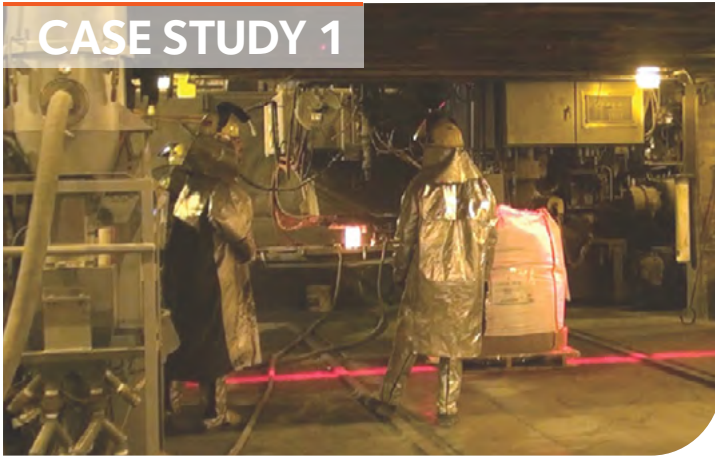


## Case studies: Outcome 1

### CASE STUDY 1



## Using technology to enhance safety

Ensuring the safety of our employees is our top priority. Therefore, we are consistently on a quest to discover new tools and programs to improve our safety performance.

Sometimes the best solutions to safety issues can come from unlikely sources. For Chuck Boguski, a process manager in mechanical maintenance, a safety device on a bicycle inspired him to develop a safety

improvement at ArcelorMittal Cleveland's No. 2 steel producing facility.

"Red zones" are special areas in the facility that have unique hazards, such as areas where molten metal is handled. An employee may have to wear specific PPE in a red zone or follow certain safety protocols. So making sure employees can clearly see the boundaries of a red zone is absolutely critical.

Boguski explained that red zones in the facility have traditionally been marked by a yellow line painted on the floor. The problem is that painted lines don't last long in the harsh environment of a steel mill. As the paint fades or gets covered by dirt, the red zone becomes less clear.

"I always thought that we could project a line with a light on the ground instead of painting it," Boguski said. He noticed a small LED light on his bicycle that would project two red lines on either side of the bike, creating a virtual bike lane with light. "So I knew we should be able to do it, and I did some more research and found this company that did sell lights like that in a bigger version."

In fact, the lights Boguski found worked just like the bicycle lights did but were designed for forklifts. They throw out lines in red light on either side of a forklift. He combined this with a bigger, bright spotlight from above, and the red zone is clearly visible.

"It definitely catches your eye... and you know if you shouldn't be on the other side of the red line. With a dirty yellow line on the floor before, you really wouldn't notice it as much."

Plus, powered by long-lasting LED technology, the lights require far less maintenance than the ongoing re-painting of red zone lines.

The use of drones at a number of our plants is another example of adopting technology to minimize safety hazards. AM/NS Calvert has begun using a drone, also known as a sUAS (small unmanned aircraft system) for aerial video and photography in order to minimize costs, lead time and most importantly, safety-related risks, during scheduled and unscheduled inspections of plant infrastructure.

A drone was used to capture video and pictures of repairs needed on the spray roaster, saving approximately \$2,115 and one day of work. The job was performed from a safe distance with two people approximately

### Case study 1: Using technology to enhance safety (continued)

300 feet from the structure. By using this method, the normal operation of the spray roaster was unaffected and all employees were out of harm's way.

Tony Faith, team manager, safety, at AM/NS Calvert, explains that, "In addition to efficiency, use of the drone technology is proving to be a great tool in reducing risk exposure. Recently when surveying a spray roaster roof for an upcoming project, a drone was used, eliminating the need for employees to climb and actually access the roof, thus completely eliminating the potential fall hazard in this phase of the project. In addition, the drones have been used to access other areas where elevated risk exists such as coil fields, slab yards and stack inspections. In the future, I see even more opportunities to utilize this technology to reduce our employees' exposure to potential risk."

In addition to AM/NS Calvert, our Indiana Harbor, Coatesville and Burns Harbor facilities all have drones that are used for similar projects. Not only do inspections via drones save time and money, but they also eliminate safety risks for our employees.

## Case studies: Outcome 1

### CASE STUDY 2



## Real life superheroes

ArcelorMittal's sustainable development outcome one emphasizes safe, healthy, quality working lives for our people. To that end, we offer numerous health and wellness programs in the United States. With an aging workforce and rising healthcare costs, it is critical to equip our employees with information and tools required to lead a healthy lifestyle. In 2016, our health and safety programs proved effective in many ways, not only for our workforce, but for their families and local communities.

Bob Stoner, a process manager in the shipping department at ArcelorMittal Coatesville in Pennsylvania, was driving near our facility one day when he saw traffic backed up at an intersection. He heard screaming and ran to the scene to find a man who had collapsed. He immediately went to the man and checked his pulse. The man had no pulse and his eyes were rolled back in his head. Stoner decided to take action right away. He performed CPR for almost ten minutes until EMTs and ambulances arrived to the scene.

Stoner received CPR training at ArcelorMittal during Health and Safety Day. He explains, "When I took this training years ago, I never ever thought that I would be somebody that would be required to use it." Because of that wellness training, Bob saved a life.

At ArcelorMittal, it is key that our employees and contractors are safe on the job. This includes everyone being aware of their surroundings and looking out for one another. This notion of shared vigilance is equally as vital when our people are away from work. Brian Sadowski is another example of shared vigilance in action.

Sadowski, an ArcelorMittal Burns Harbor iron producing MTE (maintenance technician electrical) was enjoying a walk on the beach with his wife at the Michigan City, Indiana, Lighthouse Pier this summer. His wife noticed a young boy, about 10 years old, struggling in the water. As they got closer, they noticed another boy. Without hesitation, Brian sprang into action and dove into the turbulent waters, swimming over 30 feet to rescue the boys. Fighting exhaustion, Brian noticed a different couple in the water fighting the undertows after trying to rescue the two boys. Brian managed to save these adults as well, serving as a human life preserver. Strong swimming and practicing shared vigilance saved the lives of four strangers.

We asked Brian how our company could prevent and protect individuals from drowning in our lakefront. Sadowski mentioned the need for life-saving equipment on the lakefront, and we agreed to assist. "At ArcelorMittal, safety is paramount in everything we do, including shared vigilance which is watching out for the safety of others," said John Mengel, vice president and general manager, ArcelorMittal Burns Harbor. "When learning of Brian's involvement in saving the lives of those four people, I wasn't surprised that he quickly took action. He is a great example of a caring individual who risked his own life, by heroically stepping in to save those in need.

### Case study 2: Real life superheroes (continued)

Following Brian's input, our company met with the Michigan City Lakefront safety committee and asked the group to develop a list of what was needed to quickly get this equipment purchased and installed. Within a month, the committee made its recommendations. ArcelorMittal agreed to purchase and pay the installation costs for 25 Coast Guard-approved ring buoys and cabinets, each with 100 feet of rope and a theft stopper. The equipment would be installed at three sites: Washington Park, Millennium Park and Department of Natural Resources lakefront property locations.

In the grant proposal, the safety committee stated: "ArcelorMittal and the Lakefront Safety Committee pride themselves on the focus on safety. Since 2014, 25 people have been victims of water accidents off and around these areas and six drowned. In several cases, bystanders had no equipment to attempt a rescue." With the purchase of this life-saving equipment, ArcelorMittal hopes to set an example of shared vigilance in Northwest Indiana.



## Case studies: Outcome 2



### Innovating automotive solutions

The automotive industry is facing increasingly aggressive safety standards and new, stringent tailpipe emissions and fuel economy standards implemented by the U.S. Environmental Protection Agency (EPA) and National Highway Traffic Safety Administration (NHTSA). The standards will require a footprint-based, fleet-average fuel economy of 54.5 MPG for new vehicles by 2025. In light of these changes, ArcelorMittal is fervently innovating to

find unique opportunities to improve the crash performance of vehicles through advanced steel solutions including lightweight hot-stamped materials designed for mass production.

ArcelorMittal and ArcelorMittal Tailored Blanks have been engaged in co-engineering discussions with FCA US LLC and Magna International's Cosma International operating group since 2012 to identify applications that would reduce the weight of the next Chrysler Pacifica while meeting or exceeding crash test requirements and minimizing costs to the consumer.

Together, the partners identified the side structure of the vehicle's body-in-white, specifically the door ring and b-pillar, as the area of most opportunity for weight reduction and improved safety performance for this mainstream, high-volume family vehicle. After 36-months, 2,000 engineering hours and approximately 300 design iterations, the team agreed on one central concept – the world's first five-piece hot-stamped laser-welded door ring and b-pillar that first appeared in March 2016 in the 2017 Chrysler Pacifica. This solution offers the perfect balance of ridged high-strength steel and more pliable energy absorption material that would allow the body of the vehicle to safely manage crash energies in small offset and side impact crashes without a significant impact to the overall weight of the vehicle.

In order to meet the production needs for the 2017 Chrysler Pacifica and allow for production expansion to meet additional demand from other automakers for the product, ArcelorMittal invested heavily in the development of a dedicated, state-of-the-art processing facility in Woodstock, Ontario. This facility opened in 2015 and allowed ArcelorMittal to amplify the central innovation and meet the high volume and productivity demands of the mainstream application.

The facility's current capacity will support the annual production of more than two million hot-stamped laser-welded blanks using two continuous ablation and welding systems and a dedicated quality lab. The facility has the ability to further expand to help absorb market demand.

Through the use of ArcelorMittal's patented and award-winning laser ablation process, the company was able to combine two high-strength steel grades – Usibor®, a hot stamping grade that supports weight reduction in advanced shapes that require higher tensile strength, and Ductibor®, an energy-absorbing grade designed specifically to complement Usibor® in hot-stamping applications and offer ductility – to better manage the

### Case study 1: Innovating automotive solutions (continued)

crash energies. This marks the first time these two steels were used together in North America. During a small offset and side impact crash test, the energies could effectively be distributed around the passengers, while still maintaining a safe vehicle cabin.

Through the co-engineering process, and the ability to apply ArcelorMittal's patented and award-winning laser ablation process, the partners were able to dramatically reduce the weight of the vehicle by 8.64 kg/19 lbs. and help improve the vehicle crash performance, especially for the challenging narrow offset and side impact crash requirements. This innovation also contributed to the Chrysler Pacifica being the first vehicle in the minivan class to achieve an IIHS 2017 Top Safety Pick Plus award, as well as being named Utility Vehicle of the Year at the Detroit Auto Show.



## Case studies: Outcome 2



### Reducing greenhouse gases requires a life cycle approach

At ArcelorMittal, we are innovating new automotive steel products and solutions that provide strength and mass reduction, while helping to reduce greenhouse gas (GHG) emissions of vehicles. Government regulations have become more stringent in recent years. The 2025 vehicle fleet must improve fuel economy and GHG emissions to about 54.5 mpg. Therefore, automakers

are making a number of modifications to vehicles. One is incorporating materials to reduce weight, thereby reducing fuel needs and ultimately GHG emissions. These materials could include advanced high-strength steels (AHSS), aluminum or carbon fiber, among others. Each material contributes to vehicle lightweighting and improves fuel economy. However, each does so at a different cost to the manufacturer – and to the environment.

If we want to know how “green” a vehicle truly is, we have to measure emissions over its entire life cycle. This is done using a process called Life Cycle Analysis, or LCA. LCA looks at total emissions generated during the three stages of a vehicle’s life – production, drive phase and disposal.

Right now, regulations only consider tailpipe emissions generated during the drive phase of a vehicle. However, the production phase of a vehicle makes up nearly 20 percent of total GHG emissions for internal combustion engines. That figure more than doubles to 47 percent for battery electric vehicles. If we don’t consider production phase emissions when evaluating environmental impact, we may choose lightweighting materials that emit more GHGs during their production than they save during the vehicle’s drive phase. This will result in a huge and irreversible environmental mistake.

In collaboration with Steel Market Development Institute and outside experts, we conducted life cycle analyses on steel. In fact, there have been many scientific studies done in the last decade, including a 2016 Production Phase Emissions study. This study found aluminum produced in North America emits four to five times more GHGs than steel. Additionally, aluminum requires seven times more energy to produce than steel. Dr. Roland Geyer developed the University of California Santa Barbara Automotive Materials GHG Comparison Model V4, or UCSB Model. This 2007 study calculated GHG emissions and energy over the entire life cycle of a vehicle. Peer-reviewed and publicly available, the study found the majority of aluminum-intensive vehicles result in higher overall lifetime GHG emissions and significantly higher production phase emissions in every vehicle class tested.

The steel industry, while confident with the realistic modeling assumptions employed in the UCSB Model, recognized some might question only using inputs from our industry. The study was broadened in 2016 to include LCA model parameters that, frankly, favored aluminum-intensive vehicles. It also included a “Monte Carlo” assessment which ran the LCA analysis 5,000 times with different parameters, using assumptions

### Case study 2: Reducing greenhouse gases requires a life cycle approach (continued)

from both the steel and aluminum industries. This was a big endeavor – a conclusive effort that hadn't been run previously.

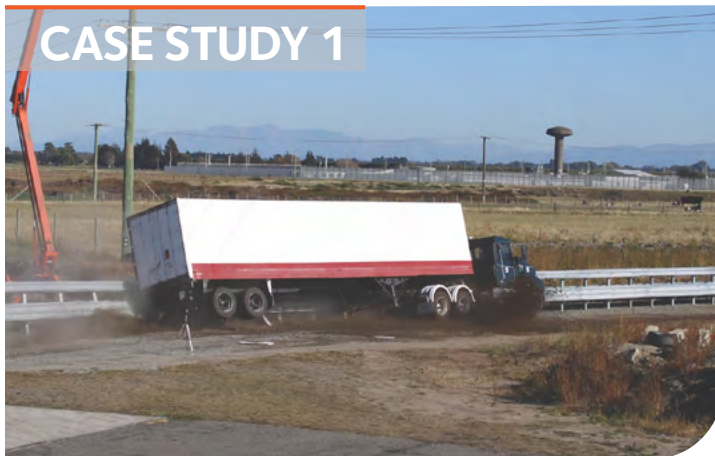
The findings show steel-intensive vehicles still had lower total emissions versus aluminum in approximately 70 percent of the potential scenarios. When we take into account an entire annual fleet of sedans, SUVs or pickup trucks, the aluminum-intensive option versus AHSS results in about 1.5 billion kg more GHGs per vehicle class.

When we look at the disposal stage of a vehicle, steel is recognized as the most recycled material on the planet. One of the most amazing things about steel is that its properties allow it to be recycled continually into any number of products, with no loss of strength or performance. The physical properties of automotive aluminum, however, prevent it from being recycled the same way. Automotive aluminum must be sorted and recycled to the same grade, which is time consuming and expensive. In their quest for materials to build lighter cars, automakers have grabbed headlines by replacing steel with aluminum. For consumers and the environment, however, a wholesale shift to alternative materials is not occurring.

Automakers are still capitalizing on the value and performance of advanced steel grades and other technologies to meet regulatory requirements. In fact, AHSS is the largest growing material to replace the traditional mild steels used in the early 2000s. Steel also provides the best value by allowing automakers to maintain their existing manufacturing and repair infrastructure. At ArcelorMittal, we are innovating new automotive products and solutions that further prove why steel is the sustainable choice.



## Case studies: Outcome 3



### Keeping you safe on the road: ArcelorMittal's steel median safety barriers

The development of stronger steels directly contributes to making vehicles safer now than ever before. Steel's strength has multiplied by almost 10 times over the past 20 years. Our research and development

teams continue to innovate and strengthen steel, while also reducing its weight.

On our roads, safety moves beyond vehicles with steel infrastructure solutions. ArcelorMittal Global Research and Development, in cooperation with U.S. safety barrier manufacturer Gregory Industries, has developed a new, proprietary high-containment steel center median safety barrier for use in North America.

The new barrier is able to safely contain and redirect a fully loaded 79,000-pound tractor trailer truck, a quad cab pickup truck, and a mid-size car. It is the first Methods for Assessing Safety Hardware (MASH) Test Level- 5 (TL-5) rated steel center median safety barrier developed for the U.S. market. It is safer for vehicle occupants and a cost effective alternative to concrete cast in-place barriers.

According to the U.S. Department of Transportation, motor vehicle traffic accidents are a leading cause of death, not far behind heart disease, cancer and stroke. No doubt, some can be attributed to barrier crashes.

"In the early 2000's, ArcelorMittal worked with European safety barrier manufacturers to design higher performance safety barriers as a result of new regulations that promoted safety performance instead of specifying set barrier configurations," said Rich Clausius, projects manager, Global R&D, East Chicago. "This work proved to be quite successful and led to safer roads and increased steel sales in Europe. In 2008, I was asked to determine if the same approach could be done in the U.S."

The answer was yes. It was an opportunity to create additional steel sales in the U.S. and help customers solve a problem. In addition, development of this product aligns with ArcelorMittal's commitment to safety.

"It's a win – win," said Clausius. "There are many benefits. This barrier results in lower deceleration rates on impact versus concrete resulting in less damage to the vehicle and injuries to the occupants. It also has a lower installed cost than a comparable concrete center median barrier."

In order to contain the vehicle during impact, high-strength steel grades were evaluated during the early development phase of the project. An existing grade 80 HSLA (high-strength low alloy) steel provided the best combination of strength, formability, weight savings and cost.

HSLA steels have been used in the auto industry for many years. "But as far as we can tell, this is the first time it's been used in a U.S. safety barrier application," added Clausius.

### Case study 1: Keeping you safe on the road: ArcelorMittal's steel median safety barriers (continued)

"We reached out to the four largest steel safety barrier manufacturers in the US," said Clausius. "Of the four, Gregory Industries, proved to be the most interested in our capabilities and in developing a new proprietary barrier for the U.S. market. They were already an ArcelorMittal customer, so that helped too."

Once a non-disclosure agreement was signed, Clausius, along with representatives from Gregory Industries, focused on market needs expressed during US Transportation Research Board Roadside Safety Design Committee meetings.

These meetings were attended by federal and state highway officials, government contractors and researchers, safety hardware manufacturers and crash test facility experts. It became apparent there was a market for higher performance safety barriers. And at the time, no one was making a TL-5 steel center median barrier.

For a TL-5 barrier design to be approved in the U.S., it has to pass three MASH full scale crash tests. The tests include a mid-size car, quad cab pickup truck, and a fully loaded tractor trailer. In all three tests, the vehicles must be contained (can't go through or over the barrier), be safely redirected, no rollover, no excessive intrusion into the occupancy department, and must have reasonable deceleration rates.

Before using real vehicles and barriers, computer modeling was conducted to simulate crashes. The barrier design was optimized for performance, based on the results.

Results of the actual crash tests were very good. The barrier successfully contained and redirected the car, pickup truck and tractor trailer. No debris or detached elements penetrated the occupancy compartment. The vehicles remained upright with satisfactory vehicle stability and resulted in satisfactory occupancy risk factors. Overall it was a huge success. And the test performance was very similar to the computer models.

"We applied for patents and expect to receive approval from the U.S. Federal Highway Administration in early 2017," added Clausius.

As soon as the barrier is approved, Gregory will begin marketing and manufacturing the barrier with ArcelorMittal steel.

When compared to concrete barriers, ArcelorMittal's new TL-5 steel center median safety barrier has attributes above and beyond its safety benefits. Steel is kind to the environment because it's 100 percent recyclable. The barrier has a long service life and it's easier to repair than concrete, making it cost effective. It weighs less than concrete, so transportation costs should be lower.

These highway barriers represent ArcelorMittal's deep commitment to developing products that will create sustainable infrastructure in the United States.

## Case studies: Outcome 3

### CASE STUDY 2



## Stadiums of steel

Two new stadiums are now standing tall in the United States with the help of ArcelorMittal. The architecture in U.S. Bank Stadium in Minneapolis and Mercedes-Benz Stadium in Atlanta was made possible with ArcelorMittal steel. Hundreds of thousands of people will visit these stadiums in the coming years.

Completed in 2016, the 65,000-seat U.S. Bank stadium is the new home of the Minnesota Vikings. Operated by the Minnesota Sports Facilities Authority, the stadium will host major

sporting competitions – including the 2018 Super Bowl – but also civic, cultural, community and nonprofit events.

The Minneapolis stadium replaces the Metrodome. In its design, architects worked to ensure the new stadium was adapted to Minnesota's cold temperatures and snow. In 2011, the Metrodome's roof collapsed under the weight of heavy snowfall, further emphasizing this need. Today, the stadium's slope – rising 205 feet from grade in the east to 272 feet high in the west – gives the building a unique ability to shed snow. Secondly, the use of translucent ethylene tetrafluoroethylene (ETFE) material allows more sunlight and heat through the roof. This, combined with the natural rise of heat from inside the stadium, helps melt the snow and ice. Diverters redirect it to gutters and collection basins located on the edges of the roof, keeping snow and ice from falling to the ground below. The roof contains more than 3,000 metric tons of HISTAR® high-strength steel (in 65 ksi grade) produced at our Differdange plant in Luxembourg.

Further south, the Mercedes-Benz Stadium in Atlanta will be home to the Falcons NFL football team and the Atlanta United MLS team.

ArcelorMittal has played a significant role in the construction of this state-of-the-art stadium. Steel plate came from ArcelorMittal Burns Harbor and ArcelorMittal Coatesville, and steel beams were provided by ArcelorMittal International. A total of 22,000 tons of steel will be used in the stadium – nearly three times more than what was used in 1992 to build the Georgia Dome, the previous home of the Falcons. ArcelorMittal steel will be used for the infrastructure of the stadium, as well as the roof structure.

Canam Steel Corp., a Canadian fabricator with locations in Canada and the U.S., was awarded the fabrication contract for the Atlanta Stadium. Over the years, ArcelorMittal has developed a strong relationship with Canam. "This is a prestigious project that will be very visible in the Atlanta region," said Gary Moffat, account manager, plates, sales and marketing, ArcelorMittal. "It's another example of the capability of our customer, Canam, to deliver projects that require special engineering and fabrication. Through our partnership with Canam, we also have the opportunity to grow with them."

"ArcelorMittal employees visiting Atlanta can walk into this stadium and see first-hand how the products we make are used," added Moffat. "They should feel a sense of pride and ownership in the steel products they make that create these types of structures."

The \$1.2 billion stadium will seat some 71,000 spectators and will open for the start of the 2017 football season.

ArcelorMittal is proud of these two projects and many others that provide innovation and infrastructure in the United States.

## Case studies: Outcome 4

### CASE STUDY 1



## Extracting iron from blast furnace byproducts reaps benefits

Like many steelmakers, ArcelorMittal Burns Harbor produces byproducts that contain valuable iron units, yet not enough to be recycled directly back into our operations. The Burns Harbor iron producing department

has initiated a separation process where the high-value iron material can be extracted and used in the blast furnace.

"This creates a win-win situation, as we get a very inexpensive iron source for the blast furnace that's half the cost of an iron pellet, and we are able to minimize our environmental footprint at the same time," said Doug White, lead engineer, operating technology, iron producing, ArcelorMittal Burns Harbor. "We're in the early stages of this project, producing about 6,000 tons a month with hopes to improve on that number in the future."

The process has been developed jointly by ArcelorMittal Global Research and Development and other service providers. It's been successful at producing a useable product in the blast furnace that has more than 70 percent iron, where a typical pellet would contain about 65 percent iron.

"The product we are putting into the blast furnace is less than half the price of a pellet, so every ton of this material we use saves about \$50," said White. "Another cost benefit is that this high-iron material has a relatively low slag volume in the blast furnace. This saves coke rate in the furnace and produces more iron in the blast furnace than what could be produced with just pellets alone."

White says there are also energy benefits to this process. The material that goes into the blast furnace – called metalized material – has only to be melted and not reduced like an oxide material. When it gets to the blast furnace, the material is able to be processed into pig iron at a lower energy (fuel) rate than iron oxide pellets.

While there are no start-up costs for this iron extraction process, White said that the service provider does charge a fee for processing the material. Our Indiana Harbor facility is also starting to utilize this process.

"There are also long-term sustainability benefits as these materials are returned directly to the process. So while the program is still in the infancy stage, we're seeing many possibilities and benefits from re-using this recycled material," added White.

"After many tries to identify a viable separation process to recover these valuable iron units that is cost effective, it's gratifying to see these preliminary results that seem so promising," said Dale Heinz, senior division manager, primary operations, ArcelorMittal Burns Harbor. "It seems a long time in the making, but this recycling breakthrough promises significant economic benefits to the company."

## Case studies: Outcome 4

### CASE STUDY 2



## Iron oxide and mill scale: recycling our byproducts for everyday use

The steelmaking process requires significant raw materials. As these materials are transformed into steel, a number of byproducts are created. To reduce our waste, we seek ways to recycle and reuse these byproducts whenever possible.

For example, 4 percent of the mixture included in a cement kiln is iron. The presence of iron reduces the temperature at which the cement reaction can take place, thereby resulting in less energy consumption and less wear and tear on the refractory kiln.

Some cement kilns are located near a limestone quarry that naturally has enough iron required to optimize the reaction process. Those kilns do not add extra iron to the kiln. Other companies, however, make cement out of limestone that is low in iron. Those kilns must have added iron-rich material to lower the temperature for the reaction.

That's where ArcelorMittal comes in. In our process, not all iron is converted into steel. Some is converted to iron oxide and recovered through the fume collection system. This material is a dry dust that is a fairly pure form of iron oxide. In many cases, this iron oxide cannot be reused in blast furnaces. At Indiana Harbor and Riverdale facilities, we avoid landfilling this byproduct by selling micro pellets of iron oxide to cement companies. The process for making these pellets is relatively simple: we add a binder (ironically often cement) to iron oxide and mix it in a kiln onsite. As the oxide, moisture and binder tumble together in the rotating kiln, the material turns into spherical pellets that we then sell to cement companies.

It costs ArcelorMittal approximately \$15 to make 1 ton of micro pellets, more than the \$10 per ton price of the pellets we sell. This is more cost effective than the landfilling alternative, which totals \$35 per ton. This saves the company money and helps us to use resources most efficiently.

In addition to iron oxide, ArcelorMittal also recycles mill scale from our Indiana Harbor East and Cleveland plants. During the steelmaking process, heated slabs are red hot, and when the slabs are rolled, the outer "skin" come off as mill scale. While some mill scale can be recycled into the sintering process, we try to sell the rest.

Mill scale can be pressed into sheets and reused as a counterweight for filing cabinets. With a sheet of very heavy material in the back of the filing cabinet, the center of gravity is close to the wall and therefore the drawer won't tip over. This same counterweight effect using mill scale can also be found in stadiums and sports arena seats. Mill scale in the back of the seats ensures chairs flip up automatically.



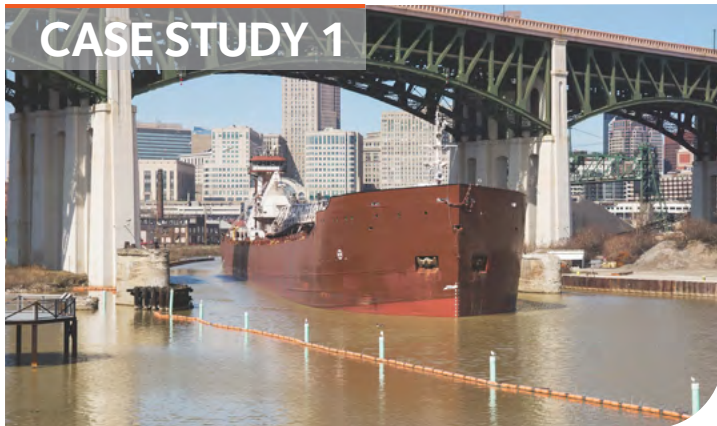
#### Case study 2: Iron oxide and mill scale: recycling our byproducts for everyday use (continued)

While iron oxide and mill scale are not harmful materials, they do accumulate and must be either landfilled or reused. William Sammon, manager, procurement, at ArcelorMittal Indiana Harbor, explains that, “We try to think about the properties of our byproducts and educate ourselves on what industries require materials with such properties. With research, knowledge of the market, and listening to others, we figure out how we can provide a customer with something valuable while also recycling our own byproducts and enhancing our efficiency.”

In an effort to be more sustainable, we are dedicated to figuring out who would consider our byproducts to be raw materials in their processes.



## Case studies: Outcome 5



### Partnering to create a healthier habitat on the Cuyahoga

The Cuyahoga River shipping channel is sometimes referred to as a lifeline to ArcelorMittal Cleveland. This federal navigation channel is a critical six-mile maritime route that delivers five million tons of essential raw materials to the facility's docks each year. But ArcelorMittal and other industries along the banks of the Cuyahoga

aren't the only ones that rely on the shipping channel for their livelihood. The river is also home to a rich ecology of fish, plants and other wildlife.

With support from ArcelorMittal and the Sustain Our Great Lakes program, Cuyahoga River Restoration – a local nonprofit organization committed to restoring and protecting the river – is working to make the shipping channel healthy and productive for both industry and fish through a program called “Habitat for Hard Places.”

“We know that when things are better for fish, they're better for people,” explained Jane Goodman, executive director, Cuyahoga River Restoration.

Fish can have a difficult time traveling the industrial shipping channel. The steel walls that maintain the channel for large freighters don't naturally provide vegetation necessary to give shelter, food and oxygen for fish. This can create a “hard place” environment for larval and juvenile fish if they cannot find places to grow and breed, hide from larger fish or hungry birds, or rest on their journey to and from Lake Erie. So Cuyahoga River Restoration and its partners are developing and testing new “habitats” that can support fish in this unique environment.

Goodman likes to think of these habitats installed along the shipping channel's bulkheads like a series of rest areas along a highway: “They are like truck stops or nurseries for fish.”

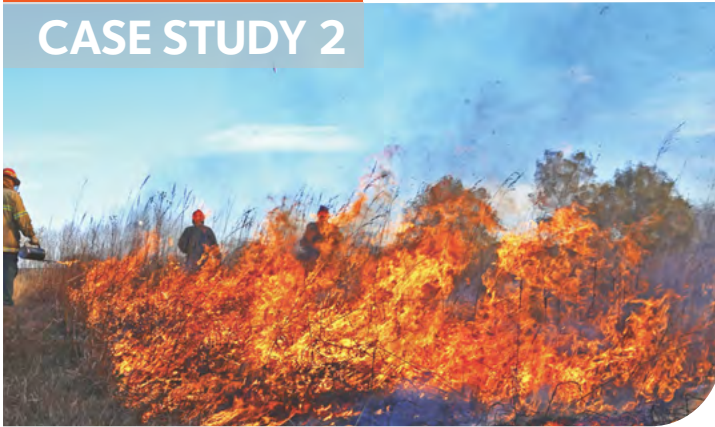
“We've been able to build fish shelves, and fish pockets, so that fish moving at different parts of their life cycle have a place to stop. ArcelorMittal has been one of the finest, most supportive partners in restoring this part of the river, which many people thought would be totally impossible.”

In the spring of 2016, 600 habitat units were installed, covering 3,600 linear feet of bulkhead in two-mile stretch of the channel. Half of the units are hanging on or adjacent to ArcelorMittal Cleveland property. Goodman said that monitoring over the summer showed that algae (food for fish) is successfully growing on the structures and fish have already been observed using the rest stops.

The shipping canal is critical to our operations, so we are proud to work with Cuyahoga River Restoration to develop habitats for the fish, plants and other wildlife that call the same canal home.

## Case studies: Outcome 5

### CASE STUDY 2



## Protecting our land: the preservation of dune and swale

In our effort to be a trusted user of land, ArcelorMittal Global Research and Development, in partnership with The Field Museum and The Nature Conservancy, launched an exciting project in the spring of 2013 to restore ten acres of globally rare dune and swale habitat on its East Chicago, Indiana campus.

Dune and swale is a unique type of natural habitat. It can be found along the southern rim of Lake Michigan and was created when glacial Lake Chicago (the precursor to Lake Michigan) receded thousands of years ago.

Museum ecologists noted the site's unique topography, undisturbed sandy soils and a few native plants growing in the rougher areas of the site. These were all clues that something very special lay beneath the mowed field. These suspicions were confirmed when mowing of the area ceased and thousands of native plants emerged.

Inventories of the ArcelorMittal site have documented more than fifty species of plants, including a state-endangered species and two state-threatened species, all of which are being monitored.

The site requires ongoing management to restore plant diversity, manage invasive species and help maintain the health of rich natural areas. One technique used for this is a prescription burn or fire.

"Fire was a natural occurrence in wetlands, woodlands, prairies and dune and swale habitat until recent times," said Laura Milkert, ecological stewardship manager, Keller Science Action Center Science and Education, The Field Museum. "Prescription fire is now a key component to restoration."

Prescription fires are part of a national effort to identify, restore, protect and connect over 1.4 million acres of natural areas across the United States. Conservation Land Stewardship in partnership with The Field Museum recently set a prescription fire on the grounds of our Research and Development site to manage the ten acres of globally rare dune and swale habitat.

"The City of East Chicago Fire Department was involved in the planning stages," said Matt Bartz, technical procurement and process research, ArcelorMittal R&D. "They were onsite to ensure a safe burn. And because we're located directly next to a school, the school board president was also engaged in the planning discussions."

Bartz coordinates student visits to the dune and swale habitat as part of the Mighty Acorns® program funded by ArcelorMittal. The Mighty Acorns program incorporates classroom curriculum, hands-on restoration activities and exploration as it seeks to provide students with multiple and meaningful interactions with the outdoors.

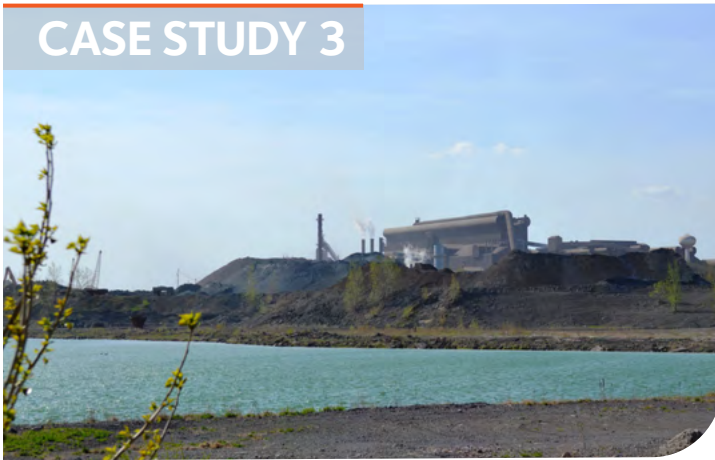
Case study 2: Protecting our land: the preservation of dune and swale (continued)

"Students are using our land to learn about dune and swale, which is very rare. There are very few left in the world," said Bartz. "This habitat can never be replaced. Its value is immeasurable."

We value our partnerships with local organizations and our communities in order to ensure the protection and restoration of land where we will continue to operate for years to come.

## Case studies: Outcome 5

### CASE STUDY 3



## Documentary highlights intersection of industry and environment

ArcelorMittal was proud to partner with Northwest Indiana filmmakers on a documentary film project in 2016. *Shifting Sands* illustrates the intersection of industry and nature in the past, present and future. The film addresses the unique natural landscape of Northwest Indiana.

In this region, rare landscapes have existed in the shadows of steel mills for more than 100 years.

On the coast of Lake Michigan, the industrial revolution gave birth to many steel mills in the late 1800s. During this time, Northwest Indiana's biodiversity also drew experts in environmental conservation to the region. These experts recognized that while the steel boom built strong economic progress, it also had negative environmental effects on the region. Quickly, these experts became a catalyst for change. In the mid-19th century, a process launched that would lead to vast environmental policy changes and the creation of a National Park.

Over the years, major changes occurred in environmental responsibility in the steel industry. ArcelorMittal (then Mittal Steel) purchased predecessor company ISG in 2005. ArcelorMittal immediately engaged in dialogue with local stakeholders. The company committed to achieving environmental excellence and being a trusted user of air, land and water. We also began work to educate the next generation to care for our natural resources.

These kinds of proactive stakeholder relationships spurred collaboration with the *Shifting Sands* producers in 2016. We brought to the table members of our environmental, corporate responsibility and leadership teams. These individuals helped *Shifting Sands* producers with key pieces of content to complete the project. ArcelorMittal provided historic footage and photos as well as video content and first person interviews of our operations and community initiatives today.

While the steel industry of the 1800s had many negative impacts, we are proud to be a part of a film project that takes an honest and realistic representation of the industry's history and current state. ArcelorMittal is committed to championing environmental excellence within our facilities and in the communities where we operate. Each year, we invest more than \$2 million in environmental community initiatives near our United States facilities. In Northwest Indiana, we have specifically invested in engaging youth in environmental outreach programs. We are proud to continue our engagement with the *Shifting Sands* film by sponsoring the development of a toolkit for teachers using the film in their classrooms.<sup>7</sup>

## Case studies: Outcome 6



### A bold partnership to reduce our carbon footprint

Making steel is an energy-intensive enterprise. About 15 percent of our cost to transform raw materials into finished steel products is directly related to energy. We run our business more efficiently and reduce our impact on the environment when we reduce energy consumption. One of the ways we

are working toward our energy reduction goals is by forging bold partnerships, exemplified by our work with LanzaTech.

Together with LanzaTech, a carbon recycling company, we are working on an exciting project to convert waste gases from the steelmaking process to produce ethanol on a commercial basis. Construction of the €87 million flagship pilot project at our steelmaking site in Ghent, Belgium, is taking place in two construction phases with a completion date in 2018.

Approximately 50% of the carbon used in the chemistry of steelmaking leaves the process as carbon monoxide. Today, this waste gas stream is either flared or used to heat and power the steel mill. In either case, the carbon monoxide is combusted and the resulting CO<sub>2</sub> is emitted. LanzaTech's technology, however, recycles the waste gases and ferments them with a proprietary microbe to produce bioethanol.

Ethanol generates 84% fewer greenhouse gas emissions than fossil fuels, and the plant will produce enough every year to run half a million cars. Every ton of ethanol produced will reduce overall CO<sub>2</sub> emissions by 2.5 tons and displace eight barrels of gasoline. This breakthrough recently earned LanzaTech the US Environmental Protection Agency's Presidential Green Chemistry Award in 2015, the top award of its kind in the country, and a Circular Economy Award at the World Environmental Forum in 2016.

Carl De Maré, vice president of emerging technologies at ArcelorMittal, said, "This partnership is an example of how we are looking at all potential opportunities to reduce CO<sub>2</sub> emissions and support a transition to a lower carbon economy. Steel is produced through a chemical process that results in high levels of waste gases being emitted; this new technology will enable us to convert some of these waste gases into fuels that deliver significant environmental benefits when compared to conventional fossil fuels. It is an example of why our carbon footprint should be viewed on a life cycle analysis basis, given steel is 100% recyclable and the material impact we make on reducing the carbon footprint of our customers through product innovation."

Not only will CO<sub>2</sub> emissions created as part of the steelmaking be reduced by two percent but, more significantly, when the ethanol created is used as an alternative to conventional gasoline to fuel aircrafts and cars, greenhouse gas emissions will be reduced by upwards of 80 percent.

LanzaTech's headquarters is in Skokie, Illinois, not too far from our steelmaking facilities in Northwest Indiana. This facility houses both the main corporate offices, as well as extensive laboratories where the company is continuing to test and develop their technology.

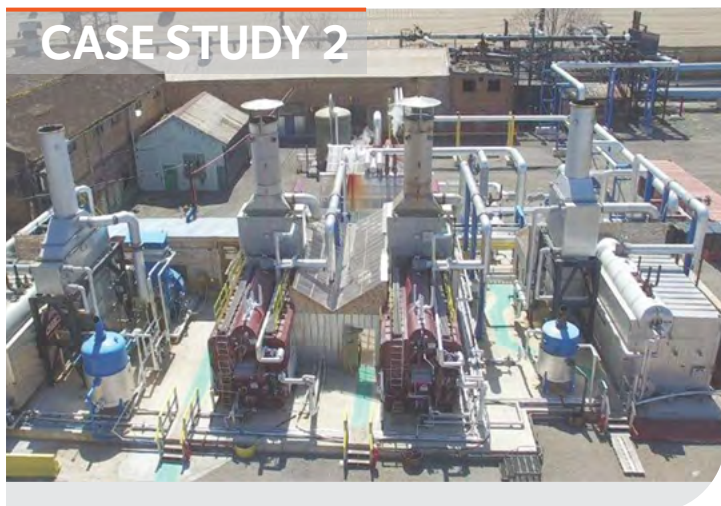
### Case study 1: A bold partnership to reduce our carbon footprint (continued)

Once construction of the Ghent flagship plant is complete and the commercial viability of the project is proven, the intention is to construct further plants across ArcelorMittal's operations. We are proud to be a part of a project that highlights the role carbon capture and reuse has to play in ArcelorMittal's contribution to a low-carbon economy.



## Case studies: Outcome 6

### CASE STUDY 2



## Weirton investment yields significant savings

ArcelorMittal Weirton received the 2016 Energy Achievement award at AISTech 2016. The award recognizes an individual or organization that has made significant improvement in energy-related productivity through new technology, practices and/or engineered methods. The Weirton facility was recognized for its package boiler installation project.

To reduce energy consumption, ArcelorMittal Weirton replaced its old boiler house with a new, energy-efficient package boiler system. Once installed, the new system immediately started yielding significant energy and cost savings. Since the installation, ArcelorMittal Weirton's MEU, tin mill, and strip steel divisions have been working together to optimize those savings.

One of the benefits of the package boilers is that they produce steam in close proximity to the manufacturing processes at the tin mill and strip steel operations. The system is also capable of adapting to changes in the plant's operations. So, working with the manufacturer and ArcelorMittal's engineering division, the Weirton team developed guidelines and procedures to reduce boiler output pressure when operating conditions don't require full line pressure.

The result is that the plant has dramatically reduced the natural gas it uses to make steam. For example, in the winter months of 2015, the plant's average natural gas usage was 6.18 mmBTU per packaged ton. The monthly average for the same period in 2016 was only 4.11 mmBTU, an improvement of more than 30 percent.

This energy improvement results in a total cost savings for Weirton of approximately \$275,000 - \$300,000 per month: \$250,000 per month because of the installation of energy efficient package boilers, and an extra \$25,000 per month due to reduced pressure operating practices.

"With our old system, opportunities like this were not even available to us. The capital investment to implement the package boilers enabled us to be more energy efficient. The initial savings were low-hanging fruit, and we could have stopped there. Instead, we are actively managing the system to achieve more savings at no extra cost," explained Matt Caprarese, division manager, MEU.

Collaboration and communication have been key to the team's success. The approach was inspired by a project implemented at ArcelorMittal Conshohocken, and through the company's U.S. Energy Team roundtables, best practices were shared between facilities.

In developing the guidelines for when and how to flex the package boilers' steam production, safety was – and continues to be – the very first consideration.

### Case study 2: Weirton investment yields significant savings (continued)

“Our goal is to achieve the lowest possible SAFE pressure. This must be done very carefully; it is not as simple as just shutting the boilers off. We also must take care not to damage the equipment,” said Wally Jancura, utilities manager.

Practically, this means that the utilities crew communicates with the operating units to make real-time decisions to safely increase, decrease or maintain steam pressure within the established boundaries.

“We realized there is free energy we can reap just by talking to each other,” Jancura said. “Our employees are proud of the gains we’ve made, and this project demonstrates how everyone can contribute to our energy goals.”

Consisting of five units, the new high-efficiency package boiler system has improved energy efficiency by 25 percent (from 58 percent to 83 percent). The system has reduced total energy consumption, decreased CO<sub>2</sub> emissions by 54 thousand metric tons per year, improved system reliability and reduced operating costs – new boilers will save about \$3.8 million per year in natural gas costs, plus \$1 million per year in maintenance costs.

## Case studies: Outcome 6

### CASE STUDY 3



### Saving money and energy with VFD technology

At ArcelorMittal, we recognize that the steelmaking process requires significant energy. As a result, we are constantly finding ways to save energy. We strive to be a responsible energy user that helps create a lower carbon future. The installation of variable frequency drives (VFDs) is one example of our efforts to do so.

At the Burns Harbor hot strip mill, four 400 horsepower motors power pumps supply water to the runout table to cool a steel strip after it passes through the finishing mill. According to Tom Poplawski, process manager, “These pumps ran all the time, whether the mill was down or on a slower pace – even when we were running product that did not require all the 60,000 gallons per minute.”

To reconcile this unnecessary expenditure of energy, Tom and three of his colleagues decided to install VFD technology. A VFD is a type of motor controller that drives an electric motor by varying the frequency and voltage supplied to the motor. With the VFDs varying the speed of the four motors, the pumps provide just the amount of water required for cooling the steel and no more. “Today, they are running between 60 to 80 percent of the speed that was previously used and we’re only delivering the water required by the operation,” explains Larry Fabina, manager, continuous improvement.

The replacement process took careful planning and the team had a tight window to get the VFDs installed.

“We didn’t have time to remove the old starters, so we had to find an area to install the new drives, while we were still running on the old drives,” says Melecio Magallon, project manager. “Once we identified that, the next hurdles were power cables. We weren’t very comfortable with the existing power cables, because of their age, and they weren’t really designed for a VFD. So, we figured out a way to get the new power feeds from the new drives down to the existing motors. Then, we brought in a contractor to work with our in-house electricians and do the physical install, as well as all the wiring, the start-up and commissioning.”

The first advantage of the new process is energy efficiency, but that is not all. Burns Harbor is also saving money on maintenance, because there isn’t as much wear and tear on the pumping system. Plus, the system may ultimately help improve the quality of the product, due to more consistent temperature control.

“One of the things we looked at was how the pressure is affected by turning on the bottom spray,” explains Chris Thompson, engineer. “Sometimes this causes a pretty big pressure drop, which affects our coiling temperature. We were never able to do anything about it before because the speeds always had to be at 100 percent for all the pumps. Now we’re able to increase the speed right when we’re turning on the bottom spray. We don’t get the pressure dip and it improves our coiling temperature control in the head end of the strip. So it made a difference in quality to make it better and we didn’t even think about that to begin with.”

### Case study 3: Saving money and energy with VFD technology (continued)

This project was a success on many levels, according to Fabina. "Number one, it was done safely – no injuries happened throughout the project. Number two, it came in under cost. Three, the project has attained the energy savings that was in the new original project scope. And four, we maxed out on the incentive check from the utility company (NIPSCO), which was \$440,000. This project has a little over a one year pay back and from here on out it will be saving approximately \$360,000 a year, year after year."

ArcelorMittal acquired the VFDs from Eaton, a power-management company that works with companies to improve their energy efficiency and worked on the installation with Glenmount Global solutions, an independent engineering and technology company.

VFDs have been installed at a number of other facilities and will continue to be adopted due to their many benefits. Saving energy and money, they are an effective solution that contributes to our goal of being a responsible energy user.

## Case studies: Outcome 7



### GM awards ArcelorMittal with prestigious diversity supplier recognition

Supplier diversity is a strategic business process for ArcelorMittal. The company is committed to developing and maintaining supplier relationships that provide a source of competitive advantage. Having a diversity program allows ArcelorMittal to provide an opportunity for minority and

women-owned businesses to participate in the company's procurement process.

For the second, consecutive year, ArcelorMittal was recognized with a General Motors Supplier Diversity Award. ArcelorMittal received GM's 2016 Top Diversity Performer Platinum Award at the Michigan Minority Procurement Conference in Detroit in May of 2016, after having been recognized with a silver award in 2015.

The award was presented for top diversity performance within General Motors tier one suppliers. The platinum award was given in recognition of those companies exceeding in performance to goal (over eight percent) and top diversity spend for 2015.

Just as ArcelorMittal is strengthened by the diversity of our workforce, our supply chain is strengthened by the inclusion of minority and women-owned businesses. We continue to work with General Motors and the other automotive customers to increase the participation of minority and women owned businesses as suppliers to ArcelorMittal.

Many companies, including automotive, are recognizing their suppliers who have established diversity supplier initiatives. In addition to GM, Ford, Fiat Chrysler, Nissan and Toyota, have strategic goals that must be met by suppliers if they want to do business with the automakers.

ArcelorMittal USA has averaged more than \$200 million in diversity spend with minority and women-owned business over the past two years. During this period the company has also doubled its diversity spend with qualified and certified diversity suppliers.

Some of the ArcelorMittal's diversity supplier initiatives include:

- Understanding our customers' requirements and expectations
- Analyzing and tracking pertinent metrics
- Identifying and mentoring our current qualified/certified suppliers
- Providing internal communications, education and awareness of diversity activities
- Constant networking with the national certifying councils; NMSDC (National Minority Supplier Development Council and WBENC (Women's Business Enterprise Council)
- Participate in customer recommended trade shows, conventions and workshops

As the leading steelmaker in the world, ArcelorMittal aims to have the number one supplier diversity program in our industry. This award from GM indicates we are moving in the right direction.



## Case studies: Outcome 7

### CASE STUDY 2



## Moving 2.7 million tons of steel

As one of the world's leading suppliers of automotive steel, ArcelorMittal knows that every automotive supply chain is analyzed in great detail. Our customers need to know which operation in which mill makes the steel from which each of their parts is manufactured. Any change in where the part originates, whether it's the mill or an operation within the mill, requires the whole process of qualification and validation to be done again.

So imagine the intense planning and complex logistics that had to occur to enable our company to transfer 4,200 parts, or 2.7 million tons of steel, without affecting our customers or losing any business.

The strategy to transform the USA business began with the asset optimization plan, which is a large part of Action 2020 in the USA. Action 2020 is ArcelorMittal's global strategy plan to deliver real structural improvements unique to our business. The goal is to generate Ebitda per ton of steel produced in excess of \$85, and to increase shipments to 90 million tons by 2020. In 2015, our Ebitda per ton was \$62, and we shipped just under 85 million tons of steel.

We wanted to make improvements that would better align our capabilities with our customers' current and future needs. The 2014 acquisition of AM/NS Calvert in Alabama (a joint venture with Nippon Steel and Sumitomo Metals Company) was key. We realized that streamlining our assets and process flows would be the key to our transformation. In order to accomplish this, we first had to face the enormous and multifaceted challenge of moving nearly three million tons of steel production.

Planning and mobilization for the parts transfer endeavor began in early 2015. Teams were created to address each of the stakeholders in the complex project, with customers top of mind. It was very important for the company to make this entire experience seamless for our customers.

The transfer teams were built out and brought up to speed, while further vetting of the original plan continued throughout the year. Customer communications, which were critical in this effort, were rolled out in November of 2015.

Leadership at the United Steelworkers union were made aware of our efforts to create a more sustainable company and were supportive. The new basic labor agreement, signed in 2016, allowed for the free transfer of parts within the ArcelorMittal facilities in the U.S.

In the first quarter of 2016, the No. 1 aluminizing line at ArcelorMittal Indiana Harbor was shut down, followed by 5GCL and the 84-inch hot strip mill. All of these activities were performed on time, with personnel relocated and steel production shifted to other ArcelorMittal facilities – all without losing a single customer.



### Case study 2: Moving 2.7 million tons of steel (continued)

The project would not have been possible without the close cooperation of our group of stakeholders:

- commercial group
- planning groups
- corporate quality assurance and customer technical services
- plant operations
- plant quality assurance
- leadership team
- research and development
- outside processing group
- information technology

Our successful parts transfer project is a piece of our larger sustainability story. Global overcapacity, a flood of cheap imports and relatively flat demand for steel during 2013–2015 weakened our country's steel industry and we had to take action. Our leadership at ArcelorMittal USA took a hard look at our operations and formulated the asset optimization plan that would help the company be more sustainable.

The original footprint optimization plan is now nearly complete, with No. 2 steel producing shutting down in the first half of 2017. This means ArcelorMittal can use its existing assets more efficiently with no loss in total production or market share, creating a healthier, more sustainable company for the future.

## Case studies: Outcome 8

### CASE STUDY 1



## Using LEGOs as a vehicle for STEM education

At ArcelorMittal, we recognize the importance of scientists and engineers to our business, our industry and our communities. As a result, over 40 percent of our annual community investment budget supports STEM (science, technology, engineering and math) education throughout the United States. In the U.S., 15-year-olds rank 21st in

science test scores among 34 developed nations. Of high school seniors who take the ACT, only 31 percent are ready for college-level science courses. ArcelorMittal wants to be a part of the solution in reversing these statistics. To do so, all children must have access to STEM experiences.

In 2016, ArcelorMittal decided to expand our partnerships with two science institutions in order to bring STEM to children and their families through a fun and relatable medium: LEGOs!

### *Brick by Brick at the Museum of Science and Industry*

The Museum of Science and Industry (MSI) is the largest science center in the western hemisphere. The museum hosts nearly 1.5 million visitors each year, including approximately 350,000 children on field trips. Since 2012, ArcelorMittal has invested \$375,000 in programming with MSI.

In 2016, we funded the Brick by Brick exhibit which features hands-on building challenges and 13 giant LEGO®-built structures of engineering marvels constructed by LEGO® Certified Professional and Chicago native, Adam Reed Tucker. Many of the of the real-world structures featured in the exhibit – including the St. Louis Gateway Arch, Golden Gate Bridge, Burj Khalifa and One World Trade Center – have been constructed with ArcelorMittal (or legacy company) steel.

STEM education is at the core of *Brick by Brick*. Museum guests can practice the skills scientists and engineers use, including asking questions, developing models and designing solutions. *Brick by Brick* supports the type of thinking that all children need in an increasingly STEM-focused world. Hands-on activities include exploring the strength of materials by walking on a steel I-beam, and building and testing LEGO structures to withstand earthquakes and heavy winds.

“At the essence of innovation, science and engineering is creativity. The simple act of play is its catalyst,” said Kurt Haunfelner, vice president of exhibits and collections at MSI. “This exhibit explores that close relationship, using a very relatable and much-loved toy, the LEGO brick. We want both kids and adults to come to this exhibit and leave motivated by the idea that play is a powerful thing and that a new world can come from a single brick.”

*Case study 1: Using LEGOs as a vehicle for STEM education (continued)**Build It! Engineering Fun, One Brick at a Time at the Great Lakes Science Center*

The *Build It!* exhibit officially launched in February 2017, but our partnership with the Great Lakes Science Center (GLSC) and the planning process go back many years. Like the Museum of Science and Industry, GLSC sought to bring the love of LEGOs to life-sized proportions, inspiring visitors to design, engineer, problem-solve and build.

Most of *Build It!* was developed, designed and fabricated by Science Center staff working with an inspiring team of LEGO artists including Adam Ward, Michael Hickox and Arthur Gugick. Additionally, several ArcelorMittal Cleveland engineers served as STEM advisors for the exhibition.

The exhibit is being presented in three distinctly different hands-on phases so guests can build their own unique experience each time they visit: Play It! Explore It! Move It! Each phase features activities and experiences for LEGO lovers of all ages, from creating brick puzzle mazes and mosaics and marveling at spectacular sculptures, to exhibits that take LEGO into the exciting realm of motion through simple machines and robotics.

Dr. Kirsten Ellenbogen, CEO of the Science Center, explains that, "Curiosity and creativity are at the heart of what we do here at the Science Center. We have taken that to the next level in *Build It!*, using LEGOs to create exciting ways for guests to play with design, materials and engineering."

## Case studies: Outcome 8



### Skills-based volunteerism in our communities

Each year, hundreds of ArcelorMittal employees generously give back to the communities where they live and work. Whether making monetary donations to support local nonprofits or volunteering to lend a hand with schools or NGOs, our employees realize the importance of helping those in need and those hungry to learn.

Our employees engage in skills-based volunteer efforts that benefit not only organizations and schools, but also allows them to tap into their own talents to help others. Whether it's helping students with after-school science, technology, engineering and math (STEM) projects or helping clear open spaces by removing invasive plants, our employees enjoy participating in activities that match their skill-sets while helping their local neighborhoods and schools.

We partner with after-school STEM and environmental education programs offered by the Boys and Girls Clubs of America, Science Olympiad, Great Lakes Science Center, Girl Scouts of America, and Indiana Dunes Environmental Learning Center and YMCA, to name a few. Our employees enjoy assisting with project-based activities and programs that provide students with the valuable knowledge and skills that can help shape their future career aspirations.

"Working in a steel mill and in a STEM environment allows me to work with men and women who are experts in their fields, in situations that continually challenge me to think differently, to solve issues, and to do something better," says Judith Cremieux, process automation manager, ArcelorMittal Indiana Harbor. "This is what I hope to share with young girls when I volunteer for STEM activities: that a career in a STEM field promises work that values inspiration and an opportunity for continual learning."

## Case studies: Outcome 8

### CASE STUDY 3



## Millennium Reserve becomes the Calumet Collaborative

Sustainable development means, in short, meeting today's needs without compromising future generations. At ArcelorMittal, we believe our company and the steel industry can rise to this challenge. One of the many ways we contribute to sustainable development at ArcelorMittal is through public-private partnerships that build opportunities to be

an active and welcome member of the communities where we operate. We recognize it is not enough for ArcelorMittal to be resilient and sustainable; the communities surrounding us must be as well. Our experience has shown that strong public-private partnerships can be instrumental in bringing together a variety of experienced, like-minded partners to leverage collective resources around common goals for greater impact.

Our involvement and leadership within Millennium Reserve exemplifies this work in action. With a large footprint in the Calumet region, ArcelorMittal was a founding member of Millennium Reserve – a public-private partnership formed in 2012 by then Illinois Governor Pat Quinn as part of President Obama's *America's Great Outdoors* call to action. The group was formed to bring together state and local government agencies, nonprofit organizations, and private companies to advance sustainable development initiatives that recognize and build on the nexus between economic development, stronger, more resilient communities, and the many environmental and ecological assets of the Calumet region.

Bill Steers, general manager of communications and corporate responsibility for ArcelorMittal Americas, was honored to become chair of the Millennium Reserve in 2015, and with the support of Illinois Governor Bruce Rauner, has been working to move this project to the next level. In 2016, in an effort to strengthen the partnership and foster a new level of collaboration in the region, Millennium Reserve expanded across the Illinois border, engaging stakeholders in Northwest Indiana and taking a regional approach to solving the area's great challenges. Reflecting this larger geography, the group has changed its name to Calumet Collaborative and is applying for its 501(c)3 designation with the IRS.

The Calumet Collaborative has four focus areas that will drive projects in the region:

**Economic opportunity:** Industry innovation, cultivation of a robust economy, job creation, workforce development, talent attraction and retention

**Livable communities:** Access and connectivity to transit and trails, housing, outdoor recreation

**Cultural heritage:** Elevate culture and history

**Natural resources:** Green infrastructure, conservation and restoration, environmental justice/quality; land, air and water remediation

ArcelorMittal is proud to have our own Bill Steers at the helm of this public-private partnership and remains committed to bettering the regions where we operate through sustainable innovation and fruitful partnerships.

## Case studies: Outcome 9



### Taking campus partnerships to the next level

At ArcelorMittal, we are looking for the best and brightest minds to help us transform the future of steel. To achieve this goal, we seek to develop and recruit professionals in engineering, finance, business management and other areas. We have created partnerships with nine accredited four-year

colleges and universities focused on engineering and business programs. Through our Campus Partnership Program, ArcelorMittal USA focuses on equipping students with the skills needed to succeed in the global marketplace and increasing opportunities for women and minorities.

Our engagement with our partner schools is not limited to interviews and career fairs. In fact, throughout the school year, we aim to provide experiences and opportunities for college students who may be interested in a career in the steel industry.

Michigan Tech is one of our partner schools. In March of 2016, nearly 30 students from Michigan Tech travelled to Chicago and Northwest Indiana for a special program with ArcelorMittal. Joe Nowosad, lead recruiter for Michigan Tech and employee at Burns Harbor, explained, "We initiated this tour in conjunction with AIST and Michigan Tech in an effort to raise awareness of what the steel industry has to offer young engineers. We targeted first and second year engineering students to give them an opportunity to see what we do and how we make steel in the hopes that they will become natural ambassadors on campus and hopefully help us recruit future talent to our industry."

The students boarded a bus from campus and visited the Museum of Science and Industry and toured our Indiana Harbor plant. They saw the hot strip mill, No. 2 steel producing, East finishing and No. 7 blast furnace. They then gathered for lunch where Bill Dalzotto, senior division manager, MEU at Indiana Harbor, presented to the students along with a peer panel composed of Michigan Tech graduates working for ArcelorMittal.

Our partnership with Colorado School of Mines (CSM) also illustrates our commitment to developing a pipeline of talented scientists and engineers. CSM's "The Outlet" is a student-run lab where students can work on personal projects, finish lab experiments outside of class or meet to work on group assignments. ArcelorMittal was a significant donor in the creation of the lab which was officially opened in April 2016.

"ArcelorMittal is very pleased to help Colorado School of Mines electrical engineering students," said Al Barsophy, chief technical officer at ArcelorMittal USA. "We equipped The Outlet to help students expand their knowledge and increase their ability to think openly."

"The lab can meet any electrical hardware needs that a student may have," explained Stephanie Claussen, Colorado School of Mines teaching associate professor. "In addition to the comfy chairs and social area, it has oscilloscopes, power meters, signal generators and a collection of components."



### Case study 1: Taking campus partnerships to the next level (continued)

The Outlet is the latest in the continuing expansion of student-made spaces on the Mines campus. The lab is designed to be open 24/7 to all students and will be managed by both student and faculty advisory committees.

Our partnership began with Colorado School of Mines shortly after the Arcelor and Mittal merger. Since then, we have hired 29 Mines graduates.

“This type of relationship is incredibly valuable and we are committed to maintaining it throughout challenging business cycles,” said Morgan Hewitt, representative, talent acquisition and development, ArcelorMittal USA. “Through labs like this and summer internships, ArcelorMittal introduces students to practical applications of their classroom instruction. Graduates who are hired can hit the ground running, already familiar with the company, our products and our culture.”

Programs like these support ArcelorMittal’s efforts to develop and recruit talented individuals who are critical to the future of our industry.

## Case studies: Outcome 9



### Steel and robotics go hand in hand

At ArcelorMittal, robots are often an integral part of the steelmaking process. From processing samples in the chem lab, to completing hazardous tasks at the zinc pot, robots are a reliable, efficient, and safe alternative. At the zinc pot, for example, robots drag the dross across the top of the molten zinc instead of humans. Given the extreme heat of the molten material, there is a high potential for splashing. Having robots handle the drossing process eliminates the

human risk. Additionally, robots can be used to remotely control peck lifters which handle very heavy loads that would otherwise require operators working in very close proximity to these loads. With the loads often in tight locations, pinch points are a big hazard. With robots controlling the lifters instead, operators stay out of harm's way.

These are just a few examples of how robots are used to enhance safety and streamline processes at ArcelorMittal. With the automation industry in full swing, engineers are constantly innovating new robotics. But just as important as having cost-efficient robots that often eliminate safety hazards is having enough qualified humans to oversee and maintain these robots.

As part of our effort to develop a pipeline of talented scientists and engineers for tomorrow, we support numerous robotics programs in the communities where we operate. One such example is Safe Harbor in Michigan City, an organization that has sponsored a robotics team at the high school level for the past five years and two robotics teams for 5th and 6th graders over the past four years. In 2016, ArcelorMittal played a major role in expanding Safe Harbor's reach, providing funding for the organization to offer a robotics team at the middle school level and three new teams at the elementary level for third and fourth graders.

At the recent kickoff for the 2017 annual First Robotics competition, John Mengel, vice president and general manager of Burns Harbor, addressed Safe Harbor robotics teams and other regional clubs. Mengel recalled that, as a kid, growing up in Bethlehem, Pennsylvania, he loved taking things apart to see how they worked, and joking, "sometimes not so good at putting them back together." Yet, after attending Penn State University, he was hired by Bethlehem Steel for the Burns Harbor facility as a maintenance engineer, "to take things apart and put them back together."

"Manufacturing products is a noble activity," said Mengel. "It's the basis of advancing society's standard of living and truly becomes the basis for any economy's wealth creation. Our salvation is the creativity that America inspires, which drives productivity and yield benefits through improved processes, today most notably, automation and robotics."

### Case study 2: Steel and robotics go hand in hand (continued)

AcelorMittal is highly committed to STEM (science, technology, engineering and math) initiatives and we gladly support local STEM initiatives such as robotics clubs. The skills and experiences these students are exposed to may pique their interest in the steel industry, and we need a talented pipeline to drive our company into the future.

## Case studies: Outcome 10



### Telling our steel story: communicating our contributions

When ArcelorMittal recognized its 10-year anniversary in 2016, we celebrated by recounting the decade's numerous stories of achievement and excellence. Still, many of our facilities in the U.S. have been operating for far longer, some for a century or more, in so-called "rust belt" communities.

Our past is rich and our roots are deep, but the ArcelorMittal story is a fairly new one and has been shaped by a changing world, country and industry. Moreover, as we embrace a circular economy and operate in an increasingly global marketplace, our stakeholders' views and expectations of us have also evolved.

So, how do we tell our story so it honors the profound impact steel has had historically – on the economy, jobs, environment, communities – while educating stakeholders about ArcelorMittal USA's role and contributions today?

Our work on outcome 10 – to ensure our contributions to society are measured, shared and valued – was especially critical in 2016 as American manufacturing took center stage in a divisive election year.

ArcelorMittal's focus is on making steel and creating value for our stakeholders, not endorsing candidates or getting involved with election politics. But the nation's debate on manufacturing afforded an opportunity to share our story, engage with elected officials and the public, and highlight several key issues that are paramount to our sustainability. Top among these issues is the need to strengthen and enforce U.S. trade laws.

In August, our Cleveland, Ohio, facility hosted U.S. Secretary of Commerce Penny Pritzker and U.S. Senator Sherrod Brown. They met with ArcelorMittal and United Steelworkers' leadership to better understand the challenges faced by domestic steel producers following a surge of steel imports caused by massive overcapacity in the global marketplace. The visit shined a light on efforts by ArcelorMittal USA and other major steel producers to file petitions against unfair trade across a range of steel products. It was one of many engagements that ArcelorMittal had with government officials on the topic of trade throughout the year.

"Cleveland's ArcelorMittal is a testament to the productivity of our steelworkers and how competitive our steel manufacturers can be. But that success will be threatened if we don't deal with steel overcapacity long-term," said Senator Brown. "We must hold China to its trade obligations and that starts with finally reducing steel overcapacity that hurts U.S. workers."

Shortly after the visit by Pritzker and Brown, and on the heels of the Republican National Convention held in Cleveland, local media also got interested in our steel story. ArcelorMittal Cleveland and the United Steelworkers Local 979 opened their doors to a team of journalists and photographers from the *Cleveland Plain Dealer* and ideastream. The six-page special feature, titled "Heart of Steel: A Cleveland Survival Story,"

Case study: Telling our steel story: communicating our contributions (continued)

reported on the plant's changing role in a longtime steel town: "Above all, it's a story of adaptation. Today, ArcelorMittal Cleveland is among the world's most productive steel mills. It has survived because it has changed. It produces a new kind of steel" (referring to the new advanced grades of steel the Cleveland plant supplies for lighter weight, fuel-efficient vehicles).

As the *Plain Dealer* series suggested, creating a sustainable future will require ArcelorMittal USA to continue to adapt and innovate, but also to actively communicate in our communities about our goals and progress.

## Case studies: Good governance

### CASE STUDY



### Ethics and integrity in the workplace

Ethics and integrity are at the heart of how we do business at ArcelorMittal; they form a fundamental part of our company's DNA. In order to further strengthen our commitment, the company identified a set of eight basic principles in 2014 – ArcelorMittal's principles of integrity – which all employees are expected to follow and promote in our day-to-day work.

These principles are articulated around three key pillars:

1. honesty and transparency
2. respect and dignity
3. exemplarity

The eight principles for everyone at every level of the organization to follow are:

- |                    |                             |
|--------------------|-----------------------------|
| 1. be honest       | 5. respect assets           |
| 2. be transparent  | 6. respect confidentiality  |
| 3. honor your word | 7. lead by example          |
| 4. respect people  | 8. communicate about ethics |

Reputation is earned, and our aim is to become the most admired steel and mining company in the world. We want to be known by all our stakeholders as a company that operates with honesty, transparency, respect and exemplarity. We can only achieve this if all our employees follow the same moral standards in their daily work.

Indeed, lack of integrity can have grave consequences – for the individual committing the breach, but also for the company. Multinational companies around the world lose millions every year due to fraud and corruption issues show that these principles are not always systematically followed. For individuals, non-adherence can in the worst case scenario result in criminal charges. For companies, integrity issues can result in reputational damage and financial losses. So there is a lot at stake.

Throughout 2016, ArcelorMittal launched a global campaign to remind employees of what we as a company believe the basic principles of integrity are through a series of articles and illustrations. Communicating our integrity principles across our company demonstrates our commitment to transparent good governance, which underpins everything we do and guides our company toward success.