, Academic institutions/research initiatives, Sector peers</td>
<td>11.6, 12.2, 12.5</td>
</tr>
</tbody>
</table>
| Increase rates of zinc recycling through:  
  • Scaling innovation for sorting and recycling technologies for low zinc containing secondary raw material;  
  • Scaling waste ore reprocessing to recover other minerals;  
  • Identifying possible ways of efficiently recovering metals contained in concentrates and tailings;  
  • Increasing innovations in recycling zinc from low-containing steel mill dusts; and  
  • Scaling promising technologies for recycling of landfilled residues (e.g. Jarosite). | H | H | Steel/iron/brass industry/associations, Industry associations, Academic institutions/research initiatives, Investors, Governments/policy makers/regulators | 9.4, 11.6, 12.a, 12.2, 12.5 |
| Facilitate zinc reaching maximum potential in the circular economy:  
  • Move towards 100% member contribution of up-to-date and transparent LCA and inventory stocks and flows data (would lead to more accurate regional LCA data).  
  • Initiate study on long-term availability of zinc and implications for its use over alternative products.  
  • Work with governments to remove any barriers inherent in policy curtailing the use of zinc. | M | H | End users, Users organizations, e.g. Retail Motor Industry Federation (RMI), Drive Sustainability, Sector peers, LCA practitioners and designers, Academic institutions/research initiatives, Governments | 12.2, 12.5, 12.6 |

**Enablers:** Increased funding and research as well as partnerships with other industries with similar needs can help achieve this Impact Opportunity. Supportive policy to accelerate circular economy thinking and increased knowledge sharing amongst the sector may be expected to facilitate the research, uptake and deployment of innovative technologies.
Zinc contributes to the longevity of steel infrastructure by protecting it from corrosion and extending the useful life of buildings, cars, public transport, and other types of societal infrastructure that is crucial to everyday life.
5.0 THE ROAD TO 2030

Next Steps
The Roadmap has used the lens of the SDGs to better understand and describe where the zinc sector’s main opportunities lie to make a meaningful contribution to some of the world’s most pressing societal and environmental challenges.

The SDG Impact Opportunities and Impact Pathways articulated in this Roadmap are focused on where the sector can maximize positive impacts while minimizing negative effects, whilst working with partners in a collaborative and transparent way to achieve the 2030 Agenda.

With the understanding that concerted action is indispensable for its success, this Roadmap invites sector peers and stakeholders to use the Impact Pathways to help guide, inform and influence strategic decision-making.

Looking to the Future
This Roadmap is part of a journey to guide and inspire IZA member companies and the broader zinc value chain to work together to scale SDG contribution in areas where there is the most potential to have impact.

The IZA is committed to:
• endorsing and developing this Roadmap through its work programs and by bolstering internal support;
• actively investigating metrics and indicators to measure progress across the sector;
• encouraging member companies and peers within the zinc value chain to champion and leverage the Roadmap to drive action and enhance stakeholder engagement and dialogue; and
• involving further stakeholders in the Roadmap implementation process to a) expand the approach from the zinc core sector to its downstream users and b) further refine and improve the Roadmap, building on new opportunities or responding to changing contexts.

Tracking Progress
Following the release of this Roadmap, the IZA will focus on developing program proposals for 2020 related to the Impact Pathways. As part of these programs, the IZA will aim to develop associated key performance indicators (KPIs) to track progress. The KPIs developed by IZA to track SDG progress will be grounded in the work that member companies and the IZA itself are already conducting.
This Roadmap articulates the significant potential of the zinc sector to play a role in achieving the 2030 Agenda