Introduction to barriers, challenges, and financing issues to Just Energy Transition in the Transport Sector: Technology and Capacity Challenges

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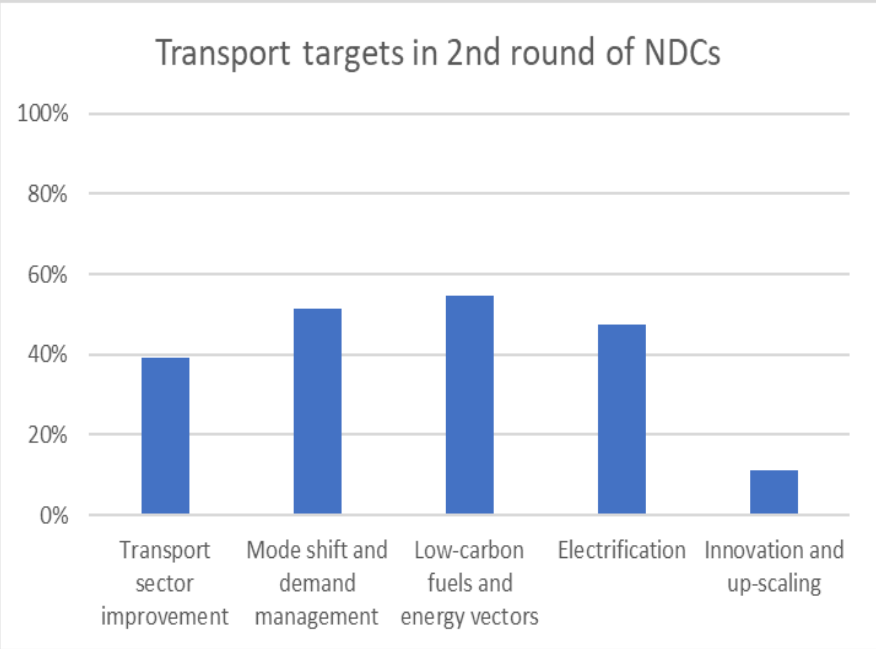
Transport Targets in Climate Plans

- **Ambition, targets and policies in NDCs and LT-LEDS**

- A large number of countries have submitted transport targets in their climate plans (both GHG and non-GHG reduction targets)

- Only a couple of countries have specific transport sector long-term targets aligned with net zero goals

- Room for improvement: transport sector targets are not in line with growing global climate ambition



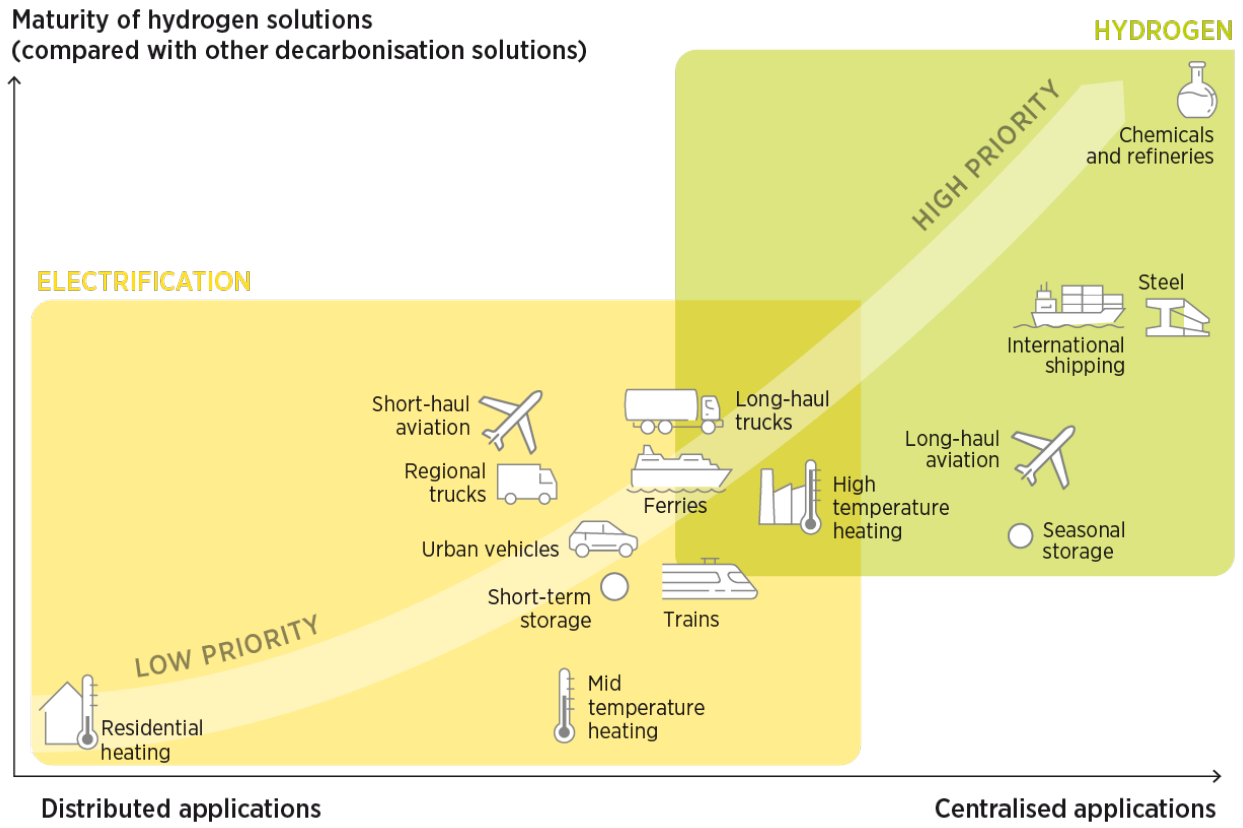
Source: IRENA based on GIZ & SLOCAT. (2023). NDC Transport Tracker (vs 2.0). Available from: www.changing-transport.org/tracker.

Challenges for Electrification of Road Transport

- Standardised and interoperable charging infrastructure
- Costs of electric vehicles

As the transition accelerates, economies of scale and continued innovation will reduce those costs, unlocking investment, boosting sales, and bringing the benefits of clean transportation to more cities and communities.

The role of green hydrogen and derivates for the transport sector



Policymakers should identify priorities for indirect electrification using green hydrogen with a focus on hard-to-abate sectors and devise strategies for its deployment.

Examples of challenges from the EV Battery Materials report

Dominating battery chemistry in this decade

- **LFP, NMC 811** and **NMC 722** dominate **until 2030**
- Production of **sodium-ion batteries** starts in 2023, demand to reach **68 GWh** by **2030**
- **Solid-state** batteries still at mid-TRL level and potential for their mass production is **from 2030**, companies to run tests as soon as 2025
- **Graphite and silicon-graphite anodes** dominate until 2030

Lithium-ion gigafactories on the rise

- **Annual capacity** to grow from 1 TWh in 2022 to **4 – 7 TWh** by 2030 (EU + N.America ~60%)
- The **average gigafactory size to nearly triple** from 5.75 GWh in 2022 to 15 GWh by 2030

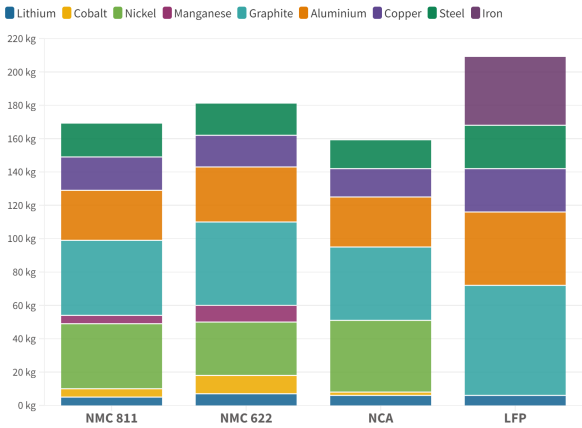
Meeting increasing material demand needed by 2030

- **Passenger EVs** would raise demand for **cobalt** by **2x**, **graphite 5x**, and **lithium 5.5x**
- **Supply deficits** for copper, cobalt, lithium and nickel **as early as 2026**

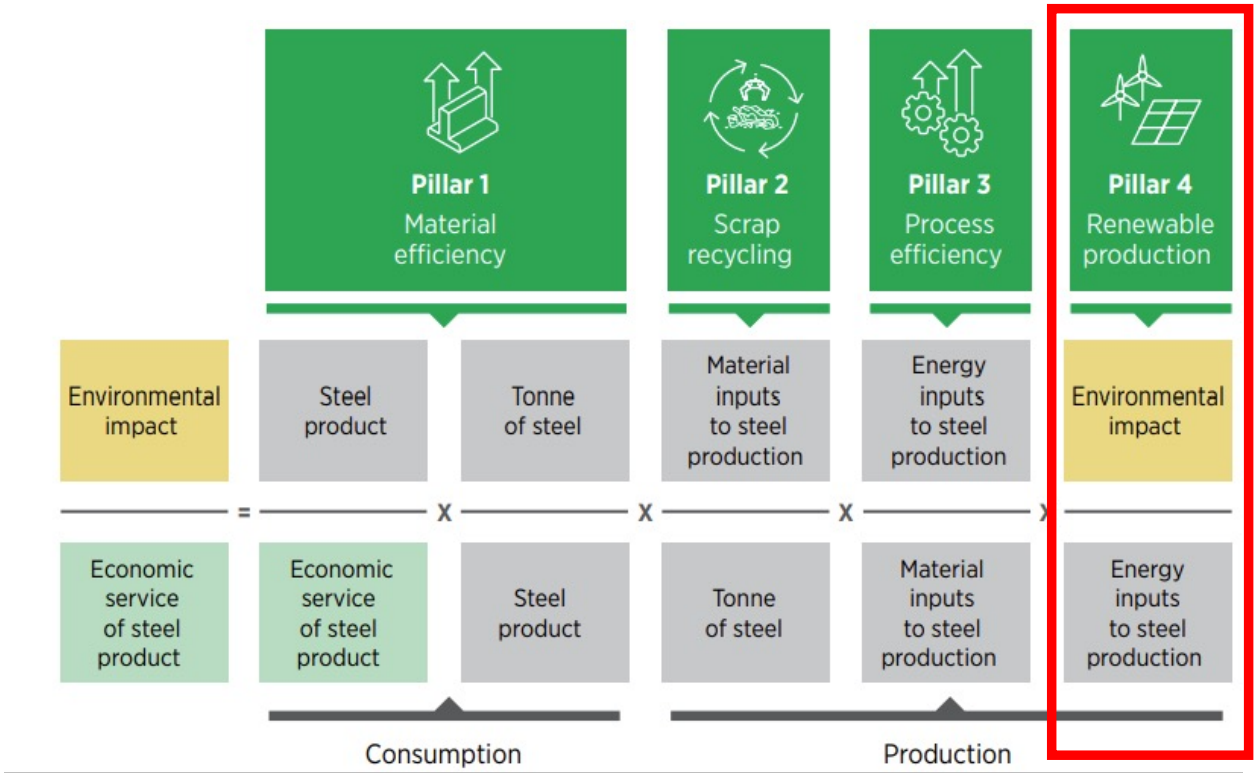
Reuse and recycling

- **Reuse** EV batteries for stationary storage to support renewables with **200 GWh/yr** by 2030
- **Recycling** technology exists but vast **improvements are needed**
- **Process scrap** to account for **80%** of recyclable battery materials by 2025

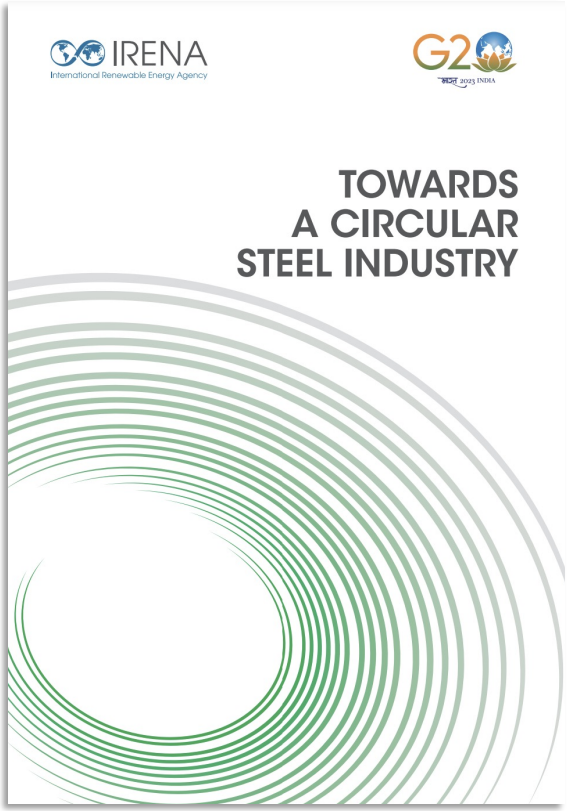
Battery chemistries by mineral and metal content (kg/battery pack)



Circular Economy in Steel Sector



Key factors of the environmental impact of steel products, and four pillars for a circularity strategy
steel circularity plays a vital role in supporting electromobility and addressing critical materials supply challenges in the global energy transition



Source: **IRENA (2023)**, Towards a Circular Steel Industry

Challenges to decarbonizing road transport from a technology and capacity perspective

- Infrastructure for widespread electrification and availability of electro vehicle at lower up-front-costs
- Availability and scale-up of cost competitive green hydrogen and its derivates
- Challenges in biofuels scalability, certification and traceability while ensuring sustainability
- Development of mining capacity for critical materials without compromising on ESG criteria. Innovation offers solutions to substitute and recycle materials.
- Steel circularity plays a vital role in supporting electromobility and addressing critical materials supply challenges in the transport sector.


THANK YOU