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News: Coking Coal

- Recently, a NITI Aayog report titled ‘Enhancing Domestic Coking Coal Availability to reduce the import of Coking Coal’ advocated coking coal to be included in the list of critical minerals.

Coking Coal

- Coking Coal (or Metallurgical coal) is a **naturally occurring sedimentary rock found within the earth’s crust.**
- It **encompasses a wide range of quality grades including hard coking coal, semi-hard coking-coal, and semi-soft coking coal. All are used to make steel.**
- Coking coal **typically contains more carbon, less ash and less moisture than thermal coal, which is used for electricity generation.**
- India is the **largest importer of coking coal** in the world.
- **Formation of Coke:** Coking coal is **heated in the absence of air in coke ovens to produce coke, a porous, carbon-rich material.**
- This process, called coking, **removes volatile compounds from the coal, making the coke suitable for use in the blast furnace.**

Role in Steelmaking

- **Fuel:** Coke burns at high temperatures (around 1,000°C to 1,200°C) to produce carbon monoxide (CO), which is used to reduce iron ore (Fe_2O_3) into molten iron.
- **Reducing Agent:** Carbon monoxide (CO) reacts with iron ore in the blast furnace to reduce iron oxide (Fe_2O_3) into iron (Fe).
- **Coking Coal Production:** The largest producers of coking coal in 2022 were China (62%), Australia (15%), Russia (9%), USA (5%) and Canada (3%).
- **Strategic Importance:** Steel is cited as a strategic material in all industries related to the low-carbon transition.
- About 780 kg of coking coal is needed to produce 1 ton of steel.
- **By-Products of Coke Production:** By-products such as tar, benzole, ammonia sulphate, sulphur, and coke oven gas are used in chemical manufacturing and for heat/power generation.