

Dunkirk CO2 Roadmap to Carbon Neutrality

“A French Norwegian Approach to Decarbonisation of the Industry”

10 march 2021

Dominique PAIR – ArcelorMittal Dunkerque



DUNKERQUE
L'ÉNERGIE CRÉATIVE

TRANSFORMATION D'UN ÉCOSYSTÈME INDUSTRIALO-PORTUAIRE



Our carbon emissions reduction roadmap: 33% in 2030 and carbon neutral in 2050

- **Circular economy:**

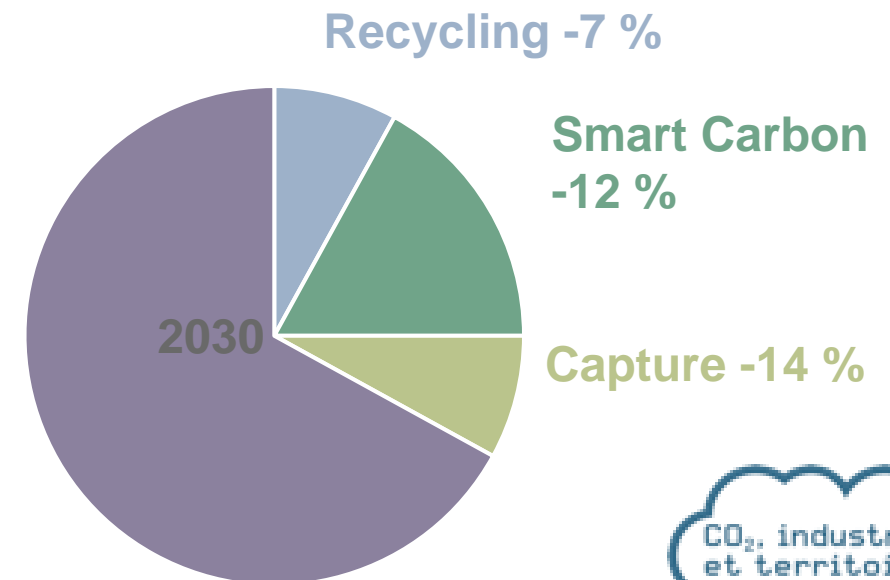
- circular carbon (biomass & waste) and circular iron/aluminium (scraps)
- Gas recovery and transformation to heat and electricity
- Heat superhighway

- **Smart Carbon:** new technologies for Blast Furnace and Aluminium plant

- **Carbon Capture:**

- > CO2 Hub, with pipe, rail and ship transport,
- > CCS to export to Norway perhaps...
- > CCU (from CO2 to fuel.....)

- **Hydrogen** for DRI plant and for CCU (when the price of hydrogen will be accessible)



Dunkerque : hub français du CO₂



Sites industriels de la zone industriale-portuaire

- edf
- COHILOG
- BEFESA
- HSWT
- BASF
- EROMET
- ALVANCE
- SNF
- EGIOM
- ecocem
- IMERYS
- AccelorMistal
- DILLINGER
- eni
- versalis
- Ferroglobe
- ENGIE
- Dunkerque LNG

Enseignement supérieur & recherche

- UCLouvain
- ulco
- EiL

Dunkerque 3^{ème} port de France

- Flux de chaleur fatale
- Flux de CO₂ de la zone d'émission vers la zone d'utilisation
- Flux de CO₂ non utilisé allant vers la zone d'export.
- Flux H₂
- Flux de d'électricité décarbonée
- Transport par pipeline
- Transport par train
- Transport par bateau

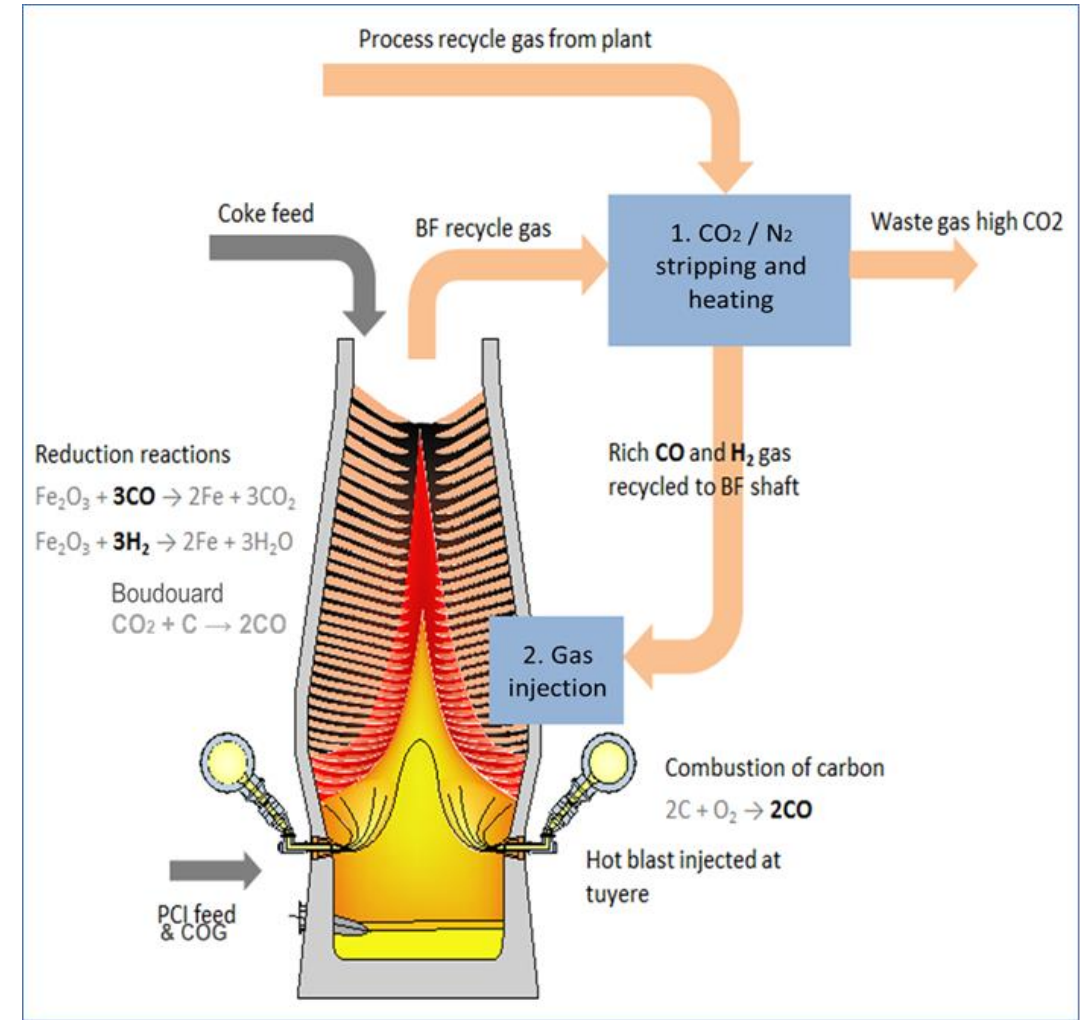
CO₂, industries
et territoires

Import

Export

Focus on ArcelorMittal Dunkerque / 2030 / Smart carbon : Igar Hybrid BF project

- **Principle** : reinject reducing gas, from iron and steel gases, into the blast furnace, replacing fossil fuels
- **Objective** : **-17 %** CO2 ArcelorMittal DK émissions in 2030
- **It's a first of a kind** (ETS IF fund demand)
- **Timing** : 2021 – 2025 and 2026 – 2030



Focus on ArcelorMittal Dunkerque / 2030 / CO2 capture

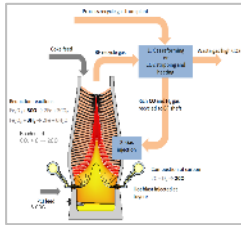
- **Principle : capture, purify and liquefy CO₂, for reuse or storage**
- **Objective : -8 % CO2 ArcelorMittal DK émissions in 2030**
- **Means :**
 - European project of 19 M€, funded by l'Europe à 75 % (Horizon 2020) with a consortium of 11 partners : Axens, IFP-EN, Total, ArcelorMittal...
 - Demonstration of the DMX process with an industrial demonstrator of 0.5 tons of CO2 per hour
 - Objective: to design an industrial installation of 1 million tons of CO₂ per year to supply a CCS hub in Dunkirk
- **Timing :**
 - 2021 – 2023 for industrial demonstrator
 - 2026 – 2030 for industrial installation



Dunkirk CO2 Roadmap



Circular Economy



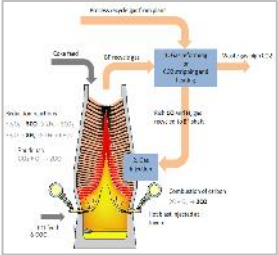
Smart Carbon



CO2 Capture

2020 – 2030

**2030 :
-33 %
CO₂**



Smart Carbon + hydrogen

2030 – 2050

DRI / Hydrogen

Studies: DRI + electric furnace



**2050 :
Carbon
Neutrality**

