

Project update: C⁴U & INITIATE

CATO

Jurriaan Boon | Rijswijk

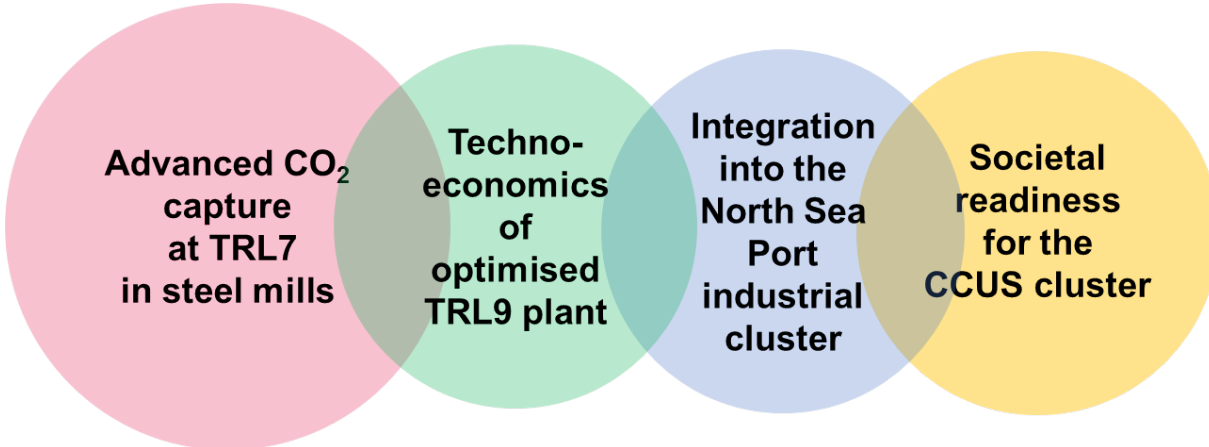


C⁴U

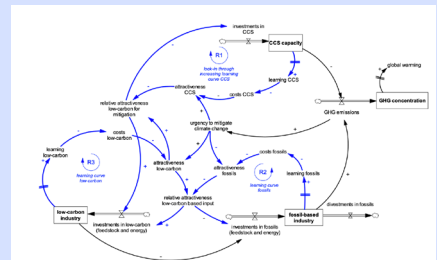
<https://c4u-project.eu/>

• C⁴U addresses the essential elements for the optimal integration of CO₂ capture in the iron and steel industry as part of the CCUS chain. This spans demonstration of two highly efficient solid based CO₂ capture technologies for optimal integration into an iron and steel plant and detailed consideration of the safety, environmental, societal, policy and business aspects for successful incorporation into the North Sea Port CCUS industrial cluster.

<https://c4u-project.eu/>



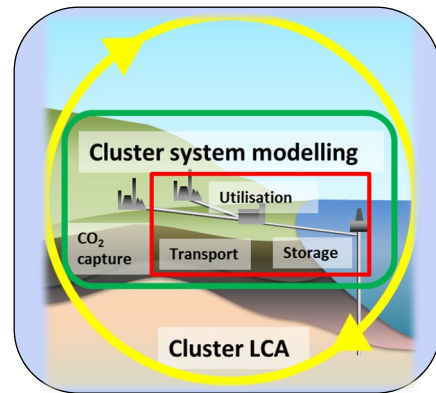
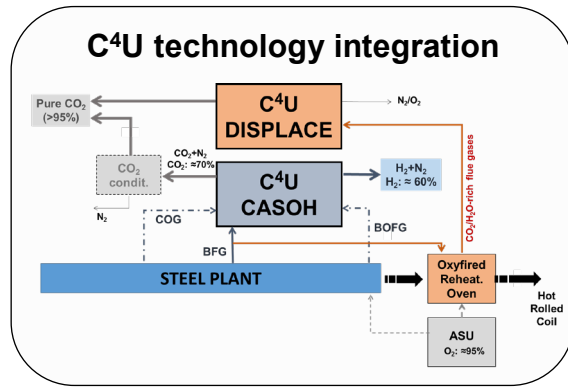
- System dynamics studies
- Policy instrument assessments
- Business model innovation



DISPLACE - High temperature sorption-displacement process for CO₂ recovery

CASOH - Calcium Assisted Steel-mill Off-gas Hydrogen production

DISPLACE column



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 884418.

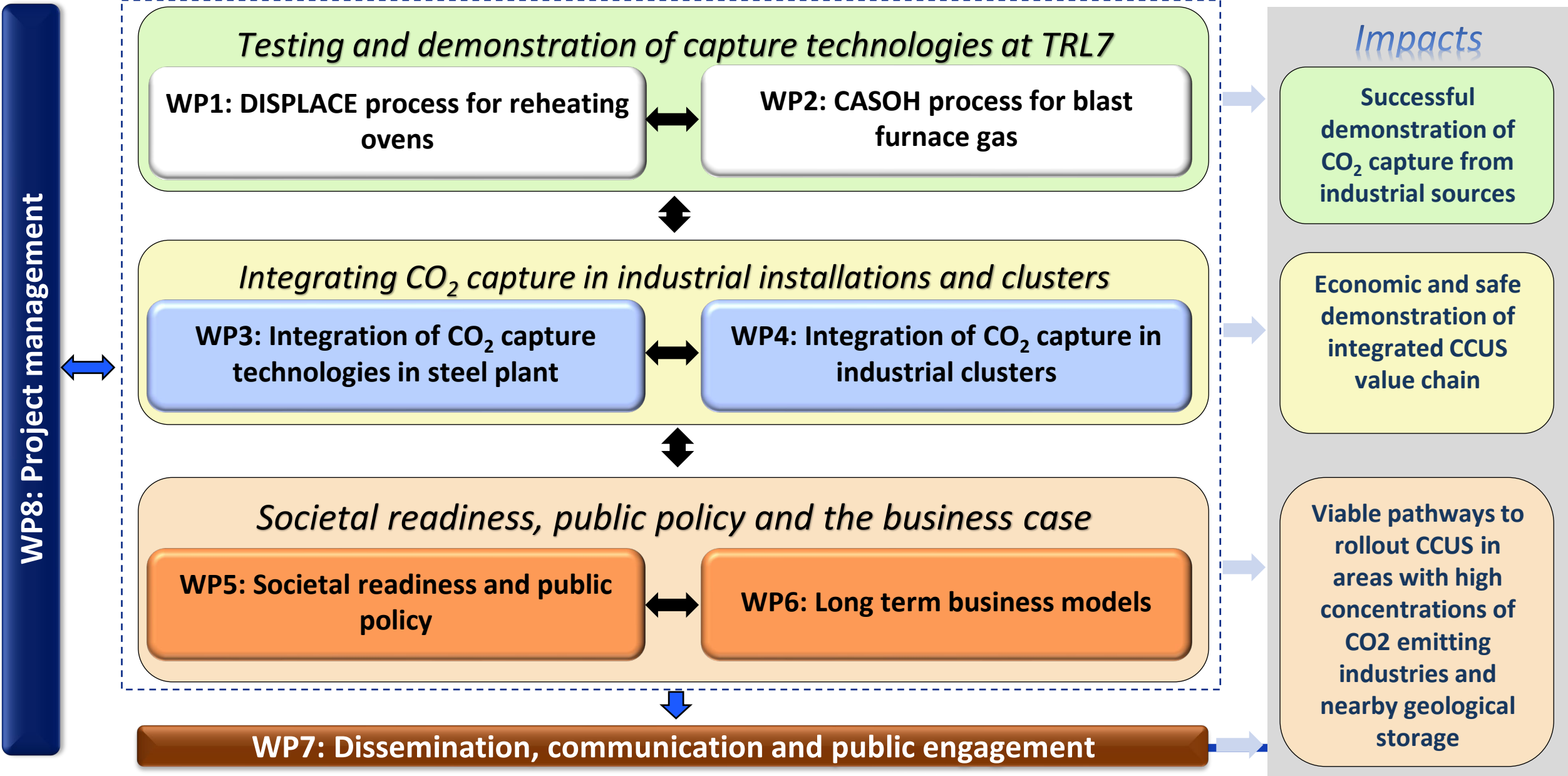
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Project Period
 April 2020 - March 2024

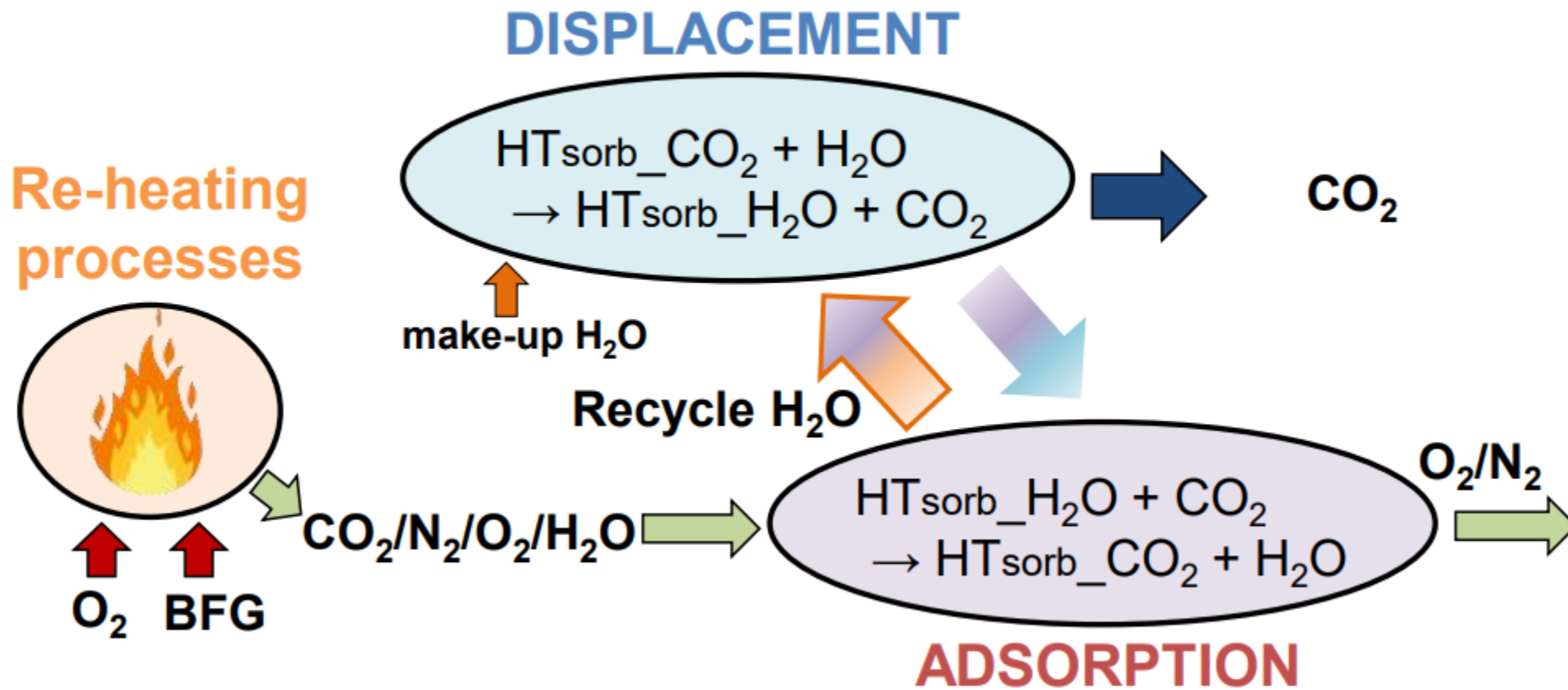
Overall budget
 € 13,845,496



C⁴U PERT Diagram



DISPLACE PROCESS



Highlights DISPLACE

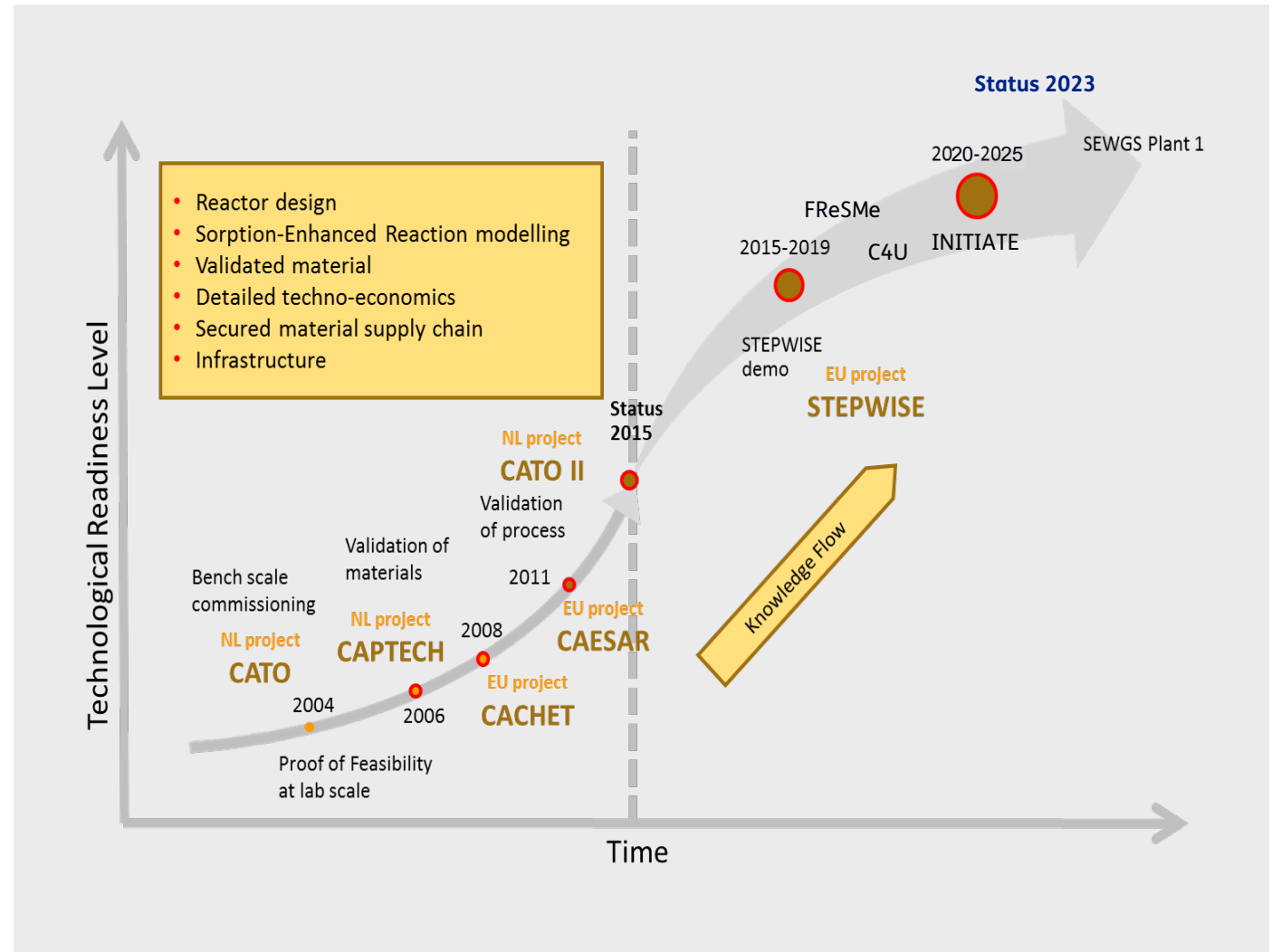
- We successfully completed the TRL7 pilot experimental program: 9 weeks 24/7 operation in 3 campaigns with an additional 550 hr commissioning
- The pilot data has refined our understanding of how CO, CO₂, H₂O and impurities interact with hydrotalcite-based materials. This update significantly improves both our process models and overall cycle optimisation.
- The demonstration to TRL7 by integrating and demonstrating decarbonisation around the steel-plant (i.e. in the reheating ovens) paves the way for further development.
- The premise of C4U was to show that decarbonisation around the steel plant could be achieved using only 2 technologies that could be tuned in different manners for the many different potential sources around the steel plant. Flexibility in DISPLACE process operation was demonstrated and will soon also be demonstrated for CASOH

INITIATE

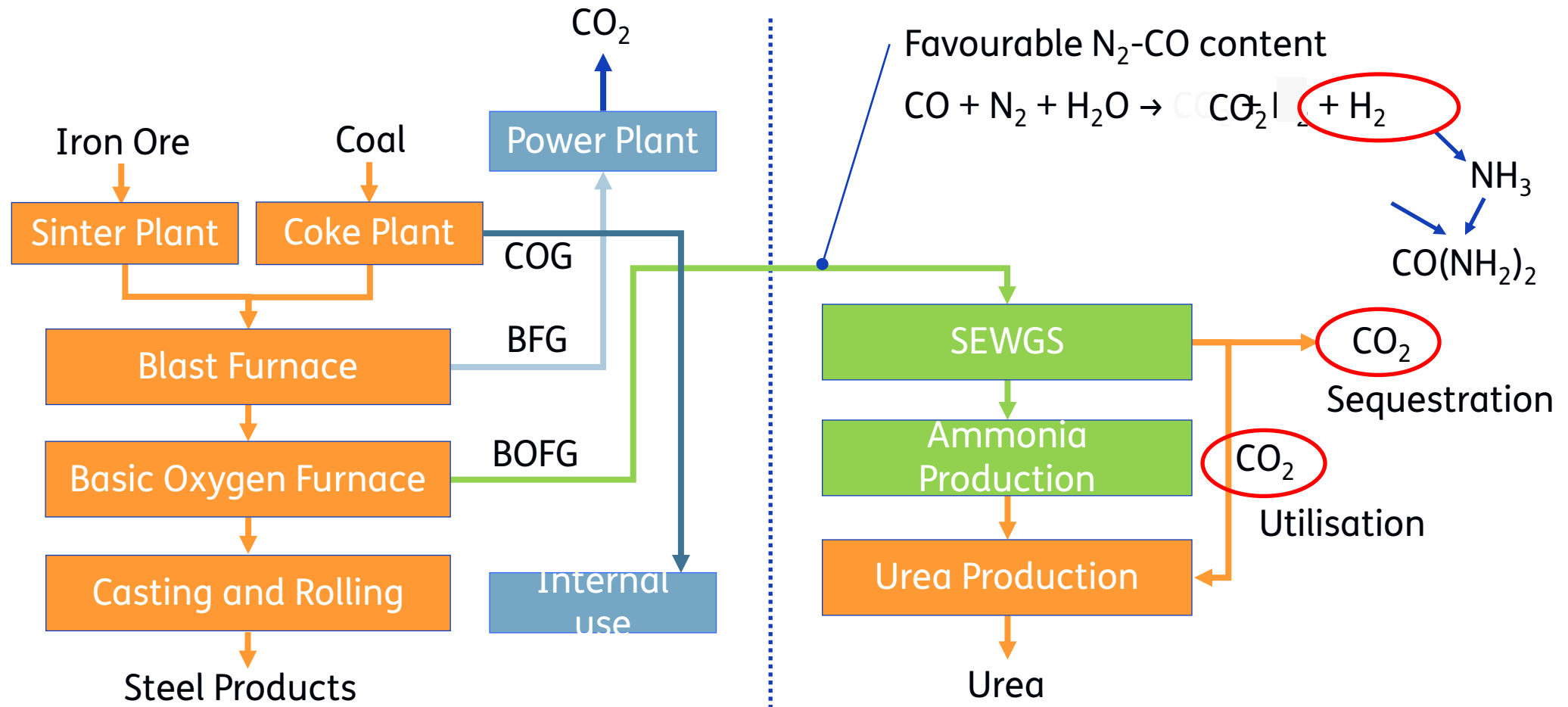
<https://www.initiate-project.eu/>

SEWGS Development continues

Internal	1 st experiments, gram scale
CATO	Lab-scale
CACHET	Bench scale
CAPTECH	Materials development
CEASAR	Low steam usage
CATO-II	Process development
STEPWISE	Validation in industry, ton scale
FReSMe	To methanol
INITIATE	Prototype for NH ₃



INITIATE Industrial symbiosis concept



INITIATE project concept and vision

VISION:

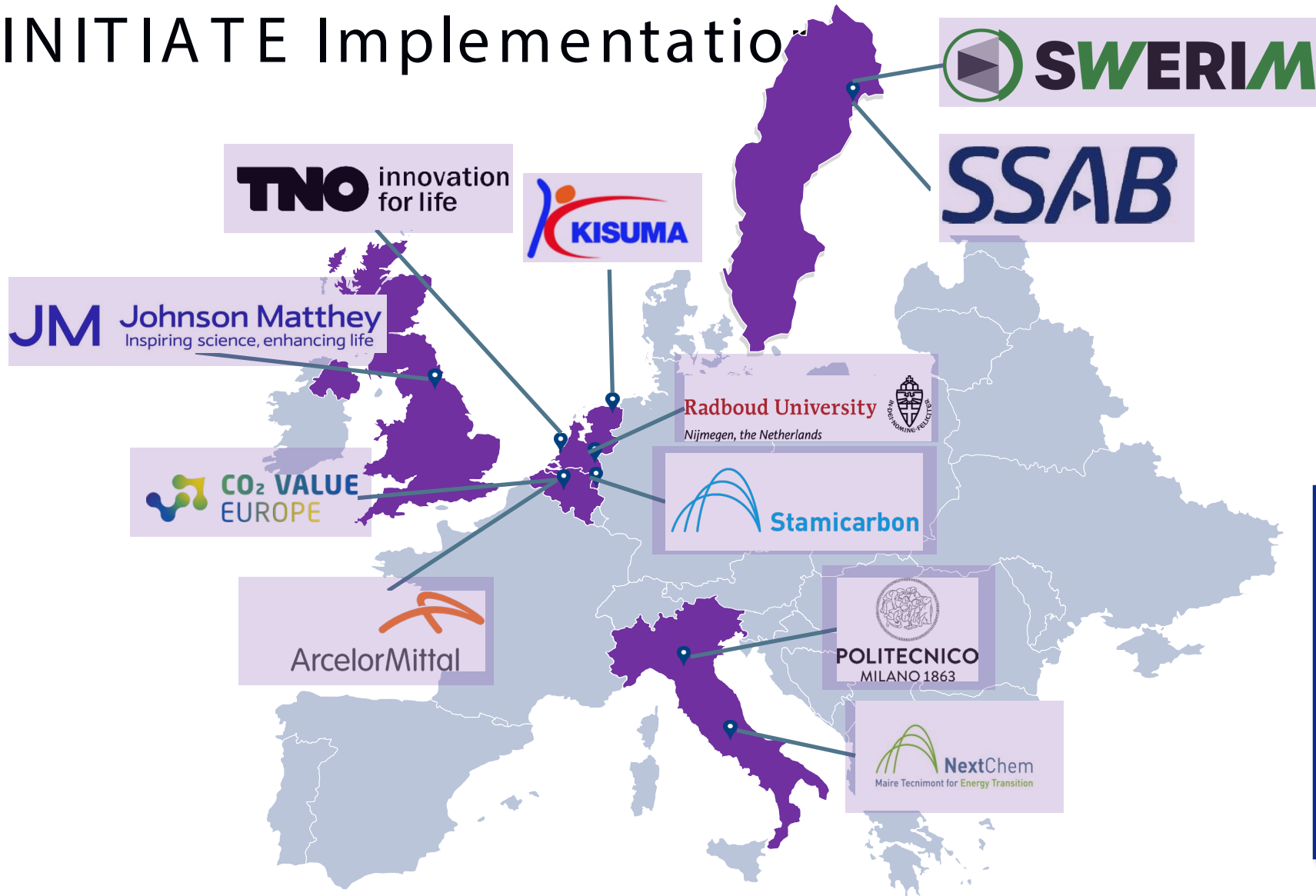
- › Create bankable case for a first commercial size demonstrator at a scale of 50 kt/y urea production capacity on the basis of BOFG

ROUTE:

- › The INITIATE project takes all the steps required to develop the FOAK plant
 - › Demonstration of continuous production of NH₃ from BOFG at scale
 - › Site identification
 - › Business plan development
 - › IP&R, ownership, collaboration



INITIATE Implementation



Materials and equipment
Technology licensors
End-users
Knowledge support

5 years
Nov. 2020 – Nov. 2025

21.3 M€ EU funding

958318
H2020-LCCI-2020-EASME
A.SPIRE

SEW GS development towards TRL-7

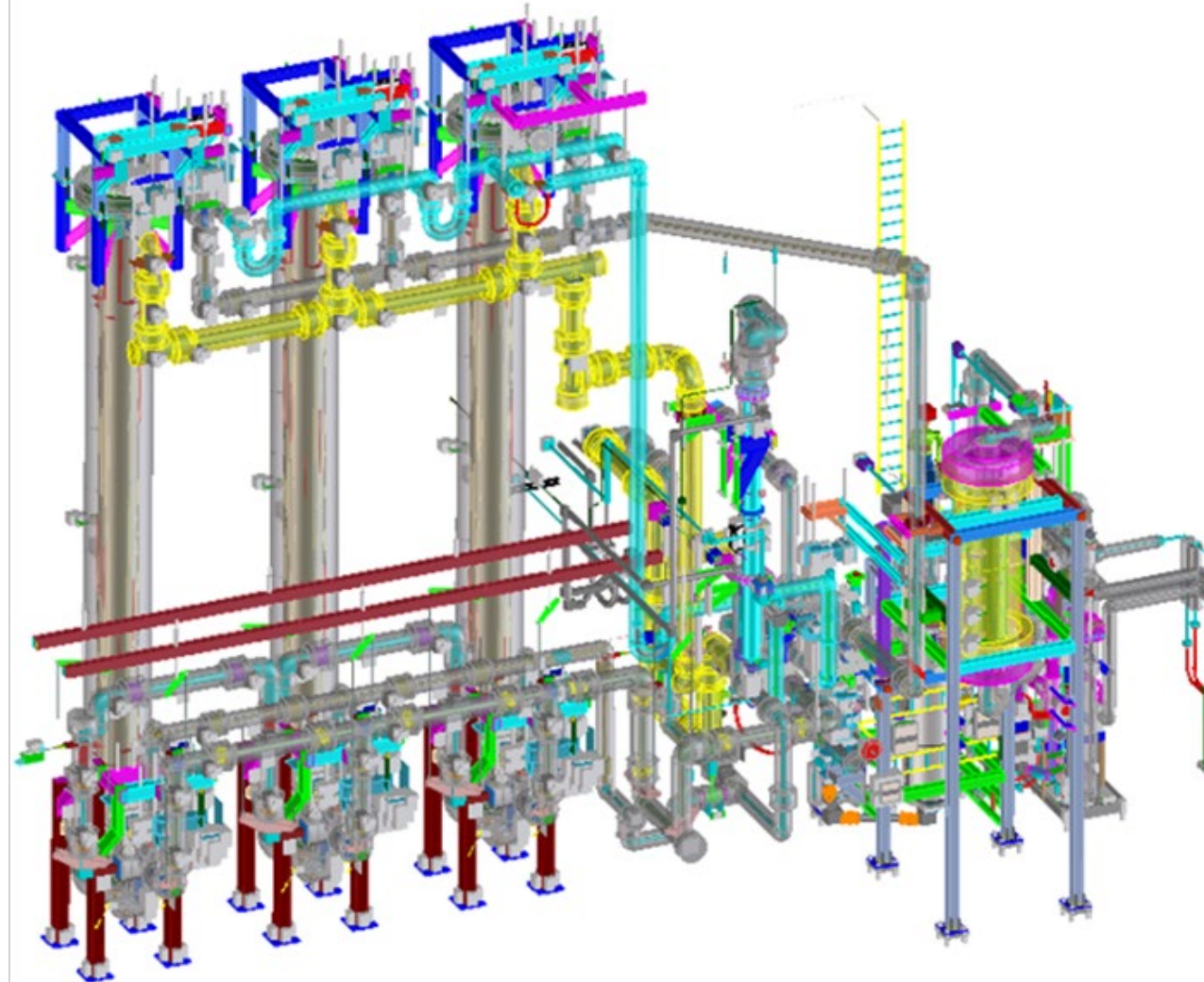
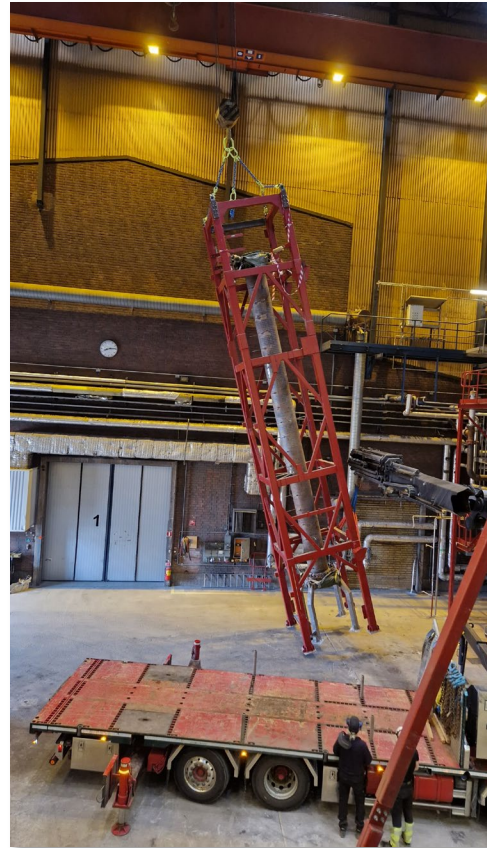
2017

Column arrival for
STEPWISE



2023

Column dismantling
for reuse






Thank you for
your attention

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