

Financing Innovative Clean Tech Conference  
September 25, 2020

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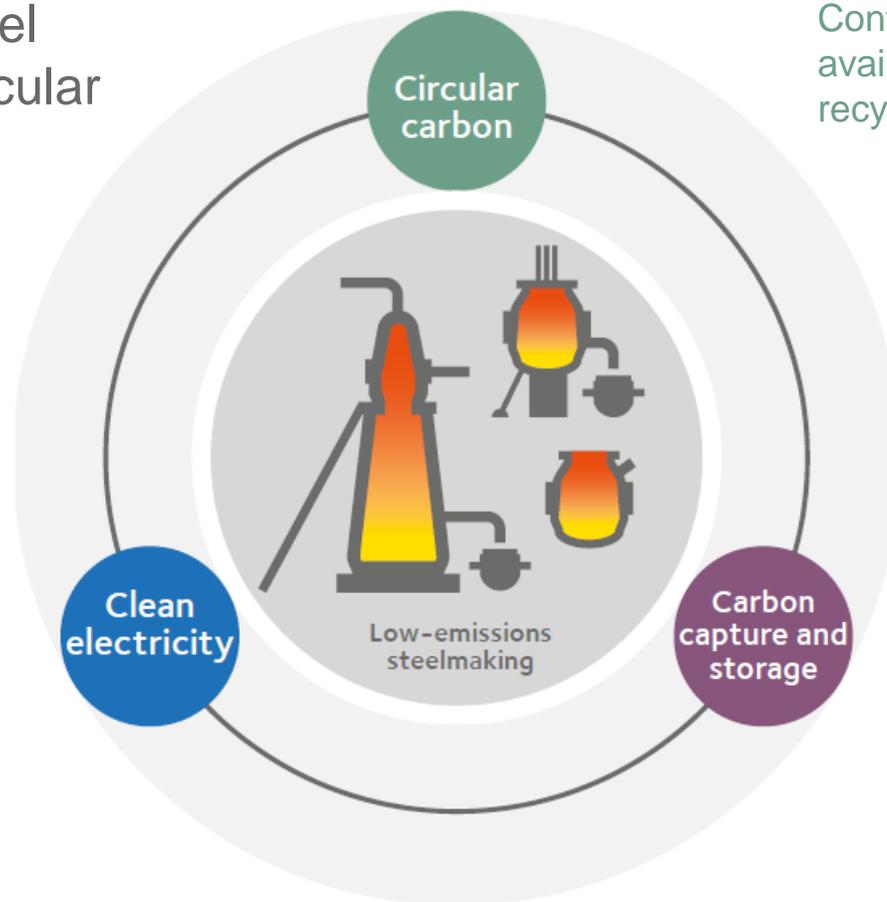


Steelmanol/Torero Project  
Carl De Maré, Vice-President Technology Strategy

# ArcelorMittal Europe Plan : -30% in 2030 & Carbon Neutral in 2050

We see three clean energy vectors to transition steel industry to net zero: circular carbon, CCS and clean electricity

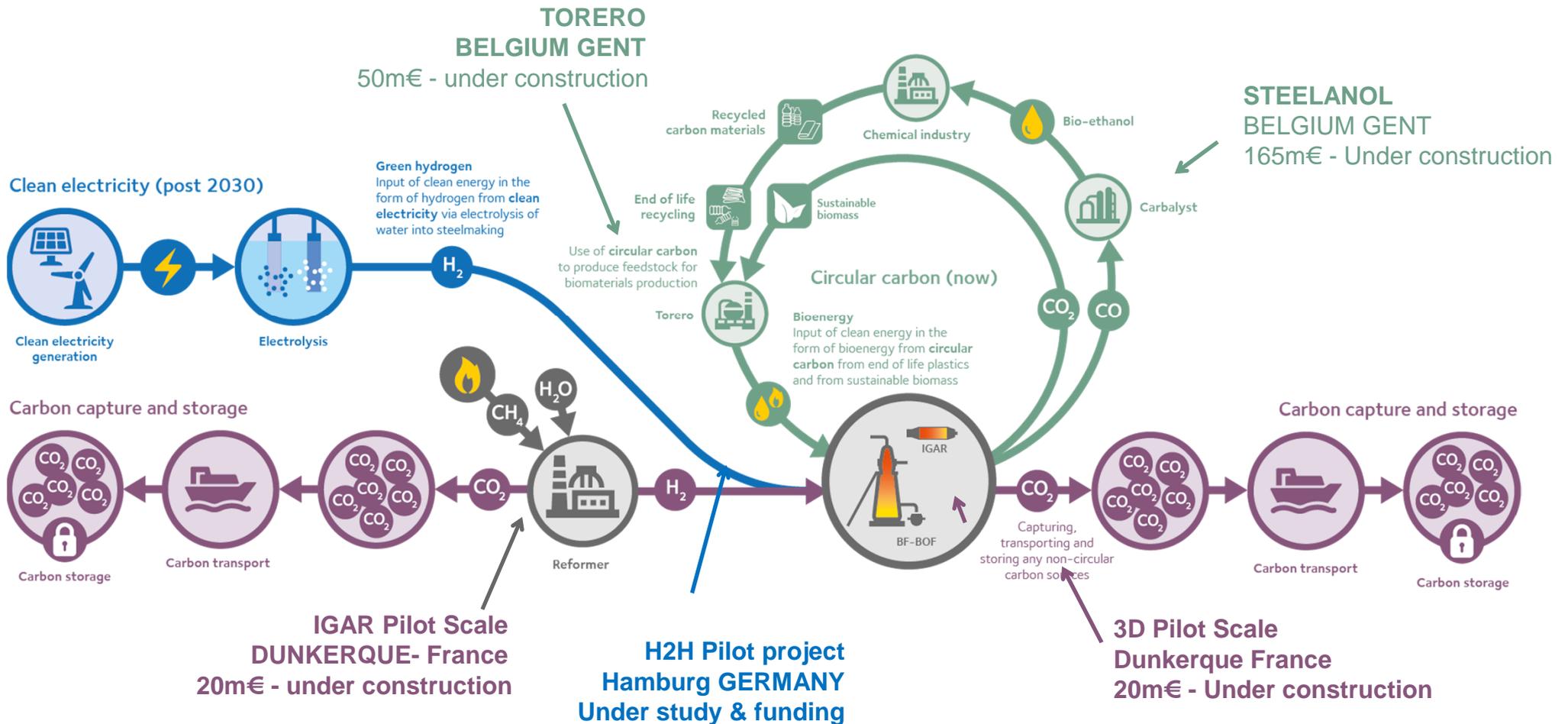
Recycle waste back into high valuable Chemicals through steelmaking  
Contingent on biomass & waste availability and technology for chemical recycling



Contingent on development of CCS infrastructure

Contingent on low electricity and green Hydrogen costs

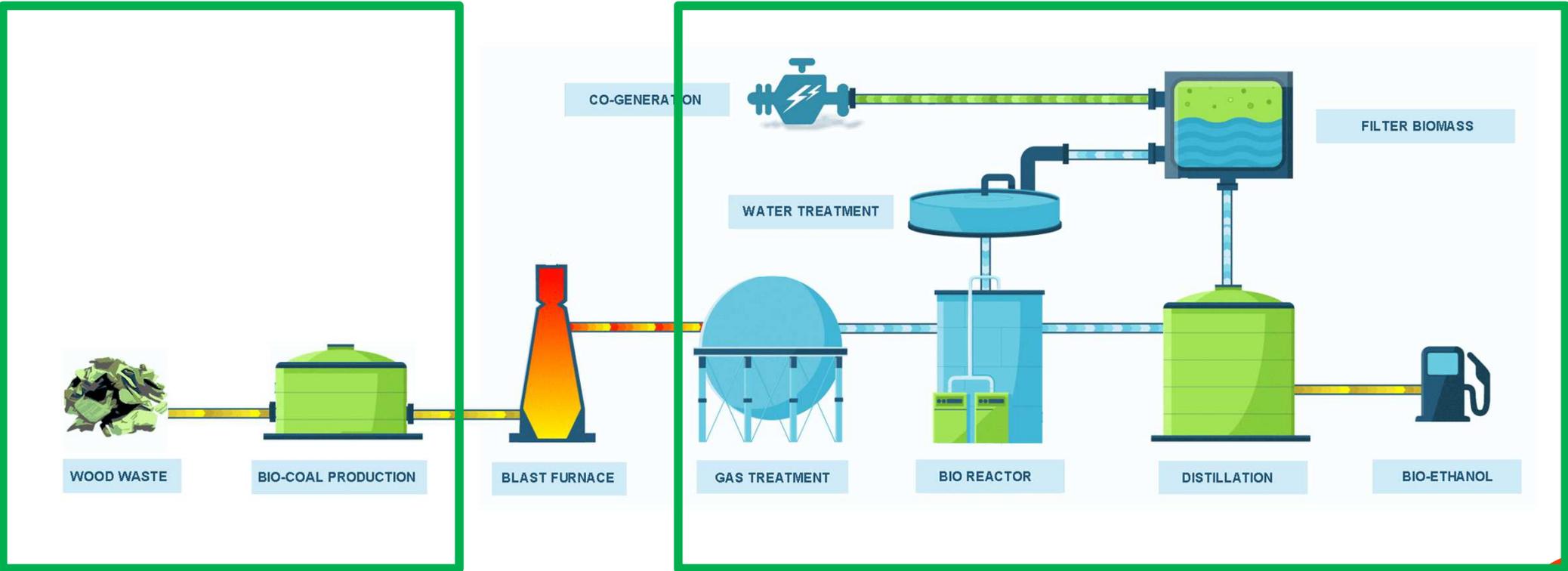
# Making carbon-neutral steel: Smart Carbon route Development with 5 large scale demonstration projects

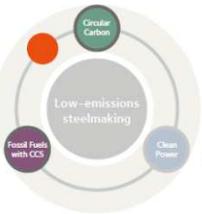


# Two Circular Carbon Demonstration projects named “Carbalyst” under construction at ArcelorMittal Gent, Belgium

## TORERO

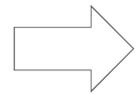
## STEELANOL



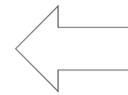
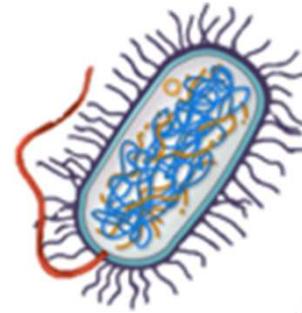


# Carbalyst : Industrial Bio-Technology to convert waste gas into high value molecules (chemicals, proteins, ...)

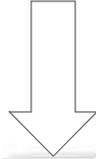
**Carbon Waste Gas**  
 $\text{CO (+H}_2\text{+CO}_2\text{)}$



**Microbe**



**Water**  
 $\text{H}_2\text{O}$



**Ethanol**  
 $\text{C}_2\text{H}_5\text{OH}$

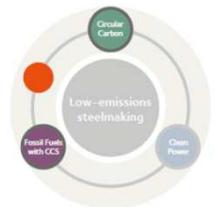


# Industrial Scalable Bio-Technology enables to convert CO and H2 into valuable chemicals with high energy efficiency



This project is co-funded by the European Union



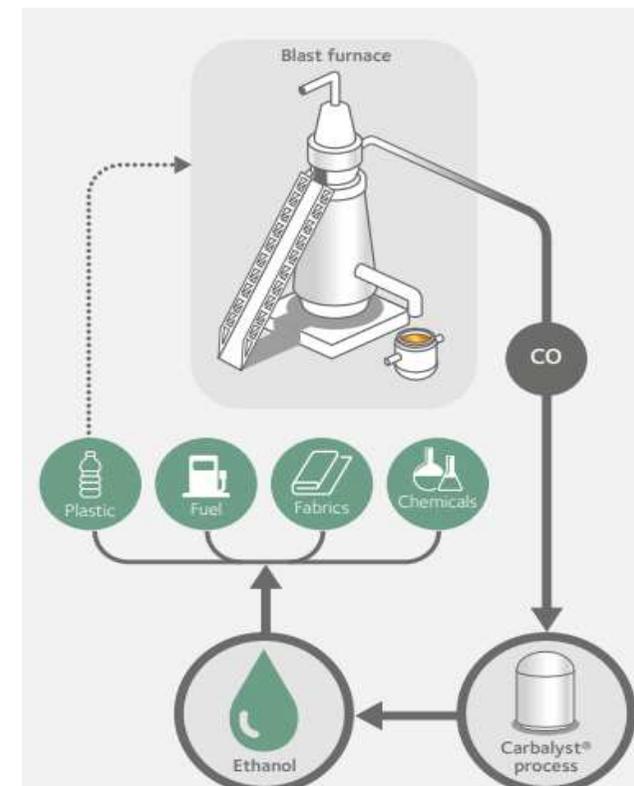
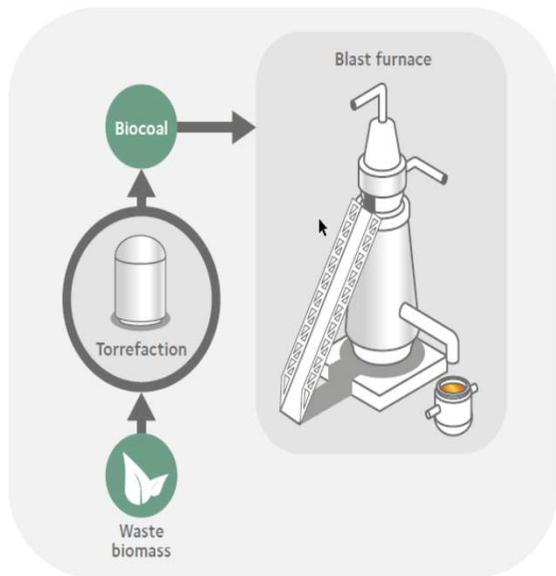


# Circular Carbon – Combination Torero & Steelanol is resulting in the largest cellulosic based ethanol plant world wide



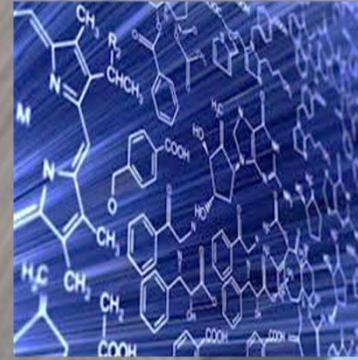
## Key Figures

- 120.000 ton waste wood into “bio-coal”
- 80 million liter of bio-ethanol production
- 350.000 ton/yr CO<sub>2</sub> reduction
- 215m€ total investment



This project is co-funded by the European Union





**Thanks for your attention**

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