#Better with Copper – Building a Sustainable Future: The Vital Role of Copper in Infrastructure

In an era marked by an unwavering commitment to sustainability, efficiency, and reliability, our choices regarding infrastructure materials carry unprecedented significance. Projections indicate that the global population will surge to 9.8 billion by 2050 and reach a staggering 11.2 billion by 2100. Significant investment in infrastructure is needed to accommodate such exponential growth, with forecasts indicating that between 2016 and 2040 alone, an annual investment of 3.2 trillion dollars is needed in infrastructure.

As we confront the complex challenges of expanding and upgrading infrastructure, we must consider materials that can withstand the demands of global transformation, burgeoning populations, technological innovations, economic progress, and the urgent realities of climate change. One unassuming yet invaluable element has consistently withstood the test of time, embodying the accumulated wisdom of our history and making an undeniable case for its indispensable role in future infrastructure: copper.

Copper has historically risen to meet many of these challenges and proven itself nearly irreplaceable. It holds a ubiquitous presence in the realm of electricity, with approximately 60% of global copper production dedicated to electrical applications. Furthermore, copper finds its place in virtually every infrastructure sector, encompassing utilities, transportation, communications, and energy production and distribution, thanks to its unique properties that make it a responsible infrastructure choice.

Notably, copper shines as a highly sustainable material, fostering a circular economy. It plays a prominent role in alternative energy sectors, including electric vehicles, energy-efficient equipment, solar and wind power installations. For instance, wind power alone is projected to consume an average of 548 kilotonnes of copper annually. An exceptional attribute of copper is its endless recyclability, with nearly two-thirds of the 690 million tonnes of copper produced in the last century still in use, actively contributing to various applications in its second, third, or greater life cycle. Many semi-finished copper and copper alloy products like plumbing tube, brass rod and flat rolled products also contain well over 50% recycled content from both pre- and post-consumer sources. This exceptional recyclability significantly reduces the need for primary mining, conserving natural resources and mitigating the carbon footprint of copper-focused infrastructure projects.

In the realm of durability, copper proves itself resilient even in the harshest environments, earning the moniker of the gold standard in water piping. The U.S. Department of Housing and Urban Development attests to copper water pipes boasting a remarkable lifespan ranging from 50 to 70 years.

Copper's distinction in infrastructure lies in its exceptional physical properties that balance strength, formability, corrosion resistance and a nearly endless ability to form alloys to suit the demands of specific end use applications. Copper’s electrical conductivity makes it an unparalleled choice for energy-efficient electrical and energy infrastructure, delivering electrical current with minimal losses from the point of generation to the point of use. Copper’s thermal conductivity is equally impressive and important to both electrical and mechanical systems. Copper’s high thermal conductivity makes it ideal for next generation efficient, sustainable heating, cooling and refrigeration. It’s high thermal and electrical conductivity combined keep vital electrical circuits, equipment, and systems from overheating, allowing them to run cooler and last longer.

We stand in a unique position where we possess the vision and knowledge to address current and future infrastructure demands responsibly. In this endeavor, copper emerges as an enduring partner, offering a pathway to a more sustainable and resilient future.