

6. Li-ion Batteries

Prelims Level: Newer Invention

Mains Level: GS-III Science and Technology - developments and their applications and effects in everyday life Achievements of Indians in Science & Technology; Indigenization of Technology and developing New Technology.

Why in News?

- Recently, India has quadrupled its imports of lithium-ion (Li-ion) batteries.

Key Points:

- Indian manufacturers source Li-ion batteries from China, Japan and South Korea.
- India is the largest importers in the world. China dominates the LI-ion batteries market.
- Indian Space Research Organisation (ISRO) manufactures such batteries but volumes are limited and they are restricted for use in space application.
- To promote indigenous development of such batteries, the union Cabinet in 2019 approved a programme called **National Mission on Transformative Mobility and Battery Storage**, under the NITI Aayog.

About National Mission on Transformative Mobility and Storage:

- The Mission will have an Inter-Ministerial Steering Committee chaired by Chief Executive Officer (CEO), NITI Aayog to promote clean, connected, shared, sustainable and holistic mobility initiatives.
- The Mission will launch the Phased Manufacturing Programmes (PMP) for Batteries and for Electric Vehicle components.

About Li-ion Battery:

- A lithium-ion battery or Li-ion battery (abbreviated as LIB) is a type of rechargeable battery.
- It is commonly used for portable electronics and electric vehicles and are growing in popularity for military and aerospace applications.
- It is the lightest metal on the periodic table, and the one most willing to donate its electrons (The Most Powerful Reducing Agent).
- From portable electronics like the smartphone to high performance electric cars like the Tesla Model S, lithium ion batteries are currently the most promising chemistry on the market for meeting our renewable energy storage needs.

Advantages of Lithium Ion Batteries:

- High energy density – potential for yet higher capacities.
- Does not need prolonged priming when new. One regular charge is all that's needed.
- Relatively low self-discharge – self-discharge is less than half that of nickel-based batteries.
- Low Maintenance – no periodic discharge is needed; there is no memory.
- Specialty cells can provide very high current to applications such as power tools.

