

Committee: Economical and Social Council (ECOSOC)

Issue: Assessing the social and economic impacts of the copper supply Chain in the international Energy Transition to Net-Zero

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Position: Deputy President

PERSONAL INTRODUCTION

Dear delegates,

My name is Faye Fragkaki and I have the utmost honor of serving as a Deputy President of ECOSOC in this year's ACGMUN. I attend the 10th grade at Deutsche Schule Athen, and this is my third time chairing (first time in ECOSOC). I am really excited to get to know you, and I really hope that this conference will be an unforgettable experience for all of you. Personally, I started MUN in 8th grade and immediately fell in love with it, and I hope you will too. The friendships and experiences are going to stay with you for a lifetime!

The study guide below is on the second topic namely: Assessing the social and economic impacts of the Copper Supply Chain in the International Energy Transition to Net-Zero. If you have any questions regarding anything about the study guide do not hesitate to contact me. I would be more than happy to help you.

Looking forward to seeing you,

Faye Fragkaki

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TOPIC INTRODUCTION

It is known that gas emissions are extremely harmful to the environment since they cause climate change due to the trapped heat within the atmosphere. More specifically, gas emitted is trapped within the troposphere layer of the Earth's atmosphere, increasing its temperature. Hence, in order to prevent the negative issues that accompany the increase in temperatures, achieving net zero is essential. Copper is vital for the clean energy transition to net zero. Because of its superior electrical conductivity, it is ideal for a number of decarbonizing technologies, such as wind turbines, photovoltaic panels, heat pumps, electric vehicles, and energy-efficient

equipment. All of such equipment is often used on the road towards decreasing climate pollution, as a replacement for fossil fuels.

However, today, the copper industry accounts for about 0.2 percent of worldwide greenhouse gas emissions, and at the same time, demand for copper is expected to double by 2050—from 25 million tonnes in 2020 to 50 million tonnes¹. So, although copper is necessary for the technologies that will assist in achieving the energy transition to net zero it is also responsible for 0.2 percent of greenhouse gas emissions. Having this in mind, the International Copper Association (ICA) and its members have developed a strategy for bringing the carbon footprint for the copper supply chain (mining, smelting, refining, and recycling) as close to net zero as possible by 2050². Copper is really important for the clean energy transition to net zero because of its superior electrical conductivity it is ideal for a number of decarbonizing technologies. The good news is that these technologies, used properly, can significantly help fight against greenhouse gas emissions (GHG).

Thus, in this committee, we will assess the multi-faceted social and economic impacts of the demand for copper which are essential for the transition to net zero but at the same time, harmful if its carbon footprint is not reduced by 2050. The reality is that over the next 27 years, the world will demand nearly twice the amount of copper the world has produced over the previous 3000 years. So, how could this be dealt with?

DEFINITION OF KEY TERMS

Copper

Chemical element. Copper is a soft red-brown metal used for making electric wires, pipes, and coins³

Supply Chain

The series of processes involved in the production and supply of goods, from when they are first made, grown, etc. until they are bought or used⁴

¹ *Copper Alliance*, 9 Feb. 2024, www.copperalliance.org/

² *Copper Alliance*, 9 Feb. 2024, www.copperalliance.org/

³ "Copper." *Oxford Learner's Dictionaries | Find Definitions, Translations, and Grammar Explanations at Oxford Learner's Dictionaries*, www.oxfordlearnersdictionaries.com/definition/english/copper

⁴ "Supply-chain Noun - Definition, Pictures, Pronunciation and Usage Notes | Oxford Advanced Learner's Dictionary at OxfordLearnersDictionaries.com." *Oxford Learner's Dictionaries | Find Definitions, Translations, and Grammar Explanations at Oxford Learner's Dictionaries*, www.oxfordlearnersdictionaries.com/definition/english/supply-chain?q=Supply+chain

Net-Zero

The state in which the harmful gasses produced by a particular company, region or country have no impact on the climate because they have been balanced by actions that protect the environment.⁵

Greenhouse Gas

Greenhouse gas is any gas that has the property of absorbing infrared radiation (net heat energy) emitted from the Earth's surface and reradiating it back to Earth's surface, thus contributing to the greenhouse effect. Carbon dioxide, methane, and water vapor are the most important greenhouse gases.⁶

BACKGROUND INFORMATION

Copper Supply Chain

Copper is one of the oldest metals known to mankind. It was first used as a substitute for stone tools around 8000 BCE by Neolithic people. Copper was also used to make ornaments and jewelry. Copper alloys, such as bronze (copper and tin), were discovered around 3500 BCE and this discovery marked a new era in the history of human civilization. Copper today is vital because of its various uses. Examples include the conduction of electricity, wiring purposes, motors, generators, transformers, and other electrical equipment. In the field of construction, copper tubing is the standard material for plumbing and heating systems in most developed countries. It is also used for roofing, cladding, flashing, and gutters. In the field of transport, copper is essential for the electrical and thermal properties of planes, trains, automobiles, and boats. It is also used for brakes, bearings, radiators, and connectors. Copper has many other applications such as jewelry, medical devices, coins, cookware, musical instruments, and art⁷.

⁵"Net-zero Noun - Definition, Pictures, Pronunciation and Usage Notes | Oxford Advanced Learner's Dictionary at OxfordLearnersDictionaries.com." *Oxford Learner's Dictionaries | Find Definitions, Translations, and Grammar Explanations at Oxford Learner's Dictionaries*, www.oxfordlearnersdictionaries.com/definition/english/net-zero?q=Net+zero

⁶"What Are Greenhouse Gases? | GHGs Explained | National Grid Group." *Welcome to National Grid Group | National Grid Group*, [www.nationalgrid.com/stories/energy-explained/what-are-greenhouse-gases#:~:text=Greenhouse%20gases%20\(also%20known%20as,greenhouse%20gases%20in%20the%20atmosphere](http://www.nationalgrid.com/stories/energy-explained/what-are-greenhouse-gases#:~:text=Greenhouse%20gases%20(also%20known%20as,greenhouse%20gases%20in%20the%20atmosphere)

⁷"Volume of 2050 Net-zero Copper Demand." *ENERGYminute* -, 3 Apr. 2023, www.energyminute.ca/infographics/the-volume-of-2050-net-zero-copper-demand/

Effects

Social Effects

Socially, such an increase in the copper supply chain demand will be beneficial. One of the key benefits is increased demand for labor. This demand will later translate into workers getting hired, decreasing the unemployment rate of nations. At the same time, people will be trained through the skilled labor required for mining. Hence, there will be an increase in the quality of labor and employment. With respect to the social issues that arise from the copper supply chain, the most prominent is that of the human life cost of mining copper. Boulders underground are extremely dangerous when exposed to the atmosphere. When removed from underground they transmit harmful chemicals and radioactive substances, affecting the soil surrounding them. At the same time, the air is polluted through such substances, affecting the health and well-being of mine workers, and creating a great healthcare risk. Common issues faced by miners include irritation of the skin, eyes, and lungs, making it difficult to breathe. Such effects are mostly seen when copper extraction is executed in extensive amounts. At the same time, pollution of water due to leaks will lead to the communities surrounding the area being affected as drinking water is not as accessible⁸.

Economic Effects

There are economic benefits that accompany the use of copper. One main benefit is the institutional reinforcement that is achieved. More specifically, by the government gaining control of the supply chain it can contribute to government revenues with trade being promoted between nations depending on availability to such resources. A further economic advantage is the ability for there to be industrial diversification. Firms will have the ability to utilize copper as a means of research and development opportunities to promote new discoveries on sustainable energy. The industry of copper also averages at about \$73 billion per year globally, expecting to increase with the upcoming demand for it.⁹ However, there are issues that may arise with the increase in copper mining. Regions vary on the amount of copper they are able to supply. For this reason, should an area be heavily reliant on

⁸ "Impacts of Copper Mining on People and Nature." *Danwatch*, 6 Dec. 2022, www.danwatch.dk/en/undersogelse/impacts-of-copper-mining-on-people-and-nature/

⁹ "Study Shows Copper Industry Delivers Multiple Benefits to Communities." *Copper Alliance*, copperalliance.org/resource/study-shows-copper-industry-delivers-multiple-benefits-to-communities/#:~:text=These%20impacts%20can%20be%20grouped,livelihoods%20and%20distributin%20economic%20value.&text=These%20key%20socio%20Deconomic%20impacts,%2473%20billion%20per%20year%20globally

the production of copper and find itself unable to extract more, its economy would crash as it had not developed other industry. This would result in jobs being lost and income decreasing significantly.¹⁰

Environmental Effects

Environmental benefits to the supply of copper as a means of reaching net zero is that it is part of the production process of sustainable energy sources. By employing such sources of energy, there will be a decrease in the overall pollution of the world as less greenhouse gas emissions will be released into the atmosphere as prior energy sources including coal, will be eliminated. Nevertheless, there are environmental drawbacks to utilizing copper in the fight towards net zero. One of the more apparent issues that accompany the mining of copper is land degradation and deforestation. Mining copper is done through the digging of one-pit mines- vast holes in the ground with slopes that resemble staircases called benches. In order for such holes to be dug all wildlife on the ground is destroyed while any trees are cut down. "One-pit mines are massive" with some even reaching a mile in diameter¹¹. Due to this vast distance, mine workers are required to cut down and destroy great amounts of land leading to such negative environmental results. At the same time, the mining of copper often results in water pollution. When water surrounds the mining site it tends to turn a reddish color due to copper acid being released. This results in groundwater being impacted and consequently wildlife, farm life, and underwater organisms being affected.

Transition to Net-Zero

Reaching Net zero is imperative for our planet's safety and its population's well-being. Regarding the energy transition, the role of copper is significant because of its many uses. For instance, it is used in solar panels, wind turbines, electric vehicles, batteries, and hydrogen production. "The clean energy transition is expected to cause copper demand to double by 2050. Responsible mining processes will be critical to protect the interests of local communities as mining companies work to meet this demand."¹² However, apart from the apparent advantages, there are also difficulties

¹⁰ "Study: Copper Mining Would Have Economic Costs." *Study: Copper Mining Would Have Economic Costs - The Timberjay*, 19 July 2017, www.timberjay.com/stories/study-copper-mining-would-have-economic-costs,13514

¹¹ "How Does Copper Mining Affect the Environment? | Calgary." *Federal Metals Inc. | Federal Metals Inc*, 11 Aug. 2022, www.federalmetals.ca/how-does-copper-mining-affect-the-environment/

¹² "Study Shows Copper Industry Delivers Multiple Benefits to Communities." *Copper Alliance*, copperalliance.org/resource/study-shows-copper-industry-delivers-multiple-benefits-to-communities/#:~:text=These%20impacts%20can%20be%20grouped,livelihoods%20and%20distributin g%20economic%20value.&text=These%20key%20socio%2Deconomic%20impacts,%2473%20billion%20per%20year%20globally

and uncertainties for the future of copper supply and demand. The copper demand may exceed its supply, thus creating obstacles to achieving net zero emissions by 2050 goals. To be more explicit, a study by S&P Global estimates that copper demand will nearly double to 50 million metric tons by 2035 and reach more than 53 million metric tons by 2050. At the same time, current copper production capacity is said to increase by about 20% over the next decade.¹³ This is an issue due to the great prospects of copper and its role in reaching net zero through the energy transition.

MAJOR COUNTRIES AND ORGANIZATIONS INVOLVED

Chile

Chile plays an important role in adjusting commodity supply chains, given the increased demand for minerals for the energy transition alongside the US and European countries seeking mineral sources. In spite of its well-established mining industries, Chile faces the challenge of increasingly and rapidly expanding its output capacity. A new constitution being prepared in Chile is likely to slightly increase the state's role in the development of natural resources, but it would continue to allow private sector involvement, although with tighter environmental scrutiny and higher taxes, including a new royalty. Chile's copper industry also has a significant impact on the country's economy, as copper exports account for a significant portion of the country's total export revenues. According to GlobalData, Chile is the world's largest producer of copper in 2022, with output down by 4.29% in 2021. Over the five years to 2021, production from Chile increased by a CAGR of 0.55% and is expected to rise by a CAGR of 2% between 2022 and 2026.¹⁴

Peru

Peru's government is likely to focus on simplifying procedures and maintaining current tax rates and incentives for the mining sector to increase private investment, but it will maintain tight environmental requirements for exploration. Increased standards related to environmental, social, and governance issues could make it more difficult to obtain a social license to operate in Chile and Peru. At the same time this could encourage more protests and/ or lengthy court challenges which could affect

¹³ "Looming Copper Supply Shortfalls Present a Challenge to Achieving Net-Zero 2050 Goals, S&P Global Study Finds - Jul 14, 2022." *News Release Archive*, www.press.spglobal.com/2022-07-14-Looming-Copper-Supply-Shortfalls-Present-a-Challenge-to-Achieving-Net-Zero-2050-Goals,-S-P-Global-Study-Finds

¹⁴ Kgi-admin. "Copper Production in Chile and Major Projects." *Mining Technology*, 4 July 2023, www.mining-technology.com/data-insights/copper-in-chile/

Australia

The CEO of a copper company in Australia through an article has given solutions and written down what he and his company would like to propose as efficient solutions in order to achieve net Zero. The “Zero Emission Mine of the Future” was commissioned by the International Copper Association. According to the report, the end products contribute to a reduction in emissions, by the companies that produce the materials. An earlier report, the Copper Technology Roadmap 2030 (also by the Warren Centre) forecasts strong copper demand over the next 15 years driven by technology, decarbonization, urbanization, clean energy, and mobility. As the world moves rapidly to deal with the impacts of climate change, every economy and industry will need to reduce their carbon footprints. To this end, the global copper industry has introduced the new Copper Mark Certification program to guide mines to comply with the U.N. Sustainable Development Goals. Over the next 20-30 years the challenge for copper mines to become zero emission will be immense in the face of falling quality, the difficulty of finding new, accessible deposits, and growing community pressures on ‘license to operate’. This Report identifies the short-term, medium-term, and longer-term technological breakthroughs and processes to move the industry to achieve this incredible goal. The value to the Australasian economy and environment and the progress we make along this path is enormous. It is quite likely that by building collaboration between copper miners, research institutes and universities, the METS Industry, and governments we will uncover valuable technologies we can also sell to the rest of the world.



Figure 1: The United Nations Sustainable Development Goals

TIMELINE OF EVENTS

Date	Description of event
8000 B.C.E.	Neolithic people used copper as a substitute for stone tools.
3000 B.C.E.	They used it for ornaments and jewelry
Roman era	Mined on Cyprus
10 th century	Started mining in Sweden
1876	The Norddeutsche Affinerie in Hamburg was the first modern electroplating plant, starting its production in 1876.[115]
1880s	Demand for Copper started rising
1967	The Intergovernmental Council of Copper Exporting Countries, was formed by Chile, Peru, Zaire and Zambia
1988	It dissolved because the USA was never a member

RELEVANT UN RESOLUTIONS, TREATIES AND EVENTS

Terms of Reference of the International Copper Study Group

This treaty concerning the International Copper Study group (ICSG), was created so as to form and maintain enhanced international cooperation on the Copper Economy and provide a forum for all intergovernmental consultations on numerous

aspects of the utilization and the production of Copper. In accordance with its establishment, it clarified the objectives and provisions of the ICSG. The aforementioned treaty also showcases greatly the significance of the development of the copper market.

The capabilities of the group as well as certain terms were clarified while market development and yearly assessments were taken under consideration and finally inaugurated. Via the group's work and objectives, the specific treaty laid the foundations for global communication on the issue. The ICSG has conducted thorough research on the copper supply chain and on the data analysis of copper. Through this treaty, a lot of other important aspects of the topic were addressed such as the enhancement of the copper supply chain and the price disruptions on copper. Thus the treaty as well as the ICSG stand as a living example of the determination of nations and their commitment to building a more resilient and sustainable future for the proper, responsible usage of copper so as to ultimately achieve net zero.

Geneva Treaty

The Treaty of Geneva was signed on the 24th of February 1989. It represents the huge efforts made by nations and the overall global community on numerous issues in need of urgent response. The aforementioned treaty had a significant impact on the copper supply chain initiation, as well. It serves as one of the main efforts seeking stability and responsibility in the copper industry as a whole. It promotes a multifaceted approach while encouraging sustainable economic development.

The specific treaty holds today an important role in overseeing both the extraction and the processes, partaking in the Copper Supply Chain. Its main focus lies in providing clear directions in accordance with existing legal frameworks so as to manage the financial sector of copper production, mining, and recycling. Ultimately, this treaty plays a really important role in the subject of the copper supply chain and wishes to find feasible solutions for the issue at hand.

PREVIOUS ATTEMPTS TO SOLVE THE ISSUE

Extractive Industries Transparency Initiative (EITI)

The Extractive Industries Transparency Initiative (EITI) is of major importance in ensuring transparency within the copper supply chain and mitigating its potential social and economic ramifications. The EITI constitutes a globally influential set of standards and guidelines, encouraging numerous nations abundant in natural resources such as but not limited to copper to disclose information about its extraction and the whole supply supply. Moreover, it promotes fruitful international

communication as well as collaboration between stakeholders including mining companies and the general public so as to ultimately minimize and potentially eliminate corruption while benefiting local communities and strengthening transparency. Finally, via scrutiny and constant monitoring, the EITI aims to monitor and mitigate any and all obstacles presented within the copper supply chain. The EITI has been proven to be a component of great importance in tackling the numerous issues in the copper supply chain and thus ensuring a more sustainable and responsible industrial future.

ILO C176-Safety and Health in Mines Convention, 1995 (No. 176)

The International Labour Organization's (ILO) Convention No.176, also known as the Safety and Health in Mines Convention of 1995 suggests a universal attempt to address the well-being and welfare of laborers within the mining industry. It plays a major role when mitigating the multifaceted socio-economic issues of the copper supply chain. Copper amongst numerous minerals and natural resources requires extraction as a part of its production process. Such extractions have been proven to be completely hazardous with various health risks. Thus, this convention has become one of the few cornerstones establishing a legal framework protecting the health of such individuals in danger.

The aforementioned convention emphasizes risk assessment via proposing control and safety measures and guidelines whose object is to track potential hazards at a foundational level, contributing to creating a safe working environment and safeguarding workers' rights. Furthermore, it highlights the significance of collaboration not only at the state level but internally, between labor and laborer. Due to the importance of copper for the global community and its prospective economic growth the ramification and actual implementation of the contents of this convention becomes an imperative need. Thus, the ILO manages to ameliorate the copper supply chain not only to achieve global financial stability but most importantly to initiate a more sustainable future built upon the foundation of Net-Zero.

The UN Guiding Principles on Business and Human Rights (UNGPs)

The United Nations Guiding Principles on Business and Human Rights (UNGPs) hold an important role in terms of the ethical considerations surrounding the copper supply chain. Since its establishment in 2011, they provided a globally applicable framework allowing for industries to take responsibility for any and all human rights violations and thus promotes respect for human and worker rights during operations. Moreover, considering the social and economic implications during mining and

extractions, adherence to the UNGPs is necessary. They are also greatly important in terms of identifying and mitigating abuses so the appropriate companies to integrate these principles into their policies and finally contribute to sustainable development and human rights protection.

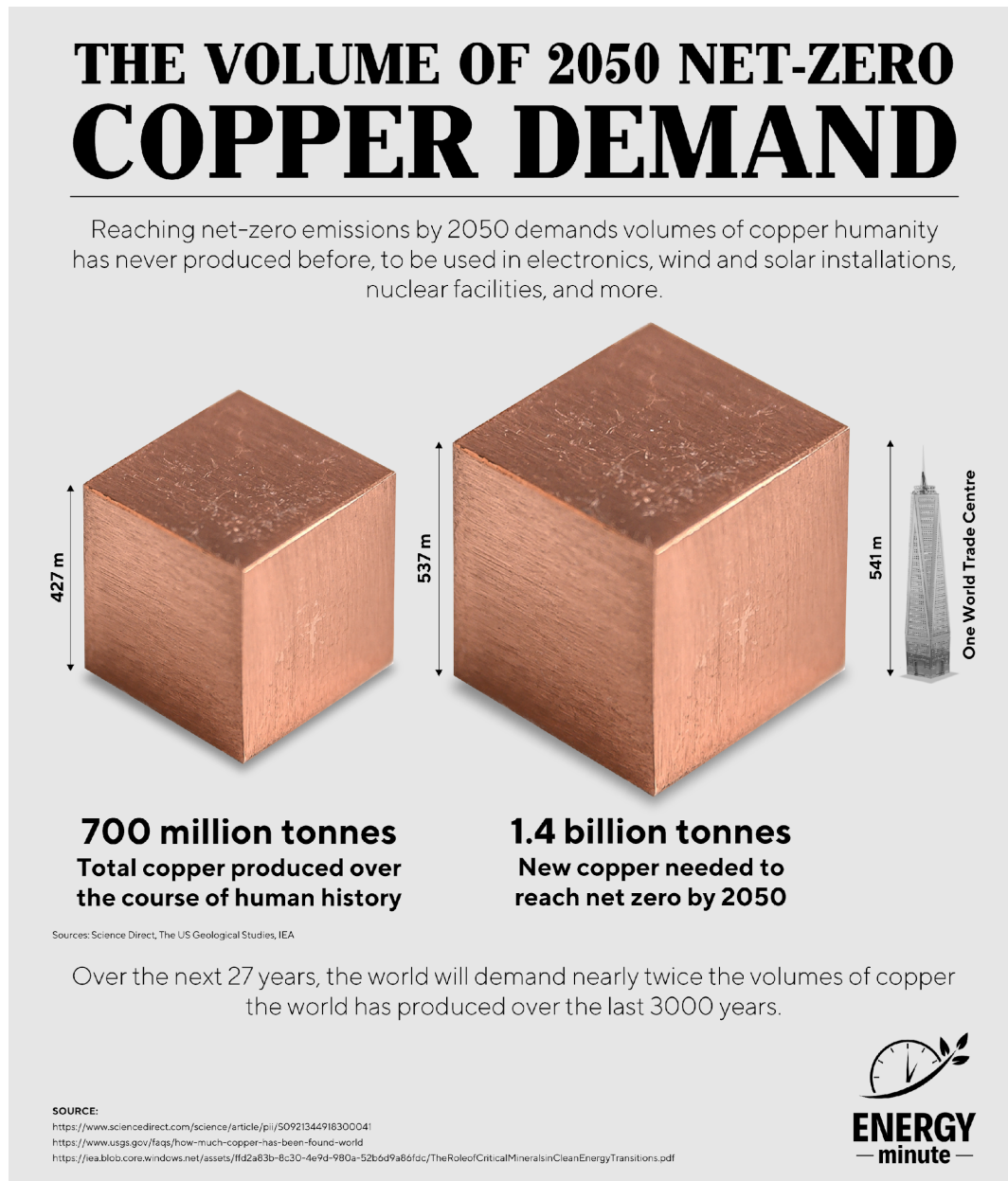


Figure 2: Demand for copper

POSSIBLE

SOLUTIONS

Government Action

Encouraging governments to engage in the issue of assessing the social and economic impact of the copper supply chain is of major importance in pivoting towards a more sustainable future, built upon the foundation of Net-Zero and financial stability. Collaboration and information at a national level is imperative prior to expecting any type of global results and amendments. Moreover, the turn to renewable energy sources, which depend greatly upon the extraction and production of Copper, currently is in need of comprehensive, sustainable, and responsible decisions within nations themselves. A properly informed and goal-oriented government suggests a nation ready to adopt new legislation and to thoroughly evaluate pre-existing systems that are deemed to not be appropriately functioning. Every government is to be adequately equipped to make decisions on the matter so as to mitigate the issue at hand while cultivating other benefits such as job creation and economic growth.

International Cooperation

When dealing with issues of both great importance and urgency, it is imperative to consider the wider global society. The copper supply chain, in its current form, from the extraction of copper to its production and utilization is in need of drastic change, mostly when discussing the transition to net zero. Due to the interconnected nature of the recent global economy, it is almost mandatory for governments, industries, and NGOs to collaborate on the matter. The aforementioned stakeholders have the capacity to manage such an issue via the provision of appropriate evaluations and frameworks (governments), the social, economic, and environmental examination of all attempts (NGOs), and finally the implementation of any potential decision.

Technological Innovation

Based on the current face of the global society it would be rather utopic to not consider the technology innovations that are to come when mitigating the ramifications caused by the Copper Supply Chain. It is of major significance for nations to consider and responsibly utilize all the available technological means. Such tools enable not only communication and collaboration but most importantly, they allow for real-time monitoring of both extraction and production. The technological advances of the 21st century offer fruitful insights and allow nations to be fully

informed about the social, economic, and environmental impact of the Copper Supply Chain. Thus, advocating technological innovation empowers decision-making and assists targeted sustainable interventions.

Research and Development

Despite the current utilization of copper, it is necessary for nations and organizations to conduct further research so as to acquire a better understanding on the ramifications such a production chain has caused while undertaking the potential benefits that could come as a result of its proper and responsible handling. Via such an approach, light could be shed on resource availability and already-existing hazards, amongst other unclear aspects of Copper handling. All of the above could be now deemed sufficient for the adoption of a proper and resilient approach to embracing the socio-economic potential of copper, but without further scrutiny and exploration of the issue, all statements are to be considered assumptions.

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