Carbon Management and negative CO_2 emissions technologies towards a low carbon future

THE ROLE OF NEGATIVE EMISSION TECHNOLOGIES IN DECARBONIZING THE ENERGY-INTENSIVE INDUSTRIAL SECTOR

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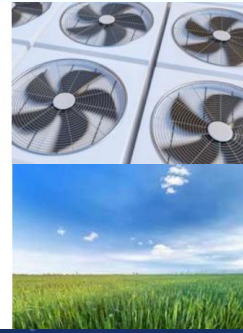
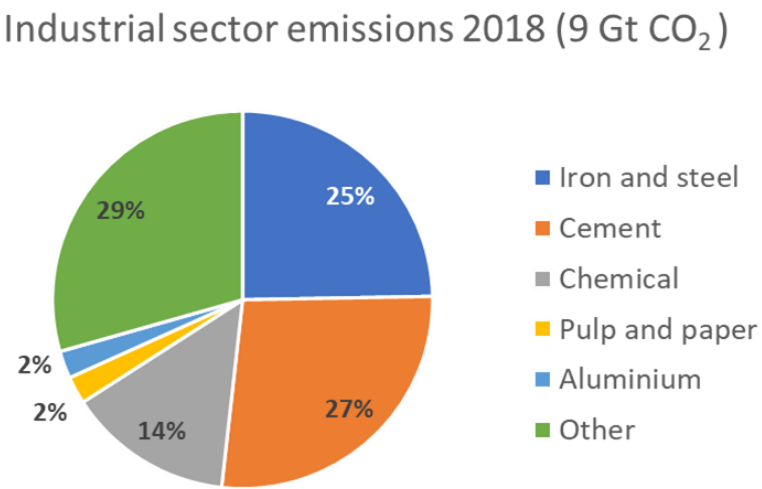
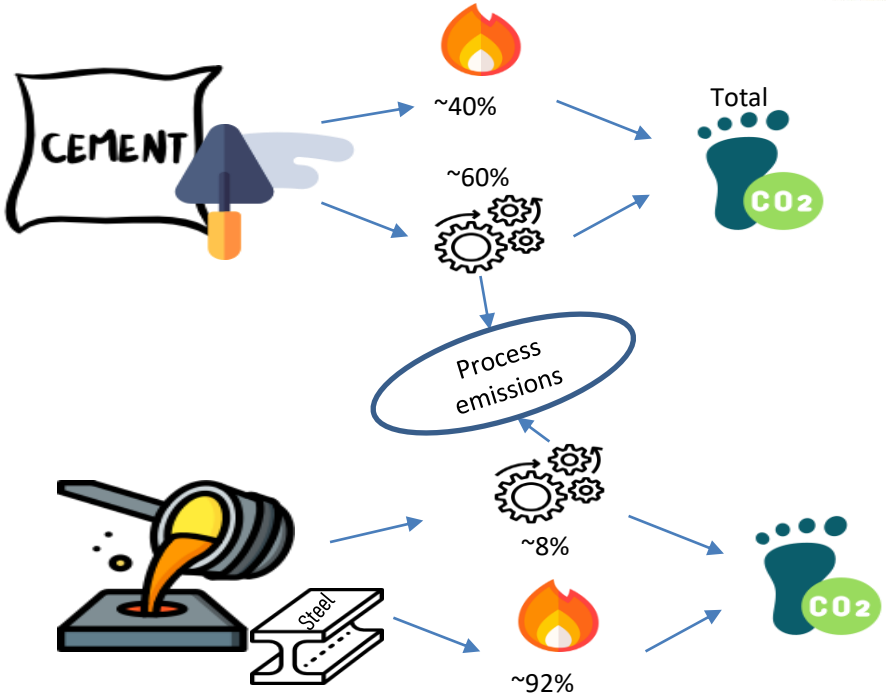
17-10-22



Energy Intensive Industries (EII) are responsible for a large share of global CO_2 emissions

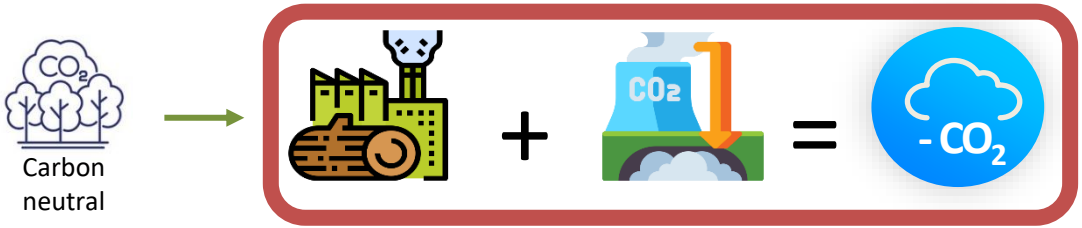


Source : IEA (2020), Tracking Industry 2020, IEA, Paris
https://www.iea.org/reports/tracking-industry-2020



- EII are responsible for around 70% of industrial direct emissions
- Process emissions will still happen even when replacing all fossil fuels by renewable energies

NEGATIVE EMISSION TECHNOLOGIES IN THE INDUSTRIAL SECTOR



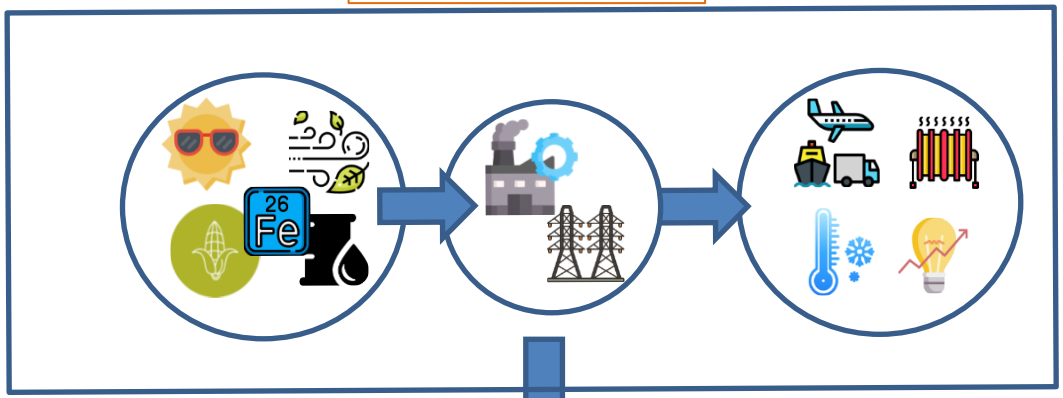
Negative Emission Technologies (NETs)

Steel	Cement	Paper	Petrochemicals
-0,7 t CO_2/t steel	0.27 t CO_2/t cement	-1,8 t CO_2/t pulp	-0,1 t CO_2/t crude oil

NETs deployment in the industry (according to the littérature)

TIMES Integrated Assessment Model (TIAM-FR)

TIAM-FR



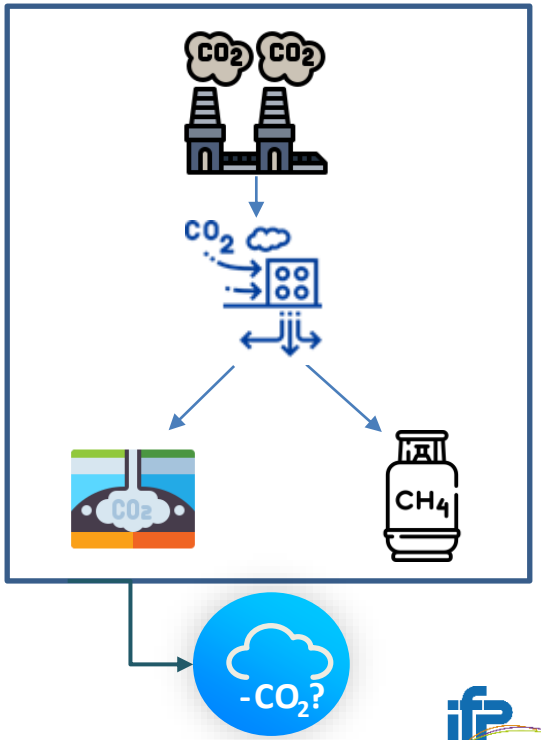
$$NPV = \sum_{r}^{R} \sum_{y} (1 + d_{r,y})^{y} \times Cost_{r,y}$$

Total cost of the system

Emissions

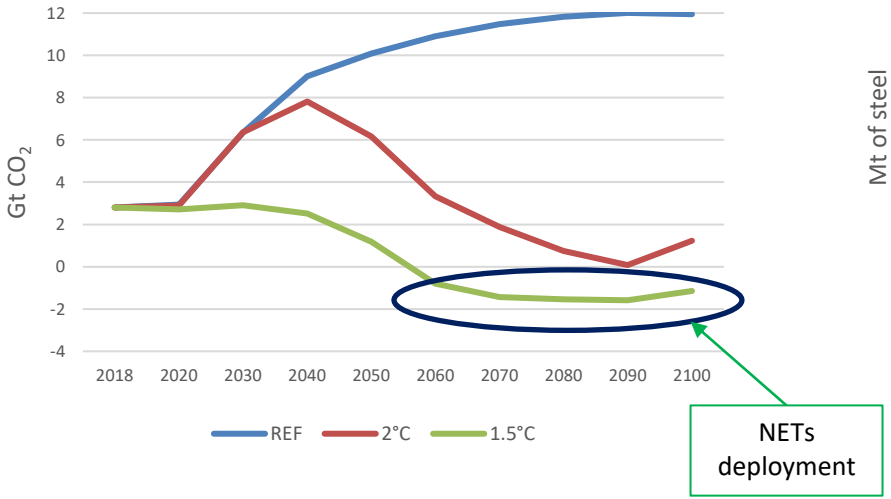
Structure of the energy system

Detail representation of emissions at each step of consumption and production

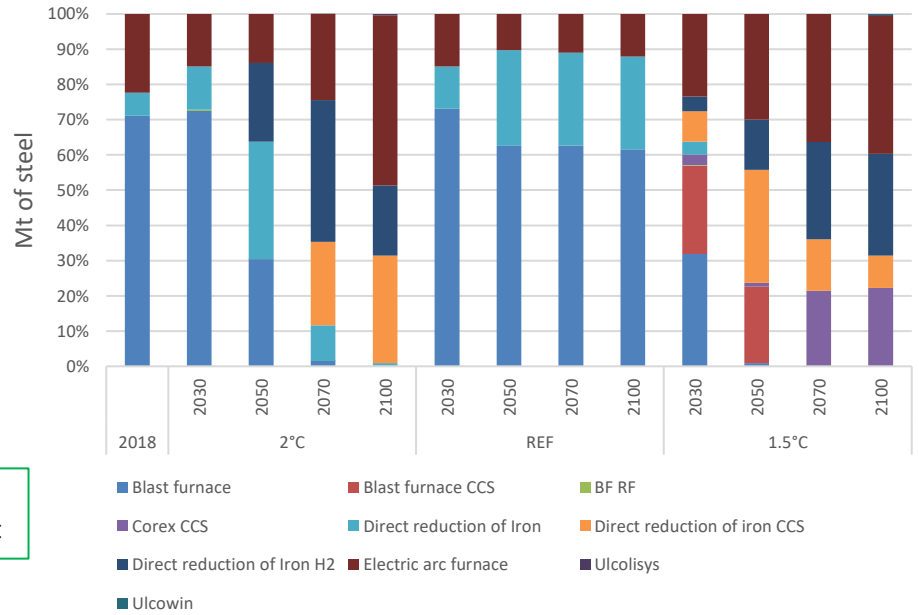


SOME RESULTS FOR THE STEEL INDUSTRY (SI)

Net CO_2 emissions in the SI by scenario



Technological deployment in the SI by scenario



- The SI has to become net negative emitter in order to contribute to global climate targets
- The Corex process appears to be a key technology for the deployment of negative emissions in the SI

THANK YOU FOR YOUR ATTENTION / DISCUSSION

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