Concern over climate change, the drive towards energy efficiency and the adoption of carbon dioxide emissions targets by governments are all helping to increase interest in renewable energy technologies involving batteries and energy storage. While nickel is not always in the name, its presence in many battery technologies is helping to reduce greenhouse gas emissions - enabling clean energy solutions to be a central part of our effort to tackle global warming.

**NICKEL ENERGIZING BATTERIES**

Nickel plays a crucial role in lithium-ion battery chemistries used to power electric vehicles, medical devices and cordless power tools as well as store renewable energy.

**LI-ION BATTERIES**

**TODAY’S BATTERY OPTIONS**

Lithium compounds are combined with other materials in order to create Li-ion batteries. Two of the commonly used Li-ion battery chemistries contain nickel.

* NCA: Nickel Cobalt Aluminium
** NMC: Nickel Manganese Cobalt

**ADVANTAGES**

- LESS SPACE
- LONGER LIFE
- ENERGY STORAGE
- LIGHTER

**NICKEL-CONTAINING BATTERIES COME IN MANY CHEMISTRIES AND OFFER THE HIGHEST ENERGY DENSITY ON THE MARKET**

![Graph showing energy density comparison between non-nickel-containing and nickel-containing batteries](graph.png)
The lithium ion battery sector will continue to grow in response to the strong demand for battery powered products. In particular, demand for energy-dense nickel-containing batteries will increase for applications such as electric vehicles and renewable energy storage. Currently 39% of Li-ion batteries contain nickel. This is expected to rise to around 58% by 2025.

Sources:
- Nickel Institute Member companies
- Roskill
- International Nickel Study Group, Nickel in batteries, 2015
- http://batteryuniversity.com/

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NICKEL IS PART OF THE SOLUTION FOR A MORE SUSTAINABLE SOCIETY
Nickel in the battery provides higher energy density and storage at lower cost. And crucially it contributes to a longer drive range. New battery developments are helping to make each kWh of battery storage more cost competitive so that intermittent renewable energy sources such as wind and solar can replace fossil fuels for energy production.

"Our cells should be called Nickel-Graphite, because primarily the cathode is nickel and the anode side is graphite with silicon oxide... [there's] a little bit of lithium in there, but it's like the salt on the salad" - Elon Musk, CEO Tesla