



Carbon Capture and Utilization

Demonstrating Industrial Symbiosis

Eric van Dijk – INITIATE project coordinator (TNO)

Soledad van Eijk – Business Developer Industrial Carbon Capture (TNO)

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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**

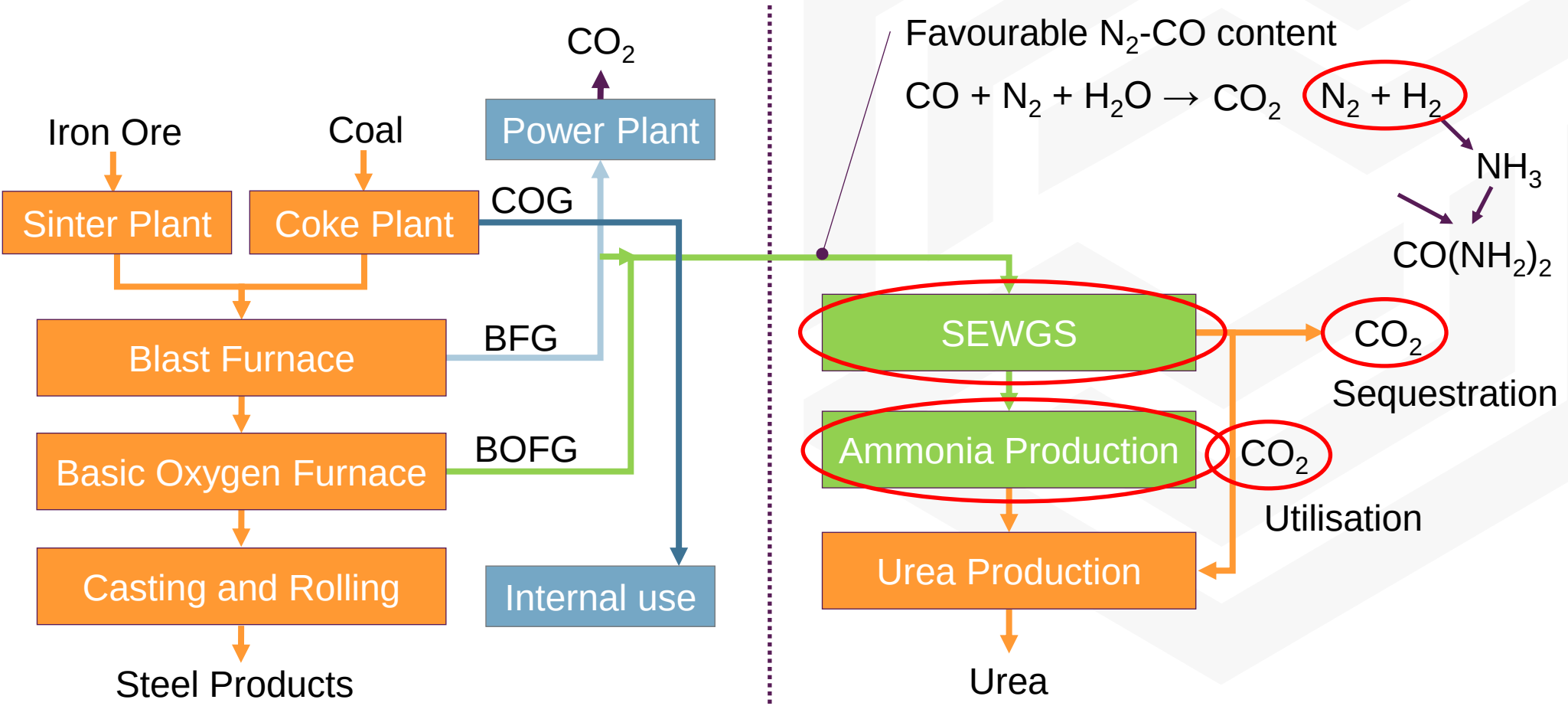
Vision Foak demonstrator at 50 kt/y urea from BOFG

Route

- TRL7 demonstration BOFG to NH_3 ($1.3 \text{ t}_{\text{NH}_3}/\text{d}$ scale)
- Site identification
- Business plan development
- IP&R, ownership, collaboration



INITIATE Industrial symbiosis



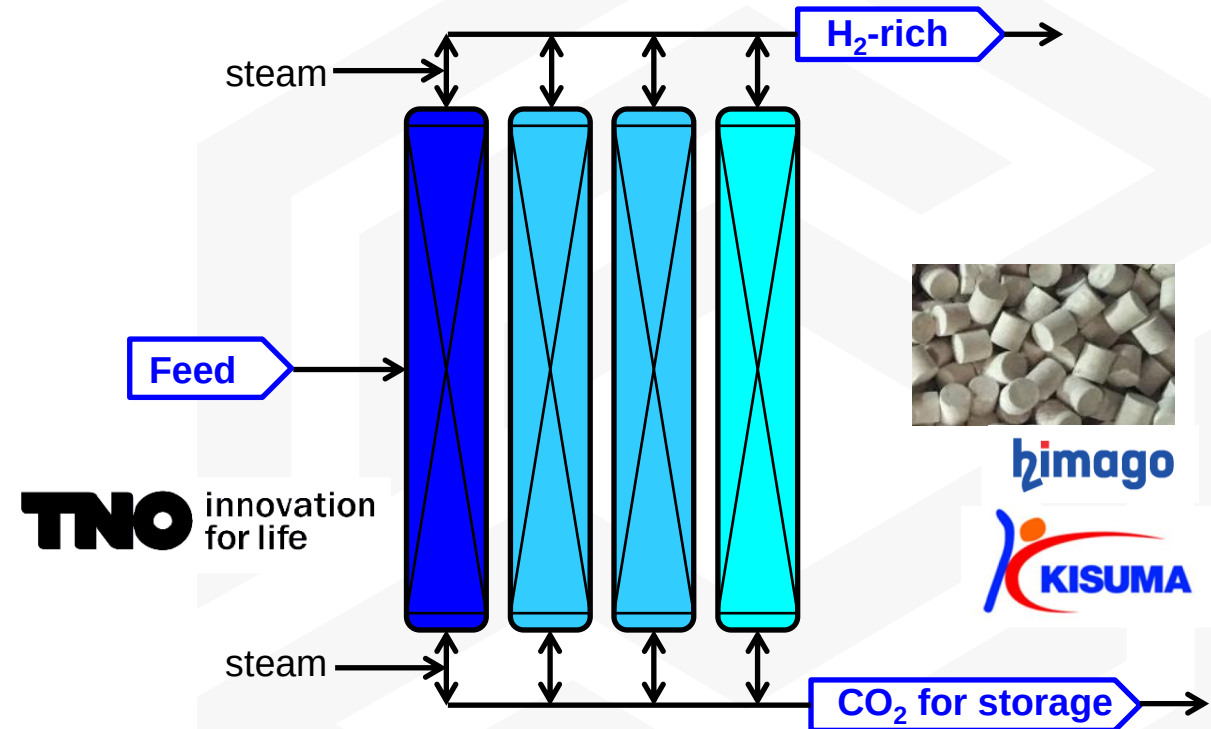
Enabling technologies

SEWGS

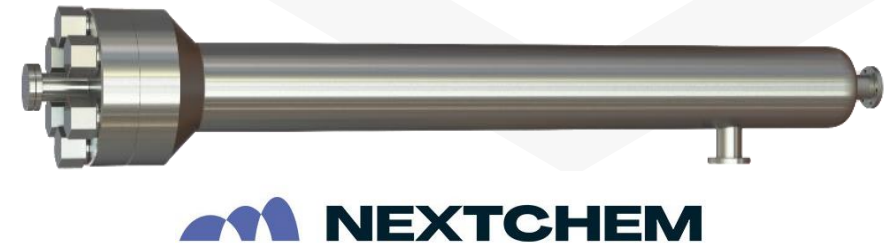
- › Solid sorbent CO₂ removal
- › Minimization of energy requirement

NH₃ Synthesis

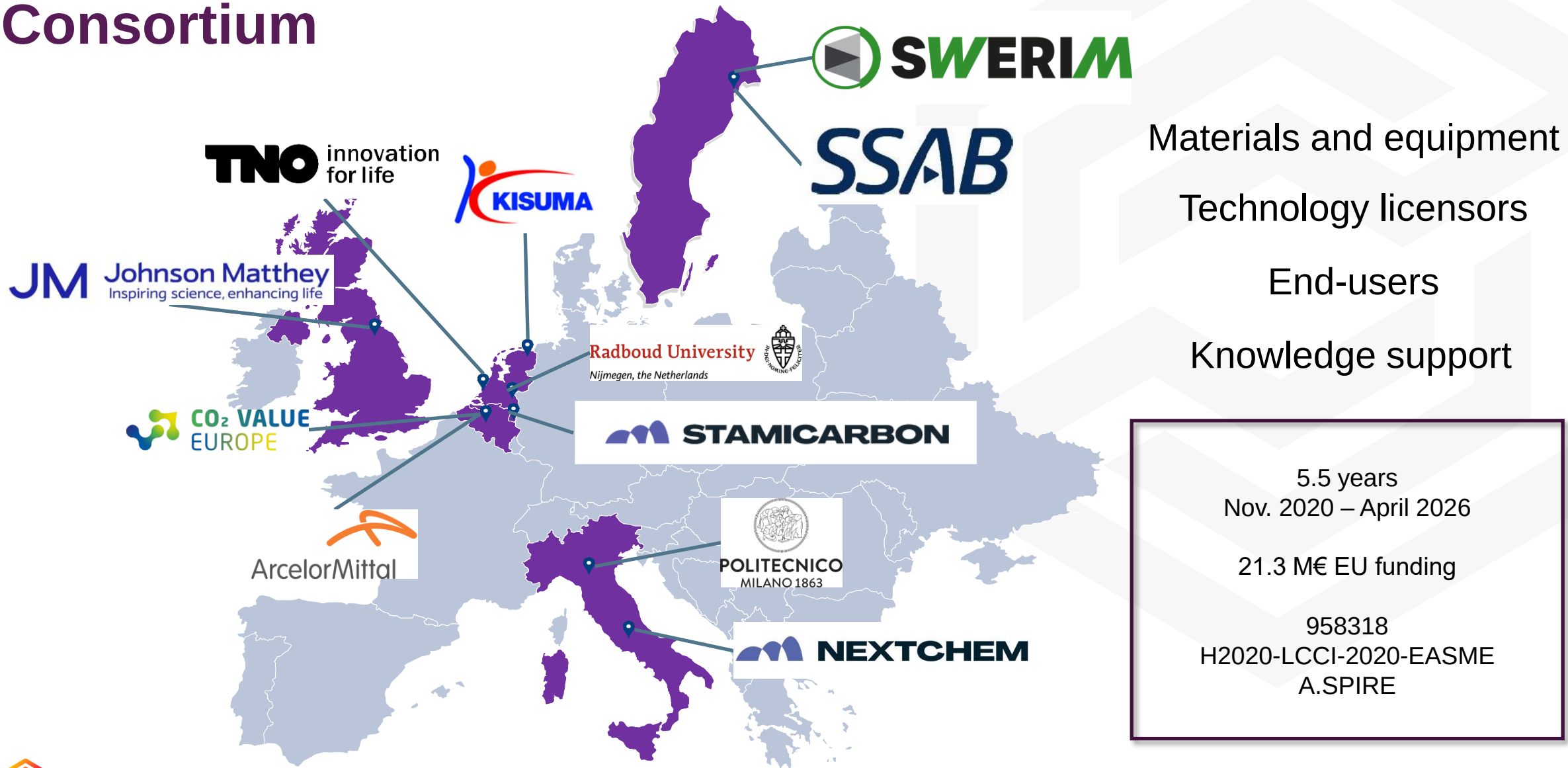
- › Variable H₂/N₂ ratio, dynamics
- › Simplification of knock-out and recycle



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>



Consortium



Materials and equipment

Technology licensors

End-users

Knowledge support

5.5 years
Nov. 2020 – April 2026

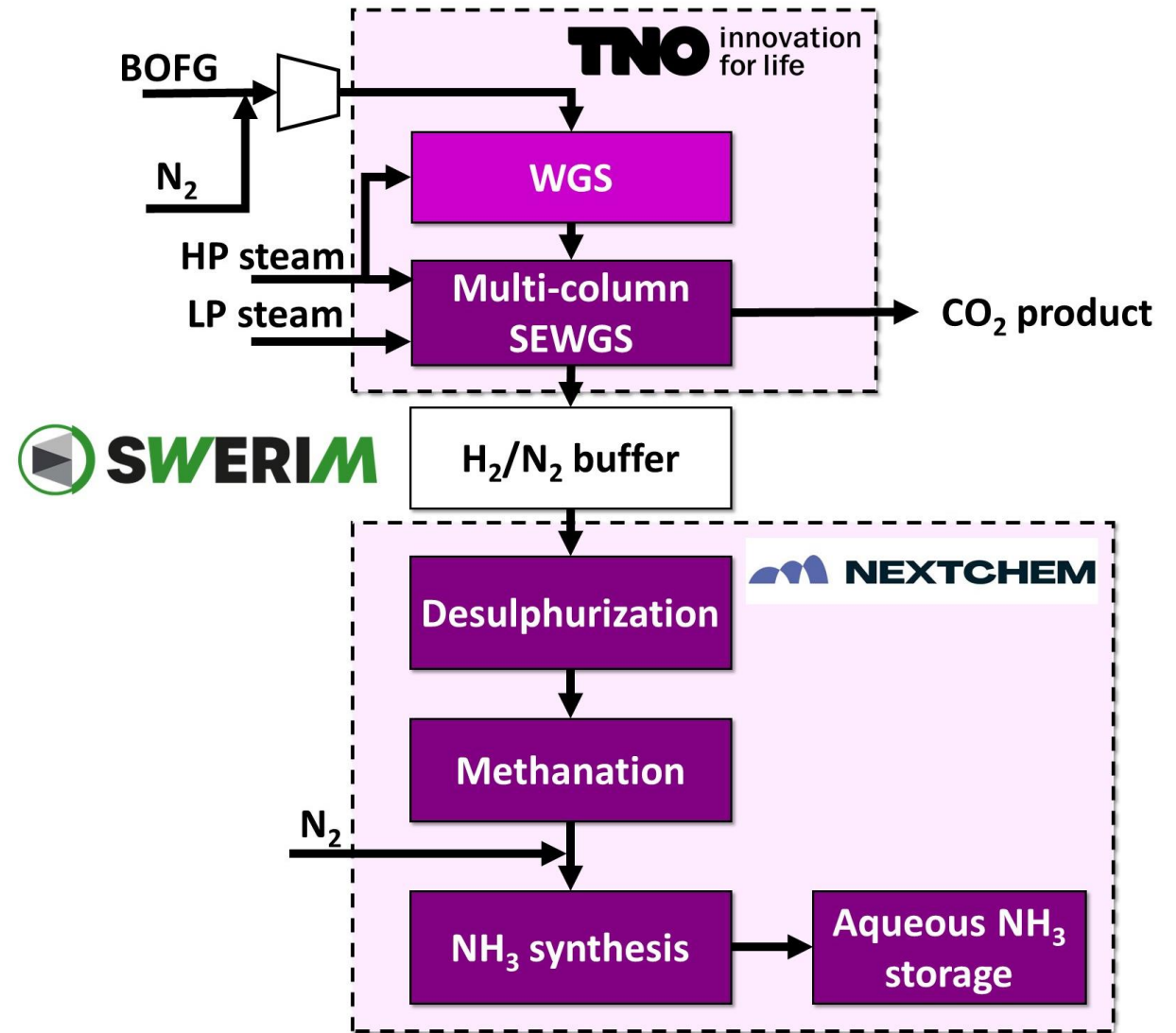
21.3 M€ EU funding

958318
H2020-LCCI-2020-EASME
A.SPIRE

Project Status

TRL7 pilot construction ongoing

- › BOFG to H_2/N_2 testing Q4 2025
- › BOFG to NH_3 testing Q4 2026

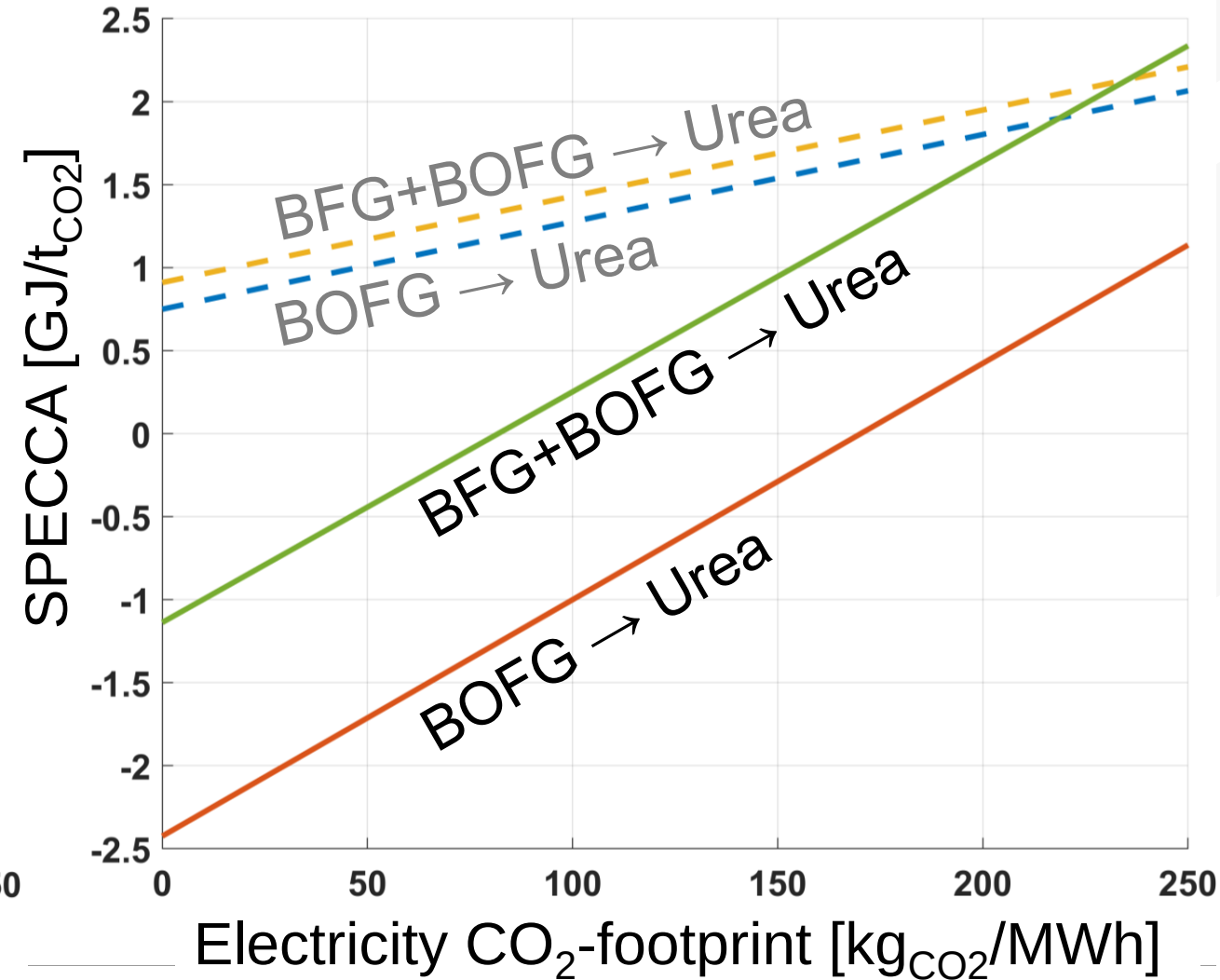
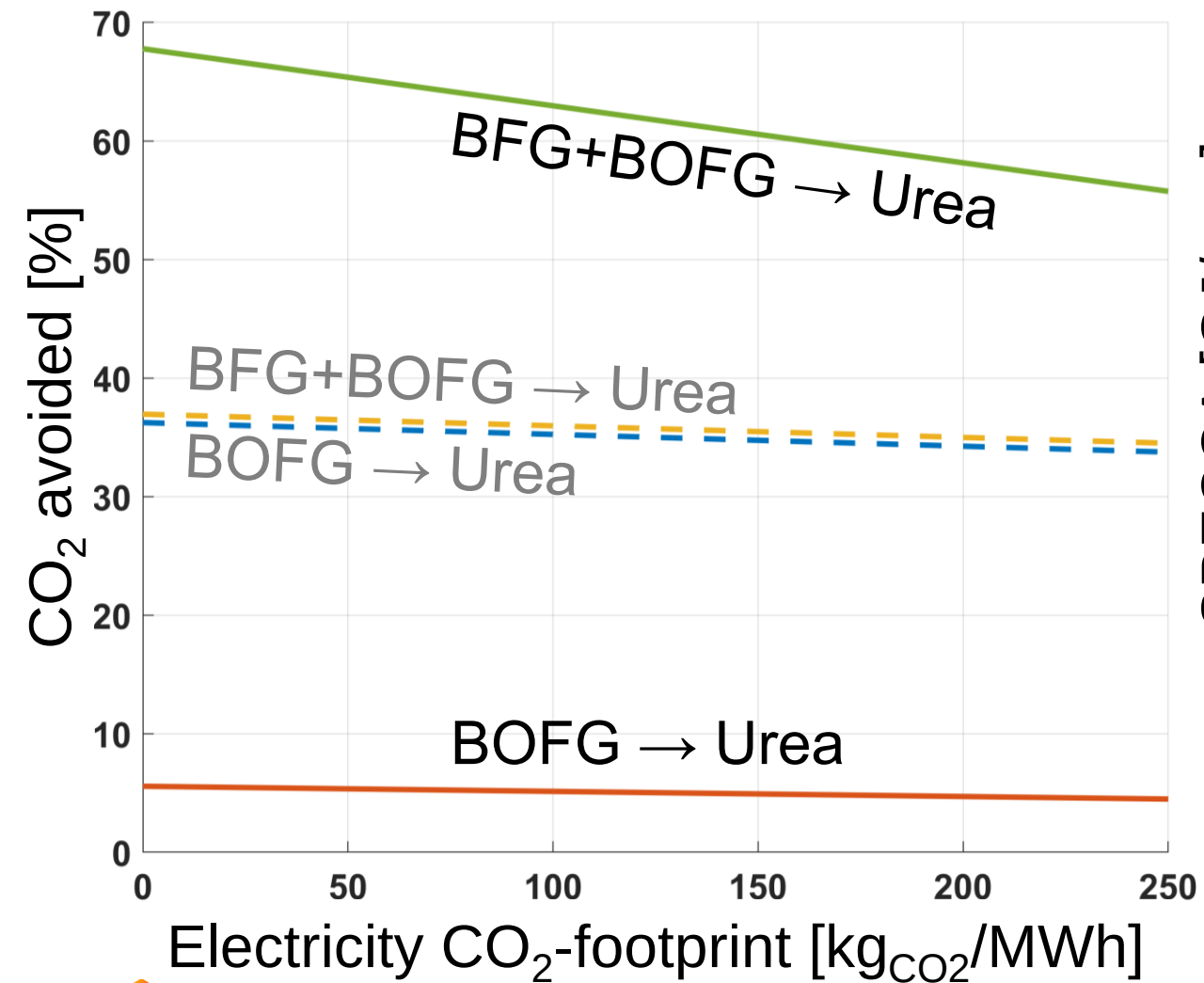


JM Johnson Matthey
Inspiring science, enhancing life
Catalysts for WGS,
Methanation, DeS and NH_3 loop

KISUMA
 CO_2 adsorbent

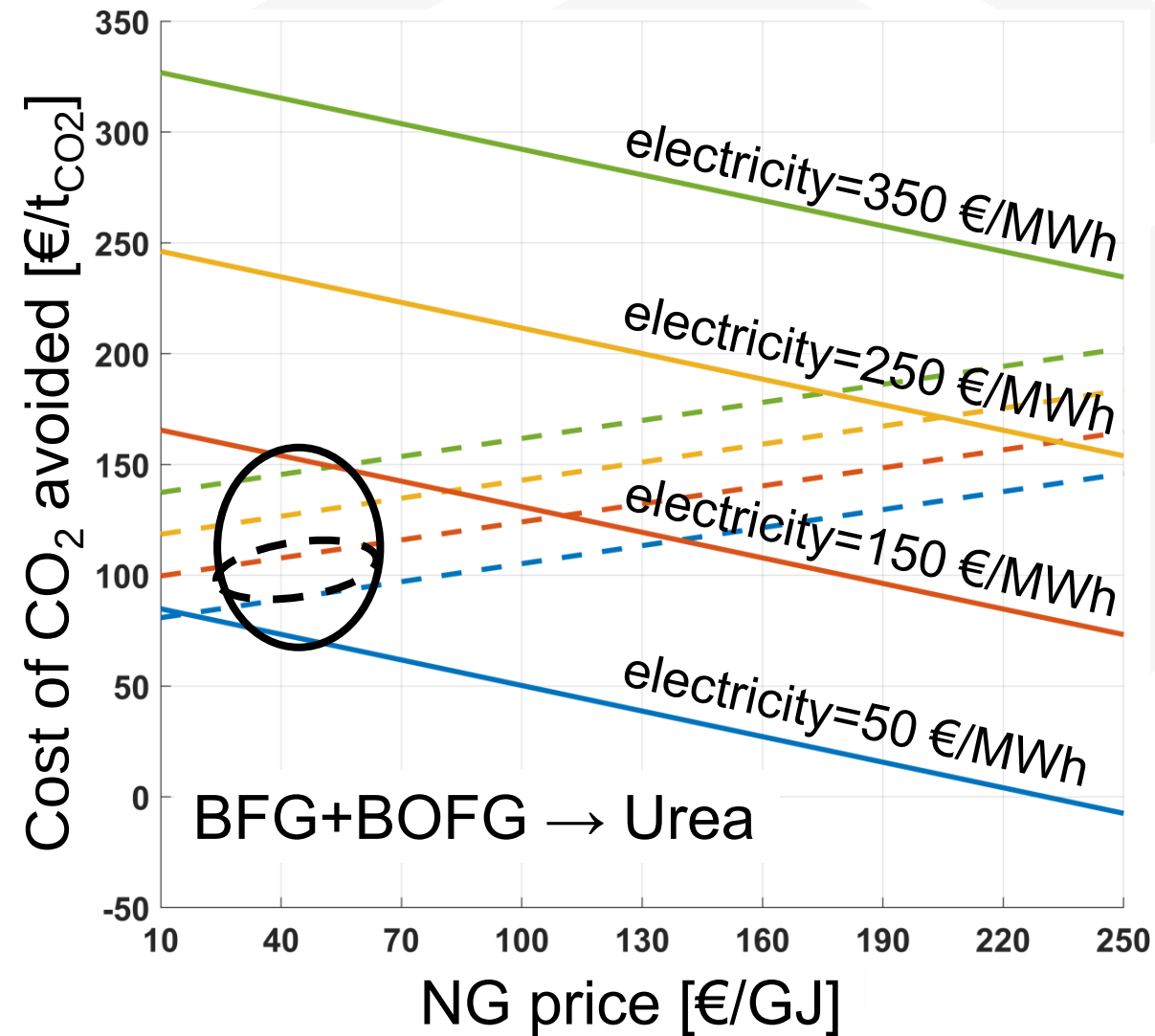
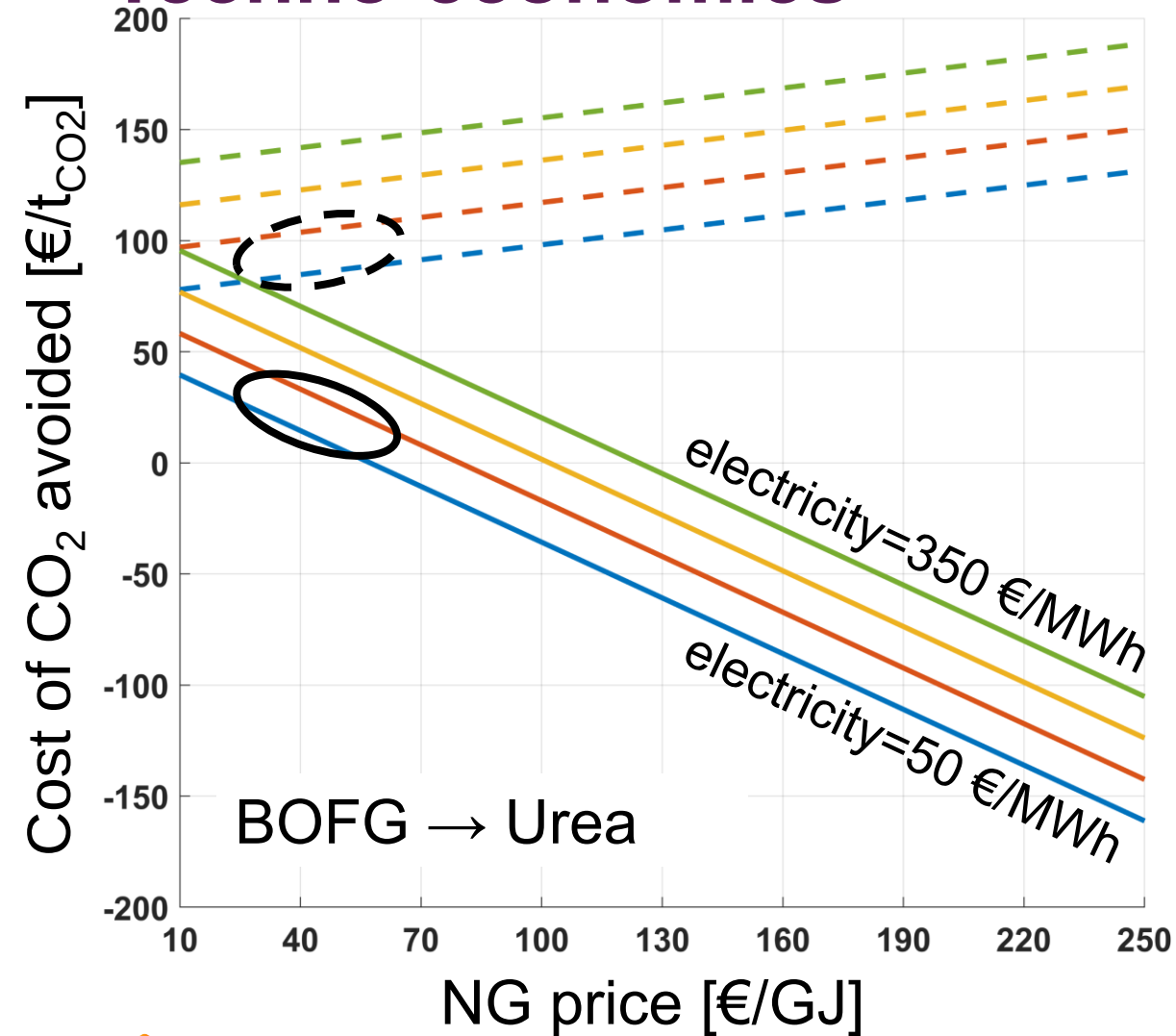
Techno-economics

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

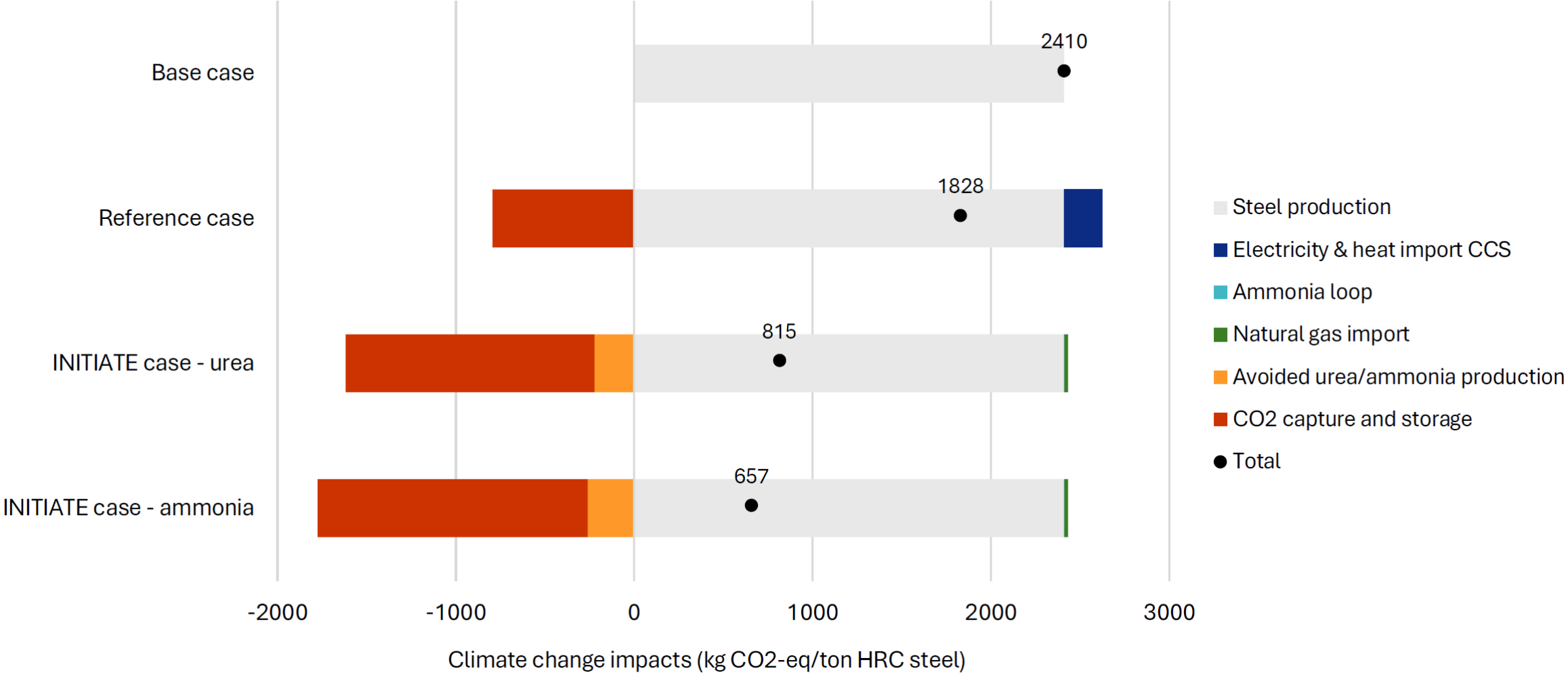


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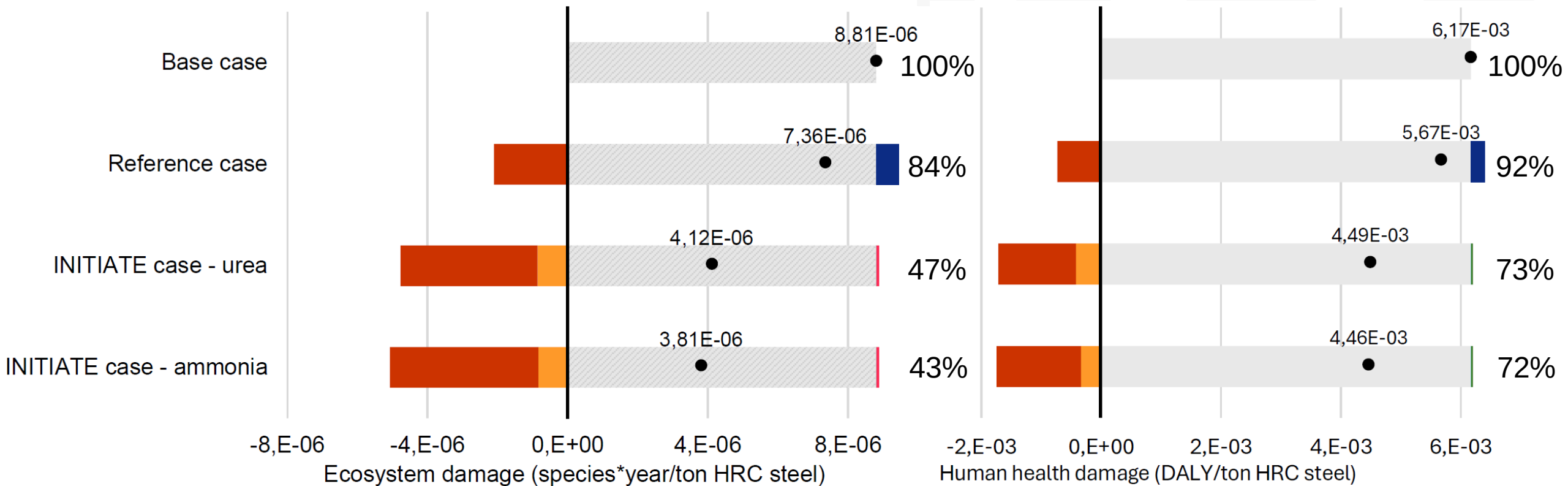
Techno-economics



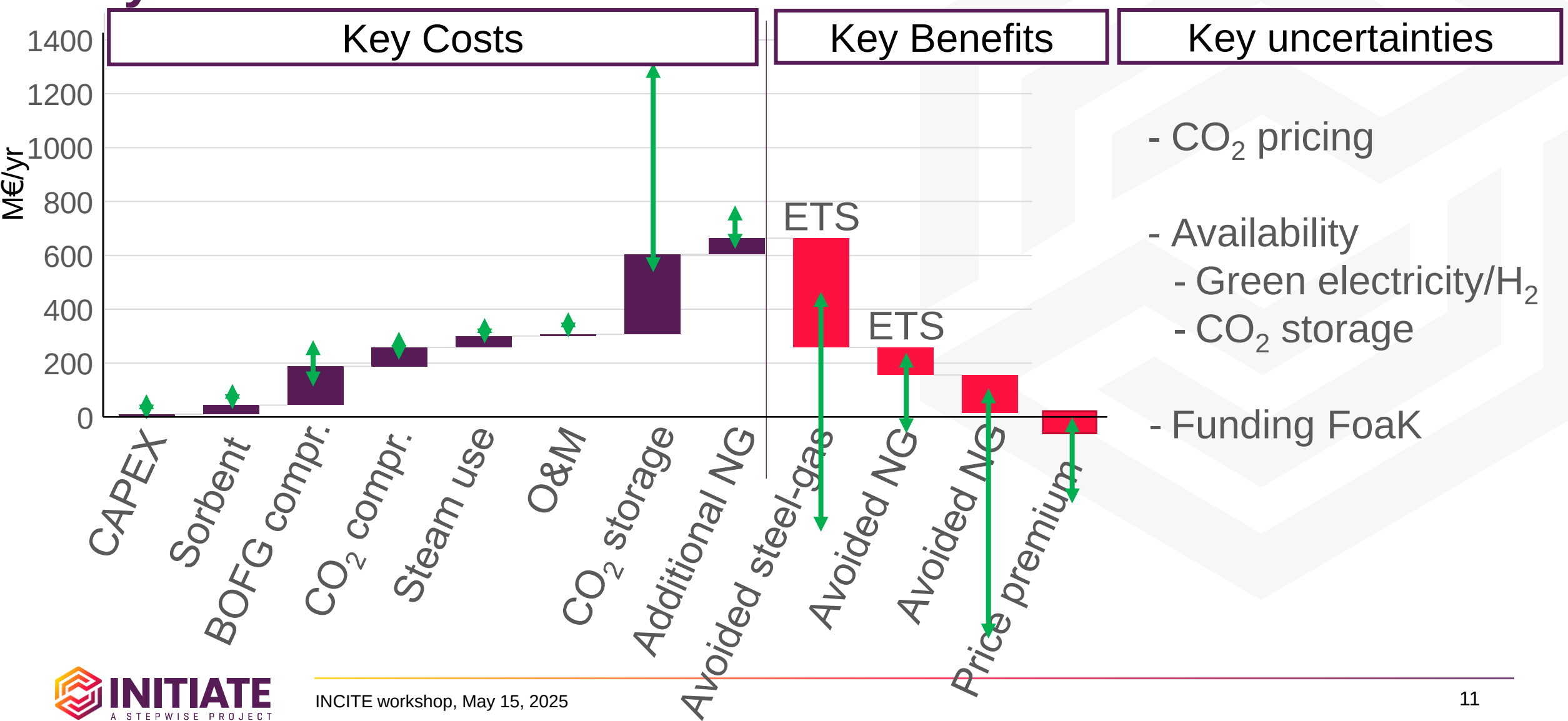
Life-cycle analysis



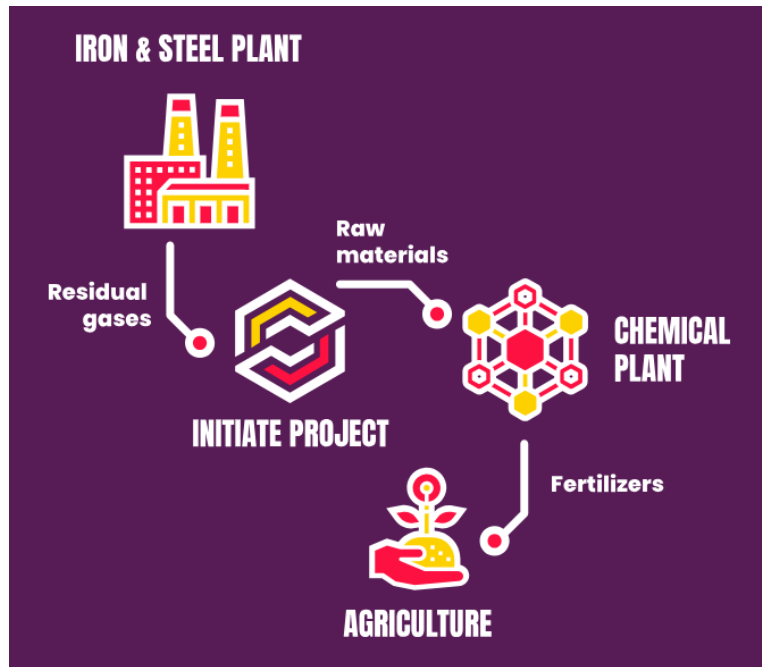
Life-cycle analysis



Key cost drivers and uncertainties



Commercial Implementation Plan

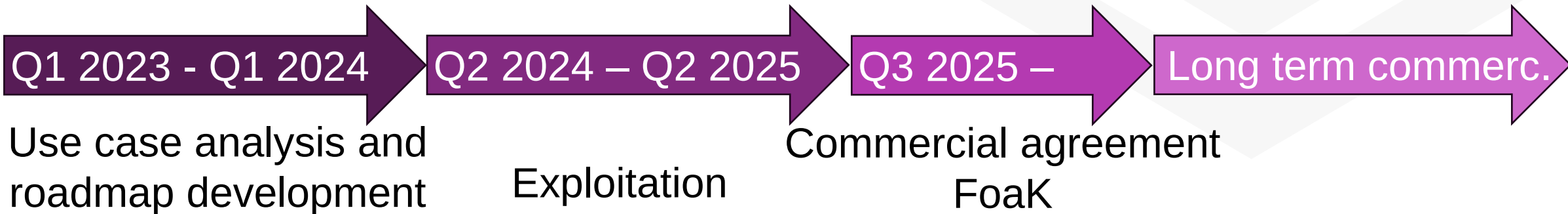


Focus: long-term implementation plan + strategy to align stakeholders' needs

↳ FOAK and the long-term vision

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License Paul Wurth signed





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