

WILL ELECTRIC VEHICLES AND LITHIUM BATTERIES ESCALATE THE U.S.-CHINA TRADE CONFRONTATION?

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ABSTRACT

China started to invest in electric vehicles (EVs) and rechargeable batteries in 2001. From 2009 through 2022, the Chinese government injected over 200 billion yuan (\$28 billion) into the EV industry. Combined with EV buyer financial incentives and local governmental support, Beijing achieved its intended goal: China's EV production and sales have ranked first for eight consecutive years. Lithium-ion battery typically accounts for around 40 percent of the cost of an EV. To secure lithium supply chains, China has acquired lithium mining rights and companies across the world, and led lithium refining and technological development of lithium-ion batteries. In 2022, China accounted for 60 percent of global lithium refining and 77 percent of the global lithium-ion battery cell capacity. China's dominance in the EV industry, and lithium supply chain creates the potential for conflicts. Trade with China is emerging as an issue in the 2024 U.S. presidential contest. EVs and lithium-ion batteries will add fuel to the fire of the U.S.-China confrontation.

Keywords: *Electric Vehicles, Lithium, lithium-ion batteries, Made in China 2025, Inflation Reduction Act*

1. INTRODUCTION

To address climate change, many countries have taken actions to reduce greenhouse gas emissions from their two main sources: transportation, and electricity generation (EPA, 2015).

Electric vehicles (EVs) reduce greenhouse gases. Australia, Canada, Germany, Israel, New Zealand, Norway, the Netherlands, Sweden, and the United States have endorsed the Zero-Emission Government Fleet Declaration (CEQ, 2022). European Union (EU) member states agreed to effectively ban the sale of new internal combustion engine (ICE) vehicles by 2035 on 29 June 2022 (Abnett, 2023). To promote the transition to EVs, 20 EU member states offer incentives for purchasing EVs. Although Belgium, Bulgaria, Denmark, Finland, Latvia, Slovakia, and Sweden do not provide purchase incentives, most grant tax reductions or exemptions (ACEA, 2023).

Outside EU, China, Japan, Singapore, South Korea, the UK, Iceland, Norway, Canada, the 12 U.S. states that adhered to California's Zero-Emission Vehicle Program, Sri Lanka, Cabo Verde, and Costa Rica have announced 100 percent sales of zero-emission vehicle or the bans of ICE vehicles through 2050 (IEA, 2020). In the U.S., buyers of EVs may be eligible for a federal income tax credit of up to \$7,500. Washington also announced initiatives in February 2023 to install at least 500,000 EV charging stations by 2030 (CNBC, 2023). Global EV sales increased more than 1,000 percent in 5 years, from 1 million in 2017 to over 10 million in 2022 (IEA, 2023), and were predicted to reach 26 million in 2030 (Kumagai, 2021).

Solar panels and wind turbines combined generated 10.7 percent of global electricity in 2021 (Enerdata, 2022), an increase of over 600 percent from 1.7 percent generated in 2010 (Jaeger, 2021). Renewable energy is not available continuously. Reliable and high-performance rechargeable batteries are thus indispensable to balance electrical supply and demand to meet the variable electricity demand.

The most important component of an EV is the battery, which typically accounts for around 40 percent of the cost of an EV (Carey and Lienert, 2023). Compared with other minerals, lithium, known as "white oil" due to its strategic importance and color characteristic, gives batteries lighter weight, faster-charging speed, longer