

Alan Knight, ArcelorMittal Carbon Capture and Storage July 2020

ArcelorMittal's overall commitments and targets on Carbon

- Commitment to Paris Agreement
- First Global Climate Action Report published in May 2019
- 'Climate Action in Europe' Report published in June 2020;
 - 30% CO2 reduction target by 2030, and carbon neutrality by 2050
 - Breakthrough carbon-neutral routes for steelmaking
 - Smart Carbon
 - ✓ DRI-based
 - Asking for new policy framework(s) to ensure the transition competitive
 - ✓ "the case for a Carbon Border Adjustment" April 2020







We see three clean energy vectors, creating two steel making pathways to transition primary steel makings to net zero







The purposes of 3D includes :

- Separate the energy molecules from our blast furnace gas to avoid further combustion
- Carbon Monoxide and Hydrogen to be used in ethanol fermentation
- Pure CO₂ that can also be re-used (like methanol, polyols, formic acid...) provided that there is enough renewable energy
- Industrial waste heat and excess renewable energy can be use.
- Develop a technology that is able to provide large quantities of storable CO₂
- Develop a technology that can be used in other industries.



The 3D pilot : 10 M€

Objectives of study :

- Net separation of CO_2 (0.5 t/h) from $CO/H_2/N_2$; with capture rate >99.9%
- Study the contaminants in CO₂,
- Polish for storage
- Check and **lower the energy needs** for amine regeneration
- Study corrosion behavior of the equipment materials





 Capacity (tCO2 capture/h)
 0.5

 Raw gas pressure (barg)
 0.082 up to 3

 (after compression)
 (after compression)

 Temperature (*C)
 30 / 40

 Composition (% vol. dry)
 23.4

 CO2
 25.0

 H2
 4.4

 N2
 47.2

 Total
 100.0

(Regeneration up to 6 bars)

3D will also do the pre-FEED study of the industrial demonstrator (app 100-150 t/h), based on the available process waste heat.



