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Importance of Critical Minerals to American Innovation

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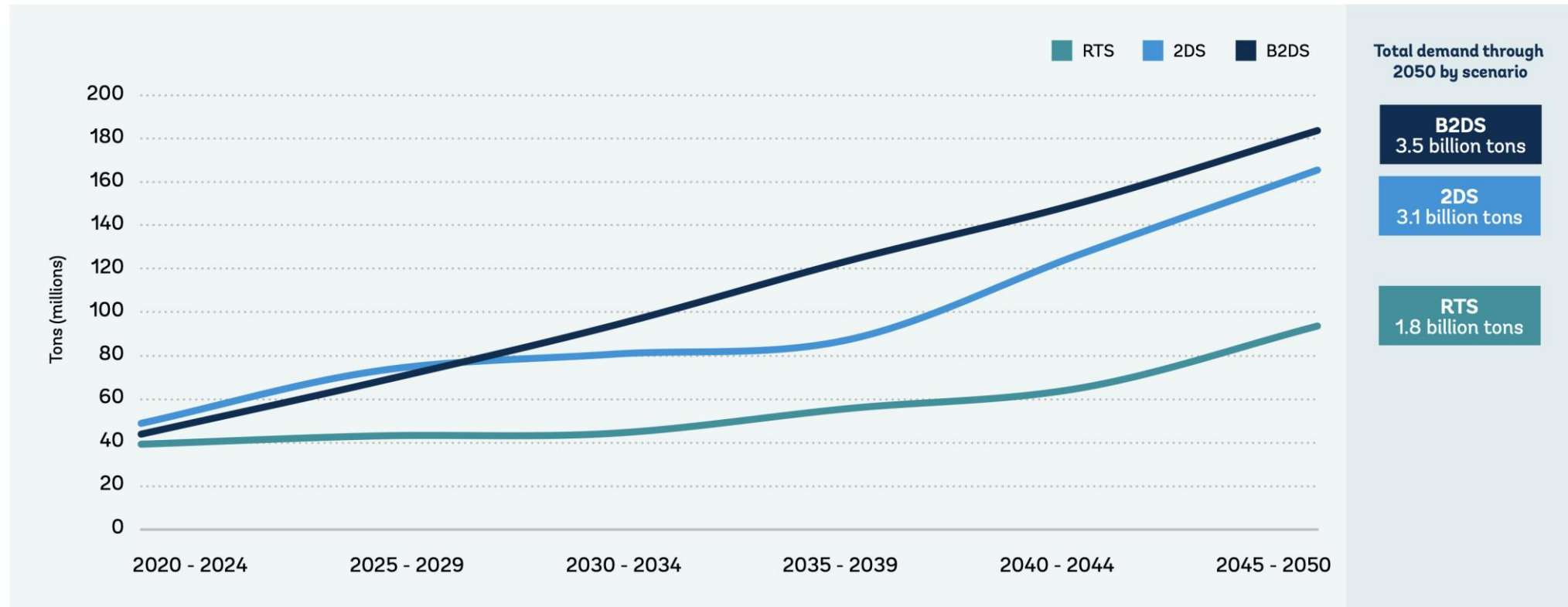
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Critical minerals are important for climate mitigation.

Figure ES.1 Projected Annual Average Demand of Minerals up to 2050 Under the IEA Energy Technology Perspective Scenarios



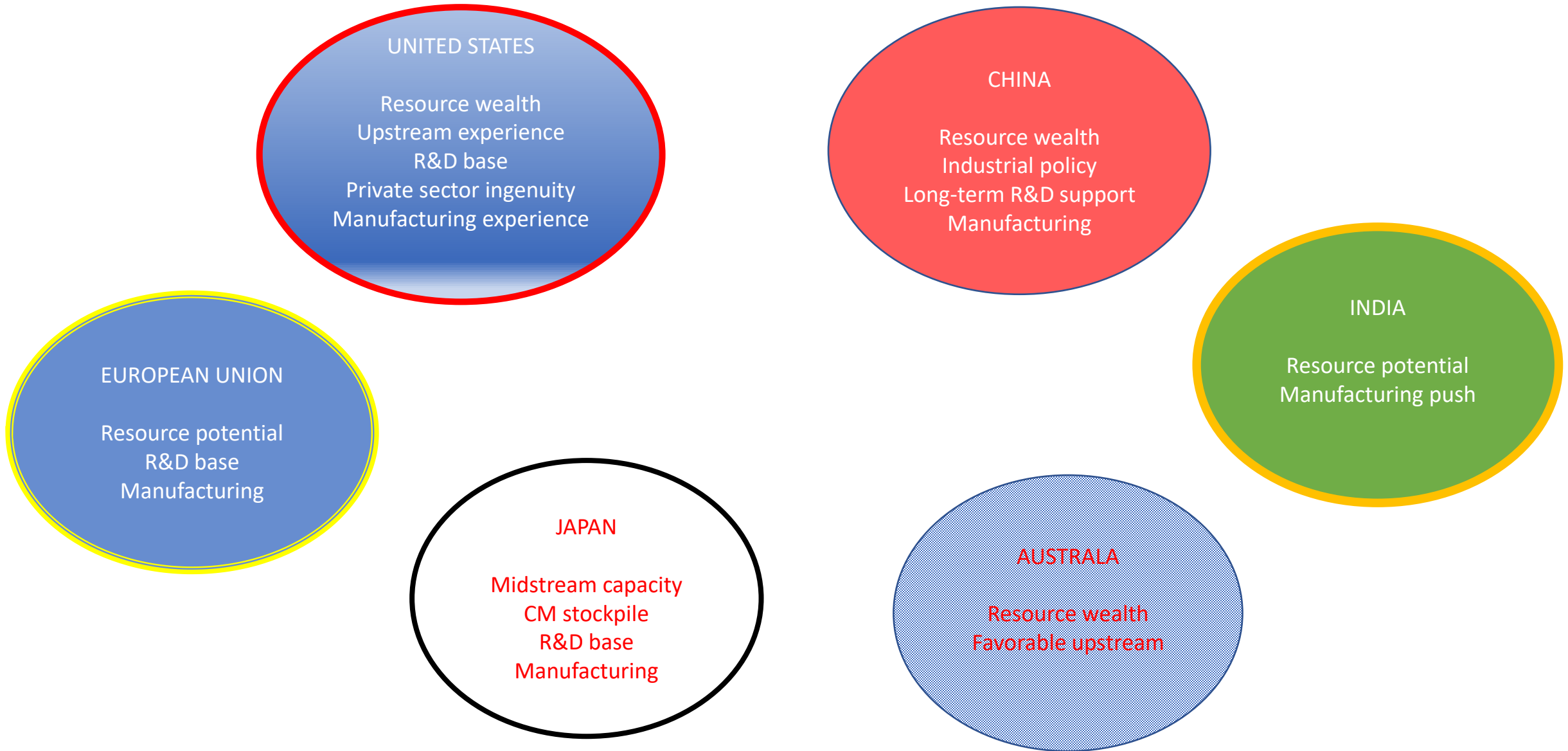
Note: "Minerals" refers to the 17 minerals included in this analysis plus steel, but excluding concrete. Steel has been included because of the size of demand for the alloy from energy technologies. Average annual demand is the mean demand for minerals across the time periods given. The higher mineral demand under the 2DS than the B2DS before 2030 can be explained by the higher overall generation capacity projected by the IEA to be needed in the 2DS compared with the B2DS. This is especially true of solar photovoltaic in the 2DS in these time periods. Subsequently, the plateau in mineral demand in the 2DS is caused by a relatively slower penetration of renewable generation, followed by a rapid increase in storage capacity from 2035 onward. 2DS = 2-degree scenario, B2DS = beyond 2-degree scenario, IEA = International Energy Agency, RTS = reference technology scenario.

The security of critical minerals supply chain is a strategic issue.

- Its role in clean energy technology components & growing demand
- The unexpected fragility in the global supply chain
- Competition from China
 - Growing domestic minerals consumption
 - Aspiration to become the global technology leader
- International Competition

Competition from China

- Supply chain dominance: upstream, midstream, and downstream
- Rising resource competition
- Growing technology competition
- Geopolitics



Note: These country specific critical minerals supply chain characteristics are not to be viewed as comprehensive. They are relative as well as dynamic.