



Market Scenario Planning: Green Ammonia - 2023

Market Scenario Planning: Green Ammonia - 2023 is one in a series of reports published as part of NexantECA's Markets & Profitability program.

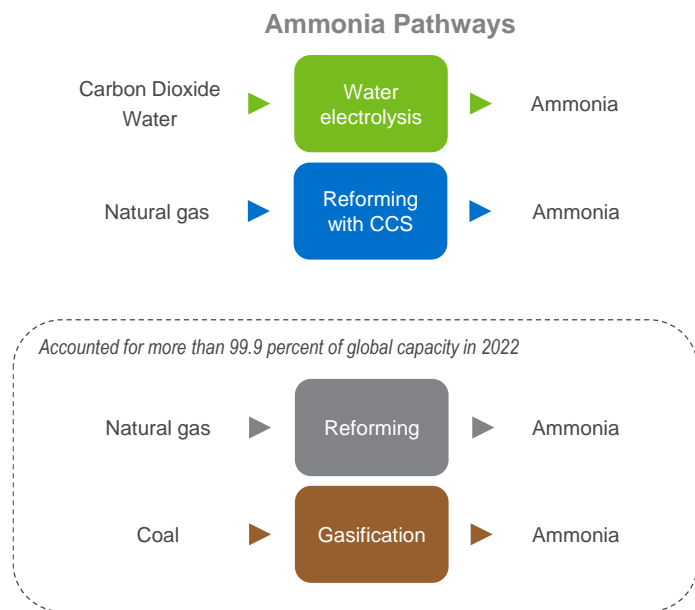
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Report Abstract:

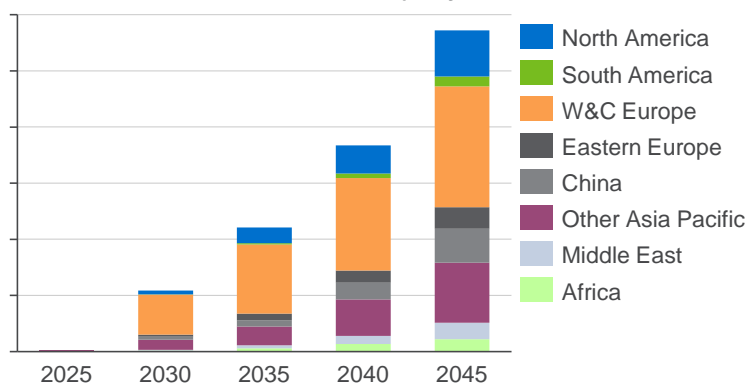
Commercial synthetic ammonia production began in 1913, when a 30-ton-per-day plant using the Haber-Bosch process was established. Today, a typical commercial ammonia plant has a capacity ranging from 1,000 to 2,200 tons per day, with some plants capable of producing as much as 3,300 tons per day.

The majority of the world's ammonia output is created by combining hydrogen and nitrogen using a catalyst in an exothermic reaction. Nitrogen is easily sourced directly from air, while hydrogen requires energy-intensive processes and is usually generated from a fossil fuel feedstock. In some processes, pure nitrogen is obtained via an air separation unit (ASU).

The ammonia produced commercially is mostly brown/grey ammonia, in which hydrogen is generated from a fossil fuel feedstock. As of 2022, over 750 ammonia plants are in operation, with a combined capacity of 260 million tons per year. Grey ammonia is created from natural gas feedstock, where hydrogen is produced by steam methane reforming (SMR). Brown ammonia, on the other hand, is produced from coal, with hydrogen generated from gasification.



Global Green Ammonia Demand by Region
Million tons per year



To reduce the carbon footprint of ammonia production, two additional pathways are being pursued for commercial production:

- Blue ammonia, in which carbon capture and storage technology is applied to the manufacturing process of grey ammonia.-
- Green ammonia, in which hydrogen is produced via electrolysis of water using renewable energy

All pathways use the Haber-Bosch technology, and the ammonia produced has the same specifications.

Table of Contents:

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Market Scenario Planning: Green Ammonia – 2023

1. Executive Summary
 2. The Current Picture
 3. Market Drivers
 - 3.1. Carbon Intensity
 - 3.2. Cost Competitiveness
 - 3.3. Policy
 - 3.4. Market Pressure
 4. Market Scenarios
- Appendix
- A. Capacity List
 - B. Terminology
 - C. Methodology

NexantECA defines the three market scenarios as:

- Base: NexantECA's expectation for demand given current knowledge of policy, technical and market drivers.
- Aggressive Adoption: NexantECA's expectation if barriers for adoption are lower – i.e. policy is more ambitious and scale up happens more quickly
- Business as Usual: NexantECA's expectation if barriers for adoption are higher – i.e. policy is less ambitious and scale up is delayed

This analysis will identify the key policy, technology and market drivers shaping these scenarios.

For related analysis, please refer to:

[Profitability and Price Forecasts: Ammonia & Derivatives Quarterly Business Analysis](#)

[Market Analytics: Ammonia & Derivatives](#)

Subscription Details:

Subscription to **Market Scenario Planning: Green Ammonia - 2023** includes:

- 12 month access via the NexantECA website, to:
 - Unlimited downloads of PDF reports
 - Downloadable data in Excel from the Online Database
- Webinar
- Consultation time with the project team

Customized subscriptions are also available.

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The **Markets and Profitability** program comprises of the well-known Petroleum and Petrochemical Economics (PPE), PolyOlefins Planning Service (POPS), Strategic Business Analysis (SBA) and World Gas Analytics (WGAS).

Markets and Profitability tracks over 60 feedstocks, petrochemicals, polymers, chemical intermediates and fertilizers on an ongoing basis and provides regularly updated reports covering all commercial aspects of these global industries. The accompanying database, provides global analysis and forecasts in two major inter-related areas: **Markets and Profitability**.

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