

# Copper – Inducing a sustainable future

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What's the secret behind the eternal youth of Lady Liberty standing tall in New York for over a century? What makes it weather all storms to continue holding the torch of enlightenment high? Historians tell us it is the same dynamic element that has been used by humans for over 10,000 years – copper. It, therefore, is unsurprising that the French were well aware that copper would be the ideal element for the Statue of Liberty's outer layer – being lightweight, rustproof, and strong but easy to shape – when they crafted it as a gift to the US in 1886. Today, copper is considered the bellwether for the global economy and is used extensively in electronic devices, electricity delivery and storage, transportation, communication, and manufacturing. Many of its industrial applications are geared for exciting long-term growth which makes copper very promising as a thematic investment opportunity.

## Copper is driving the electric vehicle revolution

Copper is prevalent in three key areas of electric mobility: energy storage; charging infrastructure; and the production of vehicles. According to the International Copper Study Group (ICSG), electric vehicles (EVs) use approximately four times more copper than cars with internal combustion engines. Wood Mackenzie expect global EV sales to rise from 5% of all vehicle sales today to 50% by 2040. This technological revolution is thus expected to invigorate the demand for copper. Copper demand in EVs could increase by a multiple of 4 within the next 7 years (see figure 01 below).

*Source: International Copper Association, WisdomTree. Data available as of September 2020. BEV stands for battery electric vehicle, HEV for hybrid electric vehicle, PHEV for plug-in hybrid electric vehicle, and EBUS stands for electric bus.*

**Forecasts are not an indicator of future performance and any investments are subject to risks and uncertainties.**

## Copper is powering smart cities

Smart cities are employing new information technology solutions to solve urban problems of housing, transportation, energy, and governance. Examples of smart city applications include the deployment of smart traffic lights that use predictive analytics to improve traffic flow; smart buildings to improve energy efficiency, safety, and security; and the development of 5G internet connectivity to promote the internet of things economy – a state in which multiple smart devices are interconnected. Copper's electrical conductivity, energy efficiency, and ductility make it ideally suited for all electrical and electronic applications to develop the smart city infrastructure. From smart grids to air conditioning systems, and EV charging

infrastructure to 5G optical fibres, copper's demand is expected to grow to enable the development and efficient running of smart cities (see figure 02).

*Source: International Copper Association, Martec, WisdomTree. Data as of October 2020.*

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### **Copper is electrifying the shift towards renewable energy**

Copper's strong conductivity makes it an indispensable component of renewable energy power generation systems such as solar, wind and hydro generators to achieve optimum efficiency in power generation and transmission. Copper helps reduce CO2 emissions and lowers the amount of energy needed to produce electricity. According to the International Energy Agency (IEA), the world will add nearly 200GW of renewable electricity capacity in 2021, up from just over 50GW of new renewable electricity capacity added in 2007. For the expected growth in the renewable energy market to gather charge (see figure 03), greater quantities of copper will be required.

*Source: Statista. Data available as of October 2020.*

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### **Doing it all sustainably**

When it comes to sustainability, there are two questions to ask: is there enough copper on earth to meet the growing demand, and is the use of copper good for the environment? The answer to both questions is a resounding yes. According to the International Copper Association (ICA), the world has – on average – always had 40 years of copper reserves since the 1950s. The US Geological Survey of 2019 estimates global copper reserves at 830 million tonnes, copper resources in excess of 5000 million tonnes, and annual copper usage at around 28 million tonnes. Moreover, copper can be recycled repeatedly without losing its physical properties and around 1/3rd of all copper used today is recycled.

### **Markets are recognising copper's potential**

Copper has been leading the way among industrial metals since the recovery in cyclical assets gathered pace in March. This is partly attributable to COVID-related supply disruption from key mining countries like Chile causing the supply deficit to widen in the first half of this year (according to ICSG). But it is also because industrial metals with long-term prospects benefit from cyclical as well as structural tailwinds. Copper is not only appealing as a tactical asset making gains from a cyclical economic recovery, but it also makes a compelling case to be classified as a thematic investment opportunity – one that has the potential to induce a sustainable future.

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