



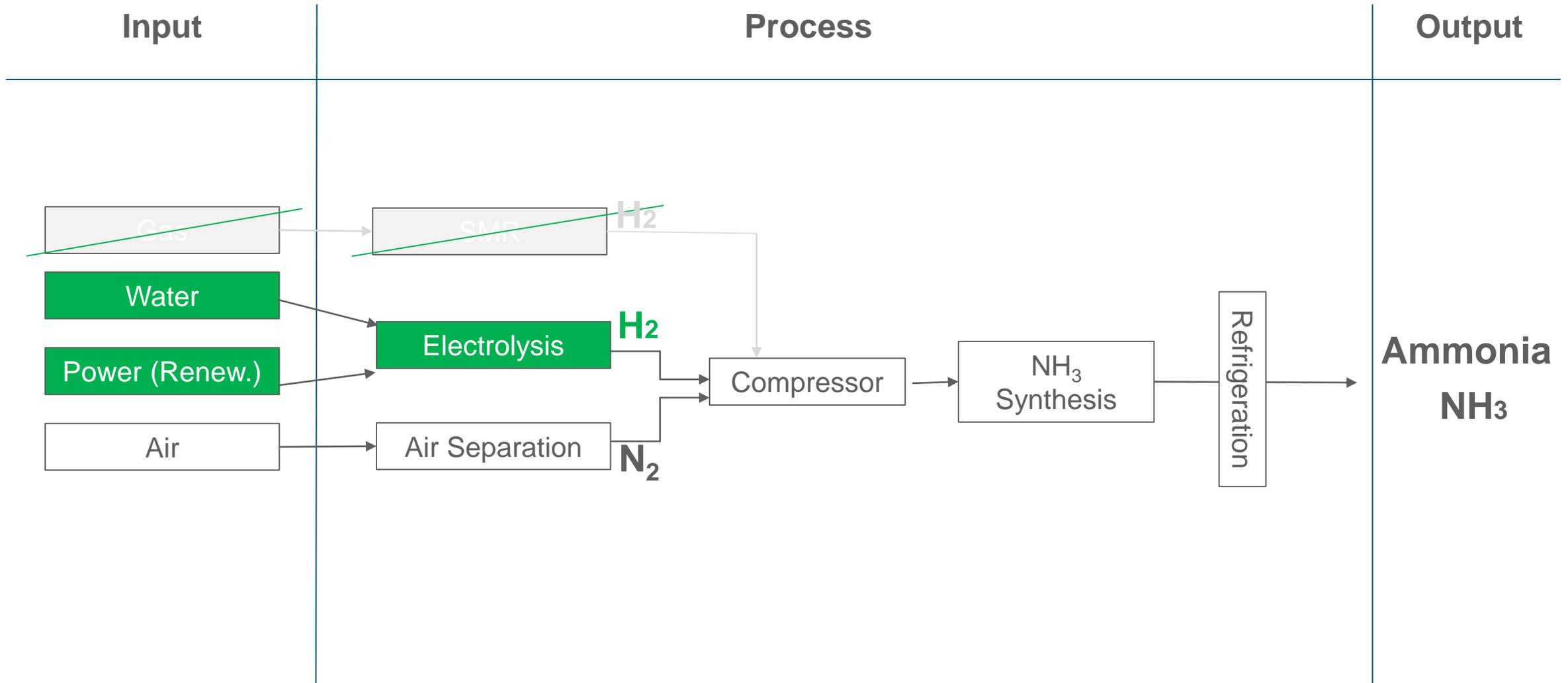
Decarbonized ammonia

H2 Forum

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Hamburg, 20 Sep 2022

What is Ammonia and how can it be decarbonized?



Existing & Future Ammonia applications



Increase of gas and Co₂ price is putting high pressure on industries

Natural gas price development
Jan 2021 until 2022



~30 GJ

natural gas
required
for 1t ammonia¹

~35%

Costs of natural
gas/ production
costs of ammonia²

Co₂ price development
Jan 2017 until 2022



+100 €/t

Forecast Co₂
price 2030³

~25%

Proportion of Co₂ tax
on levelized costs of
ammonia²

Why importing decarbonized ammonia is the right way for industrial customers



No process or asset changes required

Changing from grey to decarbonized ammonia is an **easy way to decarbonize** since it is only a change in procurement without changing processes or assets.

Plug & play approach for industries who want to decarbonize



Security of supply

Countries with high solar/wind yield are cost competitive suppliers for ammonia, also **diversifying** away from gas-heavy local production.

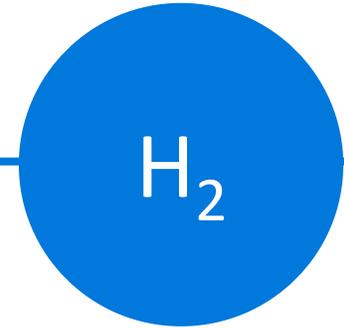
Industries can secure and diversify their source



Decoupling from natural gas

A switch to green ammonia mitigates risk by securing **independence** from the **volatile** and politically influenced **natural gas market**.

Be more independent from rising natural gas prices



Transport H2

Ammonia is the cheapest way to transfer H2 over long distances, enabling Europe to import H2 at large scales.

Unlock H2 potential at industrial scale

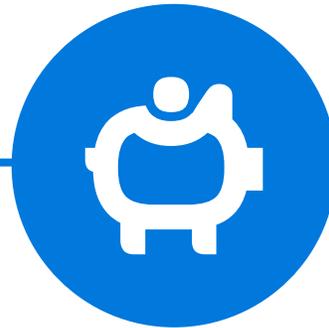
Decarbonizing your ammonia feedstock brings along additional financial benefits



CO₂ tax savings

Reducing emissions translates to direct **cost savings** by avoiding CO₂ taxes and **reduces** the **exposure** to unforeseeable CO₂ price developments.

Save taxes through decarbonizing your feedstock



Access to EU Taxonomy funding

Decarbonizing your entire **production**, including the ammonia feedstock, can secure your **access** to EU Taxonomy **funding** and future subsidies.

Profit from governmental funding to finance your green ammonia supply



Accessibility of green bonds

Equity market prices are decreasing, with **Green Bonds** developing price advantages or “**greenium**” over more traditional bonds.

Access cheaper funding for your ammonia decarbonization

There are options within your pathway to decarbonize ammonia supply

Green ammonia

*Zero emission H_2 produced through the use of **renewable power** and **electrolysis** for conversion to NH_3*



Blue ammonia

*Low emission H_2 produced through the use of **low-carbon fuels** and **carbon capture technologies** for conversion to NH_3*



Uniper is the right **partner** to enable the
decarbonization of your **ammonia feedstock**

Why Uniper; Activities in Ammonia across the value chain

Experienced energy partner

- Trusted commodity trader with risk management expertise and high credit rating
- Reliable provider of energy services internationally
- Very experienced in managing large commodity positions
- Decarbonization market and pricing experience: we are in a similar situation and the transition is a key part of our strategy



Upstream

- **EverWind, Nova Scotia (Canada)**
Type: green, wind
Offtake: 0.5 mt pa
Starting: 2025
- **Freeport, Duqm (Oman)**
Type: green, solar & wind
Offtake: 0.17 mt pa
Starting: 2027
- Own (green) asset projects and further offtake agreements (green & blue) are under development



Midstream

- **Wilhelmshaven (Germany)**
Type: ammonia & H2 cracking
Size: 2.6 mtpa
Starting: 2027
- **GreenpointValley (NL)**
Type: ammonia & H2 cracking
Size: 0.96 mtpa
Starting: 2026
- Capacities in further projects are being assessed, among others in the Benelux region



Downstream

- **Ammonia:** Uniper is in talks with existing ammonia offtakers in the chemical industry to diversify & decarbonize their ammonia supply
- **H2:** jointly with the industry, Uniper is developing H2 applications, to be supplied through H2 crackers & own assets

Uniper commodity supply, logistics and trading key facts

100+

Years of expertise in the energy sector

83 TWh

European gas storage capacity

>200

Dry and tanker cargoes delivered 2021

Project pipeline delivering

> 1 mt pa

decarbonized ammonia by 2027

>350 LNG cargoes

traded and delivered in 2021

7 LNG vessels

under term charter in 2022

20 Bulk carriers

under term charter in 2022

**Uniper –
A strong partner
for your
ammonia supply!**