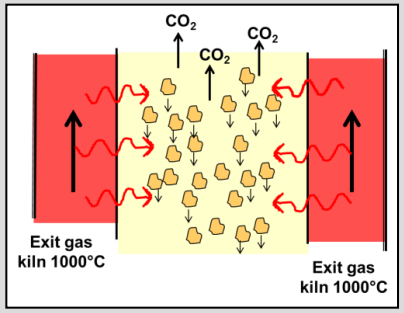
LEILAC: a third generation technology for CC

海德堡水泥集团 为巴黎气候大会提出的气温水平升高控制在**2°C以内的目**标做出贡献

Jan Theulen

Director Alternative Resources GES

Brussels, 17th October 2018



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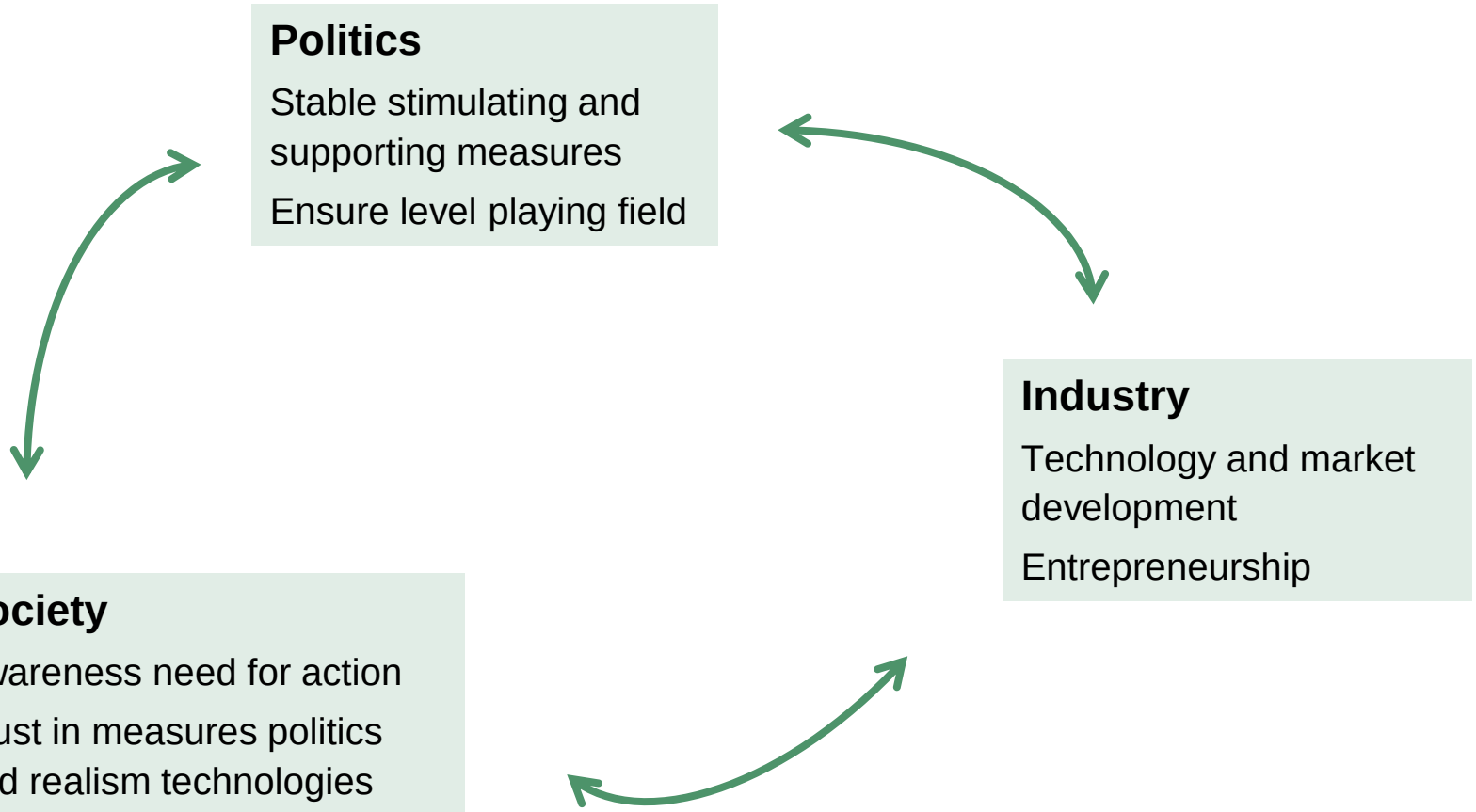
Abating climate change requires close collaboration



Politics: Paris COP21 has put climate change back on the international agenda…

What does the society say?

How do we react ?

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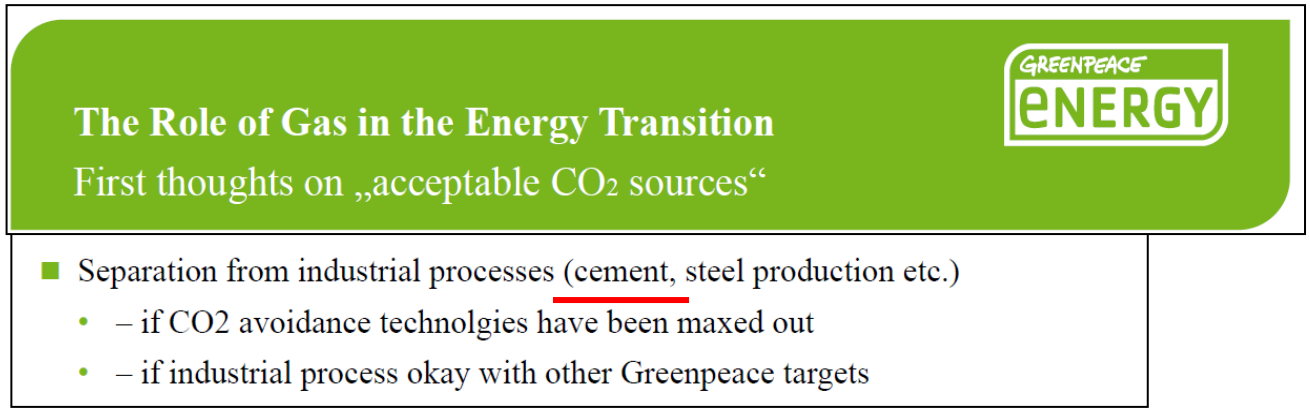
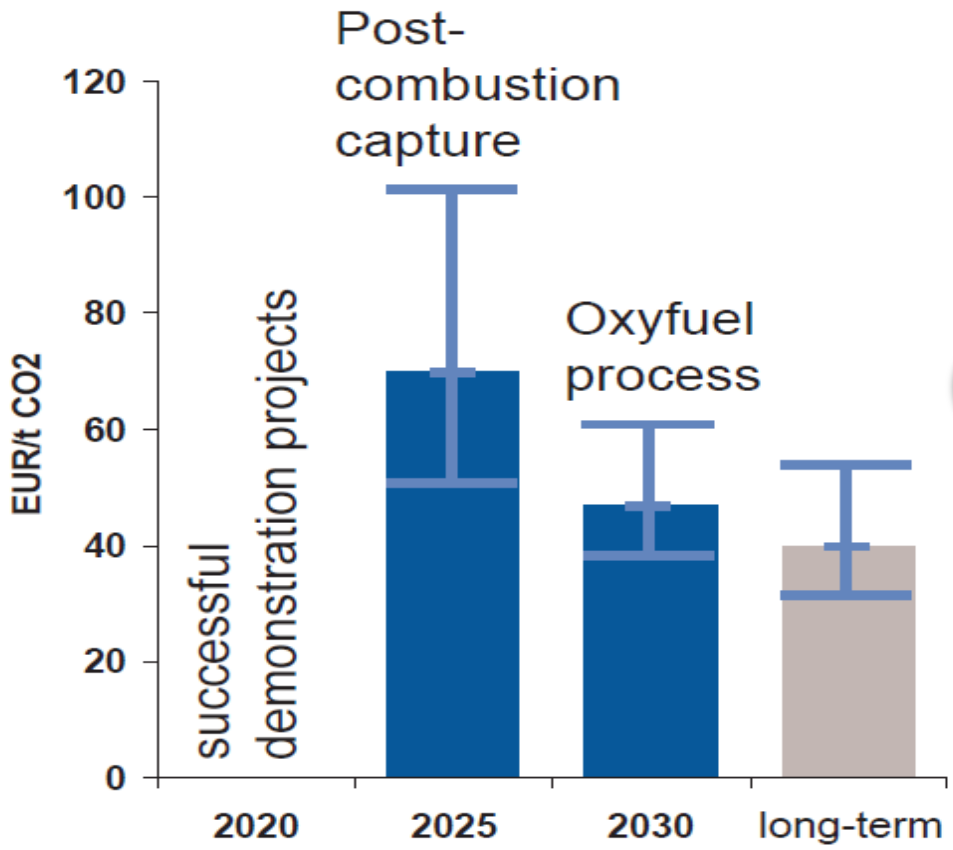
How does Society react ?



This will not cover the industrial process emissions, like for the cement and steel industry, and while **Germanwatch** favours research and development of new processes, they understand that there is a need to use CCS to achieve emission reductions compatible with a below-2° path.

Carbon Capture: playing chess on multiple tables



Process emissions LEILAC

?

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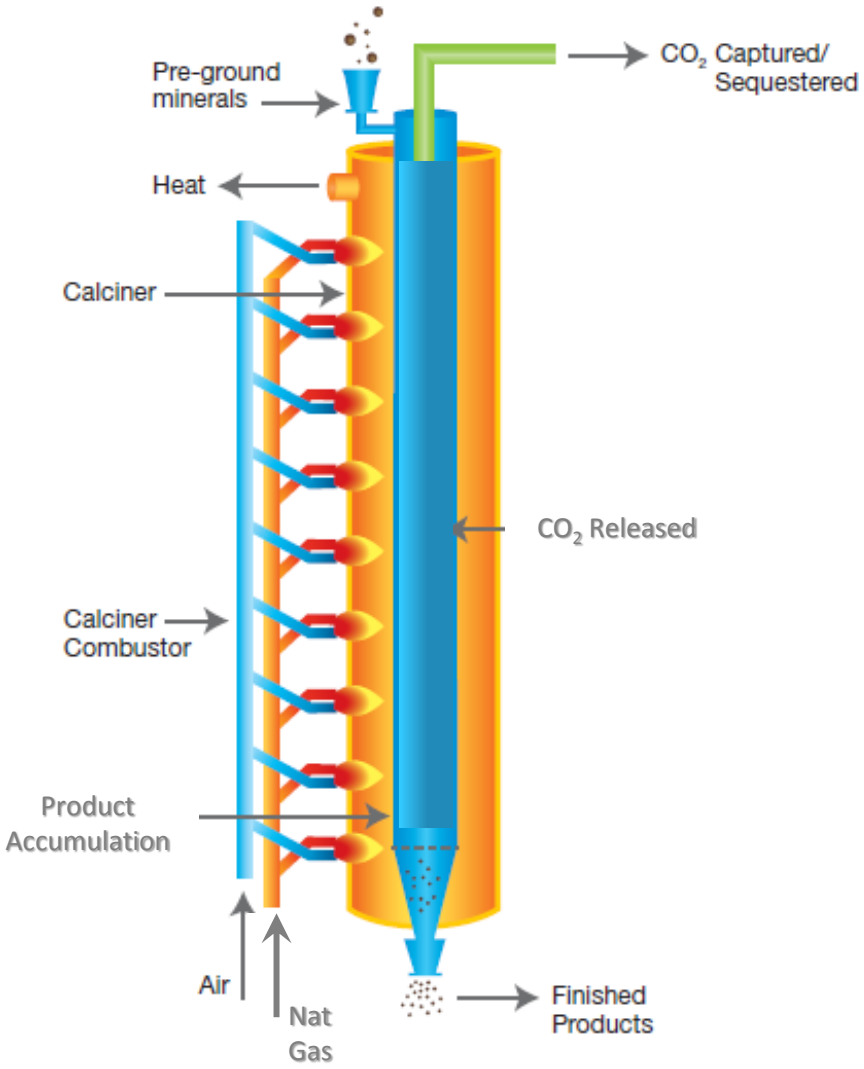
LEILAC: CO_2 separation@calcining (12 m€ EU-Horizon 2020)

- **Consortium**

Calix, Lhoist, amec foster wheeler, HEIDELBERGCEMENT, TARMAC A CRH COMPANY, CEMEX Building a better future, CARBON TRUST, Imperial College London, Quantis Sustainability counts, PSE, ECN

- **Indirect heating raw meal:**
  - Separate process CO_2
  - Calix MgO proven process
- **10 tph demonstration plant, Lixhe-Belgium**
  - Cement & Lime applications
  - www.leilac.org.uk

Schematic drawing



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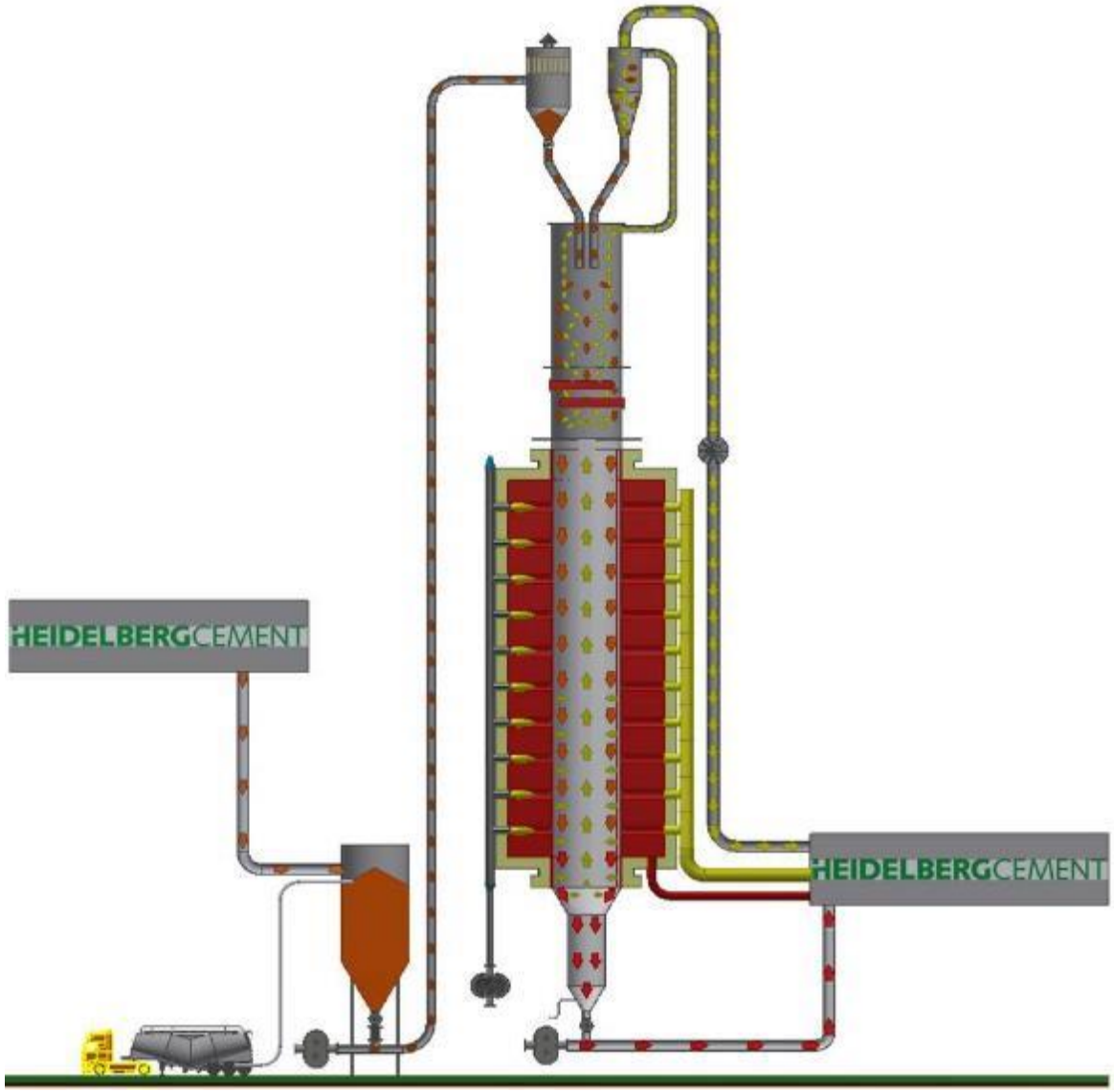
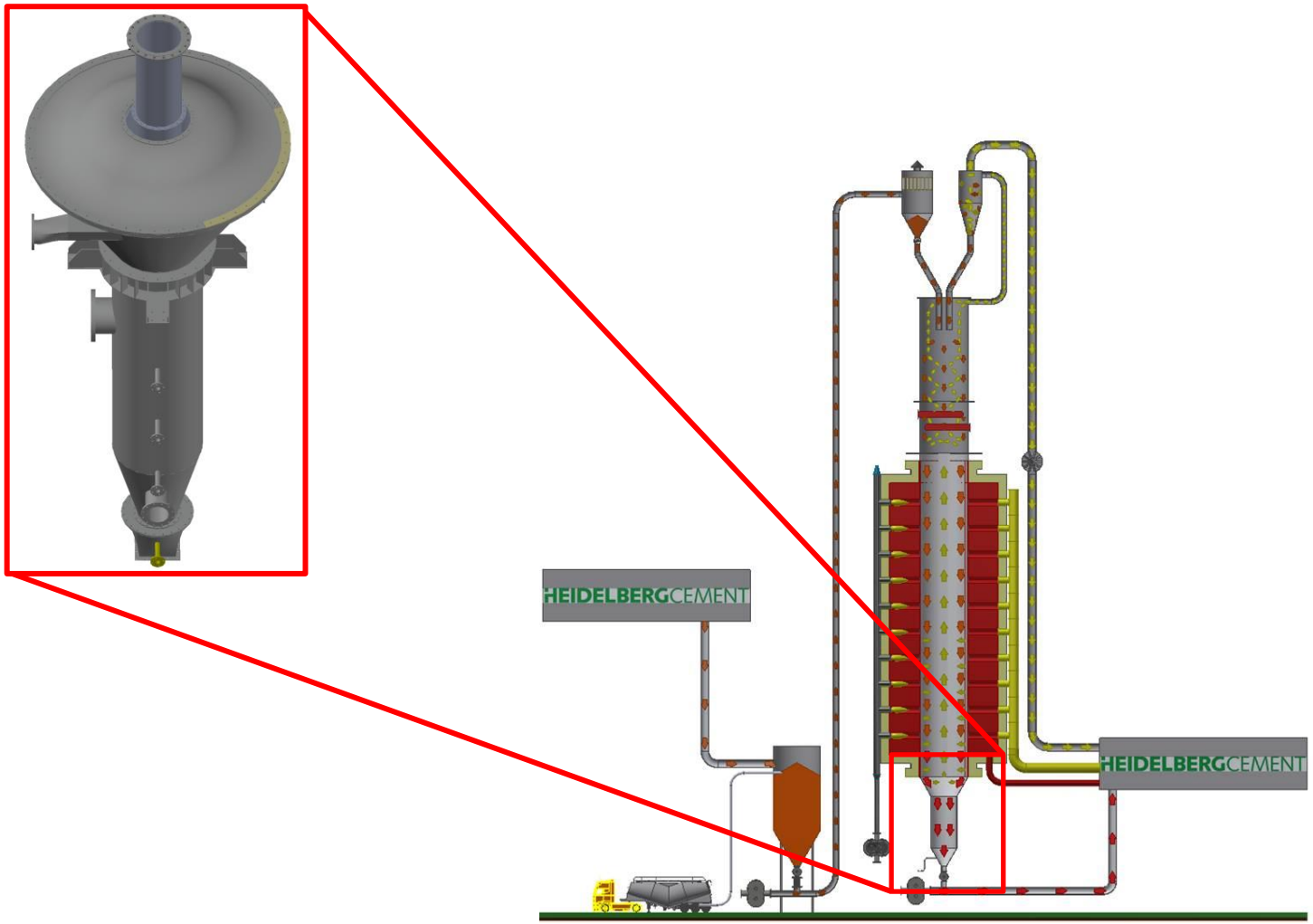
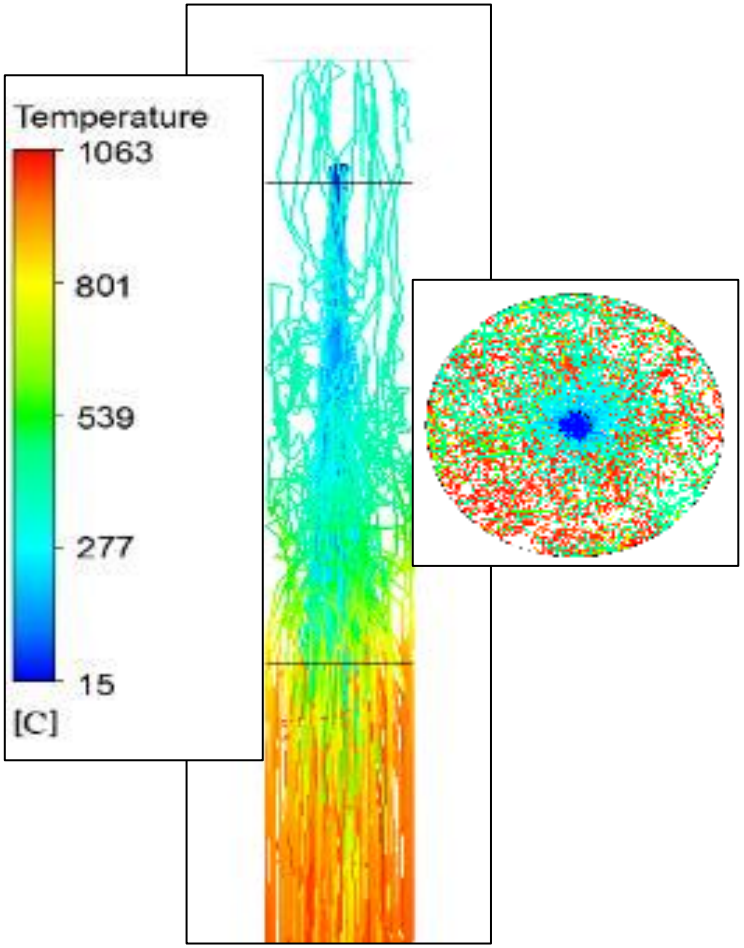
Principal design sketch

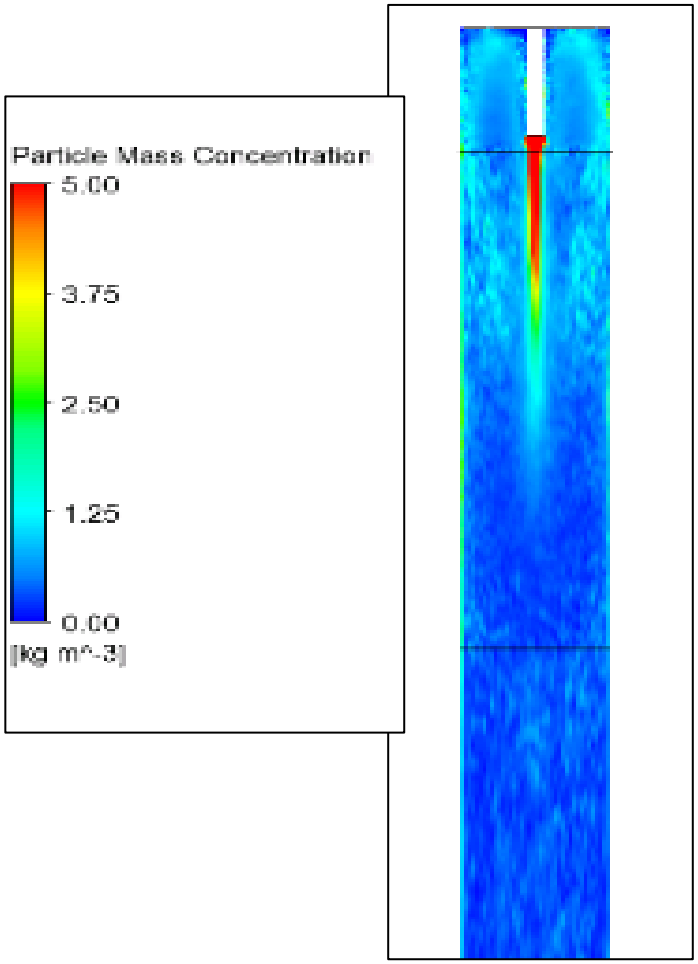


Detailed design of 1 element (just as example)

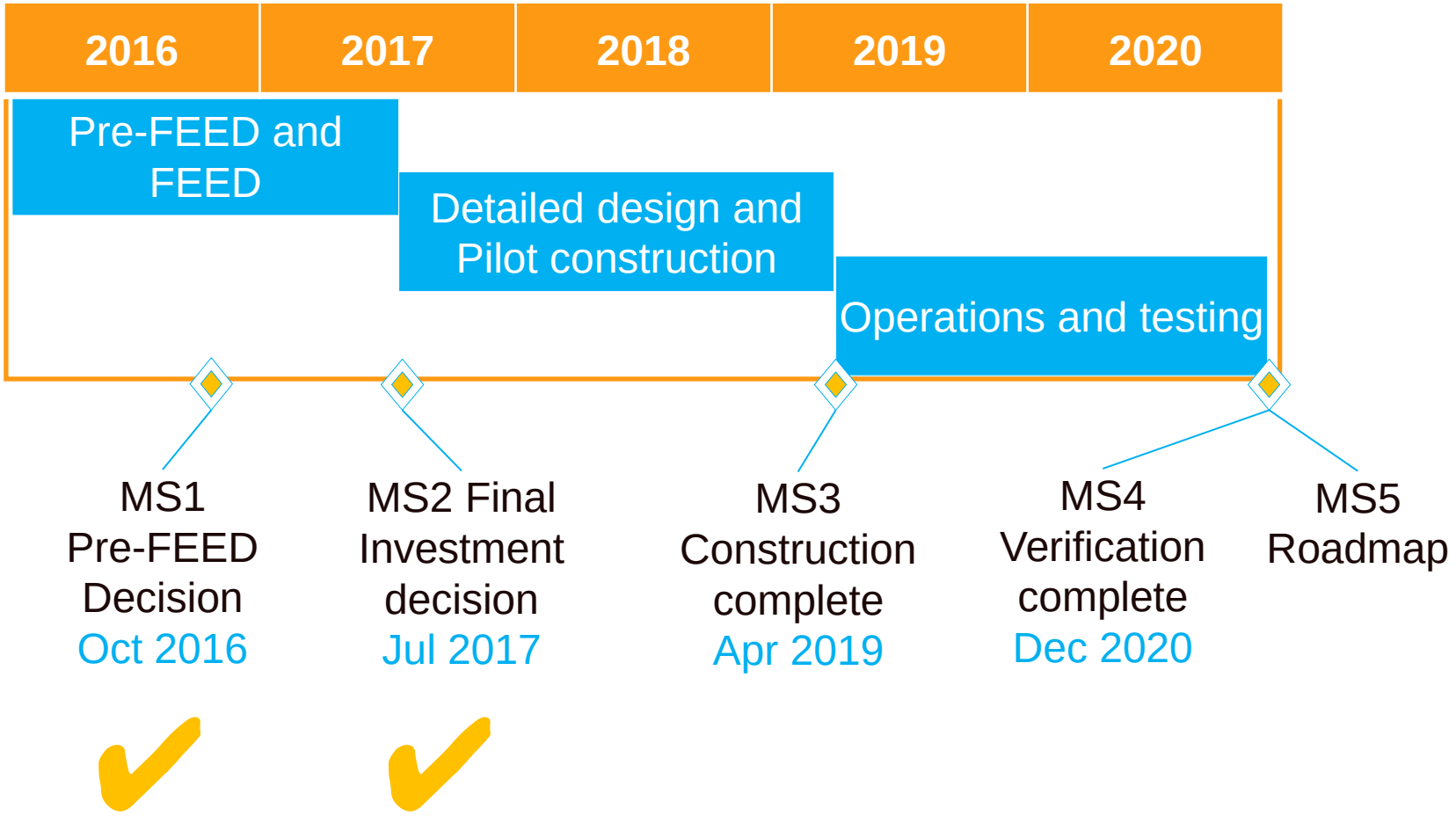


Lot of computer power used for the design





Project on schedule and on budget



The pilot is currently on budget and schedule

Ty-in to Lixhe plant + civil works finished

Drier Tie-Ins (March 2018)

Piles ready for pouring (16 May 2018)

Slab completed (26 June 2018)

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Steel structure sourced in Spain

Fabrication of LEILAC's supporting structure by Micesa in Madrid

Fabrication of the DS*-calciner in Belgium

*** Direct Separation = CO2 is direct separated**

Segments of the LEILAC pilot's furnace being fabricated by PERUWELD in Belgium

Erection at Lixhe plant by Pirson Montage (Belgium)

The furnace for Project LEILAC is unloaded on site, allowing the final preparations to take place before being installed

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Close to reaching the top of the tower……

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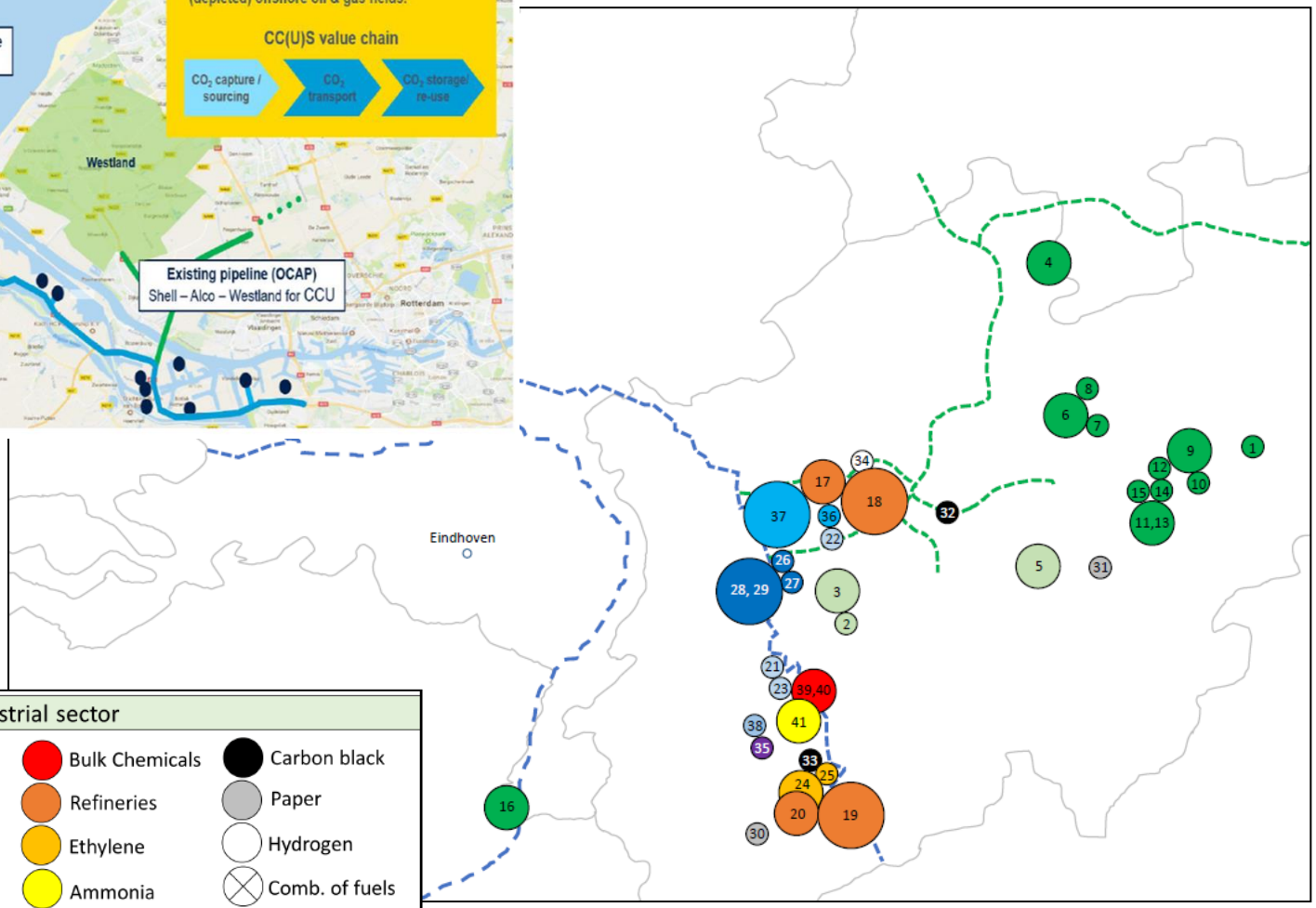
What to do with the CO_2 captured ?

CCS in Netherlands = opportunity for NRW and Cement



Industrial sector

Cement	Steel	Bulk Chemicals	Carbon black
Lime	Aluminum	Refineries	Paper
	Coke	Ethylene	Hydrogen
		Ammonia	Comb. of fuels

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HEIDELBERG TECHNOLOGY CENTER
HEIDELBERGCEMENT Group

Why Germany?

STAHL- UND ZEMENTINDUSTRIE

Umweltministerin will Klimaprojekte fördern

06. April 2018

Die Verarbeitung von Stahl ist besonders energieintensiv. Etwa hier im Stahlwerk Arcelor Mittal.
Bild: imago

Umweltministerin Svenja Schulze will Unternehmen bei der CO2-Reduktion unterstützen. Für die Entwicklung alternativer Technologien mit emissionsfreien Energien sollen bis zu 50 Prozent der Kosten übernommen werden.

Die neue Umweltministerin Svenja Schulze hat ein neues Förderprogramm für CO2-mindernde Klimaschutzprojekte in energieintensiven Branchen wie der Stahl- und Zementindustrie

Why Germany? The CCS-word is not forbidden anymore !

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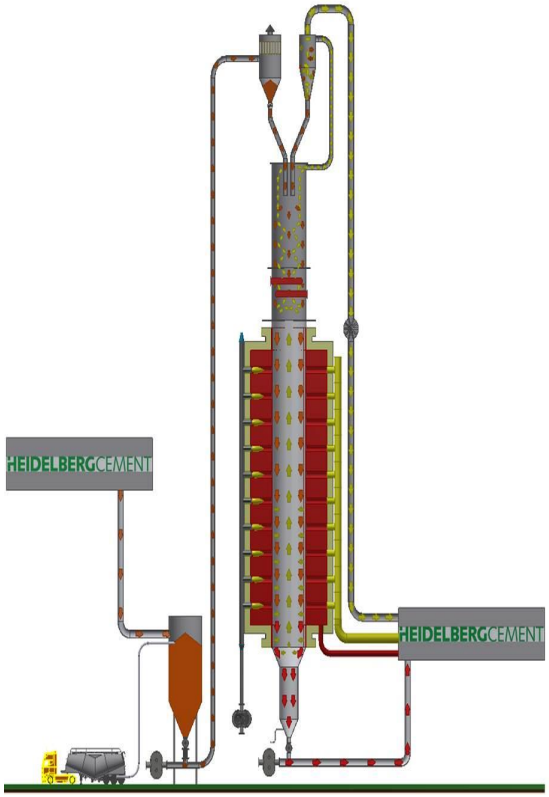
unterscheiden und sind in dieser Priorisierung vorzusehen: erstens Vermeidung von CO_2-Ausstoß durch höhere Effizienz, zunehmende Elektrifizierung sowie Energie-, Prozess- und Materialsubstitution, zweitens Verwertung von ausgestoßenem CO_2 durch Verlängern der stofflichen Nutzung, also Carbon Capture and Utilization (CCU), und drittens dauerhafte geologische Speicherung der restlichen, nicht anderweitig vermeidbaren CO_2-Emissionen durch Carbon Capture and Storage (CCS). Eingelagertes CO_2 soll im Bedarfsfall als Rohstoff rückgefördert werden können.

LEILAC 1C

Extension with CO_2-treatment



- CO_2-cleaning
- CO_2-compression + liquefying
- CO_2-storage tank
- CO_2-shipment by truck / ship

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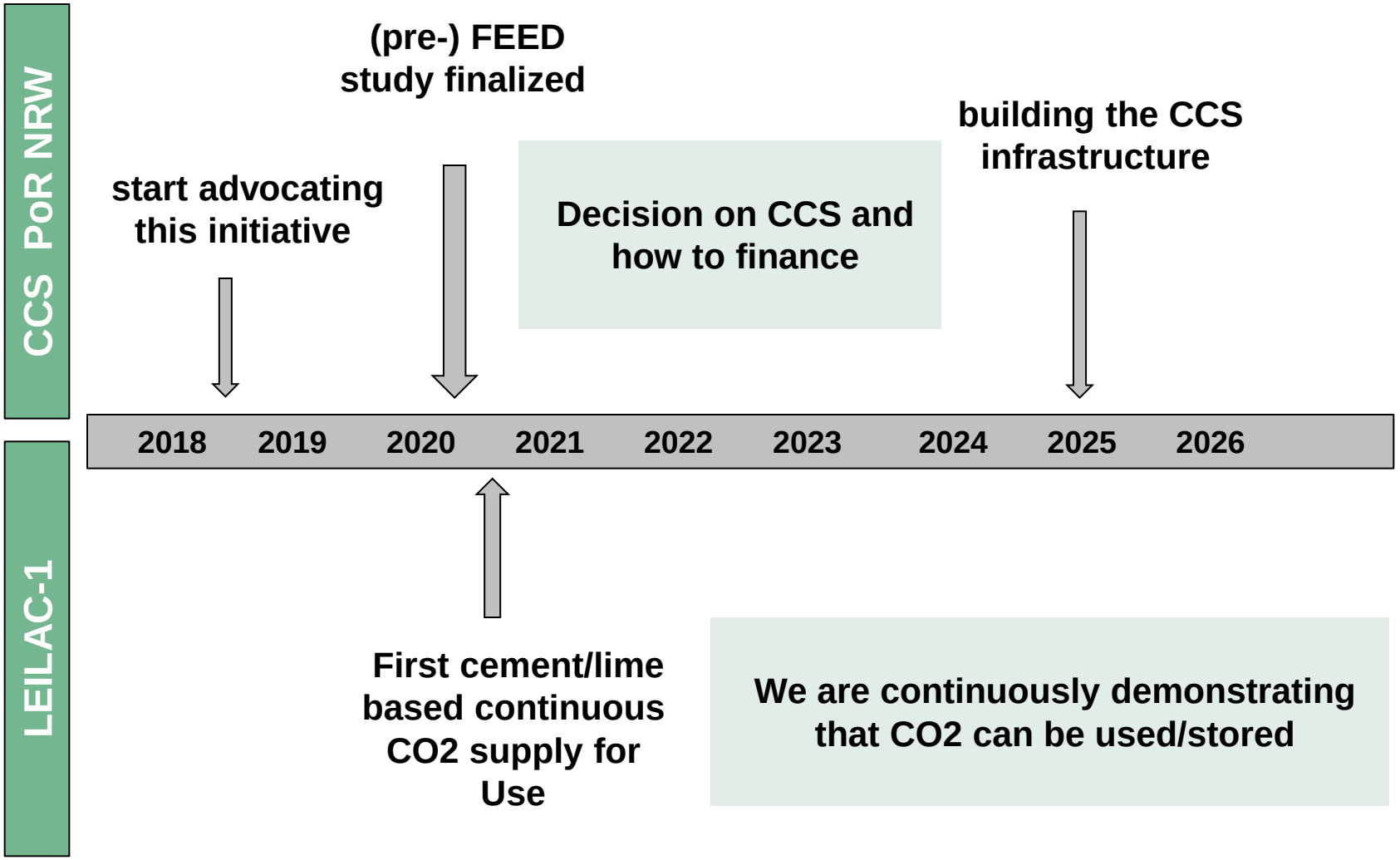
LEILAC 1C



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CO_2 a challenge and an opportunity…..

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