



SUSTAINABILITY NEWS HEADLINES

Minerals Will Be Critical For A Clean Energy Future

A mismatch between the world's climate ambitions and the availability of critical minerals could mean a slower and more expensive energy transition, according to a new report from the International Energy Agency (IEA). The IEA's special report, *The Role of Critical Minerals in Clean Energy Transitions*, is the most comprehensive global study to date on the importance of minerals, noting that the types and uses of mineral resources vary by technology. Lithium, nickel, cobalt, manganese and graphite are crucial to battery technology. Rare earth elements are essential for permanent magnets in wind turbines and electric vehicle motors, while copper is a "cornerstone" for all electricity-related technologies.

In a scenario that meets the Paris Agreement goals, the total demand for critical minerals for clean energy technologies is expected to rise over the next two decades to over 40% for copper and rare earth elements, 60-70% for nickel and cobalt, and almost 90% for lithium. EVs and battery storage have already displaced consumer electronics to become the largest consumer of lithium and are set to take over from stainless steel as the largest end user of nickel by 2040.

The IEA makes six recommendations for a new approach to mineral security. These are: ensure adequate investment in diversified sources of new supply; promote technology innovation at all points along the value chain; scale up recycling; enhance supply chain resilience and market transparency; mainstream higher environmental, social and governance standards; and strengthen international collaboration between producers and consumers. Finally, the world has sufficient deposits of critical minerals to meet growing demand, but ensuring the flows of capital to support production remains "the big question mark", Birol said. "Investors have not yet been convinced" by governmental pledges to reduce emissions.

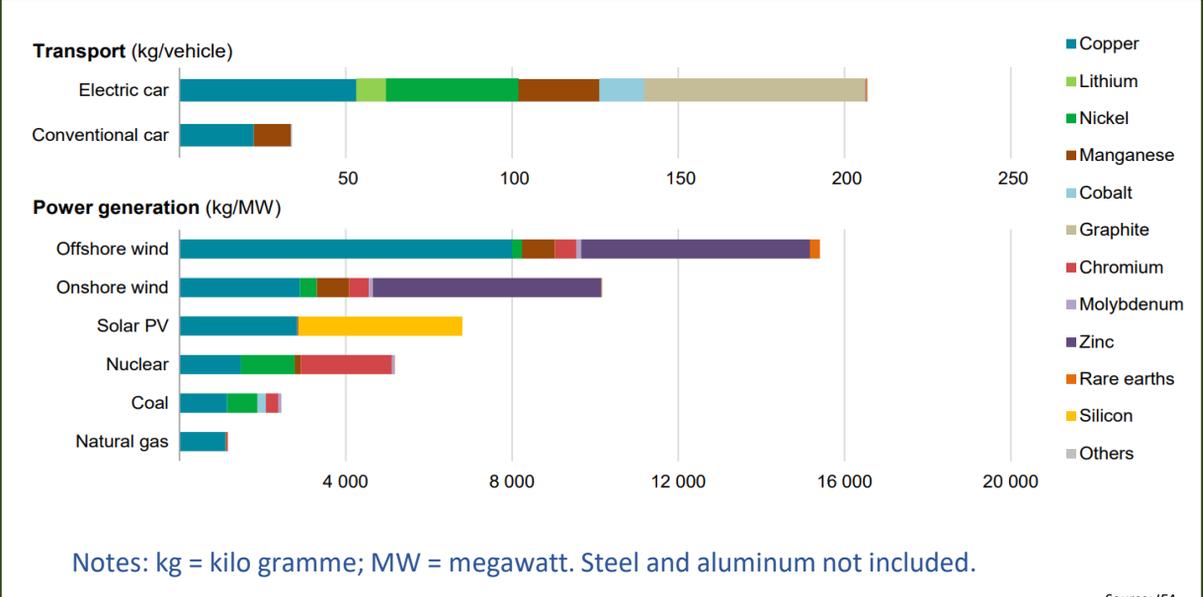
50% Increase
In the average amount of minerals needed for an additional unit of power generation capacity.
(IEA)

2050 Overall demand
for critical minerals will increase by a factor of six, if the world is to reach net zero by 2050.
(IEA)

6 Times Mineral Input
The average EV requires six times the mineral inputs of a conventional vehicle.
(IEA)



Minerals Used in Selected Clean Energy Technologies



The Green Hydrogen Export Market Could Reach \$300bn by 2050

The green hydrogen export market could be worth \$300 billion yearly by 2050, creating 400,000 jobs globally in renewable energy and hydrogen production, according to a new report by Strategy & Middle East, part of the PwC network. The global demand for "green hydrogen," produced with minimal CO2 emissions, could reach about 530 million tons (Mt) by 2050, displacing roughly 10.4 billion barrels of oil equivalent. The production of green hydrogen, at competitive costs, could lead to many economic and environmental benefits.

Rapidly declining renewable energy costs and technological advances would enable hydrogen to become the medium of choice for transporting cheap clean energy across the globe. Furthermore, the reduction in hydrocarbon demand due to COVID-19 restrictions, has given new impetus to the push toward decarbonisation. According to the report, GCC countries can ramp up production of green hydrogen to boost utilization in domestic industries, and for export. The outlook for investment in green hydrogen in the GCC is bright, because GCC countries have large domestic demand that complements the huge potential for exports.

There are several countries that have ambitious plans for green hydrogen, however, GCC states have unique advantages that could allow them to lead the hydrogen economy. They also have an incentive to move away from fossil fuels. By seizing the green hydrogen opportunity, GCC countries can lay a strong foundation for economic growth in a decarbonised world and ensure their continued influence in the energy market.

\$300 Billion Annually
The green hydrogen market could be worth \$300bn per year by 2050.
(PwC)

≈ 530 Mt by 2050
The global demand for "green hydrogen," produced with minimal CO2 emissions, could reach 530 Mt by 2050.
(PwC)

288 Large-Scale Projects
Have been announced with 85% located in Europe, Asia, and Australia.
(ET Energy World)

