

**FOCUS**

CAPITAL  
PARTNERS

# Minerals in ELECTRIC VEHICLES VS GAS CARS

Electric vehicles require a wider range of minerals for their motors and batteries compared to gas cars.

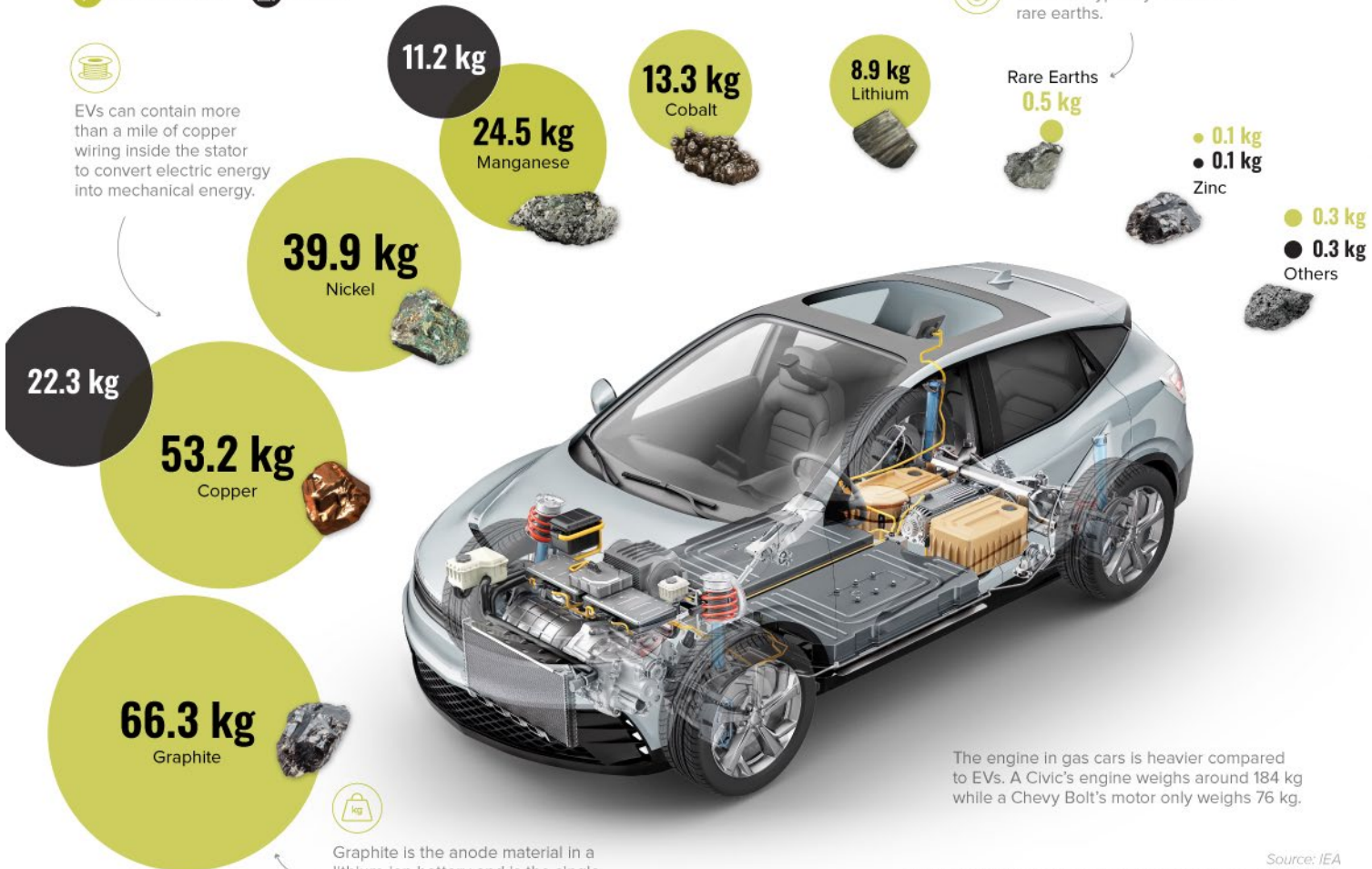
In fact, an EV can have 6 times more minerals than a gas car and be on average 340 kg heavier.

Mineral content kg/vehicle *Steel and aluminum not included.*

 Electric Vehicle  Gas Car



EVs can contain more than a mile of copper wiring inside the stator to convert electric energy into mechanical energy.



Many EV motors use magnetic materials typically made with rare earths.



8.9 kg  
Lithium

Rare Earths  
0.5 kg

0.1 kg  
0.1 kg  
Zinc

0.3 kg  
0.3 kg  
Others



Graphite is the anode material in a lithium-ion battery and is the single largest component by weight.

The engine in gas cars is heavier compared to EVs. A Civic's engine weighs around 184 kg while a Chevy Bolt's motor only weighs 76 kg.

Source: IEA  
The values are for the entire vehicle including batteries and motors. The intensities for an electric car are based on a 75 kWh NMC (nickel manganese cobalt) 622 cathode and graphite-based anode.



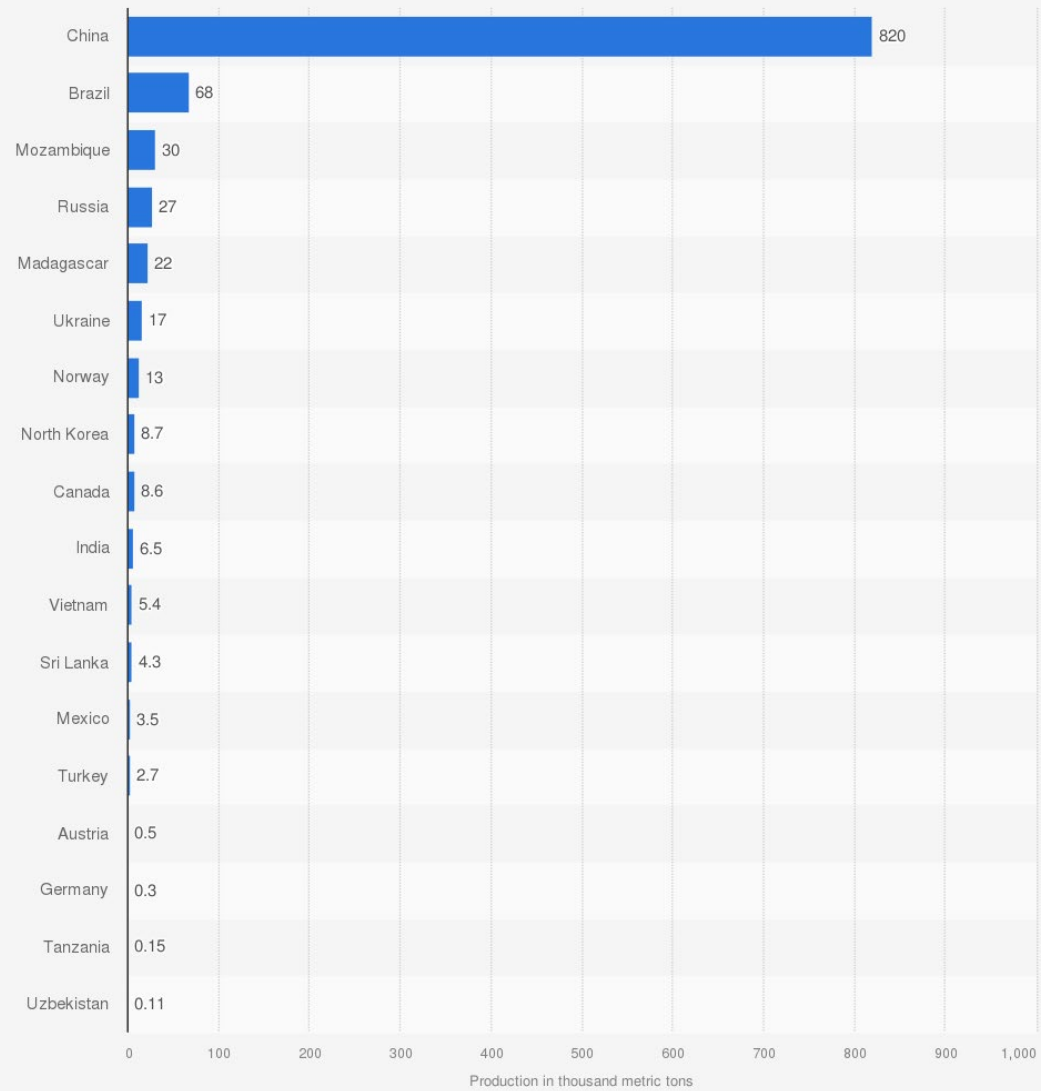








### Major countries in worldwide graphite mine production in 2021 (in 1,000 metric tons)



Source  
US Geological Survey  
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Additional Information:  
Worldwide, 2021

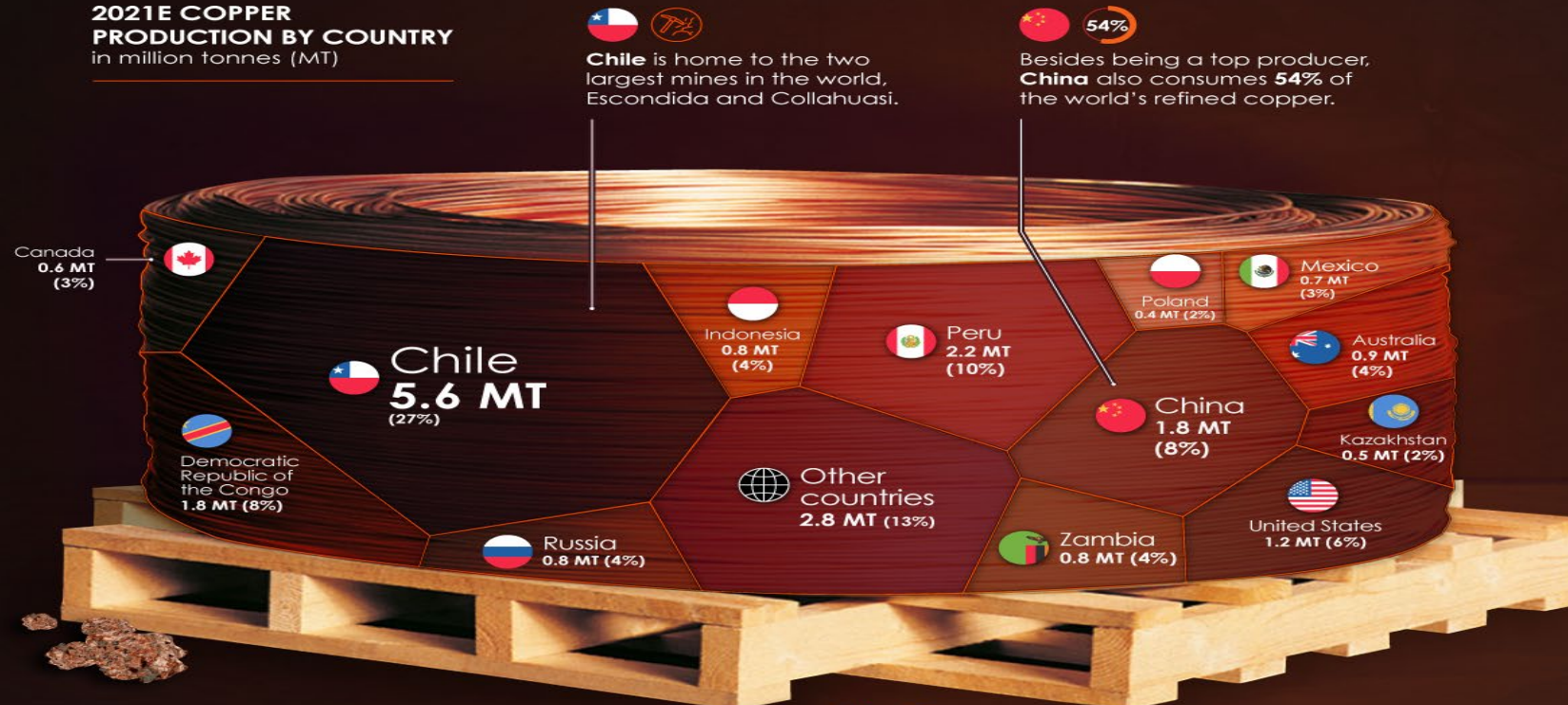


## VISUALIZING THE WORLD'S LARGEST COPPER PRODUCERS

Man has relied on copper since prehistoric times. Because of its high ductility, malleability, and electrical conductivity, it is a major industrial metal.

As green technologies like electric vehicles, solar panels, and wind turbines require copper, the demand for the red metal has increased in recent years.

### 2021E COPPER PRODUCTION BY COUNTRY in million tonnes (MT)



Chile is home to the two largest mines in the world, Escondida and Collahuasi.



Besides being a top producer, China also consumes 54% of the world's refined copper.



**WORLD TOTAL**  
21.0 MT



Most of the copper produced in the United States comes from deposits in Arizona, Utah, New Mexico, Nevada, and Montana.