



Raw Material Uncertainties for Rechargeable Batteries: UNCTAD

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Why in News

Recently, the **United Nations Conference on Trade and Development** (UNCTAD) released a report '**Commodities at a glance: Special issue on strategic battery and minerals**'.

The report facilitated **research into battery technologies** that depended less on critical raw materials and had the potential to provide **higher energy density**.

Energy density is the amount of energy that can be stored in a given mass of a substance or system, i.e. a **measure of storage of energy**.

Key Points

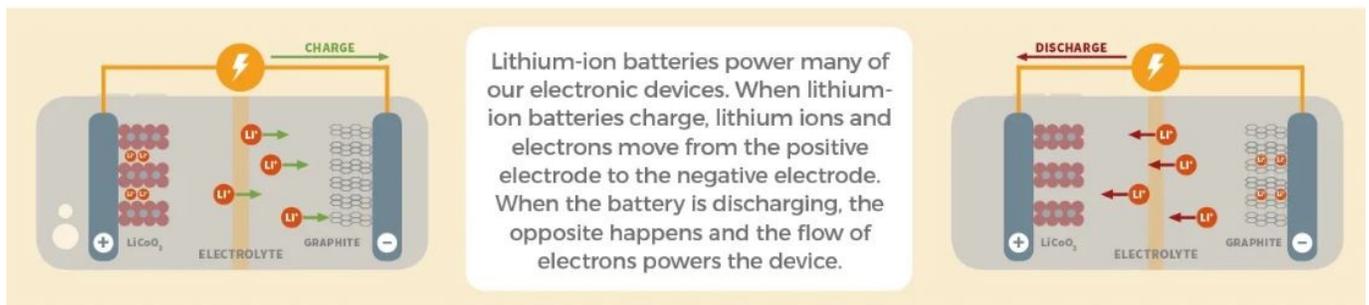
- **Uncertain Supply:** The report highlighted that the **supply of raw materials to produce rechargeable batteries is uncertain**.
 - Lithium, natural graphite** and **manganese** are critical raw materials for the manufacture of rechargeable batteries.
- **Rising Demand:**
 - **Integration of EVs:** There has been a **rapid growth in demand for rechargeable batteries** due to the gradual integration of **electric vehicles** (EVs) in global transportation.
 - The sales of electric cars have increased by 65% in 2018 from 2017 to 5.1 million vehicles and it will reach 23 million in 2030.
 - **Increased Use of Raw Material:** With the increasing number of EVs, the **demand for rechargeable batteries and the raw materials used** in them have also **increased**.
 - The worldwide market for cathodes for **lithium-ion batteries** was estimated at \$7 billion in 2018 and is expected to reach \$58.8 billion by 2024.
 - The **demand for raw materials** used to manufacture rechargeable batteries will **grow rapidly** as **other sources of energy lose their importance**.

- **Concerns:**

- **Limited Suppliers:** The **security of supplies** is a concern for all stakeholders because the **production of the raw materials is concentrated in a few countries.**
 - Over **60% of the world's Cobalt** is mined in the **Democratic Republic of the Congo** while over **75% of global Lithium is mined in Australia and Chile.**
- **Prone of Volatility:** Any disruption to supply might lead to **tighter markets, higher prices and increased costs** of rechargeable batteries.
 - In 2018, the demand for cobalt surged by 25% from 2017 to 125,000 tonnes, of which 9% accounted for the EV battery sector.
 - Cobalt demand would reach 185,000 tonnes by 2023, with about 35% accounting for the EV battery sector, the report said.
 - Growth in demand for lithium had been significant since 2015, increasing by 13% per year.

Li-ion Batteries

- A lithium-ion battery or Li-ion battery is a **type of rechargeable battery.**
- Li-ion batteries use an **intercalated** (Intercalation is the reversible inclusion or insertion of a molecule into materials with layered structures) **lithium compound** as one electrode material, compared to the metallic lithium used in a non-rechargeable lithium battery.
- The battery **consists of electrolyte**, which allows for ionic movement and the two electrodes are the constituent components of a lithium-ion battery cell.
- Lithium ions move from the negative electrode to the positive electrode during discharge and back when charging.
- They are **one of the most popular types of rechargeable batteries used for military, EVs and aerospace applications.**



Way Forward

- Alternative sources of energy such as electric batteries are becoming more important as investors become sceptical of the future of the oil industry.
- There is a need to make a strategy for dynamic monitoring of the raw material cycles, from mining through processing, refining and manufacturing to recycling.
- It will facilitate early detection of supply risks and also enable the development of mitigation strategies at either company or national level.

Source: DTE