

# Technology Pathways to Achieving Net Zero in Steelmaking



Global Research and Development



# Dofasco is part of the world's leading integrated steel and mining company – ArcelorMittal



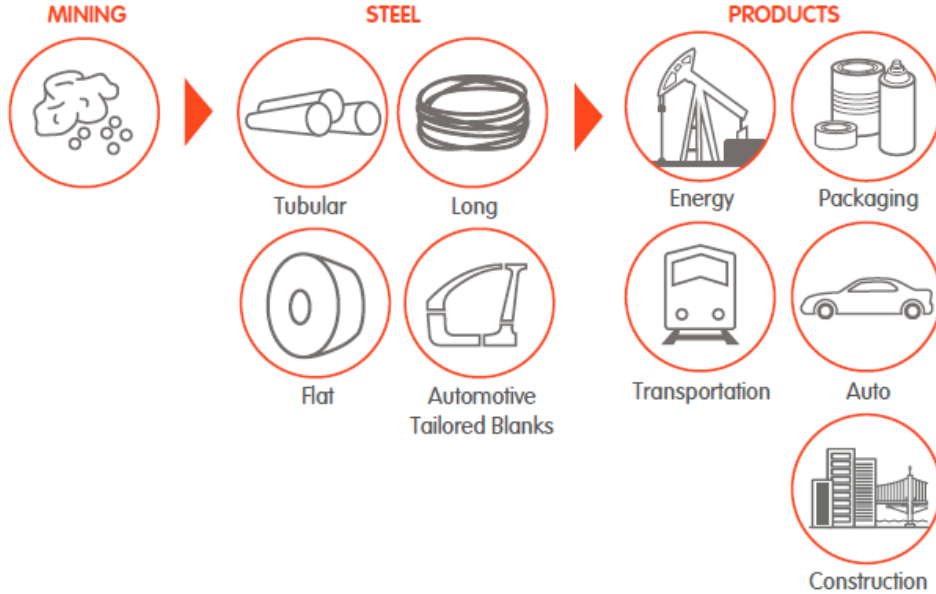
|  |   |                                     |
|--|---|-------------------------------------|
| Steel manufacturing in<br><b>16</b><br>countries | Customers in<br><b>155</b><br>countries | Employees in 2022<br><b>154,352</b> |
|--|---|-------------------------------------|

|  |  |   |
|--|--|---|
| Million tonnes iron ore mined in 2022<br><b>45.3</b> | Million tonnes crude steel made in 2022<br><b>59</b> | Steel shipments totalled in 2022<br><b>55.9</b><br>million tonnes |
|--|--|---|

|                               |                                       |  |
|-------------------------------|---------------------------------------|--|
| Research centres<br><b>11</b> | Full-time researchers<br><b>1500+</b> | R&D programs<br><b>100+</b><br>in progress |
|-------------------------------|---------------------------------------|--|

|                                     |                                       |  |
|-------------------------------------|---------------------------------------|--|
| Trademarked products<br><b>200+</b> | Active patent families<br><b>700+</b> | New products and solutions launched in 2022<br><b>41</b> |
|-------------------------------------|---------------------------------------|--|

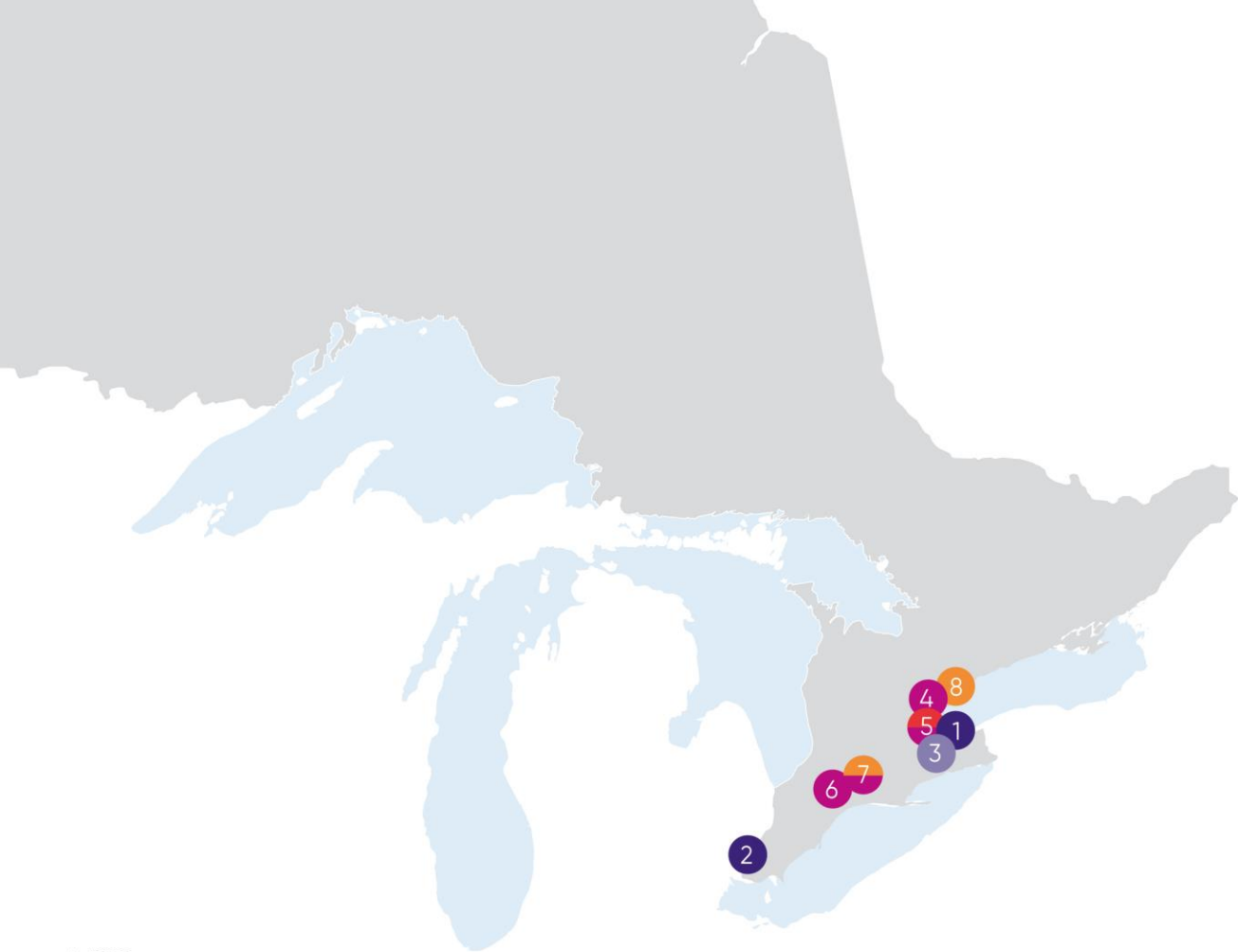
# In Canada





ArcelorMittal

# Locations in Ontario



### Flat

- 1 Dofasco (Hamilton)
- 2 Windsor

### Long

- 3 Hamilton-East

### Tubular

- 4 Brampton
- 5 Hamilton
- 6 London
- 7 Woodstock

### Research and Development

- 5 Hamilton

### ArcelorMittal Tailored Blanks

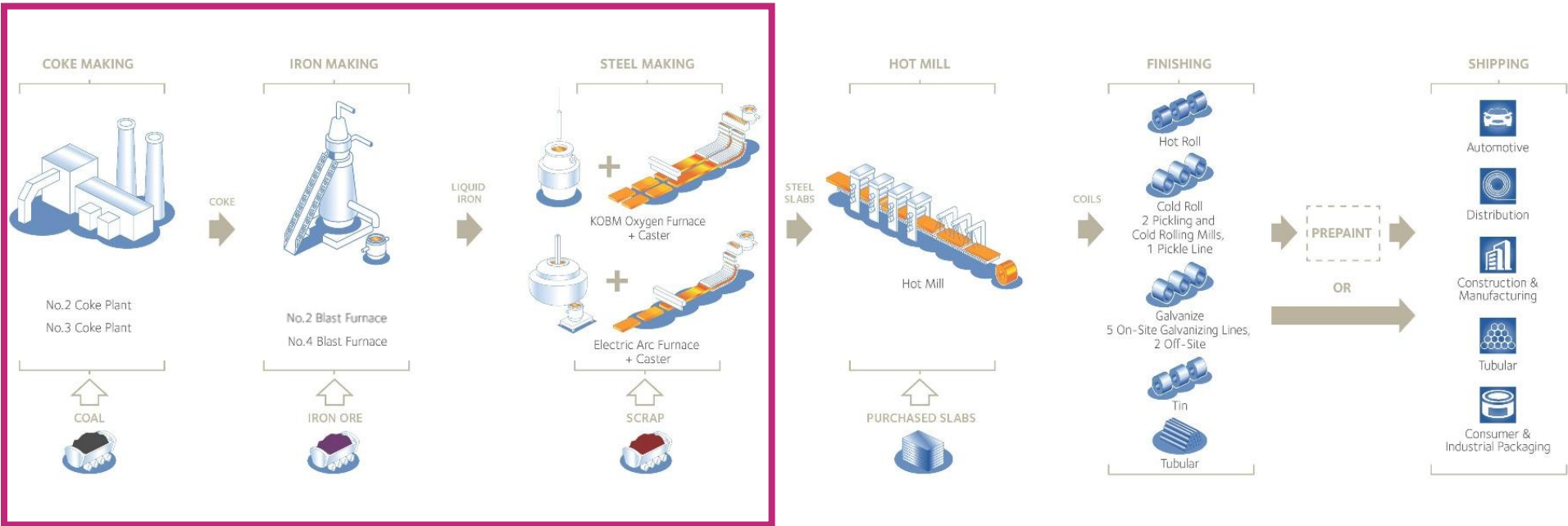
- 7 Woodstock
- 8 Concord

# In Hamilton...



Hamilton's waterfront

# Current steelmaking at ArcelorMittal Dofasco



# The path to net zero



**-25% by 2030**

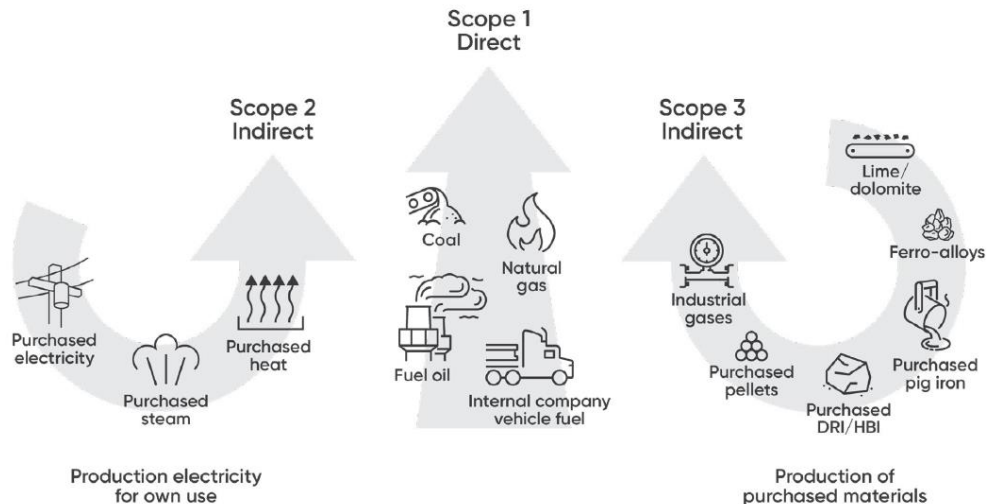
Scope 1 & 2 CO<sub>2</sub> emissions globally



**Net zero**

CO<sub>2</sub> emissions globally by 2050

and 3 GHG Protocol Emissions



\* Group target of a 25% reduction in CO<sub>2</sub>e emissions intensity (per tonne crude steel) by 2030. Targets refer to scopes 1+2 CO<sub>2</sub>e emissions, steel + mining

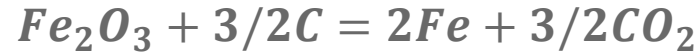
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# Three Options for Iron Production from Iron Ore

*The need for economically viable chemical reductants*

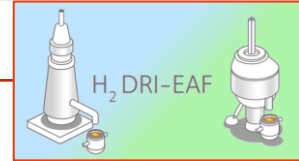
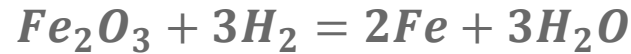
Representative  
Technology

1. Carbon

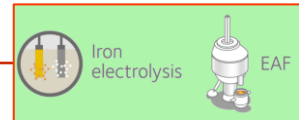


Conventional DR is in the middle of 1 & 2

2. Hydrogen

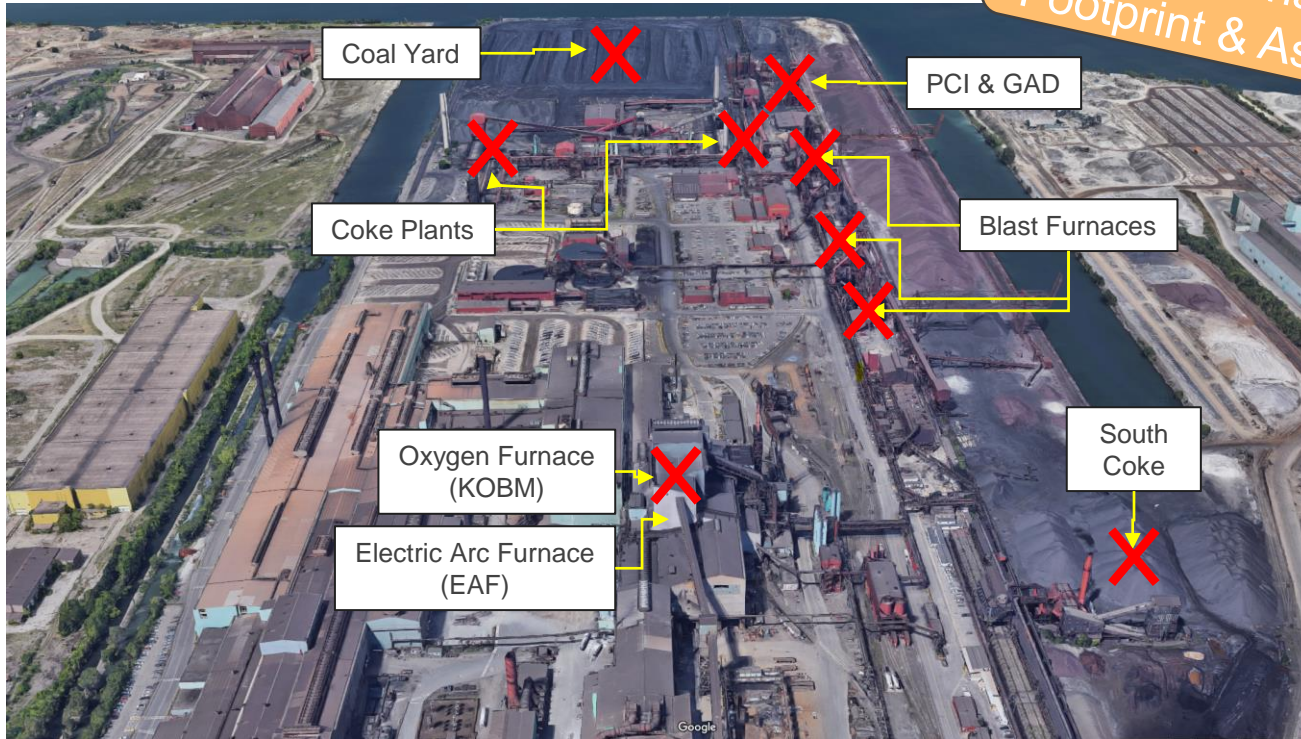


3. Electricity





# ArcelorMittal Dofasco Plant Layout & Transition

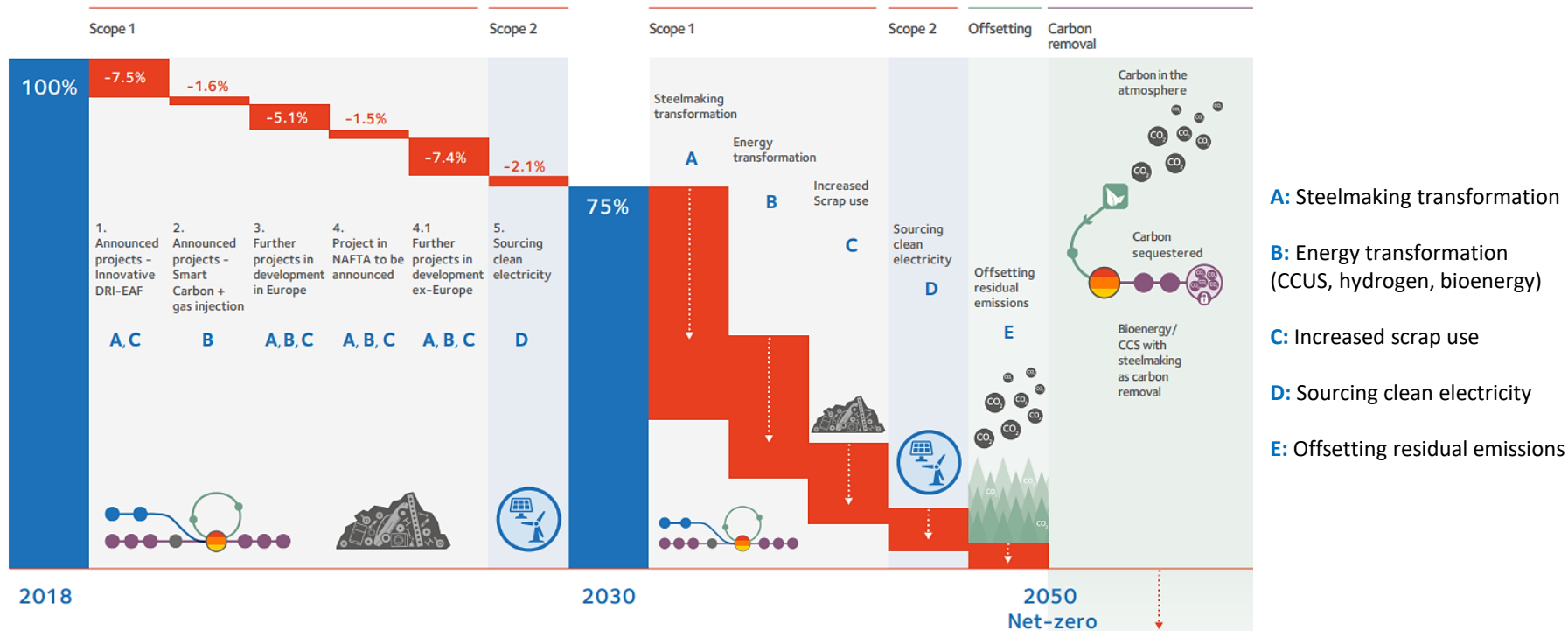


Major Overhaul of Footprint & Assets

# ArcelorMittal Global Climate Goals

Company wide 25% reduction in CO<sub>2</sub> emissions by 2030 (35% in Europe), and Net Zero by 2050

The waterfall chart 2030–2050 breakdown is for illustrative purposes only

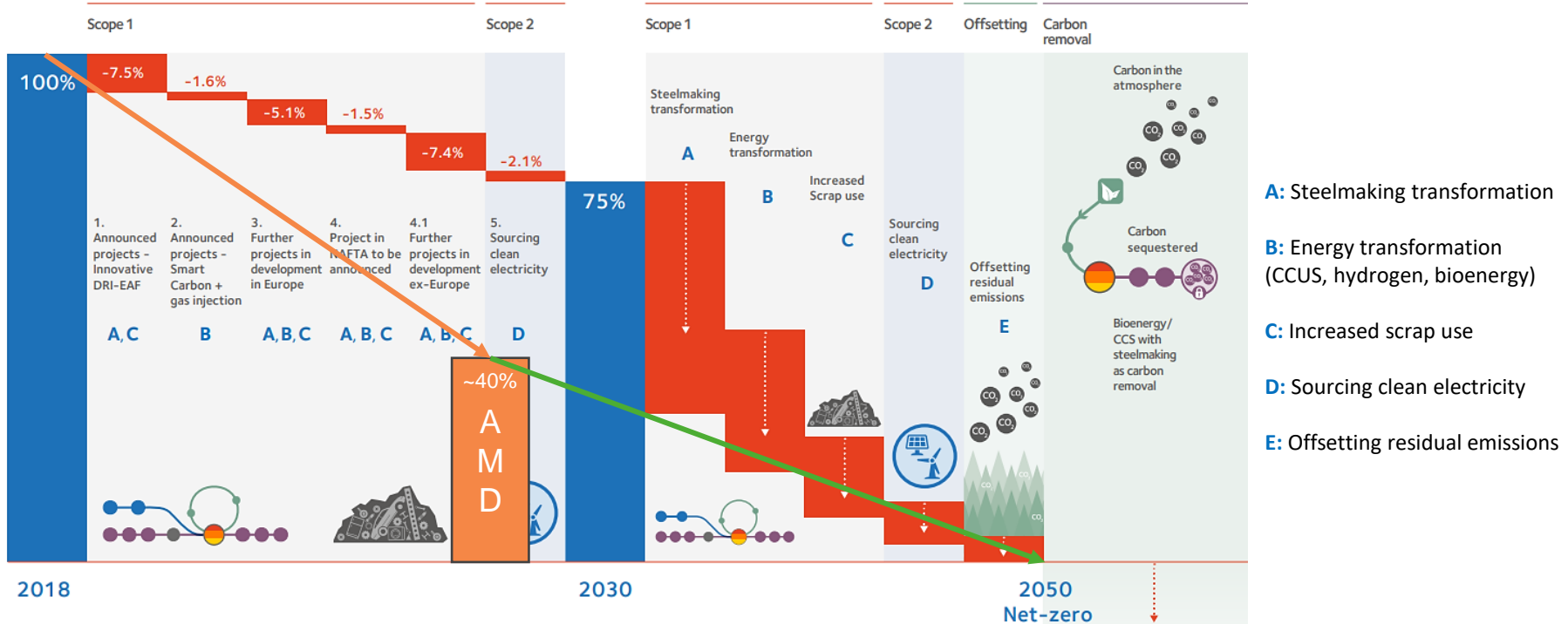


- A:** Steelmaking transformation
- B:** Energy transformation (CCUS, hydrogen, bioenergy)
- C:** Increased scrap use
- D:** Sourcing clean electricity
- E:** Offsetting residual emissions

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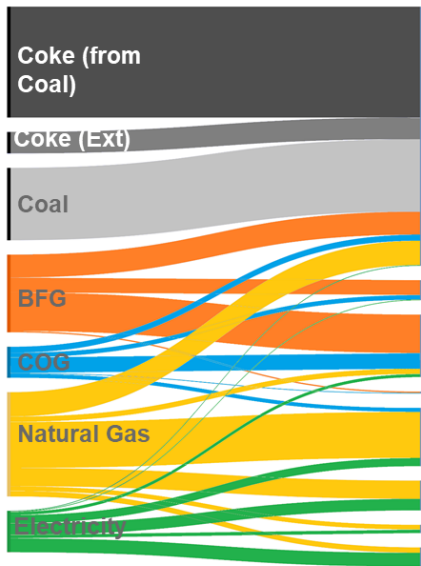
Primary Footprint Transformation

Net Zero Transformation

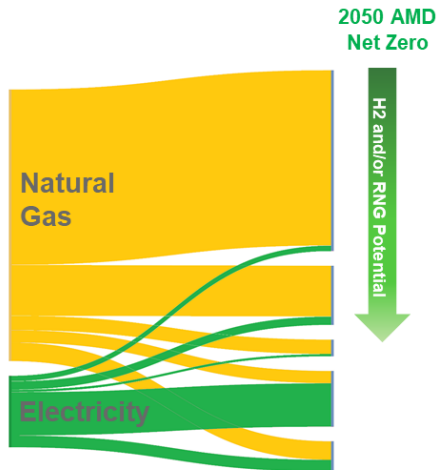
# ArcelorMittal Dofasco's Decarbonization Project Impact on Energy

## AMD's Energy Transformation

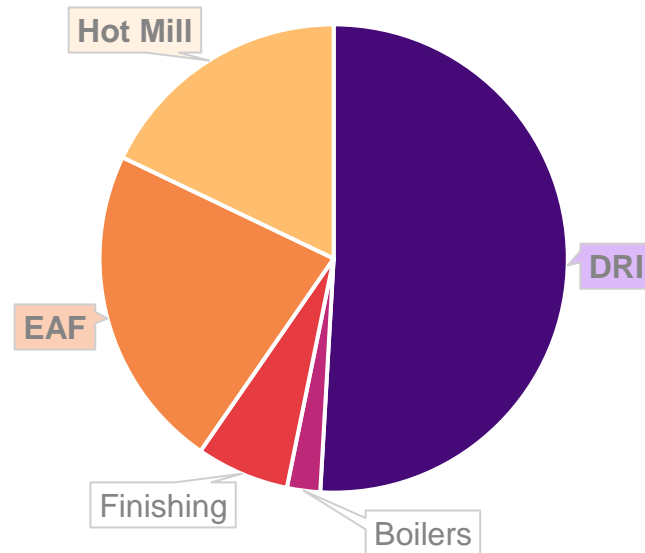
Current Footprint



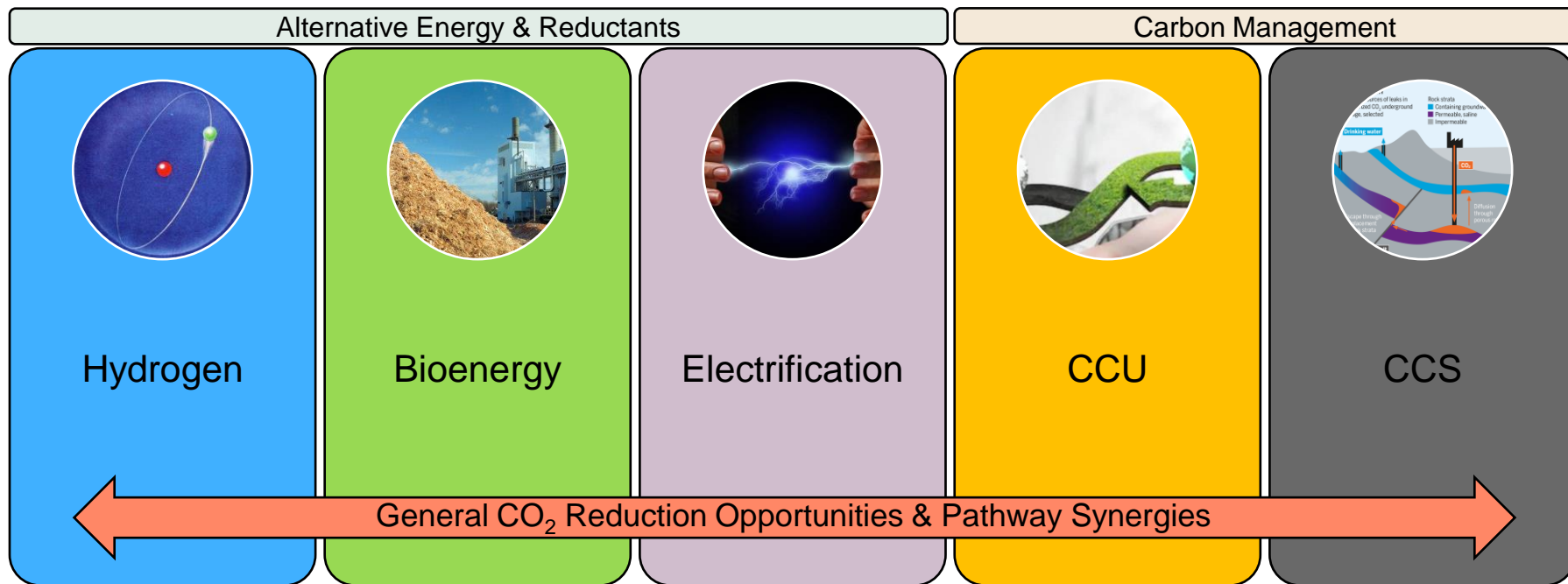
Future Footprint



## GHG Emissions By Process (Future Footprint)



# Net Zero Strategy Pillars – Complementary Pathways

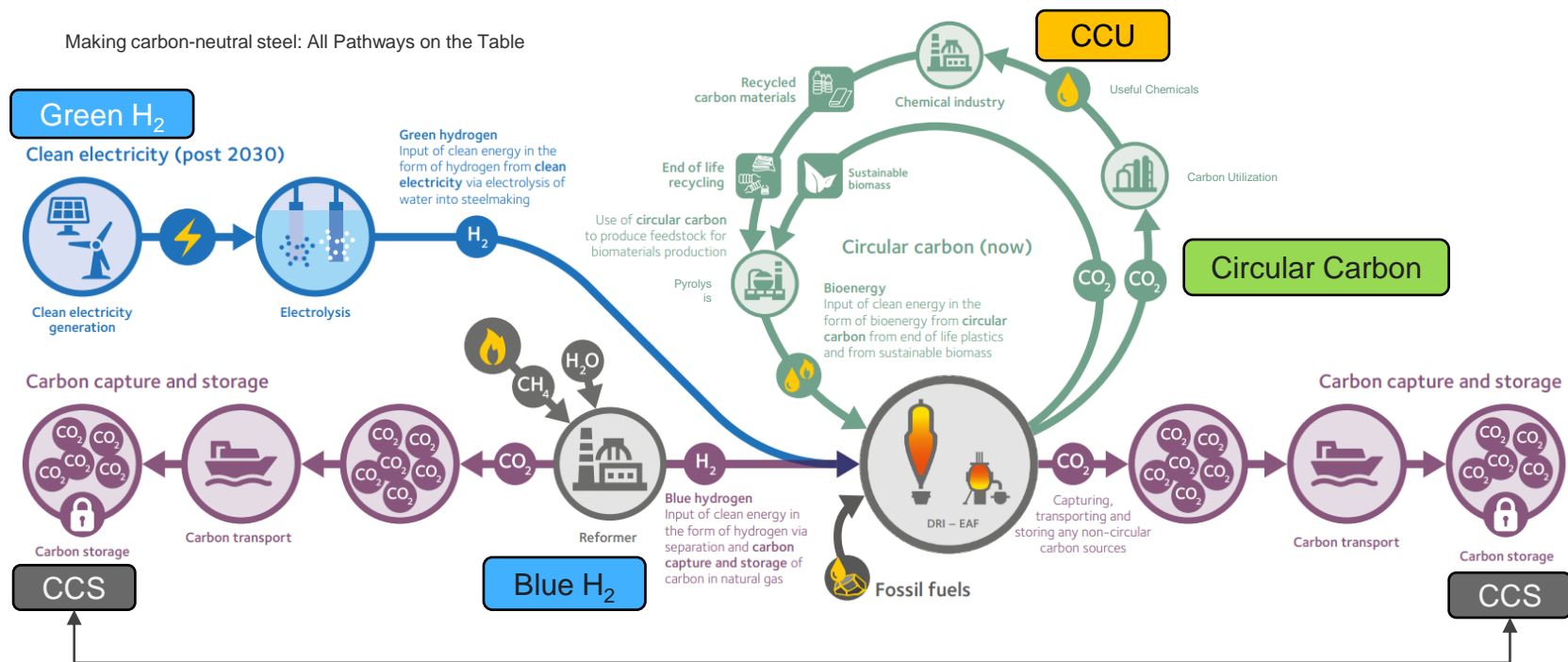


There are several pathways to decarbonize with varying scopes and timelines

# The Future of Ironmaking & Steelmaking

## Many Routes to Achieve Steel Decarbonization

Making carbon-neutral steel: All Pathways on the Table





# XCarb<sup>TM</sup>

## Towards carbon neutral steel

“At ArcelorMittal, our goal is to help build a better world with smarter steels. Steel made using innovative processes which use less energy, emit significantly less carbon and reduce costs. Steels that are cleaner, stronger and reusable.”

**Aditya Mittal, CEO ArcelorMittal**





Smarter steels  
for people  
and planet