DRIVEN BY DIRTY STEEL:

HOW AUTOMAKERS FUEL BLAST FURNACE POLLUTION IN U.S. COMMUNITIES

MIGHTY EARTH

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Executive Summary

The U.S. automotive industry is accelerating toward carbon-neutral commitments, yet its progress is hindered by a critical dependency on "dirty steel" — steel produced through coal-based blast furnace processes that generate substantial greenhouse gas emissions and harmful air pollutants. While global momentum toward "green steel" is growing, with Europe and parts of Asia adopting hydrogen-based and electric arc furnace technologies, U.S. steelmakers Cleveland-Cliffs and U.S. Steel continue to rely heavily on traditional, high-polluting production methods. Their facilities remain among the nation's top emitters of nitrogen oxides, sulfur dioxide, fine particulate matter, carbon monoxide, and lead compounds, driving major public-health impacts and degrading air and water quality in surrounding communities.

Despite some initial interest in transitioning to low-carbon steelmaking, both companies have recently reversed or abandoned green-steel investments — most notably, Cleveland-Cliffs' withdrawal from a planned hydrogen-based facility at Middletown Works, which would have been the first commercial-scale green steel plant in the United States. These setbacks come at a time when the environmental and health burdens created by U.S. steel mills are increasingly visible and increasingly severe. Across major steelmaking regions — including Indiana, Michigan, Ohio, and Pennsylvania — residents face elevated rates of asthma, cardiovascular illness, lost workdays, and premature death attributable to ongoing emissions from coal-based steel plants.

Automakers play a central role in this dynamic. As the third-largest global consumer of steel — responsible for the consumption of 60% of primary steel in the United States — the automotive sector is uniquely positioned to influence the steel industry's decarbonization timeline. Yet Ford, General Motors, Honda, Hyundai, Stellantis, and Toyota all continue to source significant volumes of steel from Cleveland-Cliffs and U.S. Steel, tying their supply chains to some of the nation's most polluting industrial facilities. Though automakers publicly champion their climate goals, their procurement decisions directly support companies that are extending the operational lifespans of coal-based blast furnaces rather than replacing them with cleaner alternatives.

There are promising signs internationally. Hyundai Motor Group's recent $6 billion commitment to build a low-carbon steel plant in Louisiana demonstrates that green steel production in the United States is technically feasible and commercially viable. Meanwhile, global competitors — particularly in Sweden and Japan — are producing or integrating green steel at growing scale, proving that costs per vehicle are modest, manageable, and expected to decline over time.

For the United States to remain competitive in a decarbonizing global auto market, and for automakers to credibly meet their emissions targets, a rapid transition to green steel is essential. Achieving this will require automakers to exert meaningful pressure on their suppliers, leverage long-term purchasing agreements, and align procurement strategies with their climate pledges. Without such action, the steel-related emissions embedded in vehicles will continue to undermine the industry's environmental commitments while perpetuating significant health harms for communities across America.

Introduction to Steel and Autos

The global steel industry is massive, with approximately 2 billion tons of raw steel produced annually.[1] Steel is everywhere — in the buildings you enter, the cars you drive, and the planes in which you fly. In fact, the average American uses about 1,800 pounds of steel each year.[2] However, the production of this much steel has historically led to large amounts of greenhouse gas emissions and carbon dioxide. In 2019, the International Energy Agency reported that direct emissions from the steel and iron industry accounted for 2.6 gigatons of carbon dioxide annually,[3] representing approximately 7% of global greenhouse gas (GHG) emissions and 11% of global carbon dioxide emissions.[4]

Fortunately, much of the globe is looking to produce "green steel," or steel produced with low emissions or carbon-neutral processes. It typically requires electric arc furnaces (EAF), scrap metal, and hydrogen. About a third of steel globally is currently produced using EAFs with recycled materials.[5] This produces approximately 0.2 tons of GHG per ton of steel, resulting in 75% fewer carbon dioxide emissions than traditional steelmaking.[6] Traditional steelmaking — relying on basic oxygen furnaces (BF-BOF), metallurgical coke, and iron ore — makes up about two-thirds of global steel production. This process produces 1.7 tons of GHG per ton of steel produced.[7]

There had been an increase in the use of recycled steel, but recent evidence suggests that this trend has hit a plateau, with one study finding, "The share of recycled iron inputs into global steelmaking has stagnated at 30% over the past two decades."[8] Despite this, there is a lot of promise on the

horizon, with the vast majority of newly announced steelmaking capacity planning to use EAFs, according to the Global Energy Monitor.[9]

One way to incentivize a quicker transition to green steel and a cleaner environment is to encourage the primary consumers of steel to push for change. The automotive industry is a major purchaser of steel, being the third-largest consumer globally,[10] historically reliant on the production of primary steel.[11] In the United States, for example, the automotive sector is responsible for not only 20% of all steel consumption but over 60% of primary steel consumption.[12] This underscores not only the automotive sector's responsibility for the impacts of coal-based steel production globally, but also the opportunity for the industry to use its leverage to shift toward manufacturing processes that protect the environment and uplift labor standards.

Automakers discuss ad nauseam their drive to carbon neutrality. This is impossible, however, if automakers continue to use dirty steel. According to academic studies and real-world examples, automakers can viably work with green steel. A recent study found that switching to green steel "would cost about $199 per vehicle on average, an increase of about 0.66% in the case of a $30,000 vehicle."[13] Even this small increase is likely to "decline over time as the prices of hydrogen and renewable electricity decrease and hydrogen electrolyzers are increasingly commercialized."[14]

In addition, many automakers have announced efforts to use green steel, lowering their carbon footprints. In 2021, Hybrit, a Swedish company, delivered the first green steel to Volvo.[15] Isuzu Motors Limited has recently promised to use green steel in its manufacturing, which would mark the first time green steel has been used for commercial vehicles in Japan.[16] Also in Japan, Nissan announced that it would increase its use of green steel in production by 500%.[17]

In the United States, progress has been much slower. In 2024, the Department of Energy awarded billions of dollars to commercial projects that aimed to cut emissions. Two steel producers, Cleveland-Cliffs and SSAB were in negotiations to receive $500 million each to build new low-carbon steel plants, but both entities withdrew from negotiations in 2025.[18] Cleveland-Cliffs cited the lack of low-cost hydrogen as the reason,[19] while SSAB provided little context for its withdrawal.[20]

In Louisiana, the Hyundai Motor Group recently reaffirmed its intent to build a low-carbon steel plant, promising to invest $6 billion in the project.[21] "This could be the flagship project when it comes to green steel," said Matthew Groch, senior director of decarbonization at Mighty Earth.[22] The Hyundai Motor Group's announcement suggests that producing green steel in the United States is not only possible but also commercially viable. Yet more automakers need to push for these changes if the industry really wants to meet its low-emission targets.

The transition from dirty steel to green steel could not come soon enough. Coal-based steel plants produce many pollutants, including nitrogen oxide, sulfur dioxide, and fine particulate matter. These pollutants poison waterways, threatening the lives of those who live near steel plants. According to a recent study by Industrious Labs, coal-based steel plants in the United States are responsible for the "equivalent of $6.9 billion to $13.2 billion in health impacts, like premature deaths, emergency room visits, and asthma symptom management, as well as an estimated $137 million in economic losses every year, like lost work days and restricted activity days."[23] U.S. society, as a whole, would be better off with a carbon-neutral steel supply chain.

U.S. Steel Companies

Cleveland-Cliffs and the U.S. Steel Corporation are the two giants of the U.S. steel manufacturing and processing sector and the only blast furnace operators in the United States.[24] They are the primary suppliers of steel to the U.S. automobile industry. In fact, Cleveland-Cliffs once considered acquiring U.S. Steel, which would have placed "65 to 90 percent of steel used in vehicles under the control of a single company."[25] This clearly demonstrates the critical importance of both companies to the automotive sector.

Both Cleveland-Cliffs and U.S. Steel have also done little to transition away from coal-based blast furnaces. These companies have a history of producing toxins — such as nitrogen oxides, sulfur dioxide, fine particulate matter, carbon monoxide, and lead compounds — that harm nearby communities. Descriptions of the toxins spewed by these plants are listed below, taken directly from Industrious Labs or the Environmental Protection Agency (EPA):

- Nitrogen oxides (NOx). A gas generated by the burning of fossil fuels that is linked to health problems and the formation of ozone, haze, and acid rain.[26]
- Sulfur dioxide (SO_2). A group of gases generated by the burning of fossil fuels that are linked to respiratory health problems, acid rain, and haze.[27]
- Particulate matter. A broad class of pollutants generated through combustion and other industrial processes that are linked to a range of health problems and poor air quality. Fine particulate matter (PM2.5), or particles that are 2.5 or less microns in width, is particularly harmful because it can lodge deep in the lungs.[28]

- Carbon monoxide (CO). A colorless, odorless gas generated primarily when carbon-containing products aren't properly combusted.[29]
- Lead compounds (Pb): Lead is used in the manufacture of batteries, metal products, and ammunition. Exposure to lead can occur from breathing contaminated air in or near workplaces that process lead or lead materials, as well as from incidentally ingesting dust or paint chips in houses with lead-based paint. Lead can cause effects on the blood as well as on the nervous, immune, renal, and cardiovascular systems.[30]

As mentioned above, both Cleveland-Cliffs and U.S. Steel are on track to continue polluting the planet with tainted steel in the years to come. "All of the coal-based steelmakers in the U.S. are doubling down on coal by extending the life of these polluting furnaces. Meanwhile, competitors like Hyundai are investing in modern alternatives that can benefit from being first-to-market with a clean steel product," said Hilary Lewis, steel director at Industrious Labs. "Put another way, U.S. Steel and Cleveland-Cliffs are sinking capital into potential stranded assets that risk their competitive advantage in the clean steel market of the future."[31]

Rather than investing in the future, U.S. steel producers seem satisfied with living in the past. Steel production in the United States has fallen by about 40% compared to 50 years ago.[32] Without major investments in green steel, Cleveland-Cliffs and U.S. Steel (or its new owner, Nippon Steel) will continue driving production into the ground.

Cleveland-Cliffs

> *"Employee safety remains paramount for us, and 2024 marked our safest year since becoming a steel company in 2020… Cleveland-Cliffs has a solid track record of environmental stewardship and safe operations, and a proud history of corporate responsibility."*
>
> — ***Cleveland-Cliffs*** [33]

Cleveland-Cliffs is one of the leading North American steel producers and is a vertically integrated company, covering the entire process from mining iron ore to primary steelmaking and downstream finishing. As of December 2024, Cleveland-Cliffs operated eight blast furnaces and five EAFs. These steel production and finishing facilities — 21 in total, according to the company — are primarily concentrated in Illinois, Indiana, Michigan, Ohio, Pennsylvania, and Ontario.[34] In 2024, 32% of Cleveland-Cliffs' production of cold-rolled, galvanized, aluminized, non-grain-oriented electrical steel and stainless steel supplied the automotive market, primarily in North America.[35] In addition to these direct sales, the company also sells to distributors and converters, which may ultimately resell part of that volume to the automotive sector.[36]

Cleveland-Cliffs is one of the heaviest polluters in the United States, failing time and again to reduce its emissions. In 2023, the company announced that it would reline its blast furnaces in Burns Harbor and Middletown Works, thereby extending the life of old plants that generate substantial pollution and GHG emissions. "Relining extends a coal-burning steel plant's life by an estimated 18 years, pushing the sector further away from the trajectory required to decarbonize. Based on EPA data, Industrious Labs estimates that these two relines would result in more than 128 million tonnes of CO2e over the lifetime of the projects, equivalent to burning more than 705,000 railcars of coal."[37] In fact, the Cleveland-Cliffs plant in Ohio is the city's "largest single source of planet-warming pollution," complicating Cleveland's goal of reducing citywide emissions.[38]

Cleveland-Cliffs had announced in 2023 that it would replace its Middletown Works coal-based steel plant with a green hydrogen plant, which was to be supported by a $500 million grant from the Department of Energy (DOE). This would have made it the first-ever green steel plant in the United States and was lauded by local residents at the time. "I live less than 1,000 feet from the coal-based Middletown Works steelmaking facility, and every day, I breathe in its toxic soup of pollution," said a local resident. "By replacing the blast furnace with direct reduced iron technology powered by hydrogen produced with renewable energy, we can bring cleaner air to my family and community, while safeguarding local jobs."[39]

The steelmaker, however, shifted its plans to transition in June 2025, with the CEO of Cleveland-Cliffs stating that it was negotiating with the current DOE to "explore changes to the scope to better align with the [Trump] administration's energy priorities."[40] Cleveland Cliffs' current processes are polluting U.S. air and water. Its Burns Harbor plant is the largest producer of fine particulate matter in Indiana; its Dearborn plant is the number one producer of carbon monoxide and lead compounds in Michigan; and its Middletown Works is a top 10 producer of nitrogen oxides and sulfur dioxide in Ohio.[41]

Toxins	***Burns Harbor***	***Dearborn***	***Middletown***
Nitrogen Oxides	7,748	241	1,888
Sulfur Dioxide	10,714	446	2,256
Fine Particulate Matter	2,825	220	476
Carbon Monoxide	44,876	7,204	15,278
Lead Compounds	1.2	0.4	0.4

Absolute emissions (air), tons

These pollutants have negative consequences for the people living near the steel plants. According to one study, Cleveland-Cliffs' three coal-based steel plants providing supplies to major U.S. automakers are responsible for approximately 262 premature deaths, 169 ER visits, 99,578 asthma symptoms, 17,802 work loss days, and 20,763 school loss days annually.[42]

Health Concerns	***Burns Harbor***	***Dearborn***	***Middletown***
Premature Deaths	130-256	11-23	37-67
ER Visits, Respiratory	115	10	44
Asthma Symptoms	72,480	5,355	21,743
Work Loss Days	13,555	1,156	3,091
School Loss Days	13,789	659	6,315

Burns Harbor

"There are also always human dimensions to these spills. We hope that company employees will continue to implement safe and vigorous work plans, policies and environmental management systems to prevent future spills and exceedances that impact our residents, beaches and Lake Michigan drinking water."

— Scott Kingan, President of the Ogden Dunes Town Council [43]

Burns Harbor is Cleveland-Cliffs' second-largest U.S. facility and is a fully integrated steelmaking plant located on the shores of Lake Michigan in Indiana. Its location provides direct access to the Port of Indiana as well as strong highway and railroad connectivity via the Burns Harbor Railroad.[44] The plant operates two blast furnaces. According to Cleveland-Cliffs, it produces hot-rolled, cold-rolled, and hot-dip galvanized coils, as well as rolled and heat-treated plates, and supplies the automotive market.[45]

This facility emits a substantial amount of pollution into the environment. EPA data show that in 2023, Burns Harbor Works generated 7,644,163 metric tons of carbon emissions. The steel mill additionally discharged 84,498 pounds of criteria air pollutants exceeding allowable limits, along with 84,161 pounds of hazardous air pollution.[46]

In 2019, the plant at Burn Harbor had a failure with its water recycling system, leading to it drawing in water from Lake Michigan and discharging it through the facility's outfalls.[47] Due to its inability to recycle the water, the plant discharged untreated cyanide and ammonia nitrogen into nearby waterways for days, killing hundreds of fish and leading to the closures of the Oden Dunes Beach and the Indiana Dunes National Park for seven days.[48] Not only did the company violate the Clean Water Act, plant operators also failed to properly notify and submit emergency reports to local authorities, violating the Emergency Planning and Community Right-to-Know Act and the Comprehensive Environmental Response, Compensation and Liability Act.

The plant was charged a $3 million penalty and ordered to reimburse the EPA and the state of Indiana for the costs associated with the emergency response.[49] Assistant Attorney General Todd Kim for the Justice Department's Environment and Natural Resources Division said at the time, "Today's settlement with Cleveland-Cliffs appropriately penalizes the company for its significant violations and requires extensive actions by the company to prevent future pollution. … The cyanide and ammonia reductions will result in a cleaner Lake Michigan, and the public will be kept informed of potential future spills."[50]

In 2024, EPA announced that the Burn Harbor facility had violated the Clean Air Act during an unannounced inspection. The company was "allegedly emitting excessive amounts of particulate matter and hazardous air pollutants from its basic oxygen furnace shop used to create steel."[51] The EPA announced the settlement in August 2024, requiring Cleveland-Cliffs to pay a small fine and take actions to stop further pollution. "We're talking about a multi-billion dollar corporation," said Ben Inskeep, program director at Citizens Action Coalition.[52] "So the fine amount looks pretty darn small to me, compared to what you see a lot of times. Other companies are paying fines that are millions of dollars, tens of millions of dollars, or even hundreds of millions of dollars when they're violating hard, clean air laws."

Dearborn Works

"[Dearborn Works] remains one of the worst threats to clean air in this area. Cliffs' CEO Lourenco Goncalves said, 'We remain committed to the blast furnace BOF steelmaking route,' which does not bode well for the people of Dearborn."

— ***Samra'a Luqman,***
Resident of the South End Neighborhood in Dearborn, MI [53]

Located in Southeast Michigan, Dearborn Works operates a blast furnace and produces carbon slabs, hot-dip galvanized steel, and advanced high-strength steel. According to the company, products manufactured at this facility serve many markets, including the automotive sector.[54]

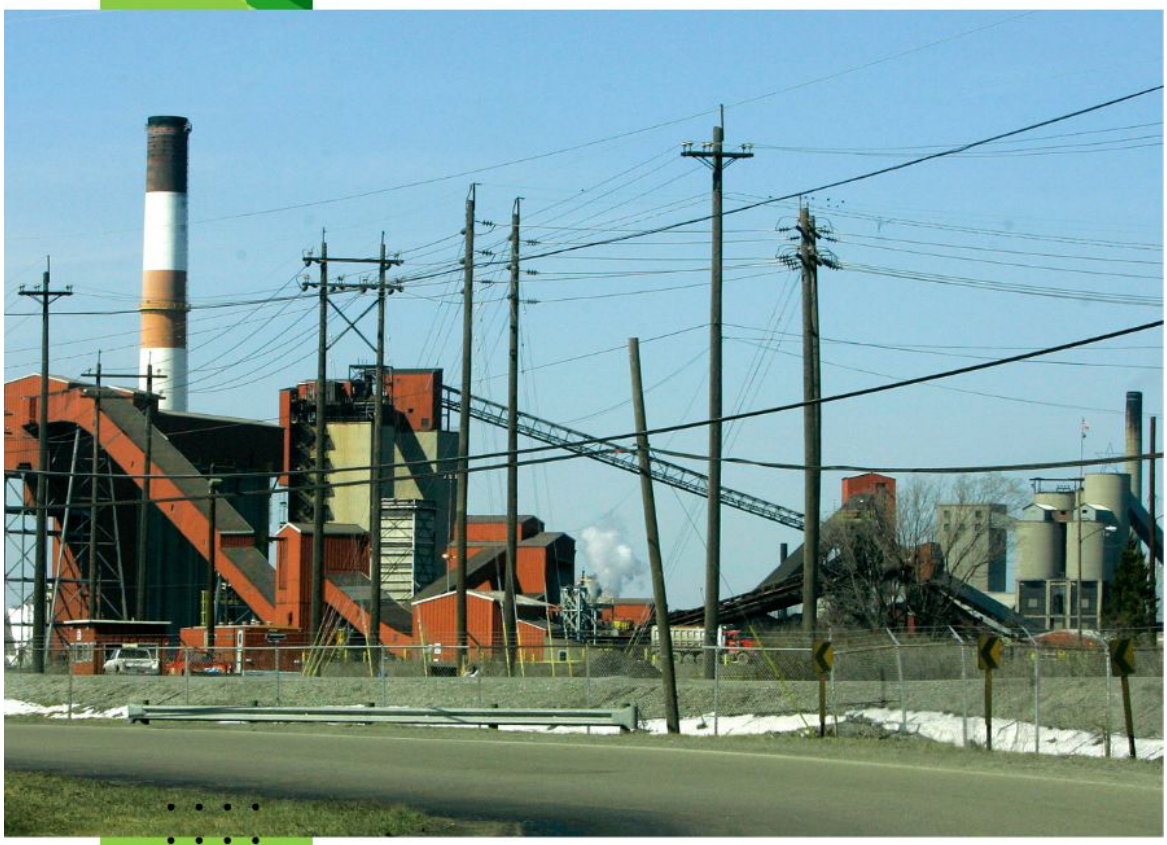
In 2022, the Dearborn Works blast furnace produced over 1 million metric tons of CO_2-equivalent emissions and placed sixth statewide in PM2.5 emissions among major polluters.[55] The facility emits multiple hazardous air pollutants — such as heavy metals and particulate matter — that disproportionately burden surrounding neighborhoods and are linked to severe health impacts.

This plant has consistently violated U.S. environmental laws, dating back to 2015 when Cleveland-Cliffs, once known as AK Steel, agreed to address 42 state environmental violations, according to local press reports.[56] At the time, the company was required to pay a fine of $1.3 million and to reduce the likelihood of future violations. By 2023, Cleveland-Cliffs had committed a further 19 air quality violations.[57] This time, the company signed an agreement with the EPA that would require it to spend $100 million to replace its pollution control technology. It was also required to pay the state of Michigan $81,380 and provide air purifiers to local residents, costing another $244,000.[58]

A local resident stated, “The [pollution controls] should have been replaced in the last consent decree almost 10 years ago. … So this was partially a success and a win, but it was also indicative of a failure of the state. … We could have been breathing clean air for the last 10 years.”[59] According to a local press report, one resident gave birth to a son who had to have a tumor removed, has asthma, and has had high lead levels in his blood. “He had high blood lead levels because he was breathing air that contained a high amount of lead and manganese. Would that have been prevented had we had [pollution controls] 10 years ago? Maybe, and I’m saddened that it didn’t occur earlier, but I am elated that it has at least occurred now.”[60]

A resident near Dearborn Works stated, “Covid impacted those with respiratory, cardiovascular, and other diseases. Because of the legacy pollution we have had to live with, our community was immunocompromised and more vulnerable to it. It cleaned out our older generation; parents, grandparents, neighbors that we grew up with. We continue to live in a cancer cluster with high rates of asthma and other chronic pollution related diseases. And all because of the steel industry and the lack of accountability for its continued violations.”[61]

Middletown Works



"There's usually smells — chemical smells, rotten egg smells — that burns your eyes and gets in your throat. It doesn't go away."

— ***Donna Ballinger, Resident of Middletown, OH*** [62]

Located in southwest Ohio, Middletown Works operates a blast furnace and produces hot-rolled and cold-rolled carbon steel, electro-galvanized steel, hot-dip galvanized products, and aluminized carbon and stainless steel sheets, much of which is destined for the automotive sector.[63]

As mentioned previously, the Middletown Works facility ranks as the largest individual emitter of greenhouse gases in Cleveland, producing approximately 4.2 million metric tons annually.[64] In addition, it released 15,278 tons of carbon monoxide in 2020.[65]

Residents near Middletown Works have consistently voiced their opposition to the plant's pollution. One resident who owns a local auto business has said that the plant produces a residue that damages cars. To remove the residue, "we have to make a chemical reaction to actually remove this. If it has this stuff on it from there, it turns white like that." Through inspections, state environmental agencies have concluded that the material comes from local steel mills. In fact, the Ohio EPA issued a notice of violation to Middletown Works for exceeding visible emission limits.[66]

Another resident who lives near Middletown Works has said, "Every day I get fallout, smells and noise. I have COPD and chronic sinus infections … itchy, burning eyes [and] sore throat, especially when there are odors. It's horrible. I don't even like to let the grandkids outside to play because you can't touch anything on my property … without getting black, oil[y] substances on yourselves."[67]

U.S. Steel Corporation

> *"Sustaining lives and livelihoods by creating a more sustainable future, for our company and the stakeholders who depend on us, is not only the right thing to do, it's also essential to our long-term success. To realize this future, we have fully integrated sustainability into our larger strategy to transform our company into a sustainable, competitive business, enabling us to remain a pillar of our communities, a source of pride for our employees, and the bedrock of sustainable manufacturing for generations to come."*
>
> — ***U.S. Steel***[68]

With a history tracing back to the early 20th century — when a group led by J.P. Morgan and Elbert Gary merged Carnegie Steel and the Federal Steel Company — U.S. Steel Corporation is currently the third-largest steel producer in the United States and the 24th largest worldwide.[69] In June 2025, Nippon Steel acquired the U.S. Steel Corporation as a wholly owned subsidiary, but U.S. Steel has kept its name and Pittsburgh headquarters. U.S. Steel has an annual raw steel production capacity of 20.4 million tons in North America alone.[70]

U.S. Steel reports its operations across four main segments: (1) North American Flat-Rolled, which includes its integrated steelmaking facilities and equity investments in North America; (2) Mini Mill, consisting of the Big River Steel facility; (3) U.S. Steel Europe, which encompasses integrated steel and coke production facilities in Slovakia; and (4) Tubular Products, covering U.S. tubular production facilities and an equity investment.[71]

U.S. Steel has a history of emitting substantial amounts of pollutants at each of its facilities. Its Gary Works plant is the largest producer of carbon monoxide in Indiana; its Mon Valley Works plant in Clairton is the third largest producer of nitrogen oxides in Pennsylvania; and its Edgar Thomson plant is a top 10 producer of sulfur dioxide and carbon monoxide in the state.[72]

Toxins	Gary Works	Mon Valley Works (Clairton)	Mon Valley Works (Edgar Thomson)
Nitrogen Oxides	2,960	2,187	285
Sulfur Dioxide	1,863	898	1,189
Fine Particulate Matter	1,605	552	132
Carbon Monoxide	48,639	2,734	1,225
Lead Compounds	0.4	0.0	0.2

Absolute emissions (air), tons

Similar to Cleveland-Cliffs, these pollutants have real-world consequences for those living near these plants. According to one study, U.S. Steel's three plants providing supplies to major U.S. automakers are responsible for an estimated 154 premature deaths, 99 ER visits, 55,417 asthma symptoms, 10,138 work loss days, and 11,745 school loss days annually.[73]

U.S. Steel	Gary Works	Mon Valley Works (Clairton)	Mon Valley Works (Edgar Thomson)
Premature Deaths	57-114	37-66	11-22
ER Visits, Respiratory	48	41	10
Asthma Symptoms	31,858	18,664	4,895
Work Loss Days	6,353	2,730	1,055
School Loss Days	5,204	5,786	755

Gary Works

By Paul Sequeira - U.S. National Archives and Records Administration, Public Domain.

"People know they're sick. They know they're getting sick. They know their relatives, their children have asthma. And so we think it only makes sense to move into the next stage of steel making, which is to produce steel without the blast furnace, the blast furnace being the evil eye here."

— ***Carolyn McGrady,***
Gary Advocates for Responsibility Development [74]

U.S. Steel's largest manufacturing plant is located on the south shore of Lake Michigan in Gary, Indiana. It comprises both steelmaking and finishing facilities, operates four blast furnaces, and has an annual raw steel production capacity of 7.5 million tons. Its products include hot-rolled, cold-rolled, and galvanized sheets, which serve customers in the automotive, metal building components, home construction, and appliance markets.[75]According to the EPA, Gary Works emitted 11 million tons of carbon, in addition, to 64,466 tons of criteria air pollutants in violation of standards and 57,935 pounds of hazardous air pollutants.[76] U.S. Steel reported environmental expenditures of $354 million in 2024, $345 million in 2023, $334 million in 2022, and $302 million in 2021 — about 2% of its total costs. The company estimates it spends roughly $100 million annually on environmental compliance alone, although it continues to produce dirty steel.[77]

A recent report shows that Gary Works emits about 24 different air toxics (also known as hazardous air pollutants that can harm the health of people and wildlife, including some that may be carcinogenic).[78] These can cause a range of health problems, especially with the lungs and heart. One study found that residents living in Gary, Indiana, are in the "top 10% of U.S. residents most at risk for developing asthma and risk of low life expectancy."[79] As a local resident stated, "Whenever I walk out the door, the rotten egg smell from sulfur hits me hard, showing it's highly concentrated. Sometimes the smell even wafts through the doors and walls into the house. The air has a thick film, soot settles on the car, and even rain never feels clean."[80]

Gary Works is one of the older steel plants in the United States and is the only one to still use sinter, or iron ore powder, in its steelmaking. Many plants have turned away from sintering, as it can emit huge amounts of lead into the air. In 2021, Gary Works was found to have emitted 1,019 pounds of lead and lead compounds, according to the EPA.[81] Lead can stay in bodies for long periods of time, causing health issues far into the future. "You have this population of people who have lived around these industrial facilities for generations, [so] you're literally going to be able to see the footprint of lead that was emitted in previous generations," said Jane Williams from the Sierra Club. "It's going to be in their yards. People are going to be exposed to it. They're going to grow up. And then when the women have the kids," the lead will show up in the next generation.[82]

Mon Valley Works

"When I can really smell it, I know it's really bad. There's a movie called 'The Deer Hunter' that was made in Duquesne and Clairton. And in that movie, they call Clairton, 'the armpit of the universe.' And that's how I feel. … You realize you're having trouble breathing, sleeping."

— ***Art Thomas, Resident of Clairton, PA***[83]

Mon Valley Works is an integrated steelmaking operation composed of four facilities in Pennsylvania: (1) the Clairton Plant, (2) the Edgar Thomson Plant, (3) the Irvin Plant, and (4) the Fairless Plant. The Clairton Plant is the largest coke manufacturing facility in the United States, while the Edgar Thomson Plant — located about 10 miles southeast of Pittsburgh in Braddock — houses basic steel production, where raw materials are processed in two blast furnaces to produce liquid iron, later refined into steel. Steel slabs from Edgar Thomson are transported by rail to the nearby Irvin Plant in West Mifflin, where they are processed into hot-rolled, cold-rolled, and coated sheet products. At the Fairless Plant, a finishing facility near Philadelphia, cold-rolled products are further processed into galvanized sheets. The complex has an annual raw steel production capacity of 2.9 million net tons, and its sheet products serve customers in the automotive, appliance, metal building component, and home construction industries.[84] U.S. Steel's blast furnaces collectively emit an estimated 14 million tons of greenhouse gases each year, much of it coming from its Mon Valley Works facilities.[85]

Since January 2020, U.S. Steel has paid $64 million in associated fines, settlements, and enforcement actions related to the Mon Valley steel plants.[86] The Clairton Plant, specifically, has violated the Clean Air Act many times, averaging at least one violation every three months for four years in a row.[87] In addition, "One study documented increased asthma episodes after a 2018 fire at the plant knocked out its pollution controls. Another found children living near U.S. Steel plants in the Mon Valley had 'nearly triple' the national asthma rate, with the highest rates among African-American children."[88]

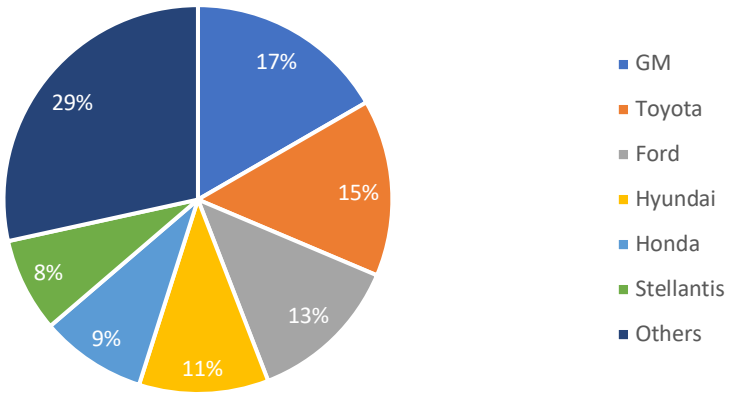
In 2025, the Clairton Plant experienced a series of mishaps, the latest being multiple explosions, killing two workers and injuring 10 others.[89] Earlier this year, there was a stack explosion and a malfunction with pollution control equipment that kept equipment offline for some time. A local group stated after the explosion, "Problems have been ongoing with the facility, piling tragedy upon tragedy. U.S. Steel has paid nearly $64 million in air pollution enforcement actions, fines and settlements related to the Mon Valley Works's three facilities since January of 2020 (more than $900,000 per month on average for the past five and a half years). The company has been assessed over $7.4 million for these items just since January of 2025; the issues are not getting better, and the community health impacts are drastic.[90]"

Auto Manufacturers

Automobile manufacturers incessantly talk of driving down emissions and reaching carbon neutrality, but achieving those goals in reality requires many changes throughout the automotive supply chain. One of the more important and more challenging segments is the sourcing of steel. Although important progress is being made in some parts of the world, steel plants in the United States have pumped the brakes, with Cleveland-Cliffs and U.S. Steel either reversing their plans to make green steel or simply ignoring the idea altogether.

One of the largest purchasers of steel is the automobile industry, as previously mentioned. The six largest auto manufacturers in the United States by market share are (1) Ford, (2) General Motors (GM), (3) Honda, (4) Hyundai, (5) Stellantis, and (6) Toyota.[91] Those six companies encompass about 73% of the total U.S. market.[92] Most of their automobiles destined for the U.S. market are assembled in North America — in either Canada, the United States, or Mexico — potentially tying them to Cleveland-Cliffs or U.S. Steel.

U.S. Market Share by Car Brands



Note: Total may not equal 100 due to rounding errors.

In an exhaustive review to establish supply chain relationships between these six major automakers and the two large U.S. steel manufacturers, Mighty Earth worked with Empower LLC[93] to investigate the main function of each steelmaking company in order to understand the role that the targeted facilities played within the corporation as a whole. This helped us clarify whether they could be automotive suppliers. Subsequently, we conducted a general documentary search, reviewing everything from annual reports and investor presentations to news articles and company websites, looking for clues regarding links between the steel facilities of interest and their ties to the largest U.S. automakers. This included their geographic locations and our hypotheses about which links are the most probable.

For the entire process, we used several tools, such as Panjiva,[94] Sayari Graph, S&P Capital IQ, MarkLines, and OpenRailwayMap (to identify railways). All of this was accompanied by logical reasoning and hypothesizing whenever available data was insufficient. Using this methodology and these tools, we can be reasonably sure that each of the six major automakers are major purchasers of steel from either Cleveland-Cliffs, U.S. Steel, or both.

Ford Motor Company

"We believe that every person has a right to clean air, clean water, and safe transportation. That's why we continue to pursue the ambitious goal of becoming carbon neutral across our vehicles, manufacturing facilities and supply chain no later than 2050."

— ***Bob Holycross,***
Ford Chief Sustainability, Environment, and Safety Officer [95]

Ford sold about 2.08 million vehicles in the United States in 2024.[96] Of those vehicles, about 98% were assembled in North America, with about 77% assembled in the United States.[97] Despite Ford's promises of sustainability and environmental protection, it continues to rely on Cleveland-Cliffs and U.S. Steel for its steel supply. According to Panjiva data, Ford appears as a recipient of steel from Cleveland-Cliffs. Between July 2021 and February 2023, Cleveland-Cliffs Steel, LLC, sent a total of 25 shipments to Ford of pickled hot-rolled unalloyed steel coils and hot-rolled alloyed steel coils, with a total weight of 3,479,577 kg and a value of $4,955,211. The shipments were likely transported by truck and arrived primarily at the Colombia customs office in Nuevo León (two arrived at Nogales, Sonora). Ford is also included in the list of customers provided by S&P Capital IQ and is mentioned in a debt agreement between Cleveland-Cliffs and Bank of America.[98] In addition, Ford has granted quality certifications to three Cleveland-Cliffs plants, according to the Cleveland-Cliffs website.[99]

Ford also acquires steel from U.S. Steel. Between 2020 and 2025, U.S. Steel sent 74 shipments of steel products to Ford, with a total weight of 14,240,243 kg and a worth of $32,055,491, according to Panjiva. These shipments were likely forwarded by truck and arrived primarily at the Colombia customs office in Nuevo León. The shipped products included electrolytically galvanized alloy steel sheet coil and cold-rolled alloy steel sheet coils.

General Motors

> *"For example, our targets for operations and sold products have a target year of 2035, and our goal to achieve carbon neutrality in global products and operations extends to 2040."*
>
> — ***GM Report*** [100]

GM sold 2.7 million vehicles in the United States in 2024,[101] and about 82% of those vehicles were assembled in North America.[102] With the largest market share in the United States among all automakers, GM seems to be a purchaser of steel from Cleveland-Cliffs and U.S. Steel, despite a very ambitious goal of achieving carbon neutrality by 2040. GM does not appear in the trade data as receiving steel from Cleveland-Cliffs, but it was identified in the S&P Capital IQ list as a prior customer of Cleveland-Cliffs, Inc., under the name "Motors Liquidation Company." GM also appeared in the debt agreement between Cleveland-Cliffs and Bank of America. In addition, for six consecutive years, from 2017 to 2022,[103] Ceveland-Cliffs was awarded GM's "Supplier of the Year Award" and in 2025, the automaker granted Cliffs the "Supplier of the Year" award to both Middletown Works and Rockport Works. Additionally, in August 2025, it was announced that GM had signed a multiyear contract with Cleveland-Cliffs.[104]

GM does not appear in the trade data as a customer of U.S. Steel, but there is a well-established relationship between the two companies. In 2023, U.S. Steel announced a supply agreement with GM for supplying "verdeX steel."[105] Finally, U.S. Steel won the Altair Enlighten Award for its MART-TEN martensitic steel, used in the 2019 Chevy Silverado manufactured by GM and highlighted again at the 2025 Detroit Auto Show.[106]

Honda Motor Company

"In our efforts to achieve a 'Zero Environmental Impact Society,' we are working towards our vision by 2050 of net zero CO_2 emissions, 100% utilization of carbon-free energy, and 100% use of sustainable materials."

— ***Honda ESG Report 2025***[107]

Honda sells about 1.3 million vehicles a year in the United States.[108] At least 60% of those vehicles were assembled in North America.[109] Honda works with both Cleveland-Cliffs and U.S. Steel, despite its commitment of 100% utilization of carbon-free energy by 2050. Honda produces more than 1.2 million automobiles in the United States across its 12 manufacturing plants, domestically producing nearly two-thirds of the Honda and Acura vehicles sold in the United States. According to Panjiva data, Honda appears as a customer of Cleveland-Cliffs through its subsidiary in Mexico. Between March 2022 and February 2023, Cleveland-Cliffs Steel, LLC, sent a total of 339 shipments, both by truck (199 shipments) and rail (140 shipments), to Honda's facilities in Nuevo Laredo, Tamaulipas (326 shipments), and in Piedras Negras, Coahuila (13 shipments). The cargoes weighed a total of 13,586,076 kg and were valued at $25,482,880. This relationship is also mentioned in the debt agreement between Cleveland-Cliffs and Bank of America.[110]

Honda also buys from U.S. Steel. From 2021 to 2025, Honda Trading de México received 8,332 shipments from U.S. Steel, according to Panjiva. Most of these shipments were delivered by truck (4,904 shipments) and railway (3,402 shipments) through Nuevo Laredo. The cargoes weighed a total of 305,807,798 kg, were valued at $488,626,832, and were addressed to a Honda facility in El Salto, Jalisco.[111]

Hyundai

"Hyundai has made incredible progress in reducing the environmental impact of our vehicles throughout their lifecycle, including the manufacturing process, with our ultimate goal of carbon neutrality by 2045."

— ***José Muñoz,***
President and CEO of Hyundai Motor Company [112]

Hyundai sold about 836,000 vehicles in the United States in 2024.[113] Of the six largest automakers in the United States, it assembles the least in North America, at only 41%.[114] Although Hyundai does not seem to be a buyer of steel from Cleveland-Cliffs, it does have a close relationship with U.S. Steel, despite its goal of reaching carbon neutrality by 2045. As background, Hyundai Steel and Hyundai Hysco merged in 2015,[115] and the new entity remained a subsidiary of Hyundai Steel. From 2021 to 2025, Hyundai Steel and Hyundai Hysco collectively received a total of 5,567 shipments from U.S. Steel. These shipments weighed 86,700,553 kg and were valued at $147,173,548. Most of the shipments were forwarded by truck either through Matamoros (5,547 shipments) or Nuevo Laredo (20 shipments). All shipments were sent to Hyundai Steel facilities in Monterrey. Some of the products shipped included cold-rolled non-alloy galvanized steel sheet coils, galvanized alloy steel sheet coils, and unalloyed steel sheet coils. Hyundai Steel supplies 70% of the special steel requirements and 99% of the steel grades needed by Hyundai Motor Group.[116]

Stellantis N.V.

> *"As part of its strategic plan adopted in 2022… Stellantis has set for itself the long-term goal of achieving carbon net zero by 2038 and taking a leadership role in decarbonization via a deep commitment to electrification."*
>
> — ***2024/2025 Climate Policy Report by Stellantis*** [117]

Stellantis sold 1.3 million vehicles in the United States in 2024.[118] Of those, about 96% were assembled in North America.[119] Stellantis has a concrete goal of achieving carbon net zero by 2038, yet it continues to work with both Cleveland-Cliffs and U.S. Steel. Stellantis appears as a customer of Cleveland-Cliffs, Inc., according to a list by S&P Capital IQ (under the names Fiat Chrysler Automobiles N.V. and FCA US LLC), as well as in the debt agreement between Cleveland-Cliffs and Bank of America (mentioned as Fiat Chrysler Automobiles N.V.).[120] In addition, along with Ford and GM, Stellantis is often cited as one of the main automakers supplied by Cleveland-Cliffs.[121]

For U.S. Steel, Stellantis manufactures the Jeep Gladiator, which has been identified by U.S. Steel to be the first vehicle to use its XGS Advanced High-Strength Steel.[122]

Toyota Motor Corporation (Toyota)

> *"Toyota is committed to leaving no one behind and delivering the freedom of mobility for all to achieve carbon neutrality by 2050, taking into account various energy situations in each region around the world."*
>
> — ***Toyota's Views on Climate Public Policies 2024*** [123]

Toyota is one of the largest sellers of vehicles in the United States, with about 2 million cars sold each year.[124] About 75% of those vehicles are manufactured in North America.[125] Toyota is attempting to achieve carbon neutrality by 2050, yet even this unaggressive timeline is in doubt since it continues to work with Cleveland-Cliffs and U.S. Steel. Toyota appears as a customer of Cleveland-Cliffs, Inc., through Mexican subsidiaries of Toyota Tsusho Corporation, according to Panjiva. Between July 2021 and February 2023, Cleveland-Cliffs Steel, LLC, sent a total of 239 shipments of stainless steel sheets to Toyota Tsusho Processing de México, S.A. de C.V. The shipments were made by rail and truck and were delivered to San Luis Potosí and Puebla. They weighed a total of 16,995,318 kg and were valued at $53,251,910. Toyota Tsusho Processing de México, S.A. de C.V., is a subsidiary of Toyota Tsusho Corporation, which in turn is part of the Toyota Group. It specializes in the slitting and commercialization of steel coils.[126] Between March 2021 and November 2023, Cleveland-Cliffs Steel, LLC, sent 425 shipments of rolled steel sheets to Toyota Tsusho México, S.A. de C.V. They were delivered to Nuevo Laredo and Puebla, primarily by truck. These shipments weighed a total of 4,138,967 kg and were valued at $6,028,119. This relationship is also included in the list provided by S&P Capital IQ as well as in the debt agreement between Cleveland-Cliffs and Bank of America.[127] In addition, Toyota granted the "Superior Quality and Delivery Award" to the Middletown Works and Rockport Works facilities.

Toyota also received 7,640 shipments from U.S. Steel Corporation between 2020 and 2025. Shipments weighed a total of 158,444,085 kg and were valued at $268,645,224. Most of them entered Mexico by truck through Nuevo Laredo (6,817 shipments) or by rail at Piedras Negras (661 shipments). Toyota's Tacoma truck likely incorporates U.S. Steel products as well.[128] Additionally, Nippon Steel — even before its acquisition of U.S. Steel — has had a longstanding relationship with Toyota.[129]

Conclusion and Recommendations

The U.S. automotive industry stands at a pivotal moment in its transition toward cleaner, more sustainable manufacturing. The automakers analyzed in this report have set ambitious carbon-neutrality targets, yet their continued reliance on coal-based steel from Cleveland-Cliffs and U.S. Steel undermines these commitments and perpetuates significant environmental and public-health harms. If the six largest automakers — which encompass approximately 73% of the U.S. automobile market — pushed for change in U.S. steel manufacturing, Cleveland-Cliffs and U.S. Steel would have to adjust. Without that pressure, as the report demonstrates, these companies will remain heavily invested in aging blast furnace operations that generate high levels of greenhouse gases and toxic pollutants, causing elevated rates of respiratory illness, premature death, and degraded air and water quality in surrounding communities.

Global trends show that the technological and economic pathways to green steel are already well established. Many international competitors are rapidly scaling hydrogen-based and electric arc furnace production, and Hyundai's recent investment in a low-carbon steel facility in Louisiana confirms that such innovation is viable in the United States. The gap between global progress and the stagnation of U.S. steel producers underscores both a competitive risk and a missed opportunity for domestic industry.

Automakers hold significant leverage to influence this trajectory. As major consumers of steel and key drivers of future demand, they are uniquely positioned to accelerate the decarbonization of the steel sector by setting clear expectations, aligning procurement strategies with climate goals, and supporting suppliers that invest in low-carbon production. Without this leadership, U.S. steelmaking will continue to lag behind global peers, and the automotive industry will remain tied to a supply chain that conflicts with its stated environmental values.

Mighty Earth and its allies call on Ford, GM, Honda, Hyundai, Stellantis, and Toyota to do the following:

- Commit to Phasing Out Coal: Automakers must unequivocally commit to halting new coal investments and phasing out coal usage in their supply chains. Ensuring that future investments exclusively support fossil-free production of essential materials such as steel and aluminum will pave the way for a sustainable and resilient production model.
- Accelerate the Transition to Electric Vehicles: Automakers must expedite the phase-out of fossil fuel vehicles and fully embrace a future of 100% electric vehicles. This transition should include setting binding deadlines for internal combustion engine phase-outs in alignment with global climate goals, particularly the 1.5°C warming limit outlined by the Paris Agreement. A robust plan to achieve this transition will reaffirm automakers' leadership in sustainable mobility.
- Decarbonize Steel Supply Chains: The steel industry, responsible for a significant proportion of automakers' emissions, requires targeted interventions to reduce carbon intensity. Automakers should establish science-based targets to decarbonize their supply chains, including annual purchasing goals for low-carbon and zero-carbon materials, backed up with binding purchase agreements. Collaborating with initiatives like SteelZero and the First Movers Coalition will accelerate these goals and catalyze broader industry shifts.

- Enhance Human Rights Due Diligence: Comprehensive human rights due diligence is essential to addressing the documented risks in automakers' supply chains. From mining to manufacturing, automakers must implement proactive measures to identify, prevent, and remediate human rights violations. This includes a zero-tolerance policy for violence throughout their supply chains. These measures should include transparent reporting and active engagement with affected communities.
- Uphold Workers' Rights and Community Benefits: Respect for workers' rights is fundamental. Automakers should adopt Community Benefit Agreements with host communities and institute independent, third-party monitoring of labor conditions within their supply chains. Such initiatives will ensure that economic development does not come at the expense of human dignity and safety.

A transition to clean steel is not only feasible but essential. By prioritizing low-carbon sourcing, automakers can help protect public health, reduce climate impacts, and strengthen the long-term competitiveness of both the automotive and steel industries. The choices made in the coming years will determine whether the United States leads in the emerging green-steel economy or continues to rely on practices that impose substantial social, environmental, and economic costs.

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