

Measuring Transition: Tracking Technology Transition in the Indian Steel Sector

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13 November 2025

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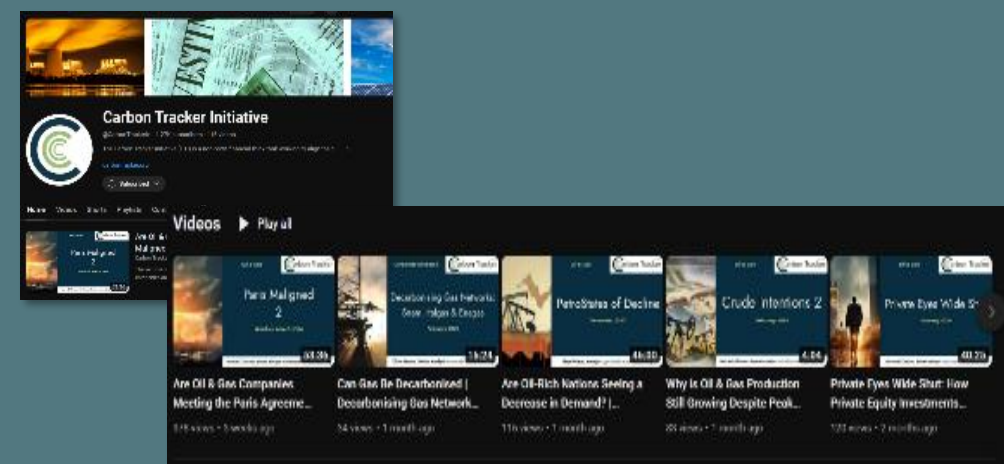
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Carbon Tracker is a non-profit financial think tank. Our research converts climate science and the energy transition into financial risk and reward. Our mission is to accelerate the energy transition by positively influencing the financial markets towards a fully decarbonised global economy.



Carbon Transition Analytics

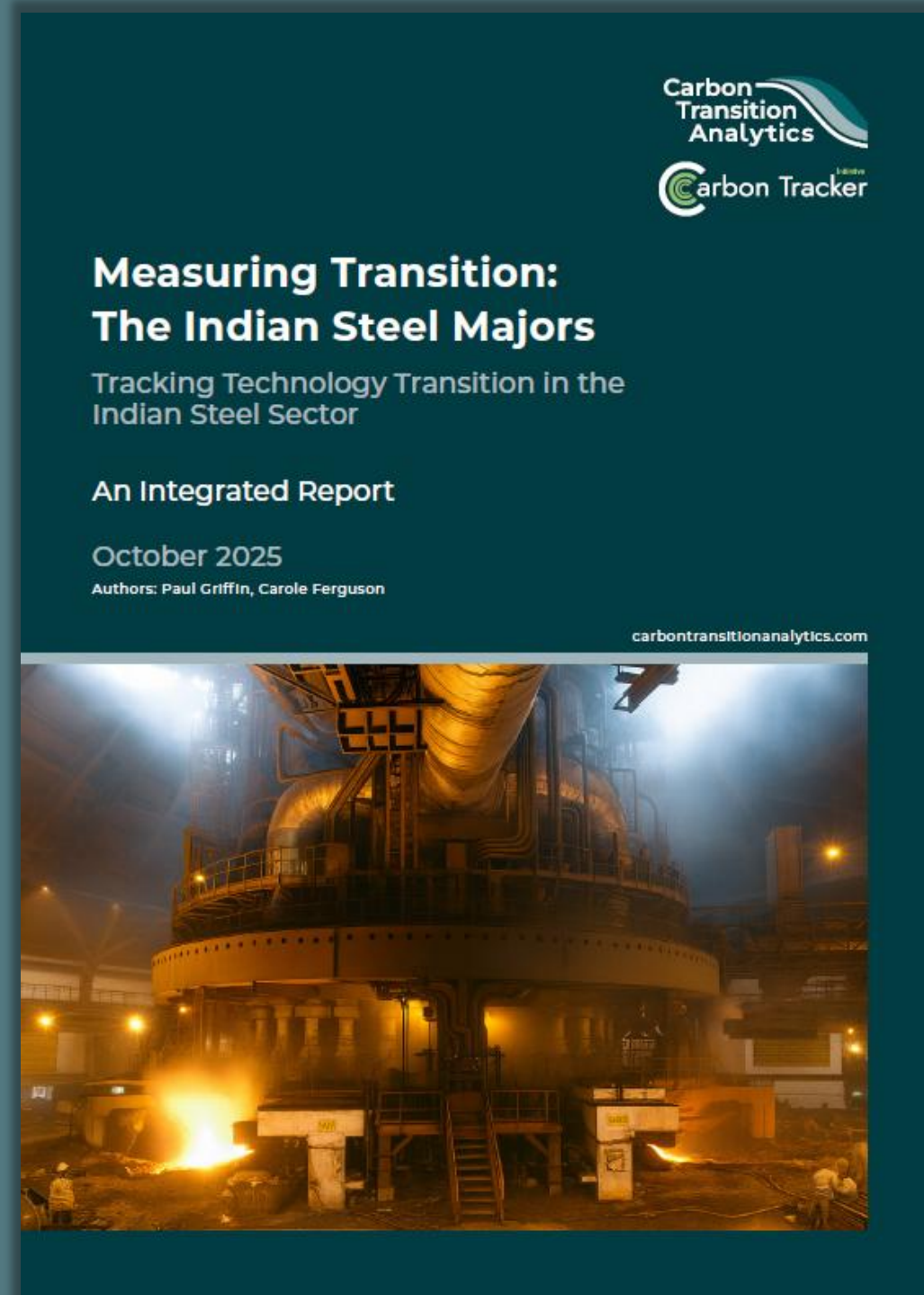
- Track record of deep dive research into high emitting sectors – CDP (Carbon Disclosure Project), Industry Tracker, Signal
- Led by the experts with climate and finance credentials
- Tried and tested framework for integrating climate and financial metrics
- Clean and complete datasets inform evidence-based research

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Who we are | Carbon Transition Analytics



Measuring Transition: The Indian Steel Majors



Agenda

- ☐ The context for Indian steel
- ☐ Summary of Integrated Report and Company Series
- ☐ League table of analysed companies
- ☐ Setting the policy benchmark
- ☐ Presentation of findings
- ☐ Questions for Management
- ☐ Q&A

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Speakers

Nicole Kozlowski

Head of Engagement – Carbon Tracker

Professional with experience working at the intersection of business strategy, sustainable finance and financial technology. Prior to joining Carbon Tracker, Nicole was the EMEA Head of Client Relations at Bloomberg LP.

Carole Ferguson

CEO & Research Director – Carbon Transition Analytics

Co-Founded CTA in March 2023 having led Industry Tracker and research team at CDP since 2017. Worked for 25 years in Finance for institutions such as Societe Generale Asset Management, JP Morgan & Flemings.

Dr Paul Griffin

Head of Research – Carbon Transition Analytics

Co-Founded CTA in March 2023 and previously led research on steel and cement at Industry Tracker. Senior member of modelling and data team at CDP since 2015 and central in work on Science Based Targets Initiative.



The context for Indian steel

- ❑ **India: fastest growing large economy in the World:** 7% GDP growth and 1.4 billion people.
- ❑ **Very low steel consumption intensity:** 100 kg/capita, compared to 225 kg/capita globally.
- ❑ **Indian Government** sets **National Steel Policy** (NSP) package in 2017.
- ❑ **Steel capacity target:** 300 Mtpa in 2030 (more than doubling from 138 Mtpa in 2017).
- ❑ But **steel CO₂ intensity in India is of the highest in the world:** 2.54 tCO₂/tcs.
- ❑ India has **low scrap availability, high cost of natural gas, and variable iron ore quality.**
- ❑ **Key solutions presently suffer from ‘viability gap’, companies opting for coal-based option:** Blast Furnace – Basic Oxygen Furnace (BF-BOF) technology.
- ❑ **BF-BOF capital intensive and long-lived** (20-40 years): lock-in CO₂ and lock-out alternatives.



Summary of Integrated Report and Company Series

Series: The 4 listed Indian Steel majors:

JSW Steel, Tata Steel, JSPL, AMNS

Integrated report: Aggregating results and comparing results

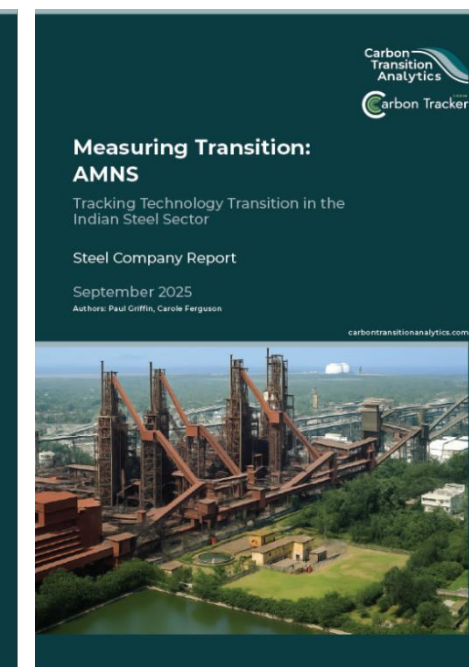
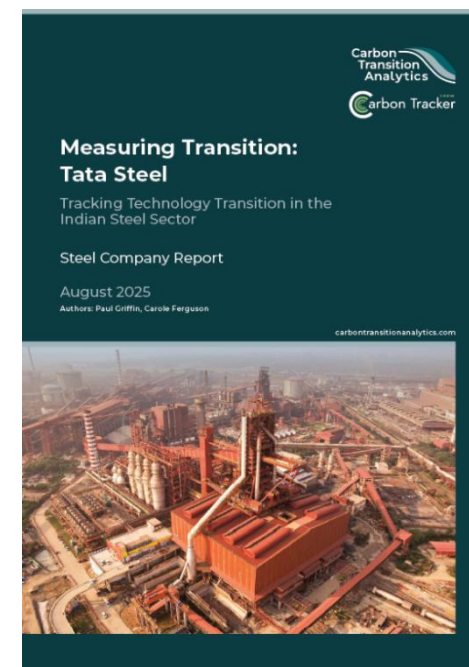
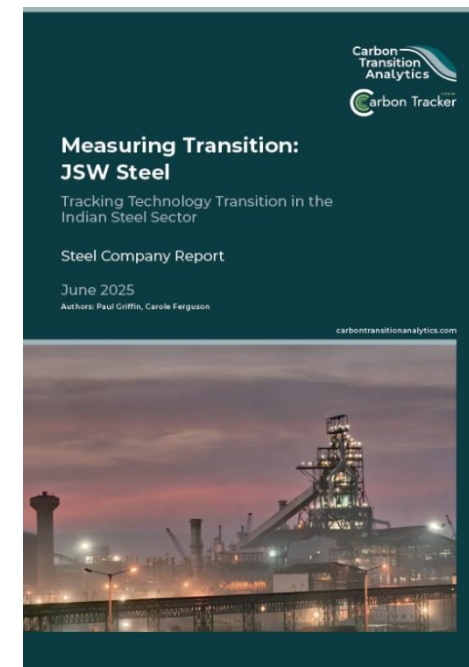
Approach: Detailed bottom-up analysis from physical asset-level

Assessment framework: Informed by TCFD and Transition Plan criteria, 4 metrics:

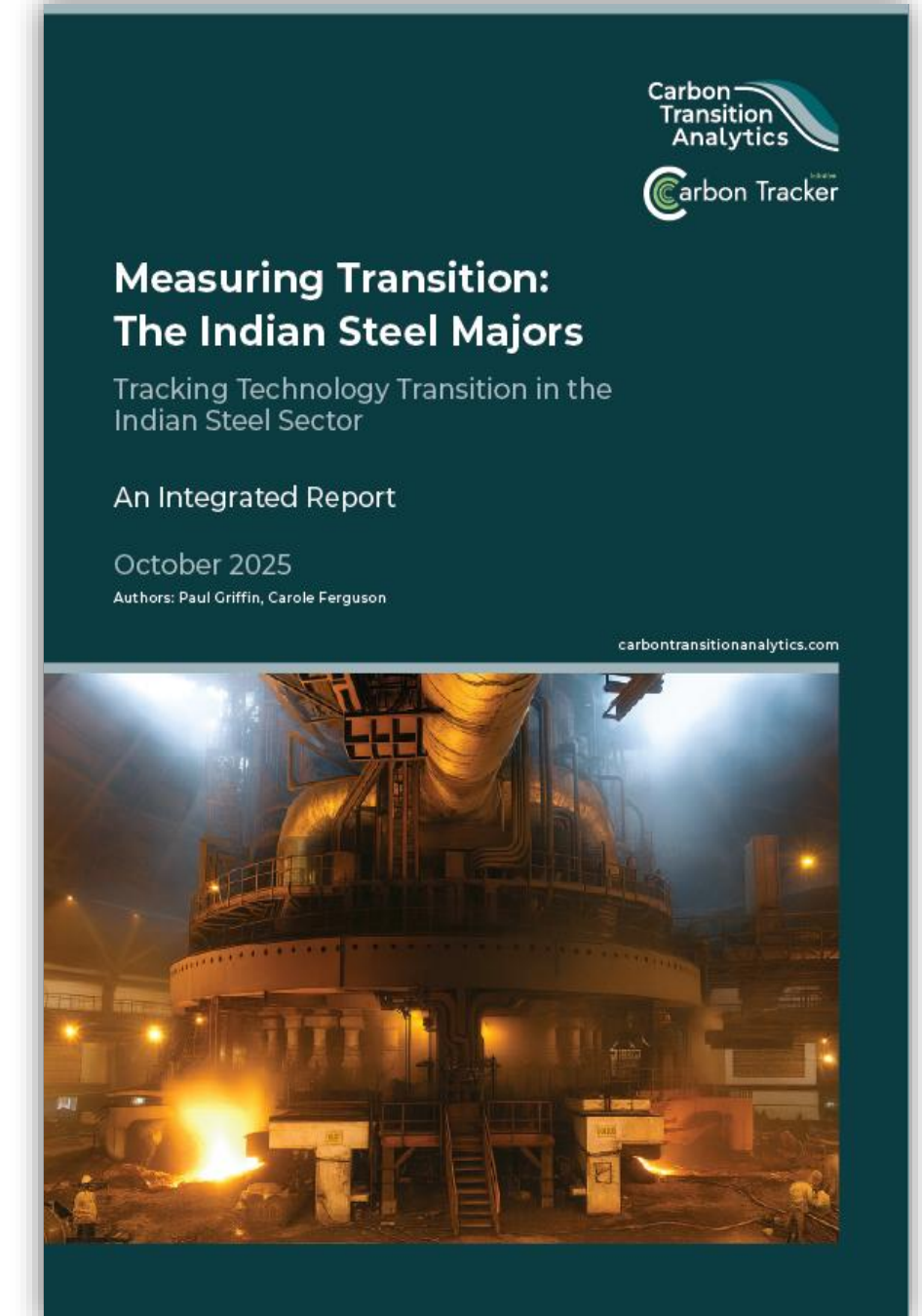
- Target Alignment
- Locked-in Emissions
- Transition Outlook
- Value-chain Exposure

Key to attracting **transition finance** and quantifying risk

FOUR-PART SERIES



INTEGRATED REPORT



League table of analysed companies

No company above 60/100 - reflects **high carbon risk** across the sector.

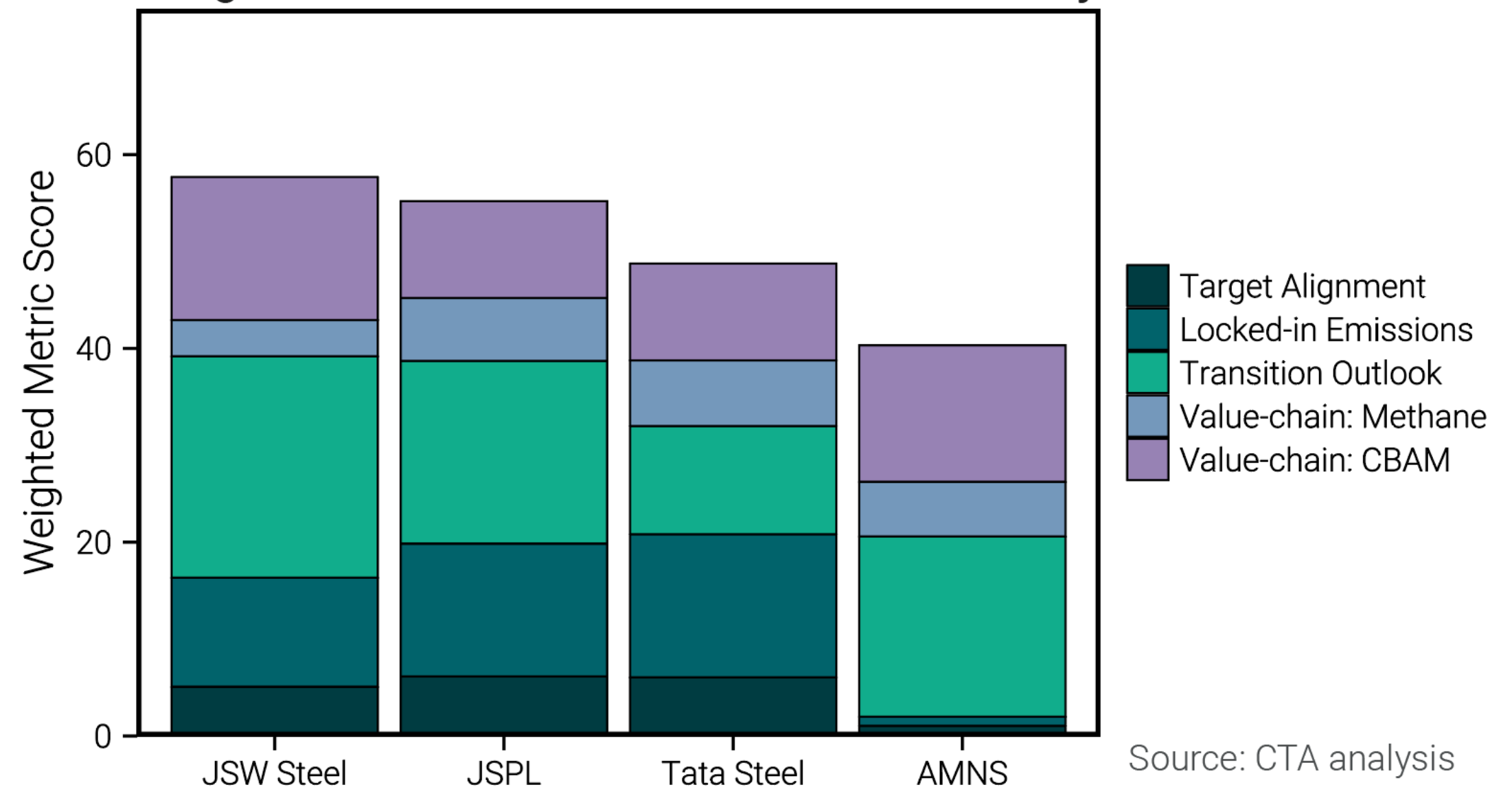
Best performer → JSW Steel

- Highly engaged low-CO₂ tech dev
[Transition Outlook: good]
- Attending to CBAM risk
[Value-chain Exposure: good]

Worst performer → AMNS

- Despite low-CO₂ tech dev
[Transition Outlook: good]
- Vast expansion into BF-BOF signaling lock-in risk
[Locked-in Emissions: bad]
- No target [Target Alignment: bad]

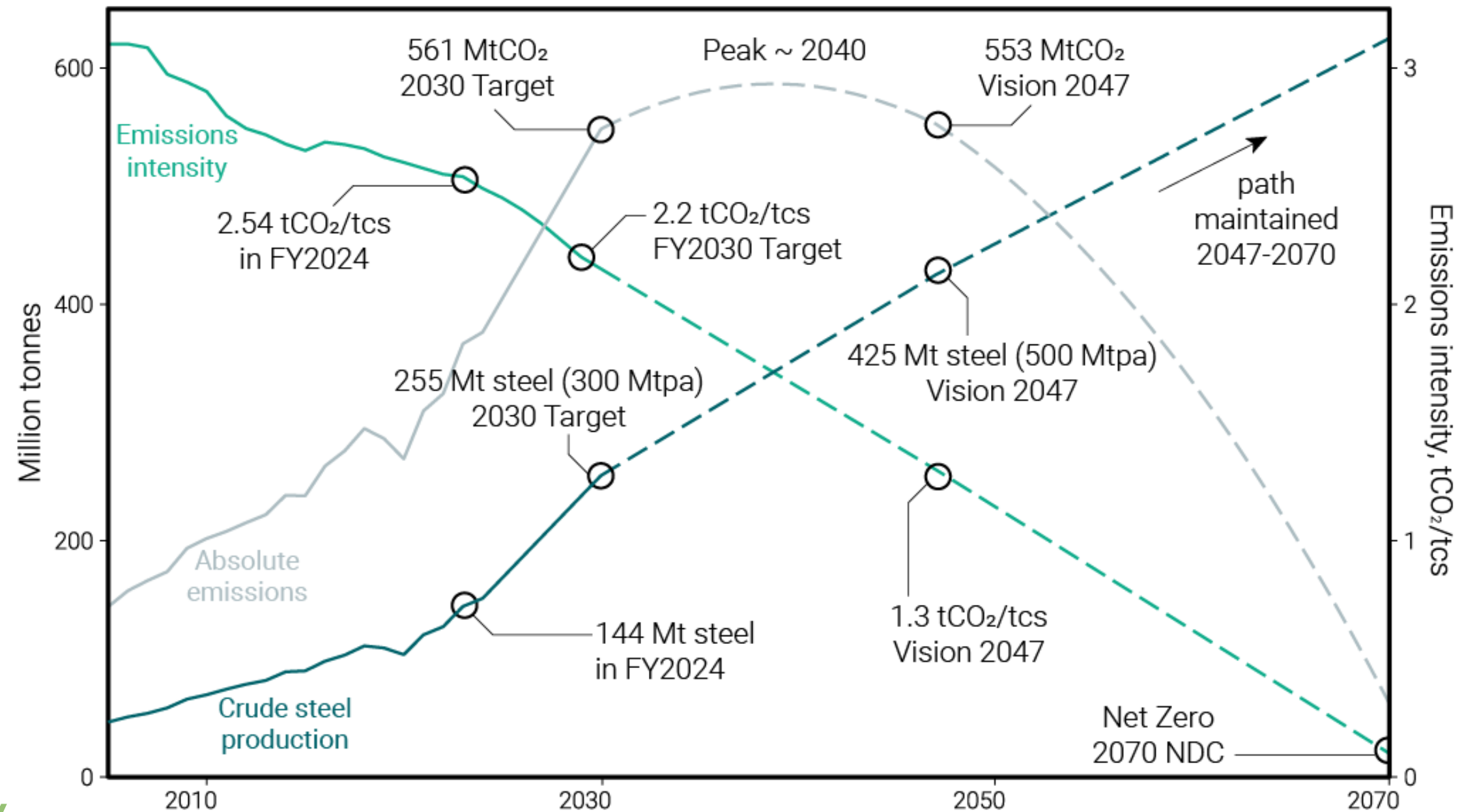
Weighted metric scores of the Indian steel majors



Setting the policy benchmark

- **Steel capacity target:** 300 Mtpa in 2030 (138 Mtpa in 2017, 200 Mtpa in 2025)
- **Steel capacity vision:** 500 Mtpa in 2047
- **High CO₂ intensity:** 2.54 tCO₂/tcs
- **CO₂ intensity target:** 2.2 tCO₂/tcs in 2030
- **CO₂ intensity vision:** 1.3 tCO₂/tcs in 2047
- **Net Zero pledge:** 2070
- **CO₂ emitted:** >0.5 GtCO₂ in 2030
- **CO₂ peak:** 2040
- **Increase from 12% to 14% of India's CO₂**

Large CO₂ source, Increasing share of economy



Presentation of findings | Target alignment

The Indian Steel majors are ambitious:

- 3/4 target net zero mid-century.
- Weighted target year of sector: 2060.
- Room for increased policy ambition?

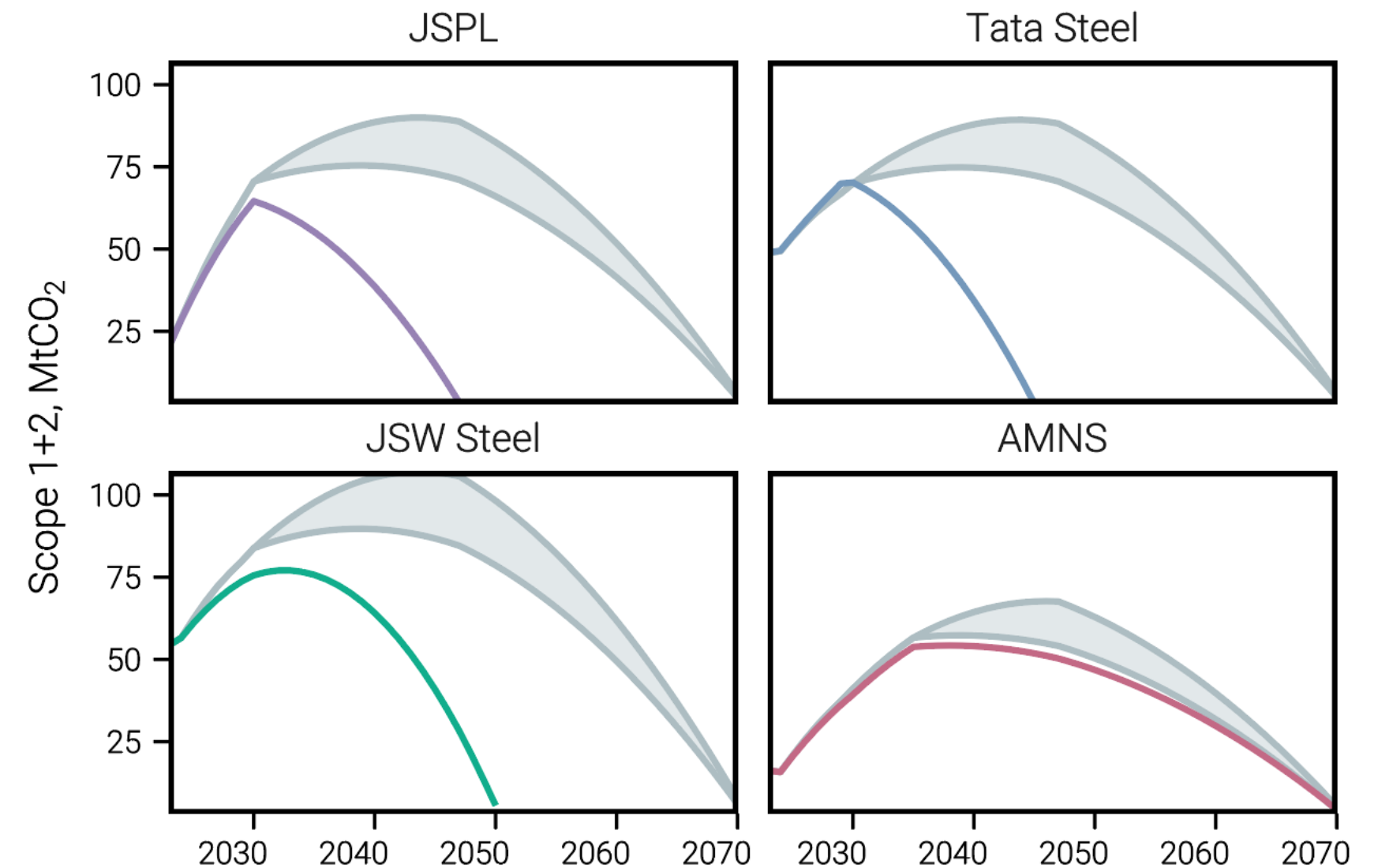
Tata Steel:

- Worst short-term performer.
- Weakest 2030 target.
- Has missed prior targets.

AMNS:

- Worst long-term performer.
- Despite good presentation (CAR), failed to specify net zero year, we assumed 2070.

Figure 9. Target and sector CO₂ targets of Indian steel majors



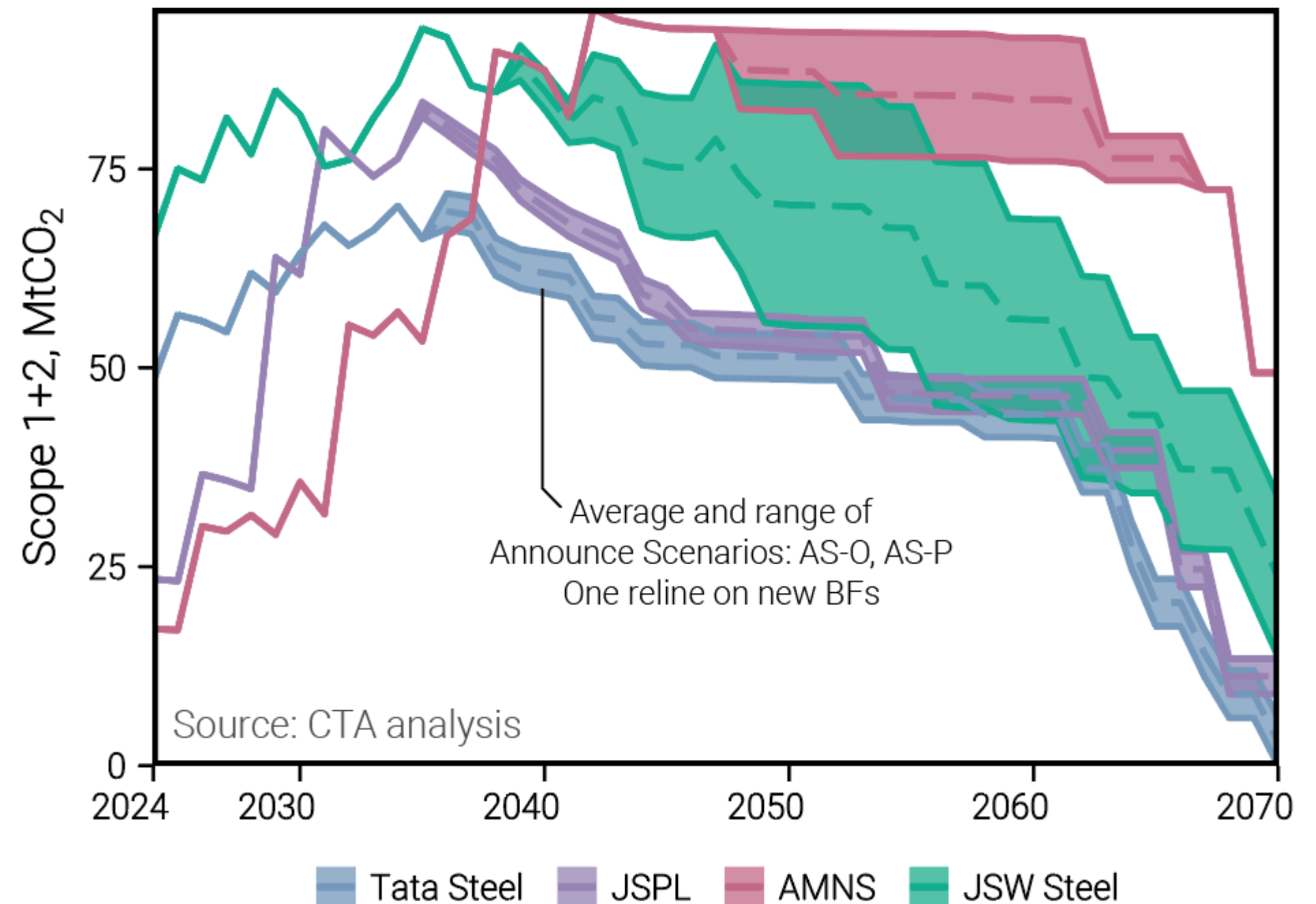
Source: CTA analysis.



Presentation of findings | Locked-in emissions

- We modelled CCS into our lock-in definition.
- **CCS limited:** Capture tech developing, but storage either: too small, too far, too late.
- We defined lock-in with and without Reline.
- We defined locked-in through scenarios:
 - CS = Confirm Scenario
 - AS = Announce Scenario
 - AS-P = Pessimistic, AS-O = Optimistic
- Room after CS, but AS projects maturing.
- Steel Majors: **Announced projects [AS] exceed CO₂ budgets: Target budgets** (no reline), **Sector policy budget** (if one reline).
- All at risk, **AMNS most:** highest growth from lowest base, shift from NG, highest emitter under AS. **Tata least:** lowest market share ambition.

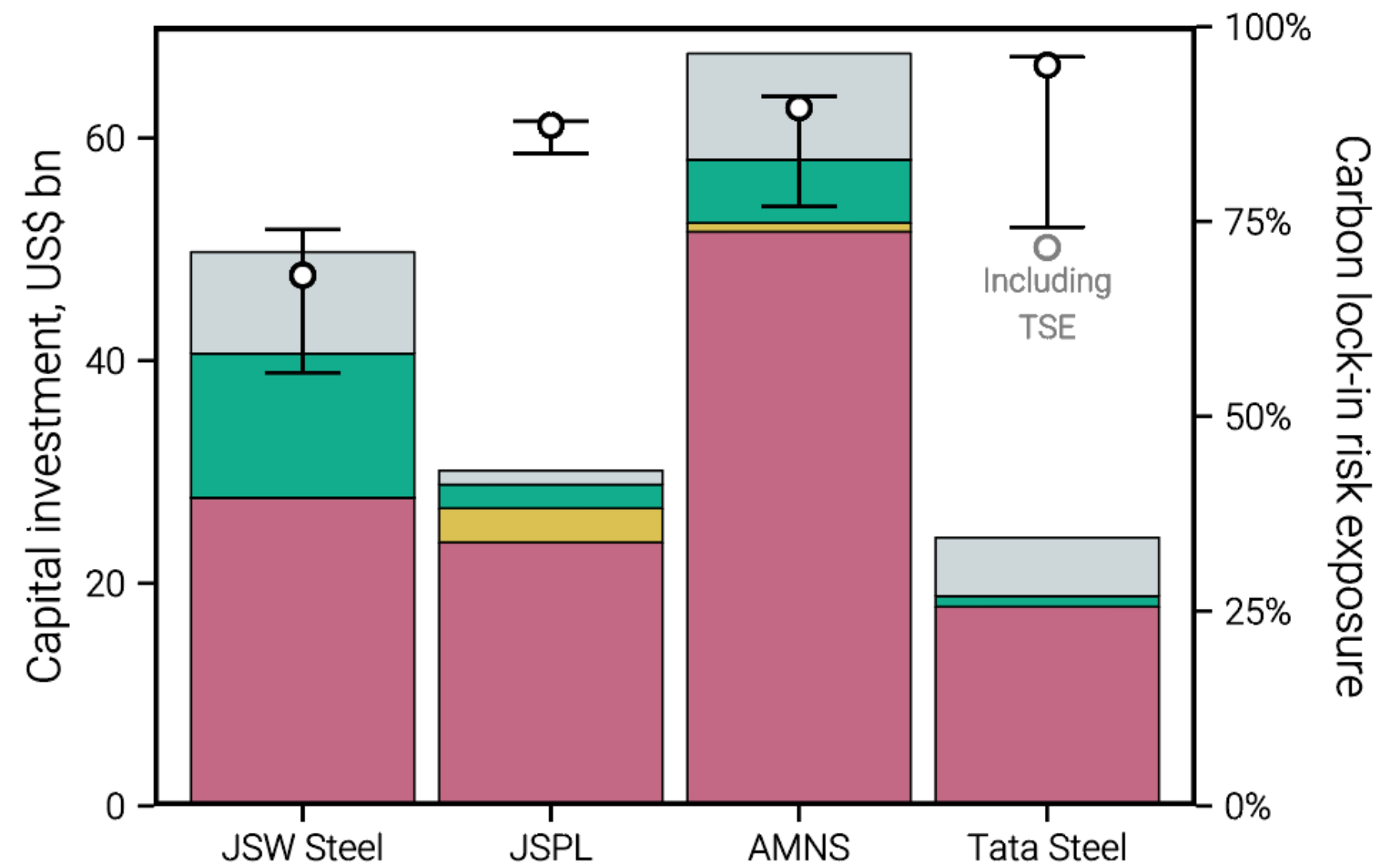
Figure 11. Scenario^s locked-in CO₂ emissions from Indian steel majors versus target and sector budgets



Presentation of findings | Transition outlook

- **We assessed portfolios of abatement techs and defined ratings:**
 - AP: Abatement Potential
 - SLR: Systemic Lock-in Risk
- **High scores emphasize essential tech triad:**
 - RE, H2, DR
- **We brought together CAPEX from all projects and banded their SLR:**
 - High, Mid, Low.
- **All potential company capital exposure [AS] aligned mostly to high-risk.**

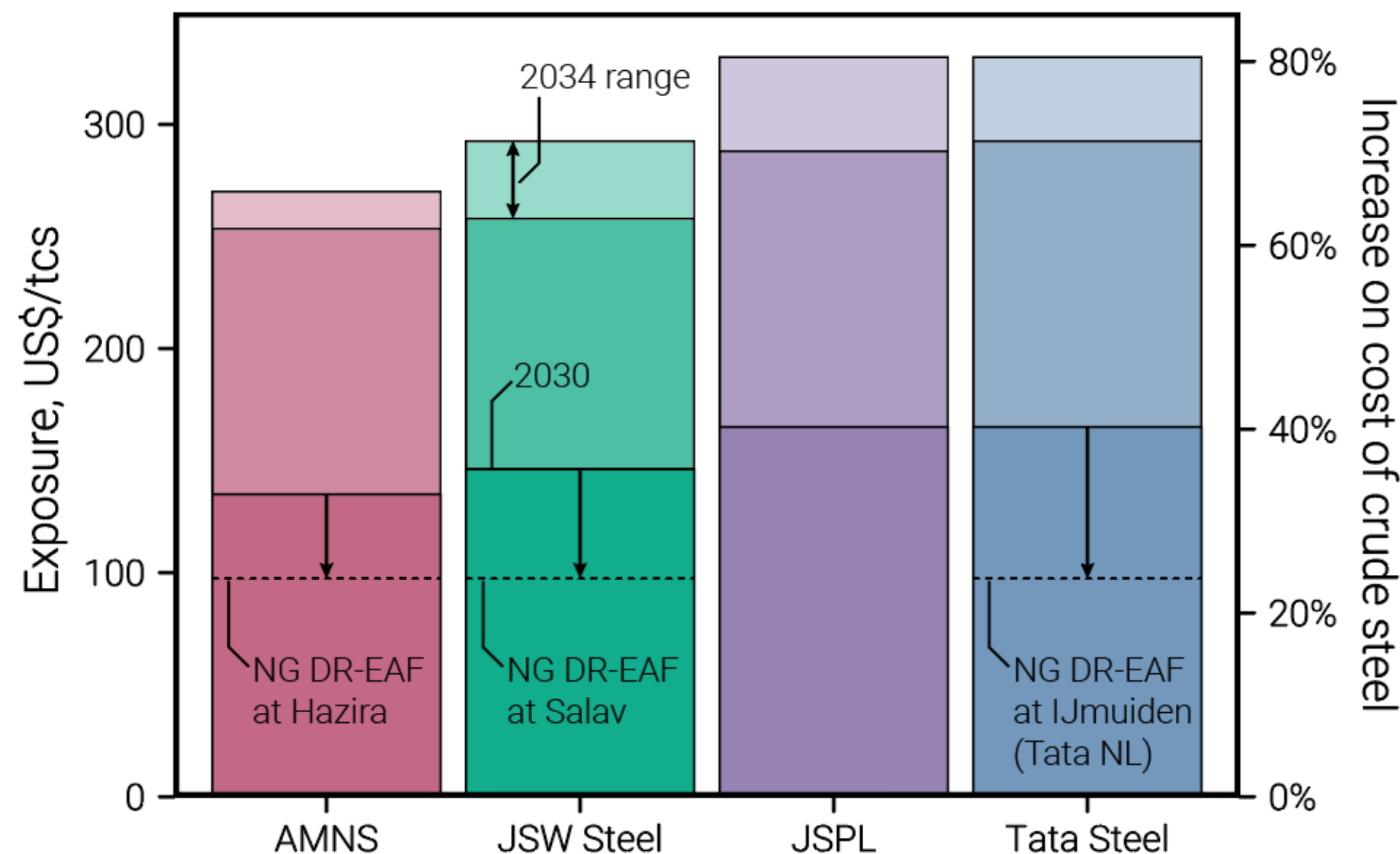
Figure 14. Systemic lock-in risk of capital investment



Presentation of findings | Value-chain exposure: CBAM

- **CBAM risk is material:** rapid exposure increase
 - 2030 ~75 US\$/tCO₂
 - 2034 ~150 US\$/tCO₂
- **Average intensity of majors in 2030 ~2 CO₂/tcs**
- **Share of production to exports ~10%** but aim of NSP is to increase exports
- Variable exposure amount Indian Steel majors
 - **High exports:** JSW, AMNS
 - **Low exports:** Tata, JSPL
 - **High Average exposure:** All
 - **Low Isolated exposure:** AMNS, JSW, Tata (TSE)
 - **High exposure:** JSPL (2030 CO₂ target less likely)

Figure 23. Projected CBAM penalty on Exports by company



Source: CTA analysis

Even with NG-DR option, ~100 US\$/tcs in 2030: need for GH₂



Questions for Management

(relevant for all companies covered in the report series)

1. Beyond your 2030 target, what CO₂ intensity (t CO₂/tcs) would you aim to have in 2040?
2. How will your capacity expansion plans align with your net zero target and when are additions to BF-BOF capacity expected to peak?
3. What specific contingency plans have you put in place should storage of captured CO₂ not become available?
4. What average CO₂ intensity do you anticipate for your Indian steel exports into the EU in 2030?
And what share of your total Indian steel production will this cover?



Q&A



Thank you!



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