Low-Carbon Steel Production

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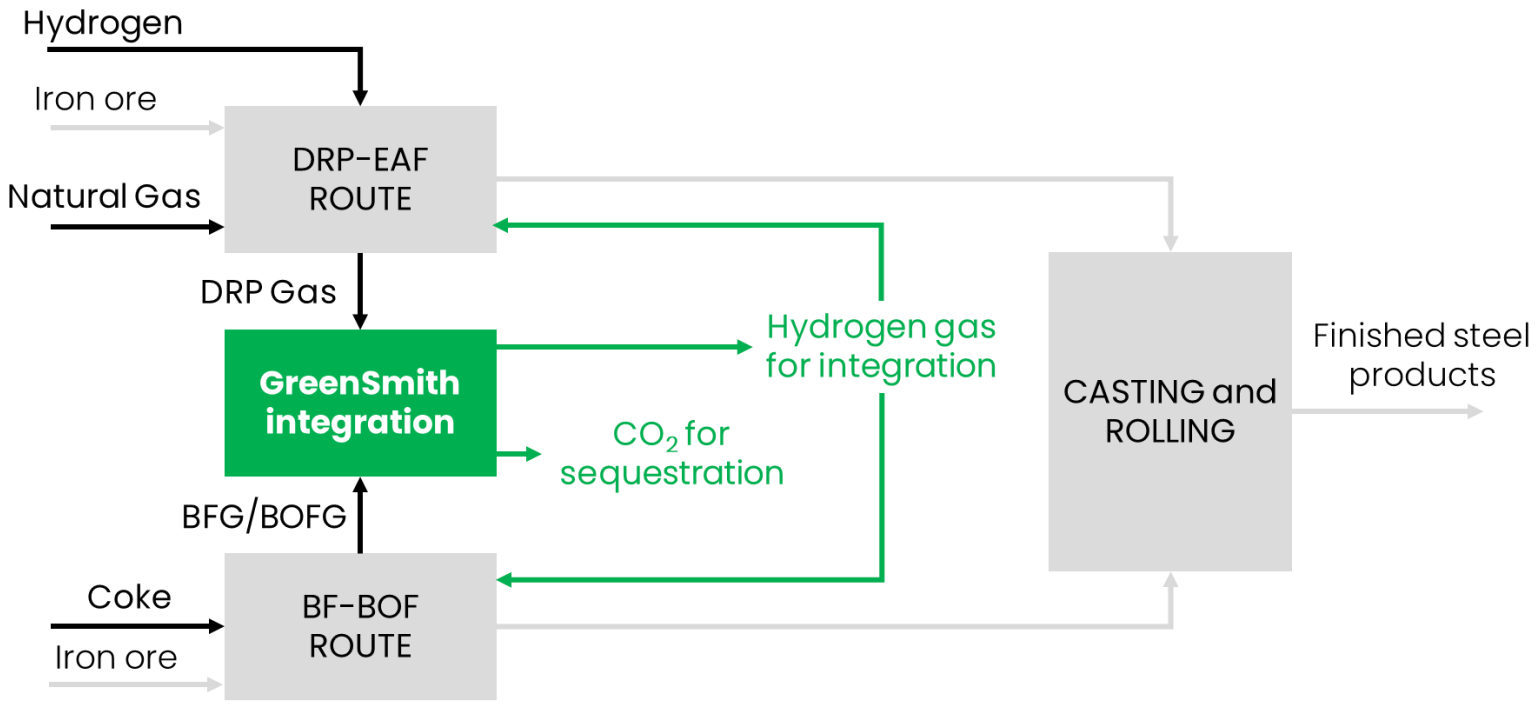
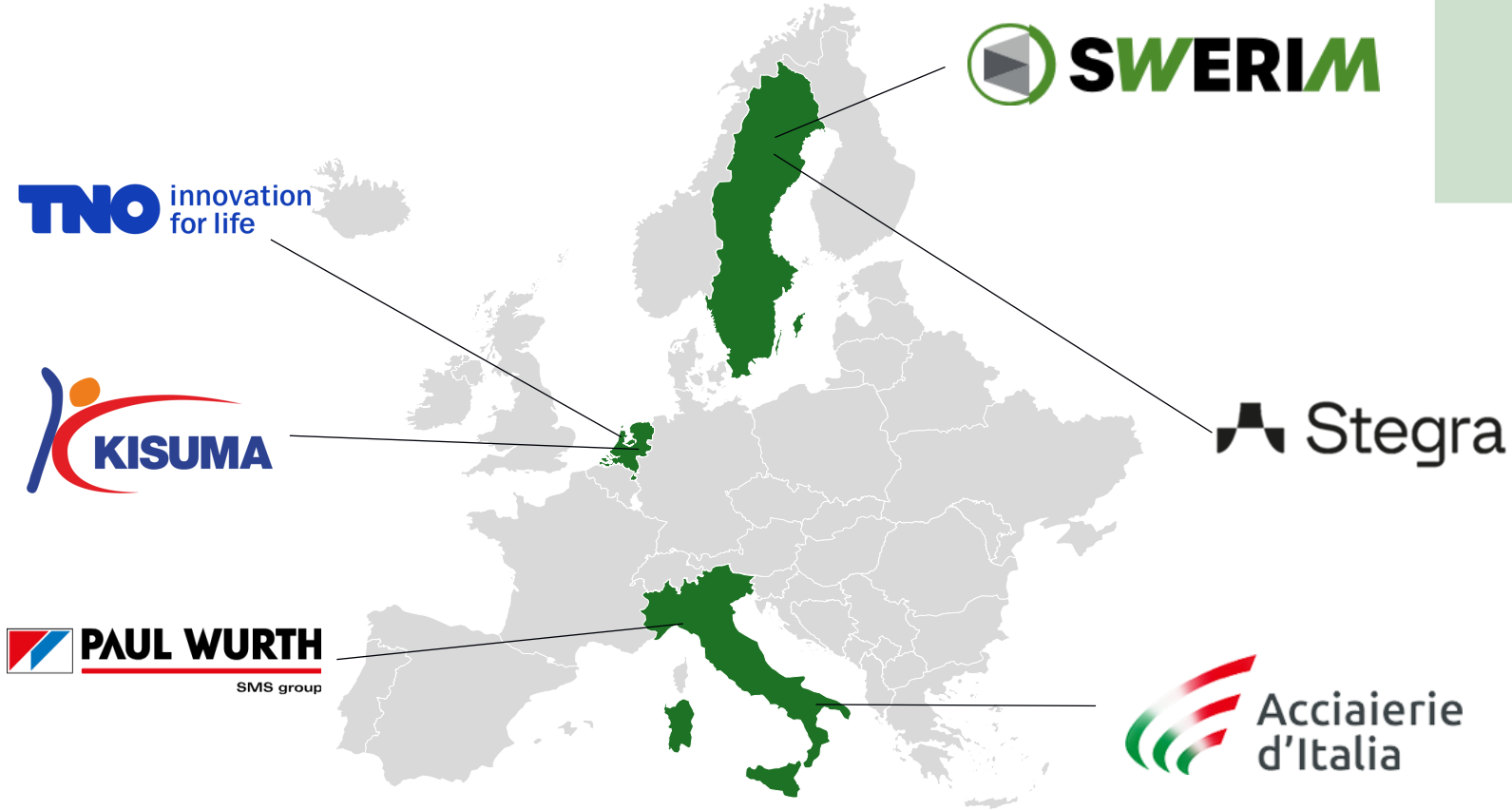
The GreenSmith Project

Demonstration of hydrogen/CO recovery from various integration routes of BF and DRP:



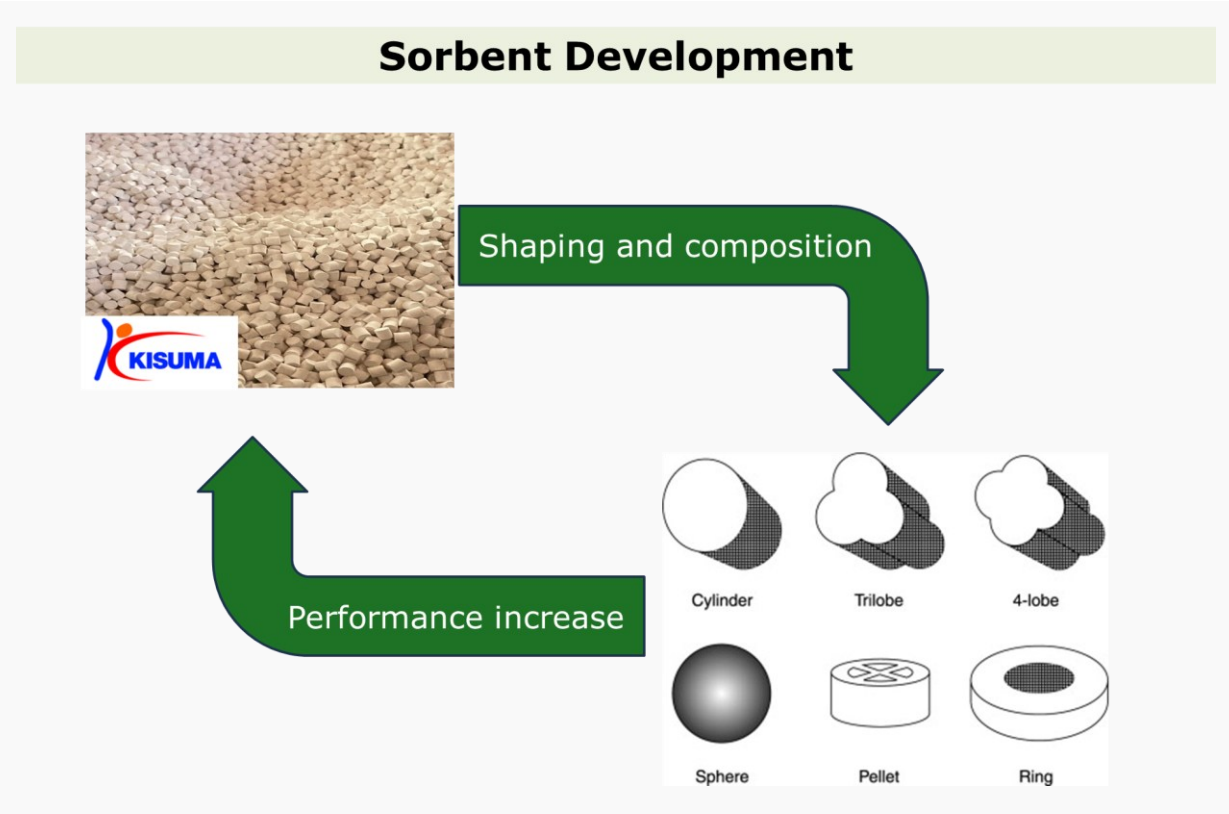
GreenSmith - Partners

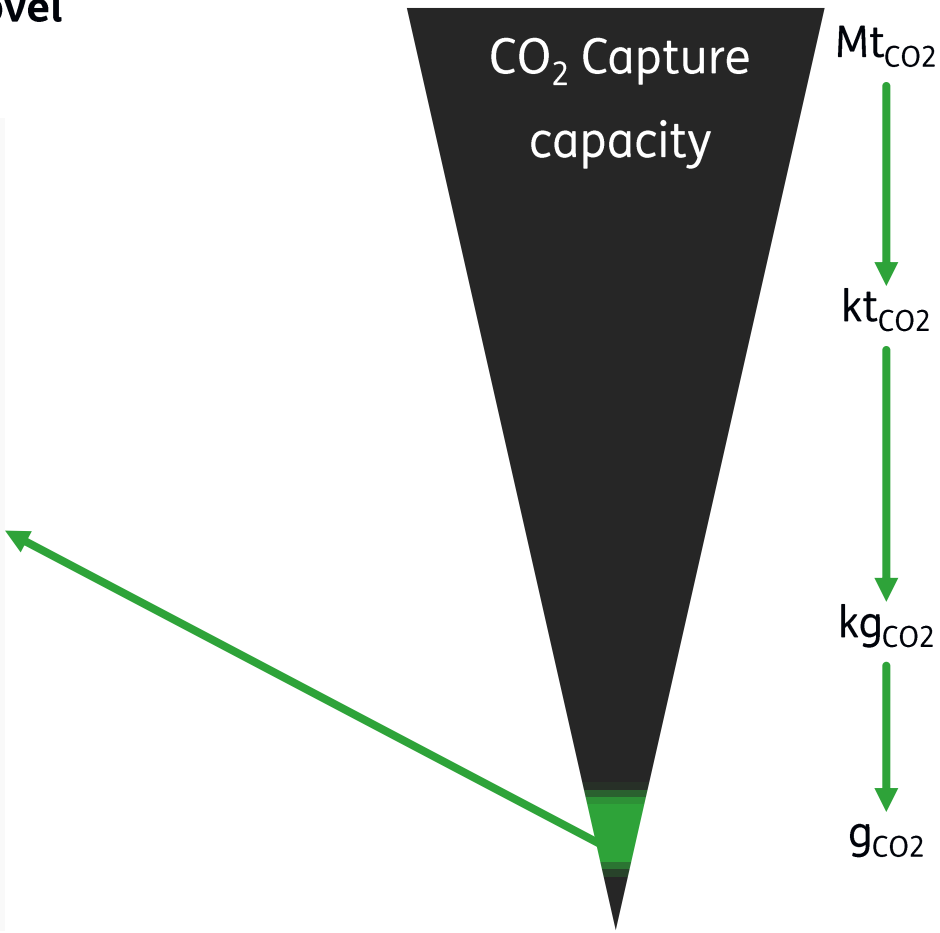
Project Passport	
Duration	July 2024- Sept 2026
Budget	2.8 M€
Consortium	Full Value Chain covered: • End-Users • Technology Suppliers • Research organisations



The Green Smith Project : Goals and Outcomes

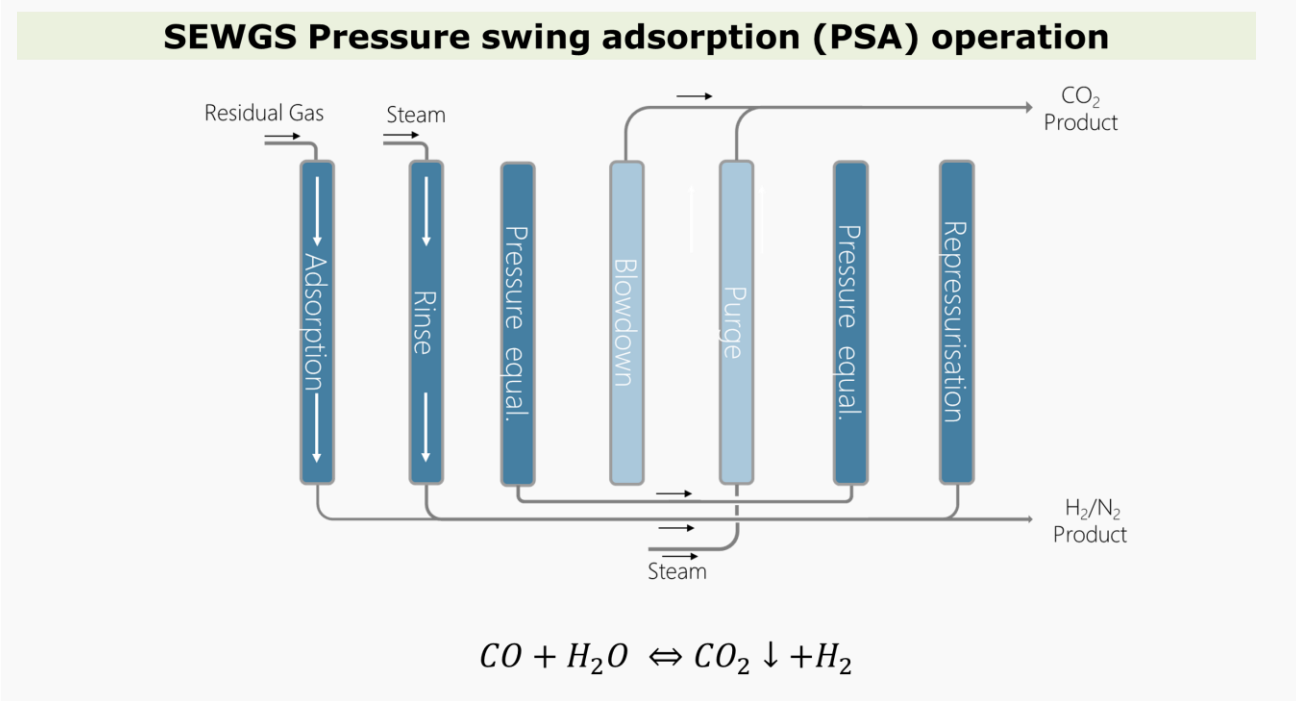
- Demonstrating a two-fold increase of SEWGS productivity by utilising **novel Himago™ adsorbents** crafted with advanced shaping techniques;

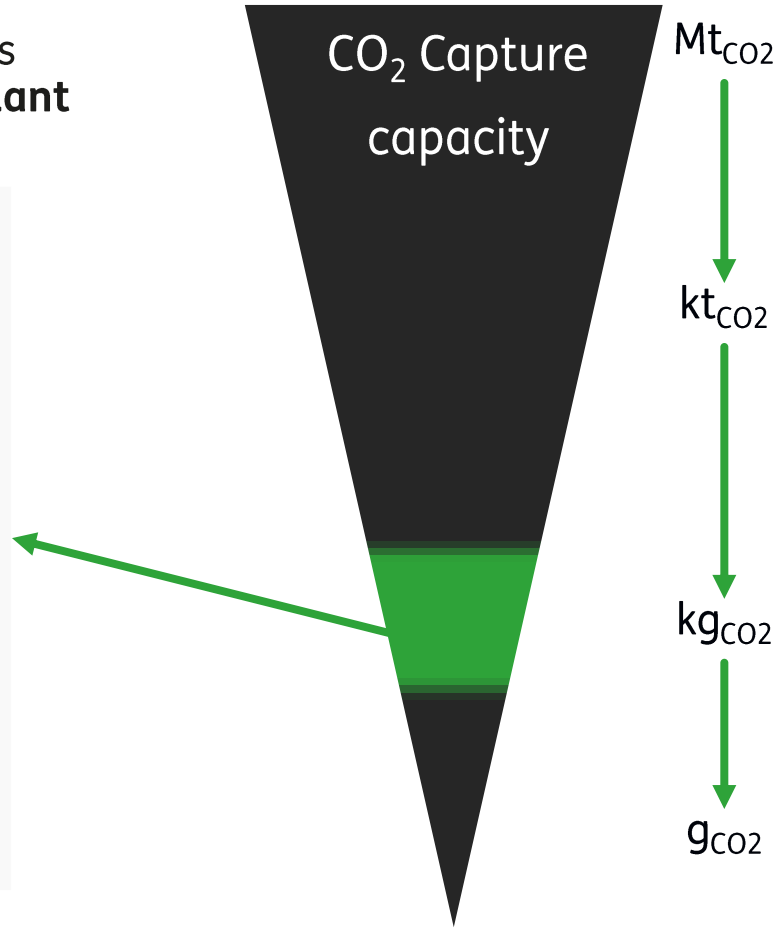




The Green Smith Project : Goals and Outcomes

- **Achieving TRL5 demonstration** of H_2-rich product streams recovery by **SEWGS** (Sorption Enhanced Water-Gas Shift) from relevant mixtures of residual steel gas from **Blast-Furnace (BF)** route and novel CH_4- and H_2-based **Direct Reduction Plant (DRP)** route

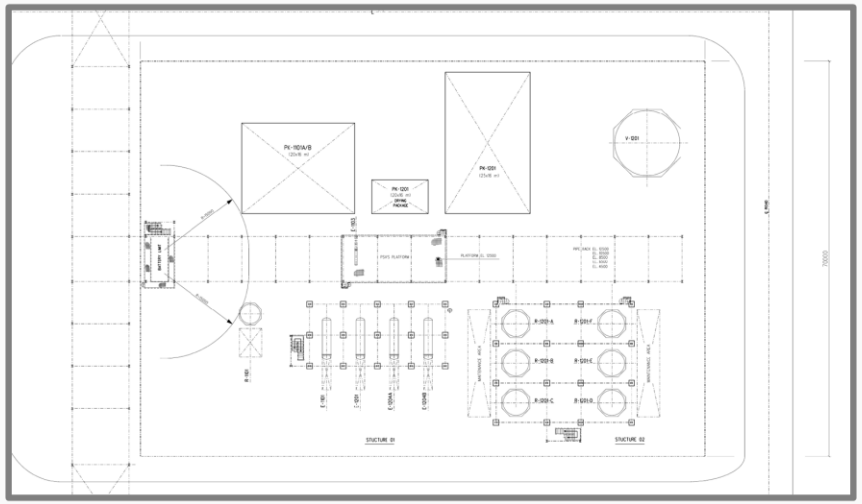




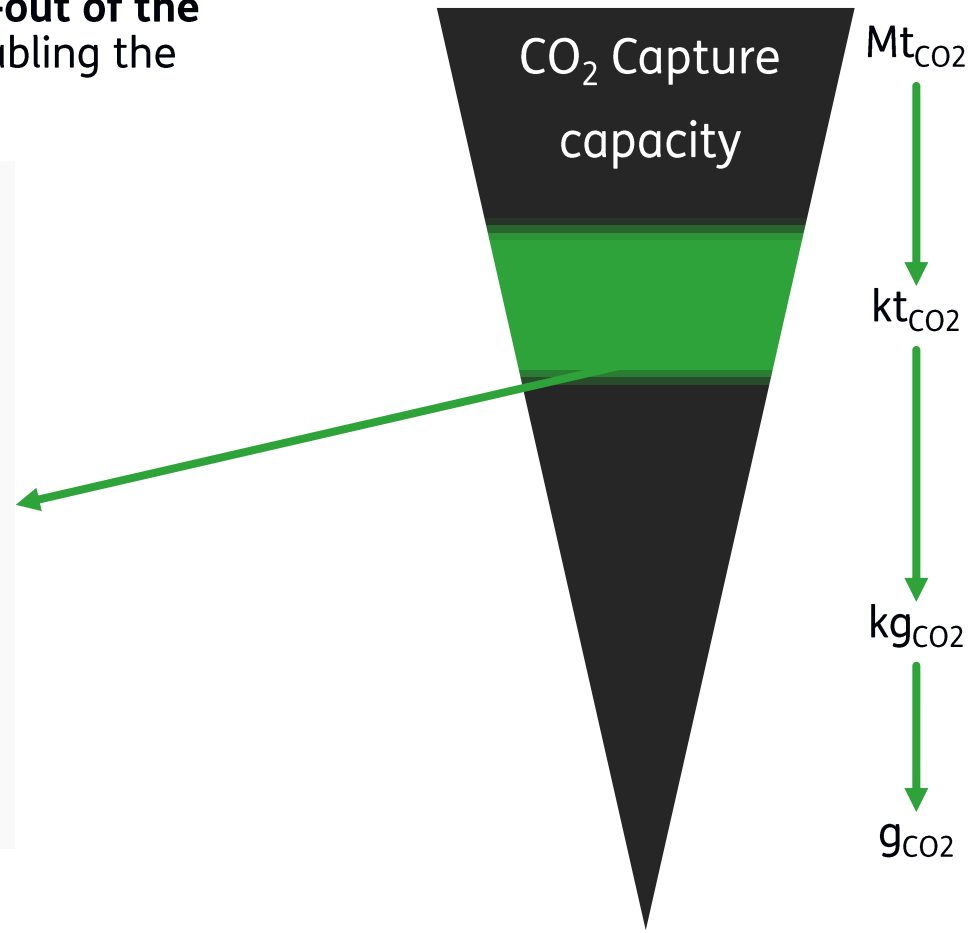
The Green Smith Project : Goals and Outcomes

- Establish a generic **Basic Engineering Design Package for a TRL8 roll-out of the technology** (50 ktonCO2/y from BFG at ADI's site in Taranto, Italy), enabling the replication potential and market diffusion.

Basic Engineering for TRL8 Plant



Example of a plot plan from project STEPWISE



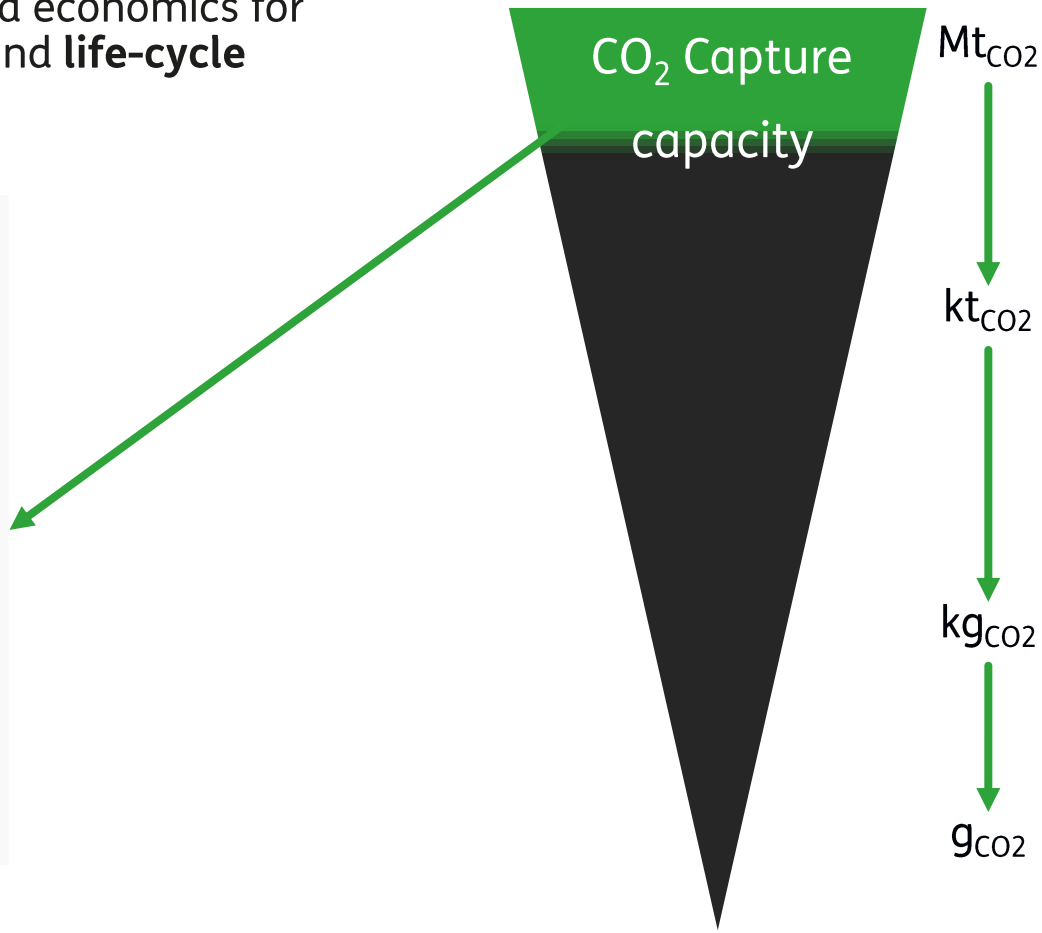
The Green Smith Project : Goals and Outcomes

- Showcasing competitive performance in terms of sustainability and economics for two implementation cases through **full scale techno-economics** and **life-cycle analysis**

Analysis of large-scale application

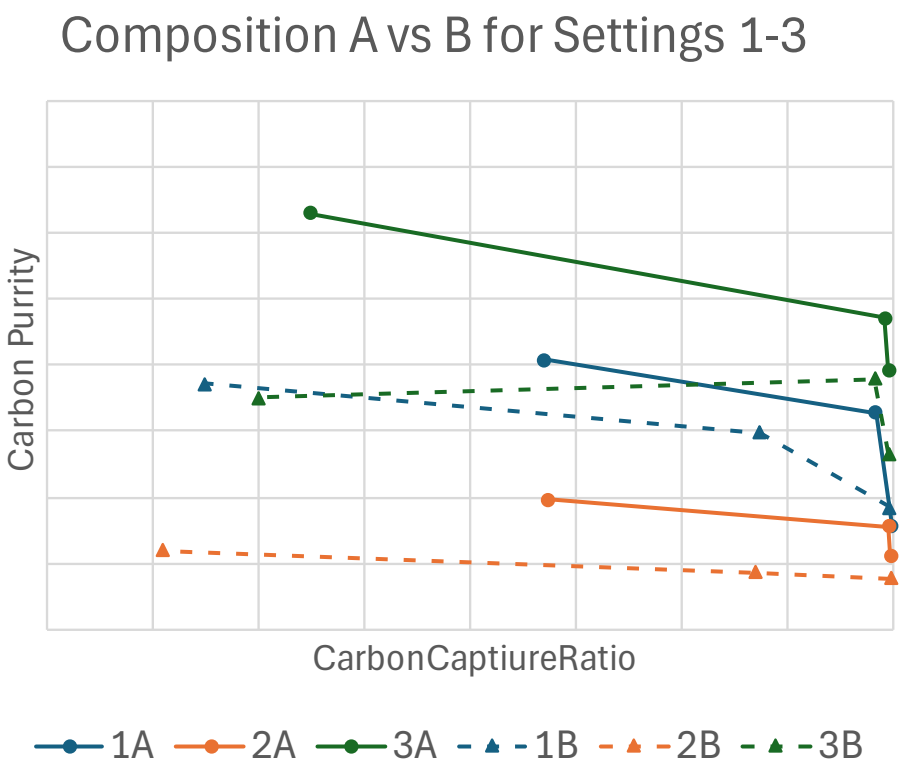
AdI's Taranto Site

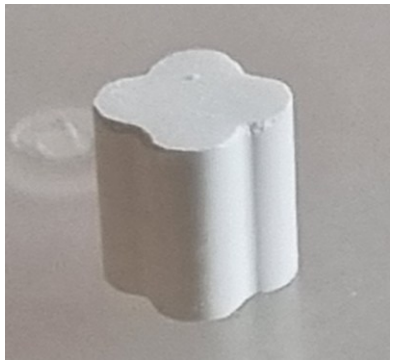
Stegra's Boden Site



The Green Smith Project : First Results

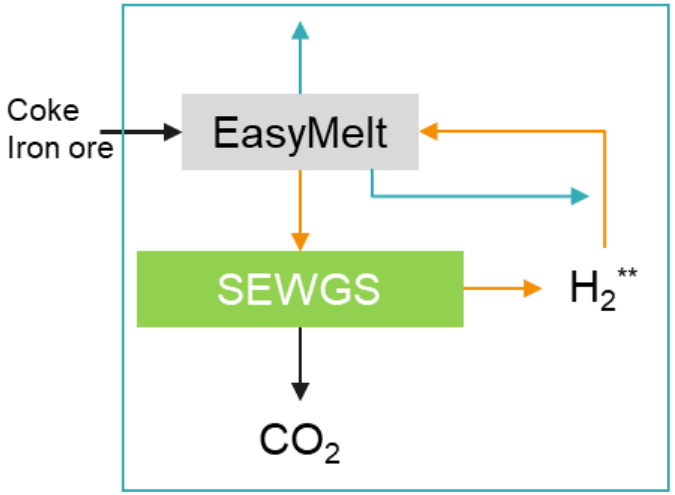
- Novel composition and shaping:



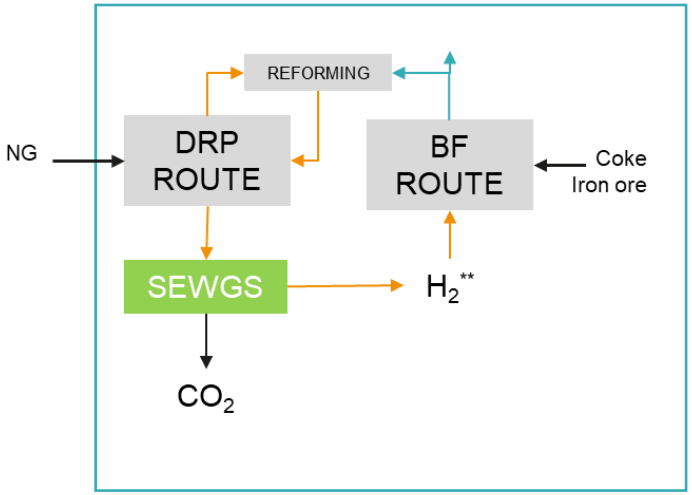


The Green Smith Project : First Results

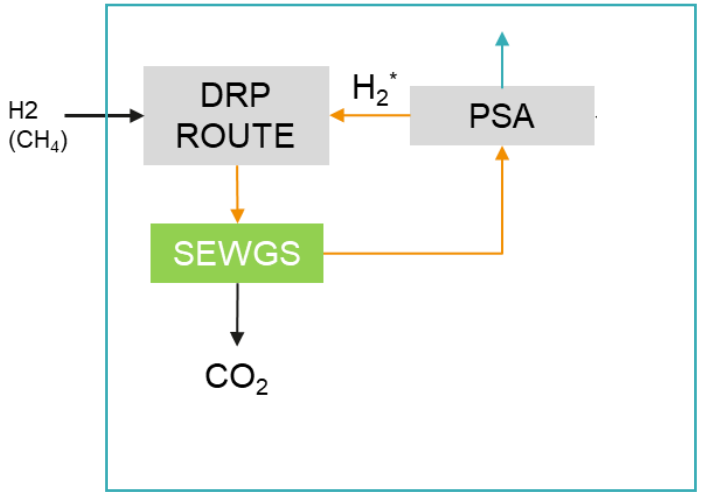
- Process integration



ROUTE 1: EasyMelt gas recycling



ROUTE 2: CH_4DRP-BF integration



ROUTE 3: H_2DRP gas recycling (H_2GS)

Consumptions	BASE CASE	**ROUTE 1**	**ROUTE 2a**	**ROUTE 2b**
Coke Rate	300 kg/tHM	-12% : -18%	**-20% : -35%**	-2% : -8%
Pulverized Coal Injection (PCI)	220 kg/tHM	**-38% : -48%**	+15% : +25%	+45% : +55%
CO_2 Saving	0%	**15% : 25%**	**15% : 25%**	**15% : 25%**
Hot Metal Production	140 tonHM/h	140 tonHM/h	140 tonHM/h	140 tonHM/h

Green Smith

More info at: greensmith-cetp.eu

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