

Vehículos eléctricos

**Actualidad y tendencias
tecnológicas en la industria
y la cadena de abastecimiento**



Vehículos Eléctricos, Innovación?

Primer vehículo eléctrico – 1832-1839



Primer vehículo de combustión interna 1885

1935-1950
Desaparición
vehículos eléctricos

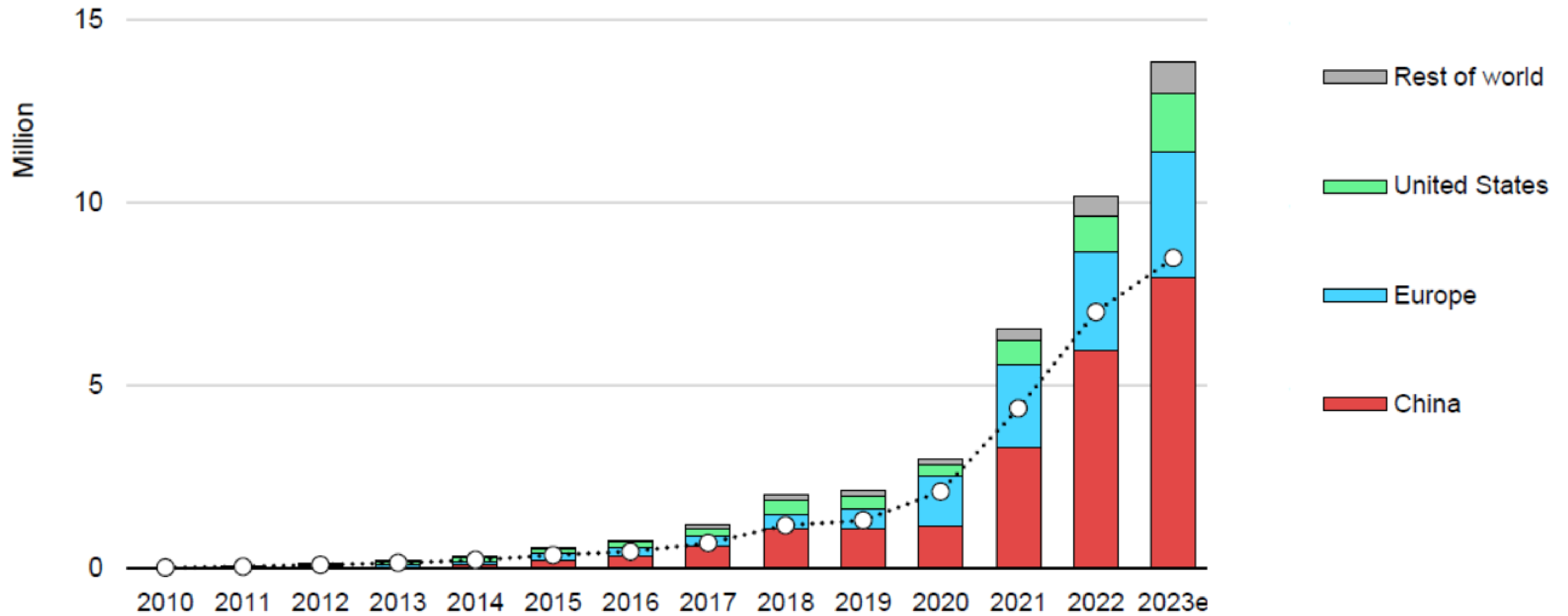
Public Electric-Vehicle-Charging Station
 A compact charging station for electric automobiles, which is inclosed in a weatherproof box and is mounted on a pedestal so that it can be placed near the curb, is shown in the accompanying illustration. A charging cable and plug are provided, and while the battery is being charged the door can be closed and locked. A regulating rheostat, ammeter, polarity indicator, lamp, switches etc. are mounted on a slate panel as shown in the accompanying illustration.

FIGS. 1 AND 2—CURB CHARGING STATION FOR ELECTRIC AUTOMOBILES

1913- 150A/48vdc coupler (30,000 EVs in 1913)

The device which is used for charging electric cars at the curb is of 100 amp and 150 amp capacity. It was designed by Clarence E. Ogden, Cincinnati, Ohio.

Ventas de Vehículos Eléctricos



Comparación de emisiones de CO₂
Vehículo mediano a lo largo de 16 años y 240.000 km.



LIFE CYCLE EMISSIONS OF **ELECTRIC** VS. **COMBUSTION** ENGINE VEHICLES

Life cycle emissions refer to the emissions associated with the production, use, and disposal of a product. Expressed in tonnes of carbon dioxide equivalent (tCO₂e), here is how they differed for electric, hybrid, and combustion engine vehicles in 2021.



Battery Electric Vehicle



Hybrid Electric Vehicle



Internal Combustion Engine Vehicle

Battery Manufacturing

5
tCO_{2e}

1

Production Emissions

Production emissions for battery EVs are ~40% higher than hybrid and combustion engine vehicles.

Vehicle Manufacturing

9
tCO_{2e}

9
tCO_{2e}

10
tCO_{2e}



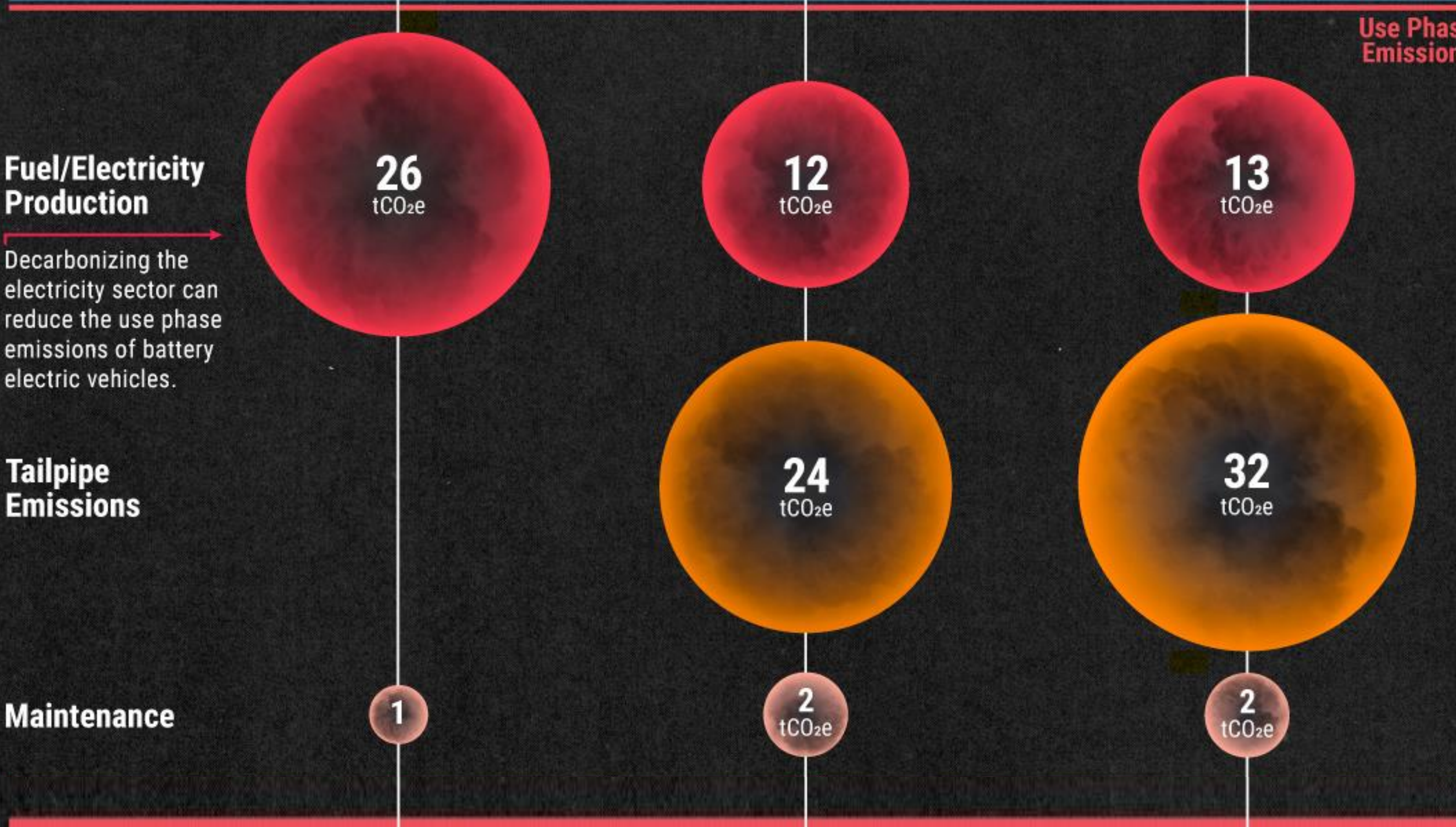
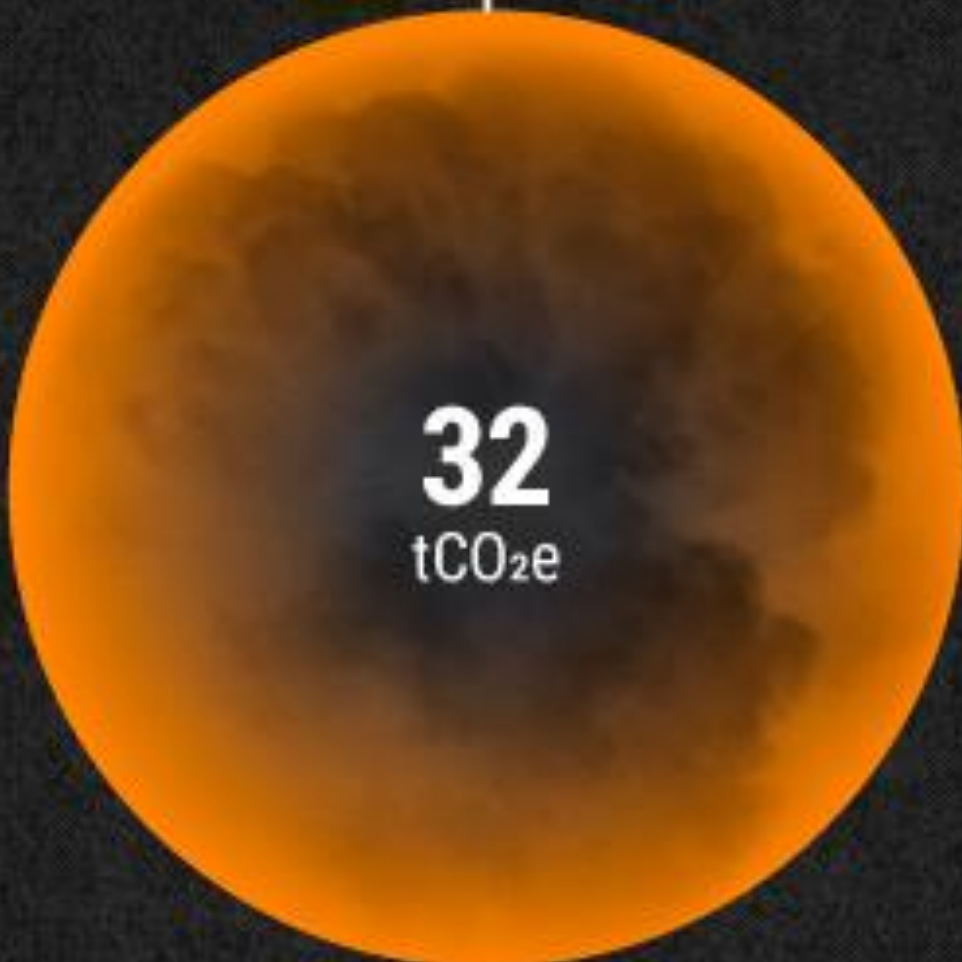
Use Phase Emissions

Fuel/Electricity Production

Decarbonizing the electricity sector can reduce the use phase emissions of battery electric vehicles.

Tailpipe Emissions

Maintenance



End-of-life

-2
tCO₂e

-1

This stage represents emission "credits" associated with recycling vehicles.

-1

Post Consumer Emissions

Total

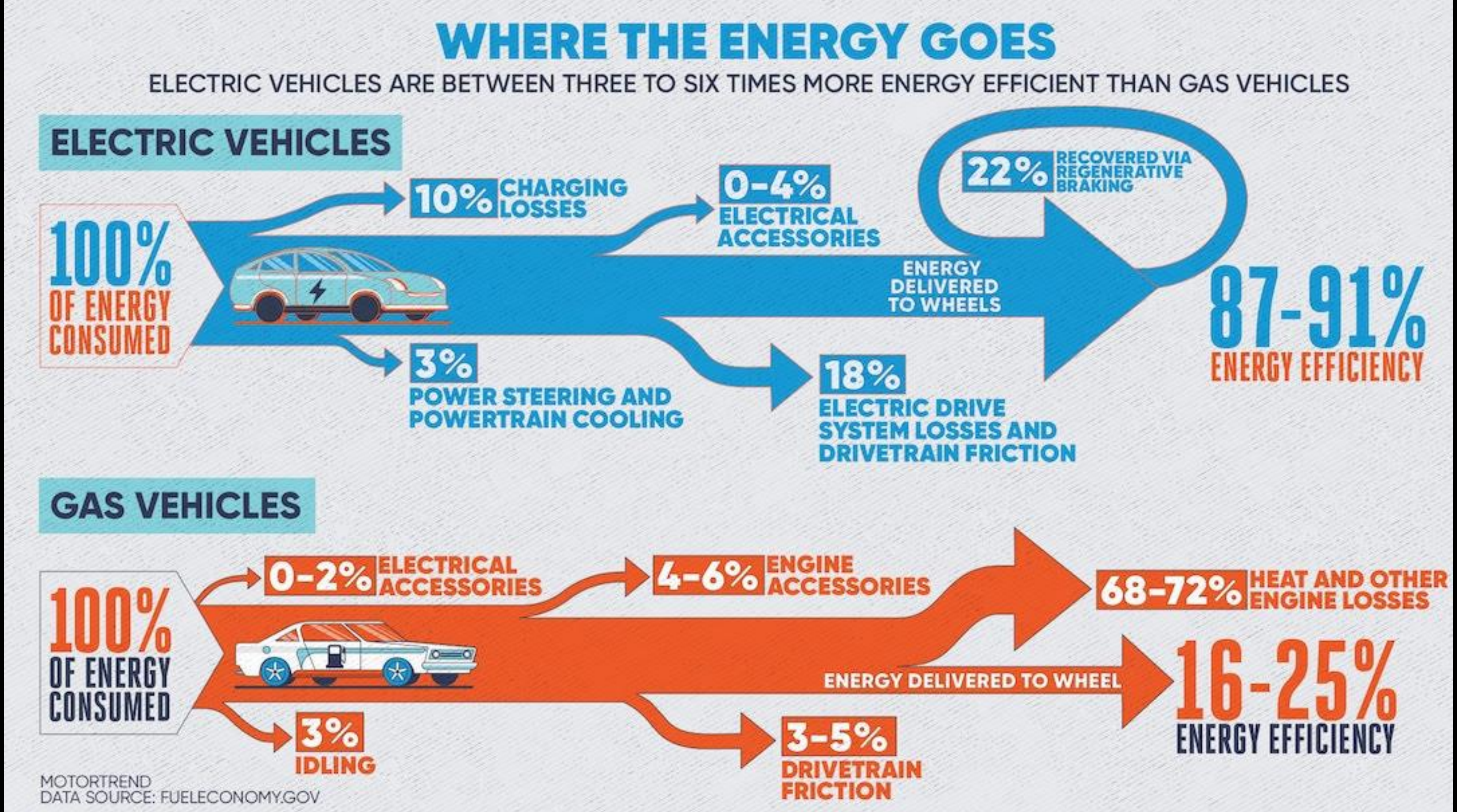
39
tCO₂e

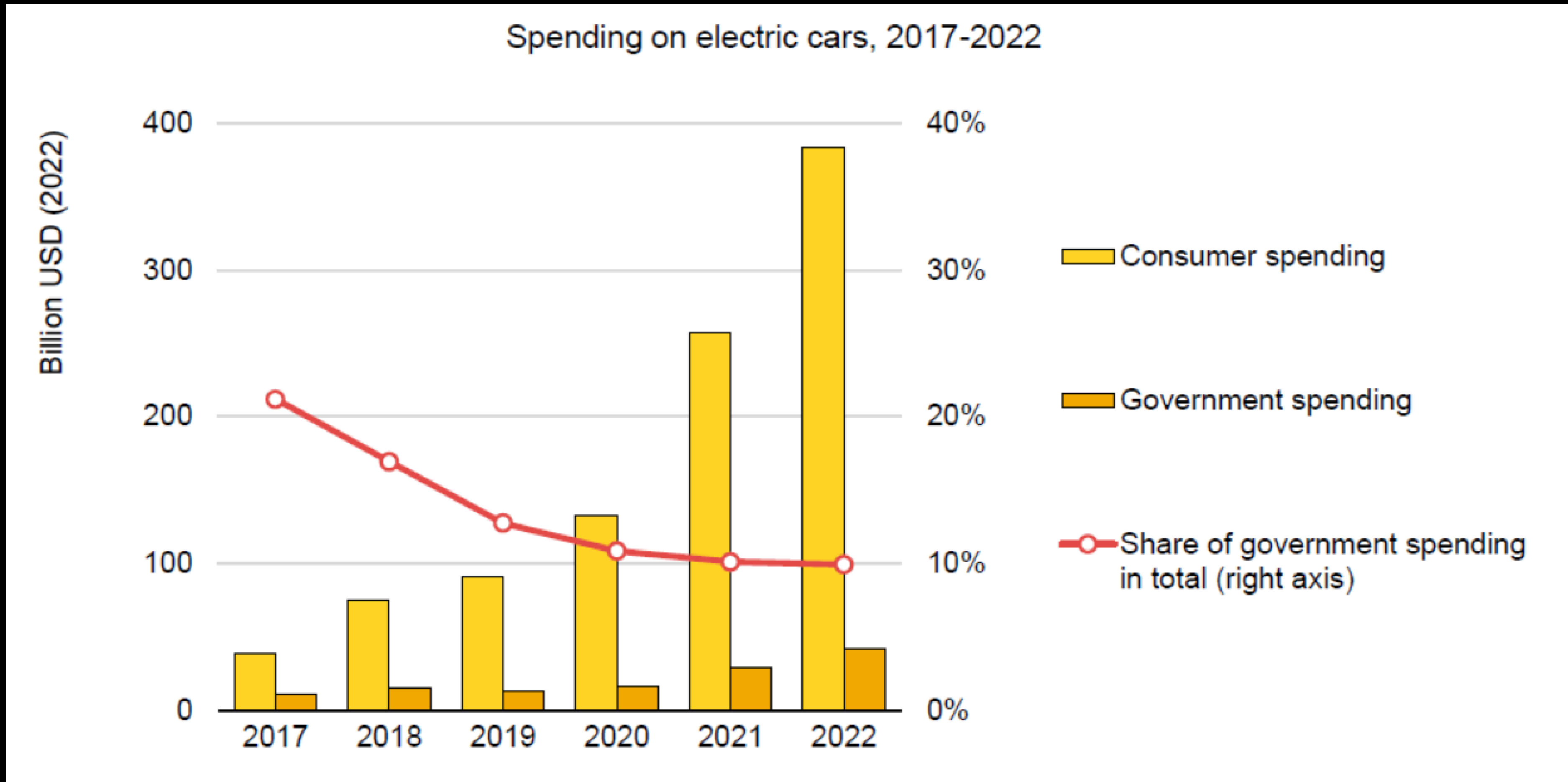
47
tCO₂e

55
tCO₂e

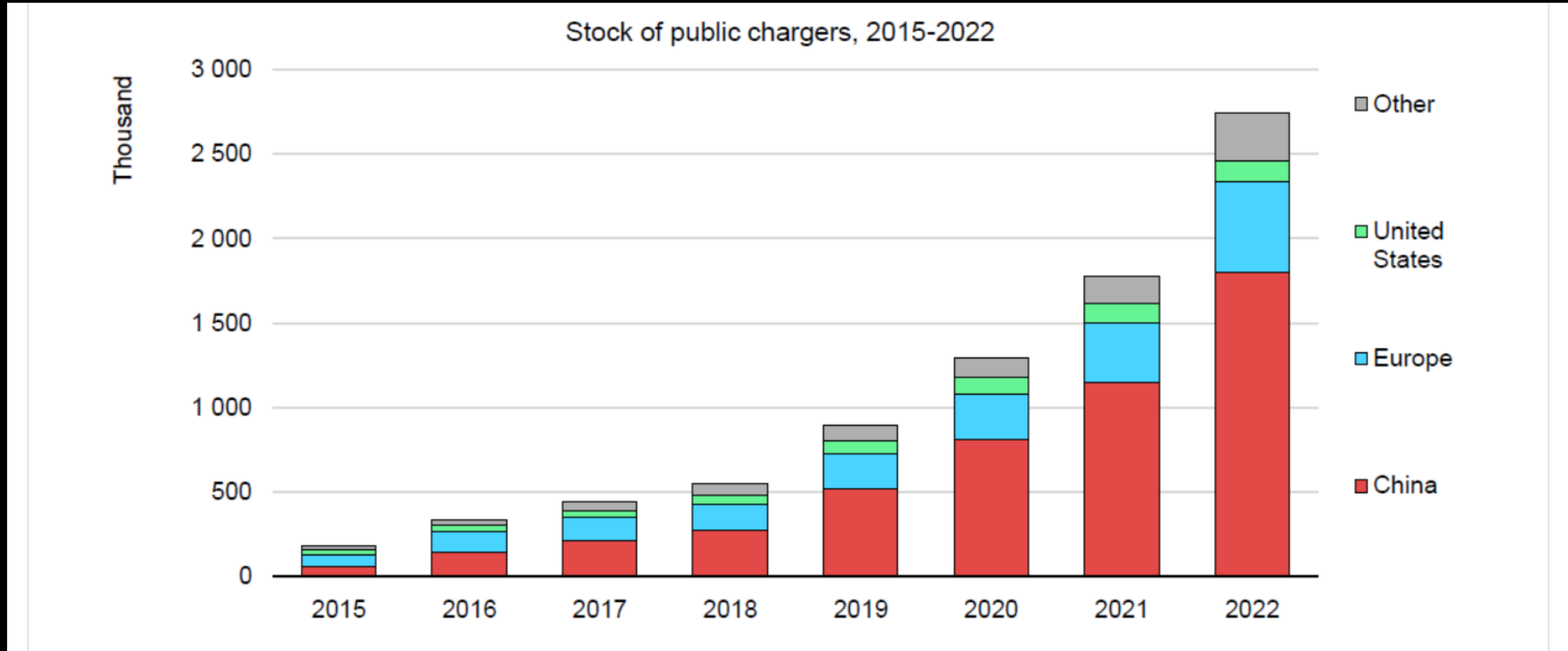
Each vehicle segment displays life cycle emissions for a medium-sized vehicle over 16 years and 240,000 km. Numbers may not add up due to rounding.

Eficiencia



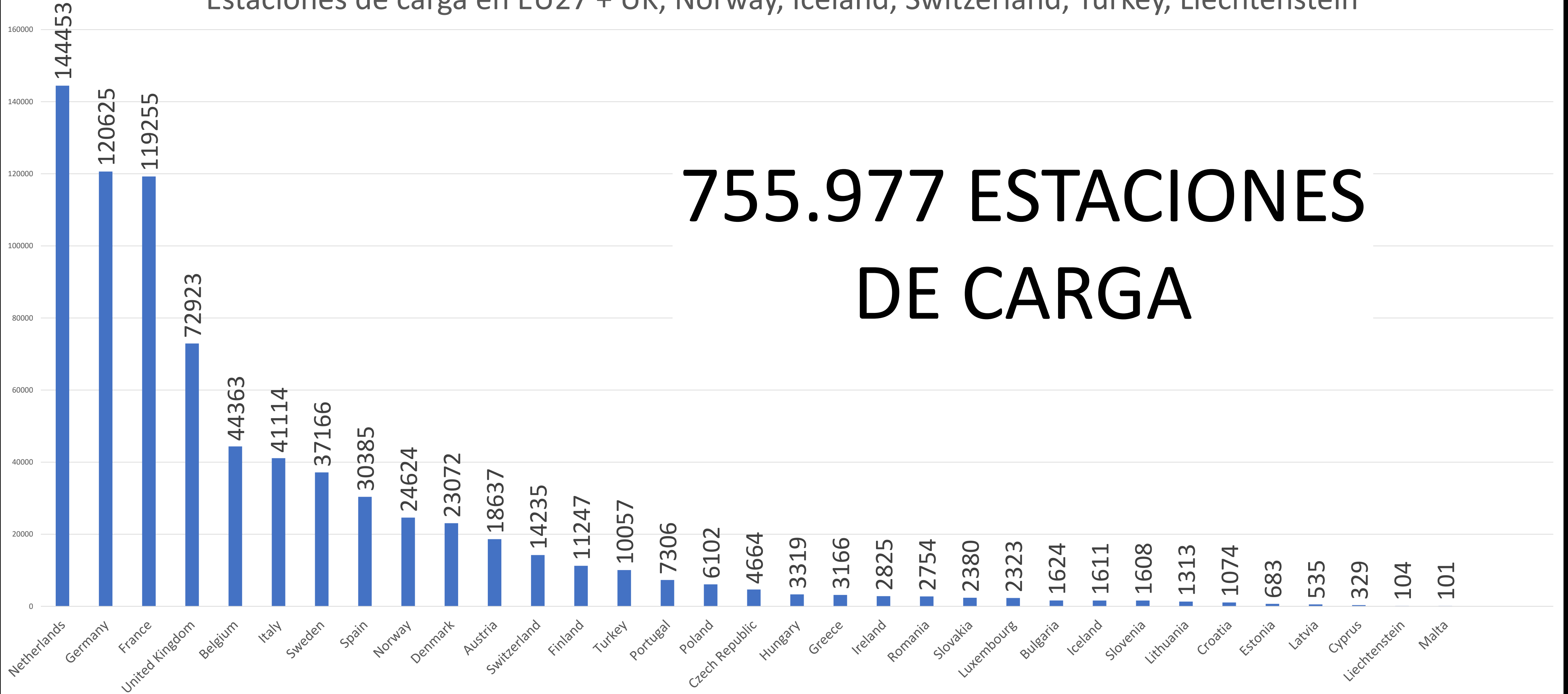


Infraestructura de puntos de carga



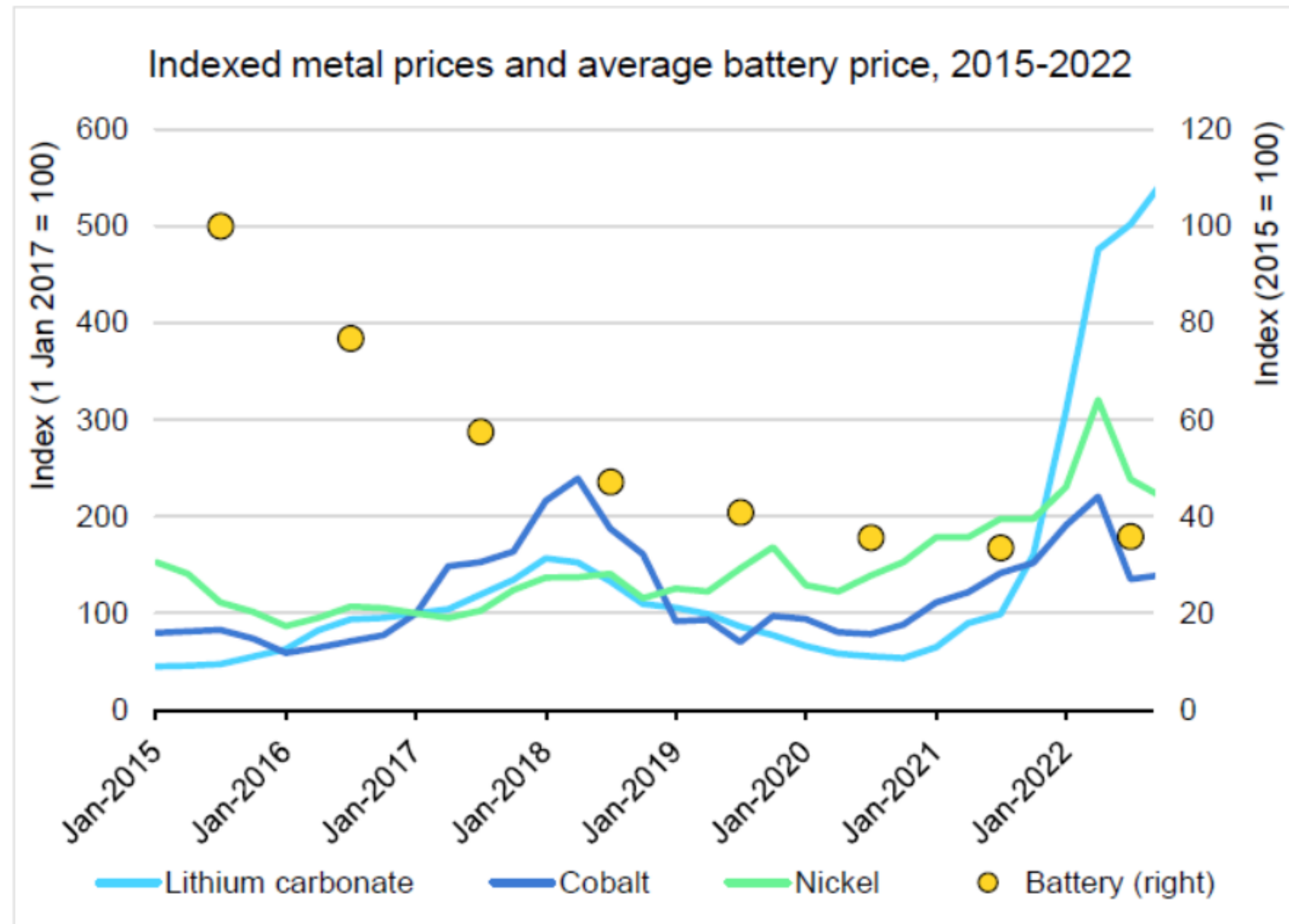
Estaciones de carga en EU27 + UK, Norway, Iceland, Switzerland, Turkey, Liechtenstein

755.977 ESTACIONES DE CARGA



Crece la demanda – Suben los precios

Battery material prices increase in 2022



THE KEY MINERALS IN AN EV BATTERY

Lithium-ion batteries harness the properties of various minerals to power electric vehicles.

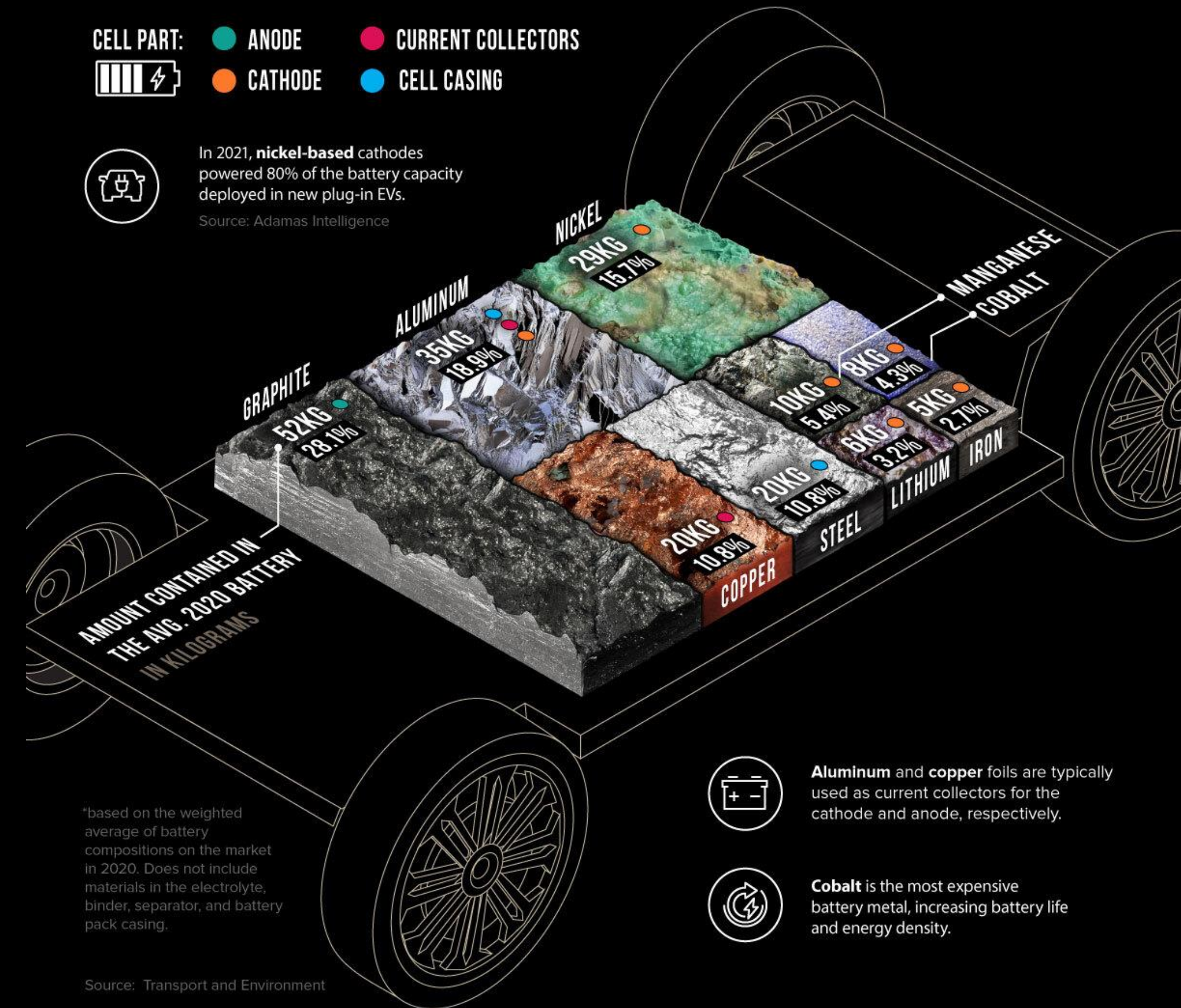
The cells in the average lithium-ion battery with a 60-kilowatt-hour (kWh) capacity contain around 185kg* of minerals.

- CELL PART:
- ANODE (teal dot)
 - CATHODE (orange dot)
 - CURRENT COLLECTORS (pink dot)
 - CELL CASING (light blue dot)



In 2021, nickel-based cathodes powered 80% of the battery capacity deployed in new plug-in EVs.

Source: Adamas Intelligence



The World's Largest Lithium Producing Countries

Lithium demand for electric vehicle batteries and other energy storage devices has grown significantly over the past few years.

Over 70% of global lithium production comes from only two countries.

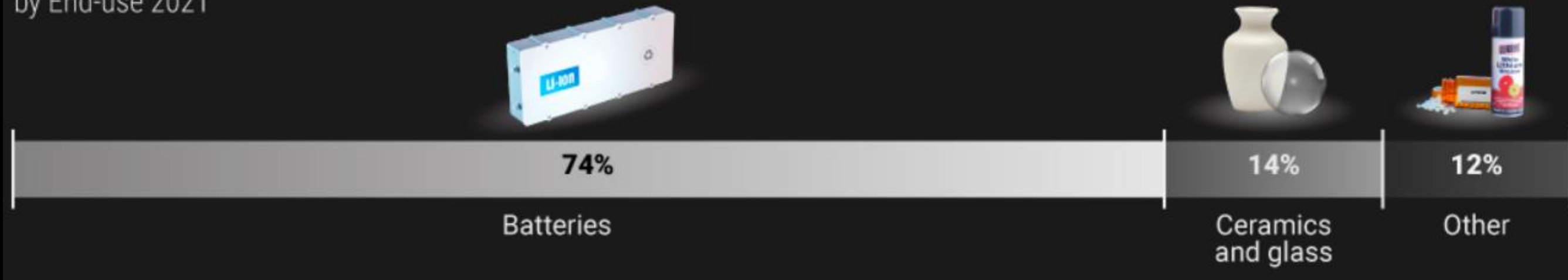
Lithium Production by Country 2022e in Tonnes

Australia produces most of its lithium by mining hard rock spodumene, unlike Argentina, Chile, and China, which produce it mostly from brine.



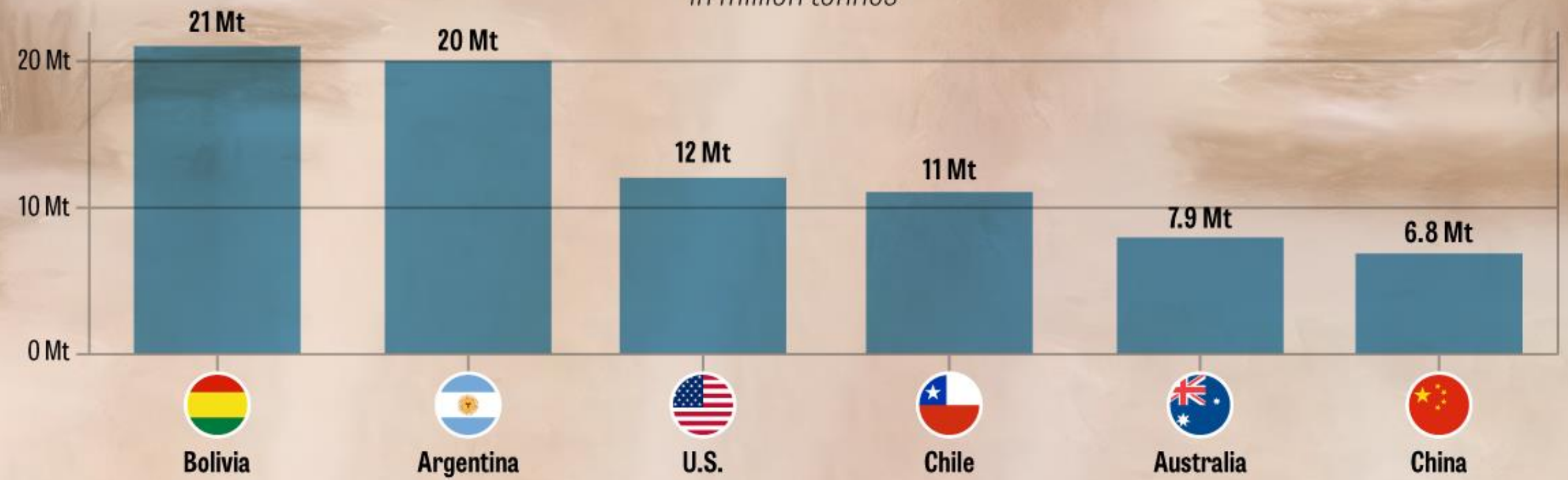
Lithium Consumption

by End-use 2021



Countries with the Largest Lithium Reserves

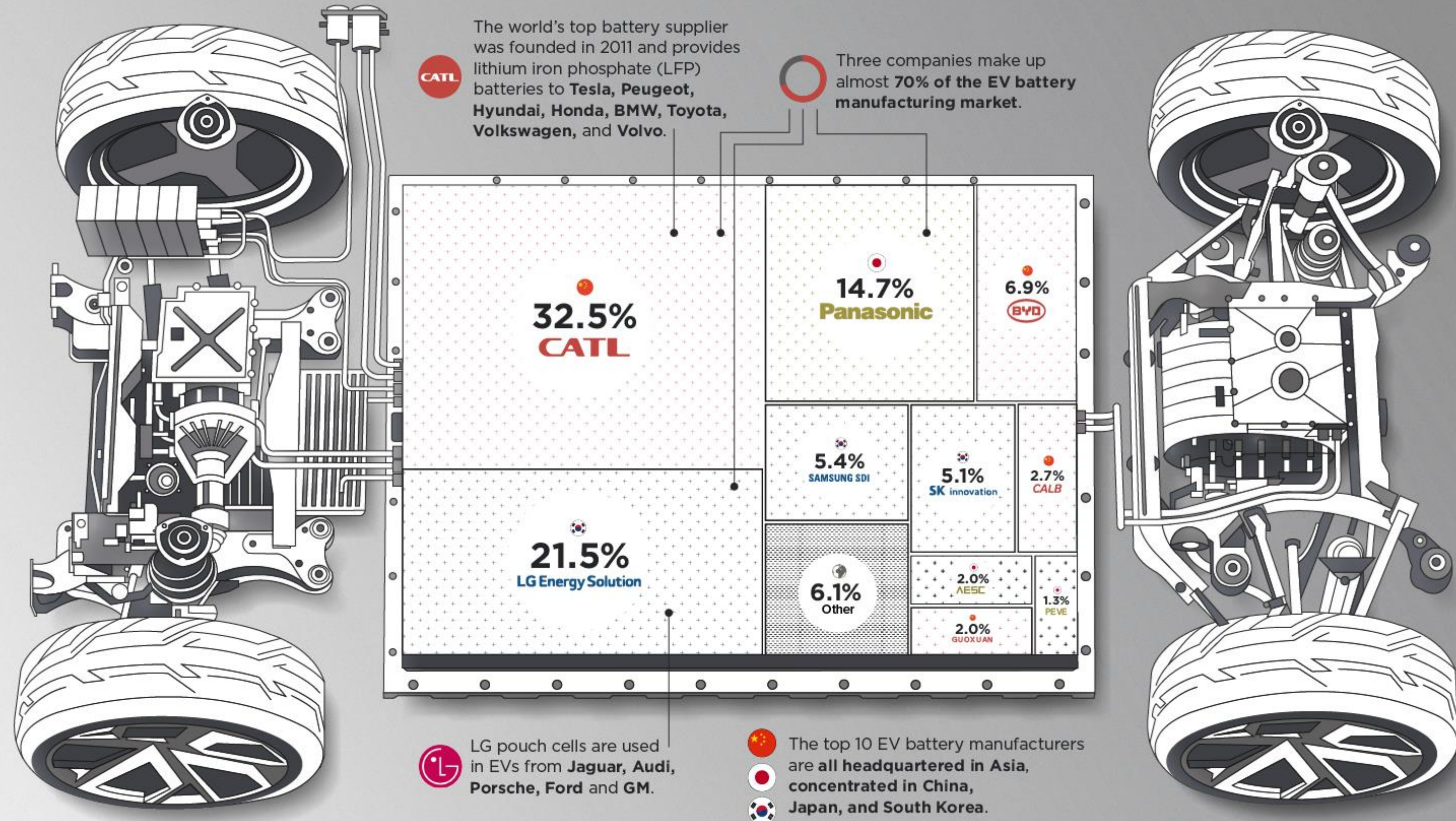
in million tonnes



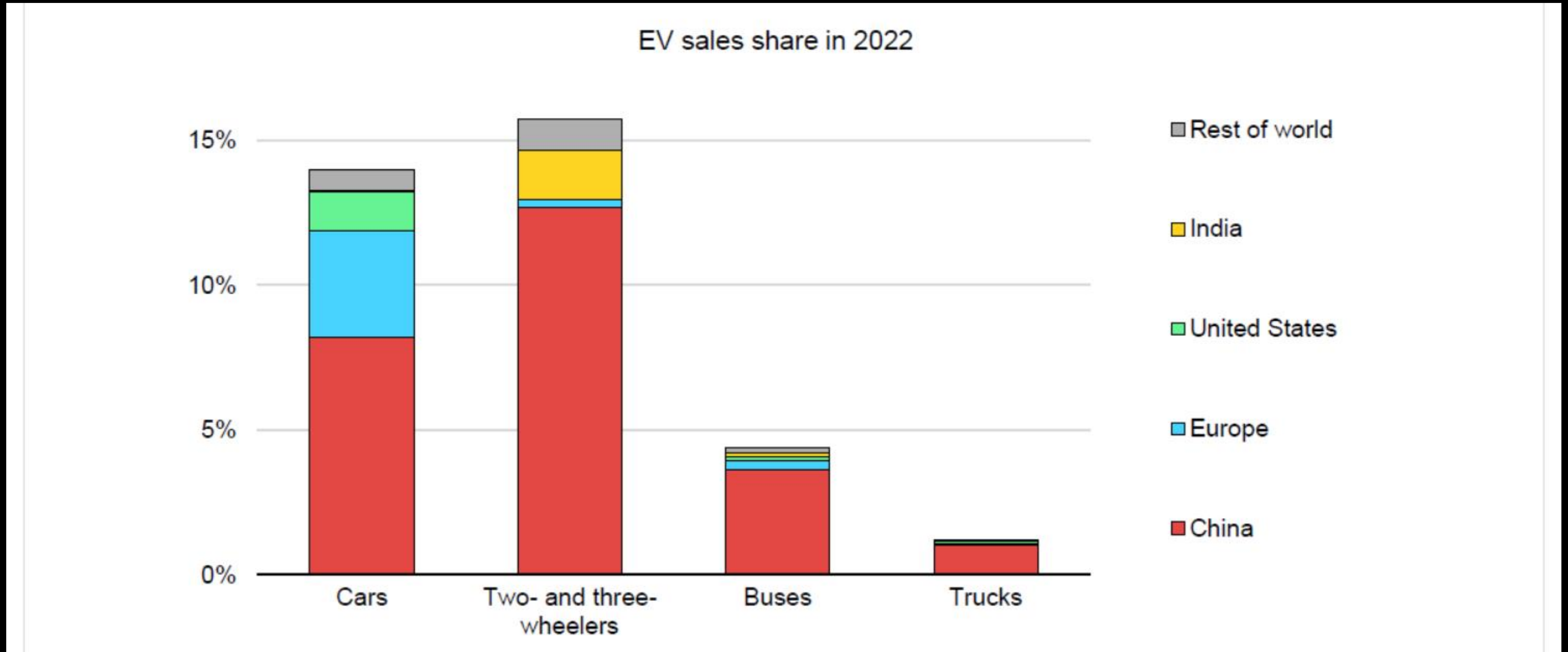
*U.S. production data was withheld to avoid disclosing company proprietary data.

BIG BATTERY: THE TOP 10 EV BATTERY MANUFACTURERS

With an increased interest in EVs, the electric car battery market is now a \$27 billion per year business.

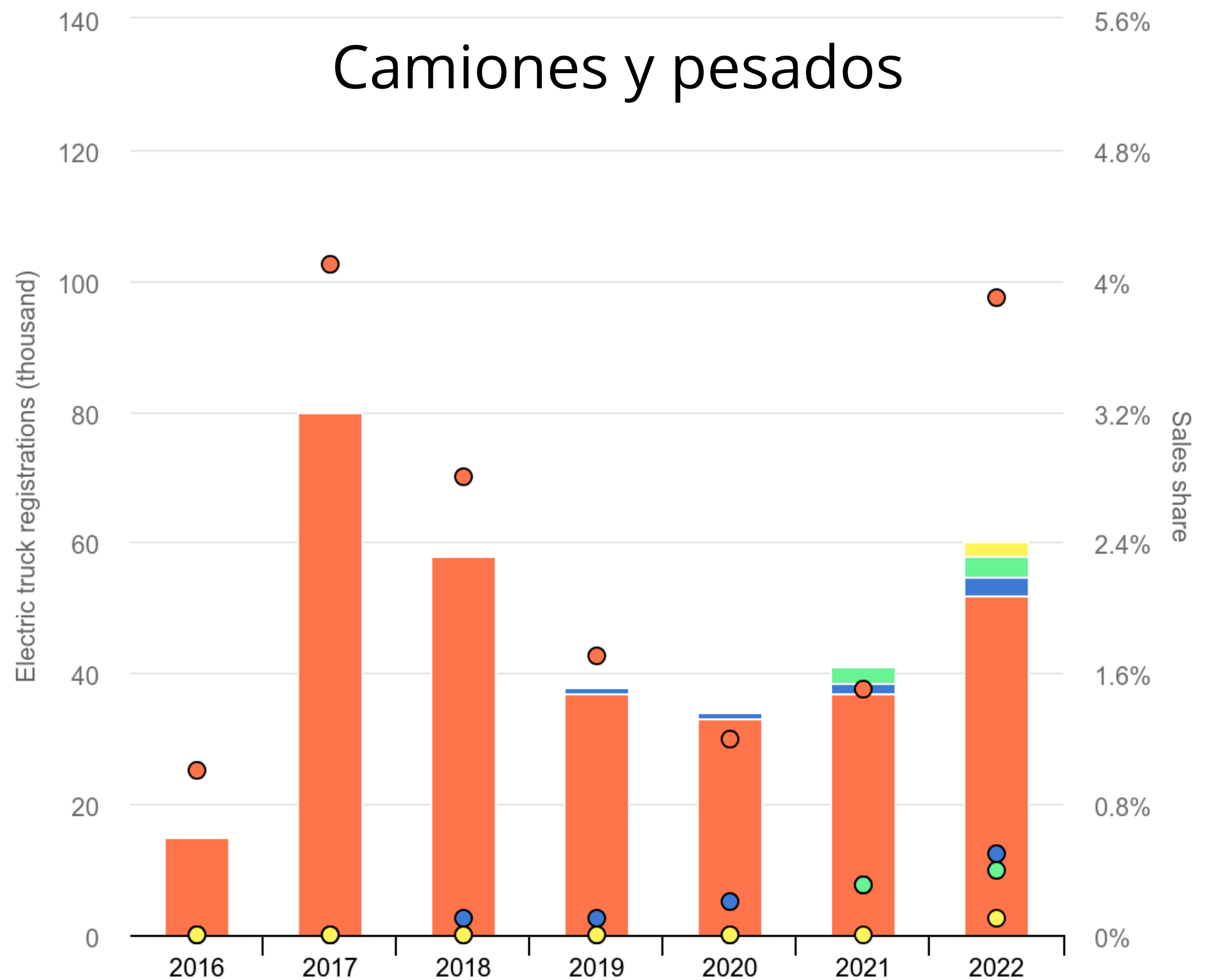


Electrificación de segmentos – Cadena de abastecimiento

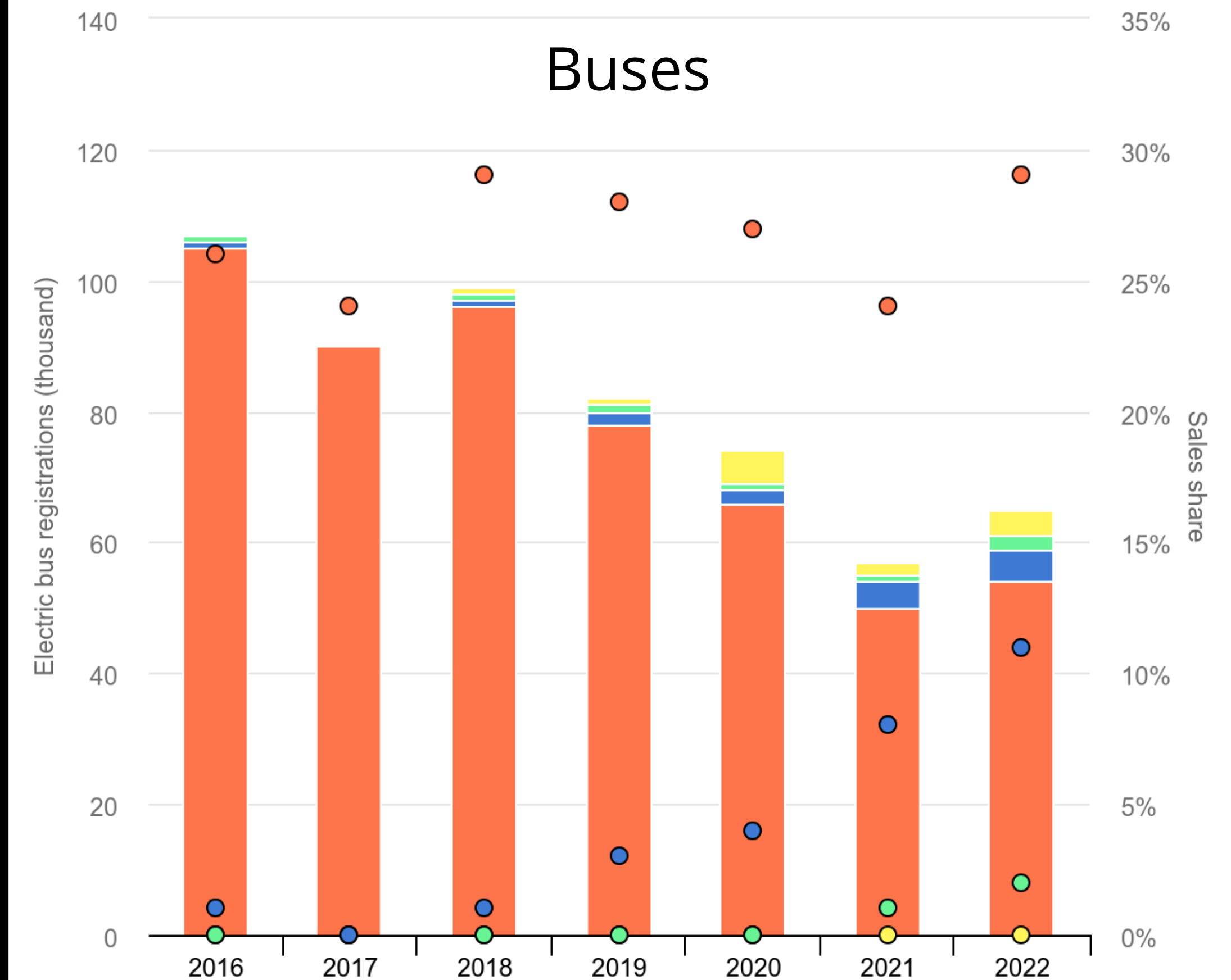


Ventas de camiones y buses eléctricos

Camiones y pesados



Buses



● China ● Europe ● United States ● Other

Electrificación de red de suministros de última milla

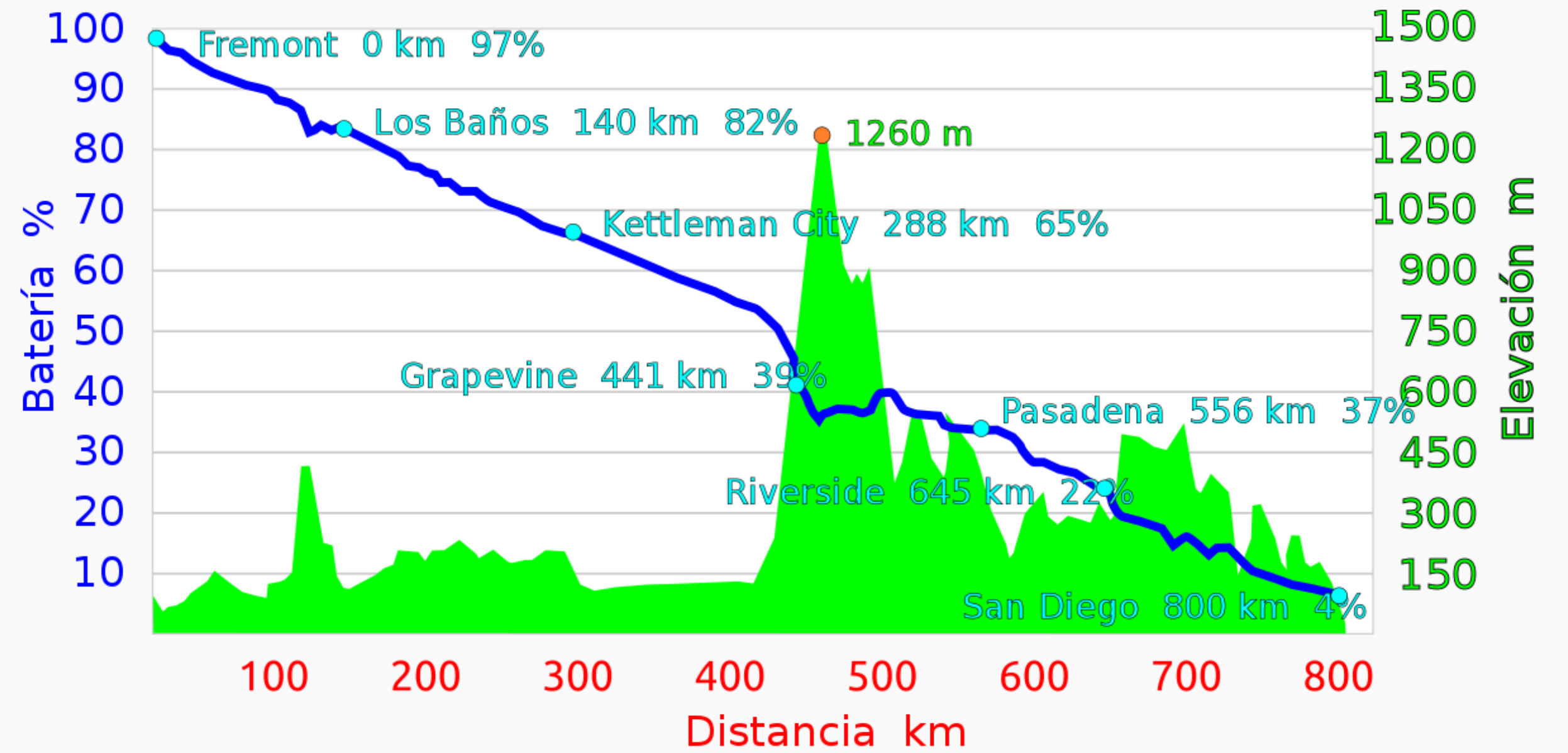
Estaciones de cambio de baterías para camiones y vehículos pesados



TESLA SEMI



Prueba de 800 km del Tesla Semi. 25 de noviembre de 2022



TESLA SEMI



Semi Specs

Fully Loaded at 82k lbs Gross Combination Weight

Mile Range

Approximately 300 or 500 miles

0-60 mph

20 seconds

Speed Up a 5% Grade

Highway speed limit

Powertrain

3 independent motors on rear axles

Energy Consumption

Less than 2 kWh per mile

Fast Charging

Up to 70% of range in 30 minutes

Fuel Savings (est.)

Up to \$200,000 over 3 years

Upcoming ELECTRIC SEMI TRUCKS



The electric revolution is extending its reach to the trucking industry. Here's every model expected to hit roads over the next few years.



SEMI

Expected Delivery **2023**

Charge Time **TBD**

Range

300-500 MILES



Tesla's Semi is powered by four electric motors and **boasts the highest range (est.) among its competitors.**

Early customers include PepsiCo (100 units) and FedEx (20 units).



ECASCADIA

Expected Delivery **2022** | Charge Time **80% IN AS LOW AS 1.5 HOURS**

Range **250 MILES**



Designed for regional distribution rather than long-hauling, this truck will be built in Portland, Oregon. In 2022, **Walmart began trialing the eCascadia in California.**



VNR ELECTRIC

Expected Delivery **2022** | Charge Time **80% IN AS LOW AS 1 HOUR**

Range **275 MILES**



This is the second generation of Volvo Truck's EV line. It's designed for regional distribution routes and will be built in the state of Virginia.



T680E

Expected Delivery **TBD** | Charge Time **100% IN AS LOW AS 3.3 HOURS**

Range **150 MILES**



Kenworth's first ever electric truck was revealed at CES 2022. Like many of its peers, it's designed for shorter routes and will be charged during off-hours.



579EV

Expected Delivery **2022** | Charge Time **100% IN AS LOW AS 3.3 HOURS**

Range **150 MILES**



The 579EV shares its platform with the Kenworth T680E. Both manufacturers are owned by Paccar, an American Fortune 500 company.



8TT

Expected Delivery **CURRENTLY IN OPERATION** | Charge Time **100% IN AS LOW AS 2.5 HOURS**

Range **167 MILES**



China's BYD Auto began producing the 8TT in 2018. **Over 100 units have been delivered to the U.S.**, with Anheuser-Busch being a major customer.



TRE BEV

Expected Delivery **2022** | Charge Time **10% TO 80% IN AS LOW AS 2 HOURS**

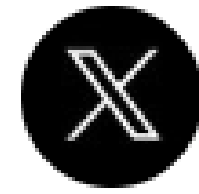
Range **350 MILES**



The Tre BEV promises a longer range than most competitors. The company is also working on hydrogen fuel cell models that could travel over 500 miles before refueling.

The majority of figures quoted in this graphic are based on manufacturer estimates, and may not reflect real world performance. Charge times are a best-case scenario using each truck's fastest possible charger.

Source: US News, CNBC, InsideEVs



Elon Musk  
@elonmusk



Production is hard. Production with positive cash flow is extremely hard.

Lordstown Motors



OHIO - 2023

Fuente: bizjournals

VOLTA TRUCKS



Stockholm - 2023

Fuente: voltatrucks

Una carrera por el éxito, Grandes cambios traen grandes desafíos

ARRIVAL - VAN XL



UK - 2024

Fuente: Arrival

PROTERRA



California - 2023

Fuente: sustainable-bus

BRITISHVOLT



Fuente: battery-news

NIKOLA



Fuente: Nikola

Bolsa

NIO



LUCID MOTORS



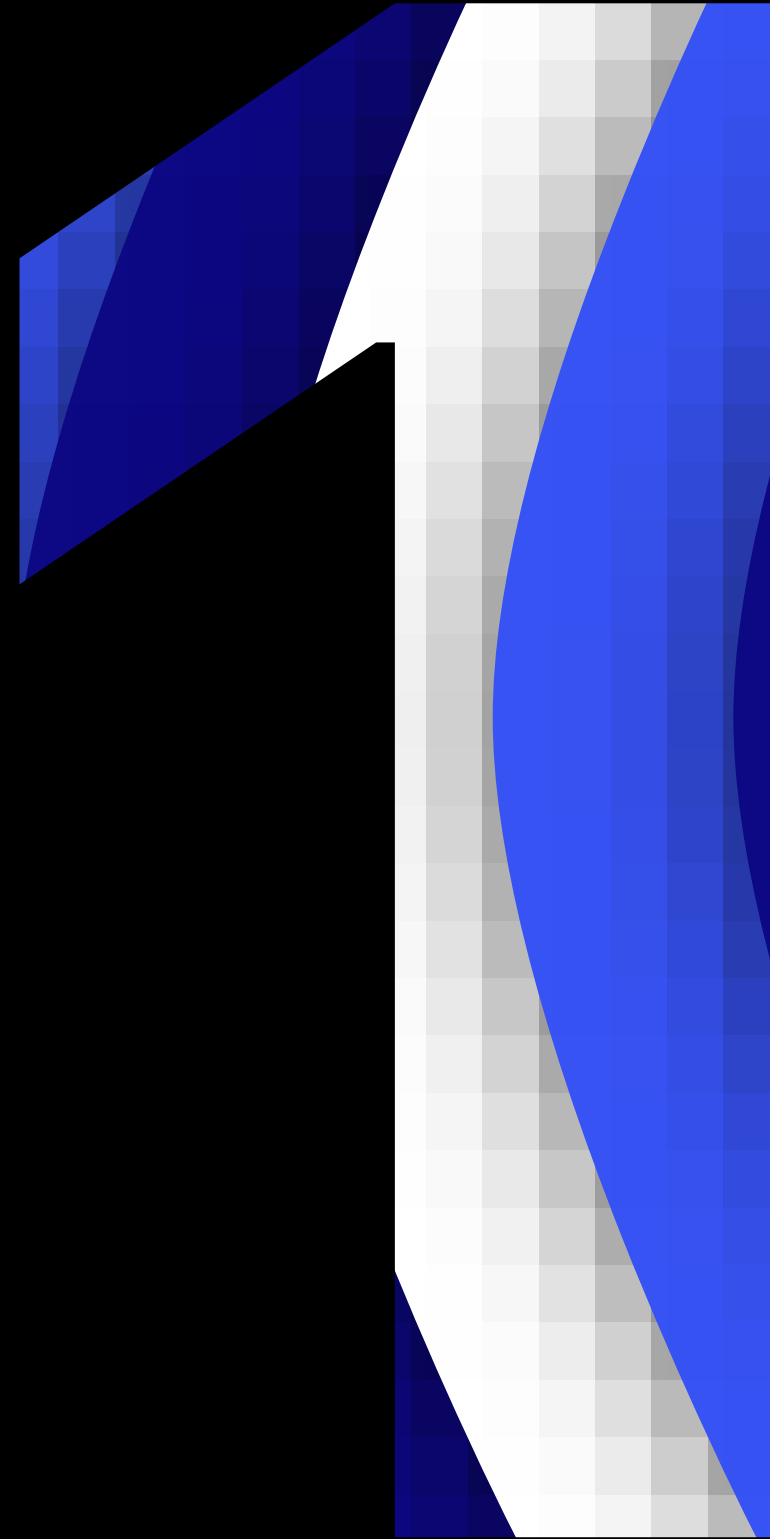
XPENG



RIVIAN



TENDENCIAS



Incremento de la producción de baterías usando energías limpias



Generación de alternativas de carga de vehículos



NIO Power



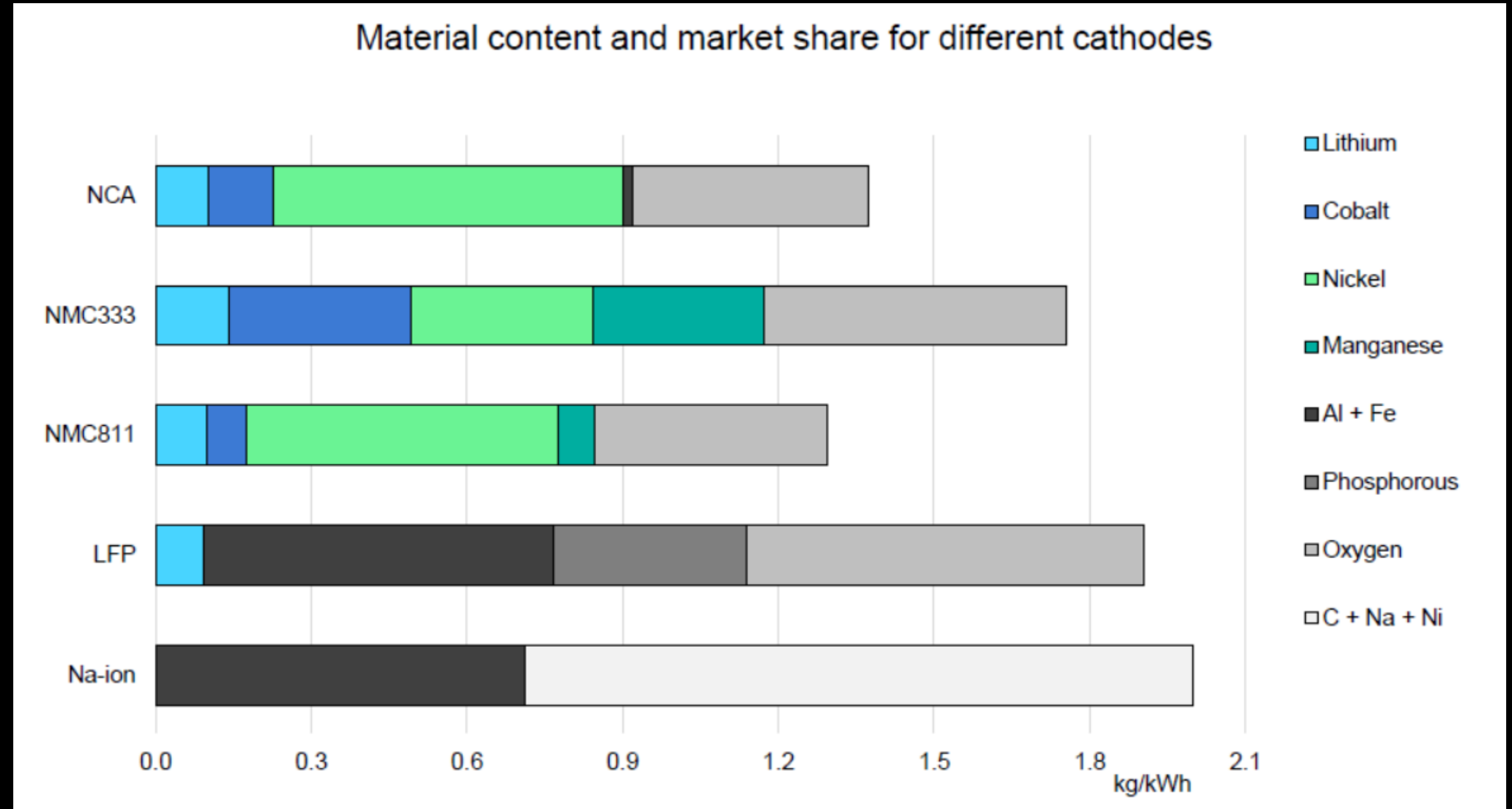
Power mobile



Suecia va a construir la primera carretera de carga de vehículos eléctricos



Desarrollo de nuevas tecnologías de baterías buscando reducción de costos



Electrificación de cadenas de suministro.
Inicialmente solo last-mile delivery



Segmento de camiones y vehículos pesados
aun en desarrollo

Continuación de incentivos gubernamentales para acelerar el cambio.

USA increases funding for domestic battery production

The US government has announced a further 3.5 billion dollars in subsidies to boost domestic battery production. It is the second round of grants in this area. The first was in 2022.

Battery Electric Vehicles (BEVs) and Fuel Cell Electric Vehicles (FCEVs):

- Vehicles registered until 31 December 2025 are exempted from the ownership tax for 10 years. This exemption is valid until 31 December 2030.



Expansión de la infraestructura de carga.



- Parqueaderos
- Oficinas
- Supermercados
- Restaurantes
- Hoteles
- Hogar

