Case study

Forging connectivity: ArcelorMittal builds France's largest industrial 5G network

Private 5G becomes core infrastructure for Europe's next-generation steel plants

ERICSSON

ArcelorMittal

Photograph courtesy of ArcelorMittal France

Private 5G becomes core infrastructure for Europe's next-generation steel plants

Case Study:
ArcelorMittal

Industry:
Steel Manufacturing/Building Materials

Executive summary

Facing intense global competition, ArcelorMittal France partnered with Ericsson and Orange Business Services to deploy "5G Steel." This deployment established France's largest private industrial cellular network across its Dunkirk steelmaking and recycling facilities, with a second core deployed at Florange.

The network spans blast furnaces, rolling mills, and scrap yards. This represents one of Europe's most challenging radio environments, where electromagnetic interference and massive metal structures typically disrupt conventional wireless technologies. Today, workers use tablets with real-time access to equipment status, maintenance procedures, and data directly on the shop floor. Additionally, a new electrical steel plant at Mardyck, set to open in 2026, has been designed with private 5G as an integral part of its digital architecture.

ArcelorMittal operates the network internally, with Ericsson providing second-line support, ensuring full control over availability while benefiting from deep industrial connectivity expertise.

Photograph courtesy of Kamelecom

At-a-glance

Goal:
- Deploy industrial-grade cellular connectivity across ArcelorMittal's Dunkirk and Mardyck steelmaking facilities
- Support digital transformation initiatives
- Enable future autonomous operations

Approach:
- Partner with Ericsson to design and deploy France's largest private industrial 5G network
- Cover vast industrial complex of blast furnaces, rolling mills, and scrap yards
- Address radio propagation challenges posed by large outdoor areas, massive metal structures, and electromagnetic interference
- Converge operational technology (OT) and information technology (IT)
- Operate the network internally with Ericsson providing second-line support

Results:
- Connected-worker applications deployed across production floor
- Real-time access to equipment status and maintenance procedures via tablets
- AI-based vision systems deployed for rail operations across multiple sites
- ROI achieved in under two years with 5× cost advantage versus Wi-Fi alternative
- New electrical steel plant designed with private 5G as core digital architecture

The challenge: Competing globally while investing to decarbonize

The European steel industry faces an increasingly challenging competitive environment in two areas: competing against low-cost global producers while investing heavily to meet aggressive decarbonization targets. In 2024 alone, Chinese steel exports reached 118 million metric tons globally, placing sustained pricing pressure on Organisation for Economic Co-operation and Development (OECD) markets.[1] At the same time, the industry must reduce carbon emissions by 90 percent by 2050.[2, 3]

"Our main competitors are in Asia, specifically in China," explained David Glijer, chief digital officer at ArcelorMittal France.

At ArcelorMittal's sprawling industrial complex in Dunkirk and Mardyck—encompassing blast furnaces, basic oxygen furnaces, and hundreds-meter long rolling mills—operational needs had outpaced existing wireless infrastructure. Electromagnetic interference and dense metal infrastructure made conventional Wi-Fi unreliable at scale. Consequently, workers were forced to rely on paper processes or frequent trips back to connected areas, without a reliable alternative.

ArcelorMittal needed an industrial-grade wireless network that could support mobility, automation, and long-term digital transformation—without compromising energy efficiency or sustainability goals.

Photograph courtesy of ArcelorMittal France

1 OECD (2025), OECD Steel Outlook 2025, OECD Publishing, Paris

2 IEA (2021), Net Zero by 2050: A Roadmap for the Global Energy Sector, IEA, Paris

3 ArcelorMittal (2025), Integrated Annual Review 2024, p. 36

Why private 5G?

Wi-Fi was evaluated early as part of the connectivity assessment, but ultimately, it was ruled out. Extending coverage across the full production and recycling environment would have cost five times more, delivered inadequate performance, and consumed significantly more energy. This represented an unacceptable trade-off given ArcelorMittal's decarbonization commitments.

Beyond coverage, ArcelorMittal needed to connect its operational technology with its business systems. Production equipment, maintenance systems, and quality data had long operated in separate silos from IT applications. Private 5G provided the foundation for IT and OT convergence, allowing real-time production data to flow directly into enterprise systems for planning, analytics, and decision-making.

> "We quickly understood that Wi-Fi could not support real industrial mobility. Private 5G was the only viable foundation for what we wanted to build."
>
> David Glijer, Chief Digital Officer at ArcelorMittal France

Photograph courtesy of ArcelorMittal France

Partnering for industrial-grade connectivity

ArcelorMittal moved decisively, selecting Ericsson for its track record deploying private networks in demanding industrial environments. Customer references confirmed Ericsson's capabilities, and early conversations revealed a team eager to understand ArcelorMittal's industrial needs and long-term vision.

Branding the initiative "5G Steel," with the support of the France 2030 initiative, ArcelorMittal designed the network to serve a wide range of current and future applications across multiple sites, such as mobile operator tools, mobile engine, and augmented reality maintenance.

Photograph courtesy of Kamelecom

Designing a private 5G network for real-world steel production

Dunkirk represents one of the most challenging industrial radio environments in Europe. Massive steel structures, high-temperature production zones, and complex electromagnetic conditions required precise radio planning and optimization.

To meet this challenge, ArcelorMittal and Ericsson designed and delivered an ideal private cellular network solution. To ensure reliable performance across both indoor and outdoor operations, Ericsson provided a suite of services including advanced radio planning, network simulation, integration, acceptance testing, and optimization.

Dunkirk's proximity to the Belgian border required close coordination with national regulators to ensure full compliance with cross-border spectrum requirements. Ericsson supported ArcelorMittal with detailed network simulations and power modeling to demonstrate that the network would operate entirely within authorized limits while still delivering the performance required for industrial mobility.

Ericsson led the end-to-end network design and optimization. ArcelorMittal managed physical installation directly, as active blast furnaces and heavy industrial equipment define where and how work can safely be carried out. This division of responsibility ensured both technical precision and strict adherence to site safety requirements.

ArcelorMittal chose to operate the private 5G network internally to maintain full control over availability in a 24/7 production environment. The company's own teams handle day-to-day monitoring, first-line troubleshooting, and routine hardware and configuration activities. Ericsson provides second-line support for advanced technical issues and access to specialist expertise when needed.

> "We needed a network that was engineered for real industrial conditions, not a lab environment. Ericsson clearly understood that from the start."
>
> David Glijer, Chief Digital Officer at ArcelorMittal France

Photograph courtesy of ArcelorMittal France

Performance gains delivered faster than expected

ArcelorMittal first deployed private 5G to support connected worker applications on the production floor. Workers now carry tablets with real-time access to equipment status, maintenance procedures, and quality metrics.

In rolling mills stretching more than 700 meters long, private 5G has eliminated minutes of wasted movement between connected and non-connected areas. Workers can now digitally tag equipment, record observations in the field, and complete maintenance sequences without returning to central offices—accelerating workflows and improving data accuracy.

The impact has been particularly significant in recycling operations. Scrap yards, previously beyond network reach, are now fully connected, giving operators real-time visibility into material flows and equipment performance. This connectivity is critical to ArcelorMittal's goal of increasing recycled steel throughput by 1 million metric tons.

While the network was designed to support safety systems, reduce energy consumption, and improve steel quality, the scale of productivity exceeded expectations.

Beyond financial return, private 5G has become a strategic enabler of competitiveness. As European steel producers face global pressure, success depends on operational excellence, product quality, and agility. Private 5G directly enables all three.

> "For us, private 5G is not just about connectivity. It is a way to strengthen our competitiveness through better performance, better quality, and a lower environmental footprint."
>
> David Glijer, Chief Digital Officer at ArcelorMittal France

Photograph courtesy of Jonathan Delahaye

Mobility of workers and mobility of engines

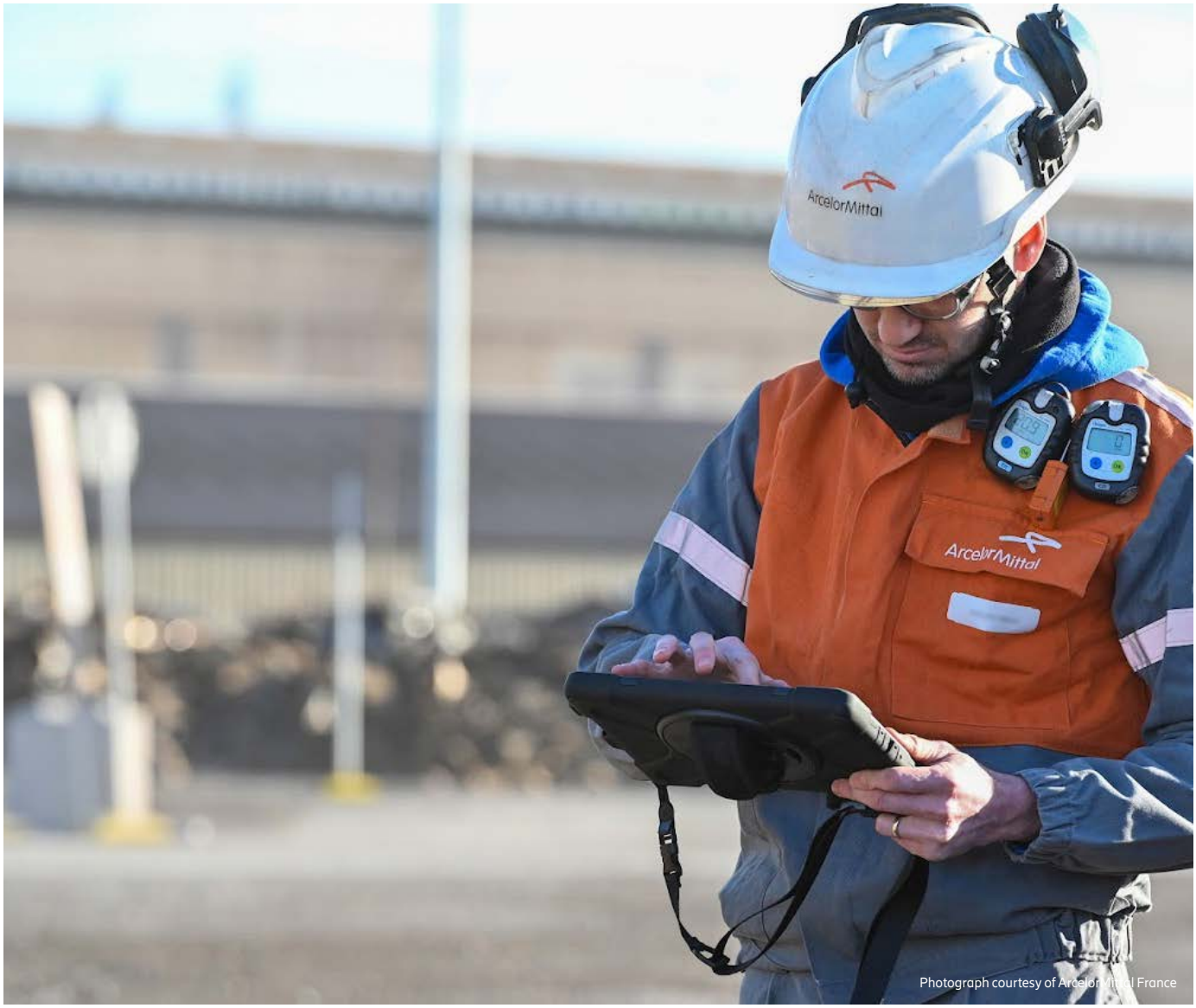
Private 5G has allowed ArcelorMittal to move beyond connected workers toward advanced automation. At Mardyck, the company has deployed AI-based vision systems for trains operating in push mode. Cameras connected via 5G provide real-time visibility during backward movements.

Private 5G is now shaping the company's next generation of facilities. At the new electrical-steel plant at Mardyck, private 5G was designed into the site from the outset. When the facility goes online, cranes, automated guided vehicles, and mobile production systems will connect natively to the network, building on four years of real-world use experience.

ArcelorMittal is also advancing innovation through its Digital Labs in Florange and Dunkirk, collaborating with partners on new industrial use cases and research programs. Florange already operates on Ericsson's newer Private 5G platform, with plans underway to migrate Dunkirk to the same architecture.

> "Private 5G is now foundational to how we design future facilities and develop new use cases. It is no longer experimental for us. It is core infrastructure."
>
> David Glijer, Chief Digital Officer at ArcelorMittal France

Photograph courtesy of Kamelecom



Photograph courtesy of ArcelorMittal France

Solution Highlights

France's largest private industrial 5G network

ArcelorMittal France partnered with Ericsson to deploy "5G Steel" across its Dunkirk and Mardyck steelmaking facilities. This deployment enables connected-worker applications, real-time material tracking, and a foundation for autonomous vehicles, even within a challenging environment where metal structures and electromagnetic interference typically impede radio propagation.

Transformational solution

- Private 5G network covering blast furnaces, rolling mills, and scrap yards
- Connected-worker tablets with real-time access to equipment status and maintenance procedures
- AI-based vision systems for rail operations
- Autonomous rail and road vehicles in testing
- New electrical steel plant designed with 5G as part of digital architecture

Radio Network

- Ericsson standard RAN solutions
- BBU 6631
- Macro radios 4418 B38 and 4422 B77
- Radio Dots for specific indoor coverage

Core Network

- Ericsson Private 5G (EP5G) platform deployed at Florange
- Migration planned for Dunkirk to the same architecture

Solution advantages

- Industrial-grade coverage across challenging industrial complex
- Single network supports OT and IT data
- Future-proof architecture supporting autonomous vehicles and AR/VR
- ROI achieved in under two years
- 5× cost advantage versus Wi-Fi alternative
- Lower energy consumption than Wi-Fi at scale

Photograph courtesy of ArcelorMittal France

About ArcelorMittal

ArcelorMittal is one of the world's leading steel and mining companies, with 125,400 employees, a presence in 60 countries, and primary steel production facilities in 15 countries. In 2024, ArcelorMittal reported revenues of $62.4 billion and crude steel production of 57.9 million tons, while iron ore production reached 42.4 million tons. Our goal is to help build a better world with smarter steels. Steels made using innovative processes that consume less energy, emit far less carbon, and reduce costs. Cleaner, stronger, and reusable steels. Steels for electric vehicles and renewable energy infrastructure, which will support the transformation of societies throughout this century.

With steel at the heart of our actions, the creativity of our teams, and our corporate culture, we will help the world achieve this change. That, in our view, is what makes the steel company of the future. In France, ArcelorMittal employs 15,400 people, including 850 researchers, spread across its 40 production sites, distribution and service centers, and four R&D sites. As an official partner of the Paris 2024 Olympic and Paralympic Games, ArcelorMittal manufactured the Olympic and Paralympic Torch, the Olympic Rings on the Eiffel Tower, and the Paralympic Agitos on the Arc de Triomphe using low-carbon steel, 100% recycled and 100% made in France. ArcelorMittal also provided Paris 2024 with the cauldron for the Olympic and Paralympic Torch Relays and the Heart of the Torch, given to each Torchbearer.

For more information, visit http://corporate.arcelormittal.com and https://france.arcelormittal.com

About Ericsson

Ericsson enables communications service providers and enterprises to capture the full value of connectivity. The company's portfolio spans the following business areas: Networks, Cloud Software and Services, Enterprise Wireless Solutions, Global Communications Platform, and Technologies and New Businesses. It is designed to help our customers go digital, increase efficiency and find new revenue streams. Ericsson's innovative investments have delivered the benefits of mobility and mobile broadband to billions of people globally. Ericsson stock is listed on Nasdaq Stockholm and on Nasdaq New York.

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