

Can solar thermal technologies be implemented in copper mining facilities in Chile?

Four analyses were carried out, aiming to assess the actual potential for implementing solar thermal technologies in copper mining facilities in Chile. In a first place, it was estimated the LCOH (1) of a solar thermal plant coupled to different copper mining operations, that currently have operating an EW process as part of the production plant.

Can a solar process dry copper and iron concentrates in Chile?

Detailed technical studies on the design of a solar process for drying copper and iron concentrates in Chile are presented in (Behar et al., 2017a) and (Behar et al., 2017b). Fig. 15 highlights a typical solar copper concentrate drying process.

Can solar energy be used in the copper mineral processing industry?

The use of solar energy in the copper mineral processing industry could solve present energy-related problems particularly GHG emissions. This opportunity is strongly encouraged by the fact that the most important copper mines in Chile are situated in the Atacama Desert.

How much energy is needed for copper mining in Chile?

The cost of energy is currently high and represents about 25-30% of total operating costs (Cochilco,2020). It is expected that copper mining in Chile will need an annual electricity demand of 39.5 TWh by 2025, which represents an increase of 60% (Cochilco,2020).

Should copper mining use concentrating solar power?

When the target is replacing fossil fuel energy from the grid with solar energy, where the electricity is mainly Alternative Current (AC), the copper mining industry should consider Concentrating Solar Power (CSP) in its future energy mix (Chiloane, 2012). This is particularly true when the operation is located far away from the grid.

Can concentrating solar power be used to dry copper concentrate?

Currently, some copper mining processing plants use the fossil-fuel dryer to reduce the humidity of the copper concentrate. It is possible to use concentrating solar power for drying copper concentrate since the operating temperature of the drying process is around 180 °C.

The two people behind the big solar heat deal: Ian Nelson from Chile and Hans Grydehøj from Denmark, two independent and very experienced solar heat experts
Photos: Private. Copper mines in Chile are ideal for solar heat usage "What Gasco will finance and build now has four times the solar heat capacity of our first plant at Gabriela Mistral ...

Copper stands at the forefront of materials driving the global transition to renewable energy and is a valued material for various important applications. ... Chile E-mail: sjadoun022@gmail ... The "first copper coin"

Using solar technologies in energy-intensive industries located in arid climate zones is an attractive alternative for that purpose. In this work, the environmental benefit of ...

The use of renewable energy (RE) in the copper industry is not new. For example, there are power purchase agreements (energy contracts) for renewable electricity supply (e.g. wind power for the Los Pelambres copper mine in Chile (Choi and Song, 2017)). Solar heat plants are also in use, such as the Pampa Elvira Solar flat plate collector plant which ...

Overview of Chile's Copper Boom in Chile In recent years, Chile has emerged as a global powerhouse in the mining industry, primarily due to its abundant copper reserves. ... Renewable Energy Growth: The global transition to renewable energy sources, such as solar and wind power, has increased the demand for copper in the manufacturing of ...

Considering that the most important copper mines in Chile are situated in regions with high radiation levels, solar energy has the potential to be an attractive and sustainable source of energy. This paper provides an overview of the current solar technologies and how they have been applied to address some of the challenges faced by the copper ...

New areas of coverage include the environmentally appropriate uses of copper cables in power transmission for wind and solar energy sources; the recycling of electronic scrap as an important new ...

Despite its historic ties to fossil fuels and copper mining, in recent years Chile has accelerated its energy transition. With a population of just under 20 million, Chile is now targeting 80% renewable electricity by 2030 and a 100% zero emissions power grid by 2050. Last year wind and solar overtook coal as renewables now dominate the local energy sector.

The majority of copper usage, worldwide, is for electrical wiring, including the coils of generators and motors. Copper plays a larger role in renewable energy generation than in conventional thermal power plants in terms of tonnage of copper per unit of installed power. [15] The copper usage intensity of renewable energy systems is four to six times higher than in fossil fuel or ...

The mining industry faces diverse challenges to maintain sustainable production, particularly regarding critical water and energy supplies. As a significant player in the copper mining industry, Chile has become a global reference. Therefore, this research analyses the distinct challenges of the Chilean copper mining industry in terms of water and energy. We also identified ten key ...

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Therefore, this document concludes with a research work carried out with the aim of treating copper slags with concentrated solar energy to recover valuable elements from these slags, as iron and copper. ... but in 1800 England became the biggest copper producer. Chile became the first copper producer in 1859 and, from that moment, this country ...

Considering that the most important copper mines in Chile are situated in regions with high radiation levels, solar energy has the potential to be an attractive and sustainable source of energy.

A significant share of the world copper production takes place in arid regions with favorable conditions for the deployment of solar energy technologies, such as the ...

The aim of this research is to analyse the impact of renewable energy (RE) technologies and sector coupling via analysing the transition pathways towards a sustainable energy system in Chile. Four energy transition scenarios for the power, heat, transport and desalination sectors were assessed using the LUT Energy System Transition model.

Chile Energy Profile - Analysis and key findings. A report by the International Energy Agency. ... largest share of solar in electricity generation in the world. Top. copper producer in the world. 2nd. largest lithium producer in the world. Population Million people GDP Billion USD (2022, PPP) GDP per capita USD (2022, PPP)

The country's growth in this area was primarily driven by renewables. Solar and wind added more than 3,435 megawatts (MW) and 2,682 MW of energy generation, respectively. ... This translates into decarbonization of the global economy given the importance of lithium for batteries and energy storage, and copper for electric vehicles ...

Copper mining is the largest industry and energy consumer in Chile, utilizing heat from imported fossil fuels of which Chile is not a producer. The goals for decarbonization ...

Looking a little deeper into these impacts, copper is a key material in the core technologies of the energy transition - solar panels, wind turbines, power cables, and energy storage systems. ... Chile, the world's largest copper producer, accounts for more than a quarter (27%) of global supply but recorded a year-on-year production decline ...

Considering that the most important copper mines in Chile are situated in regions with high radiation levels, solar energy has the potential to be an attractive and sustainable ...

Copper will play a key role in the energy transition, being needed to expand power grids and transmission lines to bring renewable energy, such as solar and wind power, from sources to urban centers. Our copper study ...

Semantic Scholar extracted view of "Towards solar power supply for copper production in Chile: Assessment of global warming potential using a life-cycle approach" by Simón Moreno-Leiva et al. ... share of the world copper production takes place in arid regions with favorable conditions for the deployment of solar energy technologies, such as ...

Chile, being the largest copper producer, also has the largest reserves in the world; therefore, it retains its potential to be a key player in future supply. ... An additional reason for replacing coal and natural gas by solar energy is that the time required for obtaining environmental permits, and the potential challenges from the community ...

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SANTIAGO, MARCH 6, 2024 - Atlas Renewable Energy, an international renewable energy leader, has signed a power purchase agreement (PPA) with Codelco, the state-owned Chilean mining company and the world's largest ...

PDF | Extracting copper is energy-intensive. At the same time, copper is a key material for building the energy systems of the future. ... Solar generation gives Peru and Chile the opportunity to ...

With this PPA, Atlas will supply Codelco, the world's largest copper producer, with nearly 375 GWh/year for 15 years. Atlas will be developing, constructing and operating a new renewable energy project with an integrated battery energy storage system in Chile. SANTIAGO, Chile, March 6, 2024 /CNW/ -- Atlas Renewable Energy, an international renewable energy ...

The Chilean economy has historically been based on raw material extraction, and copper is Chile's principal export. Nowadays, solar energy technologies have emerged as an opportunity to ...

Chile has long been the world's largest producer and exporter of copper, the super-conductive metal that is integral to pretty much every device, gadget, appliance and means of transportation ...

Copper Mining and Macroeconomic Indicators Copper mining has accounted for an average of 10% of Chile's gross domestic product (GDP) for the last two decades. In comparison, the mining industry as a whole represents 10.9% of GDP. Between 1996 and 2016, copper mining as a percentage of economic activity in Chile ranged between 3.6% (in 1998)

The present work addresses the greenhouse gas emissions of this industry and focuses on designing the future electricity supply of the main copper mines around the world, from 2020 to ...

Overview of Chile's Copper Boom in Chile In recent years, Chile has emerged as a global powerhouse in the

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