

Lithium: Western Australia's drive to green energy technologies



▲ Lithium (Li) metal with a thin layer of dark nitride tarnish, lithium as a source of electric energy, and its position in the periodic table of elements

This StoryMap is the latest release in a series published by the Geological Survey of Western Australia (GSWA). It focuses on the use of lithium (Li) in Western Australia's drive to transition to clean energy technologies.

In view of the current climate crisis, lithium plays a vital role in the global efforts to limit the rise in the global average temperature to 1.5°C. The unique chemical properties of lithium make it an invaluable component for energy storage systems. At the heart of this technology are Li-ion batteries, which have become indispensable in the area of portable electronics, electric vehicles (EVs) and grid-scale energy storage.

With lithium becoming the driving force behind EVs, by 2030 batteries will account for 95% of the global lithium demand, with the total global demand annually increasing by about 25%.

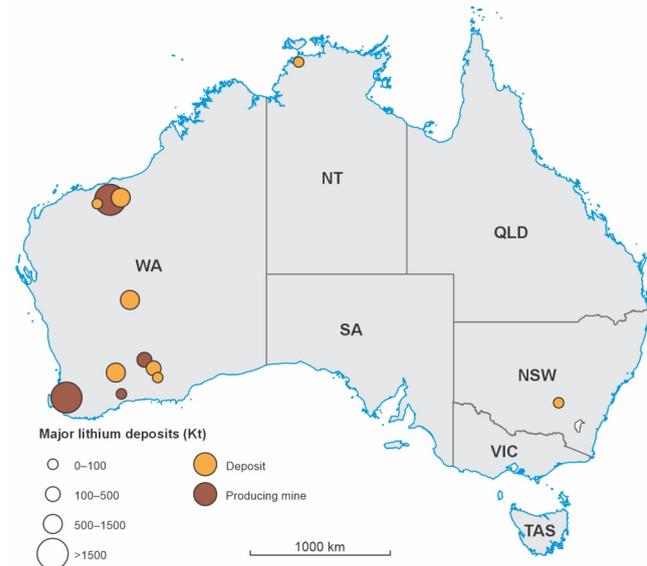
Currently, almost all lithium mining takes place in Australia, South America and China. In 2020, 98% of the globally produced lithium originated from these regions, with Australia accounting for almost 47%, and more than 99% of the country's lithium exports originating from mines in Western Australia.

This StoryMap discusses the various aspects of lithium in a more general context and emphasises on Western Australia's role as a major supplier of lithium to the world, covering the following sections:

- Properties of lithium
- Discovery and history of lithium
- Uses and projected global demand of lithium
- Lithium resources in the world
- Continental brines and hard-rock deposits as sources of lithium
- Efficiency of lithium mining: continental brines versus hard-rock deposits
- Lithium resources in Australia and Western Australia
- Lithium mining and exploration in Western Australia
- The future of lithium mining in Western Australia.



▲ Lithium-bearing minerals (from top left to bottom right): spodumene; lepidolite; petalite; amblygonite and eucryptite



▲ Major lithium deposits in metric kilo tonnes (Mkt) in Australia as of March 2023



▲ Electric vehicle (EV) being recharged

In view of a projected increase in lithium batteries for the global passenger EV market, backed by strong government support for the exploration of lithium, Western Australia faces a bright future in this continuing lithium boom, with the value of the State's lithium resources expected to be soon worth more than its oil, gas and coal resources combined.

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