Copper Development Association Inc.
Copper Alliance

Copper Drives Electric Vehicles

The market for electric vehicles (EV) is rapidly changing as leading manufacturers debut new products, battery prices drop and government incentives continue around the world. Copper is essential to EV technology and its supporting infrastructure. The evolving market will have a substantial impact on copper demand.

Projections for Increased Electric Vehicle Demand

1 million + vehicles – the number of annual sales of PEVs by 2023. This will reach more than 7 percent of annual vehicle sales by 2025.

7 million – the number of vehicles projected to be on U.S. roads by 2025, up from 567,000 today. This makes up 3 percent of the 258 million vehicles, including cars and light trucks, expected to be registered in the U.S. in 2025.

Required Investment in Charging Infrastructure

5 million – the number of charging ports required to support 7 million PEVs in 2025. This will require a significant investment in PEV charging infrastructure.

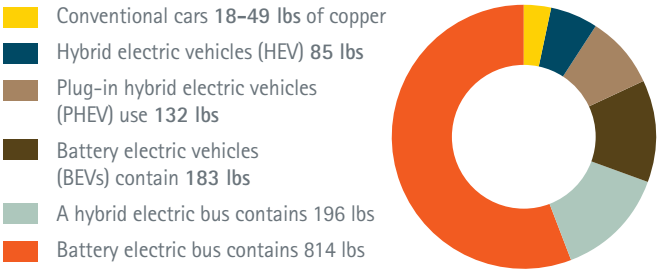
There are three types of charge ports, which are typically installed at homes, workplaces or public locations:

- Level 1: 120 Volts; Charging Time: Overnight
- Level 2: 220 volts; Charging Time: Several Hours
- DC Fast Chargers: DCFC; Charging Time: Under an Hour

There currently are **between 50,000 and 70,000 Level 2 ports in work or public locations in the U.S.; and that number needs to be increased to between 2,230,000 and 2,240,000 by 2025.**

Copper is Essential to Electric Vehicle Technology

Copper is used throughout electric vehicles, charging stations and supporting infrastructure because of the metal's durability, high conductivity and efficiency.



While conventional cars have **18–49 pounds** of copper, hybrid electric vehicles (HEV) contain approximately **85 pounds**, plug-in hybrid electric vehicles (PHEV) use **132 pounds**, battery electric vehicles (BEVs) contain **183 pounds**, a hybrid electric bus contains **196 pounds**, and a battery electric bus contains **814 pounds**, most of which is used in the battery.

In 2016, the total estimated amount of copper used in all electric vehicles manufactured by BYD, the world's largest electric vehicle maker, was nearly **26 million pounds.**

Copper is also required for charge ports. BYD's total sale of chargers in 2016 used more than **295,419 pounds of copper.**

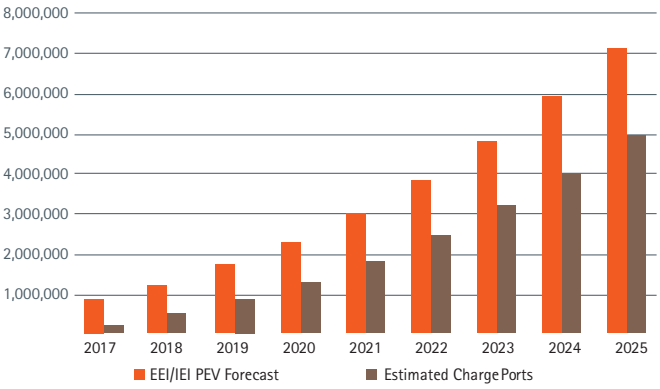
Copper Demand in a Sustainable World

The increase in the electric vehicles market will significantly impact copper. The demand for copper due to electric vehicles is expected to increase by **1,700 kilotons by 2027.**

As the world continues to move toward a sustainable and energy efficient future, copper has a major role to play. The metal is used to increase the efficiency of numerous electrical technology, from motors and transformers to solar and wind energy systems.

Copper is itself a sustainable material. It is 100 percent recyclable and can be used and reused without losing its important engineering qualities.

PEV Stock and Charging Infrastructure Needed



*Sources: IDTechEx 2017, the Edison Electric Institute and the Institute for Electric Innovation

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