

# CCS for Industry



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## EUROPE'S ZERO EMISSIONS PLATFORM (ZEP)

- ZEP serves as **advisor to the European Commission on the research, demonstration and deployment of CCS and CCU**
- ZEP is explicitly *not* a sector/industry association, but a technology platform. A coalition of energy intensive industry, oil and gas companies, equipment suppliers, scientists, academics, environmental NGOs keeping CCS on the EU climate action agenda.
- The objectives of ZEP are:
  - Enabling CCS and where relevant, CCU to be key technologies for combating climate change for all CO<sub>2</sub> emitting sectors, including electricity, energy intensive industry and producers of hydrogen and biofuels.
  - Putting in place a framework making CCS investible by 2020.
  - Accelerating next generation RD&D of CCUS technology and the widespread deployment post 2020.
- Supported by the European Union's Horizon 2020 (Grant no. 826051)



# CLOCK IS TICKING

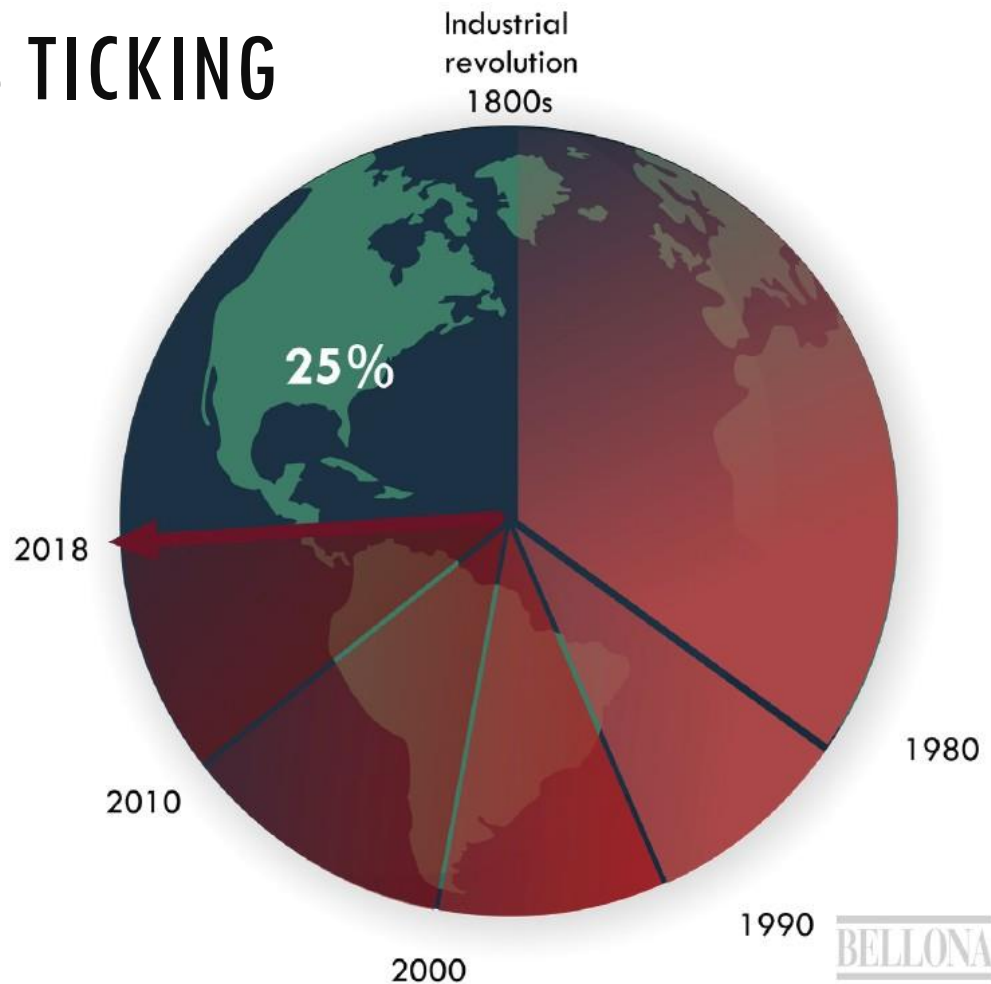
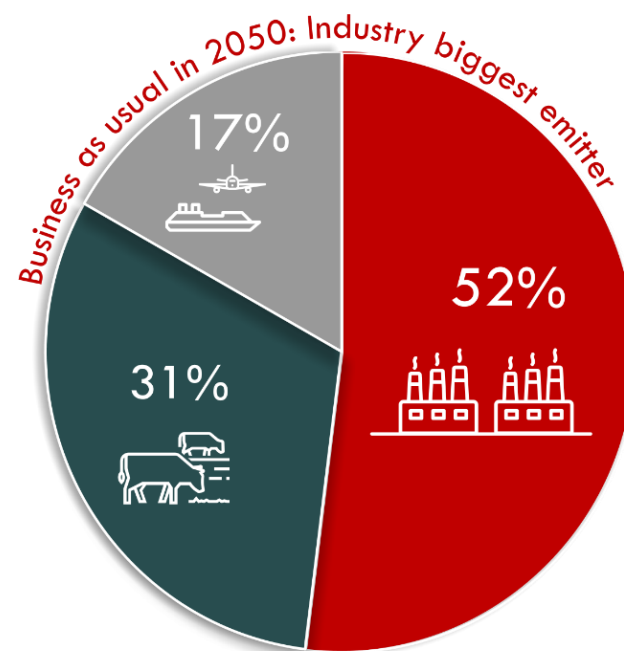
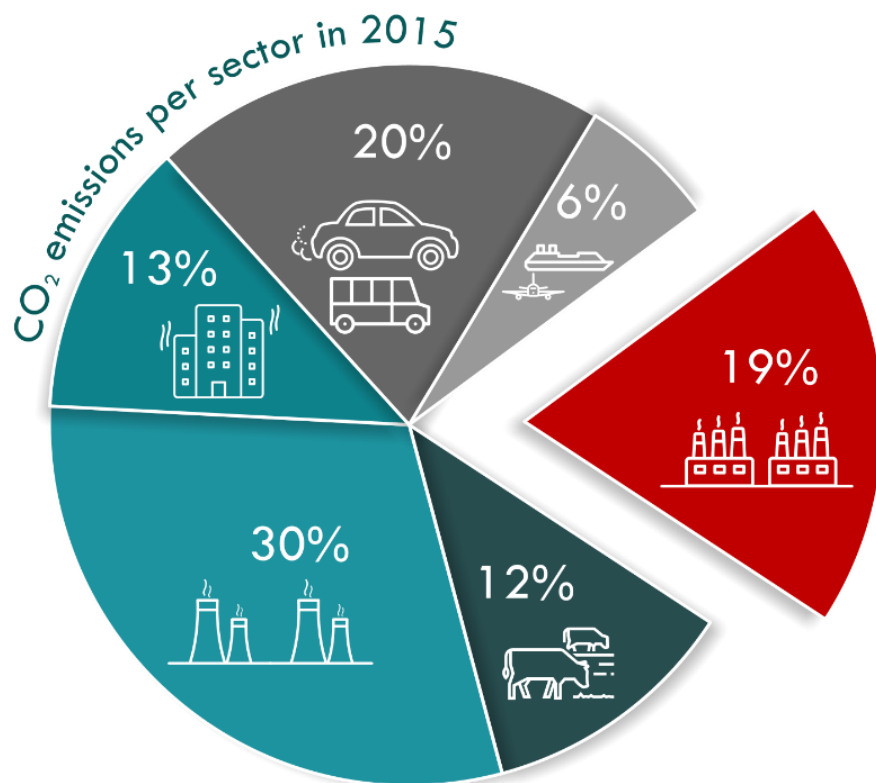


Figure 1: Over the past few decades, the pace of emitting greenhouse gases has hastened substantially. We now only have about a quarter of our carbon budget left before we cross the 2°C mark.

## INDUSTRIAL EMISSIONS SHARE

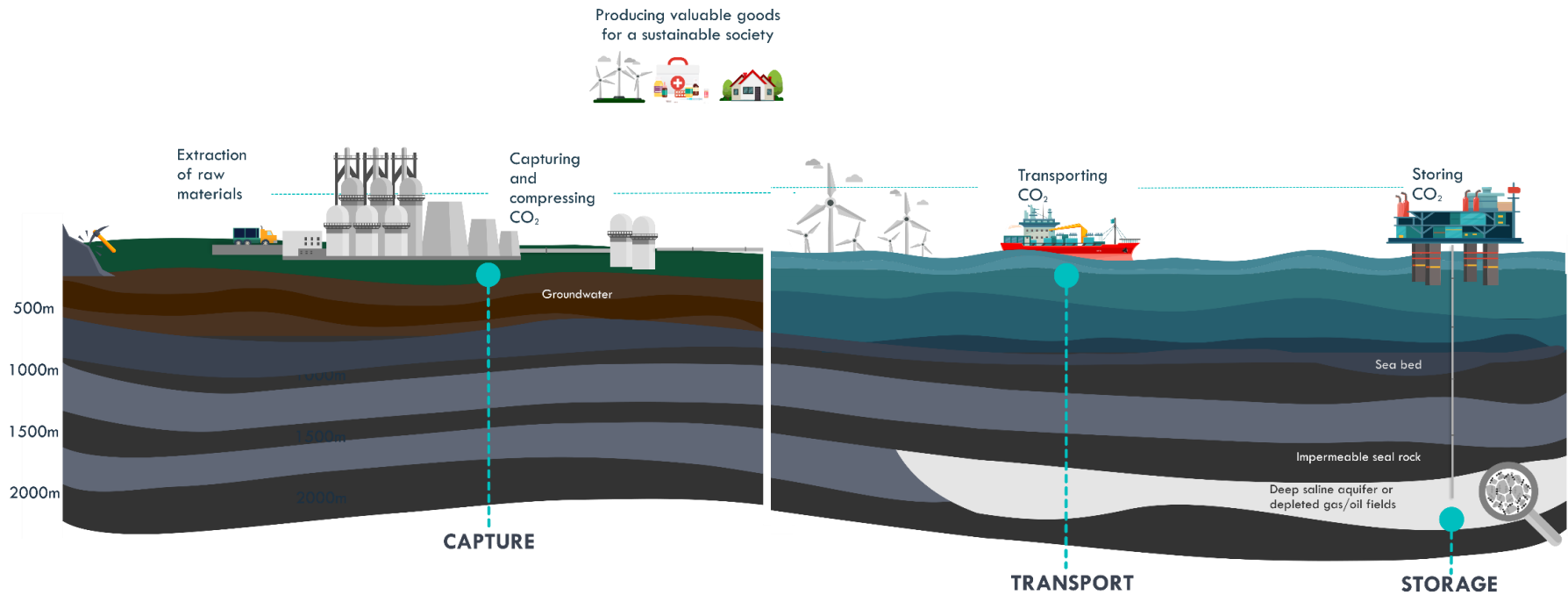




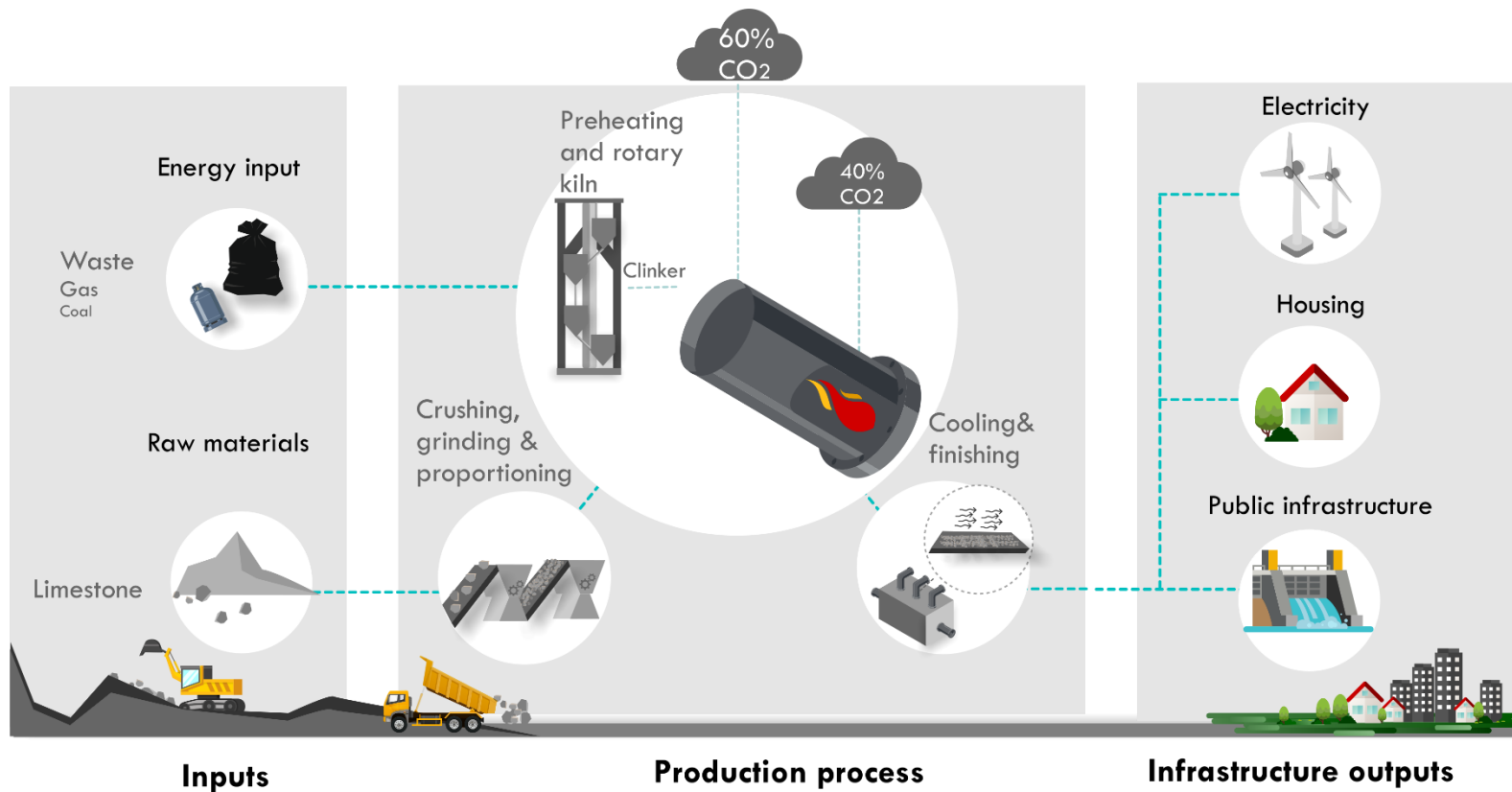




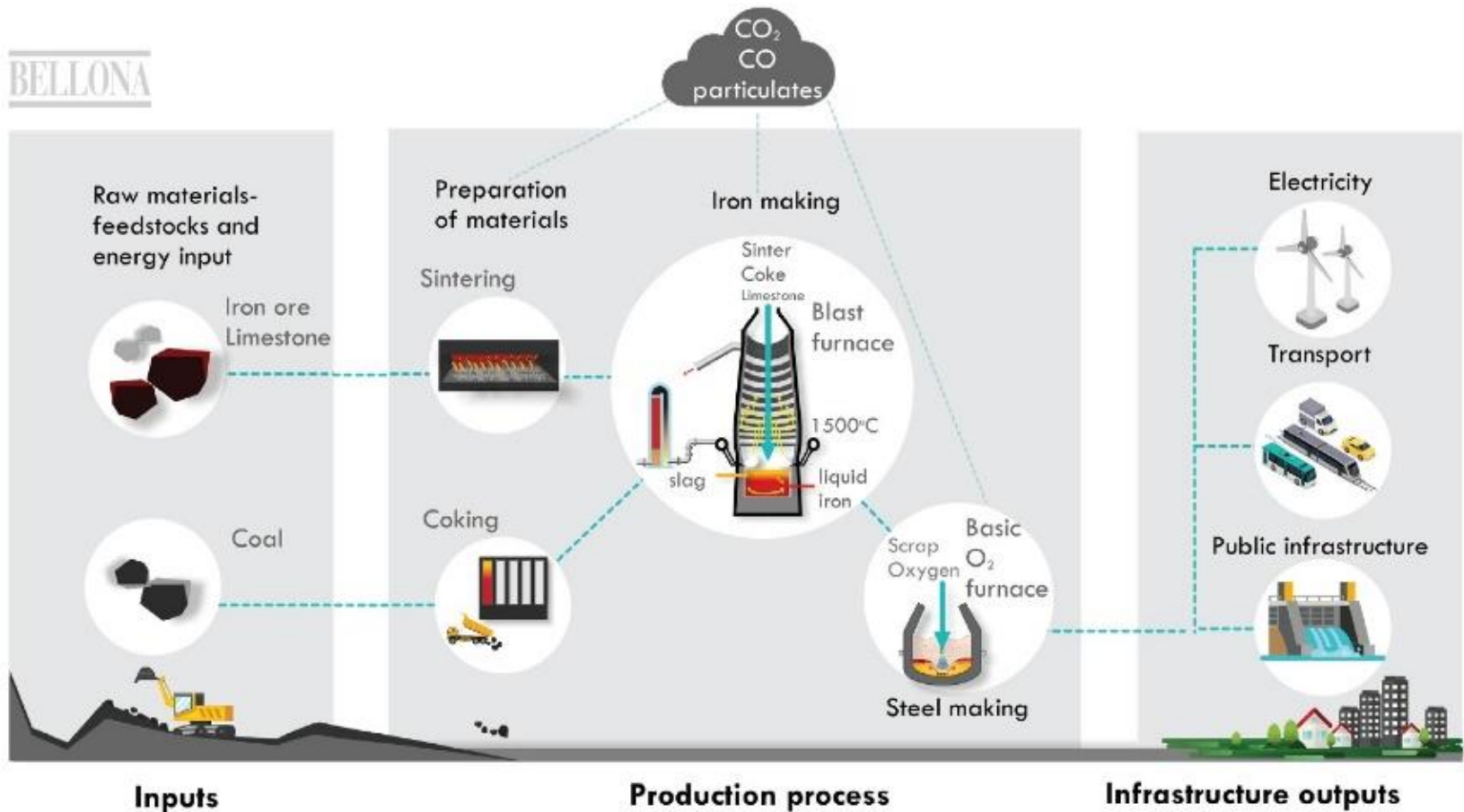
# INDUSTRIAL CARBON CAPTURE & STORAGE (CCS)



# WHERE CEMENT EMITS

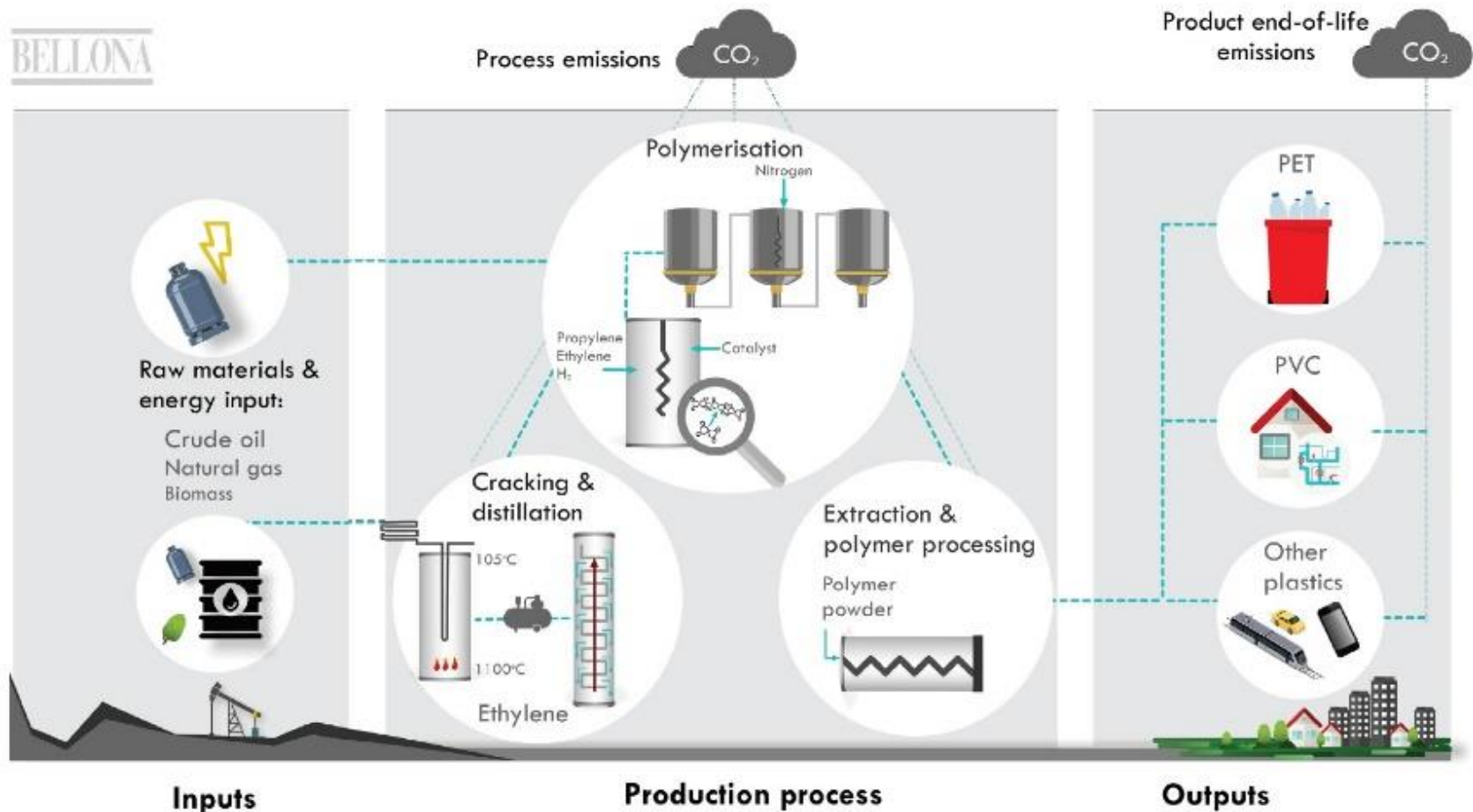


## WHERE STEEL EMITS

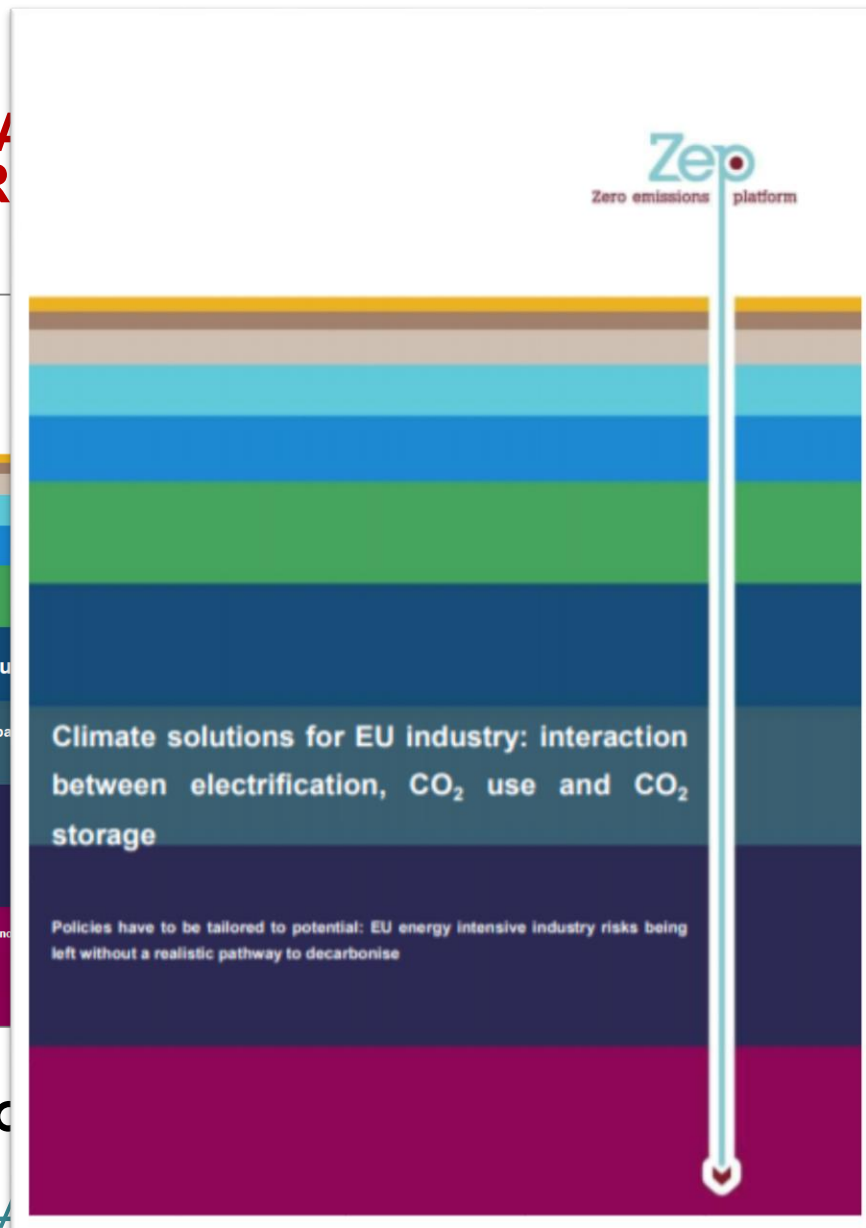




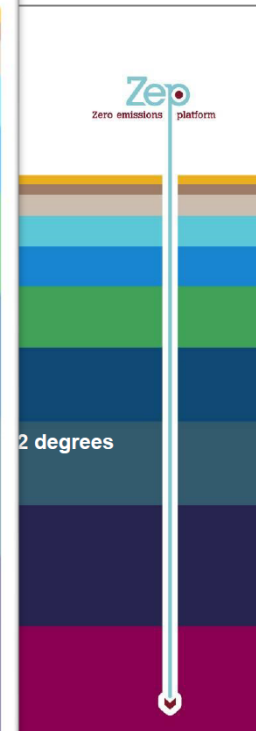
# WHERE CHEMICALS EMIT



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## US FOR



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## ROLE OF CCS IN A BELOW 2 DEGREES SCENARIO

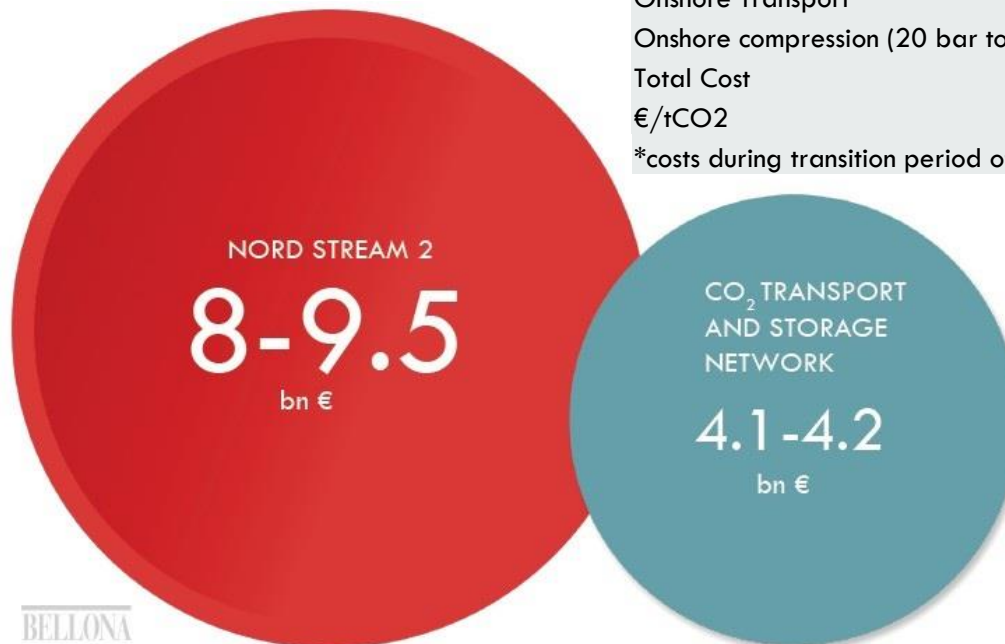
- Paris Agreement net-zero – IPCC 1.5 – EU Long-Term Strategy → CCS essential
- Without CCS, Europe's industrial regions face ever increasing risk as climate pressures mount, threatening the eventual exodus of process industries and millions of associated jobs – perhaps beautifying national emission inventories, but with no climate benefit
  - Germany; over 50 million tonnes of CO<sub>2</sub> would remain unabated without CCUS
  - Risking about 3.5 million steel-related jobs
  - Several hundred thousand more in the chemicals and cement sectors.
- CCS *enables* a 'just transition'
- Establishing a **shared CO<sub>2</sub> infrastructure** that links industrial regions with CO<sub>2</sub> storage will protect jobs, attract investment and create new economic opportunities for Europe





# SHARING MEANS SAVING MONEY

Netherlands  
Transport & Storage



## Abatement Scenarios

	Low	Mid	Mid Newbuilt	High
CO2 abated (Mt)	476	654	654	964
Mothballing*	133	216	120	474
Injection	1 499	2 740	4 154	3 382
Offshore Transport	740	764	764	1 404
Onshore Transport	366	366	366	376
Onshore compression (20 bar to HP)	1 490	2 072	2 072	3 072
Total Cost	4 229	6 158	7 477	8 707
€/tCO2	8,9	9,4	11	9,0

\*costs during transition period of infrastructure before being re-used for CO2 transport

Germany Transport  
& Storage

## A CO2 NETWORK AS A PUBLIC GOOD

*In the early 19<sup>th</sup> century, London planned to expand its sewage system, yet faced widespread public opposition. Particularly wealthier people, living uphill, did not see why a general sewage system was needed and hence did not want to pay to improve the property of private individuals 'downhill'. In fact, **sewage was not seen as a public good**, and so the government initially considered it improper to use public money. **It took several cholera epidemics, thousands of deaths, and the 'Great Stink' of 1858 for London to finally modernize and upgrade its sewage system**, at last stopping the unchecked dumping of human waste into the city and the river Thames.*



***“[The principle] was of diverting the cause of the mischief to a locality where it can do no mischief.”***

Sir Joseph Bazalgette, Civil Engineer

# INDUSTRY IN A CHANGING CLIMATE

AN  
INDUSTRY'S  
GUIDE TO  
CLIMATE  
ACTION

2

3

4

**WE HAVE  
A PROBLEM**

**A DIVERSITY  
OF OPTIONS,  
A LACK OF  
SOLUTIONS**

**THE DAWN  
OF A NEW  
INDUSTRY**

**A FAREWELL  
TO INACTION**

# Thank you!

# Dziękuję!

**BELLONA**



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