Knowledge grows

Clean Ammonia Transition @ Yara

AEA, November 19th 2020

Yara: Crop nutrition and clean ammonia for the future

220 million
People our products help to feed

+ 60
Countries we operate in

20 million
Farmers we work with

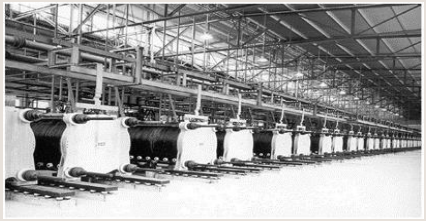
Hydrogen
Among world's largest hydrogen producers

870
Agronomists on the ground

Ammonia
Leading producer and trader

[1]Owned and operated by external parties

A history of transitions



Established in 1905 Yara produced green ammonia between 1927 and 1991

History

Yara's total greenhouse gas emissions halved by almost eliminating N_2O

Past 15 years

Further improving on world leading performance by CO_2 reduction target

Present

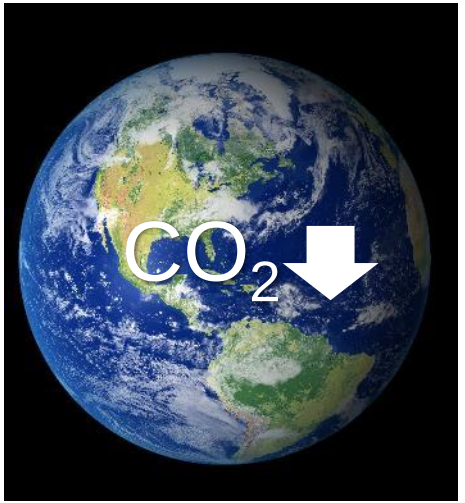
Ambition to become climate neutral by 2050

Future

Clean ammonia – a buidling block for decarbonizing food and shipping

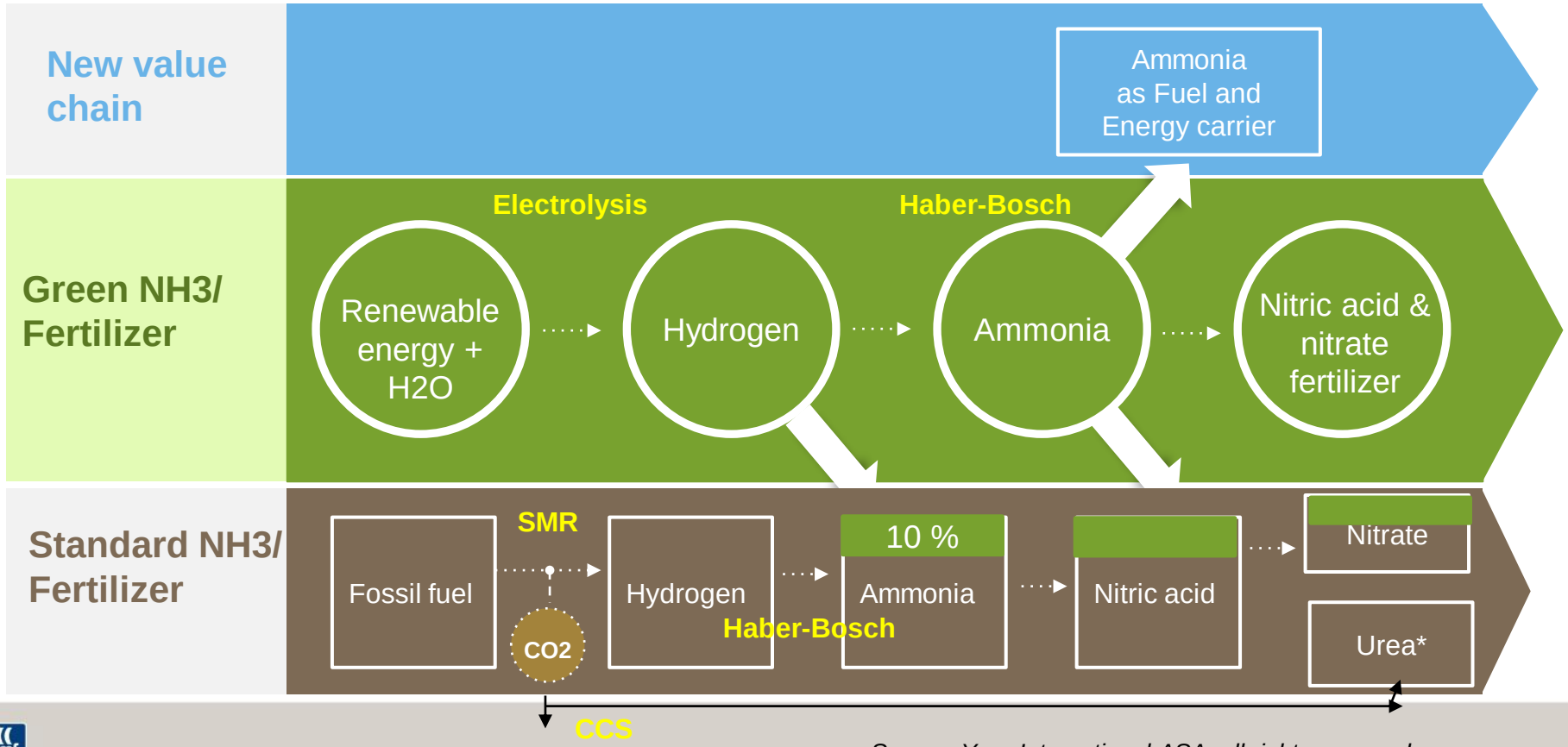
Shipping

Farm & Food



Climate

Renewable hydrogen production can eliminate CO2 emissions in fertilizer and spur green ammonia as a dominant shipping fuel



Yara positioned for transition in the whole ammonia value chain

Producer

- Total ammonia production including JV share ~ 8 million tons / 26 units
- High level of know-how of Yara plants (1 unit now +/- 5 yrs in contin. operation)
- Lower gas consumption compared to other producers, green & blue pipeline

Exporter

- 4 fully-owned ammonia export plants in Europe (export cap. ~ 1 mln t)
- Yara JV ammonia export capacity ~ 2,7 mil t
- Yara Industrial Solutions truck/train logistics expertise

Fleet & storage

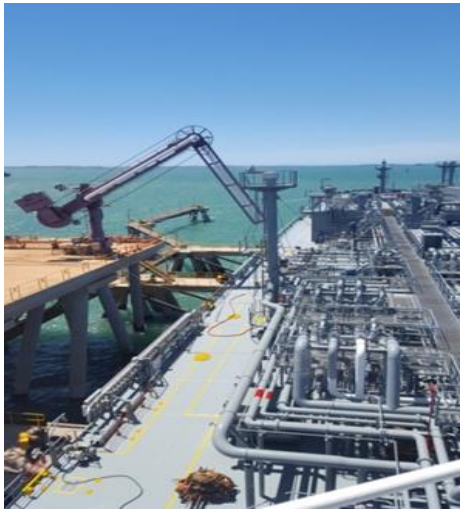
- Yara NH3 maritime transport capacity > 200 kt (momentum)
- Own storage ammonia capacity 580 kt
- 18 marine ammonia terminals

Importer

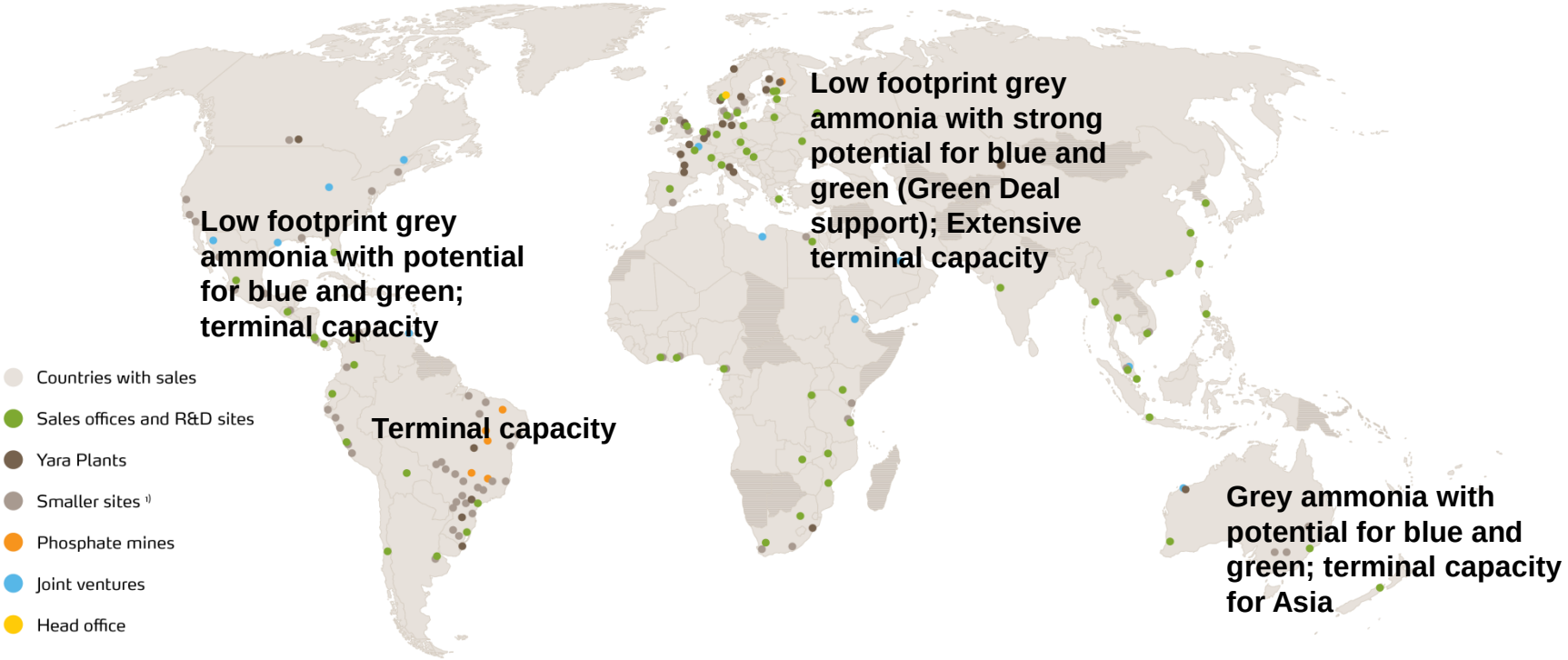
- World's largest importer with total imports of ~ 2 mln t / year (2019)
- Flexibility to produce or import ammonia

Trader

- Truly global
- Truly international
- With own back-up supply system



Yara positioned for global clean ammonia transition



Norway

Hydro

NEL tech pilot

Pilot E public funding

Australia / > 10 MW

Solar

Project with Engie

Arena public funding candidate

Netherlands / 100 MW

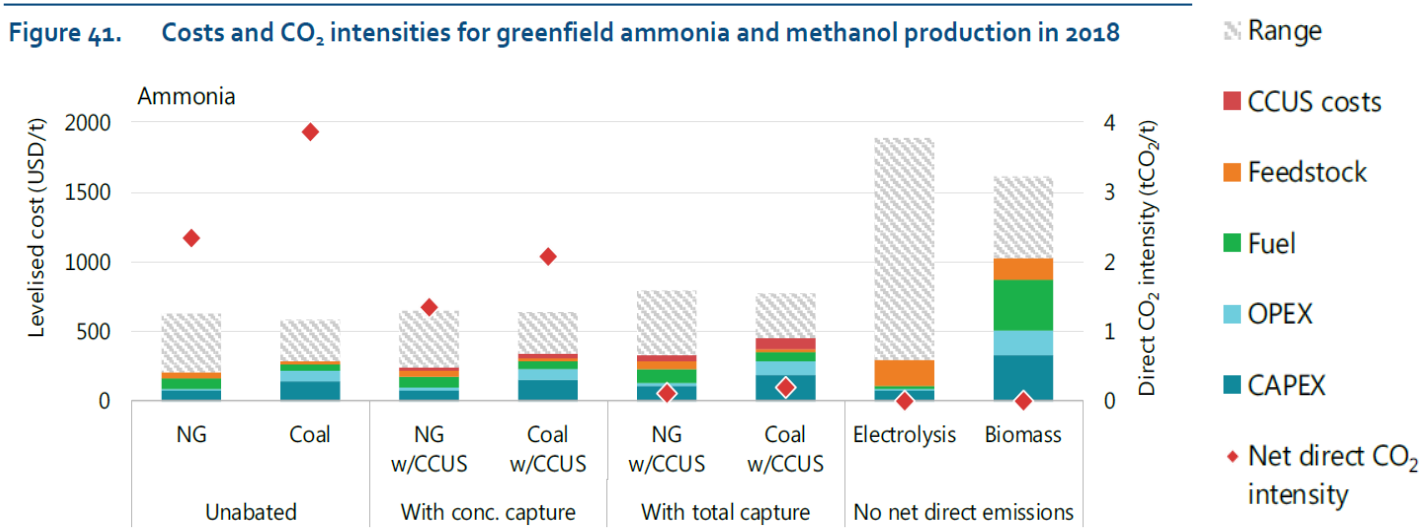
Off-shore wind

Project with Orsted

Public co-funding candidate

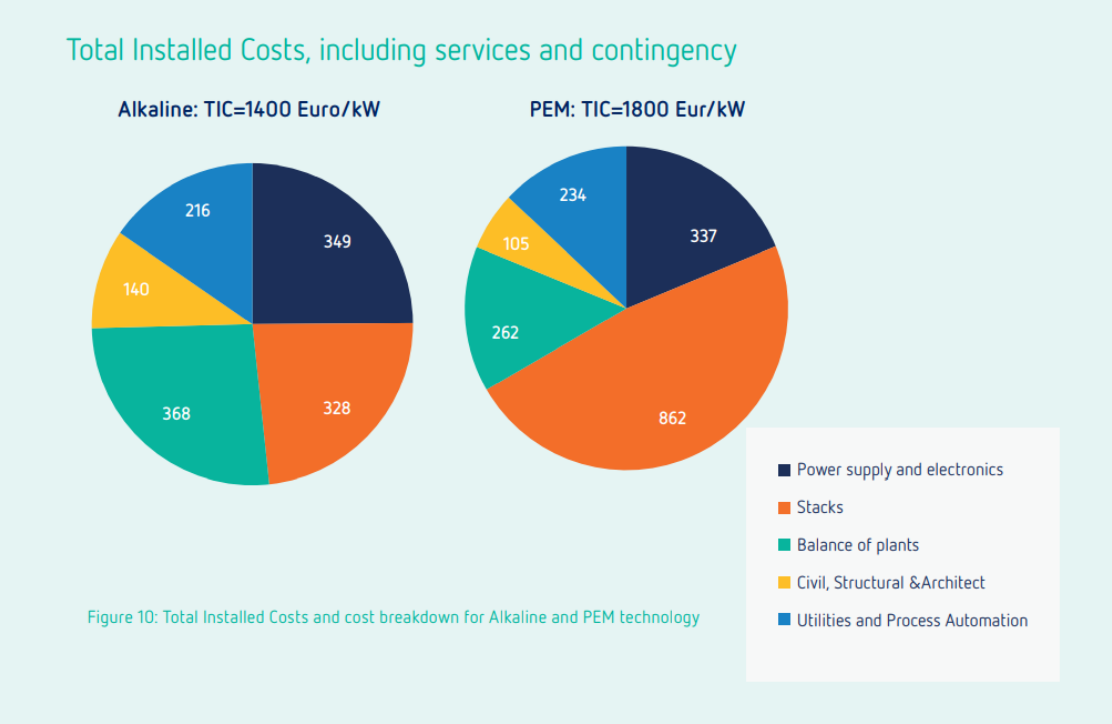
Not a walk in the park for green and blue

Figure 41. Costs and CO_2 intensities for greenfield ammonia and methanol production in 2018



Notes: conc. = concentrated; t = tonne. *CCUS costs* includes the costs of capturing, transporting and storing CO_2. *Range* refers to the range of total levelised costs across regions, with the lower end of the range (the best case for each technology) disaggregated for each technology. It is assumed that the electrolysis route is supplied with 100% renewable electricity, and the source of the biomass in the relevant routes is sustainably procured with no net CO_2 emissions. *With total capture* describes an arrangement where both process- and energy-related emissions are captured, whereas *With conc. capture* describes an arrangement where only process emissions are captured. More information on the assumptions is available at www.iea.org/hydrogen2019.

Not a walk in the park (bis)



Source: ISPT, Public Report, GigaWatt Green Hydrogen part – State-of-the-art design and total installed capital cost (Nov 2020)

Ready to jump of the cliff

Need for early support mechanisms, preferably “contracts for difference” type

Need for common standards and certification for blue and green

Need for scale and load factors in clean ammonia

Need for market creation in agriculture and shipping

The urea dilemma in the roadmap


Stay tuned for Yara ESG
Investor Seminar on
December 7th