Yara Clean Ammonia
YCA is a leading global ammonia platform well-positioned to capture the market for clean ammonia

YCA in brief

> A fully integrated midstream platform in the ammonia value chain, with asset-backed supply and a global logistics and infrastructure footprint covering operations from sourcing to sale of ammonia

> Stand-alone entity backed by majority owner and preferred partner Yara, which has almost 100 years of ammonia experience and a global presence

> A key enabler of decarbonization of hard-to-abate industries through a strong capability set and an ambitious growth strategy, targeting upstream and downstream expansion

Company highlights

- **USD 3.0bn**
  - Q1 2022 LTM Revenues¹

- **USD 166m**
  - Q1 2022 LTM EBITDA¹

- **>20%**
  - Market share of merchant / traded ammonia in 2020

- **4.2mT**
  - Ammonia transported and sold in 2021

- **#12**
  - Owned and leased purpose-built ammonia carriers

- **#18**
  - Terminal access in key geographies²

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¹ Financial figures are presented according to Yara’s segment reporting, and is expected to deviate from YCA’s combined financials as a stand-alone company. Explanations, definitions and reconciliations of alternative performance measures are included in Yara’s annual and quarterly reports (yara.com)

² Exclusive access and right-of-use of Yara terminal infrastructure

Source: Company information; Argus
Clean ammonia offers a solution to the decarbonization challenge...

Rapid growth in GHG emissions from hard-to-abate industries

Ammonia is an attractive solution

- Clean ammonia available through existing blue and green production methods
- Highly versatile with multiple direct applications
- Ideal energy carrier with favorable performance across clean fuel KPIs
- Well-established global infrastructure and storage network

Breakdown of GHG emissions by sector

- Agriculture: 13% Share of GHG emissions (2017)
- Buildings: 24%
- Industry: 30%
- Power: 24%
- Transportation: 21%


1) Based on direct EU emissions in CO₂ equivalents
2) KPIs include density, cost, scalability and distribution
...with real potential to unlock decarbonization opportunities in several key industries

**Shipping fuel**
- 50% higher energy density than liquid hydrogen\(^1\)
- Easier to scale than hydrogen, e-methanol and synfuel
- Can be stored at higher temperature than hydrogen, lowering cost
- Competitive all-in cost through existing infrastructure and know-how

**Power generation**
- Alternative for countries with unfavourable renewables conditions
- Economically favourable over carbon capture
- Enables continued use of more flexible producing assets
- Supports continued use of relatively new plants

**Agriculture**
- Fertilizers account for a very large share of the emissions of food and agricultural products
- Green fertilizer can provide up to 30% CO\(_2\) reduction on a loaf of bread at a marginal cost increase of ~1%\(^2\)
- Green fertilizer requires no infrastructure / value chain changes

**Long-term potential: Hydrogen carrier**
- Mature in transport, infrastructure and know-how
- Lower long-distance transportation cost than hydrogen
- Better characteristics for storage vs. hydrogen
- More energy dense than hydrogen

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Source: Company information; Arkwright market study 2021
2) At 1% extra cost on a loaf of bread, Yara can deliver a 15-30% reduction in carbon footprint

Yara Clean Ammonia
Significant growth potential driven by adoption of clean ammonia in new applications

Global ammonia demand expected to grow significantly in volume from 2021 to 2050, adding close to 300mT to the market.

- **Current**
  - Agriculture and industry: 184 mT
  - Shipping fuel: 48 mT

- **Expected additions by application**
  - Shipping fuel: 182 mT
  - Power generation: 20 mT
  - Hydrogen carrier: 36 mT

- **2050E**
  - Agriculture and industry: 182 mT
  - Shipping fuel: 20 mT
  - Power generation: 36 mT
  - Hydrogen carrier: 470 mT

51% of the demand in 2050 is expected to come from **new applications**, with shipping fuel as the main contributor.

The vast majority of supply is expected to come from blue and green production by 2050.

Source: Arkwright market study 2021; IFA
The future ammonia market expected to rely heavily on cross-regional transportation

Traded ammonia volumes are expected to grow substantially...

- Traded ammonia volumes: mT

- Traded ammonia expected to increase ~6mT from 2021 to 2030E, representing ~1/3 of current merchant volumes

- Traded ammonia CAGR: >12%

...driven by regional differences

- Imbalance between supply and demand as key consumption hubs will have less favorable conditions for direct production

- Land use constraints
- Infrastructure availability and potential
- Production cost differences
- Capacity for direct renewable electrification

Traded ammonia volumes:

- 2021: 184 mT
- 2025E: 191 mT
- 2030E: 203 mT
- 2035E: 233 mT
- 2040E: 294 mT
- 2045E: 379 mT
- 2050E: 470 mT

Source: Arkwright market study 2021; Argus; IFA

Yara Clean Ammonia
Clear market leader today, providing a unique starting point to develop the clean ammonia value chain...

Yara Clean Ammonia

Global No.1 with >20% market share of merchant / traded ammonia in 2020

Key success factors for YCA

- Reliable, asset-backed supply and attractive offtaker
- Deep industry know-how, market insight and track record of safe handling
- Access to specialized fleet of 12 ships
- Global network of 18 terminals located in key geographies
- Deep-sea connection to all key bunkering hubs
- Scalable platform and business model

Source: Company information; Argus
1) Exclusive access and right-of-use of Yara terminal infrastructure
...backed by an established global network with access to asset-backed supply

YCA has a leading end-to-end position in the ammonia value chain

Overview of YCA’s global footprint

- Trade flows
- YCA terminal access
- Yara export production sites
- 3rd party terminals
- Countries present (Σ = almost 40)

YCA has a differentiated model

- Producers w. inhouse freight
- Asset-backed supply
- Network / terminal access
- Optimization opportunities
- Market insight

Low | High

<table>
<thead>
<tr>
<th>Producers w. inhouse freight</th>
<th>YCA</th>
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Customers (existing MoUs)

Project execution and production
Sourcing, optimization and shipping
Global distribution, storage and sales
Ammonia fuel bunkering

Source: Company information; Argus
1) Exclusive access and right-of-use of Yara terminal infrastructure
2) YCA production is covered by Yara; YCA currently has no own production
3) Ammonia fuel bunkering does currently not exist, YCA and other players are expected to enter the segment as the market develops
Growth potential from solid upstream projects, building on YCA’s leading midstream position

**Blue ammonia**
- Robust pipeline with solid project economics and profitability without need for further subsidies

**Green ammonia**
- Early mover strategy where government support will be required – lower costs in the future will increase competitiveness

**Well-positioned to succeed**
- Access to existing production assets that can be converted to blue or green at lower costs compared to greenfield investments
- Knowledge and experience built through Yara’s almost 100 years of ammonia track record and over 8 mT ammonia capacity
- Market leading position makes YCA the preferred offtaker and partner for Yara and other third-parties, in turn enabling new projects

**Selected project candidates**

- **Blue ammonia**
  - ~2,000kT volume by 2030
  - 1. Majority stake
  - 2. Offtake only

- **Green ammonia**
  - ~500kT volume by 2030
  - 2. Own pilots
  - 1. Own large-scale
  - 1. Offtake only

**Key regions**
- Well-positioned with a maturing project hopper and additional long-term opportunities

Source: Company information
1. Estimated volume for the selected candidate projects
YCA is positioned to become a key enabler of the green transition

By successfully delivering on its business plan, YCA expects to achieve

- **3mt**
  - Reduction of existing emissions from ammonia production (Scope 1-2)
  - By 2030 (vs. 2019 baseline)
  - Equivalent to the emissions of ~650 thousand passenger cars per year²

- **4mt**
  - Avoided emissions of future conversion and new build projects net of loss in energy efficiency from use of ammonia mainly in shipping fuel³
  - By 2035
  - Equivalent to the emissions from ~4 million flights between Paris and NYC⁴

- **70%**
  - Reduction in GHG intensity vs. baseline for customers in shipping and power³
  - By 2035

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Green fertilizer can provide up to 30% CO₂ reduction or a loaf of bread at a marginal cost increase of ~1%³

**Source:** Company analysis for Yara Scope 1-2 impact (not 3rd party verified); Arkwright market study 2021, YCA GHG impact assessment for net avoided emissions impact

1) 6.1% extra cost on a loaf of bread; Yara can deliver a 15-30% reduction in carbon footprint. 2) Based on average CO₂ emission from passenger vehicles of 4.6 metric tonne (United States Environmental Protection Agency study in 2021); 3) Estimated CO₂ emission reduction from converting from a future baseline fuel mix to clean ammonia-based combustion, net of inherent energy efficiency losses of using ammonia combustion technology in shipping and ammonia co-firing in coal power plants. Analyze compares GHG intensity of YCA’s clean ammonia portfolio to a future improved GHG intensity baseline per segment, e.g. assuming a higher share of LNG and methanol in the future fuel mix for shipping, and higher share of renewables in the future power generation mix, not a like for like substitution of marine gasoil or coal with clean ammonia. Assumes partial credit for 3rd party produced volumes distributed by YCA in line with best practice methods. Higher efficiency fuel cell technology in shipping is not included. 4) 1 tonne CO₂ represents the average emission of one passenger on a return flight from Paris to New York (What exactly is a tonne of CO₂? European Environment Agency)
Attractive financial profile with high and stable cash conversion

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<tr>
<th>Key metrics (USDm)¹</th>
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<td>Ammonia price (fob Black Sea, USD / ton)⁵</td>
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Robust unit margins

Stable volume development within existing business, comprising both internal and external sales

Low capex need for midstream business – capex expected to increase as YCA targets growth in the developing clean ammonia market

Total assets⁴ of USD742m by year-end 2021, primarily comprised of investments in ships and operating capital

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² Based on the Ammonia Trade and Shipping business unit reported as part of Global Plants and Operational Excellence

³ EBITDA / transported ton is calculated by dividing EBITDA (as reported by the Yara segment YCA) by transported volume as presented in this table

⁴ Total assets excludes internal cash accounts and deferred tax assets

⁵ Publication price from Argus directly

Source: Company information; Argus

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*Attractive financial profile with high and stable cash conversion*

**Key metrics (USDm)**

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Concluding remarks

Clean ammonia represents a **massive opportunity on top of a structurally robust market for conventional ammonia**

Supportive ammonia market dynamics expected to significantly increase cross-regional trading activity

The #1 global ammonia midstream platform\(^1\) with significant barriers to challenge YCA

Access to **robust upstream projects** to further develop YCA’s integrated value chain position

Profitable and scalable business model with attractive economics and growth prospects from clean ammonia

Experienced and performance-oriented organization with strong backing from Yara

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\(^1\) Based on market share of merchant / traded ammonia market in 2020
Supporting materials
Ammonia market expected to grow by >3x supported by the crucial need to decarbonize industries

Total ammonia market expected to grow rapidly to 2050

USDbn (real terms¹)

Key market drivers

- Shipping fuel
  - Adoption expected to increase rapidly from 2030 driven by anticipated regulations and customers’ environmental focus

- Power generation
  - Market players expect 40-50% co-firing on operational coal-fired plants in selected countries by 2050, driven by Japan, Korea and Taiwan

- Agriculture
  - High-value brands with ability to achieve up to 20% premium on sustainable-labelled food products, highlighting strong adoption incentive. Ammonia base market for fertilizer will continue to grow

- Hydrogen carrier (after 2035)
  - Market based on Europe as major import hub for cheap renewable-based hydrogen and Japan as key import market in Asia

Source: Arkwright market study 2021

¹) USD 398bn in nominal terms in 2050, assuming an inflation rate of 2% starting 2021
²) Based on a normalized ammonia price of ~USD 375 / ton
Decoupling historical pattern of captive consumption will increase the importance of YCA’s midstream position

Global traded ammonia volumes are expected to grow exponentially

- 2021:
  - ~10% ammonia traded
  - ~18 mT traded

- 2050E:
  - ~50% ammonia traded
  - ~238 mT traded

- Geographically separated supply and demand centres
- Driven by production cost differences caused by several factors, mainly related to cost and availability of energy
- Majority of the demand growth expected to come near shipping hubs – largely in high-cost production regions

Source: Arkwright market study 2021; Argus
Blue ammonia will be the key immediate focus before economics improve for green ammonia.

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Transitional option for rapid abatement of emissions

Long-term fully renewable option

Source: Company information; Arkwright market study 2021

"Low-carbon" cost leader throughout the long-term; competitive access to natural resources and infrastructure key to win

Requires meaningful investments to meet demand potential

Carbon capture technology commercially ready – most economically viable low-carbon fuel

Regulatory incentives already in place in certain regions

"Subsidized" green ammonia projects could breach the blue cost curve by 2035+ but will require significant cost progress

Further scaling benefits in hydrogen needed along with increased access to ample renewable energy

Electrolyser technology still being developed and significant investments needed to achieve competitiveness

Further regulatory push required and subsidies for green / higher prices on alternatives required
Demand for ammonia as a low-carbon shipping fuel expected to increase exponentially from 2025

Blue / green ammonia shipping fuel demand outlook

mT

By 2050, the shipping end-market is expected to reach almost the same size as the total market for ammonia in 2021 (184 mT)

Key supply and demand drivers

Enabling technology
Concept proofing and developing the infrastructure is likely to push shipowners to ammonia

Increasing carbon price
Carbon taxes expected to raise the price of fossil fuels, making ammonia more attractive for shipowners

Green ammonia cost reduction
Technological advancement, access to renewable power and scaling effects expected to reduce production costs significantly

Political support
National and supranational regulations, and authority from IMO seen as key political enablers

Customer preferences
Customer preferences and ESG focus turning shipowners towards clean, future-proof solutions

Ammonia scores better than hydrogen on clean fuel KPIs

Source: Arkwright market study 2021
Note: 2030 estimated total blue / green volume including also Power and Fertilizer is ~6mt, with shipping representing ~50%

1) KPIs include density, cost, scalability and distribution
YCA covers the value chain from sourcing to sales, transporting ~4.2mT of ammonia

Current value chain

- Yara ammonia production
- Yara JV production
- 3rd party ammonia production

Offtake

Upstream / production

Midstream

- Ammonia Sales and Logistics ~4.2mT
- Yara ammonia consuming fertilizer plants and EU industrial sales
- 3rd party sales (fertilizer and chemical)
- Shipping fuel
- Power generation
- Other applications¹

Future expansion

Core midstream position is scalable to capture new end markets and supports expansion across the value chain

¹ Including e.g. ammonia as a hydrogen carrier

Source: Company information
Note: Volume numbers are as of 2021
YCA has a leading end-to-end position in the ammonia value chain

Selected players

YCA

YCA

YCA

YCA

Yara Clean Ammonia

Project execution and production¹

Sourcing, optimization and shipping

Global distribution, storage and sales

Ammonia fuel bunkering²

Customers (existing MoUs)

Source: Company information; Argus

1) YCA production is covered by Yara; YCA currently has no own production
2) Ammonia fuel bunkering does currently not exist, YCA and other players are expected to enter the segment as the market develops
3) Market share of merchant/traded ammonia market in 2020
4) Exclusive access and right-of-use of Yara terminal infrastructure

Ammonia

Fuel

Bunkering

Global distribution, storage and sales

Sourcing, optimization and shipping

Project execution and production

Customers (existing MoUs)

YCA

Integrated part of Yara as a major ammonia offtaker

Specialized skills and proprietary systems as nucleus of operations

Global and scalable platform with 18 terminals³

Production close to most major bunkering hubs

Strong and long-standing customer relationships

Attractive partner given leading market position

YCA

Reliable, asset-backed supply complemented by third-party volumes

12 specialized carriers that handle >20% of globally traded volumes³

Industry leading track-record of safe handling

Agreement with Azane for first Scandinavian bunker network

YCA

Source: Company information; Argus

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3) Market share of merchant/traded ammonia market in 2020
4) Exclusive access and right-of-use of Yara terminal infrastructure
YCA benefits from a predictable and scalable economic model with strong value creation potential

**Source:** Company information

1) Based on 2020 and 2021 financial figures according to Yara’s segment reporting, which is expected to deviate from YCA’s combined financials as a stand-alone company

2) Characteristics based on historical track record

**YCA EBITDA margin:**

- $>30 USD / ton\(^1\)

**Key margin drivers**
- Scale and scalability
- Offtake and supply access
- Market maker position
- Efficient logistics infrastructure

**Key sources of income**
- Commercial services
- Ship owning operations
- Global ammonia optimization

**Volume**
- Key volume characteristics\(^2\)
  - Historically stable around 4mT
  - Offtake agreements provide visibility
  - Predictable demand patterns
  - Limited short-term volatility

**Scalable platform with robust margins – YCA is well-positioned to drive volumes while maintaining attractive economics**
Experienced management team with almost 200 years of combined industry experience

Magnus Krogh Ankarstrand  
CEO  
- 15 years of international mgmt. and team leadership experience  
- 9 years at Yara  
- Former Head of North America, and Head of Strategy at Yara

Hallgeir Storvik  
CFO  
- 37 years industry and finance experience with Yara and Hydro  
- Former CFO and Head of Strategy at Yara

Lise Winther  
Projects & Technology  
- 34 years experience with management of large capital projects and technology  
- 13 years at Yara and Hydro  
- Former Head of Cleaner Production at Shell and System Technology at Hydro

Murali Srinivasan  
Commercial  
- 23 years industry and trade experience with Yara and Hydro  
- Former CFO for Yara Industrial and Crop Nutrition Segments

Vibeke Rasmussen  
Product Mgmt. & Certification  
- 26 years of water and environmental technology leadership experience  
- 9 years at Yara and Hydro  
- Former Director Product Quality, and Head of ET & NPK R&D at Yara

Joacim Red Christiansen  
Corporate Development & M&A  
- 15 years energy industry experience  
- 10 years at Yara  
- Former Head of M&A and SVP, Sustainable Food Ecosystem at Yara, ex. McKinsey consultant

Irene Odhiambo  
Human Resources  
- 15 years HR generalist experience  
- 6 years at Yara  
- Previously HR Business Partner at Yara Global Plants and Country HR Manager Yara East Africa

Bart van Hoof  
Business Development  
- 14 years of international large capital projects and contracting experience  
- 12 years at Yara  
- Former Head of Contracting at Yara Project Organization

Hilde Steinfeld  
Communication  
- 17 years experience from communication and public affairs  
- Ex. consultant and former VP Public Affairs at Burson Cohn & Wolfe  
- Previously diplomat and civil servant

Source: Company information

Almost 200 years of industry experience and over 100 years at Yara  
Proven ability to deliver strong financial results  
Diverse team combining key capabilities to build global businesses
Strong and committed long-term backing from Yara

- World's largest ammonia production base\(^1\) with multiple export plants, **exclusively marketed by YCA**
- Large captive ammonia demand, **exclusively served by YCA**
- World's largest network of ammonia storage infrastructure\(^1\), **exclusive access for YCA**
- Strategically attractive grey ammonia assets and sites as basis for future clean ammonia projects
- Almost 100 years of ammonia safety, large-scale project execution and operation experience available to YCA
- Corporate services with global footprint through SLAs with Yara
- Solid financial services setup with proven track record from international capital markets

YCA is set up to perform its core business activities independently while also benefiting from the deep knowledge and leading capabilities of Yara.

Source: Company information
1) Company estimate