



# Carbon Capture and Utilization

## Demonstrating Industrial Symbiosis

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**INCITE workshop, May 15, 2025**



The INITIATE project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 958318

**PUBLIC**

# INITIATE project concept and vision

Symbiosis **iron and steel** ↔ **ammonia/urea**

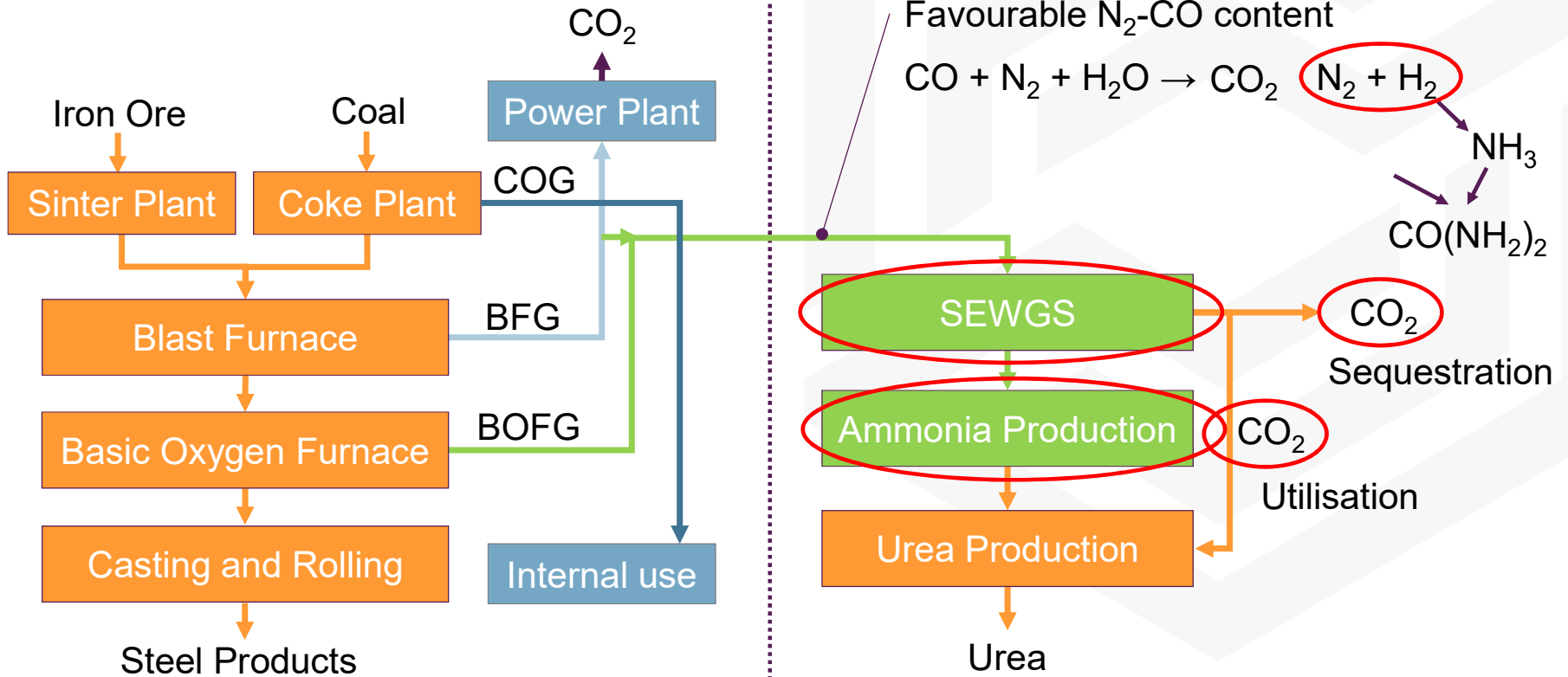
**Vision** Foak demonstrator at 50 kt/y urea from BOFG

**Route**

- TRL7 demonstration BOFG to  $\text{NH}_3$  (1.3  $t_{\text{NH}_3}/\text{d}$  scale)
- Site identification
- Business plan development
- IP&R, ownership, collaboration



# INITIATE Industrial symbiosis



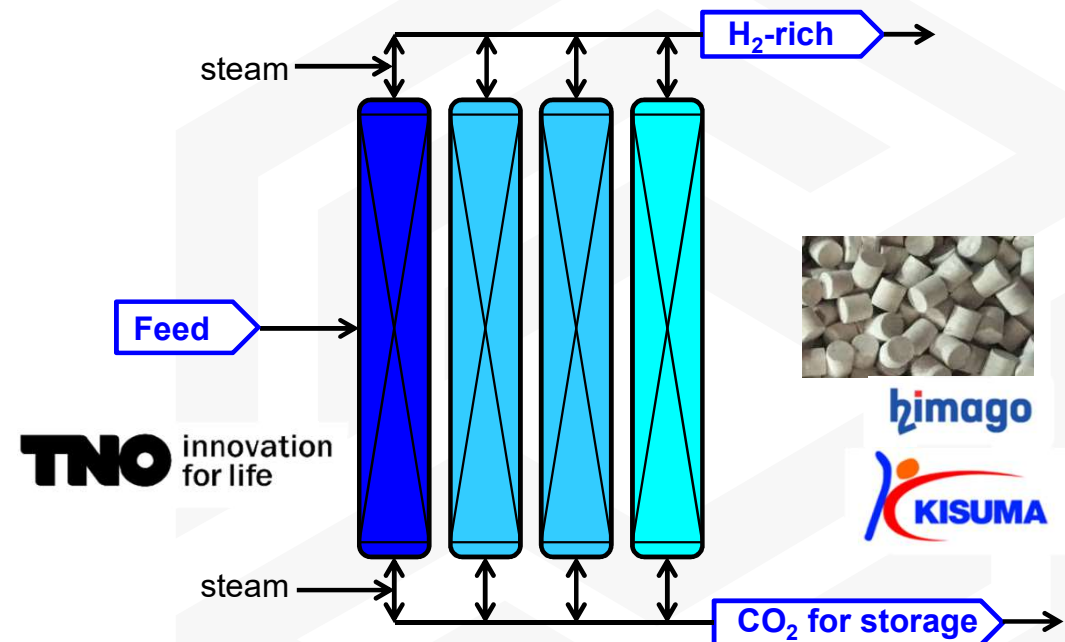
# Enabling technologies

## SEWGS

- › Solid sorbent CO<sub>2</sub> removal
- › Minimization of energy requirement

## NH<sub>3</sub> Synthesis

- › Variable H<sub>2</sub>/N<sub>2</sub> ratio, dynamics
- › Simplification of knock-out and recycle



Boon, Chem.Eng.Sci., 2015, 122, 219-231, <https://doi.org/10.1016/j.ces.2014.09.034>  
Jansen, Int.J.G.G.Contr., 2015, 40, 167, <https://doi.org/10.1016/j.ijggc.2015.05.028>

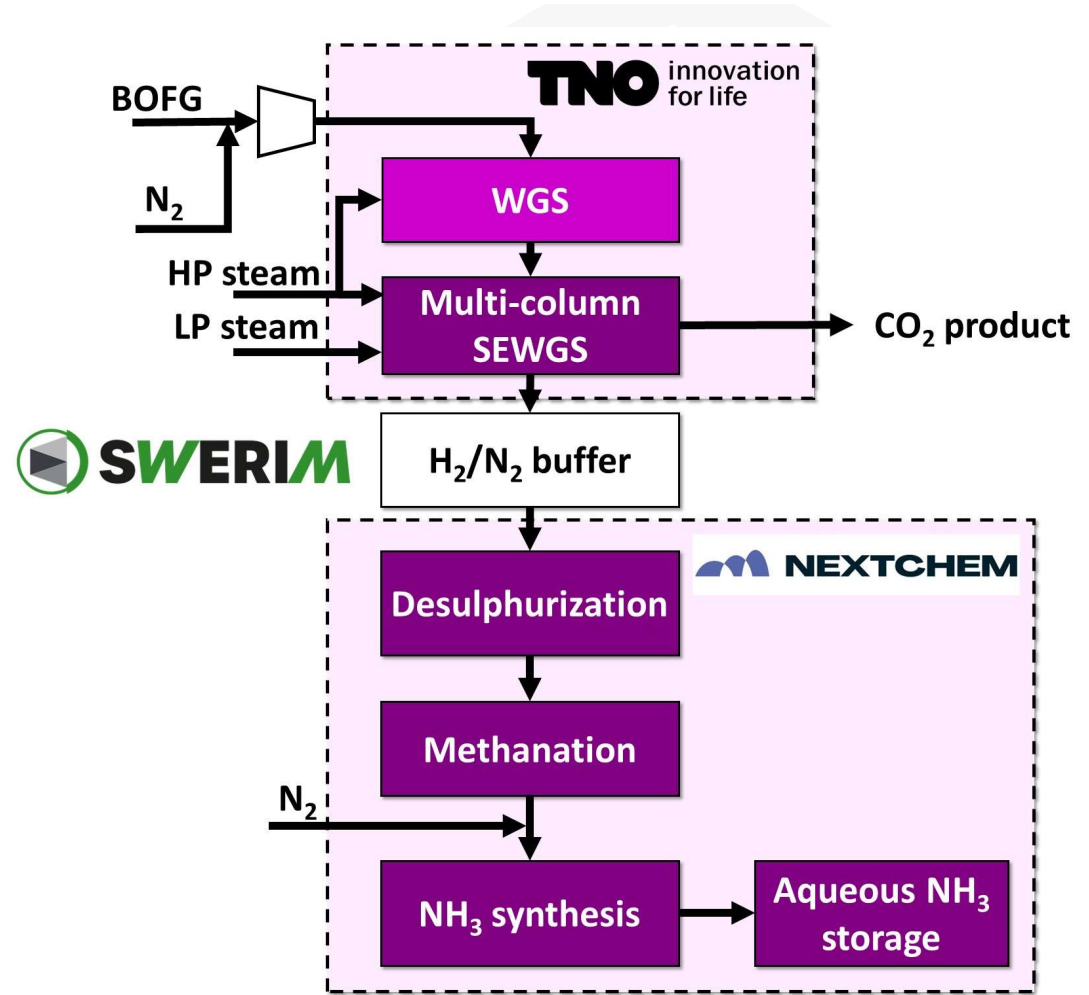


**NEXTCHEM**

# Project Status

## TRL7 pilot construction ongoing

- › BOFG to H<sub>2</sub>/N<sub>2</sub> testing Q4 2025
- › BOFG to NH<sub>3</sub> testing Q4 2026

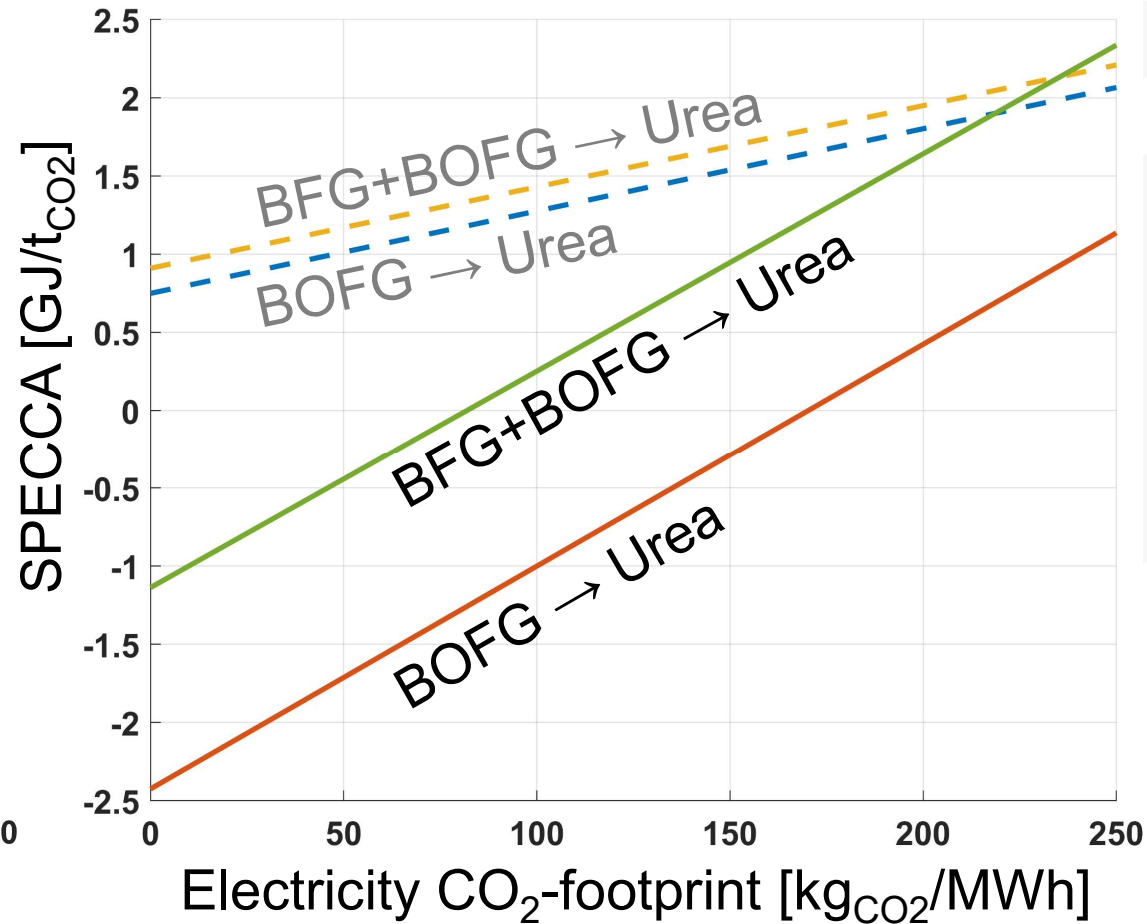
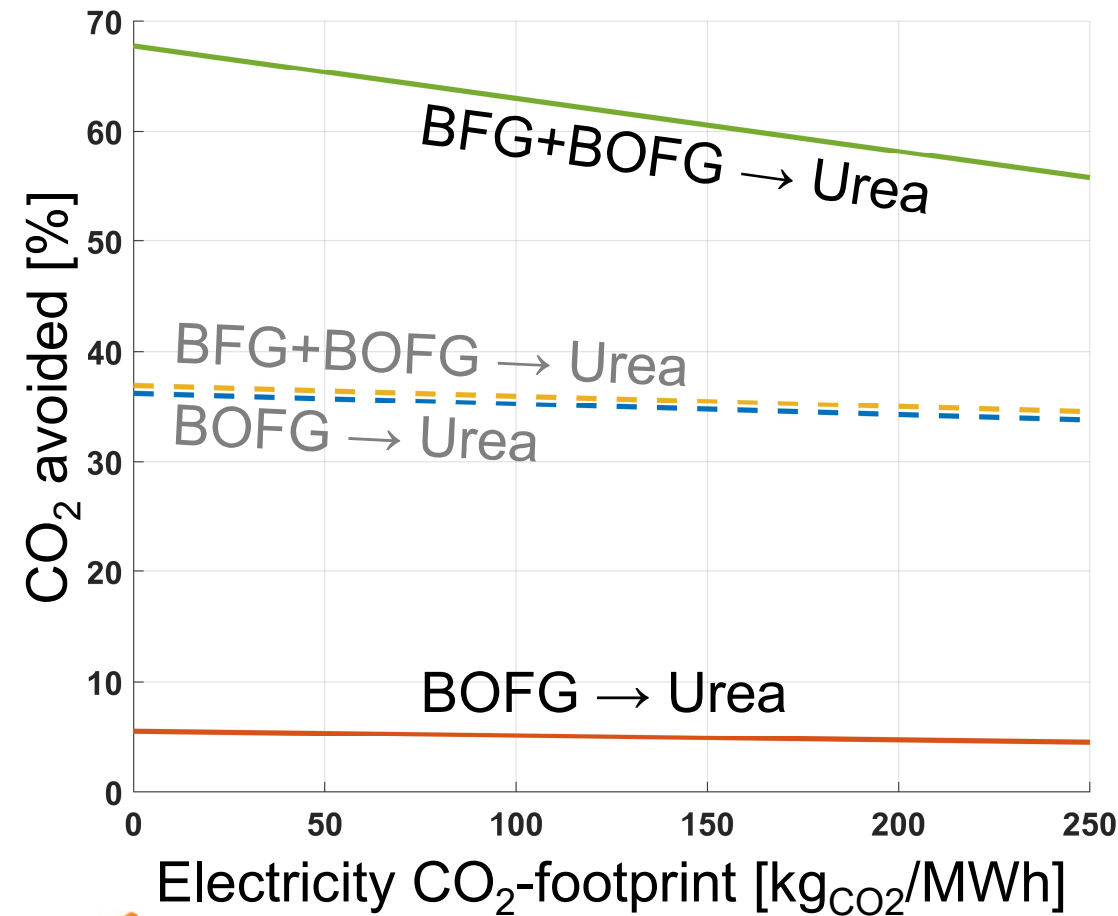


**JM Johnson Matthey**  
Inspiring science, enhancing life  
Catalysts for WGS,  
Methanation, DeS and NH<sub>3</sub> loop

**KISUMA**  
CO<sub>2</sub> adsorbent

# Techno-economics

--- Reference = individual industries + amine CCUS  
--- INITIATE = symbiotic coupling CCUS

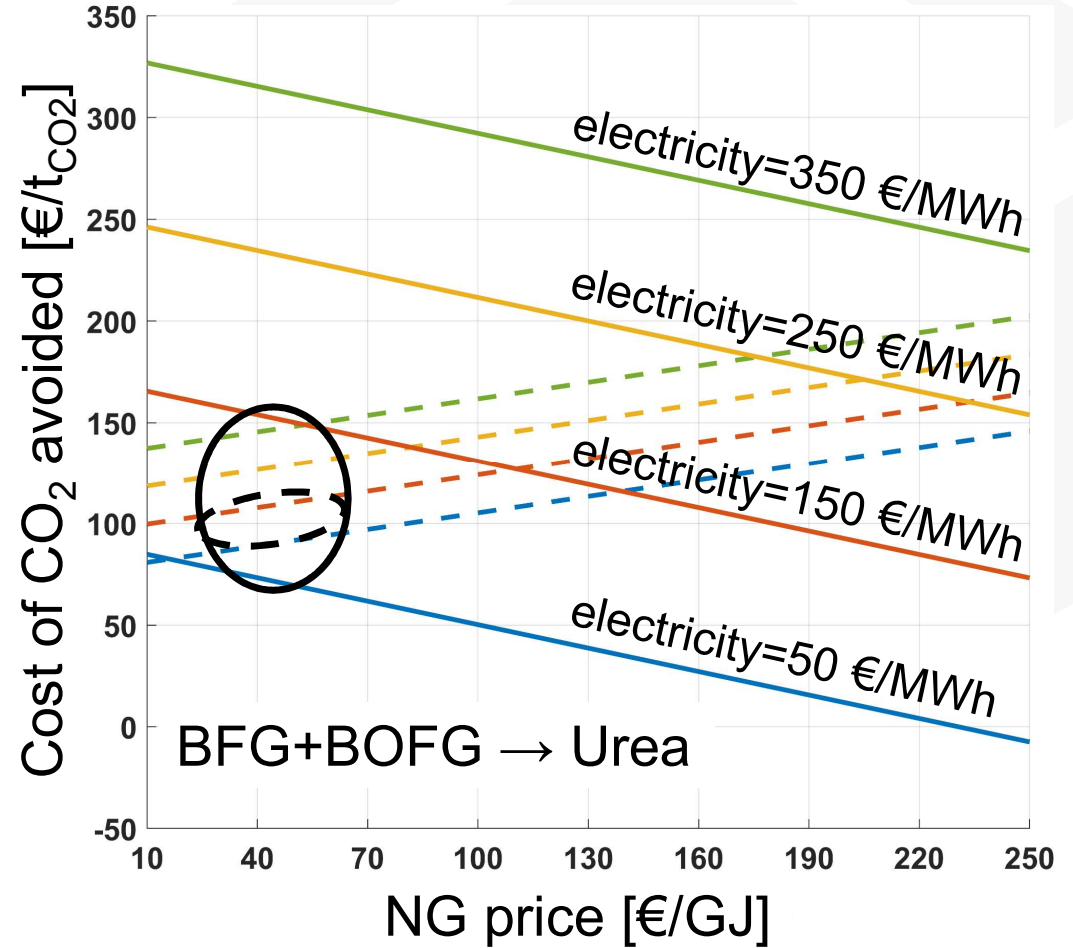
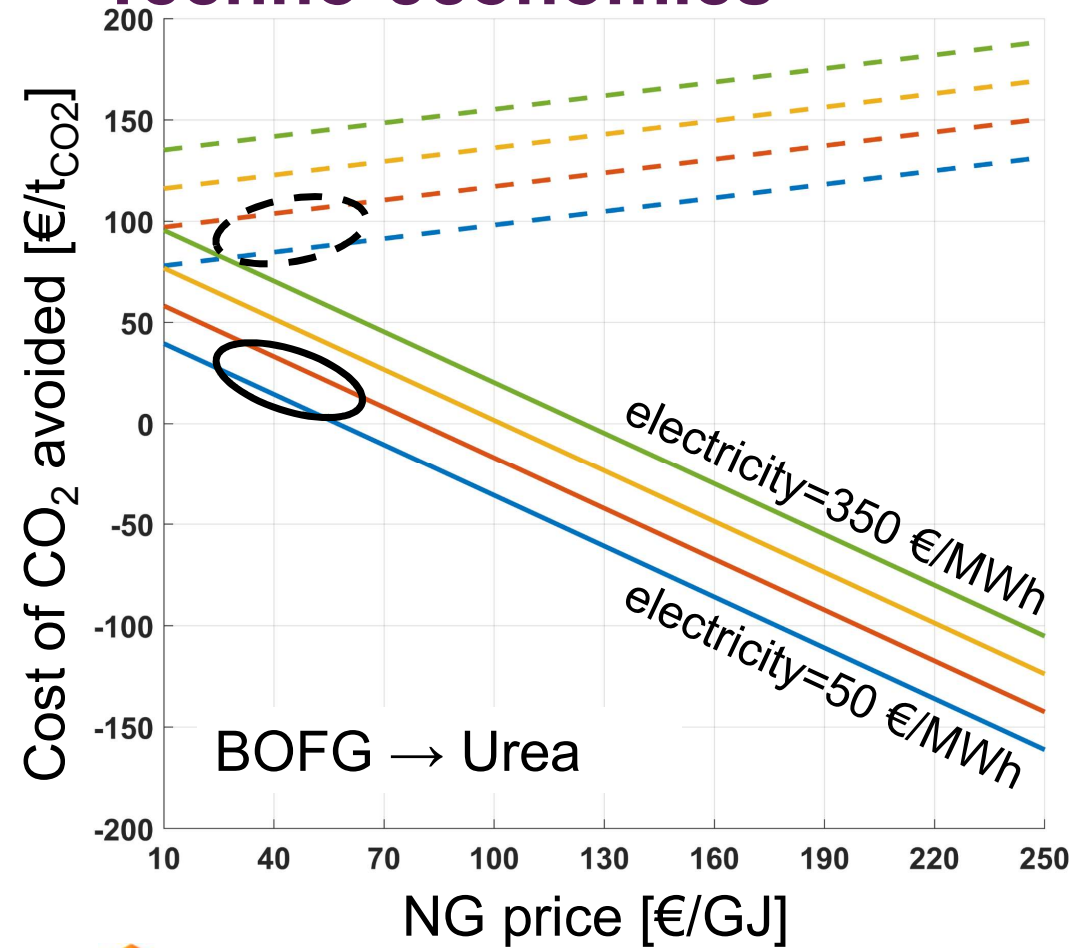


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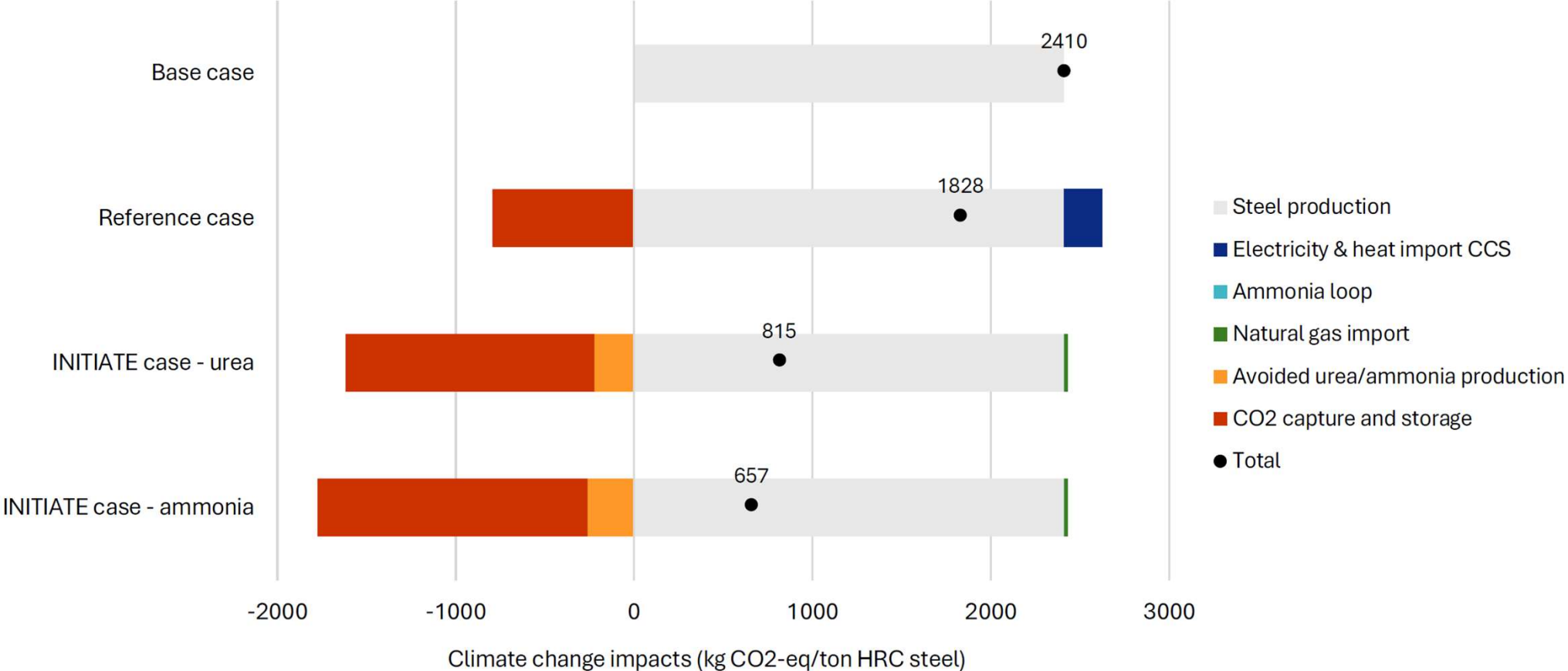
SPECCA = Specific Primary Energy Consumption per CO<sub>2</sub> Avoided

- Reference = individual industries + amine CCUS
- INITIATE = symbiotic coupling CCUS

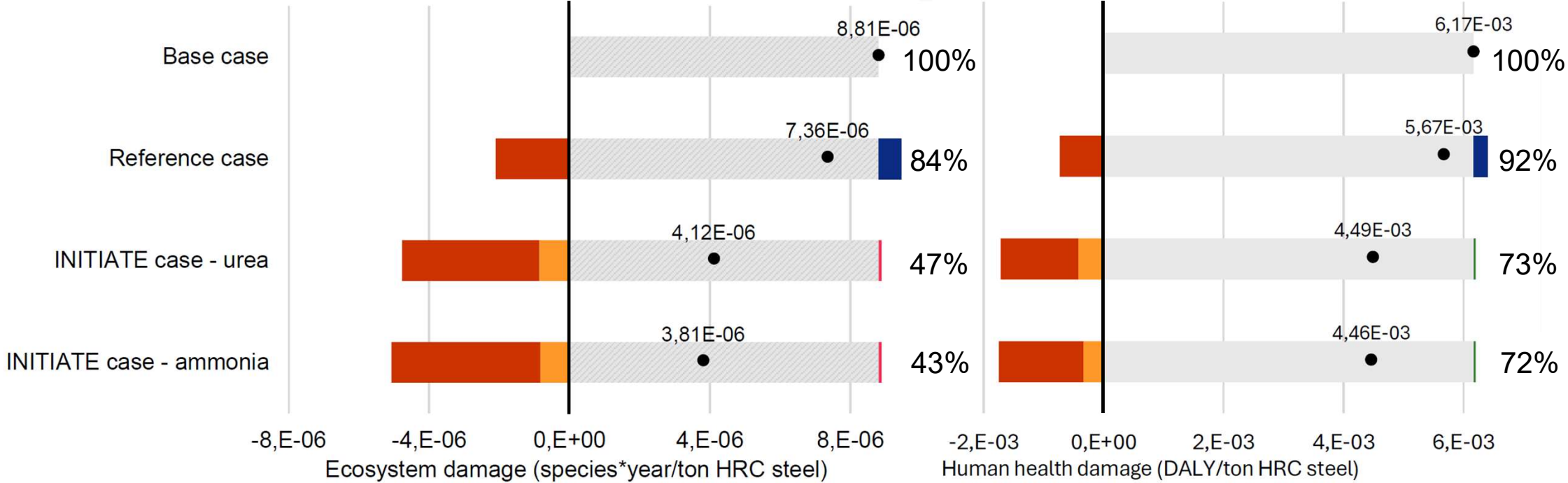
# Techno-economics



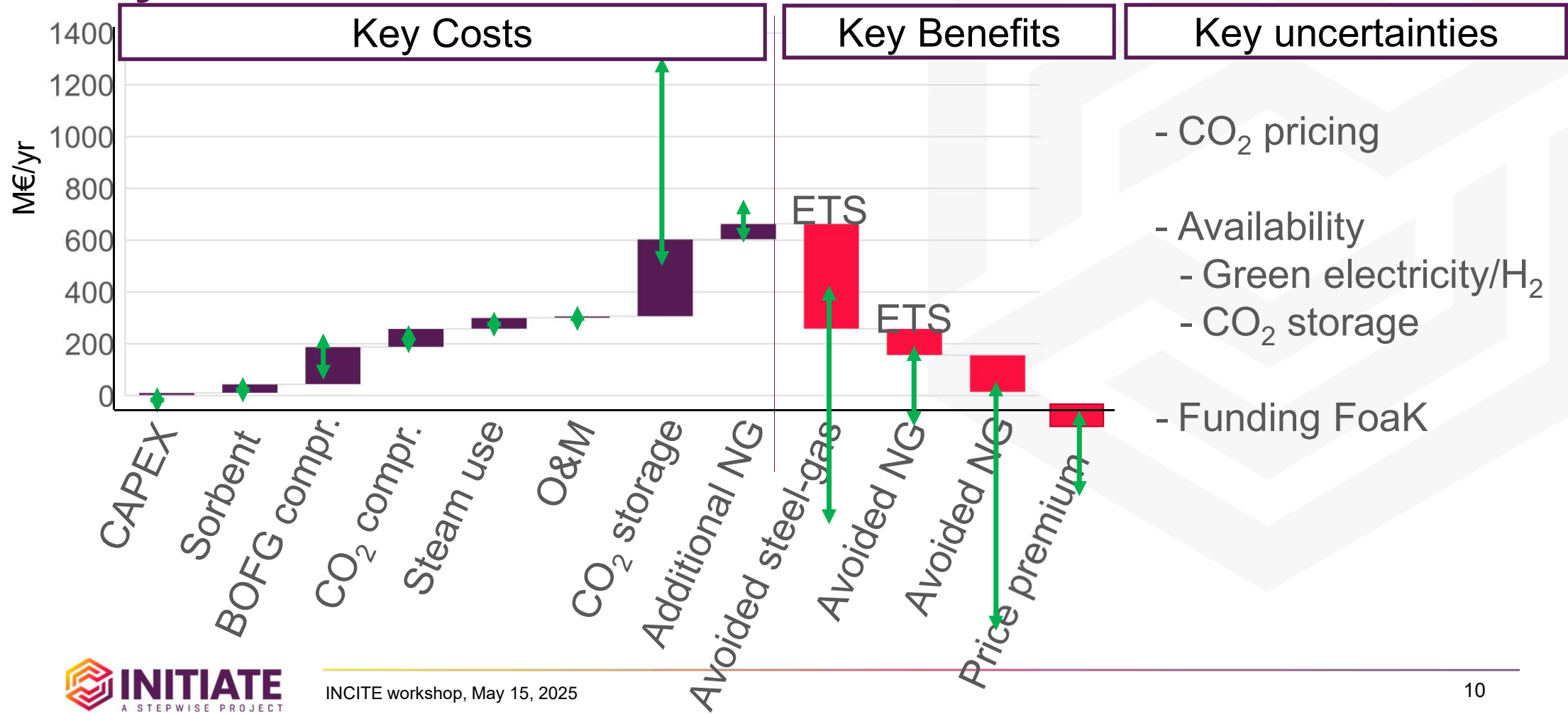
# Life-cycle analysis



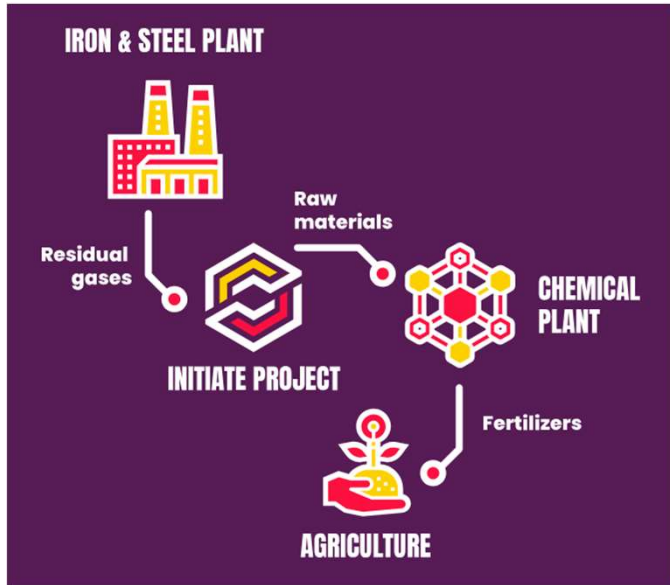
# Life-cycle analysis



# Key cost drivers and uncertainties



# Commercial Implementation Plan



*Focus:* long-term implementation plan + strategy to align stakeholders' needs

↳ FOAK and the long-term vision

License NextChem & StamiCarbon in progress

License Paul Wurth signed

Q1 2023 - Q1 2024

Use case analysis and  
roadmap development

Q2 2024 – Q2 2025

Exploitation

Q3 2025 –

Commercial agreement  
Foak

Long term commerc.



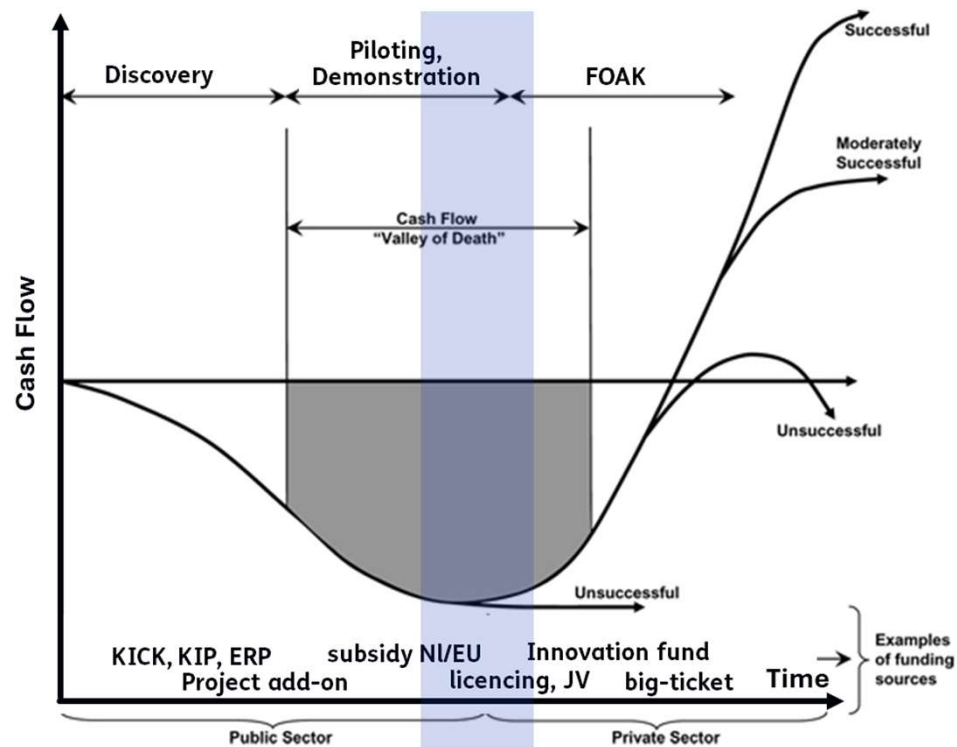
**[initiate-project.eu](https://initiate-project.eu)**



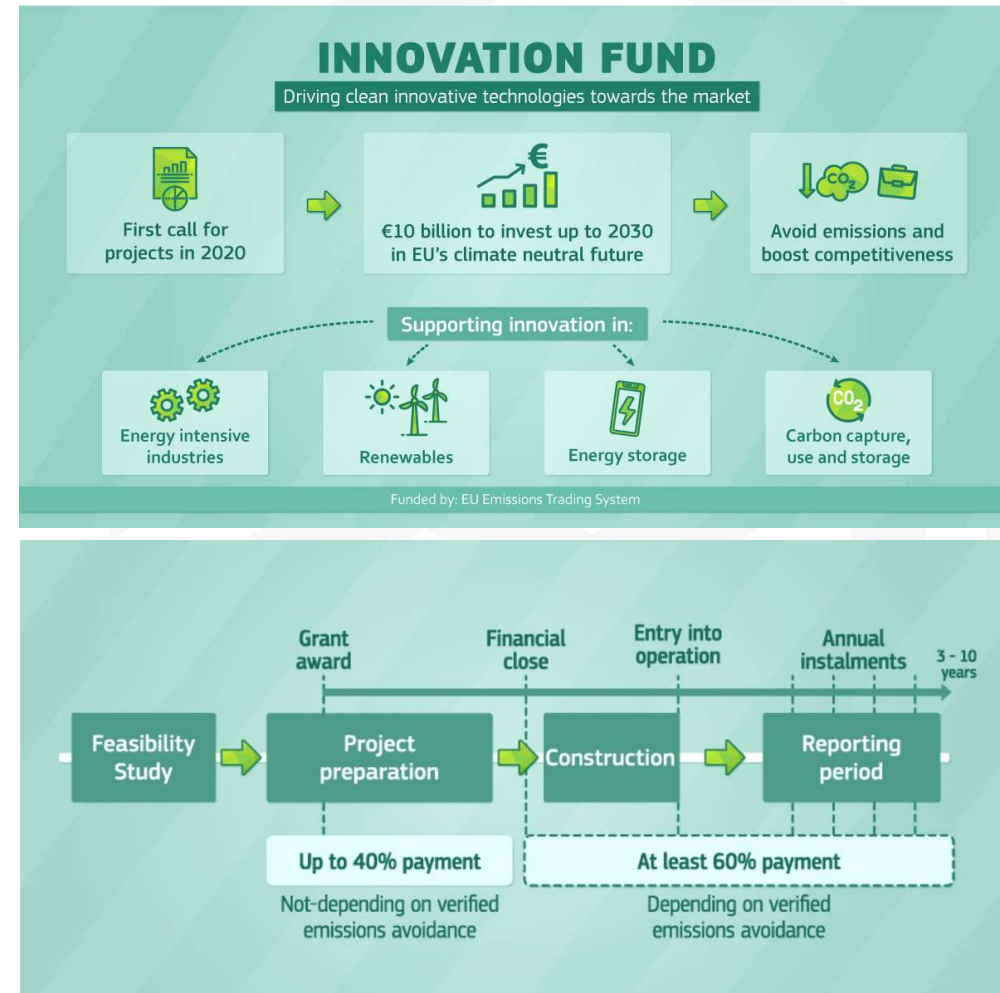
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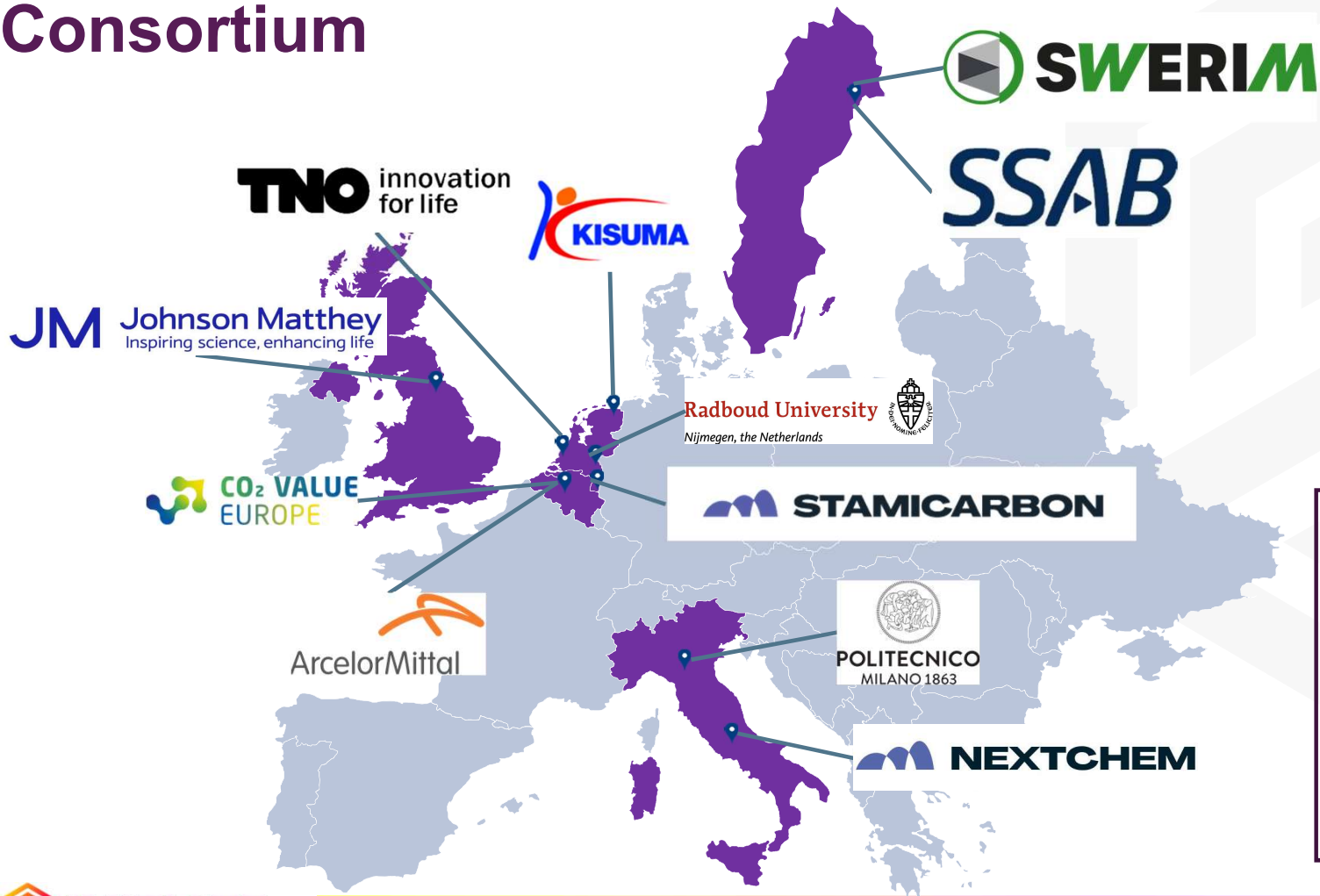
# Valley of death & Funding



estimations TRL8 plant between 30-40 M€



# Consortium



Materials and equipment  
Technology licensors  
End-users  
Knowledge support

5.5 years  
Nov. 2020 – April 2026  
21.3 M€ EU funding  
958318  
H2020-LCCI-2020-EASME  
A.SPIRE