Global Green Fertiliser Tracker

Greening nitrogen fertiliser production

Caroline Paul

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Agora Industry – about us

Who we are:
Agora Industry is a think tank, policy lab, and part of the **Agora Think Tanks**

What we do:
We develop **scientifically sound** and **politically feasible strategies** for a successful pathway to **climate-neutral industry** – in Germany, Europe and internationally

How we work:
We are independent and non-partisan, with a diverse financing structure – **our only commitment is to climate action**

Where we take action:
Agora Industry has offices in Berlin, Brussels, Beijing and Bangkok, and cooperates with a wide network of partner think tanks on the ground

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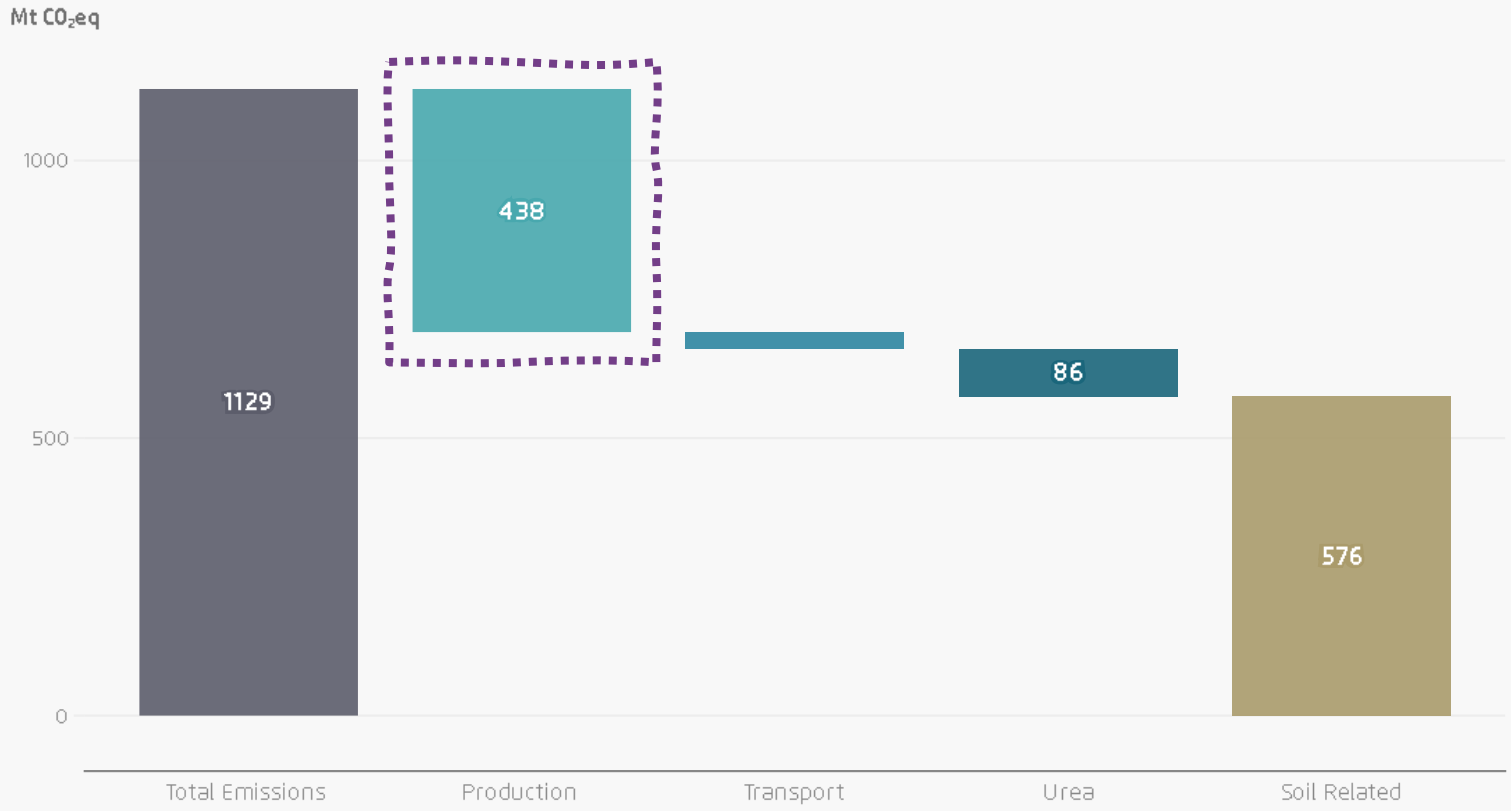
State of play:
Why should we transform nitrogen fertiliser production?

More than 1 Gt of global greenhouse gas emissions relate to synthetic nitrogen fertiliser

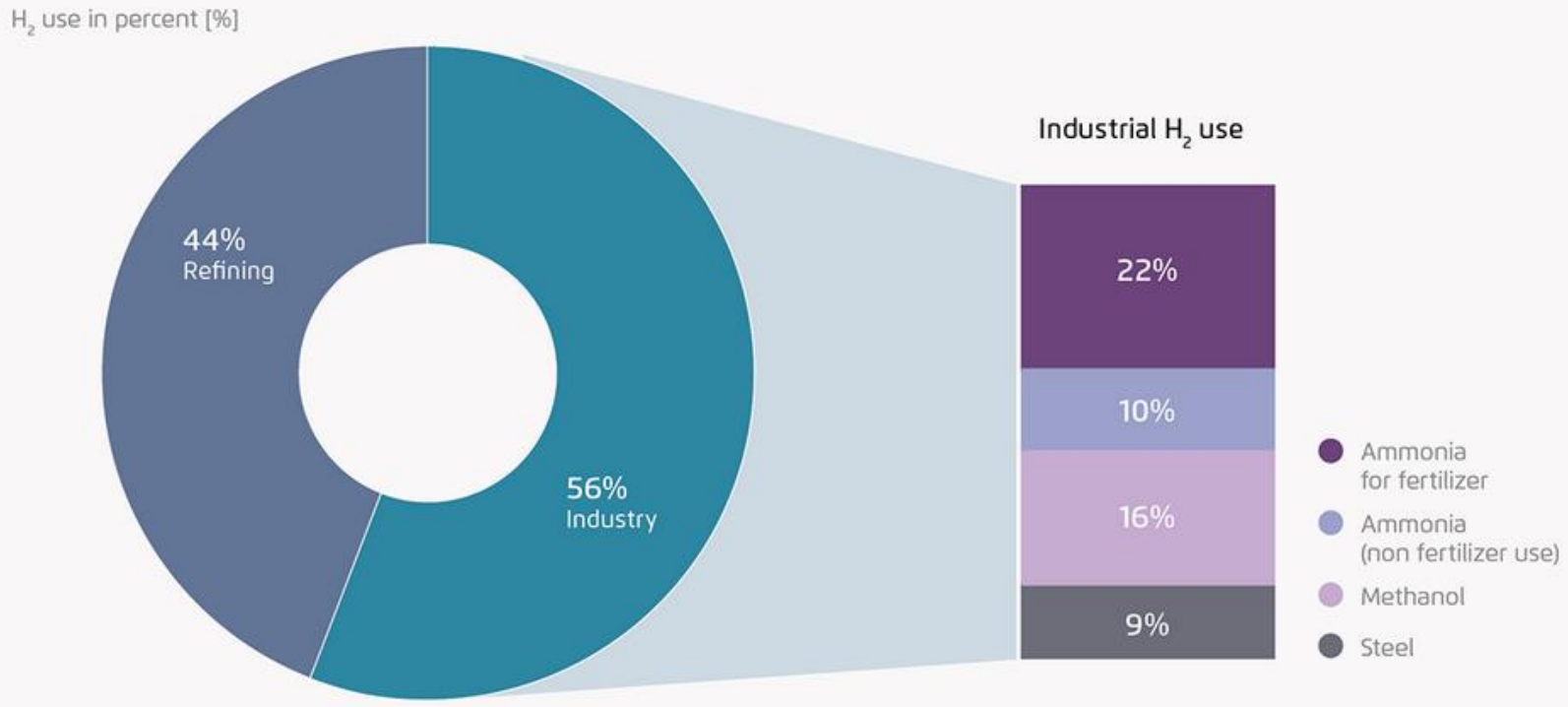
Global greenhouse gas emissions related to nitrogen fertiliser production, transport and application



- **Urea** markets differ according to world region
- Soil-related emissions **out of scope** of this workstream

Hydrogen is mainly used in refineries and as ammonia for fertilisers

Hydrogen use in 2022



- → Total hydrogen demand of 95 Mt in 2022
- → 22% of hydrogen used for ammonia production for nitrogen fertilisers
- → Hydrogen is predominantly produced from **unabated fossil** natural gas and coal

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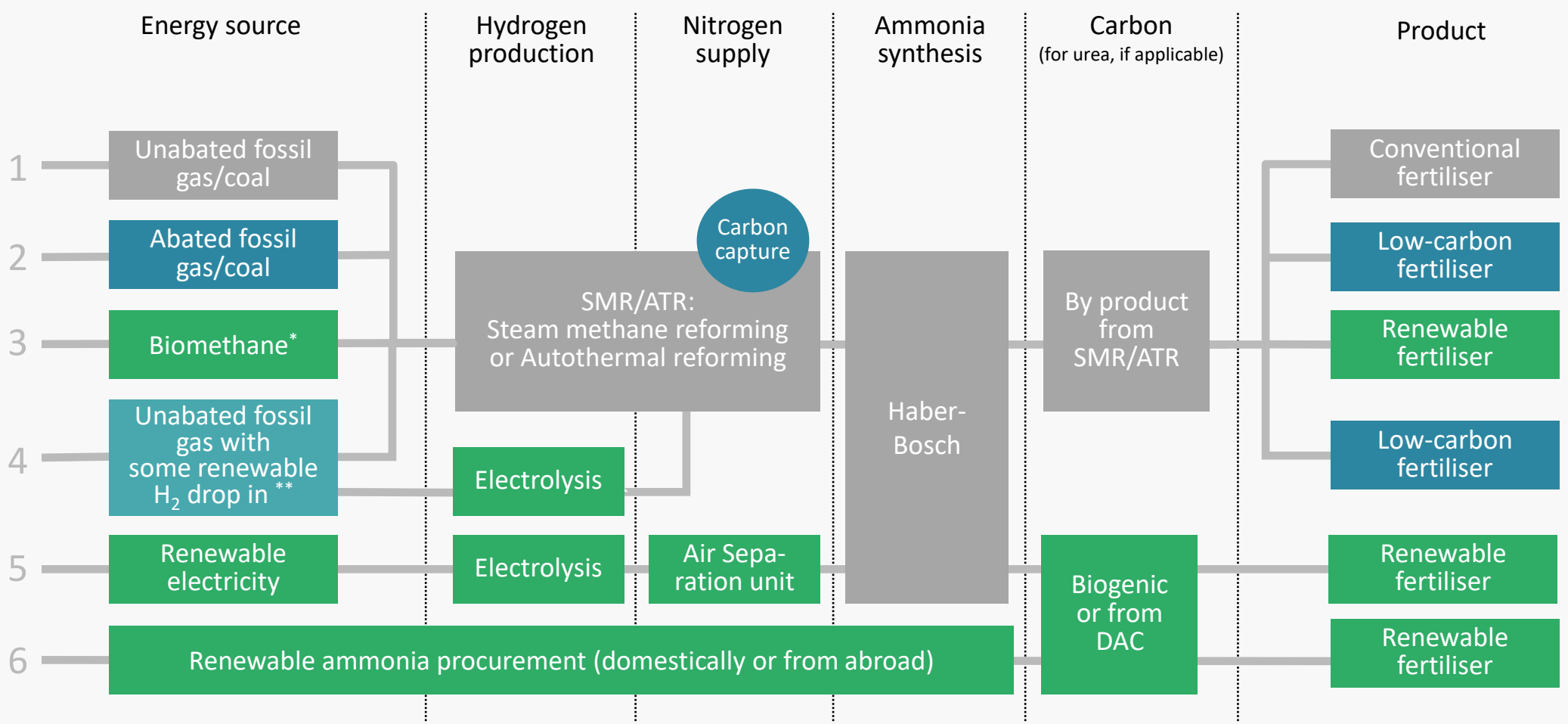
Renewable fertilisers: How are they produced?

From conventional to renewable fertilisers – a classification



* An alternative would be solid biomass gasification. ** The technical limit of bringing hydrogen into an existing integrated SMR ammonia plant typically amounts to 15-20%. This limit may be higher for special cases in which an Air Separation Unit is already available. Then, the carbon required in downstream processes may limit the H_2 share to 50%.

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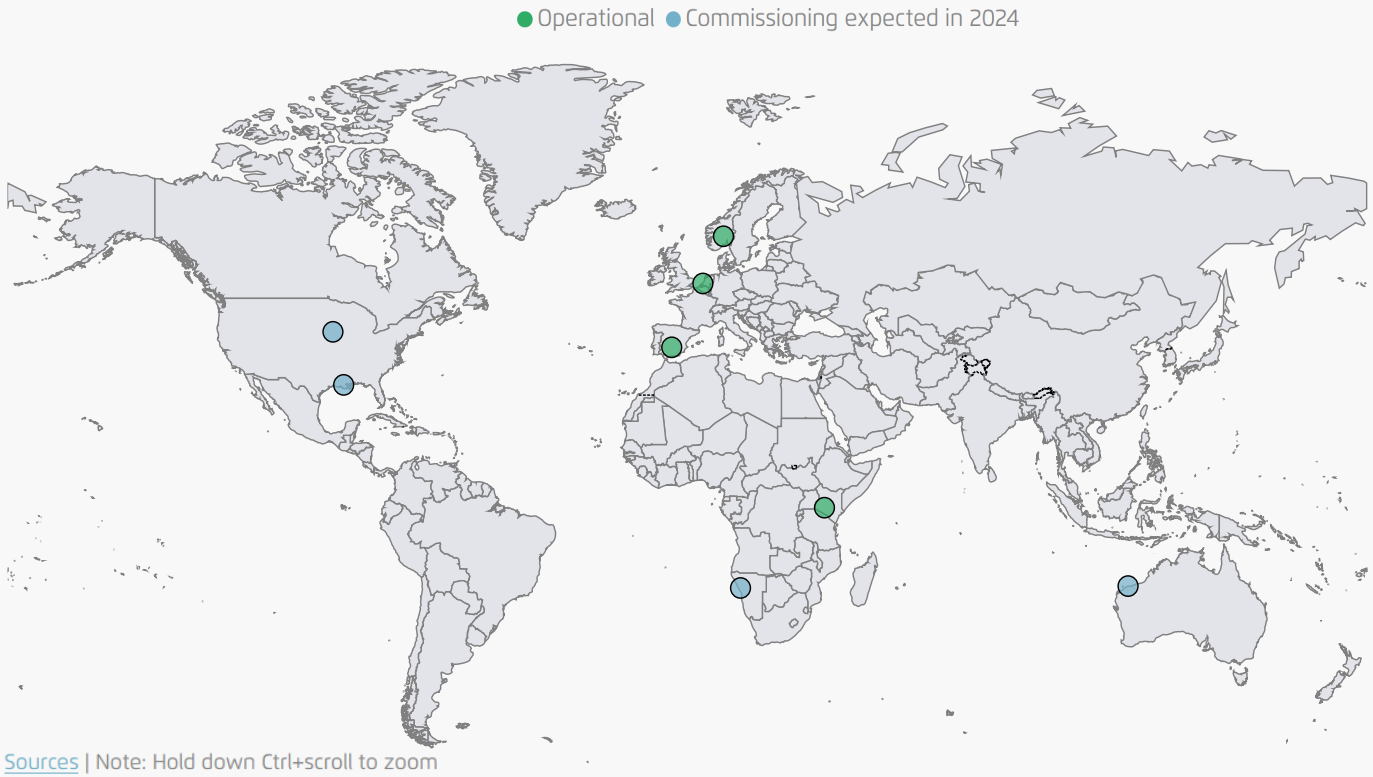
Renewable fertilizer production need to comply with sustainability criteria

- Renewable energy resources are **additional**
- **Water** required for hydrogen production must be sourced **sustainably** without exacerbating local water stress.
- **Biomethane** feedstock needs to come from **sustainable sources**
- **Carbon** required for urea production needs to be sourced **sustainably**

Global Green Fertiliser Tracker

Like a drop in the ocean:
Renewable nitrogen fertiliser projects in operation in 2024 are really scarce

Global Green Fertiliser Tracker: Data sources



- → Start of monitoring of renewable nitrogen fertiliser supply
- → Fast moving project landscape anticipated
- → **Tool will be updated regularly**
- → Company websites as main data sources (PR, reports, etc.)
- → Call for action: Get in touch if your project is missing!

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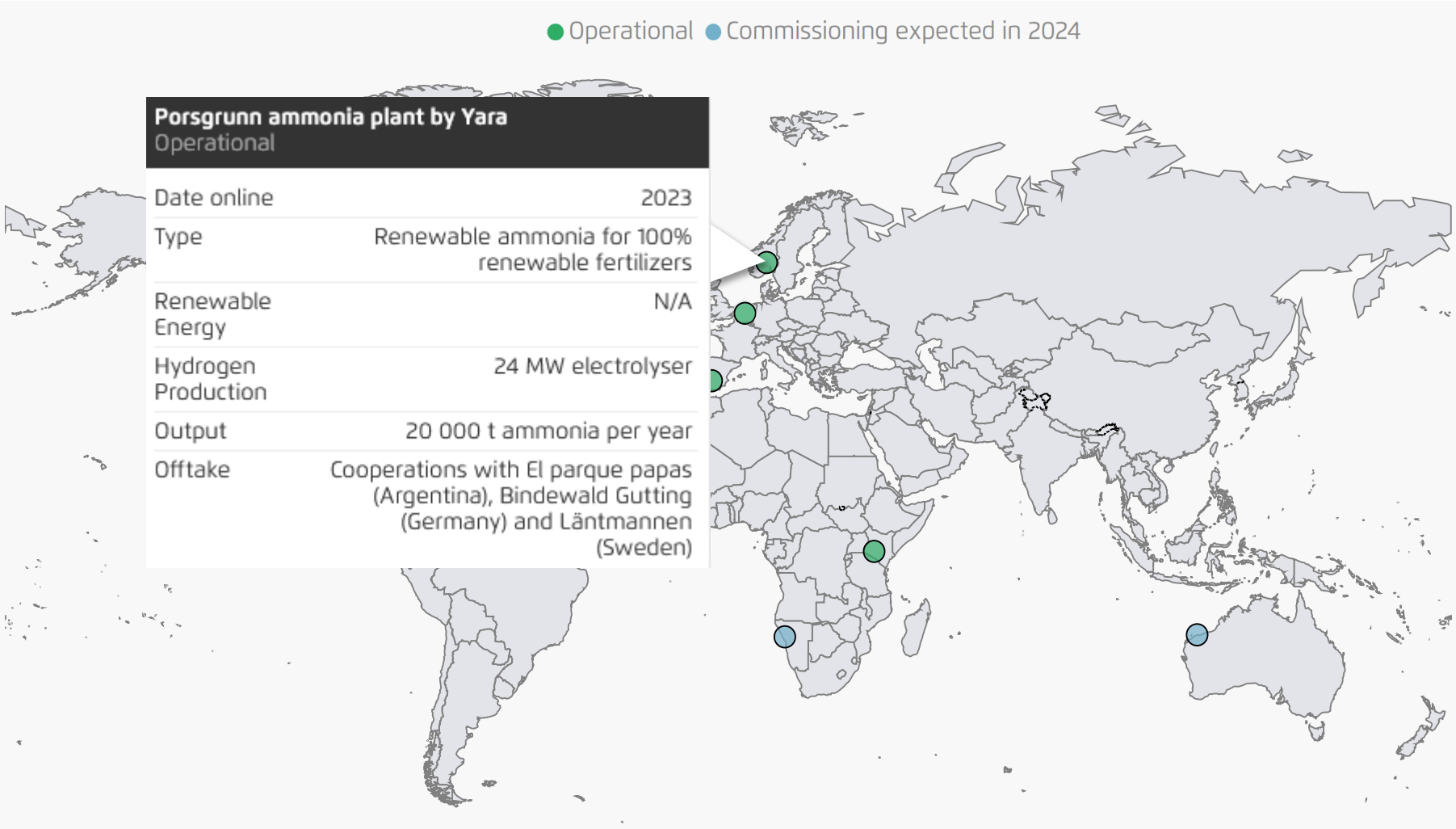
Global Renewable Fertiliser Project: Case 1



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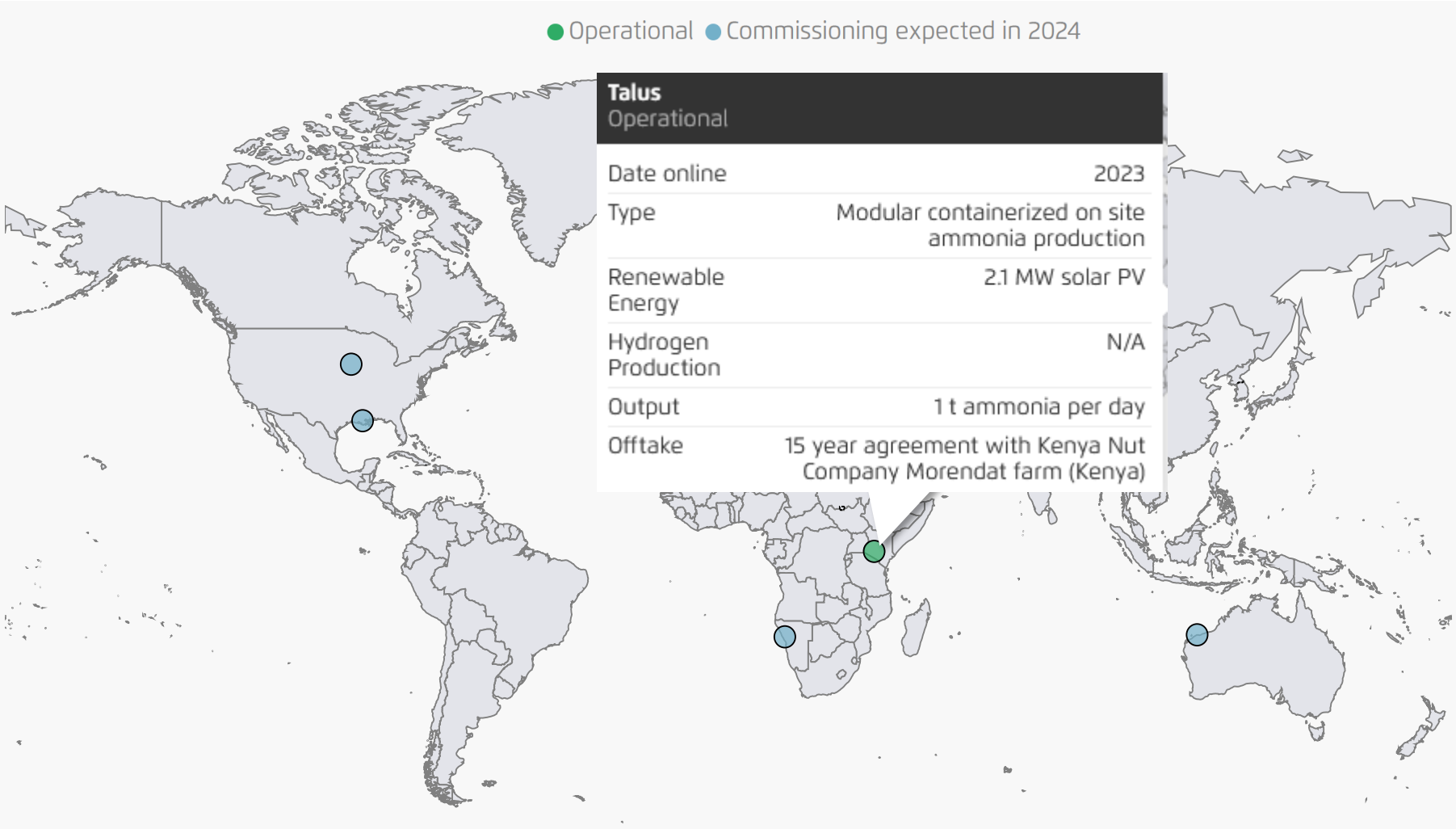
Global Renewable Fertiliser Project: Case 2



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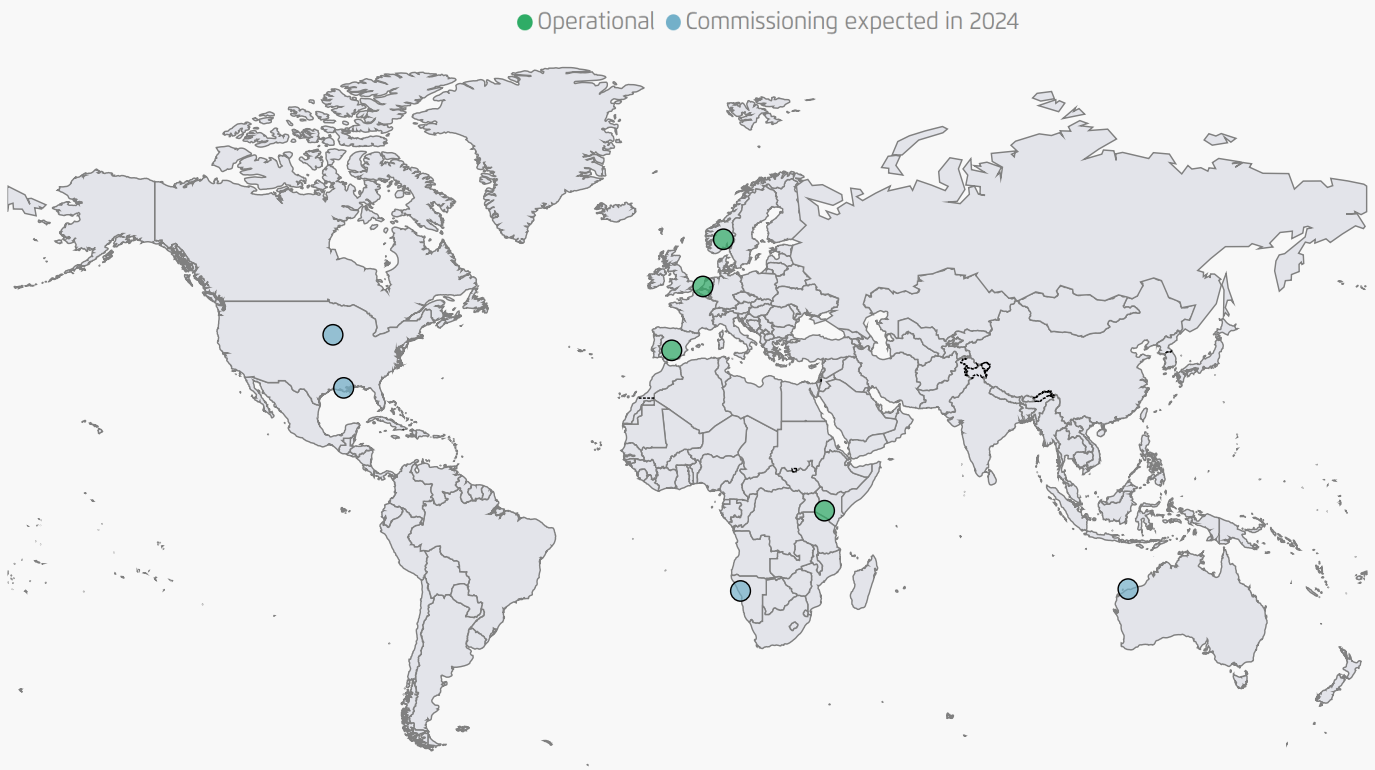
Less than 0.3% of global ammonia production for nitrogen fertilisers is renewable

Global green fertiliser tracker



→ Most projects in pilot stages

→ **Renewable energy** mainly from
- solar PV (121 MW, 5 projects),
- grid electricity (2 projects)
- and biomethane

→ **Electrolyser** capacities between 0.25 and 24 MW

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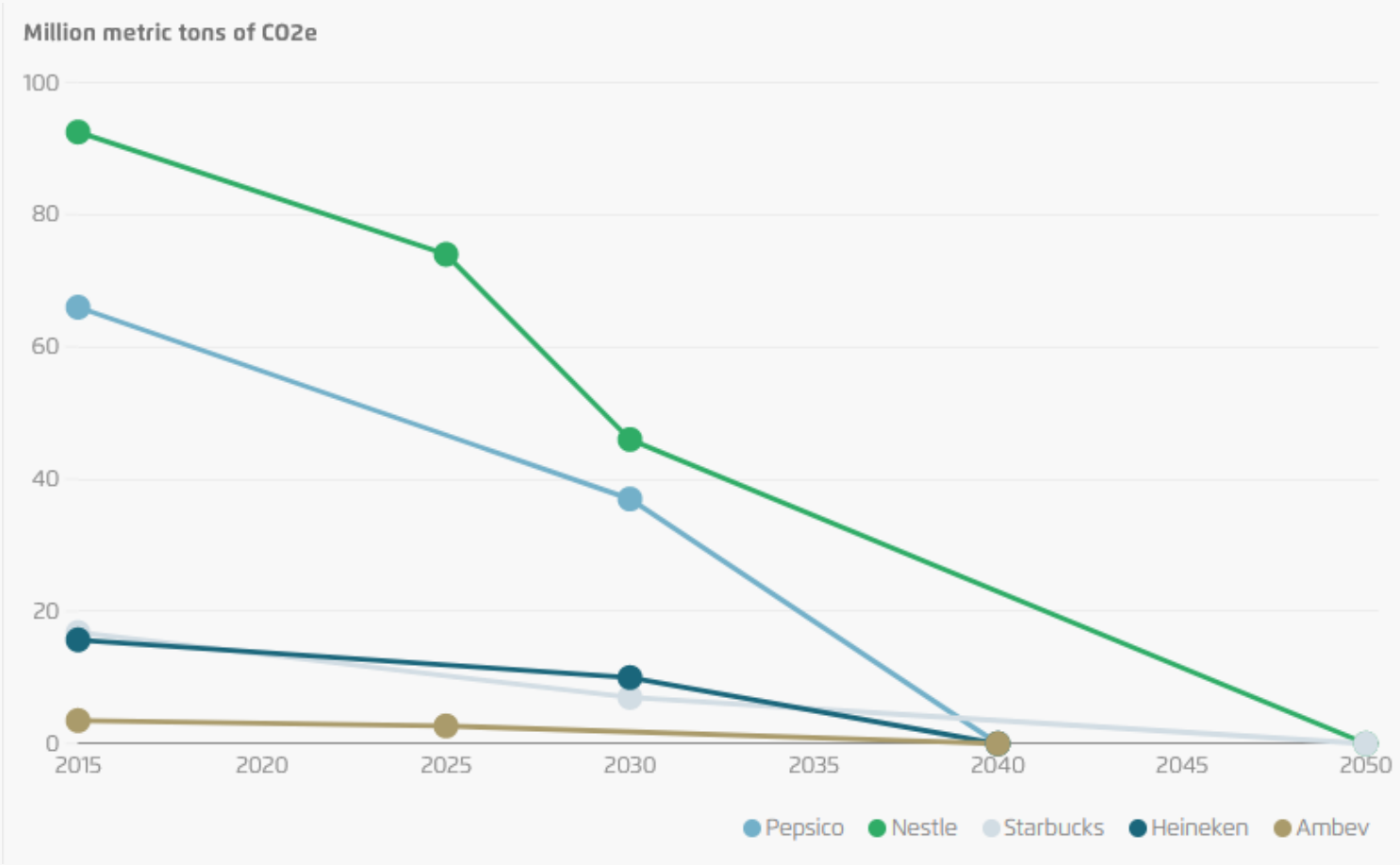
Moving forward: How can we push the transformation?

Demand-side: Renewable fertiliser production critically depends on binding offtake-agreements

Net-zero targets of five large food and beverage brands



- Major **food and beverage producers** committed to reduce scope 3 emissions
- Who will pay the **green premium**?

 | Source: BloombergNEF (2024)

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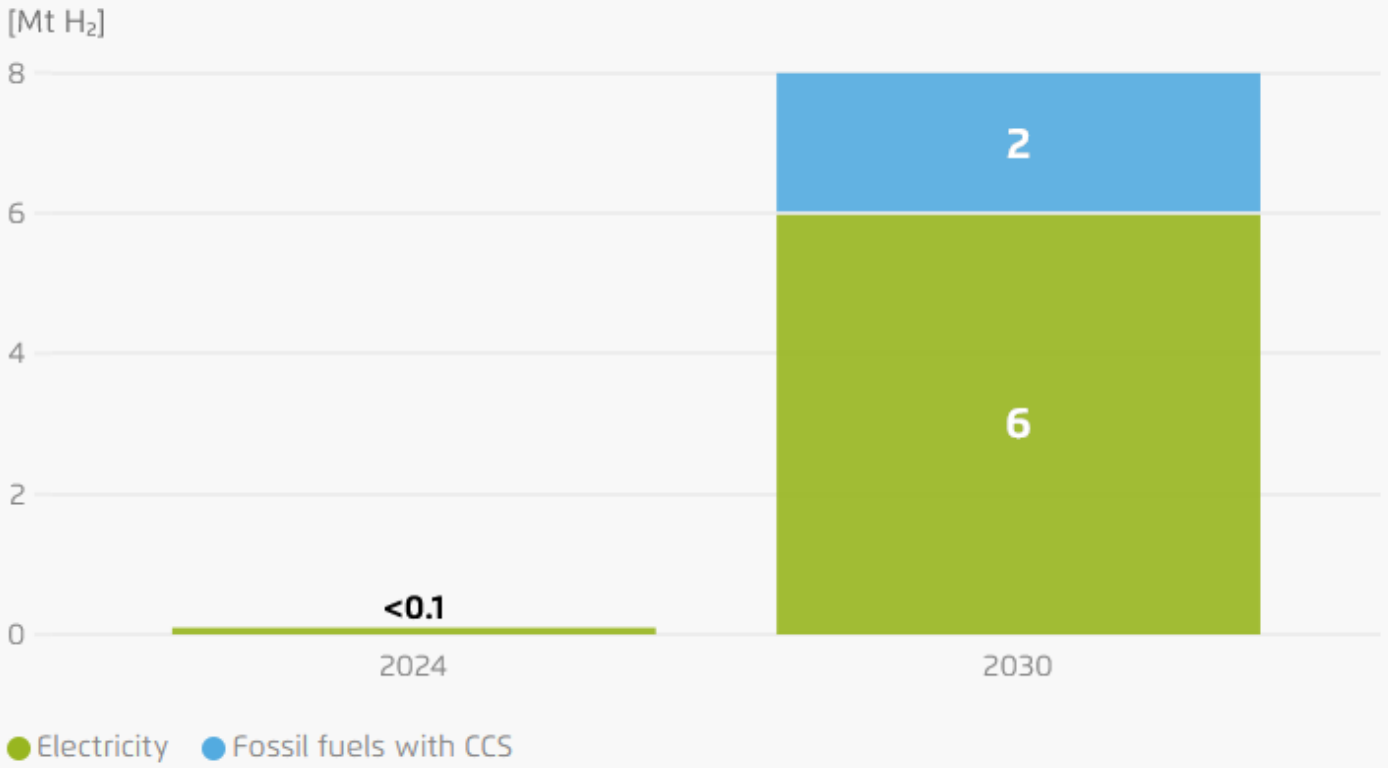
Closing the transformation gap with dedicated policies

Actual low-emission hydrogen for fertilisers vs IEA net-zero scenario for 2030



→ **Carbon pricing** does not yet incentivise renewable fertilisers over conventional ones.

→ Dedicated **policies needed** to stimulate both

- ramp up of renewable fertiliser supply and
- offtake from agricultural producers.

→ Overall future net greenhouse gas impact will also depend on the deployment of **additional renewable energy** sources.

Agora Industry (2024) based on IEA (2021, 2023), assuming an equal distribution of H_2 production technologies across applications and an increasing use of ammonia in new applications like shipping, broadly in line with the IEA NZE 2023 scenario

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Get in touch if your renewable nitrogen fertiliser project is already in operation or will be soon.

Thank you for your attention!

Do you have any questions or comments?

Caroline.Paul@agora-industrie.de
www.agora-industry.org

Link to online tool

Imprint

Agora Industry

Agora Think Tanks gGmbH
Anna-Louisa-Karsch-Straße 2, D-10178 Berlin
T +49 (0) 30 7001435-000
www.agora-industrie.de
info@agora-industrie.de

Project Lead
Matthias Deutsch
Matthias.Deutsch@agora-industrie.de

Authors
Caroline Paul (Agora Industrie)

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