

ARGUS GREY, LOW AND ZERO-CARBON AMMONIA EXPERTISE

Argus daily and weekly ammonia price assessments, news and insight

Argus Daily Ammonia Marker	\$/t	May month-to-date average	April average
Middle East fob	1,050.0	1,115.4	1,117.5
East Asia (exc Taiwan) cfr	1,115.0	1,140.4	1,077.0
NW Europe (duty paid/free) cfr	1,295.0	1,374.0	1,579.5
US Gulf cfr	1,317.5	1,386.3	1,581.0

The Argus Daily Ammonia Marker provides a calendar-month average for four key regional ammonia markets - fob Middle East, cfr East Asia, US Gulf and cfr NW Europe. The daily prices for these markets would form the underlying basis for a potential ammonia swap.

GREEN AMMONIA

Global news

- US Clean ammonia plant**
North American fertilizer producer Nutrien is expanding its ammonia production capacity in the US by building a 2.5 million tonnes per year clean ammonia production facility at its existing Denver, Colorado, complex by 2024.
Continue reading »
- Green ammonia production in Australia**
German steel producer ThyssenKrupp is electrolysis manufacturing green ammonia in Australia after opening an office in Perth, the state capital of Western Australia (WA), this month.
Continue reading »
- Green ammonia production in Norway**
The world's first green ammonia plant in Norway is set to start production in 2024.
Continue reading »

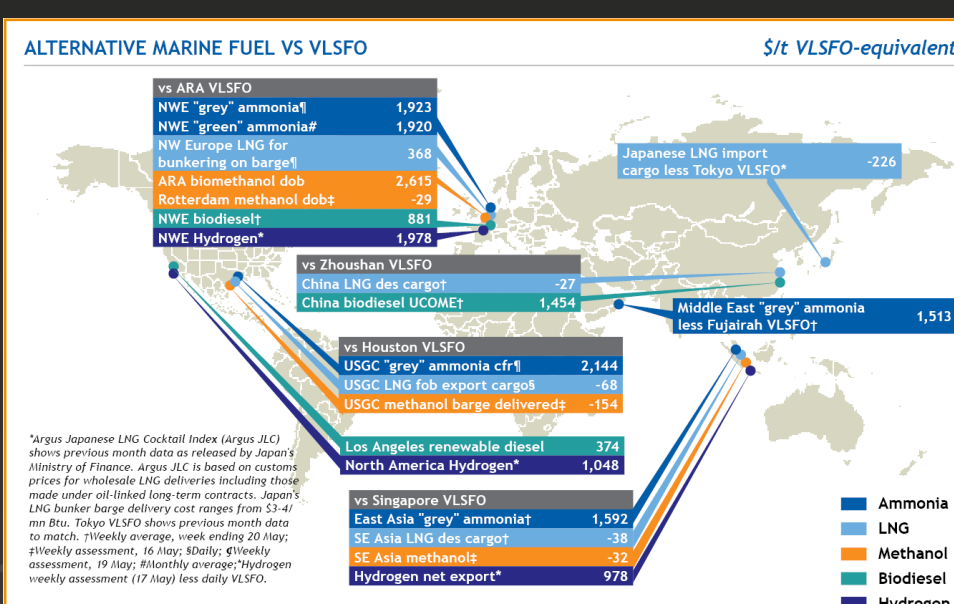
Our Argus Ammonia price reporting service includes key low/zero-carbon news, developments and excel datasets covering:

- Selected green ammonia projects in development
- Ammonia-fuelled ships in development
- Green ammonia offtake initial agreements

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Argus Marine Fuels Service for alternative and conventional bunker markets



Argus can help support you:

Access a fair price comparison - Argus publishes alternative marine fuel prices to allow a fair price comparison in:

- \$/m Btu
- \$/t VLSFO equivalent
- \$/t MGO equivalent
- \$/t HFO equivalent

Compare and track alternative bunker price differentials to conventional bunkers

Monitor alternative bunker arbitrage opportunities

Sample of the data base

Vessel Name	Type	Flag	Capacity (t)	Current Fuel	Alternative Fuel	Price Difference (\$/t)
Argus	tanker	Panama	10,000	VLSFO	Ammonia	100
...

The Argus alternative marine fuels vessels database provides comprehensive insight into vessels burning ammonia, methanol, biofuels, LNG, hydrogen, etc.

Access global ammonia terminal data through Argus

COUNTRY	Company	City	Capacity (000t)
United States	DuPont	Gibbstown	37
United States	CF Industries	Tampa	35
United States	Yara	Tampa	40
United States	Kinder-Morgan	Tampa	46
United States	CF Industries	Donaldsonville	43
United States	CF Industries	Donaldsonville	27
United States	Mosaic	Faustina	23
United States	— (low border)	Geismar	18
United States	PCS Nitrogen	Geismar	40
United States	Koch Industries	Taft	30
United States	BAF Corporation	Freeport	30
United States	DuPont-Lucite	Beaumont	20
United States	Marin Gas / Koch Nitrogen	Beaumont	30
United States	PCS Nitrogen	Pasadena	13
United States	Ineos Americas LLC	Point Comfort	20
United States	Stirling Chemical	Portland	30
United States	Calumco	Stockton	30
United States	Agrium	Sacramento	30
United States	Agrium	Portland	30
United States	Gulf Coast Ammonia	Texas City	30
United States	Inclitec Pivot (IPL)	Wagaman	30
United States	Singol	Wagaman	30

Understand global ammonia storage infrastructure with Argus ammonia terminal data

Argus green and blue ammonia project tracker

Argus low and zero-carbon ammonia: Long-term analysis & forecast

Argus Green Ammonia Strategy Report

Full the exciting potential of this fast-developing market

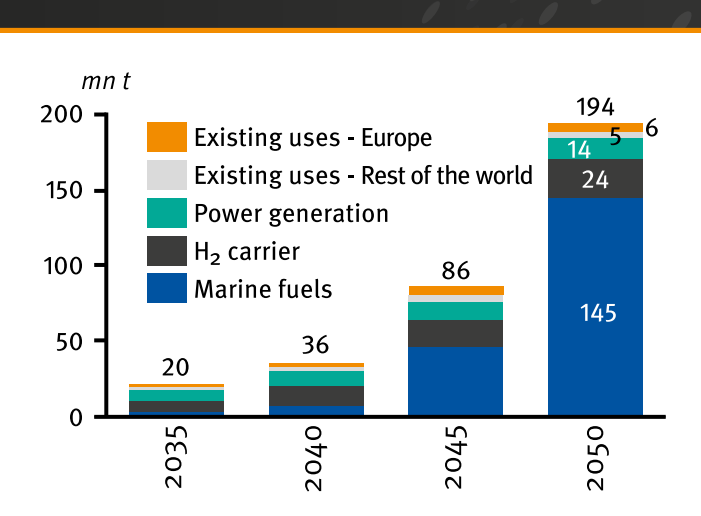
Argus is excited to introduce you to the Argus Green Ammonia Strategy Report. Our grey, low and zero-carbon ammonia expertise will enable you to capitalise on the market's opportunities and navigate its hurdles, challenges and risks to build your own successful strategy.

Key benefits:

- Understand the key market and non-market influences driving the development of ammonia as a fuel.
- Discover which sectors are the most promising for the use of ammonia as a fuel, and why.
- Develop your understanding of the economics of blue and green ammonia production, and how they will evolve in the future.
- Assess the existing ammonia market, its growth, supply and infrastructure.
- Quantify the potential size of the future ammonia market, taking into account the varying data provided by Argus' unique multi-commodity, multi-disciplined team.
- Enhance your strategy to capitalise on this fast-developing market.

Who should use this report?

- Ammonia and energy traders
- Industrial producers
- Shipowners
- Technology and engineering companies
- Market researchers
- Consulting firms



Argus low and zero-carbon ammonia consulting expertise – selected project examples:

CLIENT	TASK	RESULT
Singapore Prime Minister's Office (PMO): Roadmap to decarbonising the economy	The Singapore government's planning division (PMO) commissioned a study to assess the viability of developing a green hydrogen-based supply chain, with focus on applications in power generation and transportation	The potential demand for hydrogen for the economy was examined at the sectoral level. The magnitudes and the entry price levels for each of the sectors was established. Thereafter, the most viable sectors were examined in greater detail, including a detailed cost analysis of the most likely hydrogen carriers, including ammonia.
A major utility company	Ammonia market study – supply and value chain, blue/green ammonia cost analysis	A detailed overview of the global ammonia supply and value chain was provided, with detailed logistics analysis, databases of operating vessels and terminals, as well as an analysis of potential blue/green ammonia levelized costs in all major locations globally. The study included profiles of key players in the ammonia value chain, as well as profiles of major blue/green ammonia projects under development.
A major engineering company active in oil and gas and petrochemicals	Ammonia market study – technology, industry trends, demand potential for green ammonia	A comprehensive overview of the global ammonia market was provided, including demand, supply and price forecasts, as well as an overview of the current cost structure of the industry. Argus also provided an overview of the potential for the green ammonia market, with analysis of potential uses – both traditional and new applications – industry costs, projects activity and potential incentives.
A major bunker fuel trader	Ammonia industry overview and ammonia logistics analysis, with the aim of supporting internal study of ammonia as a marine fuel	A detailed overview of the global ammonia market was provided, including demand, supply and price forecasts, as well as an overview of the current cost structure of the industry. In addition, Argus provided a comprehensive dataset with key data on over 200 ammonia terminals globally, with information on terminal owners/operators, capacity and port data.

Green Ammonia

Blue Ammonia

Project Examples:

- Green Ammonia:** Skovgaard Invest (Denmark), North Ammonia (Norway), Aker and Varanger Kraft (Norway), Yara and Aker and Statkraft (Norway), Fertiberia (Spain), ACWA power, NEOM and Air Products (Saudi Arabia), Helios Industry (UAE), ACME Group (India), H2U (Australia), Clean Holdings and CAC-H2 (Australia), Balance-Agri Nutrients (New Zealand), Fortescue Future Ind. (Australia).
- Blue Ammonia:** Equinor, Horizont Energy, Vår Energy (Norway), Proton Ventures (Netherlands), Zenith Energy and El-Hz (Ireland), Yara (Netherlands), Fertiberia (Spain), ACWA power, NEOM and Air Products (Saudi Arabia), Helios Industry (UAE), ACME Group (India), H2U (Australia), Clean Holdings and CAC-H2 (Australia), Balance-Agri Nutrients (New Zealand), Fortescue Future Ind. (Australia).

Project Status Legend:

- Speculative
- Probable
- Possible
- Firm

Argus project rating methodology:
 - Firm: Projects are fully financed, and the EPC contractor has commenced construction. Typically, most heavy engineering will have been delivered to the site and all required gas contracting and/or renewable and electrolyser supply contracts and infrastructure will be in place. We regard firm projects as having passed the point of FID.
 - Probable: Projects we have graded as probable will be financed and the groundwork at least will have begun. However, there will be an area of concern threatening to push back the targeted completion date, such as incomplete gas pipelines, renewable supply, political risks or sanctions.
 - Possible: Projects that are currently either at the feasibility stage or, have progressed to construction but face significant delays due to political or physical impediments. These projects are ones we believe have strong potential to proceed to, or recommence, construction over the next 18 months.
 - Speculative: Projects that are still at the scoping stage or in early feasibility. EPC contracting and gas/renewable supplies will not have been agreed in most cases, and the financing process will be at the early stages or yet to commence.