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The Industry Has Spoken – You Do Not Need High Emitting Blast Furnaces to Make the Most Advanced Steel Products

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When it comes to steel decarbonization, we do not need to compromise our climate ambition to make the types of demanding steel products needed for our twenty-first century economy. Nevertheless, many of the world's highest emitting steel producers and their allies would have you believe that one cannot be done without the other. They are wrong. They have created a false trade-off between our climate and our economic goals. We can transition to low emitting technologies while still meeting demand for the most advanced and highest quality steels, such as exposed automotive, high strength, electrical, and tin mill steels.

Unfortunately, the notion that high emissions blast furnace production must be sustained in order to make high quality steel products has taken root throughout parts of Washington, D.C. and the international community. In pushing this narrative, many large steel manufacturers and their advocates have successfully lobbied for different (*i.e.*, more lenient) emissions standards to be applied to steel made in high emitting blast furnaces than to steel made through low emissions processes, such as in an electric furnace. The reasons they give for treating blast furnaces more favorably are two-fold. First, they claim that electric furnaces cannot produce the most advanced steel grades, such as those used for exposed automotive products. Second, they argue that there is not enough steel scrap available to support a transition towards greater scrap-based steelmaking in electric

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furnaces. They are wrong on both counts, and neither of their arguments reflect the modern reality of the global steel industry. We focus on refuting their first claim here but will return to the scrap availability issue on another day.

The suggestion that electric furnaces cannot be used to produce the most advanced types of steel products is simply not true. This was not always the case, but the world has changed, and the industry today knows that furnace type does not limit the grades of steel a particular facility can make. Indeed, the actions of many of the largest steelmakers in the world reflect this as they are investing heavily to transition to electric furnace and direct reduced iron (DRI) operations. And they are doing it for the express purpose of producing the same types of advanced steels that some still argue cannot be produced in electric furnaces. For example, the Biden Administration recently awarded up to $500 million in grants to the largest U.S. integrated steel producer – Cleveland-Cliffs – to replace the blast furnace at its Middletown, OH facility with a hydrogen ready DRI plant and two electric furnaces that will link with its existing mill equipment. In touting this project, Cleveland-Cliffs explains that the investment will allow it to "maintain the level of quality of the steel produced {and} the Company's leading position in the automotive end market." In fact, in their latest earnings call, the CEO of Cleveland-Cliffs comments that the Middletown project will allow it to continuing serving "the highest quality demand in end markets, like the automotive."

Similarly, as illustrated below, many Canadian and European steel producers are investing billions of dollars to replace their existing blast furnaces with electric furnace and DRI operations.

Company

Investment Size ($USD)

Capacity (MT/year)

Date Online

Algoma (Canada)

$875 million

3.7 million

2024

ArcelorMittal (Canada)

$1.31 billion

2.4 million

2028

ArcelorMittal (Belgium)

$1.3 billion

2.5 million

2030

ArcelorMittal (France)

$1.95 billion

2.5 million

2027

ArcelorMittal (Germany)

$1.6 billion

3.5 million

2025

ArcelorMittal (Spain)

$1.1 billion

1.1 million

2025

Blastr (Finland)

$4.24 billion

2.5 million

2026

British Steel (UK)

$1.6 billion

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2025

H2 Green Steel (Spain)

$2.5 billion

2 million

2025-2026

H2 Green Steel (Sweden)

>$5 billion

5 million

2025

Liberty Steel (Romania)

$1 billion

1 million

2030

Saarstahl (Germany)

$3.67 billion

3.5 million

2027

Salzgitter (Germany)

>$2 billion

1.9 million

2025

SSAB (Finland)

$4.75 billion

2.6 million

2030

SSAB (Sweden)

$4.75 billion

2.7 million

2026

Tata Steel (Netherlands)

>$2 billion

3 million

2030

Tata Steel (UK)

$1.55 billion

—

—

Thyssenkrupp (Germany)

>$3 billion

2.5 million

2026

Voestalpine (Austria)

$1.6 billion

2.5 million

2027

In making these substantial investments, many of these and other leading producers, brag about how their electric furnace conversion projects will allow them to transition away from blast furnaces and still produce the most advanced steel grades and products. For instance:

- Canadian steel producer Algoma boasts that its electric furnace conversion project will result in "{e} nhanced product quality and diversification" and touts the "enhanced capabilities expected to result

from the EAF transformation."

- ArcelorMittal claims that, when its Dofasco conversion project in Canada is completed, "all ArcelorMittal facilities in North America that make automotive steel will utilize an EAF-based process." ArcelorMittal further describes its new electric furnace and DRI operations at Dofasco as being able "to produce the most demanding steel grades" and supporting "the most demanding product segments including automotive exposed, advanced high strength steels, and consumer packing."
- In Slovakia, U.S. Steel is replacing three blast furnaces with two new electric furnaces at its Kosice mill, which currently produces "slabs, plate, sheet, tin products, spiral welded pipe, and refractory ceramic materials, and mainly serves customers in the car production, construction, container, electrical appliance, oil and gas and petrochemical markets."
- Japanese steelmaker JFE Steel is considering building an electric furnace to replace a blast furnace at its Kurashiki plant. Specifically, the company's president, Yoshihisa Kitano, has commented that it is "thinking of building one of the world's largest EAFs to produce high quality steel to be used for automotive steel sheets and electrical steel sheets."
- Japanese steel producer Nippon Steel built a new electric furnace at its Hirohata works in 2022, which produces "high-grade, high-quality steel sheets, including electrical steel sheets." Nippon also built a new electric furnace at its AM/NS Calvert facility in Alabama, which is capable of producing "high quality products, such as third-generation advance high-tensile steel sheets (980MPa and more) and Interstitial Free steel (for deep-drawing processing for vehicle exterior panels)."
- Korean steelmaker POSCO is building an electric furnace at its Gwangyang plant that it will use to produce "its high-quality steel products, which mostly include grades traditionally produced via the integral cycle only, such as interstitial-free grades for the automotive industries and the much-coveted electric steel grades."
- SSAB is converting from blast furnace to electric furnace production, through which it will continue to produce automotive steel. As the SSAB Vice President of Sustainable Business, Thomas Hörnfeldt, has opined: "Under normal circumstances, our blast furnace in Oxelösund must be rebuilt in 2025. Rather than pay the vast amount of money it costs for a rebuild, we thought, why not replace it with an electric arc furnace instead?"
- Saltzgitter similarly touts its replacement of blast furnaces with electric furnaces and DRI plants in Germany, which it claims will produce steel covering the full range of applications, including in the "energy, automotive, construction and white goods" sectors. In fact, Saltzgitter has reached supply agreements with automotive suppliers for its new low carbon steel of "mainly surface-treated flat steel products" that will be used "for the manufacture of complex body shell modules."

As these projects illustrate, the production capabilities of a blast furnace or an electric furnace have nothing to do with the type of furnace, but rather they are determined by the casting, rolling, and finishing facilities attached to it. The industry agrees on that point – just follow where the money is being spent. Companies like ArcelorMittal are replacing blast furnaces with electric furnaces and using the same casting, rolling, and

finishing mills to make the same types of advanced, exposed automotive steels that they were making before. If an electric furnace facility cannot make a particular product, it is entirely unrelated to the fact that it is an electric furnace. Rather, it is because there is not the casting, rolling, and finishing equipment needed to produce that product at that facility. From this perspective, there is simply no reason to treat steel made in a blast furnace as special or to label it as clean when its actual embodied emissions say otherwise.

Unfortunately, the outdated and inaccurate reasons given for favoring blast furnace production have been embraced by parts of the U.S. government and co-opted into American industrial policy. This is bad information fueling bad policy. As we noted in our prior commentary, the General Service Administration (GSA) has adopted a dual emissions standard that will favor certain higher emissions products as part of its Buy Clean program, despite the fact that the statute clearly limits GSA purchases under this program to products with "substantially lower" emissions. The Federal Highway Administration's (FHWA) Buy Clean program is subject to the same statutory mandate and, fortunately, the FHWA has the opportunity to avoid making the GSA's mistake and to focus its program on purchasing products with the lowest actual emissions.

In taking its approach, the GSA has repeated the same misplaced reasons to justify prioritizing blast furnaces over electric furnaces. But even if those claims were true for certain advanced steels, they are certainly not true for the construction grade steel products – such as plate and structural pipe – that are being purchased through the GSA's program. Not only can electric furnaces make all construction grade products, but they comprise virtually all of the U.S. construction market. As the CEO of Cleveland-Cliffs said in a 2022 earnings call: "We are not a supplier of steel for the construction markets . . . . That's the biggest difference between us and our competition. It's not EAF against blast furnace, it is the market that we serve."

Given that the largest blast furnace producer in the United States acknowledges that they do not primarily serve the construction market, why then has the GSA created this distinction between blast furnaces and electric furnaces for construction products? It is not clear to us. Rather, the GSA appears to have gotten it wrong twice. They have adopted a broken logic and they have applied it in a context where – even if true – it does not make any sense. Accordingly, as we have commented previously, it is critical that the U.S. government – including the GSA and the FHWA – avoid emissions policies that use dual standards. As shown above, there is a proven pathway for decarbonization, and it entails using electric furnaces and DRI.

Lest we seem unreasonable, we do not advocate for an approach that would shut down every high emissions producer or blast furnace overnight. We acknowledge that such a dramatic solution is neither feasible nor desirable from a social and economic perspective. And an ample transition period may be necessary. We also recognize that some number of blast furnaces may still operate in a low carbon world. They may find a path to significantly lower their emissions, and there may still be room for a small number of blast furnaces in a green steel industry. However, it is inconceivable that a decarbonized steel sector would contain as many blast furnaces as it does now. For instance, the U.S. exposed automotive market is approximately 3 million tons per year. This means that, even if these arguments were true, they would only justify keeping open two or three blast furnaces in the United States. There is no reason why the overwhelming majority of domestic blast furnace production (nearly 22 million tons in 2023) cannot be shifted to electric furnaces and other emerging

technologies.

So, let us find sensible and climate-focused trade and industrial policies that set aside false attempts to label dirty as clean by having two sets of emissions standards. And let us avoid policies that would minimize the pressure on the highest emitters to decarbonize and penalize many of the producers with the lowest actual emissions.