

# **WORLD POWER SYSTEMS REVIEW**

**1 September 2024**

**15 August 2024**

## **World's biggest battery storage project gets underway in Chile**

Financial close has been reached for the first two phases of the world's largest battery storage project, the Oasis de Atacama in Chile, with 1.24GWh now financed and an eventual 4.1GWh once all five phases are completed. Independent energy expert and assurance provider DNV announced on Wednesday that it had supported developer Greenergy Renovables (Greenergy) in securing financial close for the first phase of the Oasis de Atacama project. Greenergy made a separate announcement a month ago.

Financing currently secured for the first two phases will fund development of a 220MW solar farm and 1.24GWh of battery storage, with the first phase expected to be connected by year's end and the remaining four phases to be connected next year, reaching full operation by 2026. Once finished, the Oasis de Atacama project will consist of 1GW of solar generation and 4.1GWh of energy storage. Greenergy expects the completed project will generate electricity equivalent for the needs of 145,000 homes and reduce CO2 emissions by over 146,000 tonnes. Already 75 per cent of the project's energy has been contracted through various long-term power purchase agreements (PPAs).

Financing worth \$US345 million for the first two phases was secured from financial institutions BNP Paribas, Natixis Corporate & Investment Banking, Societe Generale, The Bank of Nova Scotia, and SMBC. "This operation demonstrates the banks' confidence in the hybridisation of solar plants with storage, and in Greenergy's business model, which continues to make progress in becoming a world leader in storage," said David Ruiz de Andrés, executive chairman of Greenergy. "Chile is renowned for its solar potential and dedication to decarbonisation and represents a promising market for solar and storage power," added Santiago Blanco, executive vice president & regional director for Latin America, energy systems at DNV.

*Renew Economy*

[http://reneweconomy.com.au/](http://reneweconomy.com.au)

**15 August 2024**

## **Orsted scraps Swedish FlagshipONE emethanol project under development**

Orsted has ceased the development of its pioneering FlagshipONE eMethanol project under construction in northern Sweden, citing slow market progress and an inability to sign long-term offtake contracts. "While we were aware of the substantial uncertainties and risks associated with the development of a pioneering and immature liquid e-fuel project and market at the time of the FID, it was a strategic choice to take a leading position in shaping the industry," Orsted said in a results statement.

FlagshipONE in Ornskoldsvik was to make green hydrogen from a 70-MW electrolyzer to produce up to 55,000 metric tons per year of e-methanol from 2025 using renewable energy and biogenic CO2 captured from the nearby biomass-fired Horneborgsverket heat and power plant. "We continue to believe in the long-term market for e-fuels, but the industrialization of the technology as well as the commercial development of the offtake market have progressed significantly slower than expected," it said. The cancellation of FlagshipONE, previously described by the Danish renewable energy firm as "the largest eMethanol project under construction in Europe," came as most shipping firms remained reluctant in committing to long-term procurement contracts for methanol produced via sustainable means. While methanol has emerged as the most popular alternative population in newbuild orders over the past year, ship operators are not willing to swallow the high costs of sustainable methanol with limited scope of passing incremental expense onto their customers, industry participants said. Platts bunker assessments for 0.5% sulfur

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fuel oil, the world's most common type of marine fuel, stood at \$13.39/Gj in Rotterdam on Aug. 14, compared with \$18.01/Gj for fossil-based methanol. Industry estimates suggest sustainable methanol would be at least two to five times more expensive. Platts is part of S&P Global Commodity Insights. Orsted said the FlagshipONE's business case had deteriorated since taking FID, "due to the inability to sign long-term offtake contracts at sustainable pricing and significantly higher project costs."

The company has ceased execution of the project and is to de-prioritize work within the liquid e-fuel sector, it said. Orsted regional CEO for Europe Olivia Breese told Commodity Insights the company had advanced dialogues with several possible offtakers, but these did not progress to signing long-term contracts, despite market interest. "We believe that this reflects the immaturity of the regulatory environment for the decarbonization of industry," Breese said. While the EU has extended its Emissions Trading System to cover maritime transportation from 2024 and the International Maritime Organization could introduce a carbon levy from 2027, most shipping professionals said the measures would not be able to bridge the price gaps between fossil and synthetic marine fuels until the 2030s at least. Breese said that decarbonization projects across the board were challenged by higher energy, equipment and capex costs.

"The industry is facing a significant cost-gap between e-fuels and fossil fuels," she said, noting other decarbonization options for many offtakers are seen as more competitive. "The e-fuels industry doesn't have firm commercial visibility on the offtake side." And although much of the needed EU regulation is in place, short- and medium-term regulatory requirements, such as sub-quotas for e-fuels and greenhouse gas reduction requirements, do not deliver a clear enough incentive, while national implementation and enforcement is not yet in place, Breese added. "As a result, timelines no longer match the most matured projects, where developers struggle to find offtakers willing to match the industry production costs for such commercial scale first-of-a-kind projects," she said. However, the company maintains a focus on renewable hydrogen, seeing it as a critical part of European industrial decarbonization, particularly in steel, chemicals and refineries.

Longer term, it expects the liquid e-fuels market to develop further. The decision to scrap the project led to cancellation fees of DKK300 million (\$44 million) and impairments of DKK1.5 billion, the company said. Orsted had previously secured EU funding for the project under the EU-Catalyst program and from the Swedish government, and the company was also expecting to receive a grant from Horizon Europe. However, Orsted told Commodity Insights that no funds had been exchanged at the time of its decision.

Funding schemes were still "too complex, ill-funded and not targeted enough" to kick-start the first commercial e-fuels projects, Breese said. The company had previously given a carbon capture contract for the project to Carbon Clean to capture 70,000 t/y of biogenic CO<sub>2</sub>. Carbon Clean didn't immediately respond to an email seeking comment on the contract.

*SP Global*

<http://www.spglobal.com/>

**15 August 2024**

## **Saudi firm plans hydrogen-powered skyscraper in Egypt's new capital**

A Saudi-controlled real estate firm says it plans to break ground early next year in Egypt's new capital on a \$1 billion, 50-storey office tower that aims to be the first of its kind to be powered by clean hydrogen.

The sophisticated design and high price tag represent a bet by Magnom Properties, a subsidiary of Saudi industrial group Rawabi Holding, that international clients will be drawn to the new capital, a city for over 6 million people being built from scratch in the desert east

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of Cairo. It is also a bet on clean hydrogen, produced using renewable energy and not yet proven at scale, as Egypt seeks to position itself as a green energy hub in the face of regional competition. Ministries transferred to the city from July 2023, but few residents have moved in and construction continues on infrastructure including rail links.

Magnum will soon start the detailed design of the Forbes International Tower and aims to complete the building by 2030, said Karim Dayhoum, the company's executive director of projects. It purchased land for the tower in 2021 in the new capital's business district, and is selecting land for sister towers planned later for Dubai and Riyadh.

"We want to offer our tenants and our buyers and investors the opportunity to utilise the facilities and amenities across the region," Dayhoum said in an interview. "It's a network of sophisticated office space." The new capital is the most ambitious in a series of mega-projects pursued by Egyptian President Abdel Fattah al-Sisi. They have spurred infrastructure development but also strained the budget, increased debt and sucked up foreign currency, leading the government to cap public investment under pressure from the International Monetary Fund.

Investors say they see potential in Egypt's strategic position and large workforce, but the economy has long been hampered by mismanagement and weak productivity. Critics say the new capital does not cater to ordinary Egyptians. The \$1 billion price tag for a single tower and high-luxury design are unusual for Egypt. The estimated investment cost of the rest of the Chinese-built business district, with 20 towers, is \$3 billion.

Developed with media group Forbes and Chicago-based architects Adrian Smith and Gordon Gill, the tower will have advanced cyber security systems, two ultra-fast VIP elevators and a helipad, according to the plans. It also aims to be the first net-zero carbon tower in the Middle East and North Africa. Solar panels embedded in the facade should produce 25% of the electricity it consumes, with the rest generated by clean hydrogen transported to the building in liquid form. "We're trying to completely eliminate any sort of reliance on utilities," said Dayhoum, adding that buyers of land were receiving incentives for sustainable design.

That could also help protect from outages in the local grid; Egypt has been hit by chronic power cuts linked to natural gas shortages. The tower will be financed through various debt equity instruments, said Ahmed Kassem, Magnum's chief investment officer. "We're still at a group level discussing whether to retain full ownership of the building," he said.

*Reuters*

<http://www.reuters.com/>

**15 August 2024**

## **Mingyang's 16.6 MW floating wind platform heads to installation site**

OceanX, the 16.6-MW floating wind platform by Chinese wind turbine manufacturer Mingyang Smart Energy Group Ltd (SHA:601615), has launched from Guangzhou, heading towards the Qingzhou IV Offshore Wind Farm in Yangjiang, Guangdong.

The platform will cover the 191 nautical miles (353.7 km) to the installation site in 72 hours, Mingyang said in a social media post on Monday. "To ensure safe passage, it has carefully adjusted its massive blades to minimize the platform's aerial profile, a testament to safety and precision," the manufacturer explained. The dual-turbine 'V' shaped structure, touted as the world's largest single-capacity floating wind platform, was launched in July in Guangzhou. It uses single-point mooring suitable for extreme typhoon conditions and is estimated to be capable of generating 54 million kWh a year.

*Renewables Now*

<http://renewablesnow.com/>

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## **Lebanon's state electricity company runs out of fuel, sparking blackout fears**

Lebanon's state electricity company (EDL) announced on Saturday that it could no longer supply power after its last operational power plant exhausted its fuel reserves. The company said the situation would affect “essential facilities such as the airport, port, water pumps, sewage systems, and prisons.” It also noted that from noon on Saturday, it “resulted in a total power cut” of state electricity across Lebanon. Soon after, the south Lebanon Water Corporation urged people “to save water as much as possible” because the blackout would have a “significant impact on its ability to pump water in sufficient quantities”.

State electricity blackouts because of fuel shortages are common in a country that is heavily reliant on generators for power. However, this cut comes amid growing fears of an all-out war between Hezbollah and Israel, who have been engaged in daily cross-border clashes since October 8, parallel to the war in Gaza.

When the two sides last fought a war in 2006, Lebanese fuel storage tanks were among those to be attacked by Israel. Along with Israel blockading the Lebanese coast, it led to the near exhaustion of fuel supplies. State electricity in Lebanon is available for a maximum of around four hours a day. Those who can afford it rely on expensive diesel-powered private generators to fill the gap, although very few provide power for 24 hours.

Lebanon has long struggled to provide enough power to its people, but the problem has been exacerbated by an economic crisis that began in 2019. Lebanon, which has few natural resources, imports heavy fuel oil from Iraq under a swap deal signed in 2021. As the heavy fuel supplied by Iraq does not meet Lebanon’s fuel specifications, the deal allows Beirut to swap it on the international market – through traders who make a profit – for other types of oil suitable for its power plants.

However, payment issues from Lebanon to Iraq have caused problems. Although the Lebanese cabinet approved a series of measures on Wednesday to help alleviate the issue, the benefits did not come in time – with the next Iraq fuel delivery not expected until the end of August.

*The Nation*

<http://www.thenationalnews.com/>

**19 August 2024**

## **China's largest electrochemical storage facility achieves grid connection**

Huadian (Haixi) New Energy Co., a subsidiary of China Huadian Group, has successfully completed the full-capacity grid connection of the Togdjog Shared Energy Storage Station in a cold, high-altitude region of China. This milestone marks the commencement of operations for China’s largest single electrochemical storage facility.

The project in Delingha, Haixi prefecture, Qinghai province, sits at an elevation exceeding 3,000 meters. The project boasts a power output of 270 MW and a total storage capacity of 1,080 MWh. It is divided into eight storage areas and 56 storage units. Upon full operation, it is expected to provide approximately 300 GWh of clean energy annually.

The facility features outdoor prefabricated lithium iron phosphate (LiFePO<sub>4</sub>) battery storage systems, provided by Chinese storage system supplier Sungrow. The company has installed 51 units of its Power Titan liquid-cooled storage systems. Additionally, an experimental zinc-bromine flow battery storage system has been installed, although its capacity remains unspecified.

Zinc-bromine flow batteries, a more mature technology in the flow battery category, offer an energy density three-to-five times greater than lead-acid batteries and come at 10-20% of the cost of lithium-based storage batteries. The installation aims to test the

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performance of zinc-bromine battery storage systems in high-altitude, large-scale wind-solar-storage energy bases.

The new Togdjog Shared Energy Storage Station will add to Huadian's 1 GW solar-storage project base and 3 MW hydrogen production project in Delingha, making it not only the largest electrochemical storage project in China but also the largest smart shared energy storage station built and operational in cold and high-altitude regions.

[pv-magazine](http://www.pv-magazine.com/)  
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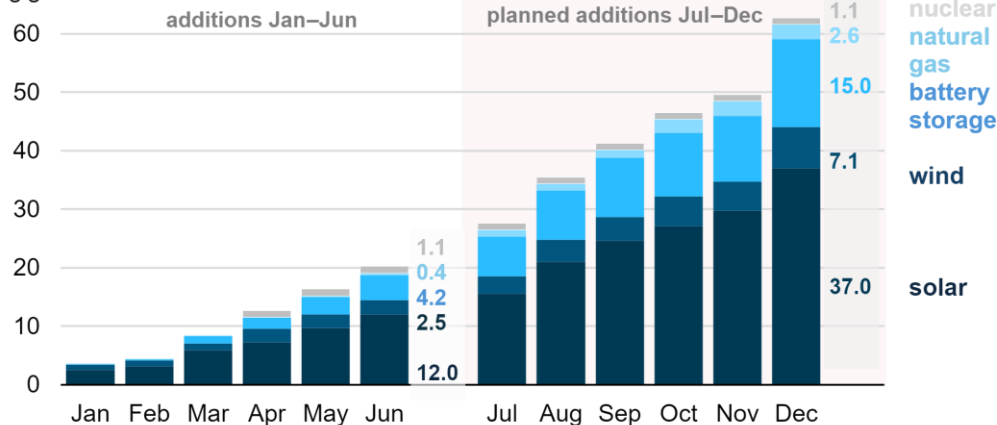
19 August 2024

## U.S. power grid added 20.2 GW of generating capacity in the first half of 2024

According to our latest Preliminary Monthly Electric Generator Inventory, developers and power plant owners added 20.2 gigawatts (GW) of utility-scale electric generating capacity in the United States during the first half of 2024. This new capacity is 3.6 GW (21%) more than the capacity added during the first six months of 2023. Based on the most recently reported data, developers and owners expect to add another 42.6 GW of capacity in the second half of the year.

Operational capacity additions: As in 2023, solar accounted for the largest share of newly operating generating capacity in the United States during the first half of 2024. Solar additions totaled 12 GW, 59% of all additions. Texas and Florida made up 38% of U.S. solar additions. The 690-megawatt (MW) solar and storage Gemini facility in Nevada and the 653-MW Lumina Solar Project in Texas were the largest solar projects that came online in the first six months of 2024.

Cumulative utility-scale electric generating capacity additions, United States (2024)  
gigawatts



The second-most capacity additions so far this year were battery storage, which made up 21% (4.2 GW). Battery additions were concentrated in four states: California (37% of the U.S. total), Texas (24%), Arizona (19%), and Nevada (13%). The 380-MW battery storage capacity at Gemini and the 300-MW Eleven Mile Solar Center in Arizona were the two largest projects that came online in the first half of 2024.

Wind power made up 12% (2.5 GW) of U.S. capacity additions. Canyon Wind (309 MW) and Goodnight (266 MW), both located in Texas, were the largest wind projects that came online in the first half of the year. Nuclear power increased in the United States during 2024 as well. Unit 4 (1,114 MW) at Georgia's Vogtle nuclear power plant began commercial operations in April, making Vogtle the largest nuclear facility in the United States and the only one with four nuclear power reactors.



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**Retired capacity:** Retirement of U.S. electric generating capacity has slowed in 2024. Operators retired 5.1 GW of generating capacity in the first half of the year. During the first six months of 2023, operators retired 9.2 GW of generation. In the first half of 2024, more than half (53%) of the retired capacity had used natural gas as its fuel, followed by coal at 41%.

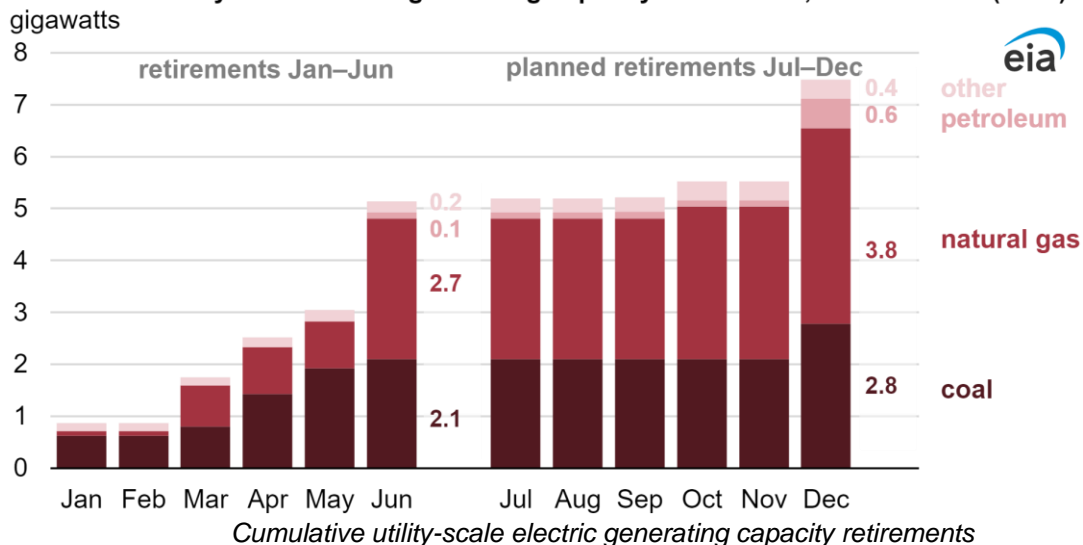
The largest U.S. coal retirements include Seminole Electric Cooperative's Unit 1 (626.0 MW) in Florida, which retired in January, and Homer City Generating Station's Unit 1 (626.1 MW) in Pennsylvania, which retired in April. The six-unit, 1,413-MW Mystic Generating Station combined-cycle facility in Massachusetts was the largest natural gas retirement this year and had been the third-largest power plant in New England.

**Plans for changes in capacity:** Developers plan to add 42.6 GW of new capacity in the United States in the second half of 2024. Nearly 60% of that planned capacity is from solar (25 GW), followed by battery storage (10.8 GW) and wind (4.6 GW). If utilities add all the solar capacity they are currently planning, solar capacity additions will total 37 GW in 2024, a record in any one year and almost double last year's 18.8 GW.

Utilities could also add a record amount of battery storage capacity this year (15 GW) if all planned additions come online. Plans for storage capacity in Texas and California currently account for 81% of new battery storage capacity in the second half of the year.

About 2.4 GW of capacity is scheduled to retire during the second half of 2024, including 0.7 GW of coal and 1.1 GW of natural gas.

**Cumulative utility-scale electric generating capacity retirements, United States (2024)**



EIA  
<http://www.eia.gov/>

## 21 August 2024

### Azerbaijan's Nakhchivan, Türkiye to sign energy exchange contract

The Nakhchivan State Energy Service and the Turkish state electricity distribution system operator (TEİAŞ) will sign an agreement on the electricity exchange. According to the Azerbaijani Ministry of Economy, an Operational Agreement on the export (exchange) of energy is planned to be signed in the near future, Caliber.Az reports.

In connection with the conclusion of the relevant contract between the entities, negotiations have been held regarding the documentation related to the transmission and distribution substations on the Turkish and Nakhchivan sides, the current condition of the transmission lines, the location of the meters, as well as the scope of relay protection systems.

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In this regard, the European Network of Transmission System Operators for Electricity (ENTSO-E) has granted permission for export by the Nakhchivan State Energy Service up to 75 MW (with the Turkish side operating in a passive island mode) and for import up to 40 MW (with the Nakhchivan side operating in a passive island mode).

*Caliber*  
<http://caliber.az/>

**21 August 2024**

## **Securing copper supply: no China, no energy transition**

The world cannot decarbonise without copper, a key component of electrification. Amid efforts to secure minerals for the energy transition and achieve climate goals, demand is set to surge. We estimate that demand for copper will grow by 75% to 56 million tonnes (Mt) by 2050.

Meeting this demand will require major investment. And while the scale of the investment required in new mine supply is well understood, the implications for the downstream processing (smelting and refining) and semi-manufacturing of copper are being overlooked. Currently, China dominates both these sectors. At the same time, nations such as the US also seek supply chain diversification away from China. Legislation such as the Inflation Reduction Act (IRA) aims to subsidise supply chain investments in the US. Meanwhile, critical minerals strategies in Europe, Australia and Canada that now include copper lean toward supporting mineral extraction and the circular economy.

These dual goals – of decarbonisation and reducing dependence on metals supply from China – are at odds. Governments and manufacturers that seek to diversify away from China need to consider the full supply chain, not just mining. Hundreds of billions of dollars in new copper processing and fabrication capacity would be required to replace China. This would create inefficiencies that would result in significantly higher-priced finished goods and increase the cost and timeliness of the energy transition.

For the copper market to remain effective and deliver on the world's requirements, key stakeholders need to chart a realistic course that involves China. Yes, supply risk can be mitigated, and a certain amount of rebalancing has already begun in some countries. However, the scale of China's dominance in the copper supply chain means it cannot be fully replaced.

The copper supply chain is a complex, global system comprising trade in both raw materials and semi-fabricated products. Geographically, the net flow of copper units is between raw-material extraction in the Americas and Africa and downstream processing and manufacturing largely in China. The value chain for primary supply can be broken down into four key stages – mining, smelting-refining, semi-fabricating and the end-use manufacturing of finished goods. Each stage involves different types of company and there is limited vertical integration.

Mining isn't the only issue. The world, excluding China, currently has more primary mine supply than it needs to meet its requirements. China's domestic supply accounts for just 8% of global mine output, but its share rises closer to 20% when we include Chinese mining assets overseas. This is still way short of its needs. As with many other critical metals and minerals, it is China's overwhelming investment in the downstream processing and semi-manufacturing sectors that presents the biggest challenge to the supply security agenda. These are the sectors that the rest of the world will struggle to dissociate from and, for copper, the risks least discussed in the mineral security debate.

Close to 80% of copper mining produces copper concentrate, which must then be processed at smelters and refineries, often by third parties, to produce the copper cathode traded in terminal markets such as the London Metal Exchange. Cathode, along with high-

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grade scrap, is then purchased by semi-fabricators (“first use”) to make wire rod, tubes, plates, sheets and strips (PSS) and foil, among other products. These form the basis for the component parts of finished goods.

Ensuring greater security of copper supply does not simply mean investing in new mine supply, be it domestic or through free-trade partnerships. Security of supply is only achieved with heavy investment in stages two and three of the supply chain – smelting/refining and semi-fabricating.

Likewise, investing in copper end uses, such as battery gigafactories, exacerbates supply risks if there is no support for metals processing.

The US introduced a critical mineral strategy in 2017 that has not yet succeeded in reclaiming material market share in the copper supply chain. Rather, China has continued to dominate investment in the supply chain over the past five years. It has invested nearly half of the US\$55 billion committed to new copper mine supply since 2019, primarily in overseas projects. In smelting and refining, China has added 97% of global capacity, amounting to more than 3 Mt of production and nearly US\$25 billion in investment. Since 2000, China has accounted for 75% of all global smelter capacity growth.

China's investment spree extends to fabrication capacity, where it has added nearly 11 Mt of copper and alloy capacity since 2019, some 80% of global additions. About two-thirds of these plants make wire rod, giving China half of the world's fabrication capacity, with more on the way.

China's dominance of the copper supply chain stems from its rapid industrialisation and urbanisation over the past 25 years. The country's share of global copper demand has grown from less than 20% to more than 50% over the last quarter century, necessitating a huge scaling up of copper imports in various forms. Initially, Chinese state-owned enterprises prioritised economic growth over profitability and environmental standards. However, China's copper smelting industry has evolved significantly. In the 2000s, a drive for more stringent environmental and efficiency standards led to the regeneration of new smelting capabilities. Outdated furnaces were replaced with modern technology, including domestic Shuikoushan (SKS) and side-blown furnaces, and Chinese versions of European flash technology. The industry today is low cost and meets high environmental standards (especially in sulphur dioxide capture), making Chinese smelters highly competitive.

Because of the scale and low cost of China's smelters, the rest of the industry has had to adapt. This includes focusing on niche areas such as complex concentrate treatment and secondary material processing. These specialisations help counteract margin pressures from higher input costs and global overcapacity. Meanwhile, semi-fabricators outside China, especially in Europe, struggle to compete due to lower utilisation rates and higher operating costs. Carbon emission regulations, such as the EU's Carbon Border Adjustment Mechanism (CBAM), may reduce competitiveness by imposing higher taxes on the European copper industry without equivalent benefits. Moreover, government incentives, such as the Inflation Reduction Act (IRA) in the US, may not guarantee long-term industry sustainability.

The investment case for building subsidised capacity outside China in a market already teeming with capacity is lacking, with players desperate to avoid a race to the bottom. Meanwhile, it is unlikely that government incentives such as the IRA will prop up these industries indefinitely.

China's first use of copper now amounts to 17 Mt, or 50% of global demand. However, we estimate that 20% of this, or 3.3 Mt, is subsequently exported in finished goods. This is about the same volume of refined copper production capability that China has managed to add over the last five years. But what about future growth? In a non-China scenario, significantly more processing capacity would be required to meet energy transition targets.



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We estimate around 8.6 Mt of additional copper demand in the world ex-China over the next decade, driven by growth in transport, power and electrical networks. This equates to 70% of smelter capability and 55% of fabricator capacity in the rest of the world. Assuming global average capital intensity, nearly US\$85 billion in new smelting and refining capability would be needed to displace Chinese supply.

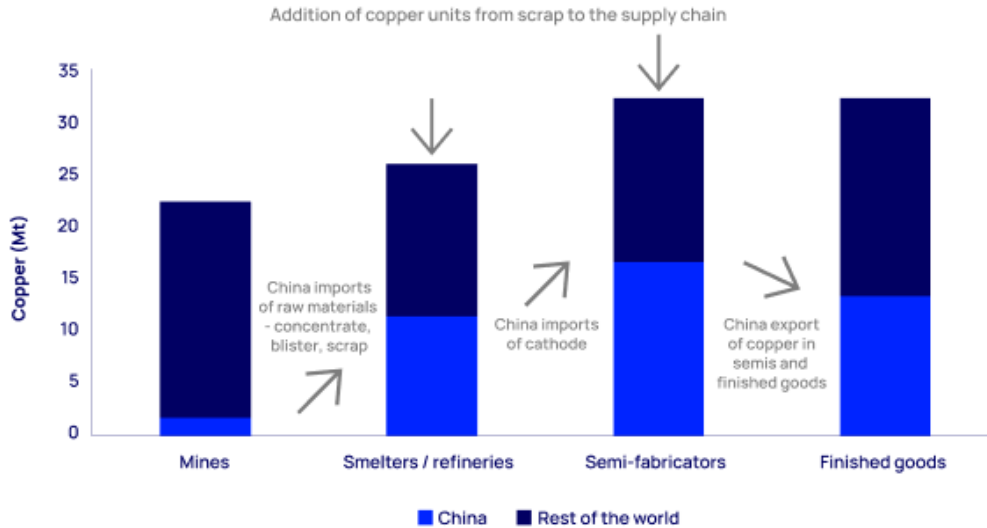


Figure 1: China's role in the copper supply chain, 2023

Yet, over the last 20 years, capacity has barely changed outside China. This raises the question of whether such a shift is achievable. Semi-fabricators might manage with lower entry barriers and nascent markets such as foil. However, they still need local copper raw materials. A wave of new primary copper smelters in the US and Europe seems unlikely. Financing would also need to be made available. However, even if policy incentives make returns more attractive, resistance to new smelter projects on environmental and social grounds is high, especially in Europe. Smelting's environmental risks, stemming from emissions and impurities such as arsenic and mercury, make it unappealing to both policymakers and communities.

Notwithstanding these challenges, some small changes are starting to emerge in certain segments of the market.

This year will see the commissioning of one custom smelter in India and two integrated smelters in Indonesia. A new smelter is also due to be completed in the Democratic Republic of the Congo next year, although this is driven in part by Chinese investment. At 1.6 Mt combined, these will be the largest smelter capacity additions outside China for decades. Interestingly, however, no new primary capacity is planned for North America or Europe.

Instead, the US has tilted towards the secondary market and scrap. The country is a net exporter of scrap copper, but plans to rebalance this trade and secure the copper units for domestic use. A new complex in the state of Georgia will be the country's first secondary smelter for treating complex materials.

In the semi-fabricator segment of the market, we have seen significant investments in foil plant capability in all regions to feed the burgeoning electric vehicle sector. Globally, we estimate that 2.0 Mt of capacity was announced in 2021 and 2022 alone – although 80% of this was still in China. The US and Europe are steadily adding incremental wire-rod capacity, too. Foil is the key product used as a current collector in batteries. It is still a small, but very fast-growing part of the fabricating landscape. Similar to investment in mining,

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building foil capacity in isolation will not secure the full supply chain, but the opportunity here is in scrap and the circular economy.

Scrap looks set to play a more significant role within the market if copper is to meet the environmental challenges facing the world today. We have begun to witness an acceleration in the direct use of scrap at the semi-fabricator level, especially for the manufacture of copper foil in the world outside China. Copper producers and consumers are also either developing standalone secondary capacity or increasing the share of scrap into their raw-material feed where possible, given the challenges associated with primary supply.

In the mining sector, there is now significant investment being made in technology to reduce the requirement for the traditional concentrate-smelter-refinery route altogether. Hydrometallurgical leaching of ores can produce cathode onsite, negating the smelting stage, meaning copper goes straight to semi-fabrication. Already, 20% of mine supply is produced in this way, but only on oxide ore types. The opportunity lies in expanding this to sulphide deposits as well.

The sincerity of the reshoring mantra looks set to be tested sooner rather than later. Additions to smelting capacity in China, coupled with the new capability in India and Indonesia this year, are leading to huge overcapacity and a deep implied deficit in the copper concentrate market. Smelters are struggling with low spot treatment charges and refining charges (TCRCs) as a result. TCRCs, the discount to the full value of the metal processed, are the main source of revenue for smelter-refineries.

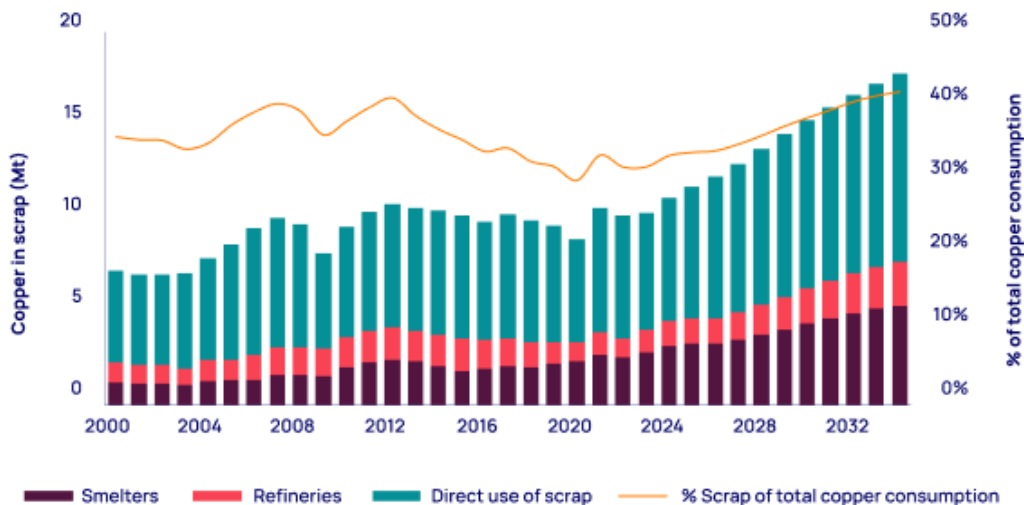


Figure 4: Greater direct use of scrap at semi-fabricators is part of the long-term solution

Mining companies now face a decision. They can squeeze out inefficient capacity but present China with more market share, or they can accept less attractive terms with some smelters outside China, but potentially embed market inefficiencies. Annual contract TCRC negotiations will begin later this year and the outcome will be telling for the direction of the industry.

Wood Mackenzie  
<http://www.woodmac.com/>

21 August 2024

## SunCable gets Australian government's environmental approval for AAPowerLink project

SunCable has secured major environmental approval from the Australian government for its multi-billion-dollar Australia-Asia Power Link (AAPowerLink) project. The latest permit for the Australian energy infrastructure project was reviewed and granted by the

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Commonwealth Minister for the Environment and Water under the Environment Protection and Biodiversity Conservation Act (EPBC).

It comes a month after the AAPowerLink project obtained environmental approval from the Northern Territory government and the NT Environment Protection Authority. The AAPowerLink project will feature a 17-20GWp solar farm, a 36-42GWh battery system, and a 5,000km high voltage direct current (HVDC) transmission system. Through two development stages, the energy infrastructure project will provide up to 6GW of continuous green electricity to industrial customers in both Darwin and Singapore through a 4,300km subsea cable.

SunCable expects to reach a final investment decision (FID) on the AAPowerLink project in 2027. The electricity supply from the Australian project is slated to commence in the early 2030s. According to SunCable, the AAPowerLink project could generate multiple new export industries for Australia. This is expected to be achieved by enabling new green industrial development in the Northern Territory and transmitting renewable electricity via subsea cables.

The renewable infrastructure project is estimated to contribute over A\$20bn (\$13.49bn) in economic value to the Northern Territory during its construction period and the first 35 years of operation. Besides, the AAPowerLink project will support an average of 6,800 direct and indirect jobs annually during the construction phase in the Northern Territory, with a peak workforce of 14,300. SunCable Australia managing director Cameron Garnsworthy said: "Today's announcement is a vote of confidence in the project and SunCable itself as responsible stewards of the local Northern Territory environment.

"SunCable will now focus its efforts on the next stage of planning to advance the project towards a Final Investment Decision targeted by 2027." SunCable is set to further invest in communities across the Northern Territory, Singapore, and Indonesia as it advances to the next phase of the AAPowerLink project.

In the Northern Territory, the company will continue negotiations of the Indigenous Land Use Agreements (ILUAs) with traditional owners throughout the project's footprint. The company will also engage with Singapore's Energy Market Authority to seek conditional approval for the subsea cable interconnector for the project. In addition, SunCable will collaborate with the Indonesian government on regulatory and permitting matters, focusing on validating the subsea route.

**NS Energy**

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**25 August 2024**

## **CPUC Approves Plan to Procure 10.6 GW of Clean Resources**

California regulators have approved a plan for the state to buy up to 10.6 GW of long-lead time clean energy resources, including 7.6 GW of offshore wind along with geothermal energy and long-duration energy storage.

The California Public Utilities Commission voted Aug. 22 to approve the central procurement plan. It is seen as a way of transforming the market for emerging technologies that will help the state meet its greenhouse gas reduction goals.

"With this new tool, California has the opportunity to jumpstart clean energy technologies and bring them to scale," CPUC President Alice Reynolds said in a statement after the vote.

The CPUC will ask the state's Department of Water Resources (DWR), through its Statewide Energy Office, to buy up to 10.6 GW of nameplate capacity including:

- 6 GW of offshore wind.
- 1 GW of geothermal generation.

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- 1 GW of multi-day energy storage.
- 1 GW of energy storage with a discharge period of at least 12 hours.

The plan excludes long-duration storage that uses lithium-ion batteries. Pumped storage hydroelectric projects will be eligible only if they're 500 MW or less and received state funding before 2023. The geothermal generation may be of any type. The procurement will be on behalf of all energy providers within the CPUC's jurisdiction, including investor-owned utilities, community choice aggregators and direct access providers. The benefits and costs will be split up among energy providers.

Solicitations will start in 2026 for long-duration storage and in 2027 for offshore wind and geothermal resources, with the resources coming online by 2037. The resource quantities in the procurement are "up to" amounts. DWR or CPUC could decide to not buy the resources if they cost too much. The CPUC is expecting multiple rounds of solicitations in which costs would fall over time. The centralized procurement strategy is a component of Assembly Bill 1373 of 2023. Under AB 1373, resources eligible to be included in the strategy are those that don't use fossil fuels or combustion to generate electricity and that have a lead time of at least five years for development and construction. The bill set a Sept. 1, 2024, deadline for the CPUC to determine if there's a need for centralized procurement. To make that assessment, the CPUC evaluated utilities' integrated resource plans and looked for gaps in certain resource types.

The CPUC saw a need for geothermal generation and long-duration storage but plans to ask DWR to solicit only about half the projected amount needed to meet renewable and zero-carbon energy targets. This will "facilitate a down payment" on the technologies, "while still leaving room for LSEs to procure the technologies individually, after costs are reduced and market transformation is underway," the agency said in its decision. For offshore wind, the CPUC said 7.6 GW is enough to signal "a strong interest in developing the resource," while going beyond that amount might be riskier for ratepayers. The California Energy Commission in 2022 adopted the nation's most ambitious long-term offshore wind goals, targeting a buildout of up to 5 GW by 2030 and 25 GW by 2045. (See California Adopts Country's Most Ambitious OSW Targets.)

The benefits and costs of centrally procured geothermal and offshore wind energy will be divided among energy providers within CPUC jurisdiction based on their annual load share. For long-duration storage, benefits and cost shares will be based on 12-month coincident peak demand. More details of cost and benefit sharing will be worked out before any contracts are signed. Although publicly owned utilities aren't within CPUC jurisdiction, the agency recommended that DWR ask those utilities if they want to voluntarily participate in the centralized procurement. The CPUC will reevaluate the need for additional centralized procurement of long-lead time resources in future IRP cycles. Previous need determinations won't be reduced in that process, according to the CPUC decision. CPUC Commissioner John Reynolds said approval of the procurement strategy "issues a challenge to the industry."

"We want to see developers deliver on the immense potential of these technologies to deliver tangible ratepayer benefits and cost efficiencies with the economies of scale we are enabling here," he said in a statement.

*RTO Insider*

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## **Renewables are 92% of new US electrical generating capacity in H1**

According to a review by the SUN DAY Campaign of data recently released by the Federal Energy Regulatory Commission (FERC) and the US Energy Information

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Administration (EIA), renewable energy sources (i.e., biomass, geothermal, hydropower, solar, wind) dominated new US electrical generating capacity additions and increased their contribution to the nation's electrical production in the first half of 2021. [1]

Key Findings from FERC:

FERC's latest monthly "Energy Infrastructure Update" report (with data through June 30, 2021) reveals that renewable energy sources accounted for 91.6% - or 10,940 MW - of the 11,940 MW of new capacity added during the first six months of the year. Wind led the capacity additions with 5,617 MW, followed closely by solar (5,279 MW). Further, wind and solar were the only sources of new capacity additions in June 2021.

Renewables now provide more than a quarter (25.1%) of total US available installed generating capacity. A year ago, their share was only 23.0%. Wind is now more than a tenth (10.4%) of the nation's generating capacity while utility-scale solar is 4.9% and that does not include distributed (e.g., rooftop) solar. [2]

Moreover, FERC data suggest that renewables' share of generating capacity is on track to increase significantly over the next three years (i.e., by June 2024). "High probability" generation capacity additions for wind, minus anticipated retirements, reflect a projected net increase of 21,129 MW while solar is foreseen growing by 44,385 MW. By comparison, net growth for natural gas will be only 13,241 MW. Thus, wind and solar combined are forecast to provide roughly five times more new net generating capacity than natural gas over the next three years.

If these numbers materialise, by June 2024, renewable energy generating capacity should account for almost 30% (29.4%) of the nation's total available installed generating capacity.

Key Findings from EIA:

The latest issue of EIA's "Electric Power Monthly" (with data through June 30, 2021) reveals that solar and wind both continued their rapid growth.

For the period January - June, solar-generated electricity – including distributed solar - expanded by 25.3% (compared to the same period in 2020) and provided nearly 4.1% of the nation's total. Wind grew by 10.0% and accounted for more than 9.6% of total generation.

Combined, net electrical generation by wind and solar is 14.1% greater than a year ago and provided a bit more than 13.7% - or almost one-seventh - of total US electrical production during the first six months of 2021. Together with generation by hydropower, biomass, and geothermal, overall production by renewables grew by 3.0% and provided 22.4% of total US electrical output.

Moreover, renewables produced 2.2% more electricity than coal through June 2021 and expanded their lead over nuclear power. In fact, during the first half of this year, renewables outperformed nuclear power by 16.4%.

"FERC's and EIA's mid-year data confirm that renewables have now moved into second place - behind only natural gas - in terms of both generating capacity and actual electrical generation," noted Ken Bossong, Executive Director of the SUN DAY Campaign. "And their continued, strong growth - especially by solar and wind - suggest that the best is yet to come."

**Renewables Now**  
<http://renewablesnow.com/>

**29 August 2024**

## **Renewables are 92% of new US electrical generating capacity in H1**

The Biden administration has finalized a plan to expand solar on 31 million acres of federal lands in 11 western states.



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The proposed updated Western Solar Plan is a roadmap for Bureau of Land Management's (BLM) governance of solar energy proposals and projects on public lands. It bumps up the acreage from the 22 million acres it recommended in January, and this plan adds five additional states – Idaho, Montana, Oregon, Washington, and Wyoming – to the six states – Arizona, California, Colorado, Nevada, New Mexico, and Utah – analyzed in the original plan. It would make the public lands available for potential solar development, putting solar farms closer to transmission lines or on previously disturbed lands and avoiding protected lands, sensitive cultural resources, and important wildlife habitats.

This announcement is part of President Biden's Investing in America agenda, which the White House is working to accelerate ahead of the November election. The Investing in America agenda is a government initiative focused on boosting the US economy by investing in infrastructure, clean energy, and job creation. BLM surpassed its goal of permitting more than 25 gigawatts (GW) of clean energy projects on public lands earlier in 2024. It's permitted 29 GW of projects on public lands – enough to power over 12 million homes. The Biden administration set the goal to achieve 100% clean electricity on the US grid by 2035.

Ben Norris, vice president of regulatory affairs at the Solar Energy Industries Association (SEIA) said in response to the BLM developments: "While we're still reviewing the details, we're pleased to see that BLM listened to much of the solar industry's feedback and added 11 million acres to its original proposal. While this is a step in the right direction, fossil fuels have access to over 80 million acres of public land, 2.5 times the amount of public land available for solar. One of the fastest ways to decarbonize our grid is to greenlight well-planned clean energy development on federal lands, and the improvements to this environmental review document will certainly help".

The Biden administration is racing to catalyze all the clean energy projects it can between now and the November election, and the latest iteration of the Western Solar Plan is a big step. It's designed to alleviate the permitting bottleneck of solar development on public lands while preserving protected lands and habitats. Plus, a lot more land, of course.

White House deputy chief of staff Natalie Quillian said in an interview [via Reuters]: "We've been really pushing ourselves to use our executive authority wherever possible to improve the federal permitting process." Proposed projects will still undergo site-specific environmental review and public comment, as they always should, but this is welcome news for spurring US renewables growth because we're still not going fast enough.

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