

Chart of the Week #2022-22

Implied Tesla Battery Production Costs

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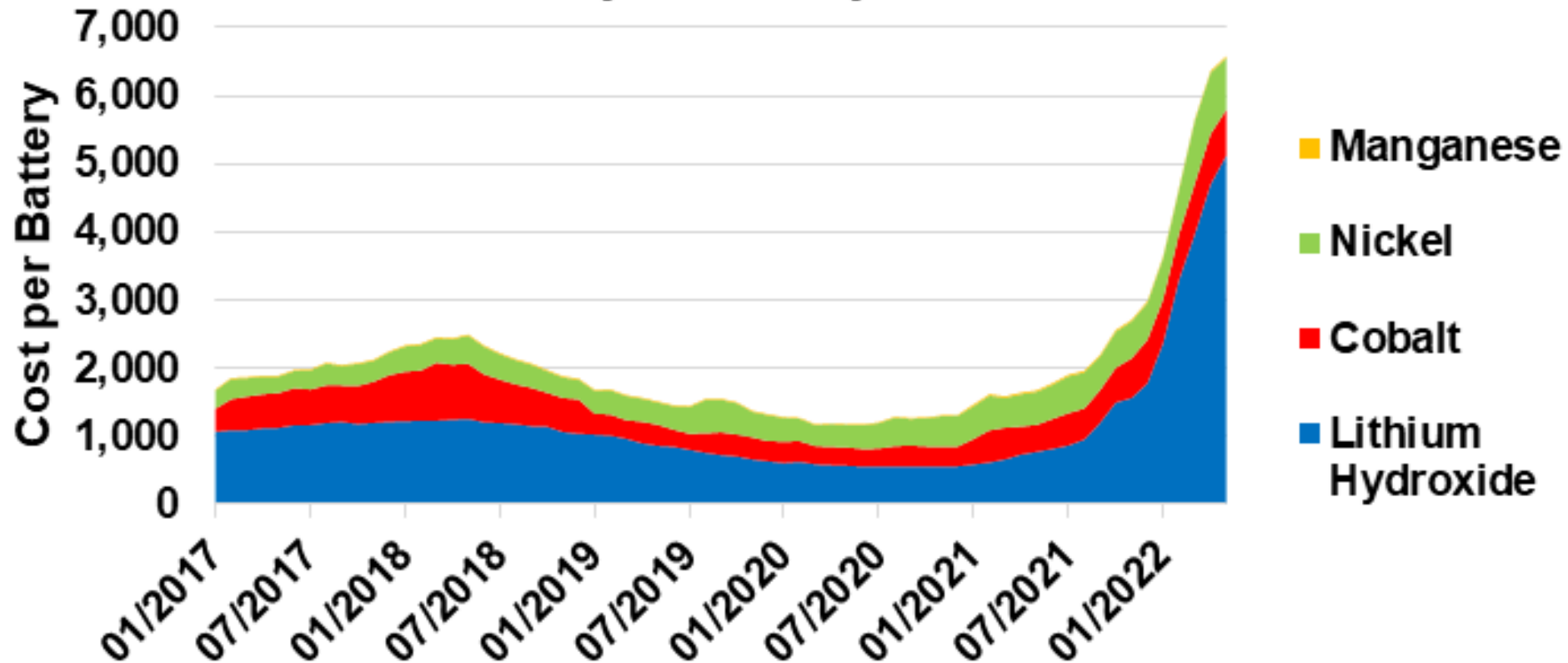
Washington, DC



Source: AP/Houston Chronicle
Everett Collection

Implied Tesla Battery Cost Based on Primary Input Spot Prices

January 2017 - May 2022



Analysis Based on LME Monthly Data

EPRINC

Implied Tesla Battery Cost Based on Primary Input Spot Prices



- Batteries in electric vehicles (EV) require several important and unsubstitutable minerals in order to charge, store, and deliver electricity to the vehicle's powertrain.
- Basic EV battery concepts have been in use for some time. Innovations are at the margins and are focused on increasing energy density and safety in order to give manufacturers proprietary edge.
- Primary EV battery materials include lithium, cobalt, nickel, manganese and other components such as copper and graphite. Some materials are in pure form. Others such as lithium and manganese are volatile when pure; therefore, they are produced and marketed as lithium hydroxide and manganese sulfate, respectively, compounds with established purity grades. Through processing, EV manufacturers then extract the core minerals and re-assemble them into the dedicated batteries they produce.
- A typical Tesla battery requires the input of almost 140 pounds of lithium hydroxide, 20 pounds of cobalt, 60 pounds of nickel, and 20 pounds of manganese. The global supply/demand balances for these particular materials are tight and current prices reflect this.
- In 2017, the implied cost for a typical Tesla battery using spot prices for lithium hydroxide, cobalt, nickel, and manganese was approximately \$1,700. After falling because of the pandemic and then recovering, this implied cost as of May 2022 is over \$6,500.
- In May 2022, lithium hydroxide prices averaged \$80,750 per metric ton, up 380% from \$16,813 in January 2017. May 2018 prices for cobalt, nickel, and manganese also were up 183%, 97%, and 44%, respectively, from their levels in January 2017.
- This slide deck is available at [EPRINC's Chart of The Week Archive](#).
- For more information on these charts, please contact Max Pyziur (maxp@eprinc.org) or Larry Goldstein (larryg@eprinc.org).