### TATA STEEL



## **Project Everest**

Enhancing Value by Emissions Re-use and Emissions STorage

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Together we make the difference

#### **Climate Change: Not exactly a novelty**



#### **Climate Change: Not always considered a problem**

mounted the cosmic processes themselves. It is largely the courageous, enterprising, and ingenious American whose brains are changing the world. Yet even the dull foreigner, who burrows in the earth by the faint gleam of his miner's lamp, not only supports his family and helps to feed the consuming furnaces of modern industry, but by his toil in the dirt and darkness adds to the carbon dioxide in the earth's atmosphere so that men in generations to come shall enjoy milder breezes and live under sunnier skies.

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# Climate Change: Models predict major areas of earth become uninhabitable



1. Source: The New York Times, The great climate migration, Abrahm Lustgarten, accessed 10-08-2020

### Wet-Bulb temperature development leading to mass migration

*Wet bulb temperature* is defined as the temperature that an air parcel would attain if cooled at constant pressure by evaporating water within it until saturation.



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### EU increases urgency to act



#### **IJmuiden Decarbonisation Plans**

- Current emission levels of IJmuiden are 12 Mt/a
- 40% by 2030
- 100% by 2050
- Decarbonisation in a phased approach









#### **Everest**



Everest: Enhancing Value by Emissions Re-use and Emissions Storage

#### Groen staal en blauwe waterstof door CO2 afvang



#### **Everest Carbon Capture & Everest Hydrogen**





### Petra Nova:

W.A. Parish Post-Combustion CO<sub>2</sub> capture plant

- 1.4 Mt/a
- Processes flue gas from coal fired power plant
- CO<sub>2</sub> used for Enhanced Oil Recovery

### **Everest Carbon Capture section**



#### **Everest Hydrogen section**



#### Description of key technical components

#### Pre-treatment and compression of blast furnace gas

- Additional gas cleaning
- Syngas compressor

#### **Produce Hydrogen**

- High temperature water-gas shift reactor
- N<sub>2</sub>/H<sub>2</sub> separation through pressure swing adsorption
- Medium pressure steam boilers for water gas shift reaction

#### Deliver H<sub>2</sub> to Gasunie hydrogen backbone

- Hydrogen compression
- Dedicated pipeline to Gasunie grid (~9 km)

#### Capture CO<sub>2</sub>

- High pressure amine wash absorber tower
- Lean/rich amine plate & frame heat exchangers
- Regeneration stripper

#### **Deliver CO<sub>2</sub> to Athos network**

- Axial compressor with interstage cooling and knockout drums
- Molecular sieves
- Dedicated pipeline to Athos

### **Plot plan**



#### **Cooling water lines – Construction**

Not as easy as it looks on Powerpoint

