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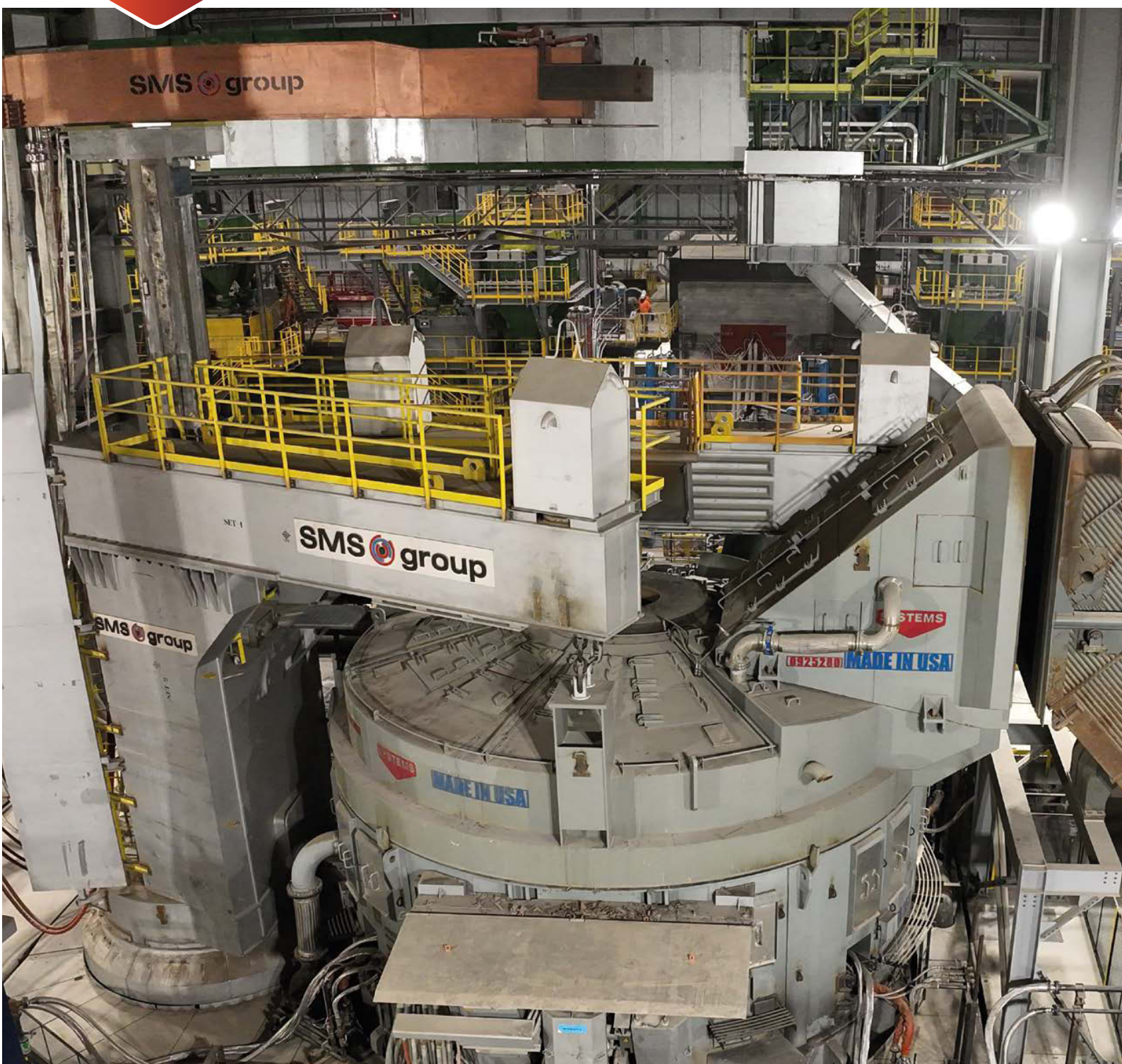
GrafTech International's CEO Tim Flanagan.

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IS NIPPON STEEL EXHIBITING BLIND FAITH IN CCS?



American steel mills come with a health warning

Matthew Groch* breaks down the distressing findings from a new report showing how steel mill emissions have had a major toll on the communities of Northwest Indiana.

A new study examining industrial pollution in Northwest Indiana estimates the cost of a burden that residents have experienced for generations: more than \$3 billion in estimated annual public-health damages from pollution associated with the region's steel mills and other major industrial facilities.

The report, *Measuring Legacy Pollution's Burden on Northwest Indiana Communities*, was commissioned by Just Transition Northwest Indiana (JTNWI) and authored by Nicholas Z. Muller, a professor at Carnegie Mellon University. It examines the effects of emissions from 20 industrial facilities on air quality, human health, and the regional economy, and found that three integrated steel mills are responsible for

most of the damages.

The paper uses integrated assessment models to trace air pollution from its source (across 20 industrial facilities) to its health and economic impacts. It starts with emissions data, using the Environmental Protection Agency's 2020 National Emissions Inventory, which tracks pollution released by facilities across the United States. Using a simplified air-modelling method, the report estimates how emissions from each facility spread through the air and affect fine particulate matter (PM2.5) levels in nearby communities.

By combining these pollution estimates with local population data and death-rate statistics, the model estimates the number of premature deaths long-term

exposure to this pollution likely causes.

This then converts estimated deaths into economic damage using a standard method economists use to place a monetary value on reducing mortality risk. With this data, the paper compares this monetary value to the economic value of the industrial facilities, 'illustrating that in some counties, the societal costs associated with air pollution approach, or even exceed, the economic output generated by major industrial activity.'

Disproportionate environmental impact

The study identifies three major contributors: two steel facilities operated by Cleveland-Cliffs and one by US Steel (now

*Senior Director, Mighty Earth



owned by Nippon Steel). Cleveland-Cliffs' Burns Harbour steel facility accounts for the largest share of the estimated damages. The report attributes approximately 124 premature deaths and \$1.7bn in damages to the facility every single year. That represents roughly 53% of the total damages identified by the study, making Burns Harbour by far the largest individual contributor among the 20 facilities examined.

US Steel's Gary Works ranks second, with the report estimating that emissions associated with the facility contribute approximately 41 deaths and \$565m in damages annually, representing about 17% of the total damage from industrial pollution. The third-largest contributor identified by the study is Cleveland Cliffs' Indiana Harbour facility, to which the report attributes approximately 36 deaths and \$496 million in annual damages, representing about 15% of total damages in the analysis. Taken together, the three steel facilities account for much of the pollution and associated damages identified by the study.

The facilities at Burns Harbor, Gary Works, and Indiana Harbor are among the region's

defining industrial facilities and have long been closely associated with the economic development of surrounding communities. Northwest Indiana has historically been one of the nation's most important steel-producing regions, and steel remains deeply embedded in the area's economy and identity. Industrial facilities support thousands of jobs, generate tax revenues, and sustain networks of contractors, suppliers, transportation companies, and small businesses. At the same time, the report clearly demonstrates that these three steel plants account for over 80% of the total pollution and damages in the region.

When measuring the economic value of industrial plants, the societal costs are rarely considered in these discussions, especially as a single dollar value that can be used to compare against economic benefits. For example, this study is particularly striking when considered in relation to the economies of the counties where these facilities are located. Pollution-related economic damages of the steel mills analysed in the report amount to approximately 42% of Lake County's GDP and more than 100% of Porter County's GDP.

This brings into question the sustainability and value of current steel production methods, given that the societal costs of these facilities may be higher than the benefits associated with them. The study, therefore, presents an important tension: the same industrial infrastructure that has historically provided employment, tax revenue, and economic activity also generates substantial pollution-related costs. It is important to note that this report does not seek to eliminate the economic benefits from the equation. Instead, its approach attempts to make another component of the equation more visible: the costs imposed on people who live near the facilities and are exposed to their emissions.

Transition to clean steel

The report arrives amid a broader debate over the future of steelmaking in Northwest Indiana and the United States. The report does three things to shift the debate on industrial policy:

1. The results provide a science-based perspective on the benefits of pollution removal from the 20 facilities covered in the analysis.

2. The analysis demonstrates that while impacts are acutely concentrated in the counties and metropolitan area(s) around these facilities, the impacts range widely over the Midwestern United States.

3. Local organisations can capitalise on the findings in this report to make the clear case that the cumulative impact of local air pollution from these facilities is substantial.

Environmental and community organisations have increasingly called for investments in cleaner steelmaking technologies, particularly electric arc furnaces and other processes that can substantially reduce emissions compared with traditional integrated steelmaking. JTNWI's broader work includes a campaign focused on clean steel, and the organisation has argued that Northwest Indiana can retain its industrial base while transitioning to cleaner production. In fact, the report highlights that Nippon Steel has committed \$1.9 billion to modernise and construct a direct reduced iron facility at a plant in Arkansas. Therefore, transitioning to clean steel is a real possibility, but it is just not happening in Northwest Indiana.

Mighty Earth, an environmental non-profit organisation, has published similar findings and has also pushed for cleaner steel production, recently making the case for purchasers of American-made steel to demand cleaner technologies down the supply chain. In its latest report, Mighty Earth found that Ford, General Motors, Toyota, Hyundai, Honda, and Stellantis are the primary purchasers of highly polluting coal-based steel from US Steel Corporation

and Cleveland-Cliffs, looking at various facilities, including those at Gary Works and Burns Harbour. These supply chain relationships undermine the automakers' climate targets and prolong the life of coal-fired blast furnaces that pollute air and water in frontline communities, as described in detail in the latest report by JTNWI.

Industry response to report

Cleveland-Cliffs and Nippon Steel both responded to the study, emphasising the potential economic consequences of efforts to transition away from existing steelmaking operations. While the study focuses on the public-health costs associated with industrial pollution, both companies argued that changes to domestic steel production must also account for the workers, businesses, and communities that depend on the industry.

Cleveland-Cliffs specifically argued that there is a "co-ordinated effort to destroy and dismantle" the US Steel industry and said organisations such as JTNWI are promoting policies that could 'accelerate the decline of domestic US steelmaking while pretending there won't be devastating consequences' for affected communities. The company warned that the closure of steel mills would eliminate good-paying union jobs and reduce the tax base supporting schools, public safety, and local services. Cleveland-Cliffs further argued that declining steel production could cause small businesses to close, families to leave, and entire communities to suffer.

Nippon Steel likewise disputed aspects

of the study, emphasising that Gary Works operates under federal and state environmental permits. The company characterised JTNWI's claims that US Steel is investing in newer, greener technology in Arkansas while leaving Gary behind as 'false and irresponsible.' Nippon Steel also argued that converting Gary Works to electric arc furnace production, combined with direct reduction technology to produce iron, would require the facility to close for several years, which could result in the loss of more than 4,300 jobs.

Next steps

The significance of the JTNWI report ultimately extends beyond its estimates for individual facilities. Its broader argument is that industrial pollution represents an economic cost that communities have historically been expected to absorb without being fully accounted for in conventional measures of economic activity. By assigning monetary values to pollution-related deaths and other health impacts, the study seeks to put those costs alongside the jobs, production, and tax revenues traditionally used to measure the benefits of heavy industry.

The findings also reinforce the importance of considering the cumulative impact of industrial pollution. Residents of Northwest Indiana do not necessarily live next to only one source of emissions. The region hosts steel mills, refineries, power plants, and other industrial facilities clustered close to residential communities. You can see the footprint of these facilities in the organisation's industrial burden mapper. Groups like JTNWI and Mighty Earth recognise the importance of industrial production and steelmaking in the United States. However, both organisations also know that a transition to clean steel is not only possible, but necessary to keep US manufacturing competitive.

In the end, the report presents Northwest Indiana with a difficult choice and an opportunity. The region has spent more than a century building an economy around manufacturing and steel. The challenge now is determining whether it can preserve the economic benefits of that industrial heritage while eliminating the health and environmental costs that have accompanied it. The study's findings suggest that, whatever the ultimate path, those costs can no longer be left outside the economic equation. ■

