

Discussion paper: Scaling transition finance for green industrial transition of the Indian iron & steel sector

A set of recommendations and guidance
from the India Green Steel Network



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To find out more about the India Green Steel Network [here](#).

To find out more about the sustainable finance and green industrial policy working group, see [here](#).

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1 Introduction

1.1 Context

The industrial sector is responsible for over one-third of annual Greenhouse Gas (GHG) emissions globally and about 30 per cent of GHG emissions in India.¹ The industrial sector is on a path to becoming India's largest carbon emissions source by 2040² due to increasing demand for industrial materials produced using carbon-intensive conventional processes and the gradual decarbonisation of other major emitting sectors such as power and transport. The Iron and Steel (I&S) sector is India's largest carbon-emitting industrial sector, responsible for about 10-12 per cent of the country's GHG emissions. While demand for steel has plateaued in most advanced economies, it is one of India's fastest-growing economic output and emission-intensive sectors. India is the world's second-largest producer of crude steel, with a total production of about 120 million tonnes per annum (MTPA), contributing about 2 per cent of the country's Gross Domestic Product (GDP).³ While India's per capita steel consumption is just one-fifth of the average for developed countries, domestic demand is expected to increase rapidly as the economy grows. Such growth in production using fossil fuel-intensive means would lead to a tripling of sectoral emissions by 2050.⁴ For India to achieve its net-zero emissions target by 2070 and the world to meet the climate goals under the Paris Agreement, industries must shift to less carbon-intensive means of production and gradually align to net-zero/carbon-neutral pathways.

Industrial sectors will likely undergo a gradual transition – adopting the best available and commercially viable technologies while investing in the demonstration and scaling up of breakthrough technologies until they become competitive. In the transition phase, best-available technologies that offer 'incremental' abatement but are not green/near-zero-emissions will be needed to gradually reduce emissions intensity, create the conditions for the near-zero and zero-emission technologies of the coming decades, and minimise cumulative sectoral emissions - contributing towards the achievement of climate targets. Most of these technologies are Capex and Opex-heavy and require large-scale investment. Transition finance (TF) is emerging as an important finance category to enable the flow of sustainable finance towards 'transitional activities' in sectors such as steel, cement, aluminium, shipping, aviation, etc., that do not have viable green alternatives readily available today.

1.2 Transition finance: Definition and scope

For this paper, we refer to the two definitions of TF also used by the International Financial Services Centres Authority's (IFSCA) expert committee report on Transition Finance. These definitions are provided by the Asian Development Bank (ADB) and the G20 Sustainable Finance Working Group (SFWG):

- ADB: 'Transition finance is a concept where financial services are provided to high carbon-emitting industries – such as coal-fired power generation, steel, cement, chemical, paper making, aviation, and construction – to fund the transition to decarbonisation'.
- G20 SFWG: 'Financial services supporting the whole-of-economy transition, in the context of the Sustainable Development Goals, towards lower and net-zero emissions and climate resilience, in a way aligned with the goals of the Paris Agreement'.

Both these definitions include the I&S sector.

Table 1 broadly defines the scope of transition finance based on an extensive review of various organisations' existing jurisdictional taxonomies and guidelines.

Table 1: Scope of transition finance.

Elements	Description
Applicability	<ul style="list-style-type: none"> • Accelerating transition in the hard-to-abate sector (e.g., steel, cement) • Accelerating transition in other emission-intensive sectors (e.g., phase-out of unabated fossil fuel assets) • Increase access to resources and inputs (e.g., green hydrogen, lithium mining, etc.)
High-level principles	<ul style="list-style-type: none"> • Alignment with the goals of the Paris Agreement • Avoid carbon lock-in • Define transition activities with no near-term green alternatives • Transparency, monitoring, and reporting of performance, and penalties for non-performance
Investment structures	<ul style="list-style-type: none"> • KPI-linked (general purpose loans and bonds linked to emission reduction targets) <ul style="list-style-type: none"> • Use-of-proceeds (directed towards low-emission assets) • Hybrid (e.g., sustainability-linked green bonds (SLGBs) - use-of-proceeds model of a green bond with the performance-based structure of a sustainability-linked bond) • Traditional loans and bonds
Instruments	<ul style="list-style-type: none"> • Equity, debt (loans, bonds, project finance), trade finance, blended finance, etc

Source: CPI Analysis

2 Transition finance framework for I&S sector: Review of core enablers

This section presents an overview of key enablers required to scale up the flow of transition finance. While these enablers apply to all sectors, we take an I&S sector-specific perspective.

2.1 Green industrial policy

The supply of transition finance globally and in the Indian economy would follow the demand for finance for transitional activities. To this effect, well-designed policy frameworks that can help level the playing field between conventional technologies and low-carbon alternatives and create an enabling investment environment are critical. Various policy instruments can incentivise early adopters of low-carbon solutions, reduce investment risks (and thereby the cost of capital) unique to these solutions, penalise carbon-intensive activities, and create and scale markets for low-emissions products.

Historically, India's policies for heavy industries, particularly for the I&S sector, have prioritised rapid growth, energy security, and competitiveness. Until recently, only a few instruments have been implemented to promote decarbonisation (e.g., the Perform Achieve and Trade (PAT) scheme). In 2024, the Ministry of Steel (MoS) launched a report, 'Greening the Steel Sector in India: Roadmap and Action Plan', laying out a detailed pathway and action plan for decarbonising the sector and as a starting point for further policy action. Ministry of Steel also released India Green Steel Taxonomy on 12 December 2024.⁵ The sector now requires a comprehensive green industrial policy that targets (and balances) multiple outcomes – output, competitiveness, and decarbonisation. This could be a 'Green Steel Mission', drawing parallels from the effective mission-mode strategies implemented in clean energy sectors. A well-designed green steel policy could include a mix of financial, market-based, and regulatory instruments to provide technology-push (e.g., subsidies, technology mandates, and tax credits) and the demand-pull (e.g., green public procurement, product carbon standards). Such a policy must also foster innovation, which is critical for sustainable green growth.

The Energy and Resources Institute (TERI) bifurcates the Indian steel sector into primary and secondary segments based on production routes. The primary sector utilises the Blast Furnace-Basic Oxygen Furnace (BF-BOF) steelmaking route. In contrast, the secondary sector largely relies on the Direct Reduced Iron-Electric Arc Furnace (DRI-EAF)/ Direct Reduced Iron-Induction Furnace (DRI-IF) route. Regarding the secondary steel sector, the small and medium enterprises (SMEs) that comprise the ecosystem require policy support tailored to their unique needs and challenges. The technology used by Secondary Steel Producers (SSPs) is different from the blast furnace route used by the primary sector. The Government of India has implemented policies such as the National Vehicle Scrappage Policy, which ensures greater availability of scrap, a crucial input for steel production by SSPs, and the PAT scheme, which incentivises energy efficiency. Proposed policy support for SSPs includes a dedicated renewable energy supply for the IF/EAF units to reduce their Scope 2 emissions as well as the development of a multi-stakeholder platform to fill the knowledge gap prevalent in the secondary sector regarding the latest technology developments, financial best practices, and due diligence.⁶

Financial sector regulations can also play a crucial role in directing financial flows to underserved but essential economic sectors. Numerous tools that could be used comprise of guidelines including disclosures that facilitate investment decision-making, build market confidence, and prevent green-washing; taxonomies on sustainable, green, and transition finance; mandates for FIs to measure and report financed emissions; mandating corporate issuance of use-of-proceeds (green/transition) and KPI (sustainability)- linked bonds; and incentivising banks to lend to specific activities.

Table 2 presents some policy instruments (aligned with the Ministry of Steel's latest roadmap) that are crucial for accelerating the decarbonisation of the Indian steel sector and stimulating demand for transition finance. According to Climate Policy Initiative's (CPI) 2023 analysis, the instruments have been classified as high, medium, or low impact.⁷

Table 2: Policy instruments to support the low-carbon transition of the I&S sector. The level of impact is indicated by H (High), M (Medium), and L (Low).

		Value chain target		
		Cross-cutting	Demand-side	Supply-side
Channel	Market-based (price/quantity)	<ul style="list-style-type: none"> Carbon pricing (H) 	<ul style="list-style-type: none"> Green Public Procurement (H) 	<ul style="list-style-type: none"> Public funding for demonstration pilots (H) Capex subsidies (H) Opex subsidies (M) Investment/Production tax credits (M) Interest subvention/credit guarantees (H)
	Regulation	<ul style="list-style-type: none"> Sustainable finance taxonomy/climate-aligned investment principles (H) Sector Transition Pathways 	<ul style="list-style-type: none"> Product embodied carbon standards (H) Certification of low-carbon materials and labelling of products (M) 	<ul style="list-style-type: none"> Technology mandates (M)
	Innovation			<ul style="list-style-type: none"> International collaboration for technology transfer (L) Public funding for R&D/ Private R&D incentives (L) State-owned impact equity funds (M)
	Others (e.g., Investment promotion)	<ul style="list-style-type: none"> Long-term sectoral targets (L) 		<ul style="list-style-type: none"> Direct public investments (L)

Source: Adapted from CPI (2023)

2.2 Benchmark sectoral and technology roadmaps

Technology pathways/roadmapsⁱ are used by companies, financial institutions (FIs), governments, and regulators for transition plans and target setting. Globally, widely used roadmaps for I&S sector are:

- [IEA Iron and Steel Technology Roadmap](#): top-down economy-wide and sectoral pathway to net-zero emissions (NZE)
- [Mission Possible Partnership's Steel Sector Net-Zero Transition Strategy \(ST-STSM\)](#): bottom-up agent-based simulation pathway

India-specific technology pathway: India's NZE by 2070 target, which is two decades later than the Paris-aligned target for NZE by 2050, and the context-specific factors related to a rapidly growing developing economy and resource endowment mean that the Indian I&S sector would follow a different decarbonisation trajectory than developed countries, and therefore, the pathway would differ from the two mentioned above.

Any sectoral pathway that is used as a reference should ideally meet specific criteria to ensure credibility: (1) climate alignment (compatible with goals of the Paris Agreement); (2) sufficient granularity (periodic - 5-year or decadal - data on emissions trajectory and technology choices); (3) transparency (availability of modelling assumptions and results to stakeholders); (4) validation from the industry and other stakeholders; (5) adaptability (to context-specific constraints).

So far, the Ministry of Steel (MoS) has laid out a long-term high-level technology roadmap and defined a carbon emissions trajectory only up to 2030, which will also serve as the reference for India's Carbon Credit Trading System (CCTS). In the absence of a nationally adopted long-term sectoral pathway currently, other pathways may serve as the reference for companies and FIs:

- [IEA Iron and Steel Roadmap for India I&S Sector – Sustainable Development Scenario \(SDS\)](#)
- [Mission Possible Partnership's ST-STSM for India](#)
- [McKinsey - Decarbonising India: steel sector pathway](#)
- [TERI - Achieving Green Steel: Roadmap to a Net Zero Steel Sector in India](#)
- [CEEW - Evaluating Net-zero for the Indian Steel Industry](#)

A note on differentiated considerations for primary and secondary steel sectors: The secondary steel sector in India accounts for about 40 per cent of the steel production in India and remains highly emission-intensive, emitting around 50 million tonnes of greenhouse gases annually (TERI, 2023). Unlike the primary sector's BF-BOF-dominated production, the sector predominantly uses the DRI-IF/EAF route. Each route requires distinct emission-reduction solutions, leading to different technology roadmaps. While the primary sector needs to either switch from the BF-BOF route to a hydrogen-DRI route or install carbon capture solutions, the secondary sector must shift from fossil-based electricity for IF/EAF units to renewable electricity, increased scrap utilisation and transition from coal-based DRI to hydrogen-based DRI for residual iron-making. The availability of proven technologies and favourable economics means that secondary steel has a high near-term potential for emissions abatement. However, the financing barriers faced by the SSPs remain a constraint.

ⁱ Literature such as EU Roadmap 2050, SBTi decarbonisation pathway et cetera often use pathways and roadmaps interchangeably. For the purpose of this paper, we define sectoral pathways as milestone-linked outcomes while a technology roadmap defines usage of different technologies at different points of time to complement sectoral pathways in achieving the desired milestones.

2.3 Taxonomies and criteria for eligible transitional activities

A taxonomy on sustainable finance specifying transitional activities or the screening criteria for such activities (aligned with a chosen technology roadmap) is critical. In the FY 2024-25 budget speech, the honourable finance minister announced plans to develop a national 'climate finance taxonomy'. While India lacks a formal taxonomy, guidance on activities eligible for TF in the I&S sector can be taken from taxonomies and technical screening criteria developed by other jurisdictions and independent organisations.

Broadly, transitional activities refer to economic activities important for emissions reduction in the hard-to-abate and energy-intensive sectors but cannot be classified as "green" because they do not meet stringent environmental criteria (e.g., zero or near-zero carbon emissions). Typically, transitional activities are not aligned with the Paris Agreement but are crucial because of a lack of green and economically feasible alternatives. Differences between the specific definitions of transitional activities exist among the taxonomies currently adopted across the globe, which means an activity can be eligible for transition finance in one taxonomy but not another. For example, while the national taxonomy in China is due to be published, the local governments of Huzhou and Chongqing have published their taxonomies. Between them, clean production and efficient use of coal is classified as transitional in Chongqing but not in Huzhou.⁸

Determining eligible transition activities: There are three main approaches to determining the eligibility of transitional activities:

- **Directly listing activities:** This approach specifies a feasible technological roadmap for the transition of the I&S sector to NZE and lists the technologies and fuels (e.g., hydrogen-DRI) that promote low-carbon emissions steel production. The reference technology roadmap must be aligned with the goals of the Paris Agreement (1.5° C or well below 2° C) or the national climate target. It may include other details such as an emission intensity trajectory, technology development, and deployment pathway. The list is updated periodically to account for technological developments.
- **Quantitative thresholds:** This approach specifies quantitative thresholds to select transitional activities. The most common approach is to define the (upper) threshold of emission intensity for primary steel production and the (lower) threshold for the share of scrap utilised for secondary steel production. The thresholds are revised periodically and gradually tightened to align with the chosen pathway's trajectory.
- Several economies like India are not in a position to jump directly to technologies such as hydrogen-DRI due to the high cost of green hydrogen (and green premium), and a lack of alternative feedstocks such as natural gas, thereby growing production through the BF-BOF route. Directly listing activities as above could significantly dampen investments and competitiveness of the sector. A quantitative threshold-based approach would allow the Indian I&S sector to use levers like Best Available Technologies (BATs) and partial carbon capture-based BF-BOF plants to incrementally reduce emissions and access transition finance without considerable pushback from the industry.
- **Combined approach:** A combined approach specifies the quantitative thresholds and the technology options that qualify. Typically, technology-specific thresholds (e.g., carbon capture rate in BF-BOF with Carbon Capture Utilisation/Storage (CCUS)) are also specified to guide activities that either meet or are on the path to meet the thresholds by a given year.

Table 3 provides an overview of existing taxonomies that define sector-specific criteria for screening transitional activities.

Table 3: Overview of existing taxonomies and technical criteria with explicit guidelines for the I&S sector.

Taxonomy	Eligibility criteria	Reference roadmaps/ pathways	Separate screening criteria for hydrogen, CCS, and cross-cutting factors (such as DNSH ⁱⁱ)
EU <i>Framework to Facilitate Sustainable Investments, 2020; Technical Screening Criteria, 2021</i>	Quantitative thresholds	Paris Agreement 1.5 °C pathway	
Japan <i>Technology roadmap for Transition Finance in Iron and Steel Sector, 2021</i>	Lists of activities	IEA ETP; Green Material economics; SBTi; Internal plans	
Singapore – MAS <i>Singapore-Asia Taxonomy, 2023</i>	Quantitative thresholds + list of activities	EU taxonomy, CBI Steel criteria	
ASEAN <i>Transition Finance Guidance, 2023; Sustainable Finance Taxonomy, 2024</i>	Refers to criteria set and roadmaps used by ASEAN member countries		
Climate Bonds Initiative <i>Steel Criteria, 2024</i>	Quantitative thresholds + list of activities	Sustainable STEEL principles, IEA NZE pathway	

Source: CPI Analysis

Green - Yes,
Red - No Clear Guidelines

2.4 Corporate transition plans and credibility assessment

Transition plans at the national, sectoral, and entity levels are increasingly recognised as the cornerstone of industrial transition to lower emissions. A feasible, duly benchmarked, and sufficiently ambitious transition plan is a critical enabler for corporations to access transition finance, and investors are increasingly including transition plans as criteria in investment decisions.

It is necessary to ensure that transition plans are credible, prevent transition-washing, and align with the basic principles of transition finance. This would need to include benchmarking against established standards/best practices in alignment with science-based targets for net-zero goals. Based on a comprehensive review of recommendations provided by various organisations and jurisdictions, this paper presents an eleven-element guideline for the development and assessment of credible plans by corporations.

ii Most taxonomies also require that green and transitional activities meet cross-cutting criteria such as the Do No Significant Harm (DNSH) principle; climate change adaptation; sustainable use and protection of water and marine resources; pollution prevention and control; and protection and restoration of biodiversity and ecosystems.

Table 4: Framework for developing and assessing the credibility of transition plans based on guidelines provided by CBI,⁹ OECD,¹⁰ and ASEAN.¹¹

Elements	Guidance
Net-Zero emissions goal	Science-based target consistent with the 1.5° C target of the Paris Agreement, with no to low overshoot and, at the least, well below 2° C.
Interim targets (phasing)	Long-term transition goal accompanied by interim (short, medium and long-term) quantifiable and time-bound targets. Include explanation of methodologies, assumptions used, and benchmarking undertaken.
Technology selection	Any science-based pathways/roadmap consistent with the goals of the Paris Agreement.
Coverage: Scope 1, 2 and 3	Scope 1 & 2 at the minimum. Include Scope 3, where material and exclusion are to be explained and justified.
Use of carbon credits & offsets	It should not be used as an alternative to reducing emissions or delaying mitigation action. Ideally, there should be no more than 10 per cent abatement.
Financing	Financial plan detailing implications of the transition, financing requirements for execution of the transition plan and how to achieve such financing.
Avoiding carbon lock-in	Identify existing assets and new investments at risk of leading to carbon lock-in. Develop a strategy and process for the responsible retirement of high-emitting assets.
Do No Significant Harm (DNSH)	Avoid harm to other sustainability objectives (e.g., biodiversity) at the activity and entity level.
Governance	Define processes and responsibilities for regular monitoring and reporting progress aligned with disclosure standards (e.g., IFRS S1 and S2), timely revisions of targets, and updated plans.
Third-party verification	Third-party verification of credibility of transition plans and activities for effectiveness, completeness, and performance against benchmarks.
Just transition considerations	Assess and account for adverse environmental and social impacts, including on the labour force and communities, from the transition in the transition plan. A strategy for mitigating such impacts is to be included in the plan.

Source: CPI Analysis

A detailed side-by-side analysis of the existing literature and guidance has been attached in Annexure I.

Several Indian steel companies including TATA Steel, JSW Steel, and JSPL, have set interim and/or long-term decarbonisation targets; some have disclosed their transition plans. An assessment of the alignment of transition plans of Indian steel companies with the guidelines mentioned above could help inform recommendations regarding improvements required in transition plans and is a future area of research.

2.5 Financial instruments

Suitable financial instruments are critical tools to enable finance flows to emission intensive industries, which are locked out of the green finance market because their operations are not demonstrably 'green'.

Transition finance instruments can be broadly bucketed into four categories:

- Key Performance Indicator-Linked - general purpose loans and bonds linked to emission reduction targets (e.g., Sustainability-linked loans (SLLs) and bonds (SLBs). These may also be referred to as 'General Corporate Purpose')
- Use-of-proceeds - directed towards low-emission assets (e.g., Transition loans, use-of-proceeds bonds)
- Hybrid - (e.g., sustainability-linked green bonds (SLGBs) - use-of-proceeds model of a green bond with the performance-based structure of an SLB)
- Traditional (e.g., Traditional loans and bonds, public and private equity).

Below, we provide an overview of 'labelled' finance instruments that have gained traction in recent years as means of raising debt for sustainable activities, including transitional activities.

Table 5: Overview of labelled instruments used to finance transitional activities.

Instrument label (Cumulative till 2023, globally)	Purpose	Mechanism	Allocation of capital
Sustainability-linked loans (\$1511 Bn ¹²)	Designed to incentivise borrowers to achieve specific sustainability targets such as emission reduction	Interest rate step-up on the loan linked to predetermined targets on sustainability-specific KPIs	KPI-Linked / General corporate purpose
Sustainability-linked bonds (\$280 Bn ¹³)	Designed to incentivise issuers to achieve specific sustainability targets such as emission reduction	Coupon step-up/ premium on redemption/ offset purchase obligation linked to the fulfilment of predetermined targets on sustainability-specific KPIs	KPI-Linked / General corporate purpose
Transition loans (\$3 Bn ¹⁴)	Designed to enable borrowers to fund an entity's transition towards a low-carbon but not completely green state	No penalty mechanism	Use-of-proceeds
Transition bonds (\$15 Bn ¹⁵)	Designed to enable issuers to fund an entity's transition towards a low-carbon but not completely green state	No penalty mechanism ⁱⁱⁱ	Use-of-proceeds ^{iv}

Source: CPI Analysis

Instruments facilitating finance flows to enable an entity to transition to lower emissions may not necessarily be limited to those labelled as transition or sustainability-linked bonds and loans. Suggestions have been proposed that any instrument may be categorised as providing transition finance if it incentivises an entity-wide transformation that enables lower emissions and lowered future financial risk arising from stringent climate policies to remain competitive in an emerging low-carbon economy.¹⁶ This includes blended finance instruments such as concessional loans, junior equity, and guarantees and novel instruments and mechanisms such as contracts for difference. A landscape view of various financial instruments, their sources, and their applicability across multiple stages of technology development is shown in the figure below. An assessment of these instruments' characteristics, utility and shortcomings concerning scaling transition finance is a suggested future area of research.

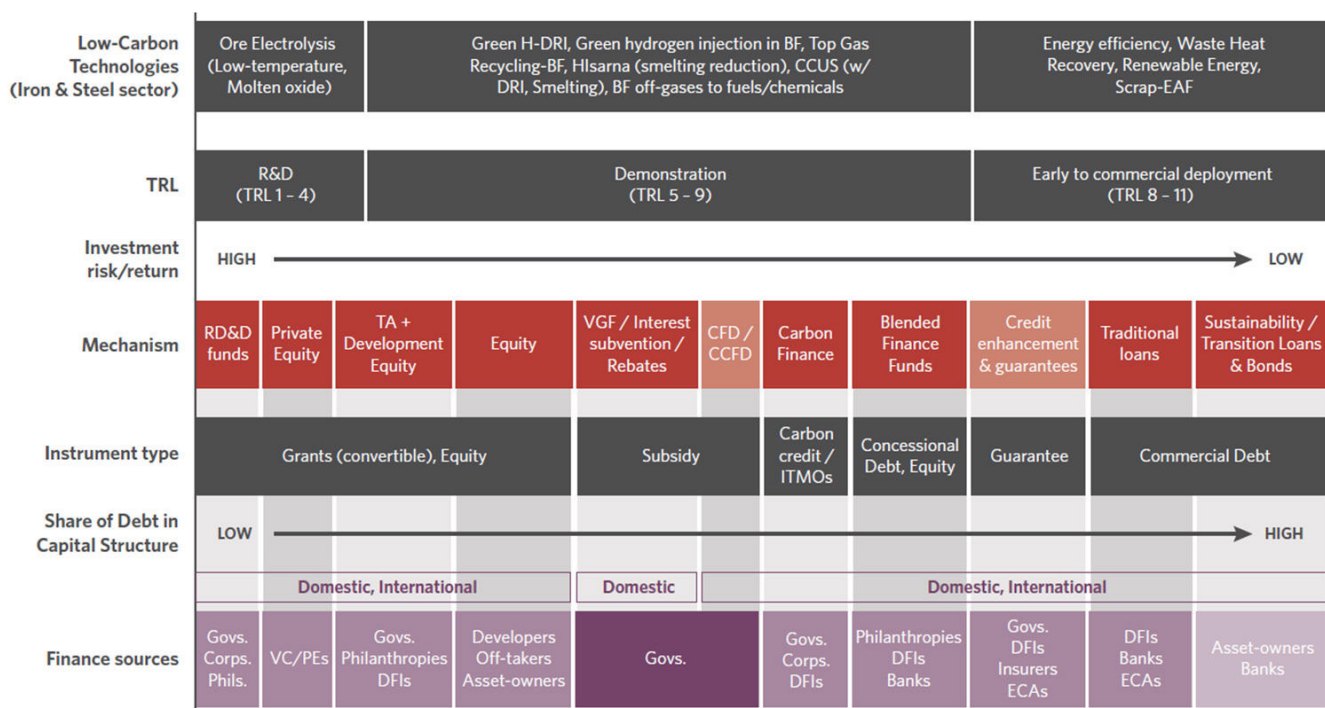
iii In most cases, no penalty mechanisms had been observed. Recently, in 2024, Japan has issued transition-linked bonds with interest rates tied to emission reduction.

iv Based on bonds issued so far. However, currently there is no universal guideline on allocation of capital for instruments labelled as 'transition'.

Mature technologies such as BF-BOF do not face significant hurdles in raising finance and typically acquire capital through traditional mechanisms such as project loans. However, the technologies which are essential for transition, such as hydrogen-based DRI, may face significant obstacles because of lower Technology Readiness Levels (TRLs) of their respective technologies, and thus require innovative ways of raising finance, such as Carbon Contracts for Difference (CCfD) and carbon finance. (please refer to figure 1)

Challenges faced by large corporations significantly differ from those faced by smaller players (MSMEs). In contrast, the instruments highlighted in the figure below cannot fully address these. Significant capacity building in the real and financial sectors would be needed, along with innovative structures for risk diversification to enable smaller players to access varied sources of finance. Similarly, the challenges faced by the secondary steel sector in India are distinct from those faced by the primary sector, and they may not be able to access transition finance through new instruments such as transition bonds. The sector suffers from higher perceived risks from investors, lack of adequate collateral, limited availability of credit history, low credit scores, and inability to tap into international capital markets. A low-carbon transition in the secondary sector demands more than traditional financial instruments. Risk mitigation and lowering the cost of capital is necessary to facilitate access to clean technologies, which remain underutilised despite favourable economics.¹⁷ Instruments such as risk-sharing facilities, concessional subordinate lending, and returnable grants could play an important role.

Figure 1: Financial instruments and sources to support the transition of the I&S sector.¹⁸



Source: CPI (2024).

■ Financing ■ De-risking ■ Public ■ Private ■ Public & private

Abbreviations:

- TRL – Technology Readiness Level
- R&D – Research and Development
- RD&D – Research, Development, and Demonstration
- TA – Technical Assistance
- VGf – Viability Gap Funding
- CCfD – Carbon Contracts for Difference
- ITMOs – Internationally Transferred Mitigation Outcomes
- DFIs – Development Finance Institutions
- ECAs – Export Credit Agencies
- CCUS – Carbon Capture, Utilisation, and Storage
- EAF – Electric Arc Furnace
- VC/PEs – Venture Capital/Private Equity
- Govs. – Governments
- Corps. – Corporations
- Phils. – Philanthropies

2.6 Emissions boundary, financed emissions, and target setting for financial institutions

Financial institutions (FIs) can be critical in directing capital towards lower-emission activities by setting specific time-bound decarbonisation targets and monitoring and reporting on their performance. To engage in the financing of transitional activities in the I&S sector, FIs would need to (1) select benchmark technology pathways; (2) define the financial scope (clients and instruments); (3) specify the emission scope and boundary; (4) select methodologies for calculating financed emissions; (5) set target carbon metrics; (6) select approach to setting portfolio-level targets. Points 1-2 are covered above. Points 3-6 are discussed below.

Emissions boundary: Steel manufacturers typically use GHG Protocol's Scope 1,2 & 3 categories for reporting their emissions. FIs can independently determine the scope and boundary of emissions to be considered in their carbon accounting and target setting. One approach is to include the client's Scope 1 and 2 emissions, with Scope 3 being included if material and significant from the perspective of the FI's targets. However, complexities arise due to differences in companies' ownership structure and vertical integration across the value chain. A review of existing approaches suggests using a 'fixed scope and boundary' approach, under which emissions occurring from activities within a specified (and consistent) boundary are to be considered in disclosures and target-setting, regardless of the scope of the emissions (and, therefore of the ownership of individual assets by any specific entity). This approach ensures standardised emissions accounting and comparability. It has been adopted by the Sustainable STEEL Principles (SSP) and implemented by the IEA and the Science-Based Targets initiative (SBTi).

Financed emissions: FIs can refer to the Global GHG Accounting and Reporting Standard for the Financial Industry to measure financed emissions for their I&S sector portfolio. It provides guidance for each type of asset class, covering both on-balance sheet and project financing. As per the standard, financed emissions (emissions attributed to the FI) are calculated by multiplying the emissions of the portfolio companies with the ratio of the outstanding loan amount (or equity) and the value of the company (sum of debt and equity for private companies; enterprise value including cash for listed companies).

Target metrics and target setting for transition finance: One prevailing approach in target setting is for FIs to report on the financing volume (new or total) to companies undergoing low-carbon transition or their sector-level decarbonisation targets. However, such metrics do not provide clear evidence of the impact of transition finance. An alternative recommended by the UNEP FI for the I&S sector¹⁹ is to measure either absolute carbon emissions or the carbon emission intensity of production and track performance against their chosen decarbonisation pathway. While either can be used, emission-intensity-based targets are recommended because they align with the reference technology pathways. Setting separate targets for primary and secondary steel is also recommended to account for the differences in the share of scrap usage.

UNEP FI recommends three different approaches for setting portfolio-level decarbonisation targets based on the choice of target metrics and the carbon performance metric in the reference pathway.

Table 6: Approaches to portfolio-level carbon target-setting for FIs.⁸

Approach	Description	Metric
Convergence	Set targets to reach the same emission intensity level (converge with) as the target in the benchmark pathway in a given year (say, 2050).	Emission intensity
Rate of change	Set targets to follow the same rate of absolute emissions/emissions intensity reduction as in the reference benchmark pathway.	Absolute emissions/ Emission intensity
Fair share	Set counterparty-specific targets for rate-of-reduction in absolute emissions based on the counterparty's performance against the industry average emissions in the benchmark pathway, such that the counterparty's emissions converge with the pathway's target.	Absolute emissions

Source: UNEP

Reference frameworks: Two comprehensive frameworks provide tailored guidance on target-setting and reporting by FIs, covering most aspects of the 6 elements:

- [SBTi's Steel Science-based Target-Setting Guidance](#) (for companies) and [Financial Sector Science-Based Targets Guidance](#) (for FIs)
- [Sustainable STEEL Principles](#)

Therefore, these frameworks are compatible with 1.5°C goals and more suitable for banks committed to NZE by 2050. These frameworks may need to be adapted to the Indian context.

3 Recommendations

The table below provides recommendations—both general/sector-agnostic and specific to the I&S sector—on actions that various types of stakeholders—policy makers, regulators, industry, and civil society—can undertake to promote each of the enablers of transition finance discussed above. Each recommendation has been assigned a priority (High, Medium, Low) based on its feasibility and potential impact on unlocking transition finance in the sector and a time frame for implementation, considering the sequential nature of interventions.

Recommendation & key stakeholders	Specifics	Priority* / time horizon
GENERIC/SECTOR-AGNOSTIC RECOMMENDATIONS		
<p>1. Develop and Implement the National Sustainable Finance Taxonomy and Define the Screening Criteria for Green and Transitional Activities</p> <p><i>Policy makers (MoF)</i></p>	<ul style="list-style-type: none"> A sustainable finance taxonomy is required that defines what is meant by <i>sustainable finance</i> in the Indian context, including the scope of coverage—sectors, types of activities, entities, financial instruments, etc. A flexible and technology-agnostic approach is suggested so it may remain functional with new developments The taxonomy may distinguish between <i>green</i> and <i>transitional</i> activities and specify eligibility/screening criteria based on science-based pathways aligned with India's net-zero emissions target (<i>sectoral pathway and transitional activity screening criteria for the I&S sector discussed under sector-specific recommendations below</i>). 	<p>High</p> <p>Short-term (1-2 years)</p>
<p>2. Harmonise the national sustainable finance taxonomy with sectoral transition pathways (for domestic investments) while ensuring interoperability with taxonomies of other jurisdictions (for foreign investments).</p> <p><i>Policy makers (MoF, various line ministries)</i></p>	<ul style="list-style-type: none"> Given India's NZE by 2070 target, sectoral transition plans/pathways may not be aligned with the 1.5°C target of the Paris Agreement (carbon neutrality/ net-zero by 2050). They, therefore, may not align with pathways used by other jurisdictions (such as IEA and NZE Pathway). However, since most financing needs of industrial sectors are expected to be met domestically, the domestic taxonomy must be aligned with India-specific transition plans/pathways At the same time, interoperability with international taxonomies may be necessary to enable foreign investments in low-emitting assets in India. The role of IFSC and IFSCA could be critical in channelling transition finance from international sources to Indian companies whose transition plans are ambitious and aligned with a science-based pathway for NZE by 2050. 	<p>High</p> <p>Short-term (1-2 years)</p>

Recommendation & key stakeholders	Specifics	Priority* / time horizon
<p>3. Mandate disclosure of corporate transition plans. Reporting may be aligned to standardised credibility assessment guidelines.</p> <p><i>Financial market regulator (SEBI), Central Bank (RBI)</i></p>	<ul style="list-style-type: none"> • Disclosures – for the real and financial sectors – could increase focus on transition planning, mechanisms, and instruments to increase transition finance. This could entail expanding nuanced Business Responsibility and Sustainability Reporting (BRSR) for MSMEs (as has been indicated by the Securities and Exchange Board of India (SEBI)) and including transition plans in disclosures for FIs (as has been indicated by the Reserve Bank of India in the draft disclosures issued in Feb 2024). This aligns with our findings that a concentrated effort by all ecosystem players would be required quickly for the needle to move • Guidelines for preparing and assessing the credibility of transition plans may be standardised. The guidelines could take input from the credibility assessment framework described in Table 3. In addition, SEBI could recognise international frameworks if any transitioning company is already following an international standardised framework • SEBI issued a circular for ESG rating providers in 2023, mandating assessment of <i>Parivartan</i> (transition) score, in addition to the ESG rating. Such a transition score may be calculated based on quantitative and qualitative metrics. Recently, CPI has developed a 'Carbon Rating Framework' that proposes a methodology for calculating a company's carbon performance based on a quantitative metric, 'carbon intensity of revenues' and various qualitative metrics such as regulatory compliance. Carbon Ratings Framework – complementary to existing credit ratings – could feed into the <i>Parivartan</i> score. This framework may be expanded to include other qualitative elements of a credible transition plan (such as those described in Table 3). 	<p>High</p> <p>Short-term (2-3 years)</p>
<p>4. Mandate FI disclosures on climate risk and reporting on financed emissions</p> <p><i>Central Bank (RBI) and financial market regulators (SEBI, PFRDA, IFRDA)</i></p>	<ul style="list-style-type: none"> • Under its draft guidelines on '<u>Disclosure framework on climate-related financial risks, 2024</u>', the RBI has notified banks to assess and report climate risk. Climate risk assessment may be extended to institutional investors such as pension funds and insurance companies. 	<p>Medium</p> <p>Medium-term (3-5 years)</p>
<p>5. Improve companies' and FIs' awareness of transition finance and the availability of robust, granular data on carbon emissions across industrial supply chains.</p> <p><i>Manufacturers and their supply chain, FIs</i></p>	<ul style="list-style-type: none"> • Build companies' and FIs' capacity and understanding of transition finance—transition plans, target-setting, financial instruments, and disclosure frameworks. This could be undertaken through workshops, seminars, executive courses, and industry forums • Capacity-building support for small—and medium-scale secondary steel producers is needed to bridge the knowledge gap and enable better adoption of best practices regarding technologies, supportive policies, financial best practices, and due diligence • Improve the coverage and accuracy of emissions data of financial institutions' portfolio companies and supply chains. 	<p>High</p> <p>Short-to-medium term (0-5 years)</p>

Recommendation & key stakeholders	Specifics	Priority* / time horizon
<p>6. Include all relevant financial instruments, including novel mechanisms relevant for I&S and other industrial sectors</p> <p><i>Policy makers (MoF) and Regulators (SEBI, RBI)</i></p>	<ul style="list-style-type: none"> A broad range of financial instruments can enable the flow of transition finance. A national taxonomy could be supplemented by a technology roadmap, which may help in the development of eligible instruments that ecosystem players can use: <ul style="list-style-type: none"> Traditional loans, bonds, public/ private equity KPI-linked instruments: sustainability-linked loans and bonds Use-of-Proceed instruments: transition loans and bonds; convertible transition loans/bonds Blended finance instruments: grants, concessional debt, junior equity, credit guarantees, concessional credit lines for SMEs, etc. Other financial de-risking instruments: credit insurance currency hedging mechanisms Novel/Innovative instruments: carbon contracts for difference, carbon results-based bonds (described in the IFSC expert committee report on transition finance), etc. 	<p>N/A</p>
<p>SECTOR-SPECIFIC RECOMMENDATIONS</p>		
<p>7. Design and Implement Green Industrial Policies for the Iron & Steel sector</p> <p><i>Policy makers (MoS, MoP, MNRE), Steel and Energy sector companies, Industry associations, Civil Society</i></p>	<ul style="list-style-type: none"> Green industrial policy (GIP) is necessary to balance the objectives of growing economic output, energy security, competitiveness, and decarbonisation. Following the recent launch of India's high-level <u>Roadmap and Action Plan</u>, a comprehensive National Green Steel Mission, consisting of technology-push and demand-pull levers, would support the flow of transition finance from the real economy. GIP instruments may include high-level missions, market-based incentives (production subsidies, interest subvention, tax credits, etc.), regulations and standards (technology mandates, green public procurement, green steel standards), innovation policy (R&D, demonstration grants), skill development, etc. (Refer to Table 2) GIPs would be needed in key sectors, including I&S, Green Hydrogen (National Green Hydrogen Mission), and Carbon Capture Utilisation and Storage (CCUS). Ensure harmonisation of policies across these sectors and the Indian Carbon Credit Trading Scheme (CCTS). Policy support for small-scale secondary steel producers is to be prioritised to promote the adoption of the best available technologies and improve capabilities to eventually transition to near-zero emissions technologies. Responsible engagement with policy makers to advocate for policy & regulatory frameworks that support adopting low-carbon technologies. 	<p>High</p> <p>Short-to-medium term (1-5 years)</p>

Recommendation & key stakeholders	Specifics	Priority* / time horizon
<p>8. Develop a sectoral transition pathway and a technology roadmap to transition the Indian I&S sector to NZE by 2070 (preferably earlier). Differentiate between emissions trajectories for primary and secondary steel production.</p> <p><i>NITI Aayog, Policy maker (MoS), and Industry associations (CII, FICCI, ISA, SIMA)</i></p>	<ul style="list-style-type: none"> • The cornerstone for companies and FIs planning transition is a detailed sectoral transition pathway complemented by a technology roadmap. These could be integral to the National Green Steel Mission (NGSM) and build on the Ministry's recent greening steel roadmap, defining clear timelines and milestones for introducing policies, incentives, and targets. • These may be based either on absolute emissions or emission intensity, sufficiently aligned to goals of the Paris Agreement (while considering the Indian context), sufficiently granular (include interim targets), comprehensive (detailed technology development and deployment roadmap), transparent (in methodology and target-setting), industry-endorsed and periodically revised/updated. • Sectoral transition pathways need to be harmonised with other domestic policies/frameworks, such as the National Green Hydrogen Mission (NGHM) and the CCTS (for instance, the emission-intensity targets under both may be aligned). • Nuanced considerations are required for primary and secondary steel production to account for differences in scrap usage. Given the tremendous demand growth in India and the limited availability of scrap, decarbonisation of primary steel production routes must be prioritised to curtail a rapid increase in emissions from the sector. • Implement an effective monitoring, reporting, and verification (MRV) system for emissions accounting, transparency, and accountability for producers. 	<p>High</p> <p>Short-term (1 - 2 years)</p>
<p>9. Define a sectoral emissions pathway and specific targets under the sustainable finance taxonomy and the criteria for screening transitional activities.</p> <p><i>Policy makers (MoF, MoS)</i></p>	<ul style="list-style-type: none"> • In relation to Recommendations 1 and 2 on taxonomy and harmonisation, it is important to consider the following: • The I&S sectoral transition plan and technology pathway should specify long-term and interim (emission-intensity) targets that can feed into the national sustainable finance taxonomy. The taxonomy could use direct listing or quantitative thresholds (discussed in section 2.3) to screen transitional activities that meet or exceed these targets. • Additionally, the taxonomy must specify the screening criteria for associated technologies, mainly hydrogen and CCUS. 	<p>Medium</p> <p>Medium-term (3 - 5 year)</p>

Recommendation & key stakeholders	Specifics	Priority* / time horizon
<p>10. Issue guidance for FIs to select suitable metrics and define a methodology for calculating portfolio-level financed emissions.</p> <p><i>Financial sector regulators (RBI)</i></p>	<ul style="list-style-type: none"> Existing methodologies for calculating financed emissions defined under the Partnership for Carbon Accounting Financials (PCAF) and Paris Agreement Capital Transition Assessment (PACTA) may be adapted to the Indian context for setting baselines. Globally recognised frameworks such as IPCC, Network for Greening the Financial System (NGFS), et cetera may be leveraged for scenario analysis and selecting metrics to undertake financed emission calculation over short, medium, and long-term horizon, enabling portfolio-level carbon performance assessment (based on absolute emissions or emission intensity). It would be key to suitably align existing methodologies/frameworks to the Indian context, given the country's development objectives and related differences. Financial regulators may consider issuing guidance in line with the approaches mentioned above. A fixed emissions system boundary and a fair-share approach to calculating financed emissions (Table 6) are recommended as they account for the differences in starting points in companies' emissions and FIs' portfolios. However, FIs may choose alternative approaches in line with guidance from regulators. 	<p>Medium</p> <p>Short-term (2 - 3 years)</p>

**Priority considers the potential impact on scaling transition finance, feasibility, and sequencing of actions.*

Annexure - I: Comparison of the existing literature and guidance on credibility assessment of transition plans.

Element	Climate Bonds Initiative (CBI)	Organisation for Economic Co-operation and Development (OECD)	Association of Southeast Asian Nations (ASEAN)
Net Zero Goal - Basis	SBTi or others consistent with the 1.5° C target	1.5°C – In case it is not possible to explain with justification. Not to breach < 2°C in any scenario	Ideally, SBTi or country- or industry-led commitments are consistent with a 1.5° C target with no to low overshoot or, at a minimum, well below 2°C
Interim Targets (Phasing)	Divide into three- Short, medium & long. The reduction should be front-loaded	The long-term transition goal is accompanied by interim (e.g., 3/5-year) quantifiable, detailed, and time-bound targets, including an explanation of the methodologies and assumptions used to derive them	Roadmap of actions to achieve near, medium & long-term milestone.
Technology Selection	IEA technology roadmap	Technology selection can be guided by sectoral technology roadmaps such as the IEA technology roadmap	No mention
Coverage – Scope 1, 2 & 3	Scope 1,2 &3. If 3 are not included, it should be explained & justified	Contain scope 3 emissions as part of metrics, targets, and related reporting. Its omission can be justified in limited with careful explanation	Scopes 1, 2 as well as Scope 3, where material
Use of Carbon Credits & Offsets	Offset and carbon credits should end for residual emissions, which should be no more than 10 per cent	Should not be used as an alternative to reducing emissions today or as a reason for delayed mitigation action but rather as part of the portfolio of solutions	No mention
Financing	Feasible financial plan detailing the financial implications of the transition in terms of the costs and how it will be financed	A credible transition plan will be integrated into the corporate business plan. Explicitly addressing needs and commitments for capital & operating expenditure, M&A, and R&D expenditures	Capital Allocation Plan: Financial requirements for execution of the transition plan and how to achieve such financing

Element	Climate Bonds Initiative (CBI)	Organisation for Economic Co-operation and Development (OECD)	Association of Southeast Asian Nations (ASEAN)
Avoiding Carbon Lock-in	No mention	Identify existing assets and new investments at risk of leading to emissions lock-in and set out the steps to prevent such lock-in, including early retirement	No mention
DNSH	No mention	Avoid harm to sustainability objectives other than climate mitigation at the activity and entity level	No mention
Governance	Internal monitoring, accountability mechanisms, and leadership systems are needed to drive the transition	Process and responsibilities for regular monitoring and reporting progress towards targets, as well as for any timely and regular revision and update of this plan	Organisational structure & mechanisms
Third-Party Verification	The company's transition plan is assessed and audited by an independent third-party	Third-party verification of its plan and related targets	Disclose performance, targets, and progress on an annual basis aligned with existing climate-related disclosure standards such as IFRS S1 and S2. Third-party verification on transition credibility
Just Transition considerations	Any risks to other social and environmental areas, such as biodiversity or transition, must be identified and mitigated	Transition impacts workers, suppliers, local communities, and consumers. The transition plan will ensure decent work, adequate capacity and skills, and a plan for retaining, retraining, reskilling, and education opportunities	Assess and account for potential adverse environmental impacts and social considerations that arise from their transition plan

Endnotes

- 1 [Decarbonising India: Charting a Pathway for Sustainable Growth, McKinsey & Company, 2022](#)
- 2 [India Energy Outlook 2021 – Analysis, IEA, 2021](#)
- 3 [Annual Report 2019-2020, Ministry of Steel, Government of India, 2021](#)
- 4 [Towards a Low Carbon Steel Sector, TERI, Shakti Foundation & Energy Transitions Commission, 2020](#)
- 5 [Union Minister of Steel and Heavy Industries Releases India's Green Steel Taxonomy, Ministry of Steel, 2024](#)
- 6 [Financing Decarbonization of the Secondary Steel Sector in India, TERI, 2023](#)
- 7 [Policies and Enabling Environment to Drive Private Investments for Industrial Decarbonization in India, CPI, 2023](#)
- 8 [Climate Target Setting for Steel Sector Financing, UNEP Finance Initiative, 2024](#)
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- 12 [Making sense of sustainable debt labels, Bloomberg, 2024](#)
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- 15 [The latest trends in transition bond issuance, Environmental Finance, 2024](#)
- 16 [Transition Finance: Investigating the State of Play, OECD, 2021](#)
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- 18 [Financing Industrial Decarbonization – Challenges and Solutions for India's Iron and Steel Sector, CPI, 2024](#)
- 19 [Climate Target Setting for Steel Sector Financing, UNEP Finance Initiative, 2024](#)



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