ArcelorMittal & Nippon Steel:
The need for more ambitious climate action

The steel industry forms the backbone of production, construction, and infrastructure. At the same time, no industry has higher CO_2 emissions, as steel accounts for about 11% of global CO_2 emissions and 7-9% of all global greenhouse gas emissions.[1] 90% of these emissions stem from the use of coal in blast furnaces.[2] It is already possible to produce steel without coal today, but the transition is currently moving too slowly. Without further action, the steel industry risks depleting 23% of the world's carbon budget for 2030-2050.[3] The IEA has clearly stated that the steel industry is currently *"not on track to meet net zero by mid-century"*.[4] As the world's second- and fourth-largest steel producers—and the two largest ones outside of China—ArcelorMittal and Nippon Steel have a significant impact on the direction of the industry and whether the transition succeeds.[5] Unfortunately, both companies are lagging.

The need for action: ArcelorMittal and Nippon Steel are…

- *building* new coal-based facilities that will lock in millions of tonnes of carbon emissions every year
- *diverting* investments away from reliable green technologies towards uncertain and ineffective carbon capture technologies
- *blocking* climate action as two of the 25 global companies most influential in blocking climate legislation

To transition the steel industry, engagement from progressive investors is needed. This brief highlights the gaps in ArcelorMittal's and Nippon Steel's current climate strategies and presents four key recommendations for investor engagement.

To future-proof the competitiveness of ArcelorMittal and Nippon Steel, NCSF recommends for investors to engage proactively on the following issues. ArcelorMittal and Nippon Steel must:

1) **Align their coal-based steel production with their 2050 net zero targets**
2) **Scale up their green steel capex and direct it towards reliable solutions**
3) **Set 1.5°C-aligned reduction targets**
4) **Align their lobby activities with the Paris Agreement**

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Two routes for primary steel production

The BF-BOF route: The blast furnace-basic oxygen furnace route is the traditional steel production route. It requires the use of metallurgical coal for reducing (i.e., removing oxygen from) the iron ore. The CO2 intensity of 1 ton of steel made this way is 2.2 ton of CO2, according to the IEA. This production route makes up 72% of global steel production.

The DRI-EAF route: Direct reduction of iron is an alternative to the BF-BOF route. In DRI, the iron ore is reduced in shaft furnaces, either by using natural gas or hydrogen. The reduced iron is then made into steel in electric arc furnaces, which are also used for secondary steelmaking with recycled scrap. When natural gas is used for DRI, the CO2 intensity of 1 ton of steel is 1.4 ton of CO2, according to the IEA. When green hydrogen is used instead (and the electric arc furnace is powered by clean electricity), the C02 intensity is near-zero.

Secondary steelmaking: 21% of global steel production is made with recycled steel (scrap). This production route does not require the reduction of iron. Therefore, neither coal, hydrogen, nor natural gas are involved. Instead, scrap is melted in an electric arc furnace, which is the same that is used in the DRI-EAF route. As the furnace can be powered with clean electricity, secondary steelmaking is sustainable, but given the limitations of available scrap, recycling alone cannot decarbonize the steel industry.

1. ArcelorMittal and Nippon Steel must align their coal-based production with their 2050 net zero targets

ArcelorMittal and Nippon Steel are building new coal-based blast furnaces, which is not compatible with being 1.5°C-aligned. Moreover, they have not specified how their capital expenditure plans are aligned with their 2050 net zero goal or disclosed any plan for how their existing coal-based production facilities will be phased out in line with being net zero by 2050.

ArcelorMittal and Nippon Steel still expand with new coal-based blast furnaces. The two companies have created a joint venture, ArcelorMittal/Nippon Steel India, with ArcelorMittal owning 60% and Nippon Steel 40%. This joint venture is constructing two new (unabated) blast furnaces at Hazira in the state of Gujarat, adding coal-based steelmaking capacity of 6 Mtpa (million tonnes per annum).[6] Beyond this fossil expansion, ArcelorMittal Nippon Steel India is planning further coal-based expansions at Hazira (adding 20 Mtpa)[7] as well as three new blast furnaces at Kendrapara (14 Mtpa)[8] and two new blast furnaces at Paradeep (7 Mtpa)[9] in Odisha. Building new coal-based capacity locks in high emissions long into the future, and the fossil-free alternatives already exist. With an estimated lifetime of 40 years for a new blast furnace, the risk of these projects becoming stranded assets loom large.[10] This underlines the severity of the fact that neither company have outlined plans to phase out capex in new unabated carbon-intensive assets.[11] While the coal-based expansion in India gets the most attention, relinings of blast furnaces similarly lock in emissions. For example, Nippon Steel will spend $300 million to reline a blast furnace at Gary Works, Indiana, extending its lifetime up to 20 years.[12] And Reclaim Finance reports that ArcelorMittal is also expanding its coal-based production capacity in Brazil and Mexico.[13] Relining plans are often not transparent or easily accessible, which makes it important that investors engage in dialogue with ArcelorMittal and Nippon Steel about them.

ArcelorMittal and Nippon Steel have not outlined plans for aligning their existing coal-based steelmaking production capacity with their net zero targets. Today, 71% of ArcelorMittal's and 73% of Nippon Steel's total steelmaking capacity is coal-based (with the rest being mostly secondary steelmaking).[14] The remaining lifetimes of these existing coal-based steelmaking facilities vary, but looking towards 2050, there is very little room for coal in steel, with unabated coal-based steelmaking being at least 95% phased out, according to the IEA.[15] The thinktank Agora Industry has shown that coal can be phased out of global steelmaking by the mid-2040s.[16] Achieving the goals of IEA and others requires action. Therefore, coal-based steel companies like ArcelorMittal and Nippon Steel must deliver concrete, verifiable asset-by-asset plans to phase out coal from their steelmaking in line with their net zero targets. Currently, neither company has provided such a plan.

2. ArcelorMittal and Nippon Steel must scale up their green steel capex and direct it towards the most effective solutions

Nippon Steel and especially ArcelorMittal present themselves as being at the frontline of steel decarbonization technologies. However, many of the companies' green steel projects rest on uncertain and inadequate technologies that will not reduce steel emissions sufficiently or move the companies away from coal-dependence. ArcelorMittal and Nippon Steel must prioritise green hydrogen-based decarbonization technology instead of CCUS (carbon capture utilization and storage), increase their investments in this technology, and outline plans for a timely transition from fossil gas to green hydrogen in their direct reduction of iron (DRI) projects.

ArcelorMittal and Nippon Steel have not outlined credible decarbonization capital expenditure plans. ArcelorMittal has announced it will spend $10 billion in 2020-2030 for decarbonization investments.[17] However, in 2021-2023, ArcelorMittal only spent $500 million, rendering the company far off target. Nippon Steel has announced an overarching figure of 4-5 trillion yen (around $30 billion) for decarbonization investments, but without outlining what these funds will go to or any implementation timeline.[18] To ensure that ArcelorMittal and Nippon Steel in fact invest in decarbonizing their steelmaking, the companies must disclose capital expenditure plans that specify decarbonization technologies and implementation timelines.

ArcelorMittal and Nippon Steel place too much faith in unreliable CCUS technologies to decarbonize steelmaking, at the expense of reliable solutions like green hydrogen DRI. Both ArcelorMittal's and Nippon Steel's decarbonization strategies for their primary production consist of two overall pathways:

1) Continued reliance on coal-based blast furnaces but equipped with carbon capture technology and limited substitution of some coal via hydrogen and non-coal-based carbon injections, and
2) Direct reduction of iron (DRI) technology.[19]

They present the two pathways as equally important for decarbonizing steelmaking. That is not the reality. On the one hand, CCUS-equipped blast furnaces have meagre emissions reduction potential[20] and do not phase out coal from steelmaking (thus upholding large methane emissions[21]). Moreover, CCUS blast furnace technology is on the test level as there is currently no full-scale CCUS facility for blast furnaces in operation.[22] The commercial pipeline is much smaller than for DRI, as CCUS is increasingly looking like an uncompetitive solution.[23]

On the other hand, DRI with green hydrogen (HDRI) can in fact bring steelmaking very close to zero emissions, it phases out coal, it is thoroughly tested, and it has no storage challenges.[24] HDRI steelmaking is a future-proof technology on its way to cost competitiveness.[25] Given all this, it is no surprise that "the project pipeline for producing steel with hydrogen rather than coal is expanding rapidly", to quote the executive director of IEA in the Financial Times,[26] and various market projections show that market for green steel is entering an exponential growth phase.[27] The project pipeline includes Stegra (formerly H2 Green Steel) and SSAB's HYBRIT project in Sweden,[28] Thyssenkrupp's tkH2Steel[29] and Salzgitter's SALCOS[30] projects in Germany, as well as many others, including ArcelorMittal's projects.[31] In tandem with these projects, the demand for green steel is growing with an increasing number of offtake agreements.[32] Beside HDRI, other ways of making steel without coal are under development, centred around direct electrolysis technologies, which do not need external input like hydrogen.[33] While the technological prospects look interesting, HDRI is currently the only coal-free primary steelmaking technology at a high technology readiness level.[34] ArcelorMittal and Nippon Steel should engage in this transition and prioritize efforts and investments towards coal-free steelmaking, such as HDRI technology, instead of upholding blast furnace-based production.

ArcelorMittal is backtracking on its commitment to transitioning from gas DRI to green hydrogen DRI. DRI facilities are often build 'hydrogen-ready', meaning that they initially use natural gas as reductant but can shift to using green hydrogen as the green hydrogen market matures.[35] As natural gas is a fossil fuel, and steel produced with gas-based DRI does not come close to achieving near-zero carbon intensities, it is paramount that plans for turning hydrogen *readiness* into hydrogen *use* are not diluted. However, ArcelorMittal has recently been backtracking on its plans to shift from gas to hydrogen in some of its DRI projects. That has been the case in its much-heralded project in Gijón, Spain, where the plans to have a hydrogen-powered DRI plant ready in 2025 have been postponed.[36] Instead, the project will run on gas without any disclosed timeline for the transition to hydrogen that was initially promised. To ensure the transition away from fossil fuels, investors should require clear timelines for when hydrogen-ready facilities will start actually using green hydrogen instead of natural gas.

3. ArcelorMittal and Nippon Steel must set 1.5°C-aligned reduction targets

ArcelorMittal and Nippon Steel have set 2050 net zero targets and 2030 reduction targets. However, both companies lack targets that are validated and Paris-aligned, encompass their entire steel production, and account for scope 3 emissions. Investors should engage with ArcelorMittal and Nippon Steel on improving their short-, medium- and long-term targets, focussing on the points below.

Climate targets exclude substantial parts of their activities. As mentioned above, ArcelorMittal and Nippon Steel are expanding their unabated coal-based steelmaking capacity through their joint venture in India. Neither ArcelorMittal nor Nippon Steel include emissions from ArcelorMittal/Nippon Steel India in their emission targets.[37] This is problematic as coal-based steel production in India will make up an increasingly large share of the companies' carbon footprint.[38] The blast furnace capacity expansion at Hazira alone – which is already under construction – will increase emissions with 12Mt CO2e annually, equalling 30% of Denmark's national emissions.[39] The other aforementioned expansion plans under consideration would add significantly to that. The omittance of the Indian joint venture from the companies' emissions targets relieves their coal-based expansion in India from the same degree of scrutiny from concerned investors that the rest of their activities face. Consequently, it makes ArcelorMittal's and Nippon Steel's decarbonization pathways look less demanding than they in fact are.

Climate targets miss scope 3 emissions. ArcelorMittal and Nippon Steel report on their scope 3 emissions, which is a commendable first step. However, neither company has set a reduction target for scope 3 emissions, meaning that there are no real incentives for reducing these emissions. This must change for two reasons. Firstly, the reported scope 3 emissions are material. Nippon Steel's scope 3 emissions amounted to 18% of its total emissions in 2023.[40] Secondly, not including scope 3 emissions incentivizes the outsourcing of essential steelmaking inputs, regardless of any reductions in emissions. We have seen this in Bosnia and Herzegovina, where ArcelorMittal has announced it will close its coking plant (where coking coal, used in blast furnaces, is made) while keeping its blast furnace in operation with purchased coking coal from external sources.[41] Such emissions shifting from scope 1 to scope 3 is merely a desktop exercise with no practical emission reductions. Moreover, such a target should include upstream scope 3 emissions from coalmining. Coalmining is obviously vital to these companies' steelmaking, and mining coal emits large amounts of methane, which can often be mitigated at relatively low costs, if the incentives exist.[42]

Climate targets are not verified nor aligned with 1.5°C. As Climate Action 100+ points out, neither of the two companies have set a medium-term target that *"is aligned with the goal of limiting global warming to 1.5°C".*[43] Nor have they set any short-term targets at all. MSCI deems both companies to be *"strongly misaligned with global climate goals"*, which according to MSCI aligns ArcelorMittal and Nippon Steel with an implied temperature rise of 3.2°C.[44] At its 2023 AGM, ArcelorMittal was asked by investors to *"commit to a 1.5°C SBTi target, as well as disclosure of short- and medium-term targets supporting its achievement"*, but just before its 2024 AGM, the company declared that it would not do so after all.[45] Consequently, ArcelorMittal's SBTi commitment was removed, while Nippon Steel never was a member.[46] Investors should engage with the companies on setting targets that can be externally validated in accordance with 1.5°C.

4. ArcelorMittal and Nippon Steel must align their lobby activities with the Paris Agreement

With their size and global presence, there are arguably no steel companies that hold more influence on the direction of the global steel industry than ArcelorMittal and Nippon Steel. So far, both companies have used their immense influence to block or halt necessary climate legislation and refrained from satisfactorily disclosing their lobby efforts. Investors should engage with the companies on aligning their lobby activities with 1.5C.

ArcelorMittal and Nippon Steel are blocking climate policy action. InfluenceMap, whose corporate climate policy engagement assessment are used by CA100+, ranks both Nippon Steel and ArcelorMittal among the 25 companies most influential in blocking climate policy action globally (as 8th and 22nd, respectively), alongside companies like Chevron, Gazprom, and Toyota.[47] ArcelorMittal and Nippon Steel have both engaged in blocking progress on carbon pricing on various occasions. Moreover, ArcelorMittal is

member of two of the ten most negatively influential industry associations (BusinessEurope, which is 4th and the Federation of German Industries at 10th), while Nippon Steel is member of the federation ranked 7th (Japan Iron and Steel Federation). Both companies have opposed carbon pricing in various instances.[48] To Paris-align their lobby activities, the companies must disclose a review of their climate policy positions' alignment with the Paris Agreement and how they have advocated for these positions through its climate policy engagement activities (as a company as well as in industry federations). At Nippon Steel's 2024 AGM, 28% of investors voted in favour of a resolution on this, which shows increasing investor sentiment regarding the issue.[49]

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