Aker Clean Hydrogen

Handelsbanken's
sustainability insight event – 17.11.2021

AKER CLEAN HYDROGEN

Aker Clean Hydrogen in brief

Integrated clean hydrogen producer

Develop, build, own, and operate hydrogen facilities

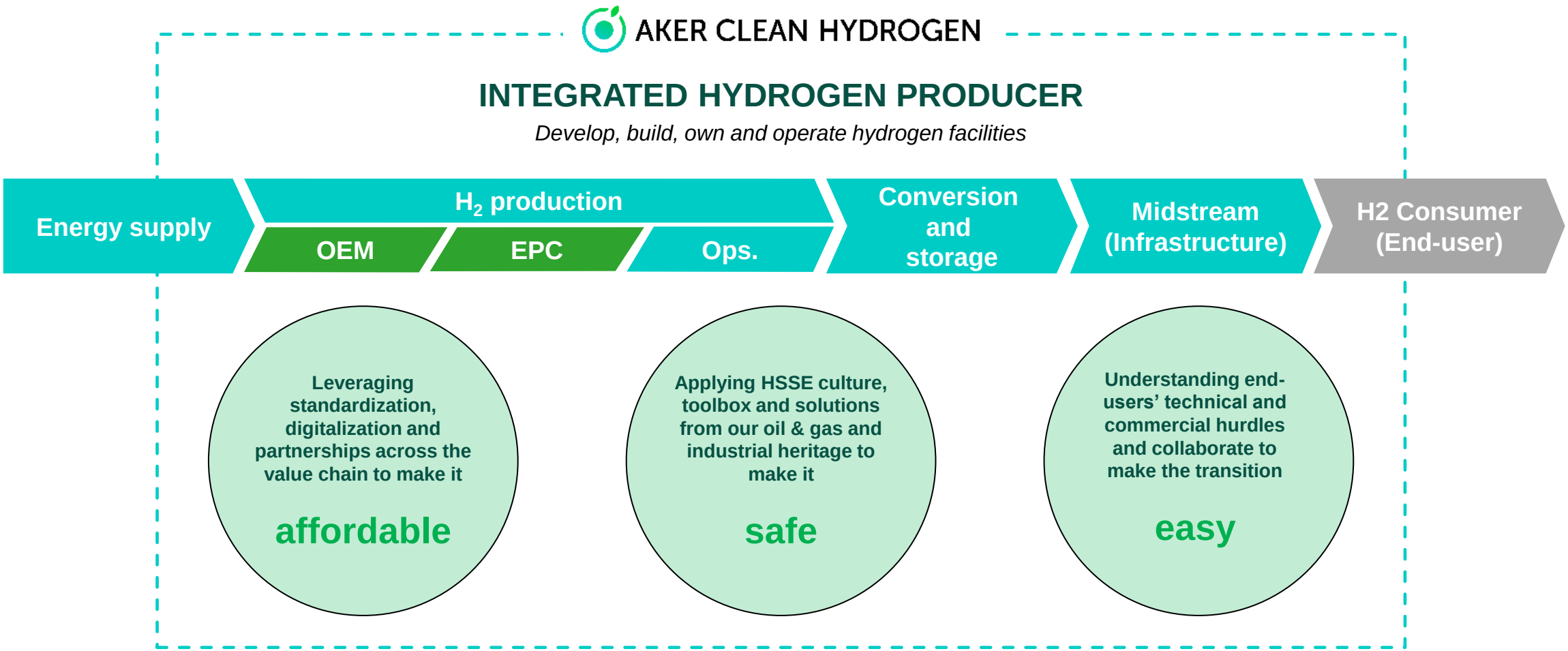
>1.8 GW net capacity project & prospect portfolio

Projects and prospects in Norway, Chile, and Uruguay

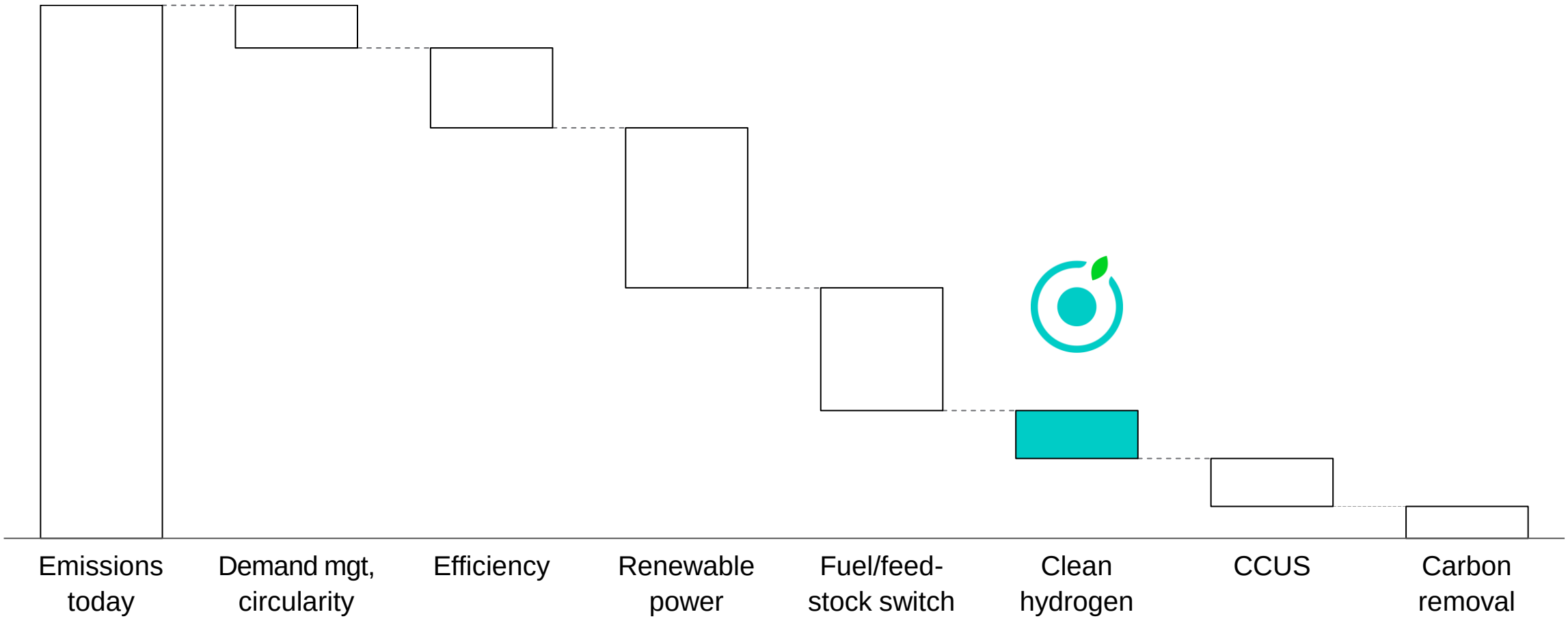
Target of 5.0 GW net installed clean hydrogen capacity in 2030

Meaningful impact of reducing **9.4 million** tons CO_2 emissions per year

Affordable hydrogen made safe and easy
Enabling efficiencies across the hydrogen value chain



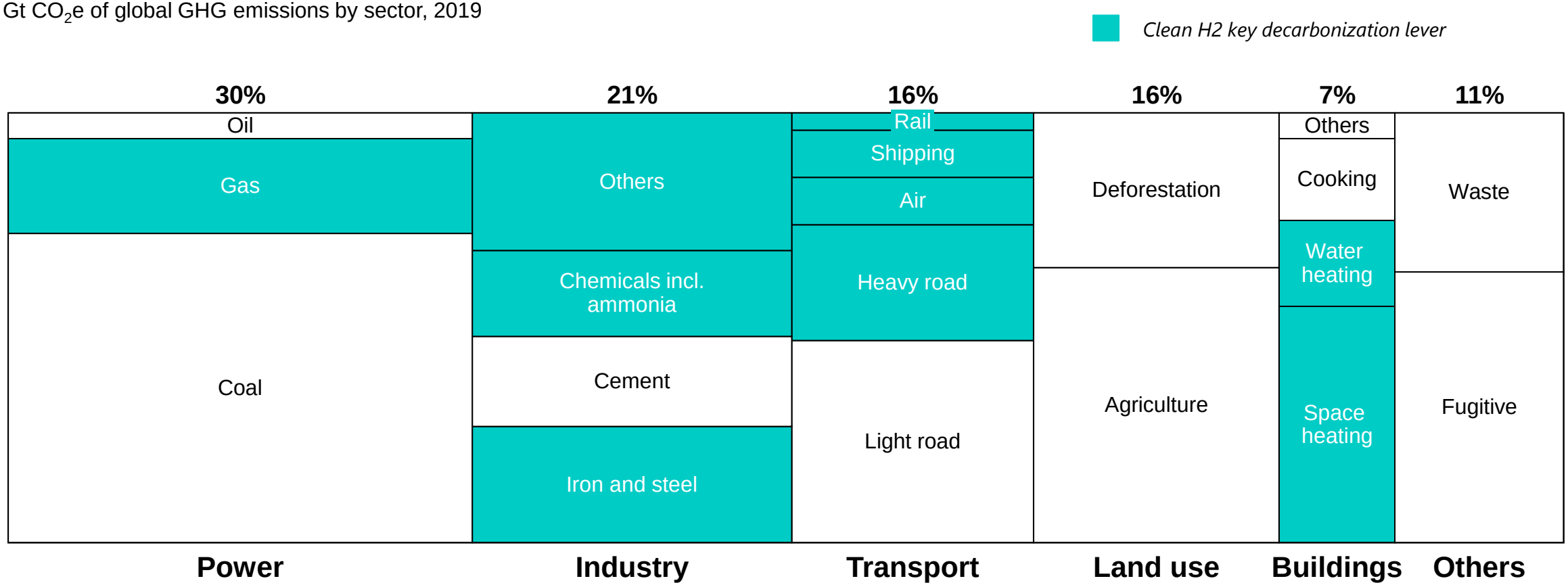
Clean hydrogen a key lever to meet net zero



Note: Indicative overview | CCUS = Carbon Capture, Utilization and Storage Source: IEA

Power, industry, transport and buildings require hydrogen

Gt CO_2e of global GHG emissions by sector, 2019



Source: EDGAR 5.0, IEA, UNEP Emissions Gap Report

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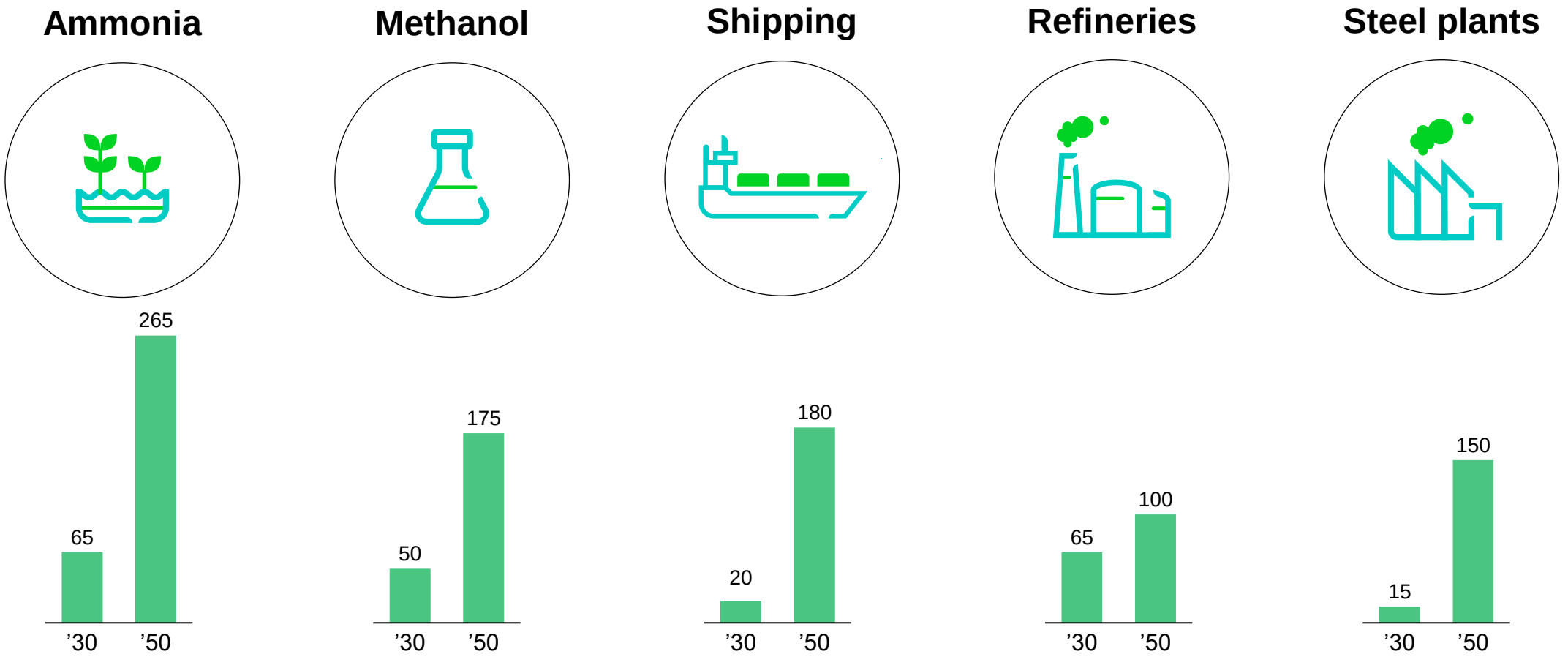
Targeted industrial clean hydrogen markets >200 GW in 2030 and >850 GW in 2050, representing a significant opportunity for Aker Clean Hydrogen



Note: Ammonia estimate excludes ammonia used in shipping
Source: BCG, ACH estimates

Hegra project: Developing Europe's largest industrial-scale green ammonia facility, removing ~800,000t of CO2 per year

480 MW(1)

Green ammonia

33% ownership

Key partners

Co-developer partners	YARA, Statkraft
Value chain partners	YARA, Statkraft

Project highlights

- HEGRA JV company established
- Joint commercial and execution team established
- Feasibility study progressing as planned
- Strong and good dialogue with stakeholders

The picture is indicative and meant only for illustration purposes at this moment until proper design reviews have been executed in the team.

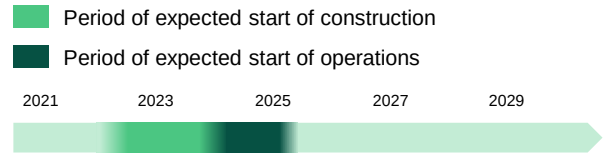
Green Ammonia Berlevåg project: Green ammonia plant to decarbonize the arctic, removing ~200,000t of CO2 per year

~100 MW(1)

Green ammonia

50% ownership

Timing and milestones



Key partners

Co-developer partner	VARANGER KRAFT
Value chain partners	GRIEG, WÄRTSILÄ, STORE NORSKE

Project update

- Technical feasibility study and concept phase completed – opportunity to expand to 200 MW
- Extended license deadline for 103 MW wind farm on Raggovidda
- LOI for ~300,000 ton ammonia per year signed - >3.5x times planned capacity
- Liv Monica Stubholt appointed chairman in project SPV, Green Ammonia Berlevåg AS

Example: Making ammonia easy for Longyearbyen

Renewable energy supply	Hydrogen / Ammonia Plant	Midstream (Infrastructure)	H2 Consumer (End-user)
VARANGER KRAFT AKER CLEAN HYDROGEN GAB Green Ammonia Berlevåg AKER CLEAN HYDROGEN | VARANGER KRAFT		WÄRTSILÄ GRIEG 	STORE NORSKE *"Objective to decarbonise 1500 offgrid communities in the Arctic"*

ENERGILØSNING SVALBARD

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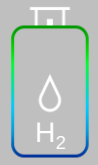
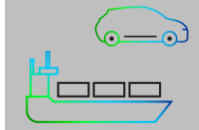
Statsbudsjettet 2022: Nullutslippsløsning for Svalbard

Energiforsyningen til Longyearbyen på Svalbard skal baseres på nullutslippsdrivstoff, enten ammoniakk eller hydrogen fra 2025.

Longyearbyen kullkraftverk skal fases ut i 2023. Dieselmotorer som kan gå på ammoniakk skal sørge for at byen går fra kull til null. (Foto: Elrik Helland Urke)

EU Taxonomy hydrogen considerations

Activity	Criteria	Description
 **Production**	**<3 tCO_2/tH_2**	• Life-cycle GHG emissions • Set at a level considered sufficient ambitious to ensure a substantial contribution to climate change mitigation
 **Storage**	**a. Construction of hydrogen storage facility** **b. Conversion of existing gas storage facility into hydrogen storage** **c. Operation of hydrogen storage facility**	•The hydrogen stored in the facility meets the criteria for production of hydrogen
 **Transport**	**Low or zero-emission emission transport criteria** **a. Freight transport services by road** **b. Freight water transport** **c. Road passenger transport**	•Businesses that aim to classify their transportation of goods as sustainable, will have to use low carbon transport solutions. •Cars, busses, trucks, trains, airplanes and ships will have to use batteries or hydrogen as fuel

Indirect effects

EU Taxonomy – blue hydrogen assessment

- The EU Taxonomy is technology neutral
- Below 3 tCO_2/tH_2
- The CO_2 captured is transported and stored underground in accordance with EU taxonomy activity 5.11 and 5.12
- Life-cycle GHG emissions savings are calculated using the methodology referred to in Article 28(5) of Directive (EU) 2018/2001
- Quantified life-cycle GHG emission savings are verified

EU Sustainable Taxonomy

3 tCO_2/tH_2

<1 tCO_2/tH_2

Aukra Hydrogen Hub

ESG an integrated part of our business

ESG a key part of ACH:

- Key criteria in concept screening
- Clear rules in the Capital Value Process
- Integrated part in Project execution model
- Key criteria for selecting suppliers & partners
- Recruitment process
- Key criteria in M&A screening

ACH uniquely positioned in the hydrogen economy

1. Building early track record being involved in several pioneer projects
2. Solid in-house industrial expertise and know-how
3. Building on a strong partnership platform
4. Well positioned in Norway with several pieces of the hydrogen puzzle in place
5. Access to the industrial and commercial ecosystem in the Aker Group

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