



## Green Nickel

**Source:** [TH](#)

A new **hydrogen plasma**-based method for **nickel extraction** promises a breakthrough in **green metallurgy** by cutting **CO<sub>2</sub> emissions by 84%** and improving **energy efficiency by 18%**.

- This breakthrough is vital as **nickel**, essential for **clean tech like EV batteries (demand >6 million tonnes/year by 2040)**, currently emits **>20 tonnes of CO<sub>2</sub> per tonne**, offsetting EVs' environmental benefits.
- **About Nickel:** Nickel is a **silvery-white metallic element**, the **5th-most common on Earth**, found widely in the **crust (80 ppm)** and forming a major part of the **Earth's core as a nickel-iron alloy**. It also occurs in **meteorites, soil, and water**, and is an **essential nutrient for plants**.
  - **Features:** **Corrosion resistance**, High-temperature stability, Strength, Ductility, Toughness, **Recyclability**, and Catalytic and **electromagnetic properties**.
  - **Reserves:** **Australia, United States, Brazil, Canada**, and China have the largest global nickel reserves.
    - In India, **nickel occurs in lateritic deposits of Sukinda Valley, Odisha**, but is **not produced from primary sources**.
      - Nickel is also found in **sulphide form alongside copper mineralization** in the **East Singhbhum** district of Jharkhand.
    - The entire demand is met through **imports**, with limited recovery as **nickel sulphate by-product** at **HCL's Ghatsila copper smelter** in Jharkhand.
  - **Ores:** **Ores of Nickel** is grouped into their two major categories i.e., **sulphide ores** and **laterite ores**.
    - **Sulphide Ores:** **Pentlandite**, **Millerite** and **Gersdorffite**.
    - **Laterite Ores:** **Garnierite**, **Nickeliferous limonite** and **Saprolite**.
  - **Applications:** **Stainless steel production**, **Rechargeable batteries** (e.g., **lithium-ion batteries** for EVs), **Alloys** (e.g., **aerospace**), **Electroplating**, **coinage**, and **catalysts** in chemical industries.
- Nickel is listed among **India's 30 critical minerals**, alongside others like **Bismuth, Cobalt, Copper, Gallium, Germanium, and Graphite**.

**Read More:** [National Critical Mineral Mission](#)

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