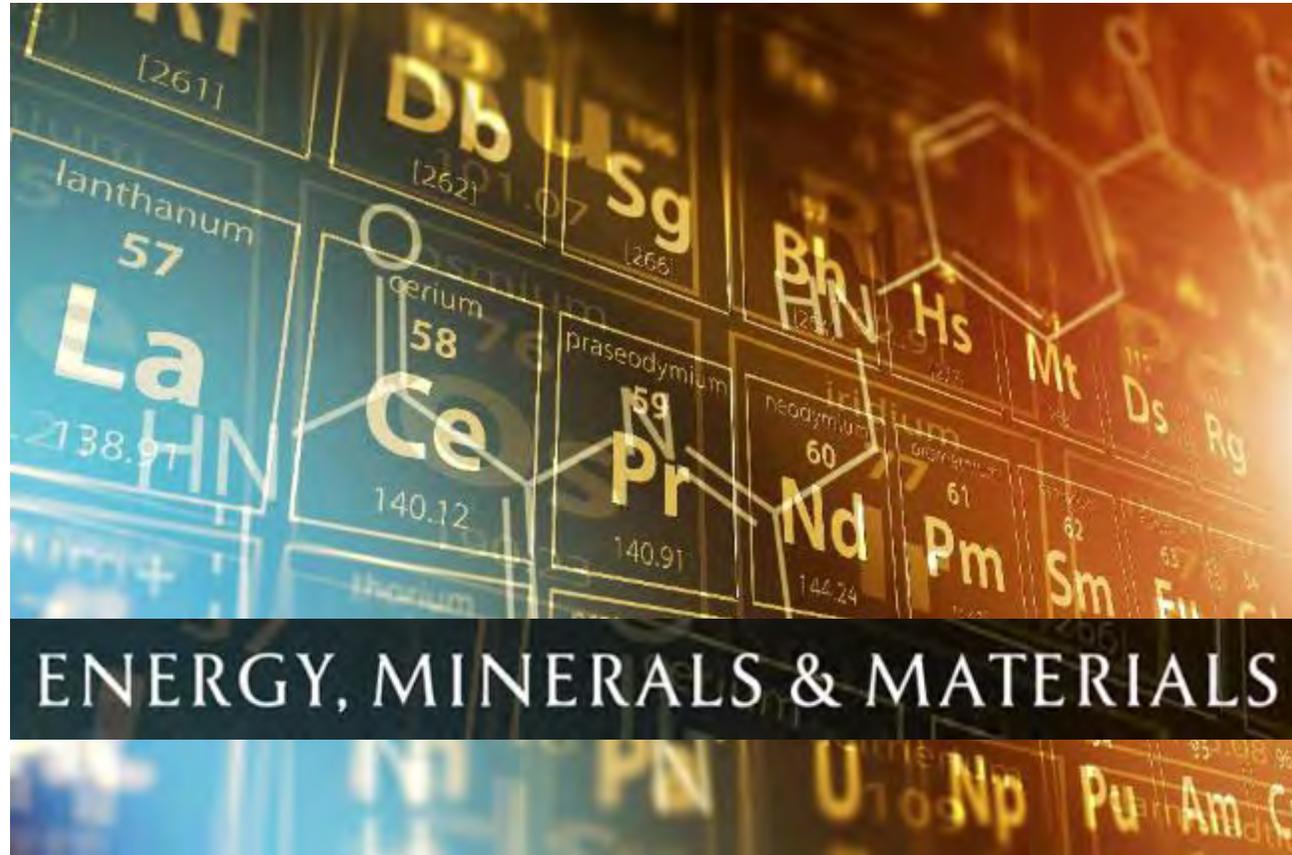


Need nickel? So does LME!



CES Roundtable, April 26, 2022

Agenda

- Welcome, 8:30 AM
- Overview on nickel
- Panel
 - Ernest Scheyder, Reuters
 - Albert Helmig, Grey House/CSIS
 - Bob Maguire, Carlyle
- Interactive discussion followed by open Q&A
- Adjourn, 10:30-11:00 AM

WHAT CHINA'S CONTROL OF NICKEL MEANS FOR THE ENERGY TRANSITION

MICHELLE MICHOT FOSS



By Michelle Michot Foss and Jacob Koelsch

The authors examine tensions in nickel supply and value chains within the context of broad aspirations to electrify transport. Through their case study, which focuses on China's growing presence in Indonesian nickel extraction and processing, they contend that China is positioning itself as a gatekeeper to the energy transition — with vast implications for strategic planning in the United States.

DOI: <https://doi.org/10.25613/3050-Y623>

Download the executive summary and the full research paper below.

-  [executive-summary-nickel-041122](#)
-  [research-paper-nickel-041122](#)

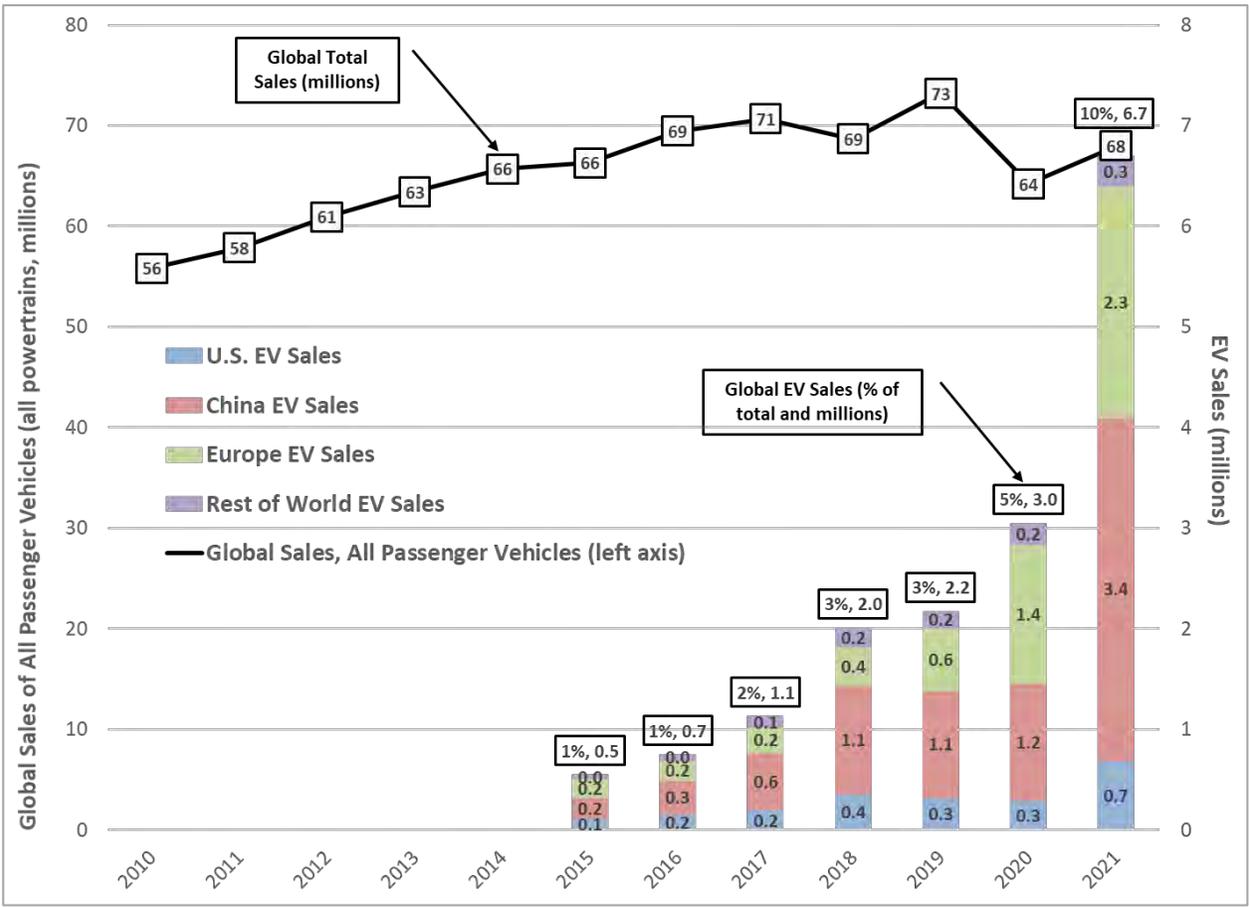
April 11, 2022, 9:45 a.m.

[Print](#)

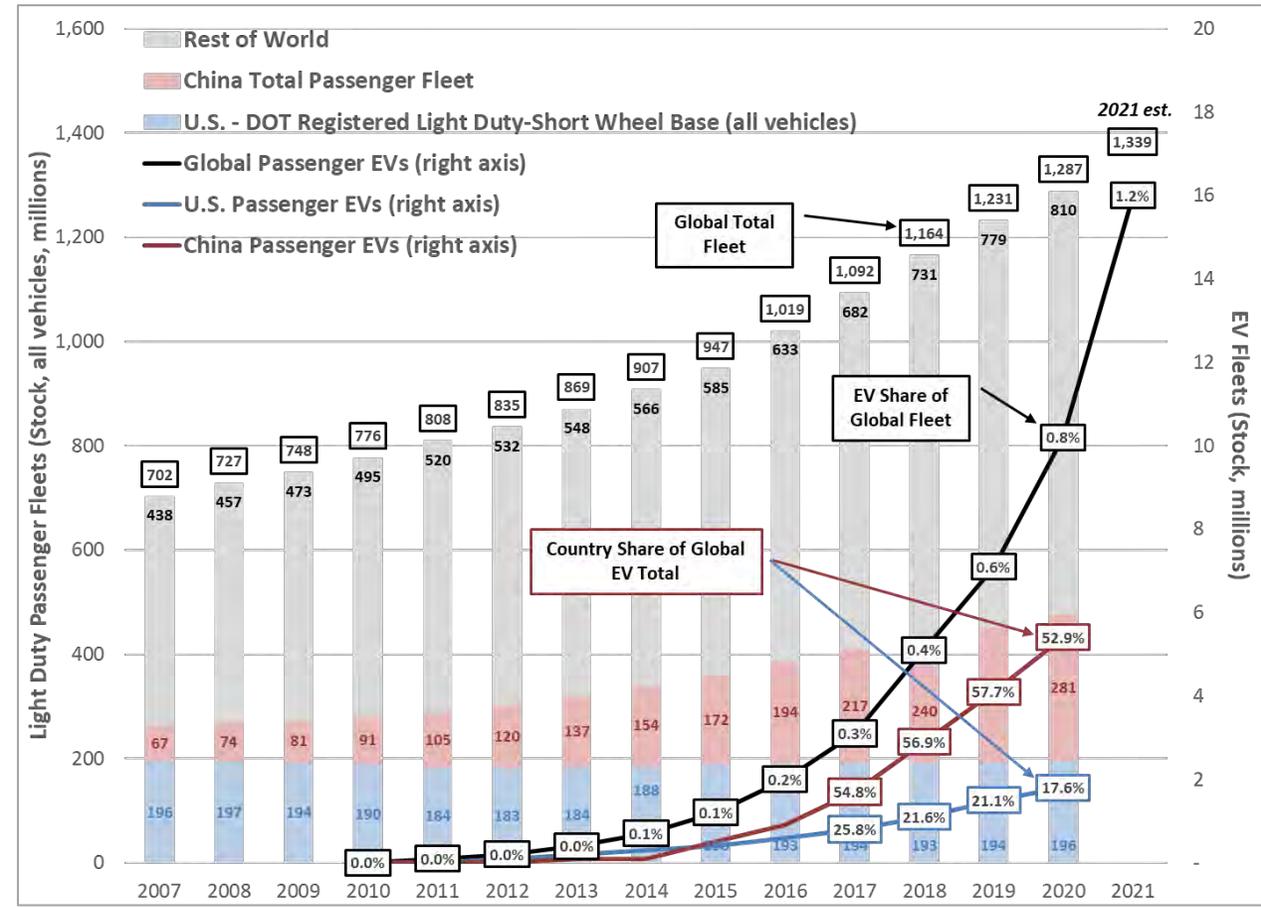
<https://www.bakerinstitute.org/research/need-nickel-how-electrifying-transport-and-chinese-investment-are-playing-out-indonesian-archipelago>

EVs in the (Speculative) Driver's Seat

Sales

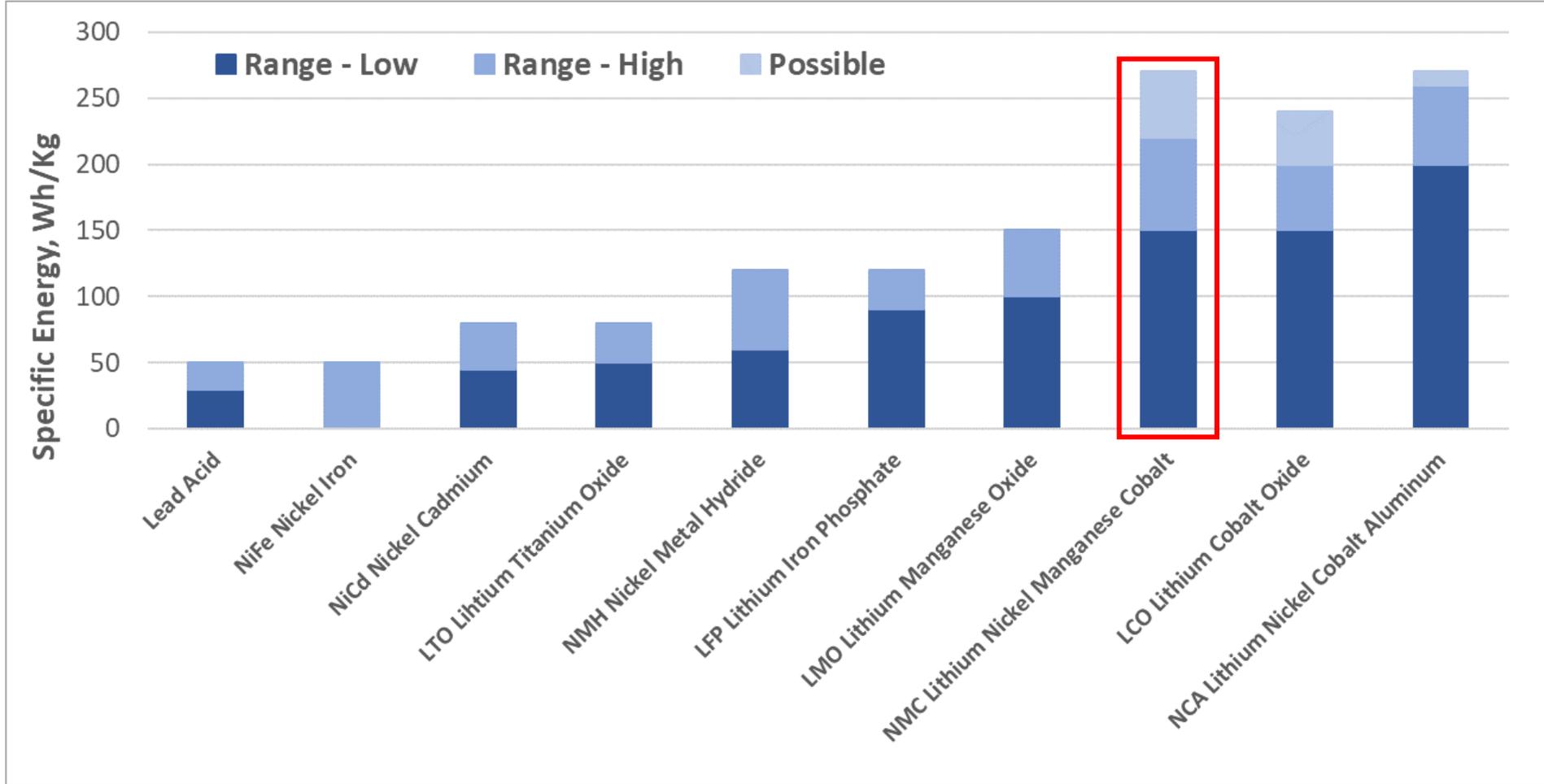


Fleet



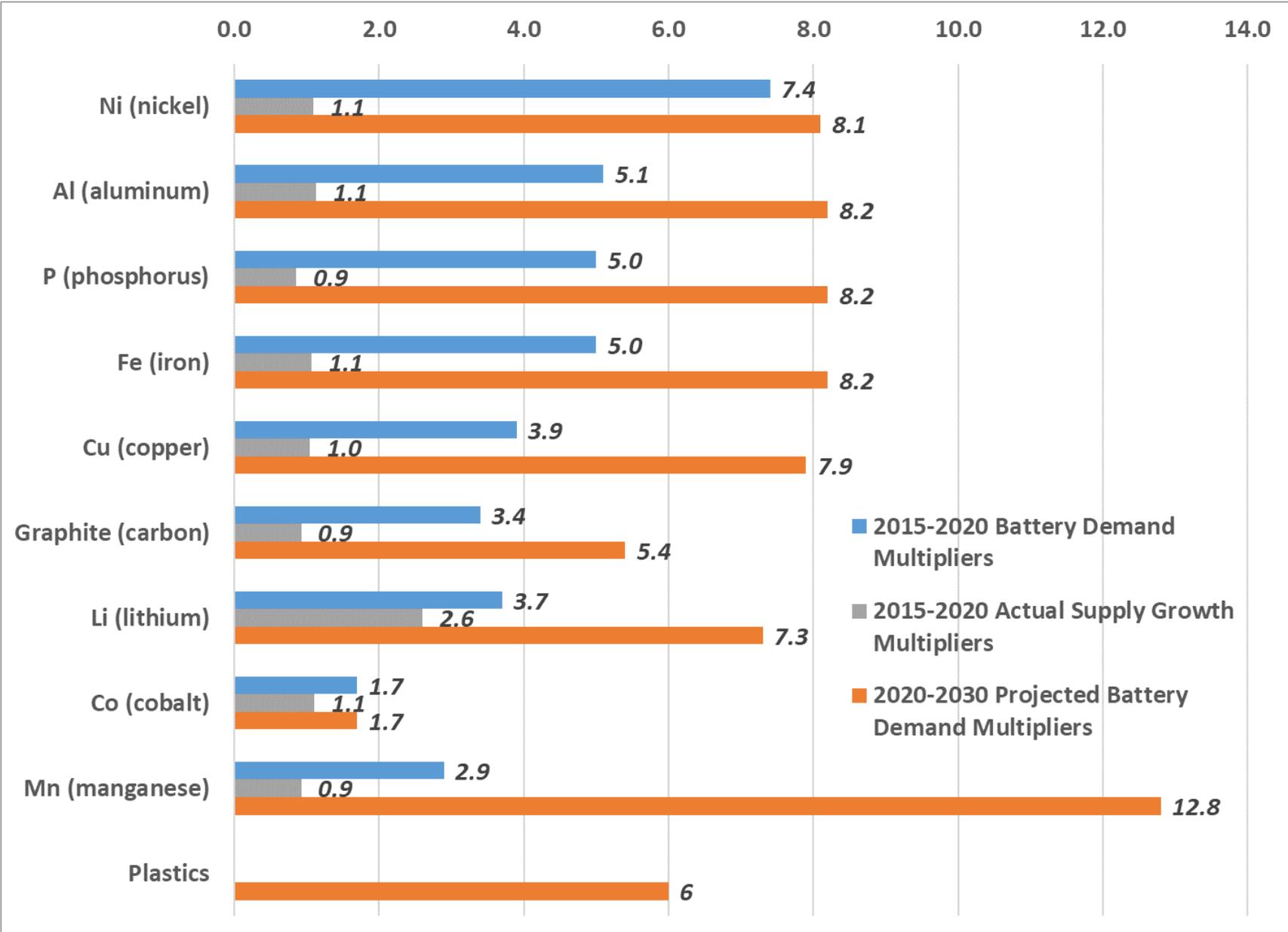
Commercial Battery Chemistries

**Gasoline =
~12,500 Wh/Kg**

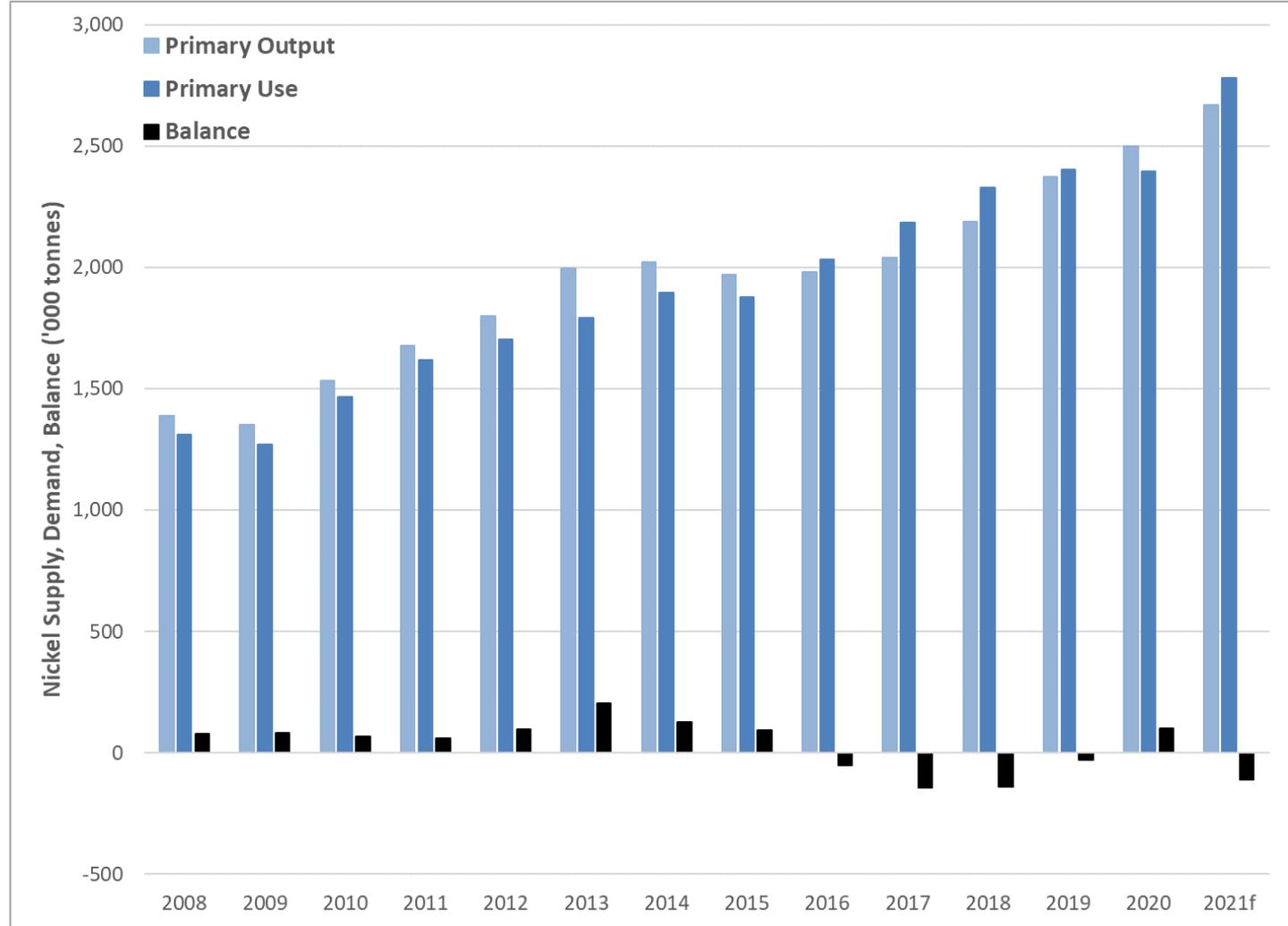


All of the Growth Fit to Print

Growth multipliers reflect demand growth ONLY from EV production.

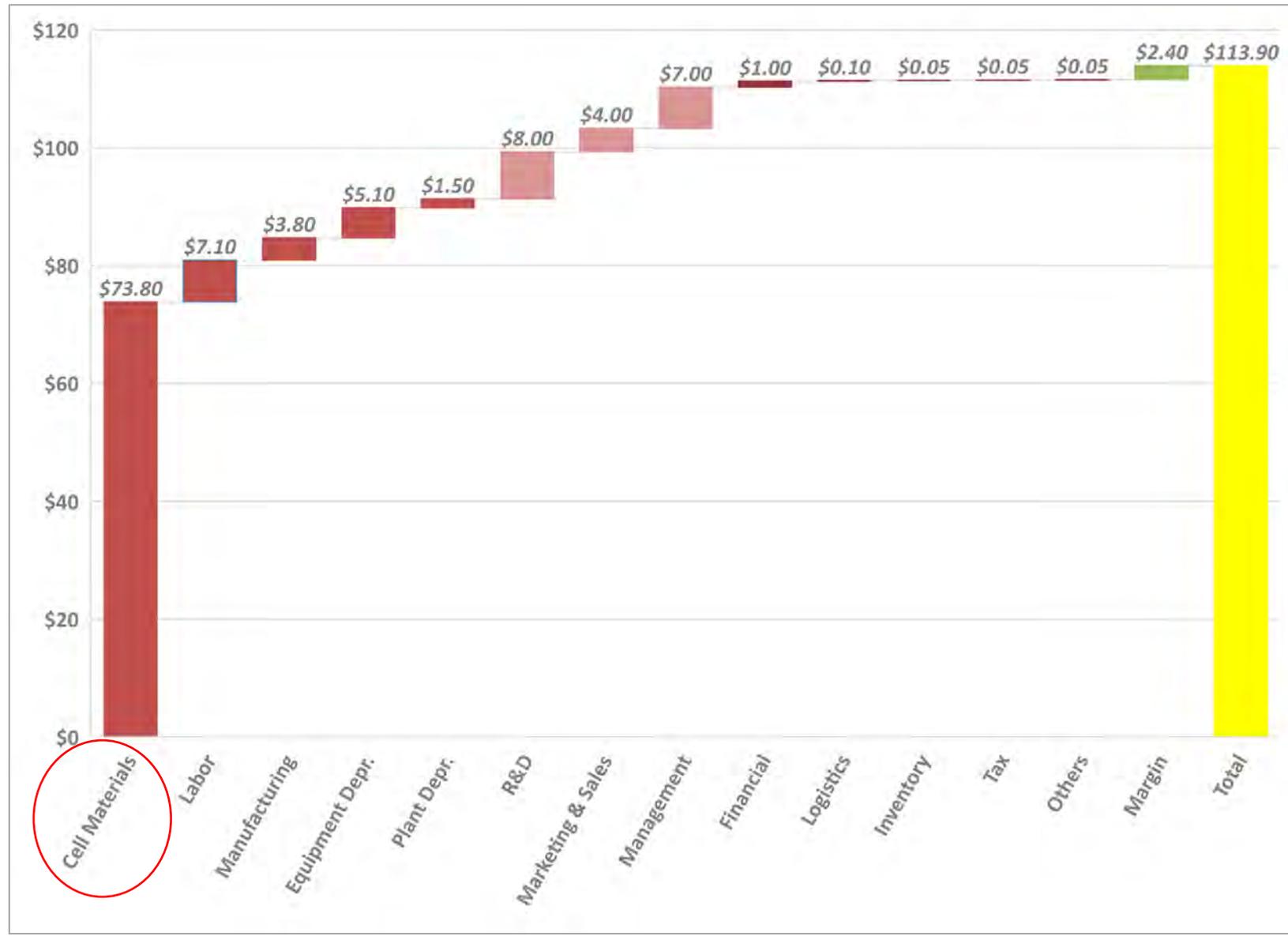


Tighter Balances



EV Supply Chain Begins Upstream

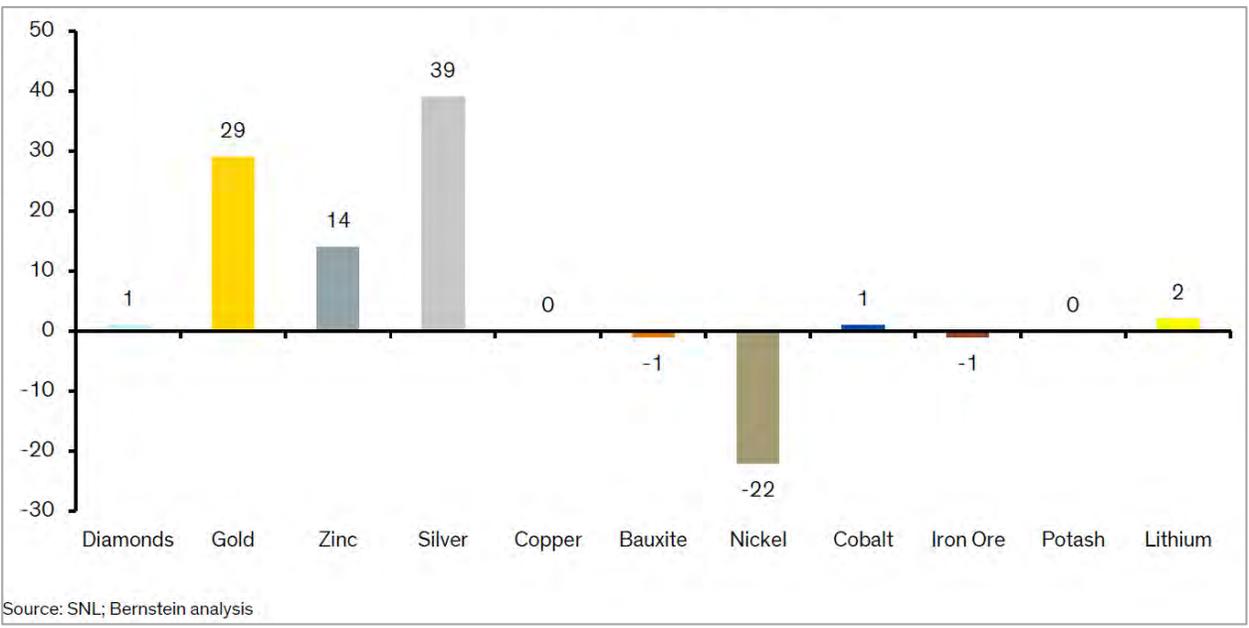
Upstream of cell materials are raw materials supply chains.



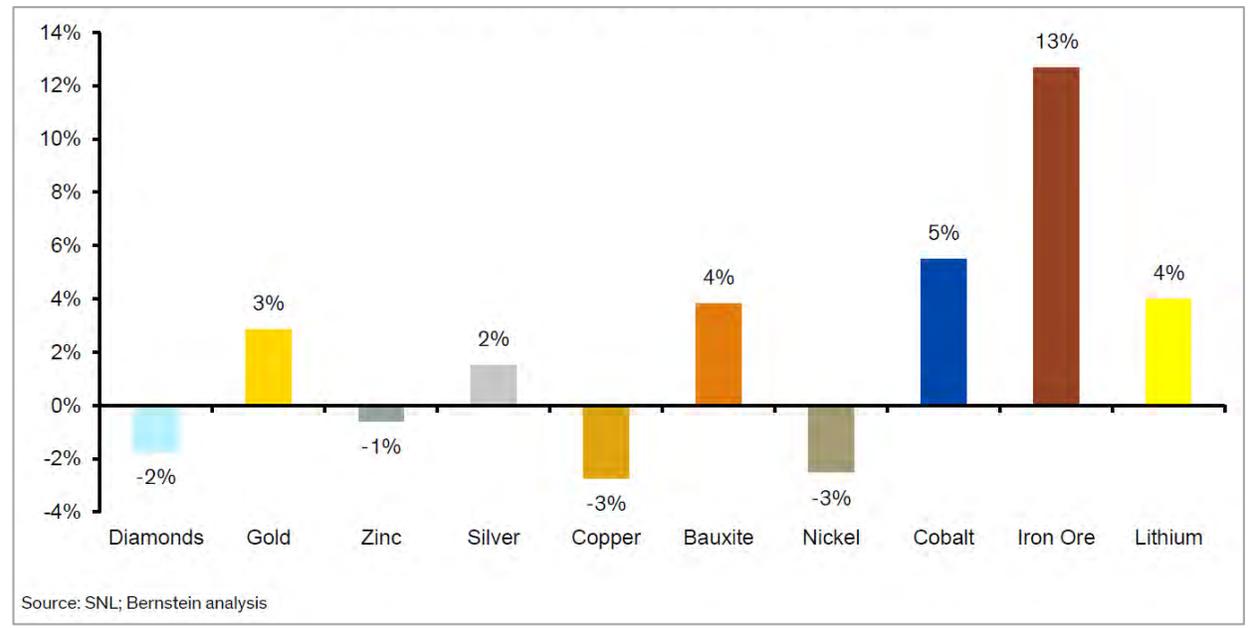
Mining is a tough business...

A Typical Pattern

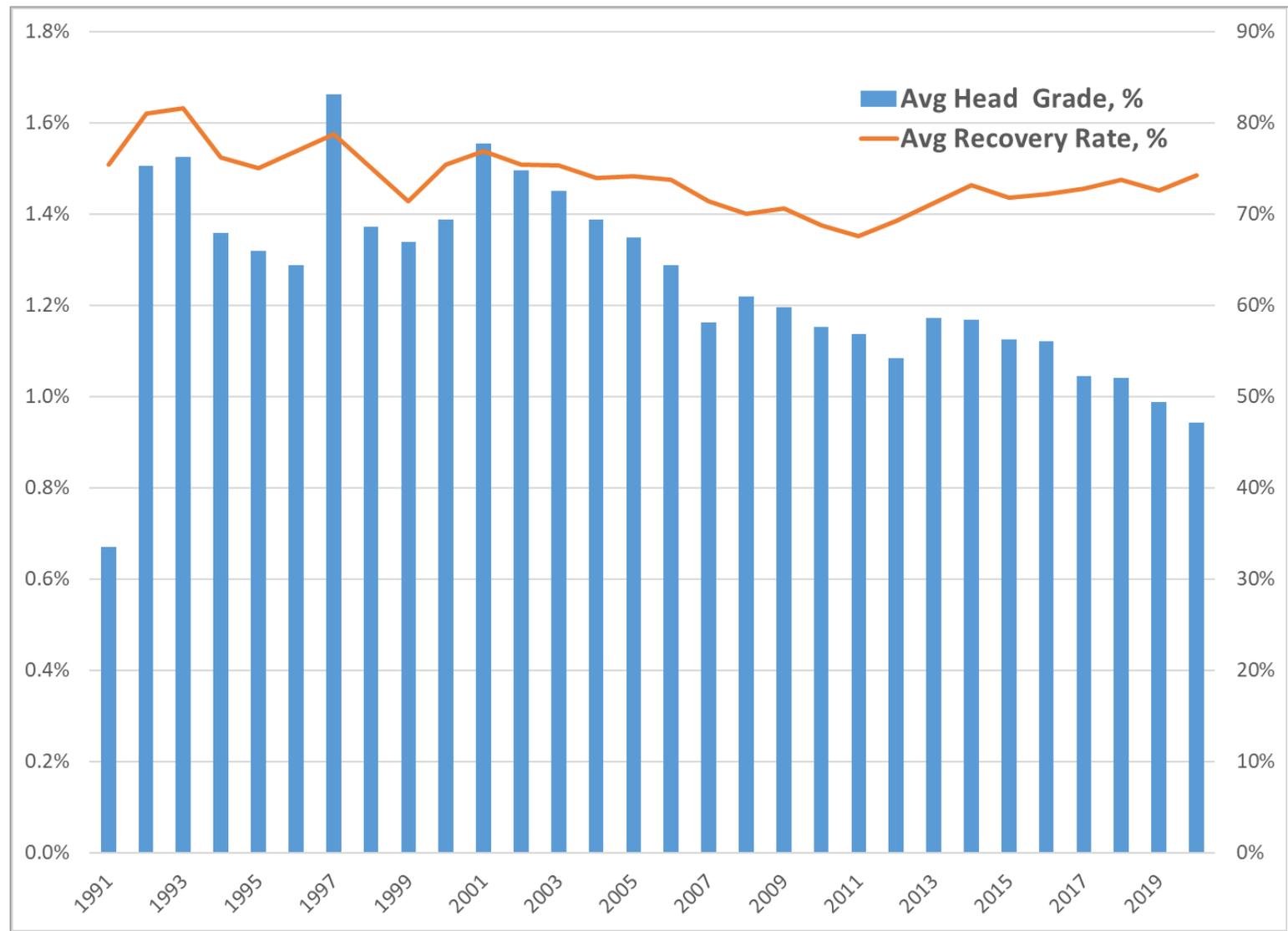
Change in Total Number of Projects Y-Y



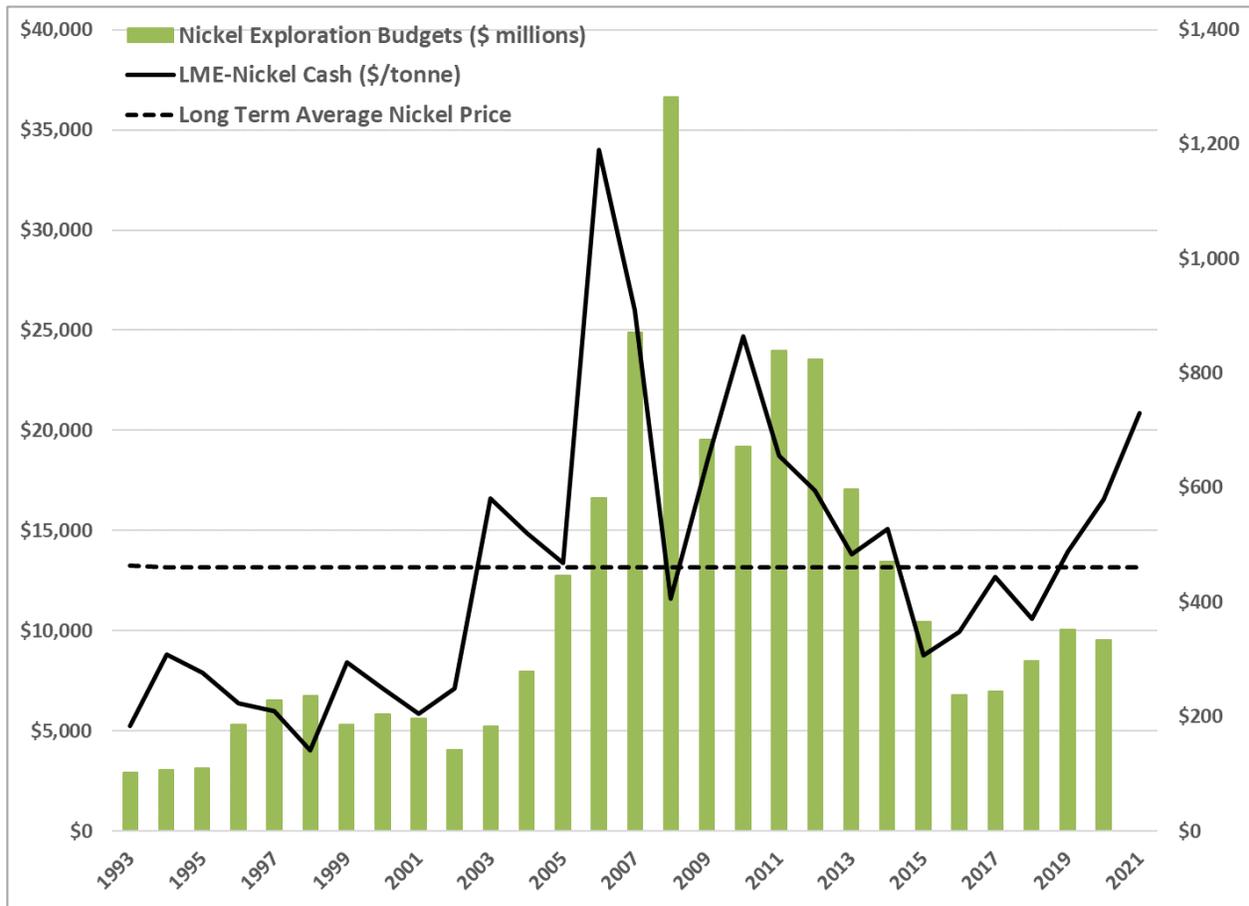
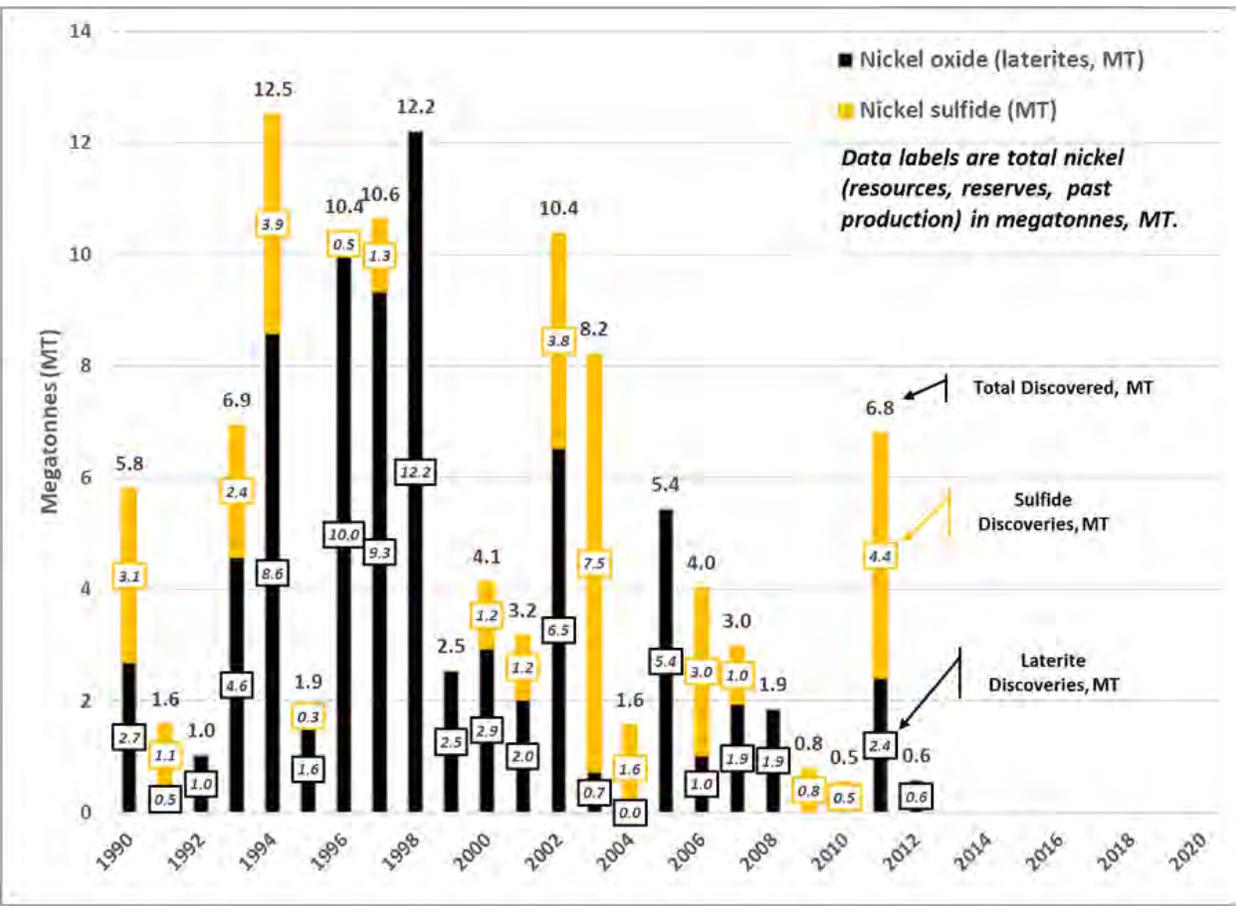
% Change in Reserves/Resource of All Projects



...anywhere...



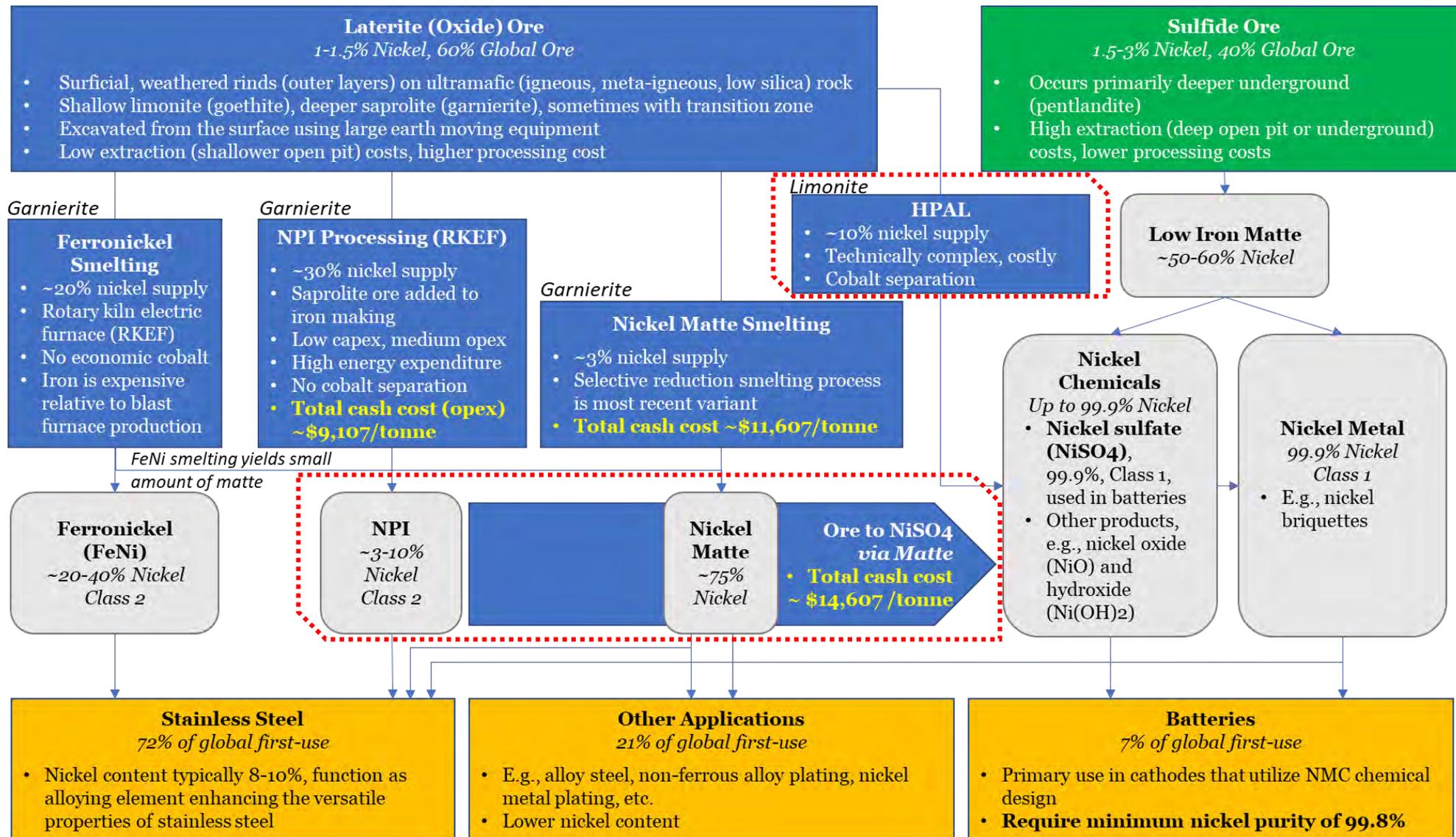
...at any price.



Generalized Nickel Processing Streams

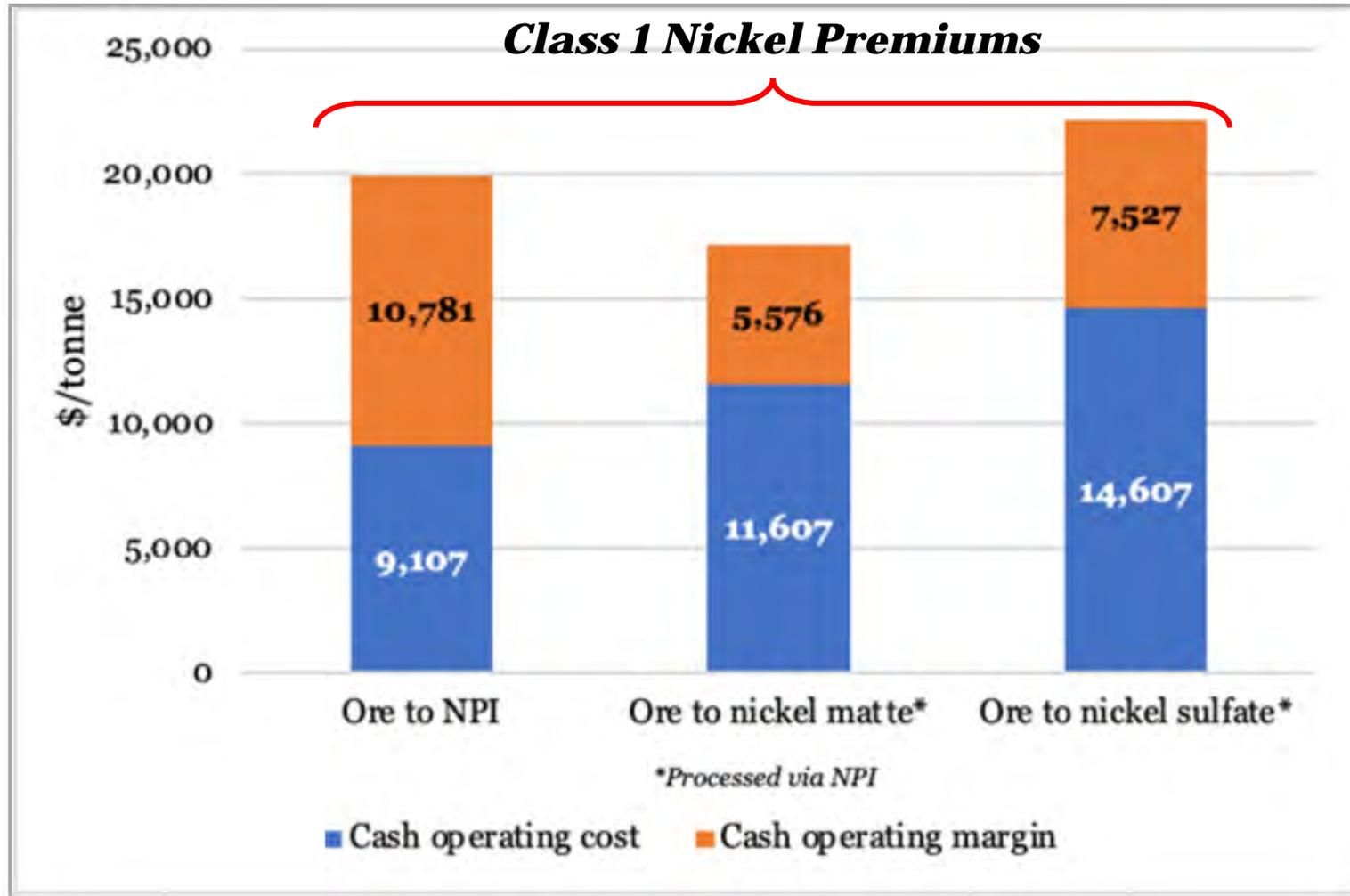
Note that sulfide ores typically are crushed, ground, floated to achieve concentrate and flash smelted to matte.

Red-dashed boxes capture strategies to process low-grade lateritic ores to battery grade nickel.



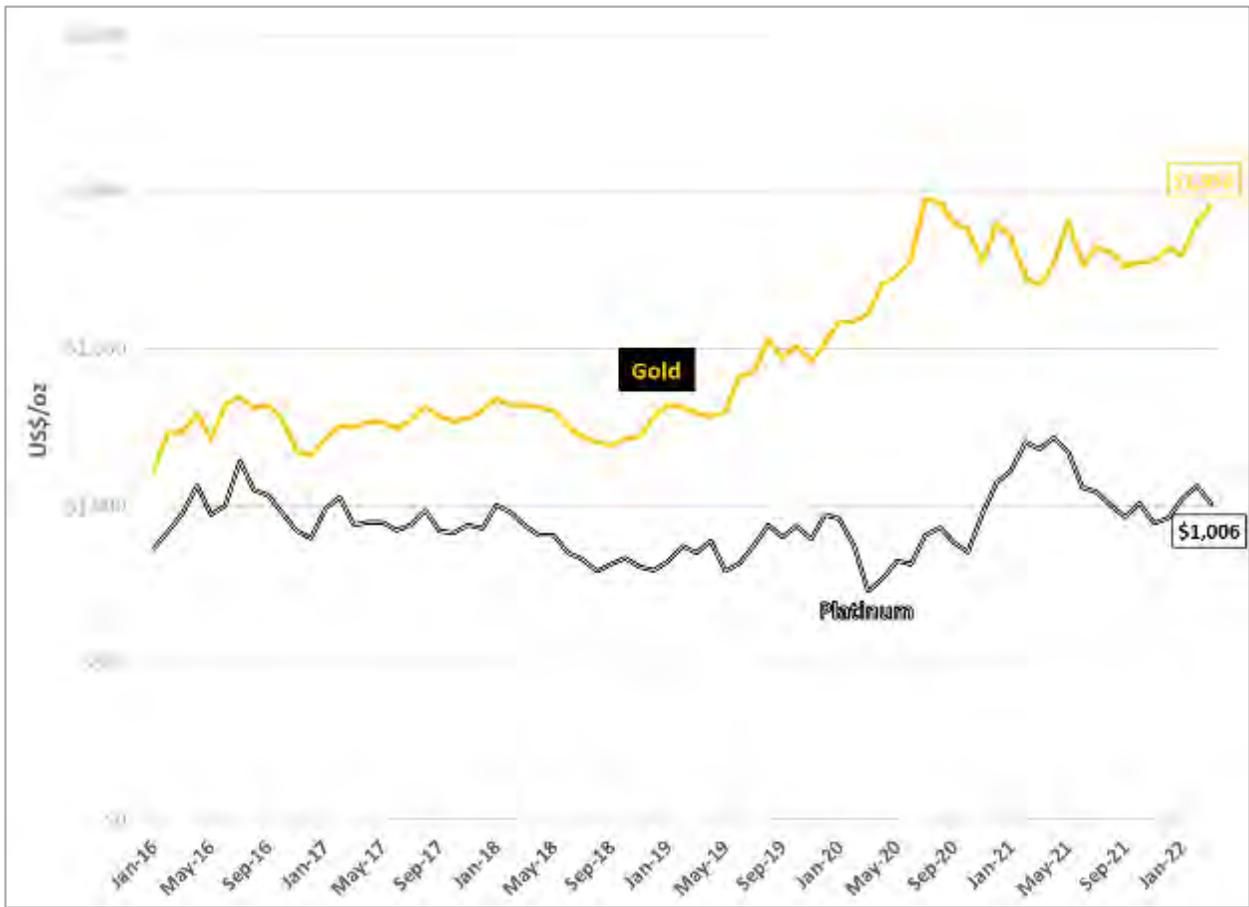
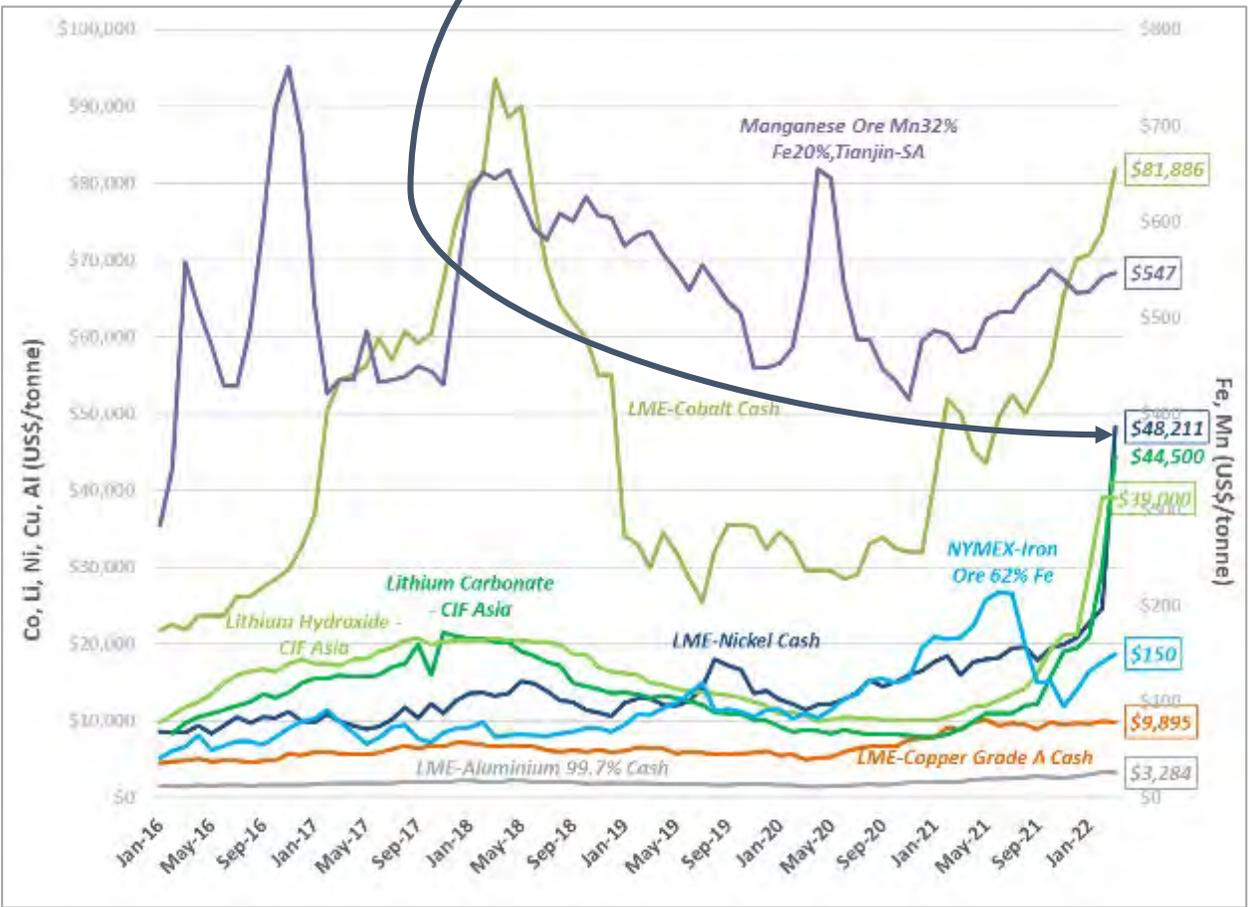
Sources: Mineral nomenclature from USGS, see endnote 4. UBS Research, from <https://www.kitco.com/commentaries/2018-09-13/Nickel-Laterite-s-Integral-Role-in-the-Coming-Nickel-Boom-Part-2.html>. For ore treatment processes, please see Monhemius, A. J., 1987, Treatment of Laterite Ores of Nickel to Produce Ferronickel, Matte or Precipitate, Imperial College, London, January, https://www.researchgate.net/publication/291165654_Treatment_of_laterite_ores_of_nickel_to_produce_ferronickel_matte_or_precipitated_sulphide and Davenport, W. and Moats, M., 2014, Nickel and Cobalt Production, Treatise on Process Metallurgy: Industrial Processes, <https://mail.google.com/mail/u/0/?tab=rm#inbox/FMfcqzGllVqqdbQTprVMRmTWrpNSRjfp?projector=1&messagePartId=0.4>. For processing costs, please see Sappor, J., 2021, Commodity Monthly – Nickel April 2021, S&P Global Market Intelligence, April, accessed via license. For global first-use figures, please see Nickel Institute, 2021, About Nickel and Its Applications, <https://nickelinstitute.org/about-nickel-and-its-applications/>.

Aspirations

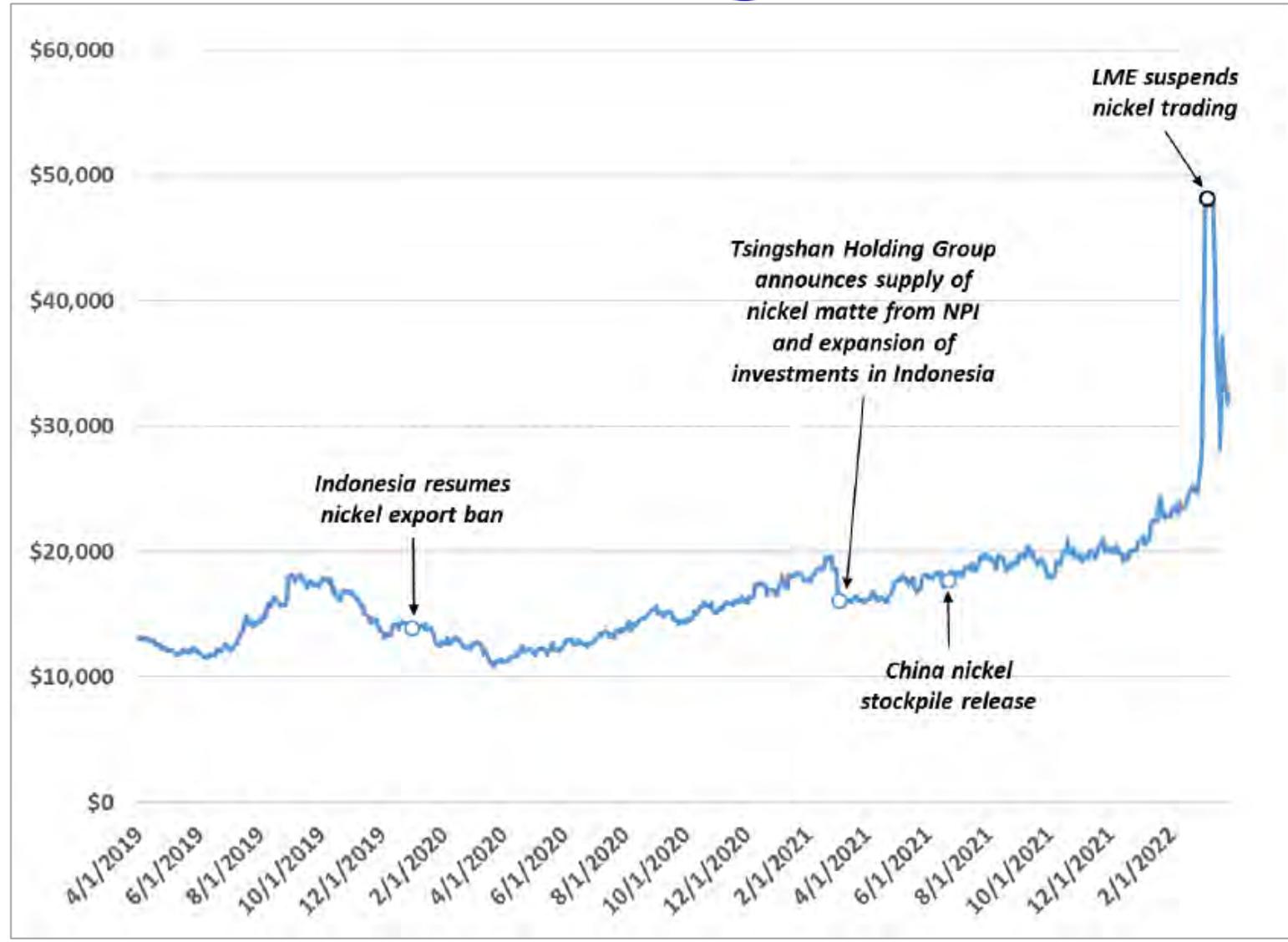


Volatility (Can be) Our Friend

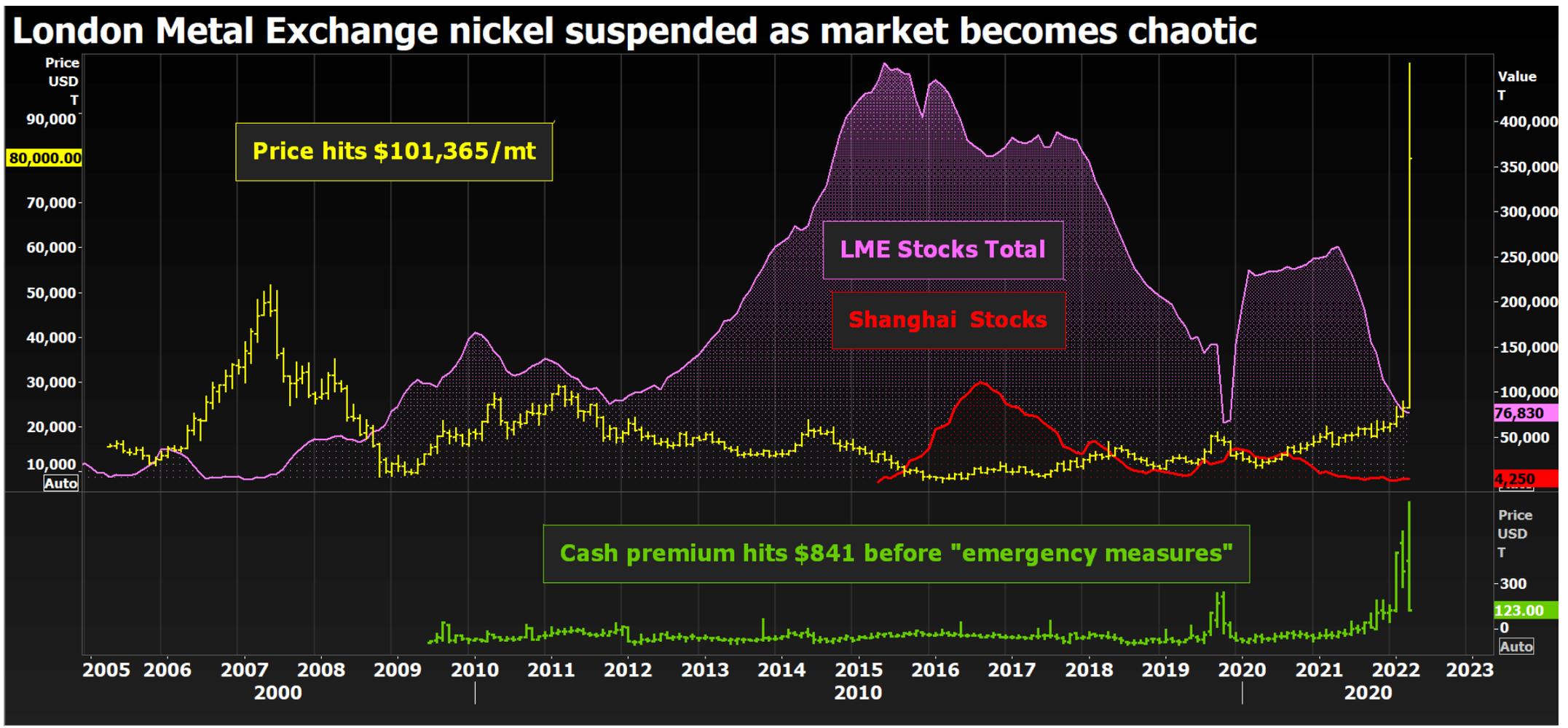
Nickel @ \$100,000/tonne (March 8, 2022) sez a lot.

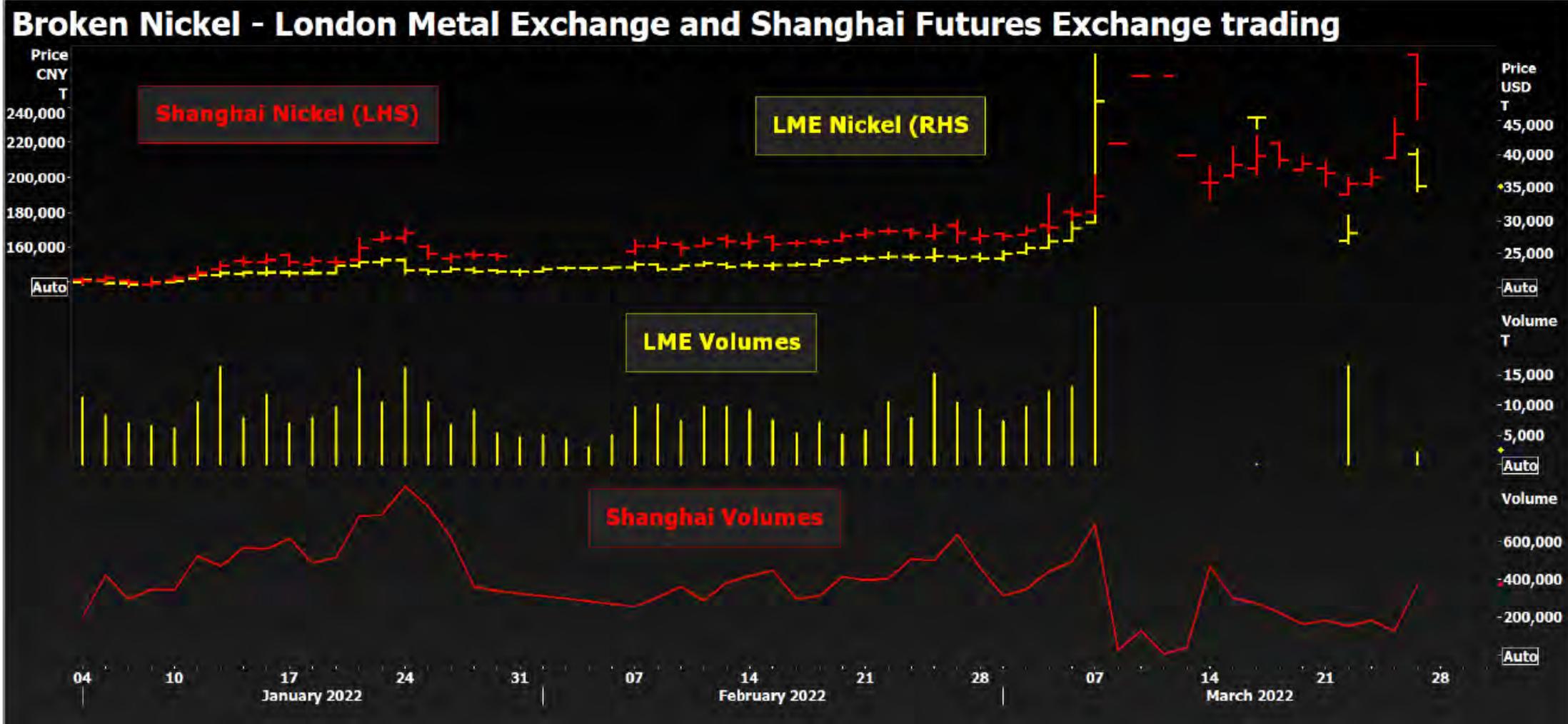


The LME Trading Adventures

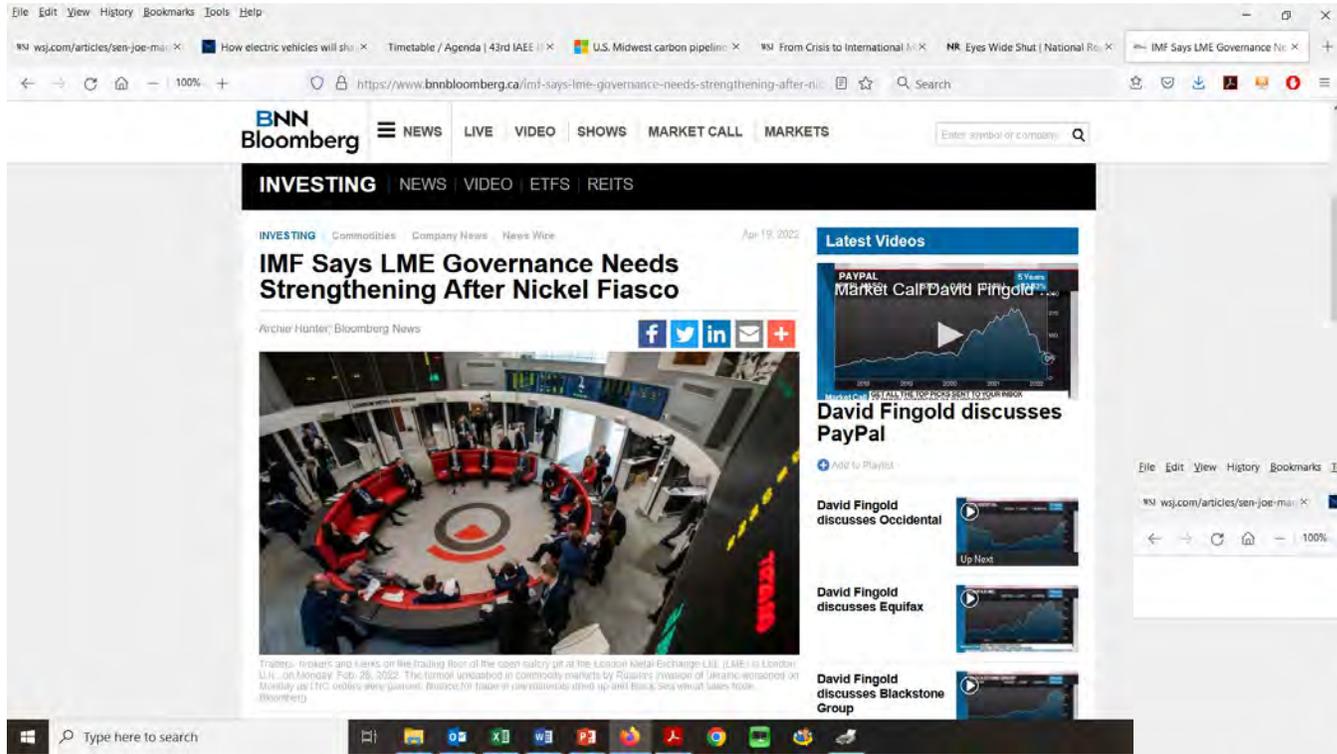


Price data extracted from SPG Market Intelligence, accessed via license.



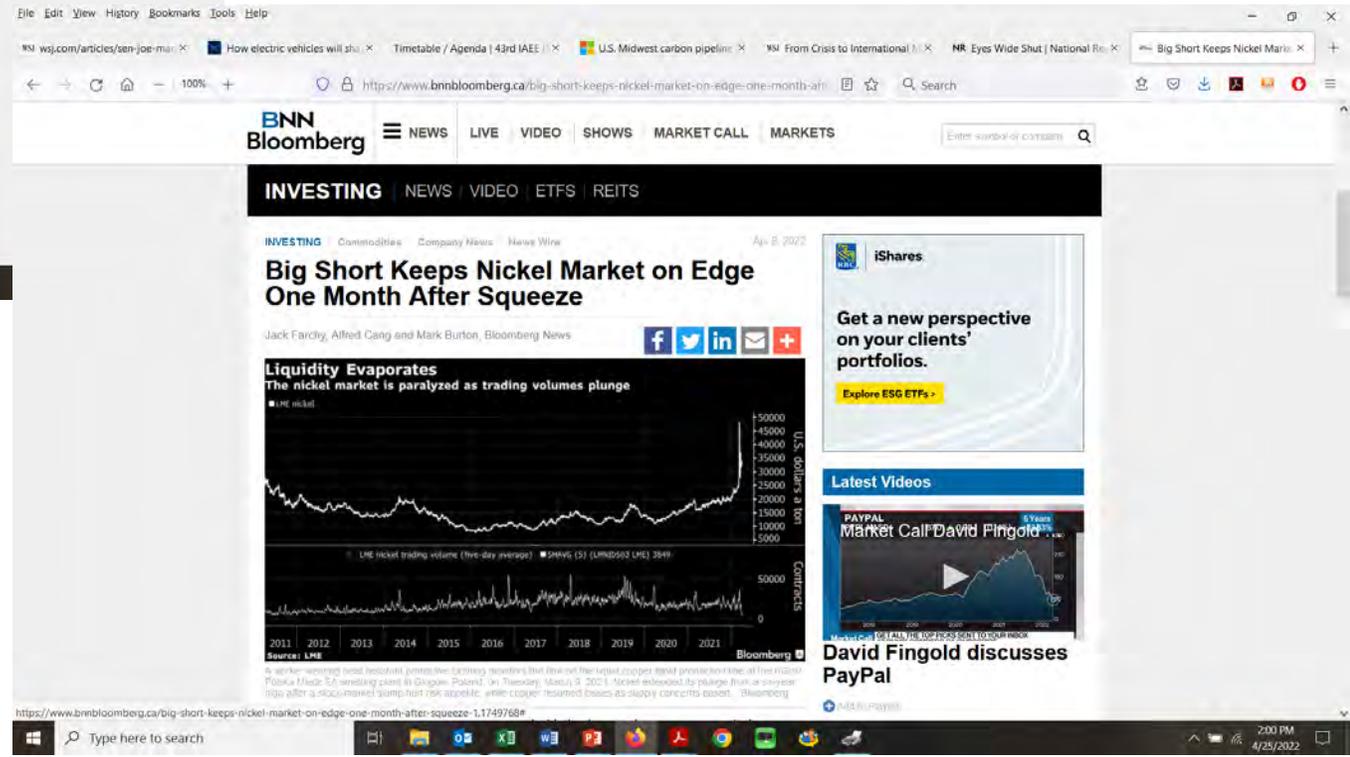


Repurcussions



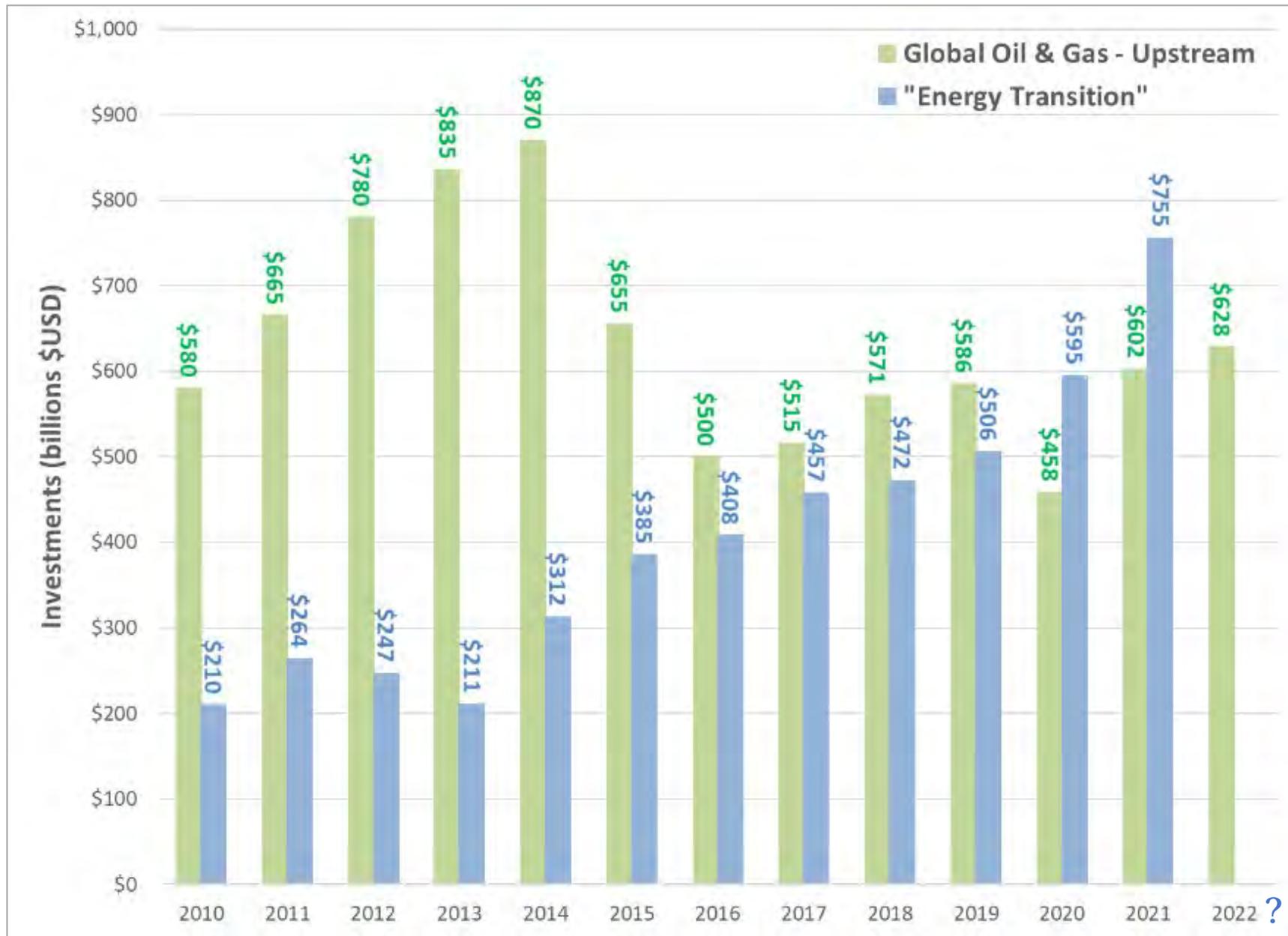
<https://www.bnnbloomberg.ca/imf-says-lme-governance-needs-strengthening-after-nickel-fiasco-1.1754035>

<https://www.bnnbloomberg.ca/big-short-keeps-nickel-market-on-edge-one-month-after-squeeze-1.1749768>

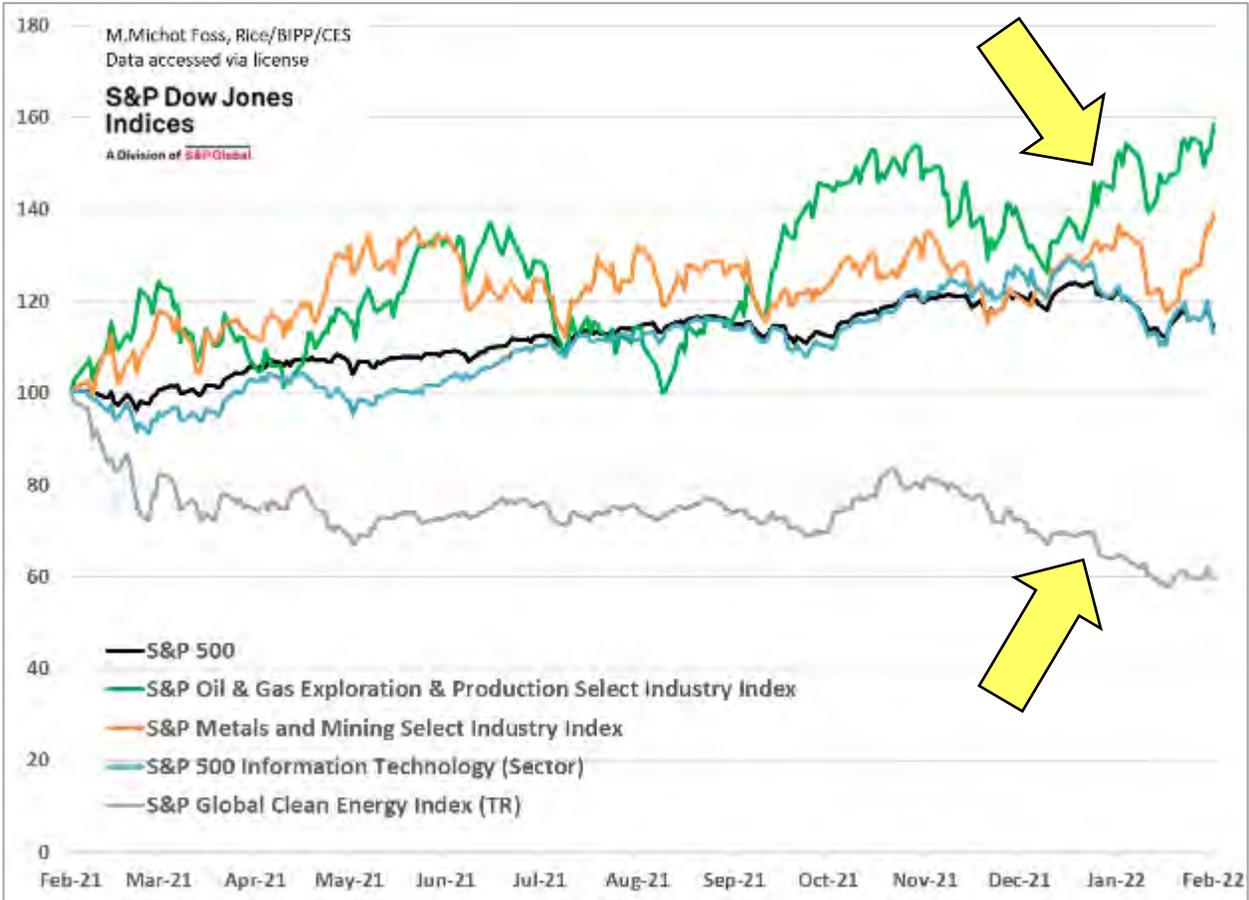


The lure of “green” investment...

Note: For 2021 about half of “ET” investment is wind, solar; more than one-third electrified transport. CCS was ~0.3% of ET investment.



...but what a difference a year makes.



A More Expensive World

