



# AMMONIA SEABORNE TRADE OUTLOOK TO 2040

QUARTERLY / ANNUAL ANALYSIS

LONG TERM



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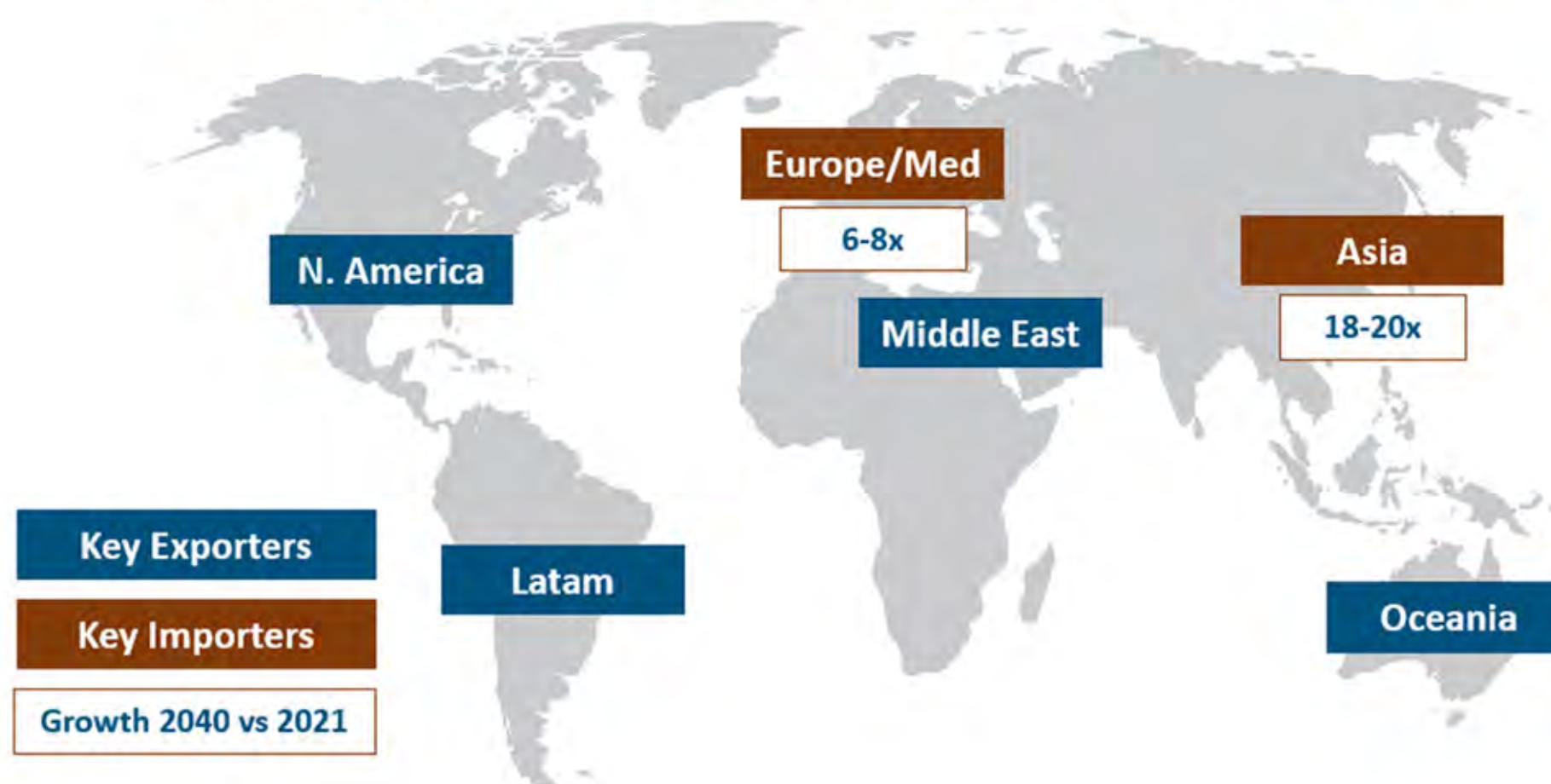
# AMMONIA OUTLOOK

## QUARTERLY OR ANNUAL

**Low carbon emissions targets and the concept of a hydrogen economy have opened the door to a massive increase in ammonia trade.**

### Key Ammonia Seaborne Trade Developments 2021-2040 (Base Case)

GLOBAL AMMONIA SEABORNE TRADE 2021: 15.6 MM T  Growth: 10x  
 POTENTIAL GLOBAL AMMONIA SEABORNE TRADE 2040: 161.7 MM T



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**On top of ammonia's traditional uses as a fertilizer, chemical and explosives feedstock, new uses of ammonia are being developed:**



for co-firing with coal in power stations



for use as a bunker fuel



for use as an economic seaborne carrier of hydrogen between supply locations and demand locations

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**And new projects, some huge, are being developed to supply green and blue ammonia:**



**green** hydrogen/ammonia in renewable energy areas



**blue** ammonia in areas with CCUS

**Governments and regional authorities have announced plans and financial backing.**

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**NGLStrategy's new report looks at these developments and answers the questions:**

### Hydrogen / Ammonia Production

- How will new developments shape the overall demand for hydrogen and what is ammonia's role?
- What are the supply drivers for the new hydrogen and ammonia projects?
- What will be the development of hydrogen and ammonia costs?
- Where will the new plants be built and when?

### Ammonia Demand

- Which are the new demand outlets?
- What are demand drivers of each of the new and traditional ammonia uses?
- How fast are the new ammonia demand outlets are expected to develop? And what will be the demand by demand outlet?

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### Ammonia Trade

- What is the likely demand/timing/location profile?
- What is the most economic means of transporting hydrogen?
- What will ammonia trade look like in 2025, 2030 and 2040?
- Who will be the major importers?
- Who will be the major exporters?
- What are the implications for infrastructure – where and how big will the required terminals/storage be?

### Ammonia Shipping

- What are implications for the shipping market?
- How will each segment of the fleet grow – and might larger vessels be needed?

**These questions are answered for a base case and low/high scenarios.**

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### REPORT CONTENTS AND SLIDE OVERVIEW

#### 1. Executive Summary: growth in total trade, dominant trade flows, shipping implications

#### 2. Introduction: moving to a hydrogen economy

- ◆ The vision to cut carbon emissions
- ◆ EU moves to the forefront of initiatives
- ◆ Overview of hydrogen supply/demand
- ◆ Major challenge in a hydrogen economy
- ◆ Ammonia's role in a hydrogen economy

#### 3. Drivers of hydrogen and ammonia supply

- ◆ Ammonia production: definitions
- ◆ Production of ammonia/hydrogen: definitions
- ◆ Ammonia production: new technology
- ◆ Ammonia supply drivers
- ◆ Hydrogen economics outlook
- ◆ Hydrogen production economics complexity

#### 4. Drivers of ammonia demand

- ◆ Changing ammonia market dynamics
- ◆ Ammonia market overview
- ◆ Current/future uses of ammonia
- ◆ Ammonia demand: new technology
- ◆ Ammonia demand drivers
- ◆ Ammonia use in traditional applications

- ◆ Different scenarios for current applications
- ◆ Ammonia use in co-firing with coal
- ◆ Overview of NH<sub>3</sub> use in power plants
- ◆ Most likely candidates for NH<sub>3</sub> co-firing
- ◆ Overview of scenarios - ammonia as a power plant fuel
- ◆ Different scenarios for co-firing demand
- ◆ Ammonia use as a bunker fuel - outlook (%)
- ◆ Ammonia use as a bunker fuel - outlook volume
- ◆ Ammonia use as a bunker fuel - considerations & assumptions
- ◆ Different scenarios for bunker fuel demand
- ◆ Overview: hydrogen economics
- ◆ Different scenarios of hydrogen demand
- ◆ Overview of scenarios - ammonia as a hydrogen carrier
- ◆ Hydrogen supply/demand balance and seaborne trade
- ◆ Ammonia as a hydrogen carrier

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### REPORT CONTENTS AND SLIDE OVERVIEW (continued)

#### 5. Seaborne trade balance

- ◆ Why is ammonia shipped?
- ◆ Current global terminal infrastructure
- ◆ Seaborne exporters overview
- ◆ Seaborne importers overview
- ◆ Traditional ammonia seaborne trade overview
- ◆ Key ammonia seaborne trade movements 2021-2040
- ◆ NH<sub>3</sub> seaborne trade – total volume outlook
- ◆ NH<sub>3</sub> seaborne trade – traditional volume outlook
- ◆ NH<sub>3</sub> seaborne trade – coal power replacement volume outlook
- ◆ NH<sub>3</sub> seaborne trade – H<sub>2</sub> transportation volume outlook
- ◆ NH<sub>3</sub> seaborne trade – bunkering volume outlook
- ◆ Introduction to ammonia shipping supply
- ◆ Freight and full transportation assessment comparison between key hydrogen transportation means by distance, size and time
- ◆ What's the cheapest way to move hydrogen?
  - ❖ Freight Cost Comparison by 2040
  - ❖ Total Transportation Cost Comparison by 2040
- ◆ Shipping cost comparison per hydrogen transportation method and major route
- ◆ Vessel demand in number of vessels vs volume demand
- ◆ Vessel demand by segment vs volume demand
- ◆ Total ammonia shipping supply/demand balance
- ◆ MGC & smaller vessels supply/demand balance and outlook
- ◆ LAC vessels supply/demand balance and outlook

- ◆ VLAC vessels supply/demand balance and outlook
- ◆ ULAC vessels supply/demand balance and outlook
- ◆ Ammonia shipping cost assessment per vessel size

#### 6. Scenarios

- ◆ NH<sub>3</sub> seaborne trade – high/low case scenarios
- ◆ NH<sub>3</sub> traditional & Coal Power trade – high/low case scenarios
- ◆ NH<sub>3</sub> bunkering & H<sub>2</sub> transportation trade – high/low case scenarios
- ◆ Ammonia seaborne trade – high & low case scenarios
- ◆ MGC & smaller demand breakdown and scenario analysis
- ◆ LAC demand breakdown and scenario analysis
- ◆ VLAC demand breakdown and scenario analysis
- ◆ ULAC demand breakdown and scenario analysis

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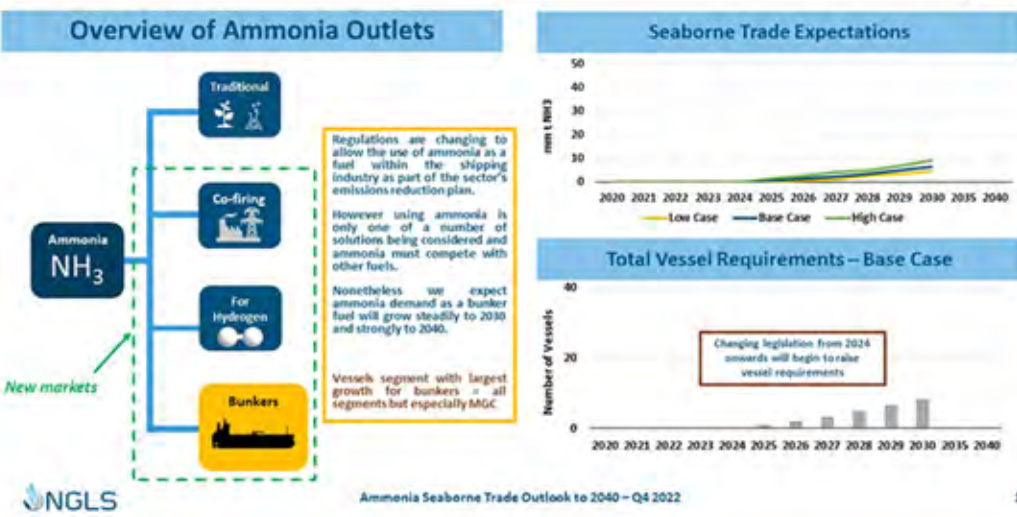
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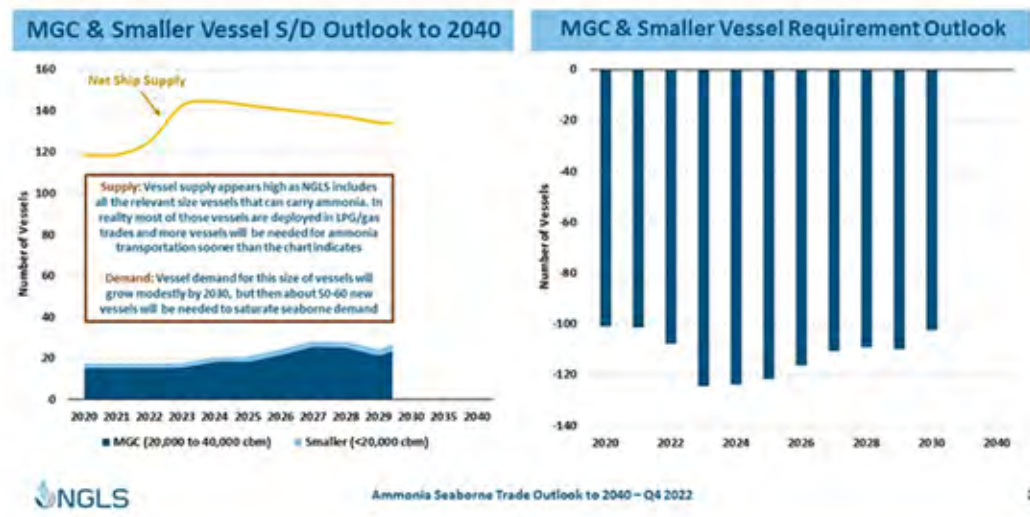
### SELECTION OF ABSTRACTS FROM REPORT

#### Ammonia Demand by Application Outlook

##### Ammonia use as a bunker fuel – overview & outlook



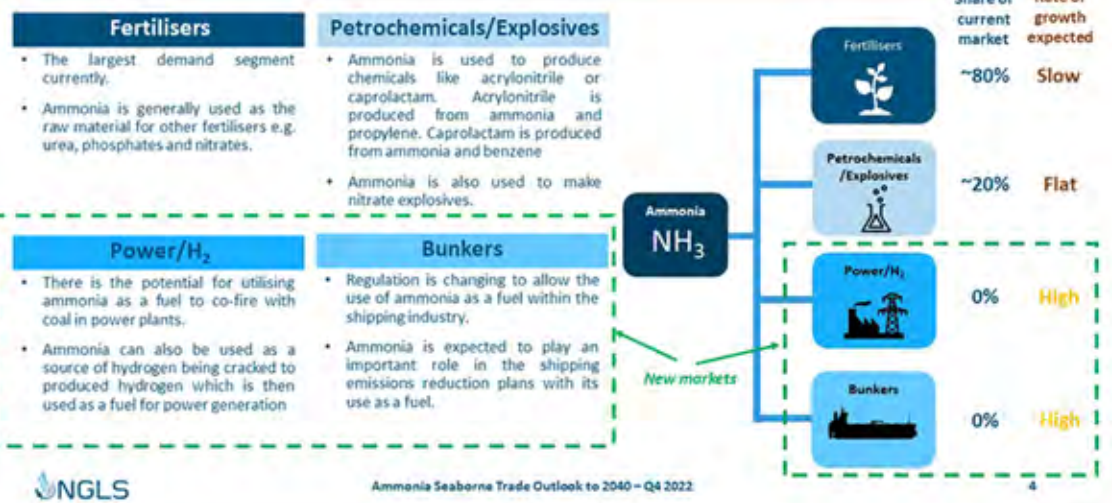
#### MGC & smaller vessels supply/demand balance and outlook



#### Current global terminal infrastructure

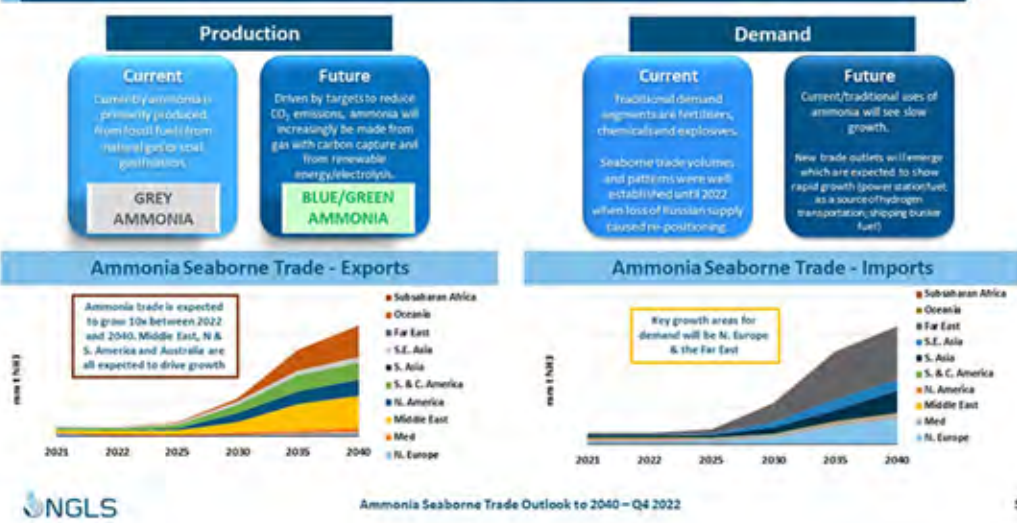


#### Current/future uses of ammonia



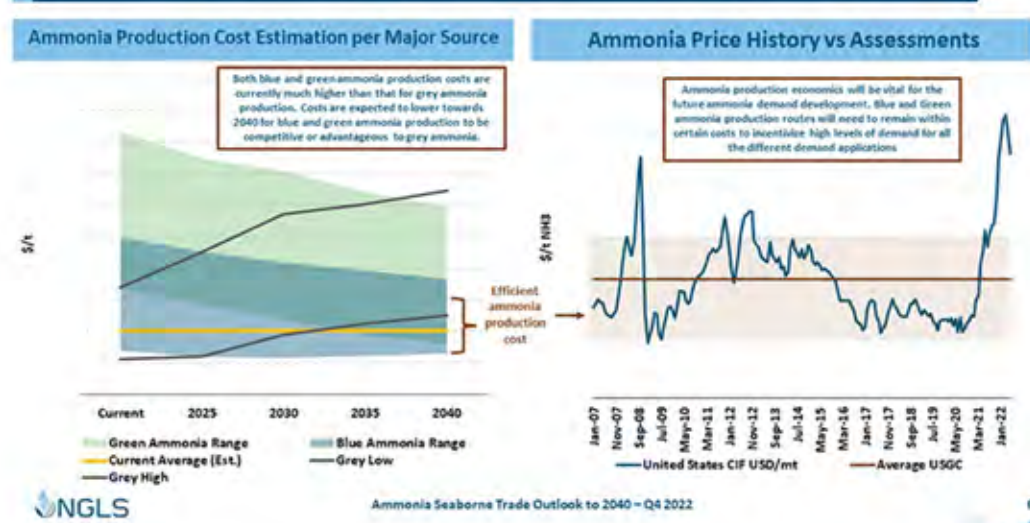
#### Ammonia Market Dynamics

##### Changing ammonia market dynamics



#### Ammonia Efficient Cost Structure

##### Ammonia production cost assessment and optimal levels



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The new report will be available in PowerPoint format in Q4 2022 with two options available:



**One-off study**



**A quarterly service**



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