

# Legal Statement

The purpose of the information in this presentation is to guide ICA programs and provide members with information to make independent business decisions.

Various public sources.

# Antitrust Guidelines

## Antitrust Guidelines for Copper Industry Trade Association Meetings

The following guidelines with respect to compliance with antitrust laws of the United States, Japan and European Community<sup>1</sup> are intended to govern the conduct of participants in copper industry trade association meetings, both at the meeting itself and in informal discussions before or after the formal meeting.

**Price:** Competitors should not discuss future prices (including terms of sale) of their products. There is no blanket prohibition against the mention of or reference to current or past prices but limits must be observed. Such references or mentions should occur only when necessary in connection with the development of association programs. For example, reference to a particular price level in comparing the cost of a copper product to a competing product is permitted. Whenever possible, such references should be discussed in advance with legal counsel.

**Competitive Information:** Competitors should not discuss the market share of a particular copper producer or copper fabricator's products. Furthermore, nothing should be said at a meeting which could be interpreted as suggesting prearranged market shares for such products or producer production levels. The overall market share of copper products may be discussed with regard to competition with non-copper products and general market acceptance.

**New Products:** Competitors should not encourage or discourage the introduction of a new product by another competitor or reveal a particular copper company's plans to change the production rate of an existing product or to introduce a new product. No company should disclose to another company whether it is in a position to make or market a new product. New products may be discussed in a technical manner or from the standpoints of competition with non-copper products and general market acceptance. In addition, proposed methods for and results of field and laboratory testing can be considered.

**The Role of Legal Counsel:** Legal counsel attends association meetings to advise association staff and other meeting attendees regarding the antitrust laws and to see that none of the matters discussed or materials distributed raise even the appearance of antitrust improprieties. During the course of a meeting, if counsel believes that the discussion is turning to a sensitive or inappropriate subject, counsel will express that belief and request that the attendees return the discussion to a less sensitive area.

A paper entitled 'Copper Industry Trade Associations and Antitrust Laws' is available upon request.

10/92, 5/93, 10/10

1. Other foreign competition laws apply to International Copper Association, Ltd. (ICA)'s activities worldwide.

# Future Themes

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London, October 2019



# Overview

1. Demographical changes

2. Regulatory changes

3. Infrastructure developments

4. Advancements in building and construction

5. Changes in energy and power generation and use



6. Water supply developments

7. Changing agriculture and food production

8. Advancements in manufacturing

9. Progress of IT and telecom

10. Change in transport and vehicles

# Recurring factors

**The constant increase in speed and capacity of communication systems.**

**Pressure to cut greenhouse gases so that the effects of climate change are reduced:**

Accelerating adoption of clean technology: in electricity generation and transportation,  
Emphasis on developing energy storage technology.

Measures to increase the efficiency of manufacturing processes, the built environment.

Adoption of more efficient electrical devices, e.g. electric motors, important copper application.

**There is more pressure now to achieve a circular economy, this means reducing waste and increasing the effectiveness of re-cycling. This should add more re-cycled copper into the market.**

**The very great importance of the Chinese presence in today's markets.**

# Demographics

Effect on use of copper

## Trends

**1 World population growth just under 1% a year up to 2030**

But still plus 1 billion! 900,000 of this divided between Asia and Africa.

More positive in the high growth areas

**2 In general GDP growth rates are forecast to slow.**

Mildly Negative

**3 But...2018, 3.4 billion people in the global middle class.**

---- 2030, this is estimated to rise to 5.6 billion [4% a year increase.]

Very positive

**4 Immigration has only slightly increased over recent decades to 3.4% of the total population.**

Small

**5 Ageing populations, electric/electronic monitoring/caring...**

Moderate

## Regulation

## Potential impact on copper

### Leaders in regulation: USA, EU, China

General focus [based on EU headings]

#### 1 Resource Conservation

**Positive**

#### 2 EU Sustainable Finance Action Plan

**Positive, but...**

#### 3 Carbon Footprint/Climate Change Global Environmental Action

**Competition in raw material expected to increase**

#### 4 Health and Environment

**Regulation on copper but also alloys and scrap**

#### 5 Product Integrity

**Co-ingredients, increasing focus on alloying ingredients could affect recycling of base metals**

#### 6 Social Licence to Operate

**Focus on social and environmental integrity of the entire supply chain**

## Notable examples

## Potential effect on copper

### **Renewables and national legislation**

US removal of barriers to participation in electric storage  
California to require solar panels on new houses

### **China**

Changes to copper scrap policy  
Elimination of feed-in-tariff scheme

**International Energy Agency** Hydrogen Initiative for cleaner energy  
Increased international attention to automotive emissions

**International Maritime Organization** reduction in ship air pollution

**US, Chinese, European vehicle emission regulations**

**Positive**

**Some issues**

**Neutral**

**Positive**

**Positive**



# Infrastructure Development

Perceived  
Impact

## Trends

**1** Forecasts for investment *needed* in Infrastructure show increasing need for spending on road and rail, energy/electricity and to a lesser extent, water/sanitation and telecoms.

Positive

**2** China's Belt and Road Initiative [BRI] is providing infrastructure to less wealthy countries, not fully accounted for in Western forecasts.

Positive

BRI focus is overland corridors and a network of ports and shipping lanes.

**3** In the USA the impetus to develop the infrastructure is increased by President Trump's "Infrastructure Initiative", [April 2019] received Government approval.

Positive



## Building and Construction

### Trends

**1 Comparatively faster growth, except China [reduced but still fast-growing]. Current forecasts average at 3.75% a year up to 2030**

The 2015 Metra Martech study, forecast + 3.3% to 2025 .

China, US and India, account for 57% of this global growth.

**2 Development of smart/intelligent/green buildings, smart cities and smart grids,** (particularly in higher income regions, use more cable. And home power storage).

**Other construction sectors, included above, which use copper include:**

- Road networks for lighting, signing [driven by infrastructure development]
- The Electrification of rail, [continued expansion and conversion from diesel].
- Electrical/electronic networks within hospitals and schools, [continuing to grow].
- Possible condenser charging lanes for electric vehicles, [5 to ten years ahead]

**Impact**

**Positive**

**Positive**

**Positive/  
Neutral**

# Energy and Power

Impact

**1 Growth in demand:** primary energy **1.8% CAGR to 2030**. Compares with 1.5% CAGR from 2007 to 2017 *[EIA data]*

Positive

**2 Growth, electricity generation,** forecast to be **3% to 4% CAGR**.  
*The main user of copper.*

Positive

<b>3 Substitution of one energy source by another</b>	Thermal generation	2% p.a. growth
	Hydro	2%
	Other Renewables	8% wind, 12% solar

Positive

**4 HVDC** Offshore wind farms use DC transmission cables as do undersea cables. There are several important HVDC transmission projects onshore and underground.

Positive

**5 Storage** Increasing availability of lower cost power storage solutions ...opportunity to overcome the renewables problem of intermittent power

Positive

**6 Restructuring** of electricity supply networks is forecast, as users large and small, including domestic, acquire electricity buffer storage and more will have generating capacity.

Positive

# Water Supply [utility level]

Impact

## Trends

### 1 Increasing water shortage trend continues...

for people in areas of absolute water scarcity, planned budgets not sufficient.

Neutral

### 2 Growth in global *spending* on water supply has been 3% a year

It is generally forecast that this will accelerate in the next ten years.

**Metra Martech has taken 5% to 6% as an average growth over the next decade.**

Positive

### 3 Need to attract new funding sources to achieve this accelerated growth.

Neutral

### 4 More attention being given to use of assets and efficiency

New water management systems evident and continuing, will use new information from Internet of Things, drones, targeted irrigation...more recycling....repair, reduce losses.

Positive

# Agriculture and Food

## Trends

- 1 Climate change, disrupting food production particularly in poorer areas**
- 2 Development of new agricultural practices and equipment, leading to precision farming**
- 3 More use of genetics, in livestock breeding as well as in crop development**
- 4 Alternative feed for livestock such as processed algae**
- 5 Environmental pressures such as: packaging food waste, reduced meat use**
- 6 Better understanding of nutrition, leading to changes in food patterns and farming**
- 7 Rapid growth of technologies:** Informatics, satellite imaging, remote sensing, drones, robotics.



Picture: Elina Mark [CC BY-SA 3.0 (<https://creativecommons.org/licenses/by-sa/3.0/>)]

Neutral to  
Positive,  
2 and 7  
more  
Positive

# Manufacturing

## Impact

### Trends

#### 1 Increased automation and robotics

Advanced communication facilities, particularly 5G and eventually 6G systems will change industry

**Opportunity  
and Issue**

#### 2 New processes and materials

Nano technologies, 3D printing, tighter control of material quantities

**Issue**

#### 3 Competition for skilled and talented employees

Big changes in employment patterns

**Neutral**

#### 4 More communication with customers

Need for and expectation that suppliers and users will communicate much more

**Opportunity  
and Issue**

#### 5 The Circular economy

Implication that more scrap will become available

**Neutral/  
Positive**

# Driving Change in the Vehicles and Transport Sector

## Impact

### Trends

- |  |                        |
|--|------------------------|
| <b>1 Increasing awareness and Government action to reduce climate change threats</b>   | <b>Very positive</b>   |
| <b>2 Technology developments, e.g. gains in battery performance</b>  | <b>Very positive</b>   |
| <b>3 Demographic change</b>  | <b>Positive</b>        |
| <b>4 Continued growth in car production: conventional [ICE] and EV</b>   | <b>Positive</b>        |
| <b>5 Rapid acceptance of electric vehicles, dependent on</b> <ul style="list-style-type: none"><li>• Government support levels</li><li>• Continued cost reduction of battery systems</li><li>• Availability of adequate numbers of charging points</li></ul> | <b>Neutral</b>         |
| <b>6 Sharing economy: Some market analysts are forecasting changing perceptions of vehicle ownership.</b>  | <b>Mildly Negative</b> |
| <b>7 Further development of autonomous vehicle technology, initially in the commercial vehicle sector.</b>   | <b>Positive</b>        |

# Overview

1. Demographical changes

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2. Regulatory changes

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3. Infrastructure developments

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4. Advancements in building and construction

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5. Changes in energy and power generation

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6. Water supply developments

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7. Changing agriculture and food production

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8. Advancements in manufacturing

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9. Progress of IT and telecom

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10. Changes in transport and vehicles

**Future copper use 2030**



# Conclusions

The large majority of future trends will have a positive to very positive impact on copper use.

Trends with the most significant positive impact on copper use include:

- Demographical changes and the growth of the population,
- Advances in building and construction,
- Changes in transport and vehicles,
- Energy and power.

Putting potential demand in perspective, building and construction, vehicles and energy and power used 9.5 million tonnes copper in 2018 with forecast between 14 and 18 million tonnes in 2030.

However, challenges remain:

- High possibility of adverse economic and political developments,
- Emerging trends of reuse/recycle and pressure to use less primary copper, and
- Innovation from new materials with claimed superior performance.

