

Transport Efficiency

Source Metadata

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IEA Technology Definition

The IEA classifies transport efficiency under end-use technologies, encompassing electric vehicles (battery EVs and plug-in hybrids), hydrogen fuel cell vehicles, vehicle lightweighting, and modal shift. The ETP Technology Guide tracks EVs as one of six key clean energy technologies alongside solar PV, wind, batteries, electrolyzers, and heat pumps. Hydrogen vehicles target heavy-duty transport, shipping, and aviation where battery electrification faces limitations.

Technology Readiness & Deployment

Battery electric passenger vehicles are commercially mature, with global sales exceeding 17 million units in 2024. Electric buses and two/three-wheelers are scaling rapidly in China and Southeast Asia. Hydrogen fuel cell vehicles remain at early commercial stage with limited fleet deployments, primarily in buses and trucks. The IEA projects the growing EV fleet will displace 8 million barrels of oil per day by 2030 in the Net Zero scenario. Electric heavy-duty trucks are emerging but face range and charging infrastructure challenges.

Key Metrics & Benchmarks

EVs now represent approximately 20% of new car sales globally. Battery costs for automotive applications have fallen below USD 140/kWh. EV energy efficiency is 3-4 times higher than internal combustion engines on a well-to-wheel basis. Charging infrastructure exceeds 4 million public charge points globally. Hydrogen fuel cell costs remain significantly higher than battery electric alternatives for most passenger vehicle applications.

LATAM Relevance

EV adoption in Latin America is growing from a low base, led by Brazil, Colombia, Chile, and Costa Rica. Chile hosts the largest electric bus fleet outside China (over 2,000 units in Santiago). Brazil's auto industry is pivoting from flex-fuel to hybrid and electric vehicles. Colombia has implemented EV purchase incentives and is electrifying its BRT systems. Charging infrastructure across the region remains underdeveloped relative to vehicle sales.

Critical Minerals Link

EVs are the largest driver of lithium, cobalt, and nickel demand growth. Each EV battery contains 8-12 kg of lithium, 5-20 kg of nickel, and 5-10 kg of cobalt (NMC chemistry). Copper usage per EV is 2-4 times higher than for combustion vehicles. LATAM's lithium triangle (Chile, Argentina, Bolivia) and copper belt are critical to global EV supply chains. Hydrogen fuel cells require platinum group metals.

Cleantech Taxonomy Crosswalk

Maps to Cleantech Taxonomy sectors: TR (Transport) — EVs, fuel cells, charging infrastructure, modal shift; ES (Energy Systems) — vehicle-to-grid, transport electricity demand; IN (Industry) — vehicle and battery manufacturing.