



Decarbonization of the Fertilizer Industry

Presentation by Volker Andresen and Lucia Castillo Nieto

Meeting of the WTO's TESSD Working Group on Trade-related Climate Measures

11 May 2023

Presentation Outline

I. Macro View:

- A. Why should we talk about Fertilizers?
- B. International Fertilizer Association (IFA)
- C. Sustainable Fertilizers
- D. Ammonia Production
- E. Ammonia Trade

II. Micro View

A. Why should we talk about Fertilizers?

- A plant needs four things to grow strong: sunlight, water, air, and nutrients
- The nutrients are in the soil: nitrogen (N), phosphate (P), potassium (K) ...
- Soil quality varies - you can add missing nutrients with help of fertilizers
- There are organic (compost, manure ...) and mineral (processed) fertilizers
- Mineral fertilizers feed around 40% of the world's population *every day*
- **Production + use of mineral nitrogen fertilizers = 2.5% of all CO₂ emissions**



B. International Fertilizer Association (IFA)

- IFA is the only global fertilizer association (founded in 1927)
- Its membership includes all actors in the fertilizer value chain:
 - 450 members are based in 80 countries (50% in developing countries)
 - Around 400 of them are producers, distributors, or traders
 - These represent about 75% of mineral fertilizer production
- IFA's mission is to promote the efficient and responsible production, distribution and use of plant nutrients
- Member Services include Sustainability and Market Intelligence

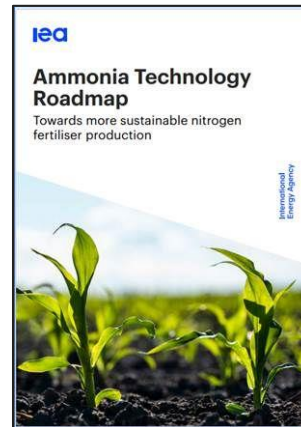


C. Sustainable Fertilizers

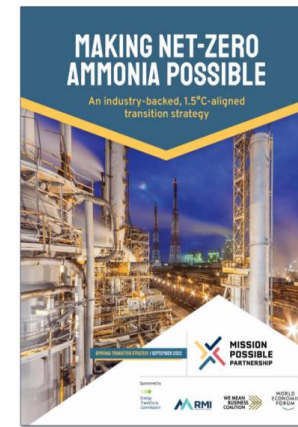
- **Background:** IFA is active in this area for years; dedicated Service launched in 2021
- **Mission:** It promotes the sustainable production and use of plant nutrients
- **Actions:**



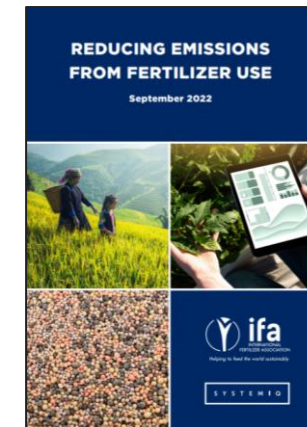
1. Developing tools:



Decarbonization of Ammonia Production



Milestones and Alternative Uses (Shipping ...)



Reduction of Nitrogen Use



Sectoral Decarbonization Approach

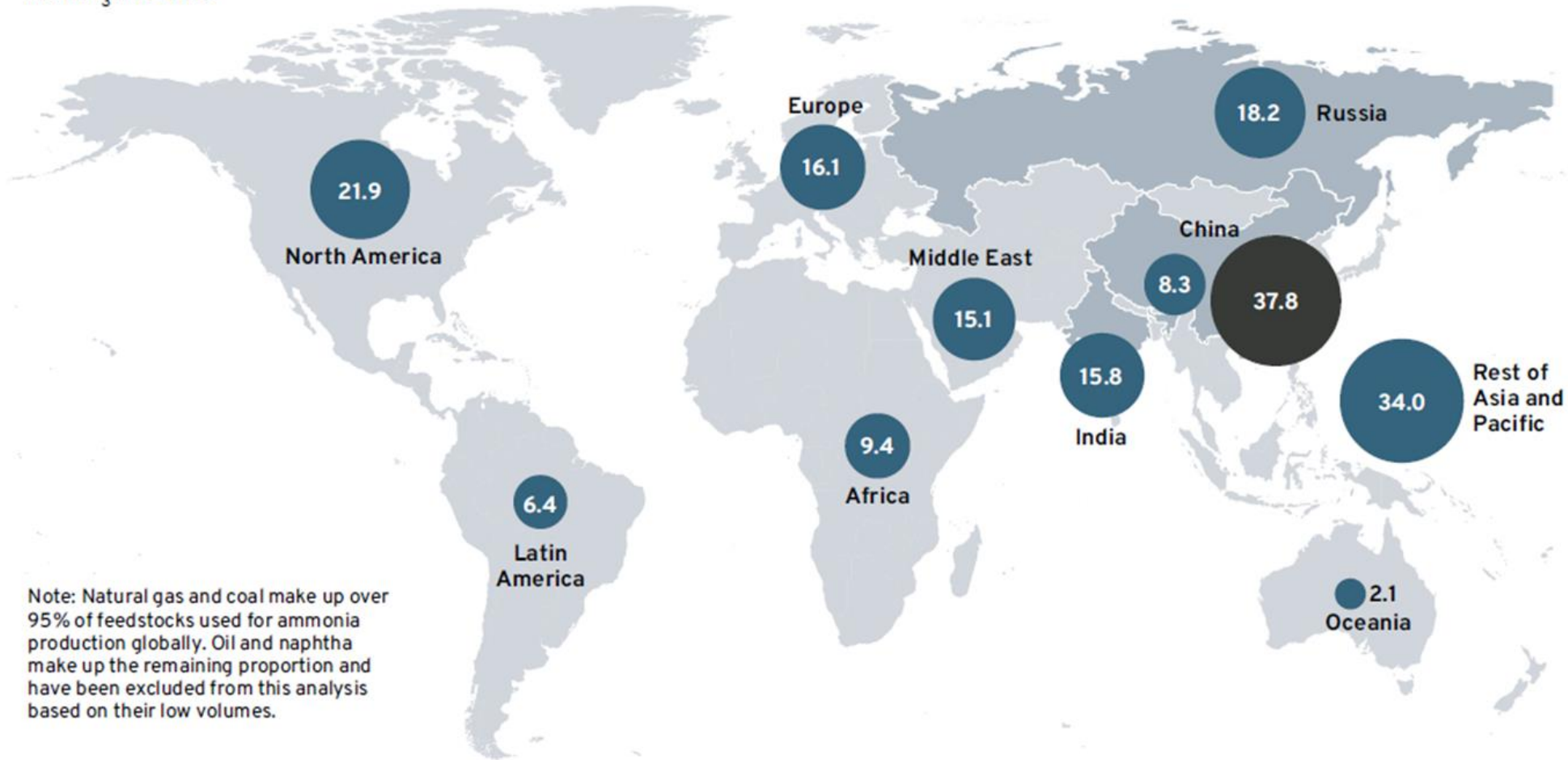
2. Sharing knowledge
3. Providing guidance
4. Recognizing leaders

Decarbonization of the Fertilizer Industry

D. Ammonia Production

Ammonia production,
Mt NH₃ in 2020

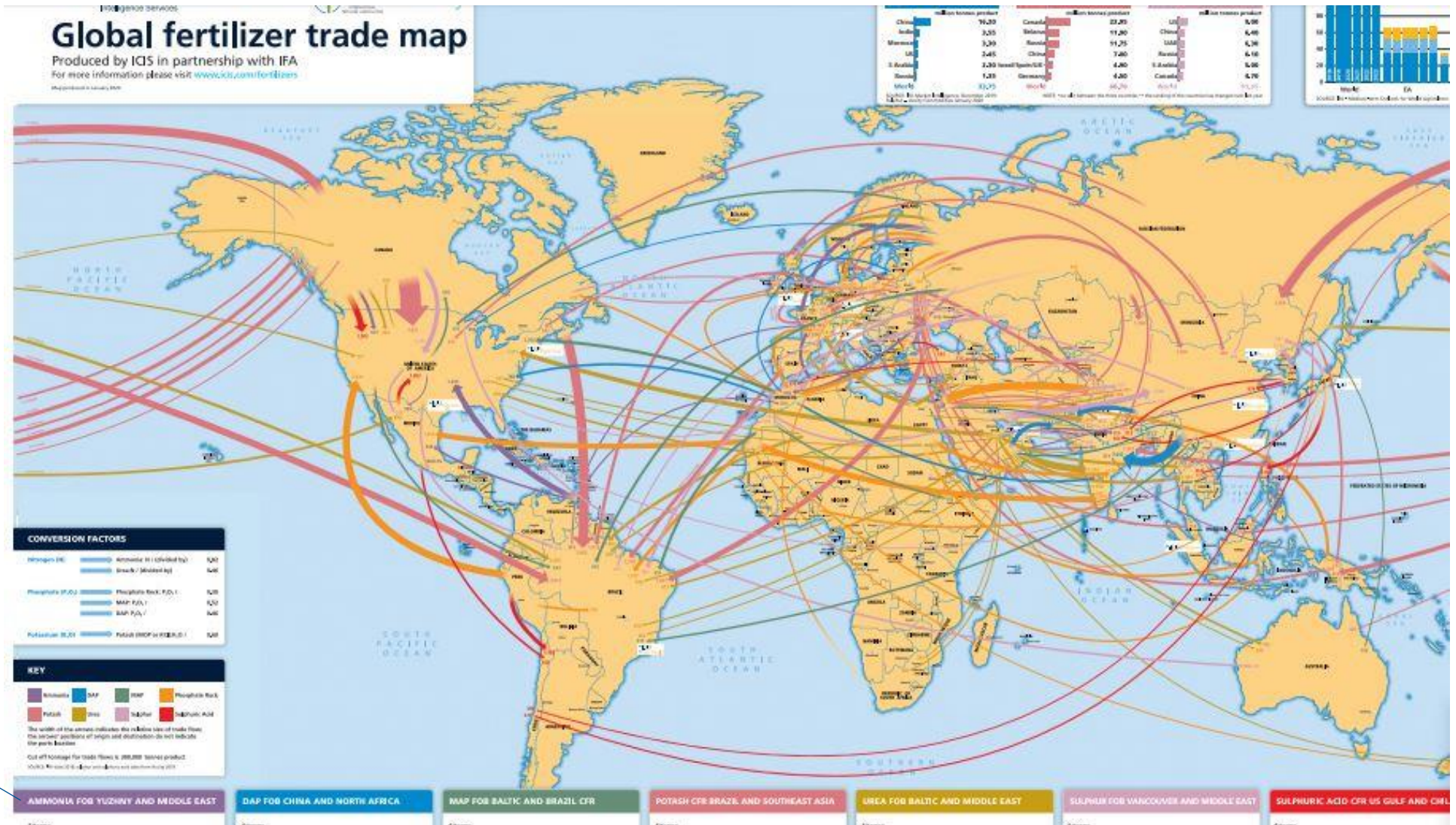
● Natural gas SMR ● Coal gasification



Note: Natural gas and coal make up over 95% of feedstocks used for ammonia production globally. Oil and naphtha make up the remaining proportion and have been excluded from this analysis based on their low volumes.

Source: IFA Market Intelligence

E. Ammonia Trade



Ammonia trade marked in purple

Presentation Outline

I. Macro View

II. Micro View:

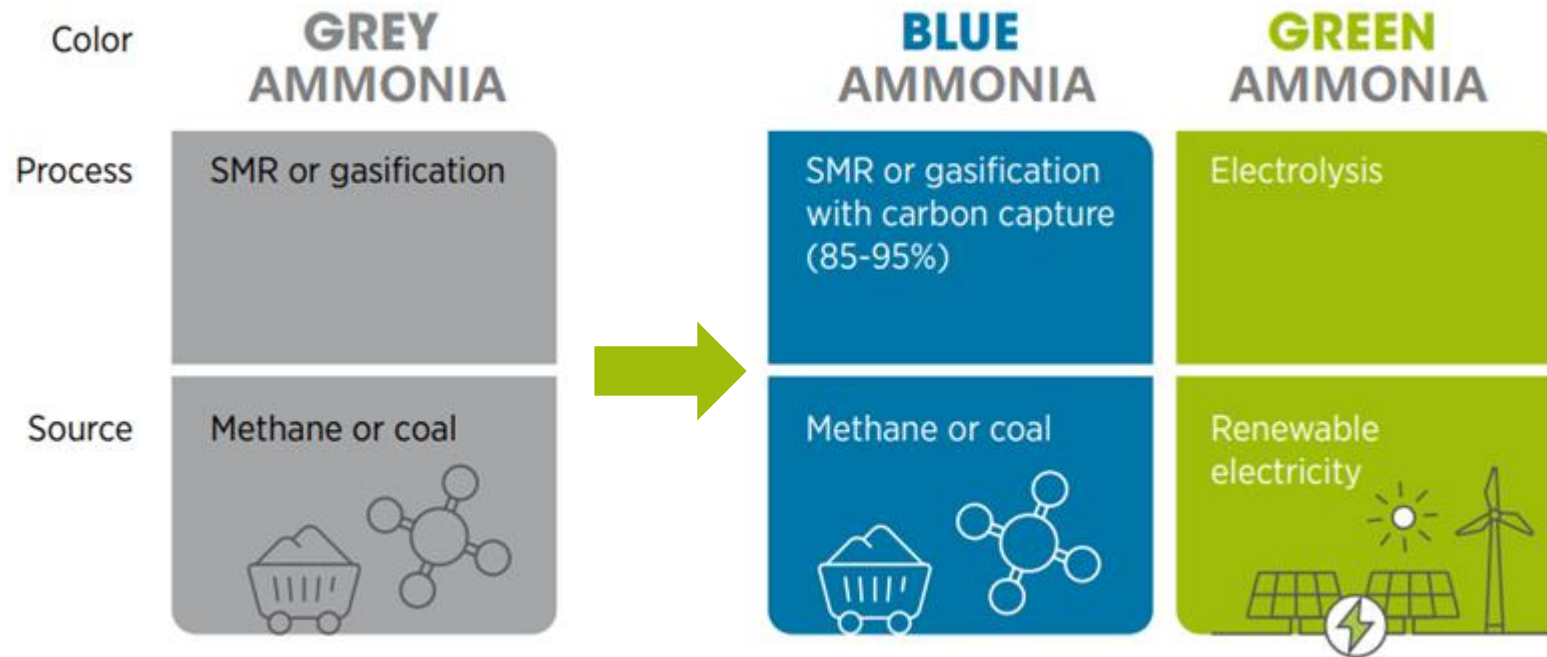
- A. Low carbon pathways for the Fertilizer Industry
- B. The tools we have
- C. What will it take?
- D. Beyond fertilizers

A. Low carbon pathways for the Fertilizer Industry

Why we need to decarbonize:

- About 1% of the world's CO₂ emissions come from NH₃ production + 1.5% come from fertilizer use
- About 2% of the world's energy is needed for the synthesis of NH₃

What technologies are available?



Note: SMR = steam methane reforming.

Decarbonization of the Fertilizer Industry

B. The tools we have

Ammonia Technology Roadmap

Objectives:

Roadmap provides different pathways to reduce CO₂ emissions from NH₃ -production for different regions by 2050

- In line with Paris Agreement

Roadmap outlines the roles and actions of stakeholders, quantifies the investment and policies needed, and establishes milestones for innovation and deployment

Conclusions:

The fertilizer industry can't do it on its own:

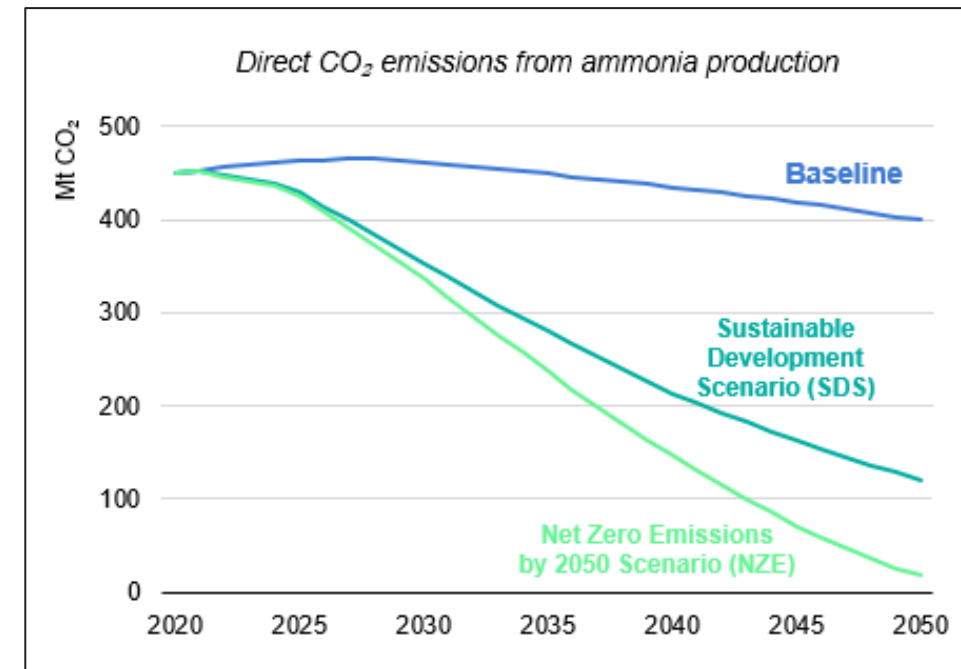
- Stakeholder collaboration (industry, technology providers, governments, supply chain...) and enabling conditions (policy, infrastructure, R&D, investments).



European Bank
for Reconstruction and Development



**International
Energy Agency**



C. What will it take?

More investment opportunities into climate action

- Investments required to scale-up low carbon technologies
- Access to finance and implementation of decarbonization routes as soon as possible
- The fertilizer industry requires an annual investment of \$14 billion in new ammonia production facilities is required between now and 2050
- More developing countries will need their own tailored decarbonization roadmaps to transition to a low-carbon fertilizer production



“Our Industry is no longer hard to abate, but costly to abate.”

**Svein Tore Holsether, President & CEO, Yara International and current Chair, IFA
(at UN COP 26)**

C. What will it take?

Local decarbonization roadmaps:

There is no one path that will fit everybody - each country will have a different decarbonization journey

Tailored local decarbonization roadmaps need to be drafted to assess each country's specific risks and opportunities to decarbonize their fertilizer industry

Example: EGYPT



© Copyright 2022 ERM Worldwide

Other countries like Turkey, Jordan Uzbekistan are developing their own roadmaps.

C. What will it take?

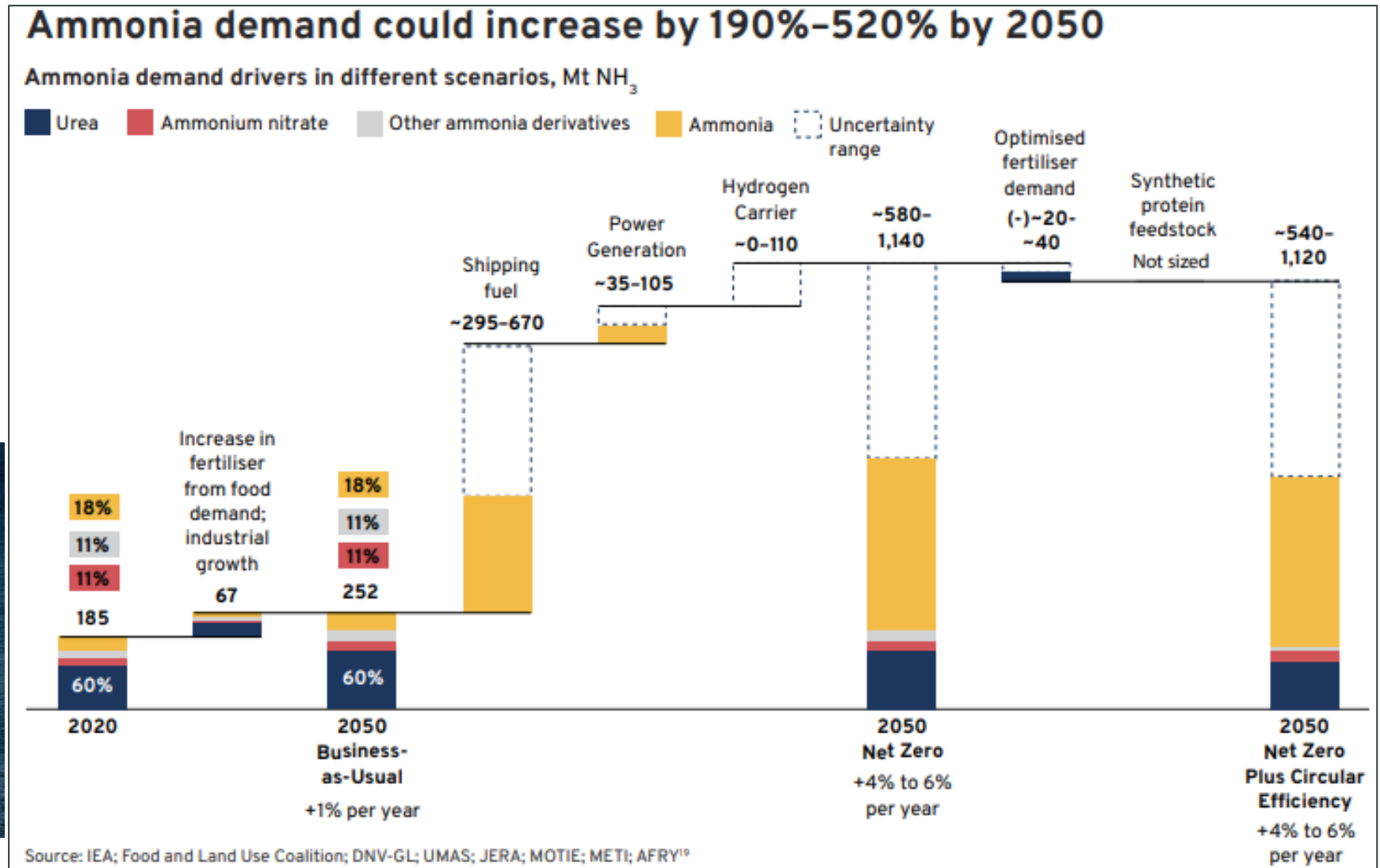
Right policies and enablers:

- Carbon trading schemes: ETS in the EU + ~20 similar schemes worldwide
- Carbon intensity requirements and carbon pricing regulations (e.g. EU Carbon Border Adjustment Mechanism)
- Policies investing incentivizing clean energy/ammonia production (e.g. USA Inflation Reduction Act)
- Development of carbon footprint standards and certifications: fertilizer, ammonia and hydrogen industry working towards the harmonization of standards for a level playing field
- Increasing reporting & ESG requirements: voluntary ESG reporting and commitments from the industry



D. Beyond fertilizers

- An estimated annual investment of \$59 billion-\$105 billion in new ammonia production facilities is required between now and 2050



Conclusions

- The fertilizer industry plays a big role in **feeding the world** and to **fight climate change** - ammonia will also **decarbonize shipping**
- The industry needs **the right support** as soon as possible to **unlock decarbonization** routes to meet its **climate goals**
- IFA is available to help the WTO to better **understand and assess decarbonization opportunities** related to nitrogen fertilizers through its Sustainability and Market Intelligence Services





For further information, please contact:

Volker Andresen
Sustainability Director
vandresen@fertilizer.org

Lucia Castillo Nieto
Senior Sustainability Analyst
lcastillonieto@fertilizer.org