ArcelorMittal

Energy Storage for Manufacturing and Industrial Decarbonization Workshop

“Energy StorM”

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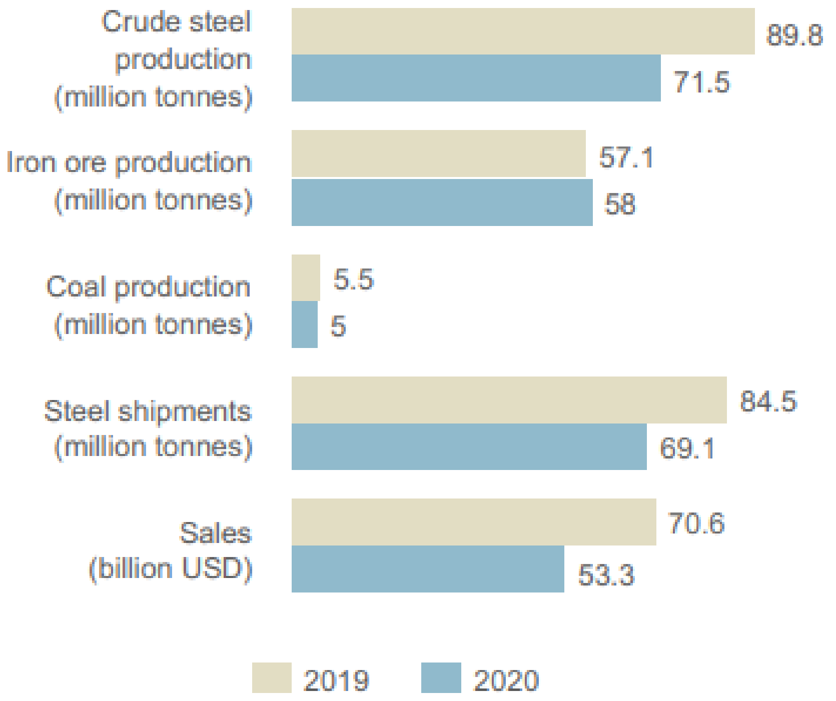
ArcelorMittal Group CTO

About ArcelorMittal

- H&S is our priority
- The world's leading steel and mining company with about 168,000 employees in 60 countries
- Recognized leader in the major global steel markets, including automotive, construction, household appliances and packaging, with leading R&D and technology, as well as sizeable captive supplies of raw materials and outstanding distribution networks
- An industrial footprint in 17 countries exposes the company to all major markets, from emerging to mature



www.arcelormittal.com

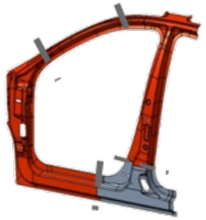
Technology leader for automotive

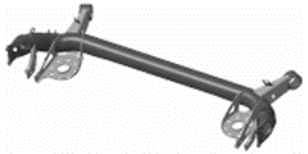
Innovation is made in all fields required by automotive:

- Advanced high strength steels (AHSS)
- Innovative coatings Usibor® (others)
- Hot and cold stamping as well as roll forming
- Laser welded blanks (LWB)
- Tubular products
- Long products

All product innovation is supported by high level process expertise

Steel solutions provider – pioneer in co-engineering with key customers





Leadership on decarbonization: targets

ArcelorMittal has adopted an ambitious set of carbon targets* that will lead our sector in reaching net-zero by 2050

* Group target of a 25% reduction in CO_2e emissions intensity (per tonne crude steel) by 2030. Europe target increased to 35% (from 30%) reduction in CO_2e emissions intensity (per tonne crude steel) by 2030. Targets refer to scopes 1+2 CO_2e emissions, steel + mining.

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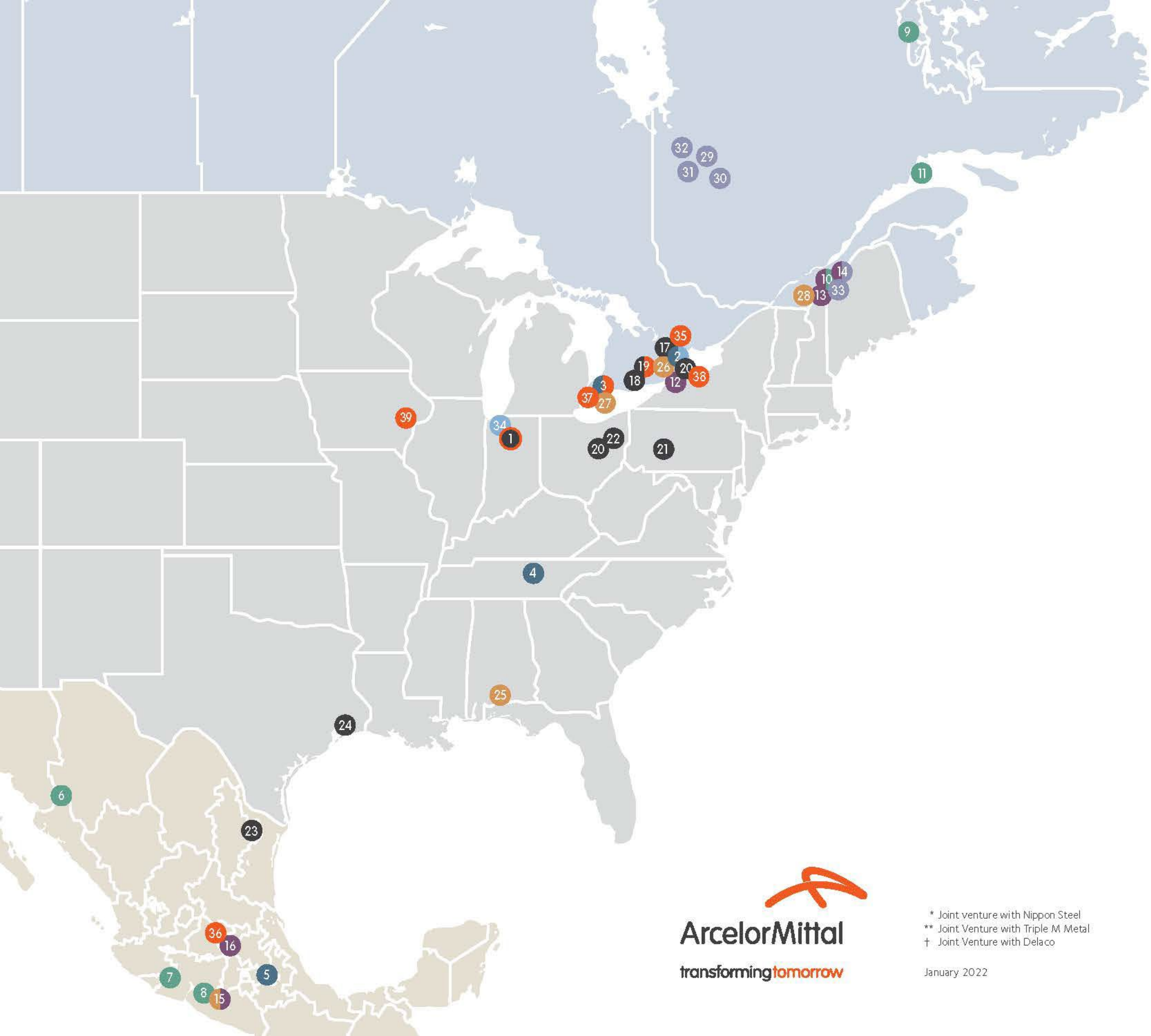
ArcelorMittal in North America



North America Headquarters
1 Schererville

Automotive Sales
2 Detroit
3 Hamilton
4 Nashville
5 Mexico City

Mines
6 Volcan, Sonora
7 Peña Colorada
8 Las Truchas
9 Fermont (Mont-Wright)
10 Longueuil
11 Port-Cartier

Long
10 Longueuil
12 Hamilton-East
13 St. Patrick (Montreal)
14 Contrecoeur (Feruni)
15 Lázaro Cárdenas
16 Celaya

Tubular
17 Brampton
3 Hamilton
18 London
19 Woodstock
20 Marion
21 Business Services (Pittsburgh)
22 Shelby
23 Monterrey
24 Houston

Flat
15 Lázaro Cárdenas
25 AM/NS Calvert*
26 Dofasco (Hamilton)
27 Windsor
28 Coteau-du-Lac

Scrap
14 Contrecoeur (Feruni)

Integrated Metal Recycling
29 IMR Trécesson**
30 IMR Val-d'Or**
31 IMR Rouyn-Noranda**
32 IMR La Sarre**
33 IMR St. Hubert**

Research and Development
3 Hamilton
34 East Chicago

ArcelorMittal Tailored Blanks
2 Detroit
27 Woodstock
35 Concord
36 Silao
37 Dearborn†
38 Tonawanda†
39 Montezuma†

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* Joint venture with Nippon Steel
** Joint Venture with Triple M Metal
† Joint Venture with Delaco

January 2022

ArcelorMittal and Energy Storage

Steel Making Industry is not new to energy storage, and we do it already for a long time for different types of energies/utilities and for different reasons:

Energies or Utilities that we commonly have storage for: Coal, O2, N2, Ar, LPG, and Waste Gases from the steelmaking process, as Blast Furnace Gas.

Main reasons to have storage, depending on the Energy/Utility:

a) Rectify supply and demand. A buffer to receive intermittent supply.
b) Pressure regulation for our waste gases.
c) Operational safety back up.

A particular storage can be justified by a single or combination of reasons.

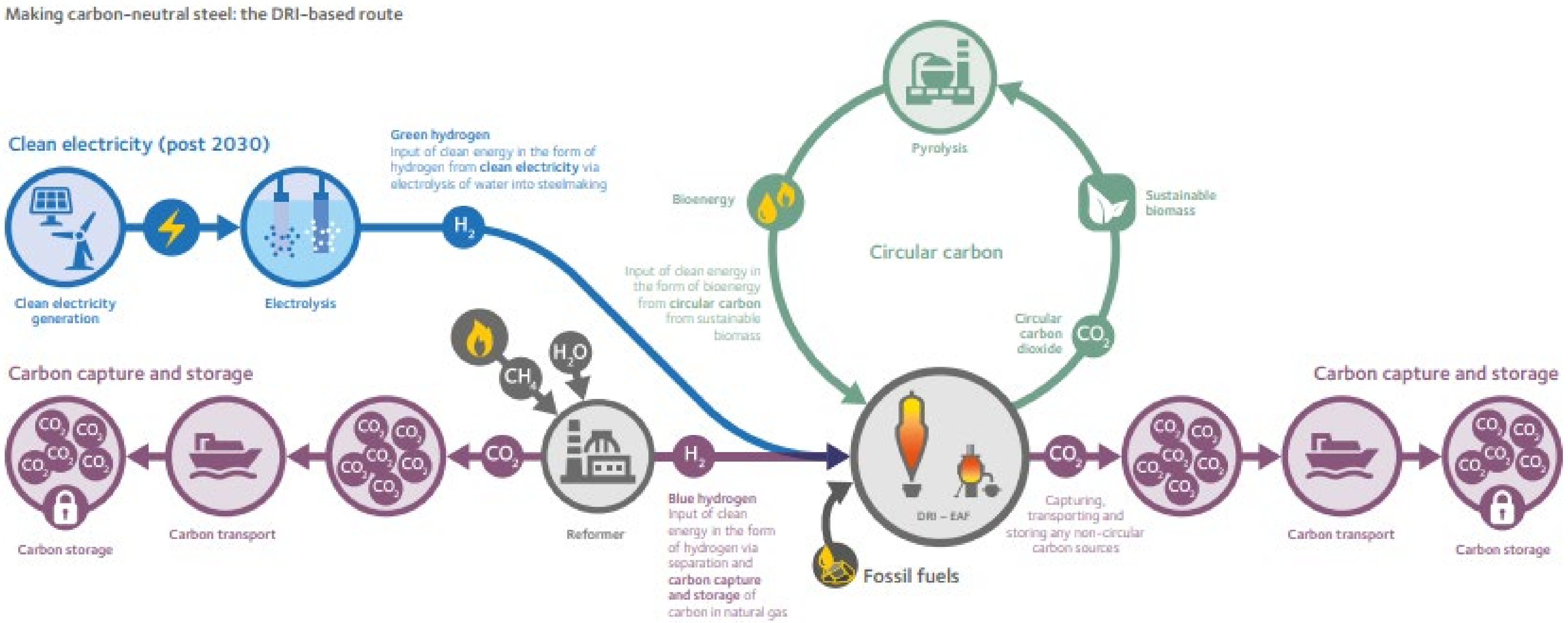
Despite being heavily Natural Gas users, we don’t have NG storage in our plants and we rely on the NG pipe grid. Similar for electricity.

ArcelorMittal and Energy Storage

Examples of Waste Gases storage. Main target in fact is pressure regulation.

ArcelorMittal and Energy Storage with **Decarbonization**

Our Decarbonization plans will strongly change the way we make steel.



ArcelorMittal and Energy Storage with **Decarbonization**

In our global operation there's not a "One Size Fits All" decarbonization path nor timeline. But we can expect for the flowing decades:

a) Waste Gases generation to be strongly reduced, even eliminated in the long term…no coal based steelmaking.

b) Natural Gas as a bridge for DRI making, until renewably produced green hydrogen is available in the amounts we need at competitive prices. Ideally receiving it by a pipe grid as Natural Gas today.

c) O2/Ar/N2 will still be demanded. Nevertheless, should be produced by clean electricity.

d) CCSU will be important during the transition period of still using fossil fuels, in particular NG.

e) Electricity usage for steelmaking will increase (EAFs, H2, heating)….we need clean electricity.

f) Biofuels will be an opportunity for some locations.

ArcelorMittal and Energy Storage with **Decarbonization**

From past slide our storage systems might change as:

a) For waste gases / coal: Trend is to be eliminated in long term

b) For Natural Gas: NG consumption will increase in the mid-term, but in general we don’t plan storages.

c) Bio gas: We expect pipe grid access, and not having local storage

d) CCS: The challenge is the location of our assets are not normally close to geological formations capable of appropriate carbon storage. Ideally, we would need access to a carbon pipe grid to transport to storage.

e) H2: We expect H2 to happen step by step, and storage might become a necessity if a H2 pipe grid is not possible. However, a full H2 steelmaking production (DRI/EAF) could need large amounts of H2…not feasible to simply truck in. An internal H2 generation could also have challenges as footprint and immense availability of renewable electricity supply.

f) Electricity storage: This technology price is going down and could be an option for markets with Power Demand Peaks prime prices / Demand response. It could be a case-by-case evaluation.

ArcelorMittal and Energy Storage with **Decarbonization**

If we need energy storage for technical/economic reasons, what we do:

a) First, we doublecheck if this storage is really needed. We check all feasible alternatives to avoid or keep it at minimum

b) If we do need the investment, we should do it in the safest possible way and guarantee a safe operation

c) We use a model/procedure to size the storage

d) Available area footprint could be a serious constrain, not only in terms of space but also on how difficult will be to integrate to existing operation (piping, elect grid etc).

e) We benchmark against previous similar projects

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