Green Hydrogen Organisation

April 2026

Decarbonising the shipping industry: Exploring green fuel bunkering in North Africa and the role of the IMO Net-Zero Framework

About the Green Hydrogen Organisation (GH2)

The Green Hydrogen Organisation (GH2) is an international non-profit foundation working to accelerate the production and use of green hydrogen globally. GH2 collaborates with governments, producers, financial institutions and civil society to promote key applications such as green fertilisers, shipping fuels and green iron and steel.

Founded in 2021, GH2 has established a presence in Geneva, London, Jakarta, Nairobi and Oslo. It serves as the secretariat for the Africa Green Hydrogen Alliance (AGHA), a government-led platform uniting eleven African countries to drive regional cooperation on green hydrogen.

GH2 is a founding member of the Global Renewables Alliance (GRA).

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GH2 Green Hydrogen Organisation

Summary

- Shipping decarbonisation is already underway. Despite the postponement of the IMO Net-Zero Framework (NZF) adoption, policies and initiatives around the world are pushing for a clean fuel switch in the maritime sector, which will cause a global redesign of shipping routes. Green ammonia is emerging as the most scalable and sustainable green shipping fuel.

- North Africa is uniquely placed to benefit from green fuel production and value chains, capture value from the IMO net-zero fund and enable green industrialisation. The centrality of North African ports in international shipping, the region's abundant renewable energy potential, domestic policy targets and EU regulations are all building the case for North African countries, especially Egypt and Morocco, to become green fuel bunkering hubs and suppliers.

- Many green hydrogen and derivatives projects have been announced in North Africa, although most of them are still at very early-stage and seem to be converging pre-FID. Most projects in Egypt, Algeria and Morocco are planning to be located at ports, which would facilitate green fuel bunkering and exports to Europe. Most of the additional storage capacity for low-carbon ammonia at ports is to come online in 2029 and 2030 in Mauritania and Egypt.

- A viability and financing gap persists as green fuels are not yet commercially competitive, and this situation is exacerbated by North African countries' high cost of capital. The postponement of the IMO NZF has also created greater uncertainty for the industry, and the availability of infrastructure remains a significant challenge for the development and deployment of green hydrogen-based fuels.

- To address these challenges, shipping decarbonisation should become a strategic priority for North African countries. This would both support green industrialisation and energy security by reducing the region's reliance on fossil fuel imports. If anything, the crisis in the Middle East has indeed highlighted the importance of moving to a more diverse set of fuel sources.

- The adoption of the IMO NZF "as is" would allow them to reap the benefits of the green fuel transition. North African countries should also leverage their relationship to the EU and could create green corridors to catalyse domestic green fuel production and deployment.

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1. Recommendations

1 Shipping decarbonisation should become a strategic priority for North African countries.

North African countries are uniquely positioned to benefit from green fuel bunkering and production given their strong renewable energy potential, strategic location on international trade routes and proximity with the European Union (EU), a major demand centre for green hydrogen and derivatives. Green fuel projects in the region however remain at very early stage and face a viability and financing gap, high cost of capital, and a lack of demand and regulatory certainty, which all delay progress towards final investment decision (FID). Integrating maritime decarbonisation into national green hydrogen strategies and industrial policies would allow North African countries to set frameworks to scale bunkering and port infrastructure, develop green hydrogen-based fuels value chains, and enable green industrialisation. It would also ensure that North Africa is not left behind in the global redesign of shipping routes as fuelling patterns change with maritime decarbonisation.

Additionally, making shipping decarbonisation a strategic priority and supporting domestic green hydrogen and derivatives production would strengthen North Africa's energy security by reducing the region's reliance on fossil fuel imports, which price volatility has intensified due to the increasingly uncertain geopolitical order. As laid out in the Global Renewables Alliance's action plan, renewable energy is the fastest and most cost competitive solution to long-term energy security, and green hydrogen plays a vital role for sectors that cannot be electrified directly (GRA, 2026). This would position North African countries for long-term competitiveness and shield them from volatile shipping fuel prices, which have doubled since the closure of the Hormuz strait (Lloyd's List, 2026).

2 North African countries should vote in favour of the IMO NZF to reap the benefits of shipping decarbonisation.

The postponement of the IMO NZF in October 2025 has deepened regulatory uncertainty, which continues to be one of the key barriers for North African green hydrogen and derivatives projects. The NZF "as is" represents a carefully negotiated balance and one of the few global policy instruments that could create new, long-term revenue stream for the region. If adopted, the NZF will send a strong demand signal and enable countries to maximise the co-benefits of the shipping transition, including increased investment, industrial development and job creation.

Adoption would also unlock the net-zero fund, which could generate over USD 220 billion by 2050 if implemented in 2029. This matters as the continent attracts only 2% of global renewable energy investment, hindered by non-investment grade credit ratings and a persistently high cost of capital. Revenues from the IMO's carbon pricing mechanism could change this by lowering initial project costs, de-risking clean energy investments and upgrading port infrastructure and grids, paving the way for Africa to power global shipping (African Liberty, 2026).

3 North African countries can leverage their relationship to the EU to catalyse domestic green fuel production.

The EU is a major demand centre for green hydrogen and green fuels. Through the Pact for the Mediterranean, the EU is looking to strengthen cooperation with the MENA region to tap into its abundant and cost-competitive renewable energy resources, which will allow both regions to address shared challenges. North Africa is therefore well-placed to benefit from EU funding and development initiatives to enable green fuel production and bunkering. Such initiatives include the T-MED Investment Platform, the European Fund for Sustainable Development Plus (EFSD+), the Financial Support Coordination Group (FSCG) under Med-Gem, and the GreenMedPorts projects. Leveraging these initiatives could enable domestic green fuel production in North African countries.

4 The European Union should provide further clarity on how domestic regulation will align with IMO measures.

The European Commission's Industrial Maritime Strategy (European Commission, 2026) states that "in line with the existing legal commitments, the Commission will revise relevant EU legislation taking into consideration global measures at IMO in order to avoid double payment." Even more clarity from the EU on this issue ahead of IMO negotiations this year would be constructive and provide greater certainty to African governments including Egypt and Morocco.

5 Improved financial coordination could enable green hydrogen-based fuels projects in North Africa.

Recent interviews with Moroccan and Egyptian stakeholders confirm that while lack of offtake and revenue certainty remains the primary barrier to FID, a second constraint is how finance is sequenced and coordinated. Concessional finance, guarantees, and blended structures typically enter only once projects approach bankability, leaving developers to absorb the highest-risk stages alone. The creation of a pre-FID project preparation and risk-sharing facility, jointly anchored by governments and Development Finance Institutions (DFIs), could fund Front-End Engineering Design (FEED) studies, support commercial structuring, including offtake and early Energy Performance Contract (EPC) engagement, and provide early-stage guarantees or contingent support. This would reduce developer exposure and accelerate project delivery.

Additionally, aligning financing sequencing through structured DFI coordination would allow financial stakeholders to agree upfront on roles across the project cycle, including which actors take early-stage risk, which enter at structuring, and which lead at financial close. Together, these measures could therefore address the current sequencing deadlock, reduce transaction costs, and make financing pathways predictable and replicable.

6 Creating green corridors from North African ports can support the development of bunkering infrastructures.

Green corridors have widely been considered to be a key transitional tool in shipping decarbonisation since their establishment at COP26 in 2021. They allow decarbonising solutions to be test run and can accelerate system-wide change. However, despite the global green corridor portfolio now comprising 84 active initiatives, with 25 new initiatives compared to last year, only one of these green corridors has been announced in North Africa, between Tanger-Med and Tarifa (GMF, 2025). Given North Africa's strategic location in international trade and strong renewable energy potential, establishing green corridors to and from North African ports could catalyse the development of green fuel bunkering infrastructure as well as green fuel production. East Port Said and Ain Sokhna in Egypt, and Tan-Tan and Jorf Lasfar in Morocco, in addition to Tanger-Med, are examples of ports that could be part of such initiatives.

Introduction

2

Maritime transport carries over 80% of global trade (UNCTAD, 2025) and is a cornerstone of the economy. It also accounts for nearly 3% of global CO_2 emissions and over 10% of transport emissions, and could represent around 10% of greenhouse gas (GHG) emissions by 2050 (T&E, 2026). Maritime transport therefore needs a clean fuel switch, and the transition is already underway.

Momentum to decarbonise the maritime sector is growing and driven by policy, while a quickly aging global fleet represents an opportunity to invest in new vessels capable of running on low-emission shipping fuels (International PtX Hub, 2025). In April 2025, the Member States of the International Maritime Organization (IMO) agreed draft regulations to reduce emissions from global shipping and aim for net-zero by or around 2050. Although the IMO postponed its vote on the Net-Zero Framework (NZF) adoption to November 2026, markets are signalling their willingness to transition to clean fuels regionally: the EU Emissions Trading System (ETS) and FuelEU maritime regulations require shipowners to surrender allowances for their GHG emissions and gradually decrease the GHG intensity of shipping fuels, while Japan and South Korea are promoting green ammonia offtake with subsidies and Contract for Difference schemes. Regional policies are signalling that shipping decarbonisation is happening, albeit in a currently fragmented way and at different speeds across the world.

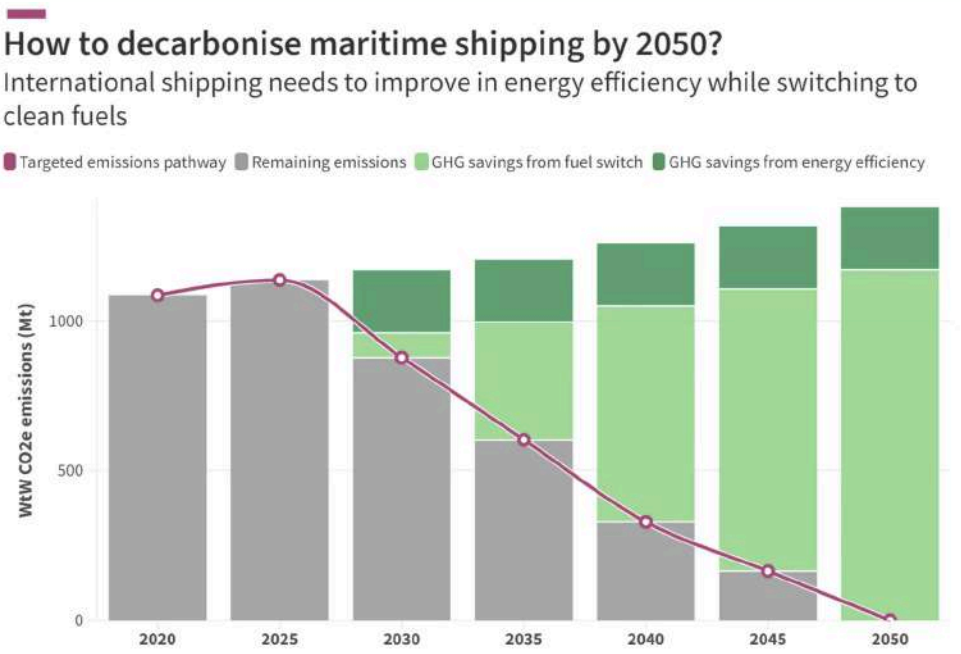
In this context, North Africa is uniquely positioned to benefit from the transition towards a cleaner maritime sector. The region's abundant renewable energy potential and its location at the heart of international trade and shipping routes make it well-situated to become a green fuel bunkering hub and green fuel supplier. Although green fuels are not yet commercially competitive and a viability and financing gap remains, the adoption of the IMO NZF, through the net-zero fund, could support green fuel projects in the region and help catalyse green fuel production. It would also bring much-needed clarity to the maritime sector and could enable port modernisation and stimulate the creation of green value chains, unlocking green industrialisation opportunities and allow the region to position itself for long-term competitiveness.

3. International shipping decarbonisation is already underway

3.1

Green fuels 101: Why green hydrogen is central to a decarbonised shipping industry

A significant part of the transition to cleaner maritime transport involves replacing fossil fuel-based fuels with greener alternatives (IMO, 2024) such as green hydrogen, green ammonia, e-methanol and e-methane. Decarbonising the shipping industry indeed requires a clean fuel switch in addition to improving energy efficiency through energy-saving technologies (see graph below). There remains uncertainty over which low-carbon fuel will be most widely adopted, and the shipping industry is expected to undergo a multi-fuel transition. The section below looks at the key benefits and challenges of different maritime fuels and highlights green ammonia as the most sustainable and scalable solution for long-term decarbonisation, while e-methanol/methane could play an important role in decarbonising the industry in the shorter-term, although vessels and infrastructure should be designed for credible conversion to ammonia in order to prevent delays in its future maritime use (Langer et al, 2026).



Source: T&E

Green hydrogen

Green hydrogen made from water electrolysis powered by renewable electricity can be used directly as a fuel for shipping, but its low volumetric energy density and liquefaction temperature make its transport costly. Additionally, hydrogen internal combustion engines (ICEs) and fuel cells for ships are currently under development and not available at scale. Green hydrogen-based fuels such as ammonia and e-methanol therefore seem to constitute more viable alternatives to fossil fuels in the short-run.

Green ammonia

Green ammonia is easier to liquefy than hydrogen and has a higher volumetric density, making it cheaper to transport. It is already traded internationally, with existing logistics and infrastructure to transport, handle and store it in many ports (International PtX Hub, 2023). If ammonia-powered ICEs are still being developed, they are quite advanced with some applications already in place (IRENA 2021). Fortescue's Green Pioneer, for example, is an ammonia dual-fuel vessel and demonstrates the feasibility of such a technology. Additionally, green ammonia can be used directly to decarbonise fertiliser production in the region (See Box 1.). This dual use of green ammonia could help catalyse green hydrogen and green ammonia production in the region by diversifying demand, strengthening project bankability and accelerating the production of green fuels.

E-methanol

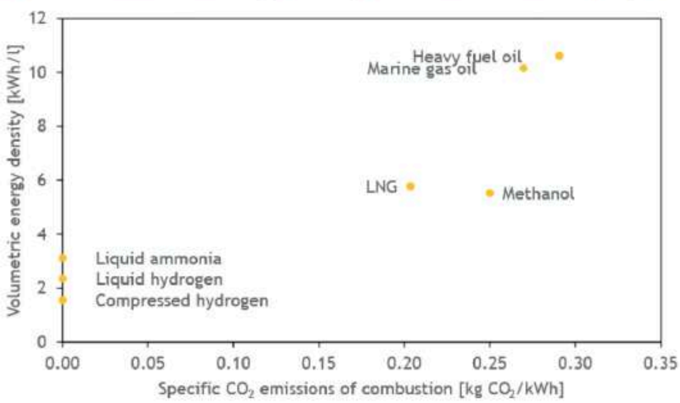
E-methanol made from green hydrogen has almost twice the energy density of liquid ammonia, and its physical properties make its transport and storage the easiest. The existing infrastructure used for fossil fuels' transport and storage can be used for e-methanol and are already available in most ports. Additionally, e-methanol-powered ICEs are well-developed, and e-methanol can be used in typical ICEs with little modifications (IRENA, 2021). E-methanol however contains carbon: the only way its production can be climate-neutral is if sustainable biogenic Carbon dioxide (CO_2) or CO_2 extracted from the air via direct air capture (DAC) is used. Sustainable biogenic CO_2 however faces supply challenges with a limited availability, while DAC technology is not yet available at scale and costly (DNV, 2025). If e-methanol can help accelerate the decarbonisation of the shipping industry in the near-term due to its high-readiness level (DNV, 2025), green ammonia remains the most scalable and sustainable option in the longer-term. Hence, e-methanol vessels and infrastructure should be designed for credible conversion to ammonia.

Box 1. Green ammonia production as a no-regret strategy

Green ammonia stands out not only as a promising green shipping fuel but also as a critical input for the fertiliser industry, which is a sector of strategic importance for North Africa. Morocco and Egypt, which are Africa's largest fertiliser producers, currently rely heavily on ammonia imports, with Morocco alone accounting for 12% of the global ammonia market and importing about 1.6 million tonnes annually (EBRD, 2022). Tunisia also imports all of its ammonia demand (EBRD, 2022). By producing green ammonia domestically, North African countries can advance their green industrialisation, reduce exposure to volatile global prices, and mitigate geopolitical risks associated with import dependence. In that regard, OCP's green hydrogen project in Morocco is planning to first meet domestic demand before expanding to export markets (GH2 interviews, 2026).

Beyond fertiliser production, green ammonia offers a practical solution for transporting and exporting green hydrogen, which is particularly relevant given the EU's role as a major demand centre. By investing in green ammonia, North African countries can simultaneously decarbonise their domestic fertiliser industries, establish themselves as green shipping bunkering hubs, and supply the EU's increasing demand for green ammonia. This integrated approach could spur the development of green value chains and accelerate green fuel production in the region.

Figure 3: *Tradeoff between volumetric energy density and GHG emission intensity of marine fuels*



Note: Calorific values refer to the net calorific value. Compressed hydrogen refers to a pressure of 700 bar.

Source: *Own illustration based on Møller et al., 2017; Engineeringtoolbox, 2023*

Source: GIZ, 2023

E-methane / e-LNG

E-methane is another synthetic fuel produced from green hydrogen with CO_2 and constitutes a drop-in replacement for liquefied natural gas (LNG). It is highly compatible with the existing bunkering network and infrastructures and can be used directly in LNG engines without requiring modifications. E-methane however presents the same challenges as e-methanol regarding the sustainable sourcing of carbon. Its production is also much more energy-intensive compared to green ammonia due to the need for carbon capture and the risk of methane leakages needs to be carefully managed.

LNG and biofuels

LNG is sometimes cited as a clean alternative to heavy fuel oil (HFO) traditionally used in international shipping. However, even with optimistic assumptions about upstream methane leakages, LNG can deliver a GHG reduction of only up to 10% compared to diesel fuels (T&E, 2026). Biofuels do not constitute a sustainable alternative to HFO for the maritime sector either, as only some advanced biofuels can provide a reduction in GHG emissions, and their production is not scalable due to the limited availability of sustainable bio-feedstock (T&E & Hydrogen Europe, 2021). The production of green hydrogen-based fuels, especially green ammonia, is therefore vital to the sustainable decarbonisation of the shipping sector.

Summary table – Green shipping fuels

Fuel type	Advantages	Disadvantages
Green hydrogen	• No need for carbon input	• Low volumetric density • ICEs under development • Limited existing infrastructure
Green ammonia	• No need for carbon input • Existing infrastructure • Dual use with fertiliser industry	• ICEs under development • Lower volumetric density than e-methanol
E-methanol	• ICEs well-developed • Higher volumetric density • Existing infrastructure	• Need for carbon input: costly, availability and scalability challenge
E-methane/e-LNG	• ICEs well-developed • Higher volumetric density • Existing infrastructure	• Need for carbon input • Risk of methane leakages

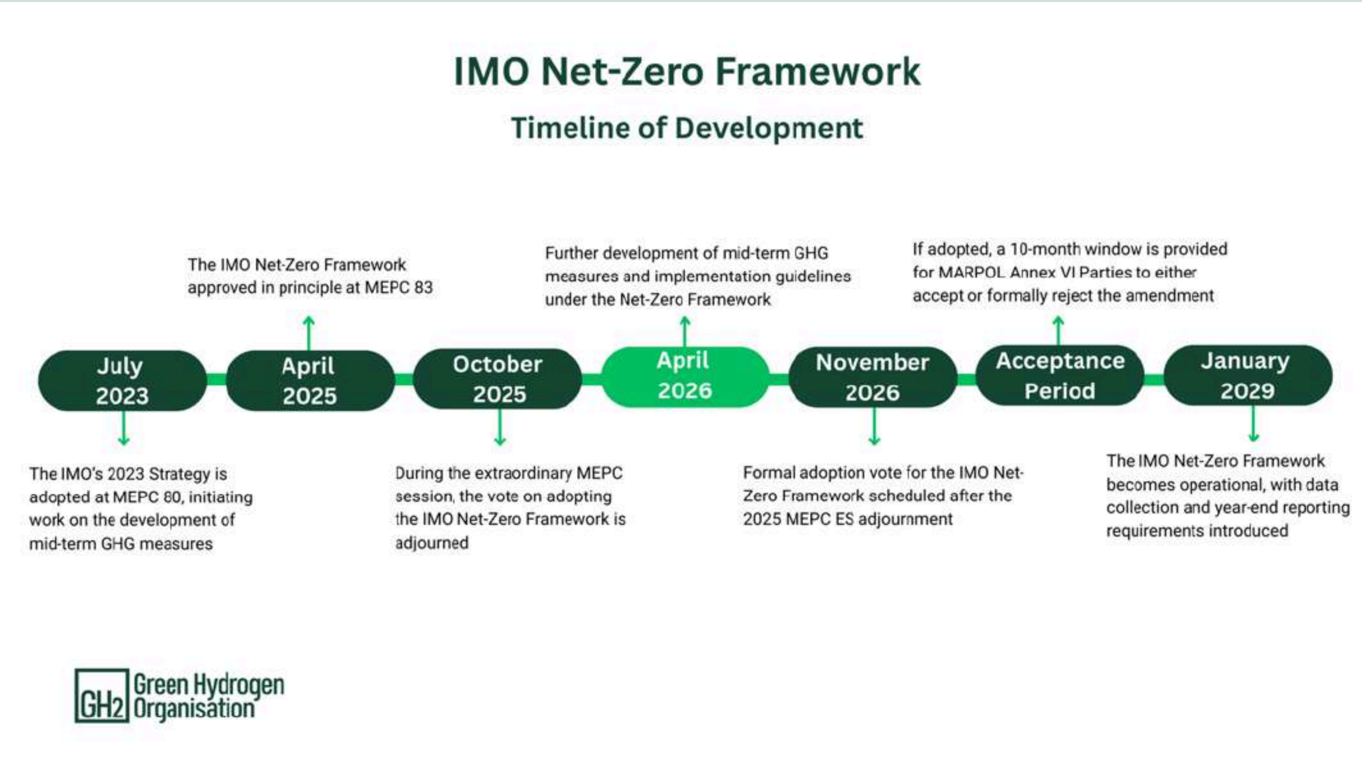
3.2

The IMO and its role in decarbonising international shipping

This importance of green hydrogen-based fuels to the decarbonisation of the shipping sector has been acknowledged in the proposed IMO NZF, creating global momentum for the development of green fuel projects. The NZF is a legally binding framework that aims to achieve net-zero by or around 2050 and includes regulations for a new fuel standard for ships and a global pricing mechanism for emissions. A vote on its adoption has postponed by one year until November 2026 (See Box 2.). The NZF sets emissions intensity targets for ships. If those targets are not met, compliance fees must be paid. Ships that meet the strictest emissions targets will earn tradable credits and be eligible for financial rewards from a fund to stimulate the uptake of green fuels as well as just transition in lower income countries. The 2023 IMO GHG Strategy sets targets for the uptake of zero or near-zero GHG emission fuels, energy sources or technologies, which are to represent at least 5% of the energy used by international shipping by 2030 (IMO).

Box 2. Postponement of the IMO NZF adoption

In April 2025, during the regular session of the International Maritime Organization's Marine Environment Protection Committee (MEPC 83), Member States agreed in principle to amend MARPOL Annex VI by incorporating the NZF (IMO, 2025). The draft amendment, approved by a 63-16 vote, required formal adoption by those members that had ratified Annex VI, which regulates air pollution from ships, before it could become international law. Following MEPC 83, the NZF legal text underwent further revisions and a six-month consultation period. Minor modifications were subsequently integrated, and the proposal was scheduled for formal adoption at an Extraordinary Session in October 2025 (UCL Shipping and Oceans Research Group, 2025). However, Member States failed to reach consensus amid political opposition from the United States and Saudi Arabia. The Saudi delegation called for adjournment and a one-year postponement of the adoption decision. This motion was supported by 57 countries, including Morocco, Egypt, Tunisia, and Algeria (Lloyds List, 2025). As a result, the formal adoption of the NZF was deferred until November 2026, with the earliest possible entry into force now 1 January 2029. Despite the delay of the IMO NZF, several regions have already begun introducing policies to decarbonise shipping and support the transition to green maritime fuels.



3.3

Regional policy landscape and green corridors: The transition to clean fuels is already underway

Although the decision to adopt the IMO NZF was postponed, momentum has built internationally to decarbonise shipping, and policies are being adopted to transition towards greener fuels. On one hand, the EU ETS, which requires companies to monitor, report and surrender allowances for their GHG emissions, has been extended to the shipping industry in January 2024, and its review in 2026 could lead to the inclusion of smaller ships between 400 and 5000 GT. On the other hand, the FuelEU Maritime regulation aims to reduce the GHG intensity of the energy used by ships from 2025 onwards and ensure that ships use at least 2% of green e-fuels from 2034 (T&E, 2023), incentivising the use and production of clean fuels through mandates. The European Commission's Industrial Maritime Strategy (European Commission, 2026) states that "in line with the existing legal commitments, the Commission will revise relevant EU legislation taking into consideration global measures at IMO in order to avoid double payment."

In the United Kingdom (UK), domestic shipping emissions from voyages between UK ports came into the ETS scope on January 1st, 2026, and a domestic fuel standard on maritime fuels is expected to be developed this year, as announced in the UK's Maritime Decarbonisation Strategy (UK Department for Transport, 2025).

Japan, China and South Korea are also leading in designing and building ammonia-ready vessels, as well as on bunkering protocols and infrastructure (IEA, 2026). Japan's roadmap to zero emissions from international shipping highlights the expansion of hydrogen and ammonia as a feasible emission reduction pathways, aligned with the targets set out in the IMO strategy and currently being developed (MLIT, 2020). Japan also saw the completion of the first onshore test of marine hydrogen engines (ESG News, 2025), pioneering the use of liquefied hydrogen for maritime propulsion and decarbonisation.

Additionally, some of China's leading ports are positioning themselves to become major bunkering hubs in green fuels, with the port of Shanghai poised to become a "world-leading international shipping centre" for green maritime fuels that will be able to dispense one million tonnes of green methanol annually to ships by 2030 (Hydrogen Insight, 2026). Today, China is leading on the production of green hydrogen-based methanol (Hydrogen Insight, 2026), and the port of Shanghai already supplies about 10,000 tonnes of it to ships per year.

Moreover, South Korea launched last year a $680m green fuel infrastructure fund, which will go towards building port storage facilities, notably for methanol and ammonia, with the first project at Hyundai Oil Terminal in Ulsan (Lloyd's List, 2025). Korea's National Assembly also passed the Green Shipping Corridor Support Act in March 2026 to enable the expansion of green vessel operations, port infrastructure transition and technological innovation (SFOC, 2026).

Furthermore, the emergence of green corridors around the world demonstrates that concrete actions are taken to advance shipping decarbonisation today. These specific trade routes between two or more ports aim to catalyse the feasibility of zero-emission shipping by creating an ecosystem for clean fuels, test running maritime decarbonisation solutions and accelerating system-wide change (GMF, 2025). 25 new green corridor initiatives were launched in 2025 in China, India, Brazil, Chile, Ghana and Kenya, reflecting the economic opportunities that the development of green fuels and bunkering infrastructures represent in these countries (GMF, 2025). Hence, despite the IMO vote having been postponed by a year, many in the shipping industry are still going ahead, pushing for decarbonisation efforts. The transition to cleaner maritime fuels is already underway, international momentum exists, and North Africa is well-placed to benefit from it.

4. North Africa's green shipping opportunity

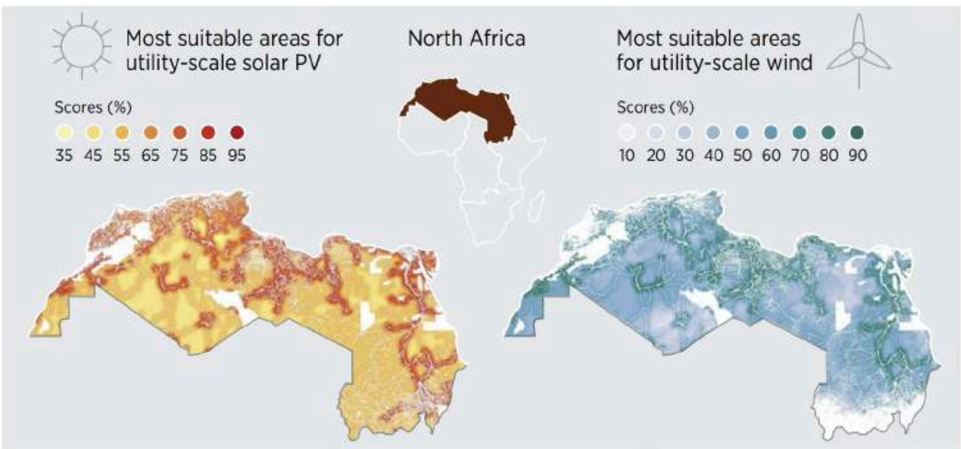
4.1

North Africa as a strategic location for green fuel production and bunkering

Abundant renewable energy potential

North African countries are garnering increasing interest for the production of green hydrogen and hydrogen-based fuels due to their immense and largely untapped endowment of renewable energy potential (see figure below). Their electricity costs are among the lowest globally, with for example Egypt's selling price of renewable energies reaching 2 cents per kWh for solar energy and 2.4 cents per kWh for wind energy (MOERE, 2023). The region's solar and wind generation costs are also 35% lower than in the EU and continue to fall (IRENA, 2024). This is crucial, as renewable electricity is the largest single cost factor in green hydrogen and green-hydrogen based fuels production, typically accounting for about two-third of the cost of hydrogen (ESMAP, 2026). North African countries, which are endowed with large renewable energy potential, could therefore position themselves in the global green commodity trade given the strong competitiveness case for green hydrogen-based fuels (IRENA, 2019).

Figure 3 Most suitable areas in North Africa for utility-scale solar photovoltaic and wind



Source: Suitability scoring and areas: IRENA. Base map: UN boundaries.
Note: PV = photovoltaic.

Source: IRENA, 2023

Strategic geographic location in international trade

North African countries, particularly Egypt and Morocco, also benefit from a strategic location in international trade. The Suez Canal, which links the Mediterranean Sea to the Indian Ocean via the Arabian Peninsula, is one of the key maritime chokepoints, as over 12% of the total global trade of all goods transits through the canal, which represents roughly 30% of the world’s shipping container volume (WEF, 2021). Similarly, the Strait of Gibraltar is critical to international shipping, as it handles more than 10% of global maritime trade (SAM Algeciras, 2025). North Africa’s central location in international trade is especially important in the context of bunkering (International PtX Hub, 2023), as the choice of where to bunker is a strategic decision for shipping companies looking to maximise efficiency and reduce voyage time to avoid additional costs (Maritimesa, 2023).

4.2

Regional and international policies are driving green fuel momentum in North Africa

Regional initiatives and policy drivers

In addition to North Africa’s renewable energy potential and strategic location, domestic and regional policies are incentivising green hydrogen production. Algeria, Egypt, Mauritania, Morocco and Tunisia have set ambitious green hydrogen and export targets in their national strategies and identify shipping as a high-priority sector for the uptake of hydrogen and its derivatives. Algeria, Egypt, Mauritania and Morocco are also part of the Africa Green Hydrogen Alliance, which now counts 11 members and aims to intensify collaboration and the development of green hydrogen and derivatives projects on the African continent (GH2, 2025). Algerian ministers have moreover emphasized the particular importance of decarbonising the maritime transport sector and switching to alternative fuels to reduce its carbon footprint and comply with international standards, highlighting the strategic role of ports in national logistics, foreign trade and supply chains (Algeria Invest, 2026). The existing green hydrogen policies in North Africa are however not specific to the maritime sector. Adopting green maritime strategies could therefore support the development of green fuel production and bunkering infrastructure in the region, making shipping decarbonisation a strategic priority.

Additionally, regional initiatives led by the EU seek to promote the decarbonisation of Mediterranean ports and catalyse investment in green hydrogen and derivatives production in North Africa. The GreenMedPorts project, which kicked off in Algeria in January 2026, aims to build a sustainable, transnational Mediterranean maritime network and strives to position Mediterranean ports, including in Algeria, Egypt and Tunisia, as leaders in the global transition to sustainable shipping (GreenMedPorts, 2025). It plans to guide port decarbonisation and pilot test green solutions in five GreenMedPorts areas. Moreover, the Mediterranean Green Electrons and Molecules Network (Med-Gem) supports renewable and green hydrogen development in the Southern Mediterranean Neighbourhood, while the Trans-Mediterranean Renewable Energy and Clean-Tech Cooperation Initiative (T-MED) Investment Platform is designed to mobilise between €8 and €10 billion in investments in renewable energy, green hydrogen and clean technologies in the Mediterranean region (Med-Gem, 2025). North African countries are therefore well-positioned to leverage these initiatives to fulfil their decarbonisation strategies and reach their green hydrogen and derivatives production targets.

EU regulation and their effect on North Africa

As mentioned above, the EU is driving shipping decarbonisation through its EU ETS and FuelEU Maritime initiatives, which have global reach affecting North African countries. The FuelEU Maritime target, which targets at least 2% of green e-fuels from 2034, will apply to 100% of fuels used for intra-European voyages, and 50% of fuels used for voyages between European and non-European ports (T&E, 2023). Because ships stopping at European ports will be required to run on a share of green fuels, they will be incentivised to bunker where green fuels are cheap and available. Additionally, an analysis from T&E shows that in 2019, 465 container ships made 2,348 round trips between the EU and East Asia, using more than 7 million tonnes of marine fuel, 2 million tonnes would fall under EU regulations. Since most of these voyages included stops at ports along the way and passed near the North African coastline, the region presents a strong opportunity for supplying domestically-produced green fuels (T&E, 2024).

Moreover, under the EU ETS, North African ports might become even more central to international shipping, strengthening the opportunity to become green fuel bunkering stations. The EU ETS requires shipping companies to purchase and use emission allowances to cover each tonne of reported CO_2 emissions (European Commission, 2026). The ETS regulates 100% of the emissions emitted for voyages between European ports, and half the emissions emitted for voyages between European ports and non-European ports, regardless of ships' flags.

The international implications of the EU's shipping decarbonisation policies are complex and point to the need for a global approach at the IMO rather than a proliferation of overlapping national or regional approaches.

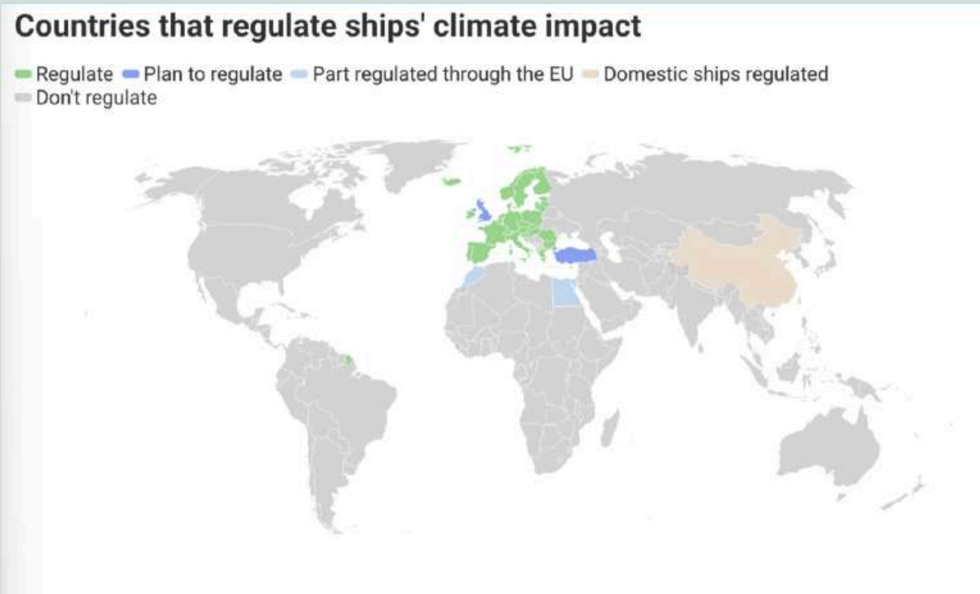
Regional and national approaches will only ever be partial and carry greater uncertainty and cost for shipowners than an IMO global approach. They will struggle to bridge the cost gap for green fuels, as the raised revenues will be too fragmented to be meaningfully recycled into the right incentives for shipping. As we have described in this section, regional frameworks also lead to transshipment complications, which increase costs unnecessarily for shipowners, including extra fuel, operational, port-call, and opportunity costs. These inefficiencies and losses of both revenue on the regulatory side and income on the shipowner side are avoided in global regulation. Finally, different CO_2e emission factors and methodologies which would come with a patchwork of regional regulations make investment in facilities extremely difficult.

It is helpful that the European Commission's Industrial Maritime Strategy (European Commission, 2026) states that "in line with the existing legal commitments, the Commission will revise relevant EU legislation taking into consideration global measures at IMO in order to avoid double payment." Even more clarity from the EU on this issue ahead of IMO negotiations this year would be constructive.

Box 3. The significance of the EU’s “neighbouring container transhipment ports” designation

Under the EU ETS and FuelEU Maritime, Tanger-Med and East Port Said have been identified by the European Commission as “neighbouring container transhipment ports” as the EU seeks to limit evasive port calls (European Commission, 2025), effectively treating East Port Said and Tanger-Med as if vessels had not called there for ETS calculation purposes. Ships sailing from a non-EU port to discharge cargo at an EU port via Tanger Med or East Port Said will therefore still pay for 50% of emissions of this voyage, despite calling at a non-EU port (European Commission, 2025). Similarly, container ships departing from a non-EU port and stopping at East Port Said or Tanger-Med before continuing the voyage into an EU port will be exposed to FuelEU Maritime from the stop prior to East Port Said or Tanger-Med, to the EU port.

On one hand, this could put East Port Said and Tanger-Med at a disadvantage compared to other container transhipment ports in the region, as ships would be able to evade EU regulations by calling at other North African container transhipment ports. On the other hand, East Port Said and Tanger-Med might have even more of an incentive to offer cost-competitive, green refuelling options, since ships will be subjected to the same regulations as if they were calling at EU ports anyway, having to pay for their emissions and use a certain amount of green fuels.

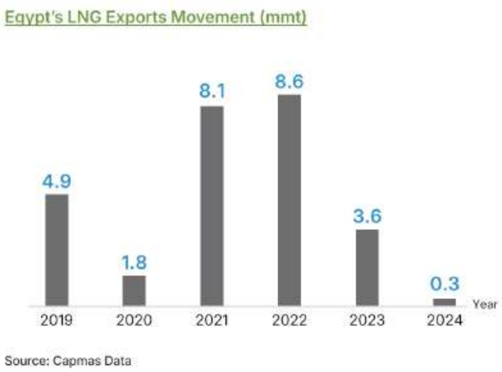


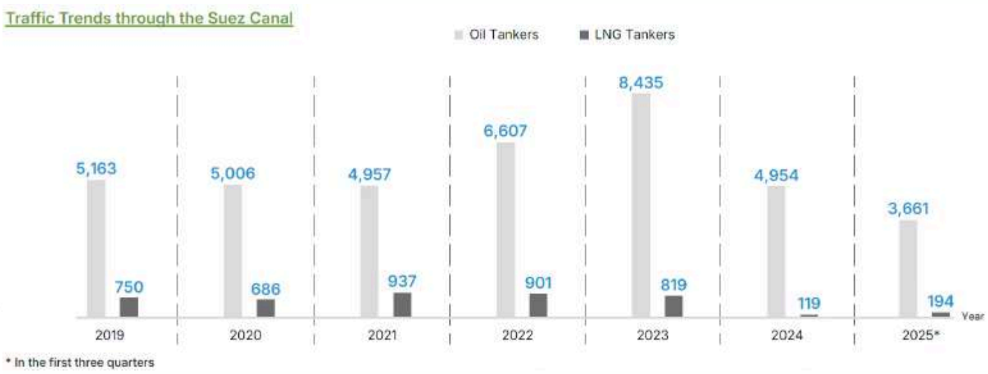
Source: T&E, 2026

How North Africa could capture value from the IMO net-zero fund and green fuel production

North Africa is uniquely placed to benefit from the IMO net-zero fund, which supports and incentivises the use and production of green hydrogen-based fuels for international shipping. The fund, created from payments made under the framework and specifically designed to help developing nations to transition, could mobilise up to 12 billion USD annually (GMF, 2026), which could in turn support green fuel production in North Africa, enable port modernisation, stimulate the creation of green value chains, and unlock industrialisation opportunities. Countries such as Algeria, Morocco, Egypt and Tunisia – which all voted to delay the establishment of the NZF – are however well-placed to benefit from its adoption.

First, trade in green hydrogen and green hydrogen-based fuels could substitute North Africa’s revenue loss from declining fossil fuel exports. Today, the Suez Canal plays a major role in global maritime energy trade, attracting about 9% of global seaborne oil flows and around 8% of LNG volumes (Atlantic Council, 2025). The generated toll revenue constitutes a major economic lifeline for Egypt. The number of oil and LNG tankers transiting through the canal has however severely decreased since 2023 (figure below). The Red Sea security crisis has of course disrupted maritime trade, but lower production from mature fields and sustained local demand have also limited the region’s ability to resume large-scale LNG shipments (EGEA, 2026). Field production declines, insufficient upstream gas developments and high domestic consumption of natural gas have all constrained North Africa’s natural gas exports in recent years (OIES, 2025). As fossil fuel production from North Africa is bound to decrease, the region has been looking to diversify its energy mix to include more renewable energies, and it is well positioned to export its vast renewable energy resources through green hydrogen and green hydrogen-based fuels value chains (WEF, 2023). Current trade in oil and gas could therefore be substituted for trade in green hydrogen and derivatives, with the EU being a major demand centre. This could allow the region to transition away from fossil fuel exports and position itself for long-term competitiveness.





Source: EGEA, 2026

Second, expanding domestic production of green hydrogen-based fuels could strengthen energy security by reducing exposure to volatile markets and geopolitical supply disruptions, such as the current closure of the Strait of Hormuz, through which 20% of global oil and natural gas supplies pass (Politico, 2026). For North African countries which rely heavily on imported energy, the strain is likely to lead to inflation, currency pressure, subsidy stress, and rising sovereign debt risks. As a result, the energy price shocks can worsen the food insecurity, weaken public finances and increase social vulnerability (Arab Reform Initiative, 2026). This is already evident in Egypt: each 10 USD rise in oil prices adds around 2.5 billion USD to the external financing gap, with the current account deficit projected to widen from 15 billion USD to 24 billion USD under sustained price increases (Atlantic Council, 2026). Over time, repeated shocks of this kind become costly to absorb, making a shift to clean energy a more stable and cost-effective path, with the net-zero fund providing a mechanism to support this transition.

Third, shipping decarbonisation presents important employment prospects across the region. The maritime sector already employs around 30 million people directly and supports more than 90 million indirect jobs globally (World Bank, 2026), and the transition to green fuels could create up to four million additional jobs, primarily in the Global South, by 2050 (GMF, 2024). The net-zero fund can help ensure that these employment gains are realised within North Africa by supporting the development of domestic green fuel industries.

4.3

The opportunity for North African countries: Becoming green fuel bunkering hubs and exporters

Becoming green fuel bunkering hubs

Ocean shipping fuel is a significant cost factor for shipping companies, typically representing at least 50% of the expense to operate a cargo ship (MTS, 2018). As fuel prices vary from ports to ports, and because large cargos tend to limit the number of port calls per trip since additional time to the voyage increases costs, choosing where to bunker is a strategic decision (Maritimesa, 2023). Moreover, because green fuels have a lower volumetric density compared to HFO, ships running on these fuels will have to make additional bunkering stops, inducing an inevitable redesign of global shipping routes. Hence, although no North African ports currently plays a major role in bunkering, changing fuelling patterns induced by the decarbonisation of shipping would involve new route planning and bunkering stops at ports offering price-competitive green fuels.

North Africa therefore has an opportunity to become a green shipping fuel bunkering hub given the centrality of North African ports in international shipping, the region's competitiveness case for green fuel production, as well as existing policy targets and EU regulations driving momentum for shipping decarbonisation. Moreover, since the vast majority of traffic from North African ports goes to European ports (T&E, 2024), most vessels going through North African ports will be subjected to the FuelEU Maritime regulations, strengthening the case for the region to become a central and cost-competitive green fuel bunkering hub.

Becoming green fuel suppliers: the EU as a major green ammonia demand centre

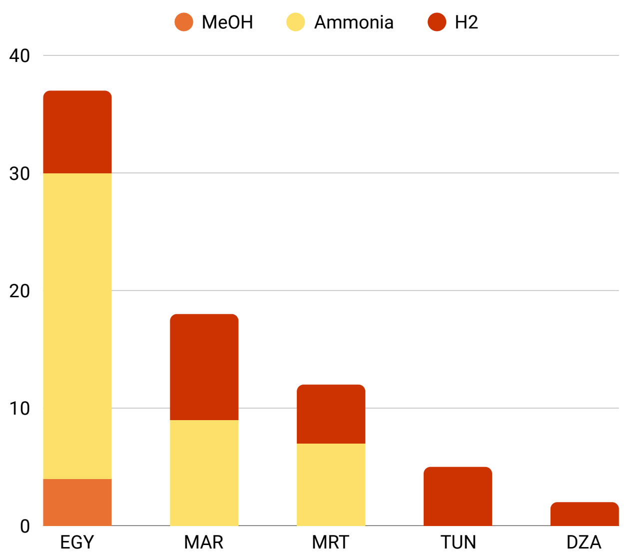
Additionally, North African countries are strategically positioned to become leading suppliers of green hydrogen-based fuels, with the EU emerging as a major demand centre for green ammonia. Europe indeed accounts for 20-28% of global ammonia imports today and has the largest ammonia net trade deficit in the world, while around 3 million tonnes of ammonia capacity has shut down permanently in the past 7 years (Argus Clean Ammonia Europe Conference, 2025). The closure of domestic ammonia capacity coupled with the EU’s Carbon Border Adjustment Mechanism (CBAM) creates an opportunity for clean ammonia trade flows between North Africa and Europe: Argus estimates that Europe will represent over 95% of the world’s clean ammonia demand share for fertilisers in 2026, and still over 50% and 30% of it in 2027 and 2028. Additionally, Europe will represent close to 70% of the world’s clean ammonia demand share for marine bunker fuel in 2028 and 2029 (Argus Clean Ammonia Europe Conference, 2025).

The EU is therefore projected to remain a major demand centre for green ammonia this decade, which could stimulate North African production of green ammonia and help establish green fuel bunkering networks and infrastructure at ports. Morocco is already planning to export green fuels to the Amsterdam-Rotterdam-Antwerp region through the Dakhla project (Hydrogen Insight, 2024), and Morocco and Tunisia have existing experience in handling grey ammonia, especially at the ports of Gabès, Safi and Jorf Lasfar, given the ammonia import needs of their phosphate fertiliser industries (EBRD 2022; EBRD, 2022). Hence, scaling up green ammonia production in North Africa could serve the triple purpose of (1) decarbonising the domestic fertiliser industry, (2) allowing ports to modernise and become green shipping fuel bunkering hubs, and (3) supply the EU’s growing green ammonia needs. This would in turn stimulate the creation of green value chains and unlock industrialisation opportunities throughout the region.

5. Seizing the opportunity: What’s going on in North Africa

Analysis of green hydrogen and green hydrogen-based fuel projects in North Africa 5.1

Using the IEA database of hydrogen projects, GH2 identified 74 electrolytic hydrogen, ammonia and methanol projects located in Egypt, Morocco, Mauritania, Tunisia and Algeria. As can be seen below, Egypt has by far the highest number of projects, followed by Morocco and Mauritania. The majority of projects are green ammonia projects, representing 42 projects, while Egypt is also hosting 4 green methanol projects. Although North Africa has announced a large number of projects, 50 of them are at the concept phase and 21 announced projects are undergoing feasibility studies. Since most projects are early-stage, they are also subject to changes. It should therefore be noted that a project initially planning to produce green hydrogen could pivot and produce green ammonia. Similarly, the end uses of these projects (fertiliser industry, shipping fuels, etc.) are indicative and provisional.



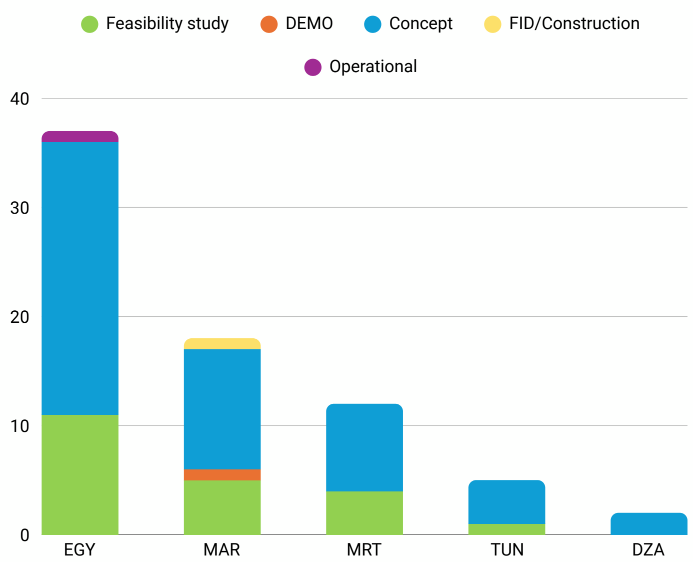
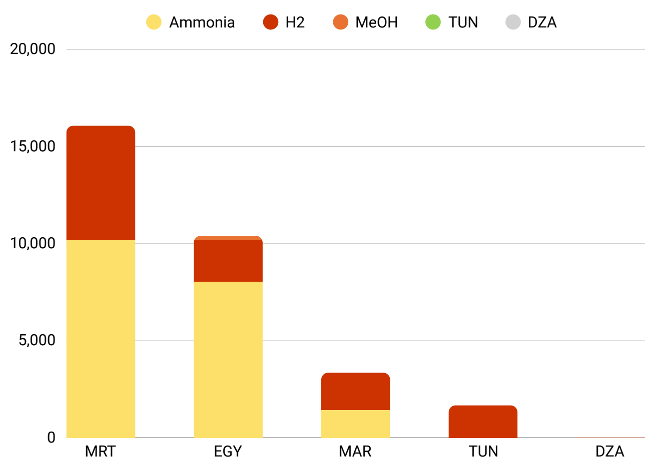


Figure 1. Number of hydrogen and derivative projects in selected North African countries (GH2, 2026)
Figure 2. Number and status of hydrogen projects in selected North African countries (GH2, 2026)

When looking at announced capacity rather than the number of projects, Mauritania stands out as the leading North African country for green hydrogen and green hydrogen-based fuels planned production, followed by Egypt and Morocco. The planned capacity is unknown for 9 of the 74 projects of this analysis. 80% of announced green hydrogen and derivatives production in the region is currently at the concept stage, and almost no planned production has moved past feasibility study. The most advanced green hydrogen and derivatives projects in the region are:

- The Sokhna Green Hydrogen project in Egypt, which consortium includes Scatec, Fertiglobe, the Sovereign Fund of Egypt and Orascom Construction, and which has started partial production and expects to reach FID in the coming months. It will notably supply green ammonia to the Port of Rotterdam and plans its first delivery on 2027;
- EDF and Zero Waste's green hydrogen and derivatives project in Egypt, which aims to have completed pre-feasibility studies by Q2 2026 and move to FID;
- TotalEnergies's project in Morocco, which is undergoing feasibility studies and is close to reaching FID;
- OCP's Jorf Hydrogen Platform in Morocco is also aiming to produce 100,000 tons of green ammonia annually by the end of 2026, although this timeline has not been updated since October 2025 and the actual state of advancement remains unclear.

Recent interviews conducted by GH2 with Moroccan and Egyptian financial stakeholders highlighted that green hydrogen and derivatives projects in North Africa are at very early-stage and seem to be converging pre-FID as (1) both developers and public institutions are reluctant to invest heavily in costly FID studies without any guarantee of returns, (2) development banks consider that scarce concessional finance would not effectively be used at the development stage, and (3) offtakers are waiting to see which projects actually emerge before committing to buying production (GH2 interviews, 2026). Financing therefore constitutes an important barrier preventing these projects from moving forward.



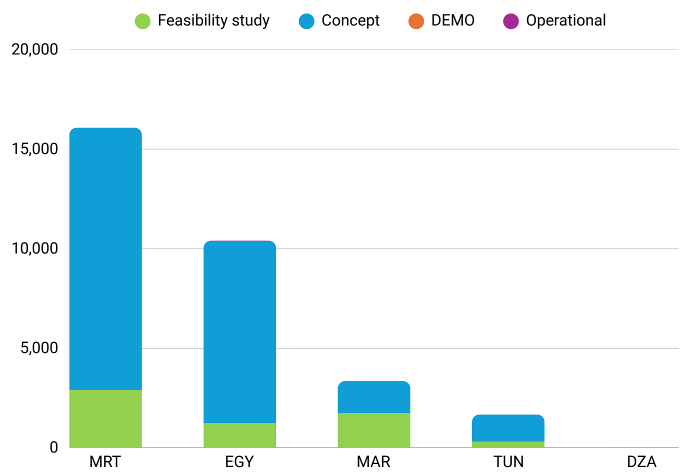


Figure 3. Normalised capacity of hydrogen projects in selected North African countries, per kt H2/y (GH2, 2026)
Figure 4. Status of hydrogen projects in selected North African countries, per kt H2/y (GH2, 2026)

Interestingly, 47 out of 74 announced projects plan to be located at ports or on the coast. This proximity to ports would avoid the need to build extensive and costly transport infrastructure and allow green hydrogen and green hydrogen-based fuels to be easily supplied at ports. This could enable North Africa's green fuel bunkering opportunity and exports to the EU.

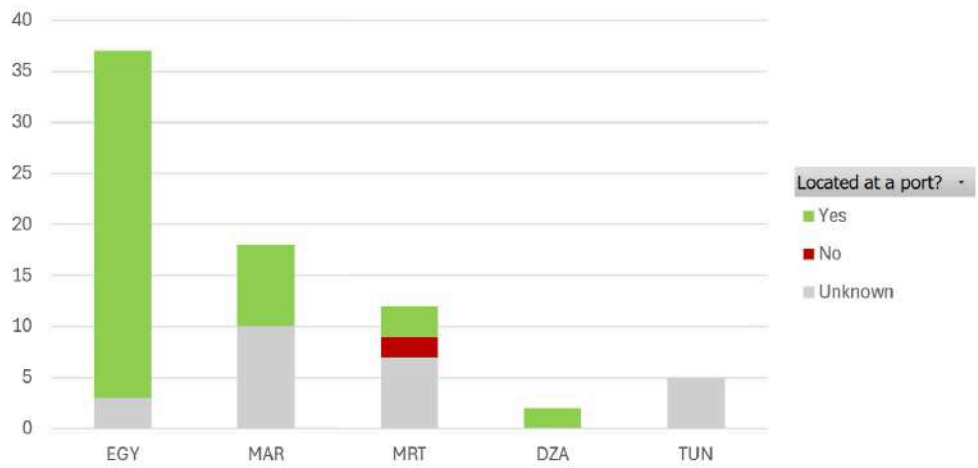


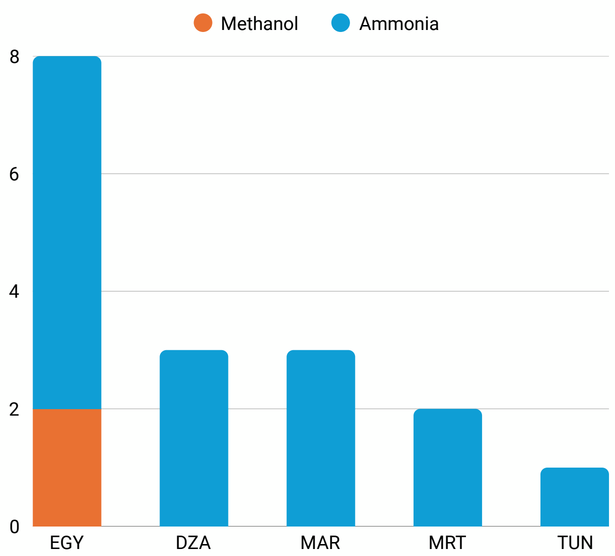
Figure 5. Number of green hydrogen and derivative projects in North African countries, and whether they are close to ports (GH2, 2026)

5.2

Analysis of hydrogen infrastructure projects at ports in North Africa

Similarly, using the IEA hydrogen infrastructure projects database, GH2 identified 17 ammonia and methanol infrastructure projects at ports. The dataset used covers projects that aim to store and ship low-emissions hydrogen and hydrogen-based fuels, and excludes existing terminals and announced projects which are principally aimed at storing and shipping unabated fossil-based ammonia or methanol (IEA, 2025).

Egypt has the highest number of projects followed by Algeria, Morocco and Mauritania. However, Mauritania has by far the largest announced storage capacity. Almost all announced projects are for low-carbon ammonia bunkering, and only 2 projects in Egypt are for low-carbon methanol bunkering. Data on the announced storage capacity of methanol infrastructure projects at ports was unavailable.



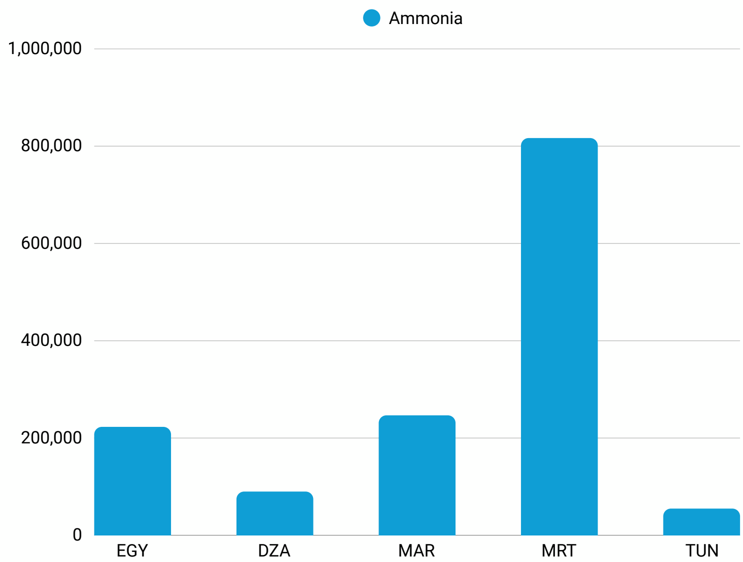
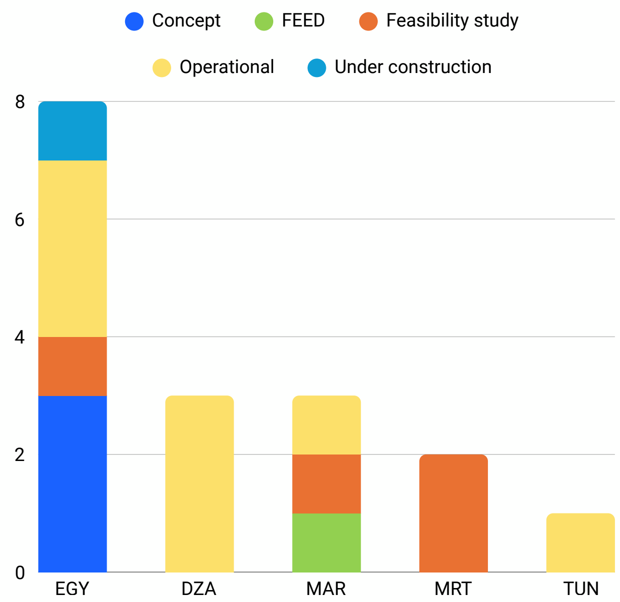


Figure 7. Number of announced ammonia and methanol infrastructure projects at ports in North Africa, per country (GH2, 2026)
Figure 8. Announced storage capacity (in tonnes) of ammonia infrastructure projects at ports in North Africa, per country (GH2, 2026)

Although Egypt has the highest number of announced projects, half of them are at the concept or feasibility study stages. Egypt and Algeria have the highest number of operational projects, followed by Morocco and Tunisia, but Morocco has the highest operational storage capacity of all considered countries. All announced projects in Mauritania are at the feasibility study stage.



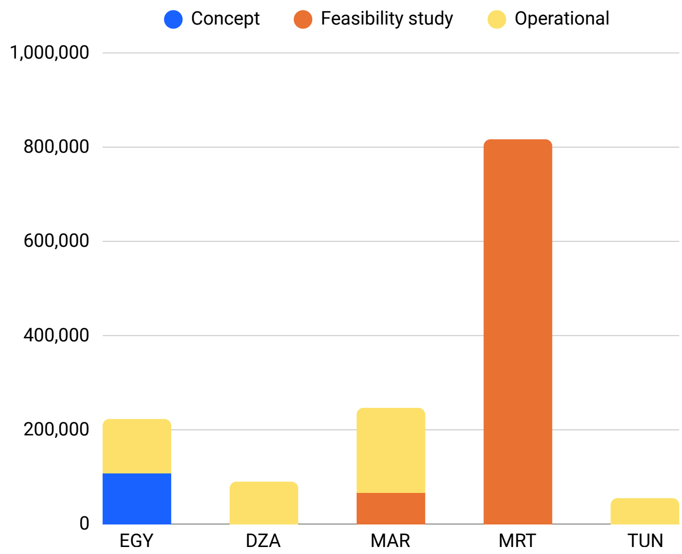
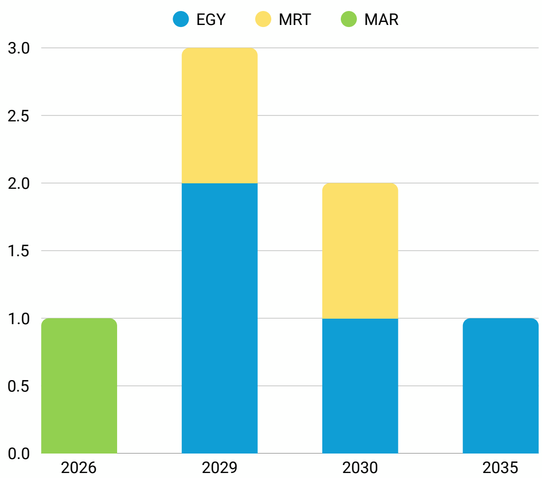


Figure 9. Number and status of announced ammonia and methanol infrastructure projects at ports in North Africa (GH2, 2026)
Figure 10. Announced storage capacity (in tonnes) and status of low-carbon ammonia infrastructure projects at ports in selected North African countries (GH2, 2026)

For the low-carbon ammonia infrastructure projects at ports that are not yet operational, most are due to come online in the next four years in Morocco, Egypt and Mauritania. The Moroccan project initially announced for 2026 in Jorf Lasfar has a relatively small storage capacity of 100ktpa and is still under feasibility studies. All other projects are to become operational by 2029 at the earliest, with Mauritania having a couple of big projects, while Egypt has announced more, smaller projects in the ports of Ain Sokhna, Gargoub, and Ras Shukeir. There are currently no low-carbon ammonia infrastructure projects in development at Algerian and Tunisian ports.



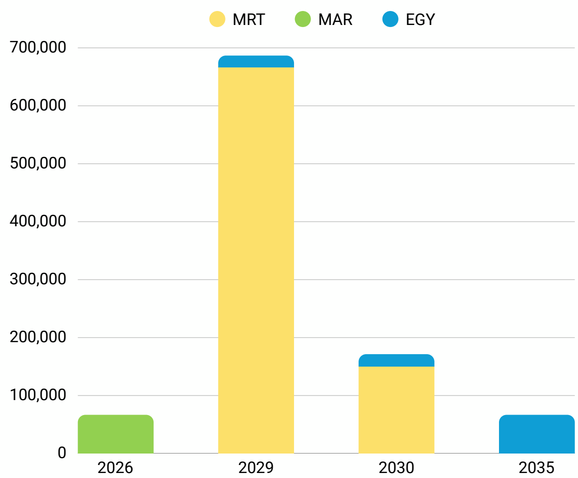


Figure 11. Planned low-carbon ammonia infrastructure projects at ports in selected North African countries, per date they are to come online (GH2, 2026)
Figure 12. Announced capacity (in tonnes) of low-carbon ammonia infrastructure projects at ports in selected North African countries, per date they are to come online (GH2, 2026)

Key takeaways

5.3

- 70 electrolytic hydrogen and ammonia projects have been announced in North Africa, with half of them located in Egypt. 4 e-methanol projects have also been announced in Egypt. If all projects were to be implemented, North Africa would produce about 32 million tonnes of green hydrogen per year. This represents roughly a third of the current global hydrogen demand (IEA, 2026).

- Almost 80% of this announced capacity is at the concept phase, and the remaining 20% is under feasibility study. Green hydrogen and derivatives projects are therefore at very early-stage and seem to be converging pre-FID, with financing constituting a major barrier for projects to move to FID (GH2 interviews, 2026).

- Most of Egypt's and Algeria's announced hydrogen and derivatives projects, and about half of Morocco's, are planning to be located at ports. This would facilitate green fuel bunkering at North African ports and exports to Europe, which is a major demand centre.

- In terms of low-carbon ammonia and methanol infrastructures at ports, Egypt has 8 projects, which is the highest number of projects, while Mauritania has the highest planned storage capacity at 800 kt. Half of Egypt's projects are at the concept or feasibility study phases, while all of Mauritania's are under feasibility study. Morocco has the highest operational storage capacity for low-carbon ammonia. Algeria and Tunisia have no low-carbon fuel infrastructure projects at ports currently in development.

- Most of the additional storage capacity for low-carbon ammonia at ports is to come online in 2029 and 2030 in Mauritania and Egypt. The fact that many low-carbon ammonia infrastructure projects are already operational at North African port, which is due to countries' existing ammonia trade activities, demonstrates North African ports' expertise in handling ammonia. This also strengthens the opportunity for green fuel bunkering in the region.

6. Case studies: Identifying green fuel bunkering ports in Egypt and Morocco

From the above analysis, the green fuel bunkering opportunity has emerged to be most relevant for Egypt and Morocco, which are strategically located on international trade routes, have immense renewable energy resources, and have the most advanced green hydrogen and derivatives projects in the region. Tanger-Med, East Port Said and Alexandria are three of the four African container ports that figured in the 2025 Lloyd's List's Top 100 Container Ports Ranking (Business Insider Africa, 2025). Additionally, given the EU's designation of Tanger-Med and East Port Said as neighbouring container transhipment ports, these ports have an even stronger incentive to supply cost-competitive green fuels, as ships calling there will be subjected to the same regulations as if they were calling at EU ports anyway (see Box.3.).

Egypt

6.1

The Suez Canal is a node in international shipping, with about 12% of global trade transiting through it, which represents about 10% of Egypt's GDP. Two of the four African ports that are in the top 100 container ports globally, the port of East Said and the port of Alexandria, are also located at the Suez Canal. The Suez Canal is therefore a key chokepoint for international trade and represents the shortest route between Asia and Europe. Decarbonising the Asia-Europe container route is significant, as it generates the most GHG emissions and represents about 3% of global shipping emissions (Getting to Zero Coalition, 2021).

The importance of the Suez Canal for bunkering along the Asia-Europe route could increase significantly as the shipping sector transitions to cleaner energy sources (Getting to Zero Coalition, 2021). Two thirds of the fuel consumption of container ships calling at European ports is indeed used on voyages between Asia and Europe through the Suez canal, which suggests that the Asia-Europe route is a primary candidate for alternative marine fuel supplies (T&E, 2024). Additionally, over 10% of the announced green shipping corridors go through the Suez Canal, and since the lower energy density of hydrogen-based fuels reduces ships' ranges, vessels will need to increase the amount of bunkering stops on a voyage and call at ports where they did not previously stop. This is particularly relevant to the Suez Canal, as most green hydrogen and derivatives projects in Egypt are located in the SCZone, allowing ports along the canal to be easily supplied with green fuels without the need for extensive and costly transport infrastructure. Given that the cost for green fuels will be one of the most important factors in route planning (International PtX Hub, 2023), the Suez Canal is well-placed to become a cost-competitive green fuel bunkering hub.

Egypt and the Suez Canal Authority have identified this opportunity as a strategic priority. Egypt's Green Hydrogen Incentive Law provides numerous incentives to encourage green hydrogen production to supply green fuels at ports, such as a 30% deduction on fees for the use of seaports, maritime transport and ship services, and a 20% deduction on the value of land rights for storage at ports (OECD, 2024). The Suez Canal's green strategy also rewards vessels that use green energy (SCA, 2026), and the SCZone signed an agreement with Tokyo Metropolitan Government (Ammonia Energy Association, 2025) to focus on renewable hydrogen for ship bunkering, demand stimulation and promotion of future clean energy applications. Egypt is also to focus on green shipping in its upcoming National Action Plan (IMO, 2025).

Egyptian ports such as East Port Said and Ain Sokhna have already taken steps towards green fuel bunkering. East Port Said hosted the first green methanol bunkering operation in Africa and the Middle East to supply a Maersk container ship (Bunker Market, 2023), and a green ammonia production and bunkering facility, the Project RA, is being planned between Lloyd's Register and DAI Infrastruktur (Ship & Bunker, 2025). The SCZone and Scatec also signed a $1.1bn MoU for green bunkering in East Port Said in 2023 (Offshore Energy, 2023), with a production capacity expected to reach 100,000 tons/year of green methanol by 2027. Since the port is located near the ship's waiting areas to enter the canal, ships could save time and reduce costs by refuelling there as they wait to enter the canal. The SCZone also signed an agreement with Orascom Construction and Itochu Corporation to develop facilities for supplying ships with green ammonia as marine fuel at Sokhna and East Port Said, and future cooperation is envisioned with Sumitomo in green methanol bunkering, hydrogen production, desalination and other related infrastructure.

Moreover, according to the IEA's latest Global Hydrogen Review, leading ports such as Ain Sokhna could be first movers on low-emissions hydrogen-based fuels for shipping, although this will require it to develop suitable bunkering infrastructure to avoid bottlenecks in the near future (IEA, 2025). The Ain Sokhna port could indeed access at least 100 ktpa of low-emissions hydrogen supply from announced projects within 400 kilometres (IEA, 2025), making it another promising green refuelling station. The European Commission also recently announced the €34.3 million Sokhna Green Ammonia project, which aims to accelerate green hydrogen and related renewable energy initiatives (European Commission, 2026). East Port Said, Ain Sokhna, and the wider SCZone are therefore well-positioned to take advantage of the green fuel bunkering opportunity.

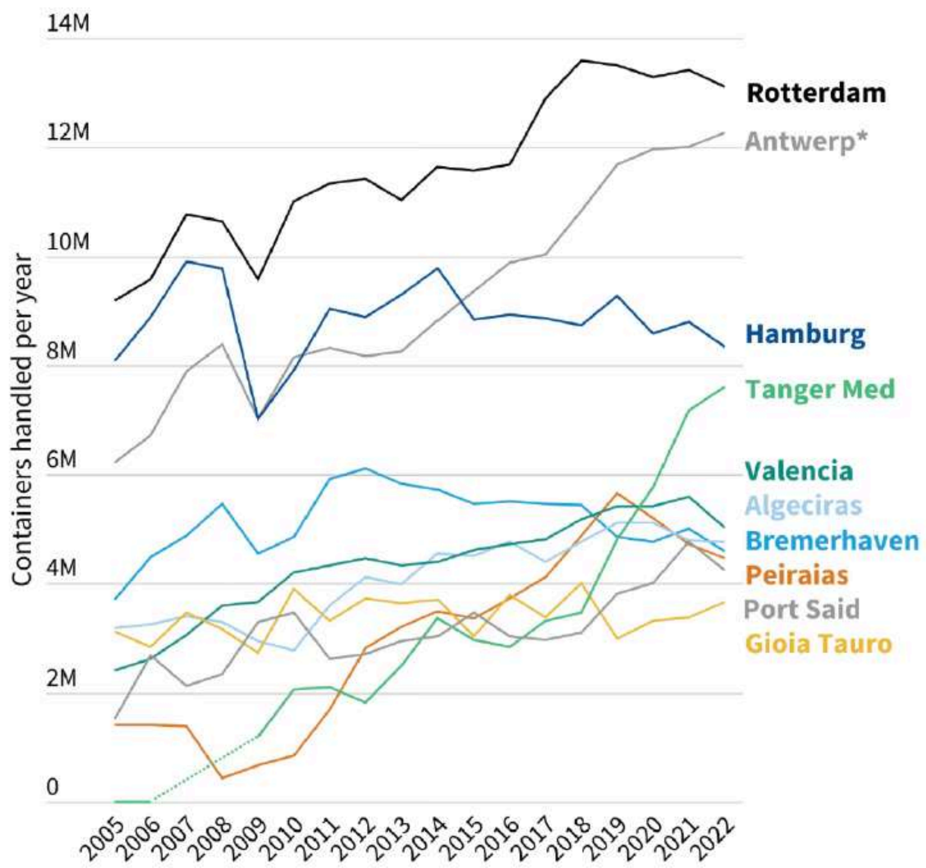
6.2 Morocco

Similarly, Morocco is well-placed to become a green fuel bunkering hub, with over 10% of international trade transiting through the Gibraltar Strait. The port of Tanger-Med, located at the Gibraltar Strait, is the leading port in the Mediterranean and in Africa and ranks 17 globally in terms of the number of containers transported (Atalayar, 2025). The port of Tanger-Med therefore represents another strategic node for global shipping.

Morocco has implemented policies supporting green hydrogen and green fuel production, making green hydrogen and derivatives a priority for the country. The Morocco Green Hydrogen Offer, announced in March, provides a framework for developing the green hydrogen value chain. Importantly, it plans for competitive infrastructure, including ports infrastructure, to be mutualised and developed (Masen, 2024). Morocco is also a signatory of the COP26 Clydebank Declaration, which aims to support the establishment of at least 6 green corridors by the middle of this decade (UK Department for Transport, 2023).

Given that 10% of all announced green shipping corridors will go through the Gibraltar Strait, the port of Tanger-Med could become a significant hub for green fuel bunkering. Tanger-Med already delivers more than 1.6 million tons of bunker products (Tanger Med Port Authority, 2026), and this could increase as the port's transshipment activities continue to grow (see T&E graph), since ships could refuel while unloading their goods. Tanger-Med has also demonstrated its commitment to decarbonising its operations, currently preparing for clean fuels, aiming to achieve 100% of green electricity supply (Tanger-Med Port Authority, 2024), and partnering with the Tarifa port to create a green corridor with electric ferries by 2027 (Riviera, 2025). Additionally, an analysis from T&E shows that using Morocco as a bunkering hub for green fuels could be a viable way to increase the operational range of most containerships traveling between Western Europe and East Asia. Provided that ships refuel once in East Asia, bunkering again in Morocco could allow them to complete 26% more voyages using ammonia or 8% more using e-methanol, without requiring additional refuelling stops (T&E, 2024).

Additionally, the World Bank estimates that ships calling at Morocco's ports could require around 0.2 million tons of hydrogen-equivalent in fuel by 2030, and 2.83 million tons by 2050 (World Bank, 2026). According to the World Bank, the most cost-effective configuration to enable trade of green hydrogen derivatives at scale would consist in hydrogen and derivatives being bunkered at Tanger Med, produced and exported from Tan-Tan, stored in salt caverns in Mohammedia, and distributed to heavy industry in Jorf Lasfar (World Bank, 2026). There is also interest in bunkering green fuels in Nador West Med, a planned transshipment port currently under construction, as CMA CGM signed an agreement to provide synthetic methanol and LNG there (Ship & Bunker, 2024).



Source: Eurostat, AAPA and Tanger Med annual reports (Tanger Med data unavailable for 2007 and 2008). *The Port of Antwerp merged with the Port of Bruges in 2022.

Source: T&E, 2024

Finally, Moroccan ports could benefit from EU regulations and energy cooperation. The Green Partnership, concluded between the EU and Morocco in 2022, aims to advance cooperation across (1) climate and energy, (2) the environment, including marine and maritime issues, and (3) the green economy. It also creates a framework to foster long-term partnership in the renewable hydrogen sector, supporting green hydrogen production and trade (European Commission, 2026). Maritime decarbonisation and green fuel production could therefore be further enabled under the Green Partnership.

7. The challenges to green fuel production and bunkering in North Africa

7.1

Financing green fuels: A viability and financing gap remain

Despite international momentum to support the introduction of zero carbon fuels, green fuels and particularly ammonia are not yet commercially competitive. Green ammonia is currently estimated to be two to three times more expensive to produce than conventional grey ammonia (BNEF, 2024), with HFO prices ranging between 500-600 USD/ton in early 2025, compared to green ammonia ranging between 885-1,050 USD/ton (S&P, 2025). Since replacing conventional maritime fossil fuels will require more than twice the amount of ammonia given its lower energy density, the price gap between green ammonia and HFO is expected to be between 1,400 to 1,650 USD per ton of HFO (Climateworks, 2025). New research has however showed that while green fuels remain more expensive today, the gap is closing and will close further with future price evolution, technology advances and supportive global policy such as the IMO NZF (Envision & WinGD, 2026).

This reality is exacerbated in North Africa, where the cost of capital is substantially higher than in the EU or China for example due to perceived risks. North African countries' credit ratings from agencies such as Moody's and S&P indeed range from "non-investment grade" in Morocco to "substantial risks" in Tunisia (Trading Economics, 2026). Low credit ratings and unsustainable debt burden therefore make it prohibitively expensive to invest in clean energy (African Liberty, 2026).

Additionally, there is a mismatch between the typical 1–3 year fuel contract cycles in shipping and the 10–15 year investment horizon required by hydrogen projects. This has created a financing gap, particularly in the mid-contract period (years 4 to 10), that remains unresolved. The lack of offtake and demand certainty has also consistently been identified as the main barrier to green hydrogen and derivatives development in Egypt and Morocco, according to over 20 interviews conducted by GH2 in February 2026 with senior executives and officials working in the green hydrogen space (GH2 interviews, 2026). The commonly held view was that with clear offtake, green hydrogen and derivatives projects would go ahead. The industry therefore needs a strong signal from ship owners on the demand for green fuels and a willingness to support long term offtake.

7.2 Postponement of the IMO NZF and regulatory uncertainty of the sector

The postponement of the IMO NZF has created greater uncertainty for the industry. Several Member States voted in favour of the delay due to a lack of specific details on fund operation, incentive mechanisms, and the treatment of various fuels under the NZF. Work on the guidelines continued during the Intersessional Working Group on Reduction of GHG Emissions from Ships (ISWG-GHG 20) in October 2025, where progress was made on fuel lifecycle methodologies, certification systems, and the operational design of the net-zero fund. Further clarification is anticipated at upcoming meetings in April 2026, including ISWG-GHG 21 and MEPC 84 (UCL Shipping and Oceans Research Group, 2025).

Some of the African nations, including those with high ambitions, have expressed concerns regarding the impact of a carbon levy on the increasing cost of living and food security, especially given that many of them import a large share of agricultural products. Analysis by the Africa Policy Research Institute shows that the effect of the levy is likely to be limited, with global prices of agricultural and processed food commodities projected to increase by 0.011% and 0.013% respectively. Advancing domestic green energy production and green ammonia output, both of which the NZF would directly incentivise, offers a far more effective long-term response by reducing food import vulnerability. To ensure a just transition, however, it will be crucial for the Net-Zero fund to redistribute a significant portion of revenues to nations most affected by the measures, considering countries' climate vulnerability and national income (APRI, 2024).

Adopting the NZF "as is": The appropriate and balanced way forward

A recent briefing by Femke Spiegelenberg and Tristan Smith for the Getting to Zero Coalition analyses three different scenarios for the IMO NZF. Under the "as is" option, as agreed in principle in April 2025, the economic measures would generate 11-12 billion USD annually for the net-zero fund, helping mitigate transition impacts on developing countries and enabling their participation in the shipping decarbonisation value chain. Compared to other options where economic measures are limited or completely removed, "as is" scenario offers the most favourable conditions for "a just and equitable" transition and provides the clearest demand signal for scaling zero-emission fuels (Global Maritime Forum, 2026).

Industry stakeholders have also emphasised the importance of adopting the NZF in 2026 in its current form. In a joint statement supported by GH2, nearly 90 companies, including shipowners, ports, fuel producers and technology providers, urged Member States to provide clear global regulation this year to scale alternative fuels, infrastructure and vessels in line with the IMO's target of net zero shipping by or around 2050 (Green Hydrogen Organisation, 2026; Financial Times, 2026). Adopting the IMO NZF as is, which had generated consensus in April 2025 and has been carefully negotiated, would therefore send a strong signal to the shipping industry, provide certainty to the sector, and give better market visibility regarding the future needs for green fuels.

7.3

Lack of infrastructure

The availability of infrastructure remains a significant challenge for the development and deployment of green hydrogen-based fuels and is particularly important in North Africa. Egyptian and Moroccan stakeholders interviewed by GH2 consistently ranked the lack of available infrastructure in the top three main barriers to green hydrogen development (GH2 interviews, 2026). Grid capacity and the lack of transmission lines are key concerns in Egypt, and there are remaining questions regarding port infrastructure currently under construction or in negotiations in Morocco, although the Moroccan Offer provides some clarity on infrastructure development. Still, overall, port authorities in North Africa lack capacity for hydrogen and ammonia readiness. The development of suitable bunkering infrastructure in ports is slow, and certification and handling protocols remain underdeveloped. Adopting green maritime strategies is therefore critical to support the construction of the necessary infrastructure and enable North African ports to become green fuels bunkering hubs.

8. Conclusion

The global maritime sector has already started decarbonising activities, with policies and initiatives driving a shift toward clean fuels and prompting a redesign of international shipping routes. Green ammonia stands out as the most promising and scalable solution for long-term, sustainable shipping. North Africa, with its strategic port locations, abundant renewable energy resources, and policy targets, is uniquely positioned to become a leader in green fuel production and bunkering, particularly in Egypt and Morocco. Numerous green hydrogen and derivatives projects have been announced across the region although most remain in early development, with key infrastructure for low-carbon ammonia expected to come online by 2029–2030.

Significant challenges persist, including the commercial viability of green fuels, high capital costs, and infrastructure gaps, all of which are compounded by recent delays in the IMO's net-zero framework. To overcome these hurdles, North African countries must prioritise shipping decarbonisation as a strategic objective, advocate for the adoption of the IMO Net-Zero Framework with its net-zero fund, strengthen partnerships with the EU and improve financial coordination. By doing so, the region can unlock new opportunities for green industrialisation, secure its role in the global energy transition, and capture long-term economic benefits.

Bibliography

Abbasov, F. (2024). Europe-Asia Green Corridors: Case for Morocco as a green shipping H2 hub. T&E. https://uploads.transportenvironment.org/production/files/Europe-Asia-Green-Corridors-Case-for-Morocco-as-a-shipping-green-H2-hub_TE-Imal.pdf?dm=1716473179

Algeria Invest (2026). Algeria attaches particular importance to educing the carbon footprint of the maritime transport sector. https://algeriainvest.com/premium-news/lalgerie-accorde-une-importance-particuliere-a-la-reduction-de-lempreinte-carbone-du-secteur-du-transport-maritime

Al-Riffai, P. & Helwa, R. (2025). A lifeline under threat: Why the Suez Canal's security matters for the world, Atlantic Council. https://www.atlanticcouncil.org/in-depth-research-reports/issue-brief/a-lifeline-under-threat-why-the-suez-canals-security-matters-for-the-world/

Armstrong, J. (2024). EU climate action and ports : How to optimize the ETS for container cargos. https://uploads.transportenvironment.org/production/files/TE_Briefing-Transhipment-Ports-and-the-ETS.pdf

Azim, K. (2026). A crisis in Egypt could be a warning sign for the global economy, Atlantic Council. https://www.atlanticcouncil.org/blogs/menasource/a-crisis-in-egypt-could-be-a-warning-sign-for-the-global-economy/

Bermudez, J., Remme, U. & Gül, T. (2026). What it would take to unlock the next phase of hydrogen growth, International Energy Agency. https://www.iea.org/commentaries/what-it-would-take-to-unlock-the-next-phase-of-hydrogen-growth

BloombergNEF (2024). Scaling up hydrogen: The case for low-carbon ammonia. https://assets.bbhub.io/professional/sites/24/CTC-whitepaper_Ammonia_Final.pdf

Burgess, J. & Weeks, D. (2025) US Gulf leads global blue ammonia price falls in Jan amid project uncertainty, S&P. https://www.spglobal.com/energy/en/news-research/latest-news/energy-transition/021825-us-gulf-leads-global-blue-ammonia-price-falls-in-jan-amid-project-uncertainty

Chukwumerije Okereke (2026). Green shipping could man a green Africa, African Liberty. https://www.africanliberty.org/2026/01/22/green-shipping-could-mean-a-green-africa/

Collins, L. (2024). Local developer ready to invest $4bn in green hydrogen and ammonia project in southern Morocco, Hydrogen Insight. https://www.hydrogeninsight.com/production/local-developer-ready-to-invest-4bn-in-green-hydrogen-and-ammonia-project-in-southern-morocco/2-1-1750611

Collins, L. (2026). China unveils plans to make Shanghai a global hub for green maritime fuels bunkering and trading, Hydrogen Insight. https://www.hydrogeninsight.com/transport/china-unveils-plans-to-make-shanghai-a-global-hub-for-green-maritime-fuels-bunkering-and-trading/2-1-1943720

Bibliography

Colombo, M. & Oei, A. (2023). Beyond oil and gas: How to unlock MENA's low-carbon hydrogen potential, World Economic Forum. https://www.weforum.org/stories/2023/12/beyond-oil-and-gas-low-carbon-hydrogen-potential-of-mena/#:~:text=The%20MENA%20region%20holds%2052,Middle%20East%20and%20North%20Africa

Declan Bush (2025). IMO to delay Net-Zero Framework vote for one year. Lloyd's List. https://www.lloydslist.com/LL1155147/IMO-to-delay-Net-Zero-Framework-vote-for-one-year

Department for Transport (2023). COP26: Clydebank Declaration for green shipping corridors. https://www.gov.uk/government/publications/cop-26-clydebank-declaration-for-green-shipping-corridors/cop-26-clydebank-declaration-for-green-shipping-corridors

Department for Transport (2025). Maritime decarbonization strategy: Supporting the UK domestic maritime sector to reduce greenhouse gas emissions to zero by 2050. https://www.gov.uk/government/publications/maritime-decarbonisation-strategy

DNV (2025). Methanol fuel in shipping: Barriers and pathways to low-GHG methanol as a marine fuel. https://www.dnv.com/news/2025/dnv-report-methanol-as-marine-fuel-at-high-readiness-level-but-adoption-hurdles-remain/

EBRD & Advisian (2022). Low carbon hydrogen economy in Morocco. https://www.ebrd.com/content/dam/ebrd_dxp/assets/pdfs/green-economy-transition/EBRD_Policy_Academy._Low_Carbon_Hydrogen_Economy_in_Morocco.pdf

EBRD & Advisian (2022). Low carbon hydrogen economy in Tunisia. https://www.ebrd.com/content/dam/ebrd_dxp/assets/pdfs/green-economy-transition/Low%20Carbon%20Hydrogen%20Economy%20in%20Tunisia.pdf

Egypt Oil & Gas Research Analysis (2026). Egypt il a volatile energy world: Past crises and future scenarios. https://egyptoil-gas.com/reports/egypt-in-a-volatile-energy-world-past-crises-and-future-scenario/

Ekanem, S. (2025). Only 4 African container ports make 2025 global Top 100 Ranking, Business Insider Africa. https://africa.businessinsider.com/local/markets/only-4-african-container-ports-make-2025-global-top-100-ranking/txbk1rk

Envision Energy & WinGD (2026). Renewable Fuel Economics. https://wingd.com/news-media/news/wingd-and-envision-energy-study-shows-path-to-green-ammonia-cost-parity

ESG News (2025). Japan advances maritime decarbonization with world's first land-based hydrogen engine test. https://esgnews.com/japan-advances-maritime-decarbonization-with-worlds-first-land-based-hydrogen-engine-test/

Bibliography

ESMAP (2026). Electrolyzers for Hydrogen Production: Technical and Economic Characteristics. https://documents1.worldbank.org/curated/en/099022326123011297/pdf/P506220-b45b0865-8706-4862-8792-d8cc71f84569.pdf

European Commission (2025). Decarbonising the shipping sector – list of neighbouring container transhipment ports. https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14432-Decarbonising-the-shipping-sector-list-of-neighbouring-container-transhipment-ports_en

European Commission (2025). FAQ – Maritime transport in EU Emissions Trading System (ETS). https://climate.ec.europa.eu/eu-action/transport-decarbonisation/reducing-emissions-shipping-sector/faq-maritime-transport-eu-emissions-trading-system-ets_en

European Commission (2026). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the EU Industrial Maritime Strategy. https://transport.ec.europa.eu/document/download/2cda36ec-b5fc-4cc9-9091-a8014ba8177e_en?filename=communication_on_EU_industrial_maritime_strategy_3.pdf

European Commission (2026). EU and Egypt launch initiatives for sustainable energy cooperation. https://north-africa-middle-east-gulf.ec.europa.eu/news/eu-and-egypt-launch-initiatives-sustainable-energy-cooperation-2026-02-10_en

European Commission (2026). Reducing emissions from the shipping sector. https://climate.ec.europa.eu/eu-action/transport-decarbonisation/reducing-emissions-shipping-sector_en

European Commission (2026). Union for the Mediterranean. https://energy.ec.europa.eu/topics/international-cooperation/key-partner-countries-and-regions/union-mediterranean_en

Fernandez, E. (2025). Tangier Med consolidates list position as the leading port in Africa in the Alphaliner world ranking, Atalayar. https://www.atalayar.com/en/articulo/economy-and-business/tangier-med-consolidates-its-position-the-leading-port-in-africa-in-the-alphaliner-world-ranking/20250329190000212732.html

Getting to Zero Coalition (2021). The next wave: Green corridors. https://globalmaritimeforum.org/report/the-next-wave-green-corridors/

Global Maritime Forum (2024). Decarbonisation of shipping could create up to four million green jobs. https://globalmaritimeforum.org/press/decarbonisation-of-shipping-could-create-up-to-four-million-green-jobs/

Bibliography

Global Maritime Forum (2025). China, India, and Brazil move on green shipping corridors as industry awaits climate regulations. https://globalmaritimeforum.org/press/china-india-and-brazil-move-on-green-shipping-corridors/

Global Renewables Alliance (2026). Breaking the energy crises cycle: The renewables action plan. https://globalrenewablesalliance.org/wp-content/uploads/2026/03/GRA-Statement-The-Renewables-Action-Plan-120226-1.pdf

Green Hydrogen Organisation (2026). A call for Member States to adopt the IMO's Net-Zero Framework in 2026. https://gh2.org/call-member-states-adopt-imos-net-zero-framework-2026

Greg Miller (2026). Fears mount on ship fuel availability as Hormuz closure drags on. Lloyd's List. https://www.lloydslist.com/LL1156602/Fears-mount-on-ship-fuel-availability-as-Hormuz-closure-drags-on

Gururaja, P. (2025). Can ammonia propel the shipping industry toward a zero-carbon future? Climateworks Foundation. https://www.climateworks.org/blog/can-ammonia-propel-the-shipping-industry-toward-a-zero-carbon-future/

International Energy Agency (2025). Global hydrogen review 2025. https://iea.blob.core.windows.net/assets/12d92ecc-e960-40f3-aff5-b2de6690ab6b/GlobalHydrogenReview2025.pdf

International Energy Agency (2026). International Shipping. https://www.iea.org/energy-system/transport/international-shipping

International Maritime Organization (2024). IMO's work to cut GHG emissions from ships. https://www.imo.org/en/mediacentre/hottopics/pages/cutting-ghg-emissions.aspx

International Maritime Organization (2025). Setting the course for Egypt's green shipping future. https://www.imo.org/en/mediacentre/pages/whatsnew-2299.aspx

International PtX Hub (2023). Towards a green shipping gateway: Establishing a green hydrogen economy in Egypt. https://h2diplo.de/wp-content/uploads/2023/11/Towards-a-green-shipping-gateway-Establishing-a-green-hydrogen-economy-in-Egypt.pdf

International PtX Hub (2025). Green Hydrogen in South Africa: Strategic enablers for a sustainable and competitive economy. https://ptx-hub.org/publication/strategic-enablers-for-green-hydrogen-in-south-africa/

Interreg Next Med (2026). GREENMEDPORTS. https://www.interregnextmed.eu/project-page/greenmedports/about/

Bibliography

IRENA (2019). Geopolitics of the energy transformation. *https://www.irena.org/Digital-Report/Geopolitics-of-the-Energy-Transformation*

IRENA (2021). A pathway to decarbonize the shipping sector by 2050. *https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2021/Oct/IRENA_Decarbonising_Shipping_2021.pdf*

IRENA (2023). North Africa: Policies and finance for renewable energy deployment. *https://www.irena.org/Digital-Report/Geopolitics-of-the-Energy-Transformation*

IRENA, T-MED Initiative, Mediterranean Renewable Energy & Clean Tech Plan (2024). Brief A.1, Renewable Energy Potential & Demand Assessment & Scenario Development. *https://north-africa-middle-east-gulf.ec.europa.eu/what-we-do/trans-mediterranean-renewable-energy-and-clean-tech-cooperation-initiative-t-med_en*

Isabelle Chan (2025). Annual progress report on green shipping corridors 2025, Global Maritime Forum. *https://globalmaritimeforum.org/report/annual-progress-report-on-green-shipping-corridors-2025/*

Kaissy, D. (2026). Hormuz under fire: LNG disruptions, regional exposure, and energy sovereignty in MENA, Arab Reform Initiative. *https://www.arab-reform.net/publication/hormuz-under-fire-lng-disruption-regional-exposure-and-energy-sovereignty-in-mena/*

Langer, P., McDowall, W., Fricaudt, M., Rehmatulla, N. & Smith, T. (2026) When is a stepping stone a dead-end? Insights into 'stepping stone' pathways from the maritime shipping transition, UCL Energy Institute. *https://www.researchgate.net/publication/401789424_QCF-transitional_fuels_-_preprint*

Maritime Studies South Africa (MARITIMESA) (2023). Maritime Economics. *https://maritimesa.org*

Martin, P. (2026). Cost of green methanol from China due to surge as government announces end to tariff rebate, Hydrogen Insight. *https://www.hydrogeninsight.com/transport/cost-of-green-methanol-from-china-due-to-surge-as-government-announces-end-to-tariff-rebate/2-1-1929479*

Masen (2024). Green hydrogen Moroccan offer: An operational and incentive offer with a simplified investor pathway. *https://www.masen.ma/en/green-hydrogen-moroccan-offer*

MED-GEM Network (2025). T-MED Platform, EDU-HUB, CBAM Help Desk and regional finance take centre stage at MED-GM's 4th Industry Advisory Board. *https://med-gem.eu/4th-IAB*

Ministry of Land, Infrastructure, Transport and Tourism (2020). Roadmap to zero emission from international shipping. *https://www.mlit.go.jp/common/001354313.pdf*

Mohd (2023). SCZONE's milestone: Egypt first methanol green bunkering, Bunker market. *https://bunkermarket.com/sczones-milestone-egypt-first-methanol-green-bunkering/*

Bibliography

Mooney, A. & Foster, P. (2026). Maritime and ports businesses push for global shipping climate deal, Financial Times. https://www.ft.com/content/aff531f1-47de-4dfc-9d08-3af9ec664645?syn-25a6b1a6=1

Moore, R. (2025). Green corridor to launch with electric ferries between Spain and Morocco, Riviera. https://www.rivieramm.com/news-content-hub/news-content-hub/spain-and-morocco-green-corridor-to-launch-with-electric-ferries-85354

Moyoun, J. (2025). South Kora launches $680m green fuel infrastructure fund, Llyod's List. https://www.lloydslist.com/LL1152197/South-Korea-launches-$680m-green-fuel-infrastructure-fund

Myers, J. (2021). Th Suez Canal in numbers, World Economic Forum. https://www.weforum.org/stories/2021/03/the-suez-canal-in-numbers/

Njovu, G. (2025). ITOCHU & Mitsui O.S.K. Lines: Ammonia bunkering demonstrations planned for 2027, Ammonia Energy Association. https://ammoniaenergy.org/articles/itochu-mitsui-o-s-k-lines-ammonia-bunkering-demonstrations-planned-for-2027/

Nrehmatulla (2025). Post-mortem on IMO's Net Zero Framework discussions: UCL readout, UCL Shipping and Oceans Research Group. https://www.shippingandoceans.com/post/post-mortem-on-imo-s-net-zero-framework-discussions-ucl-readout

OECD (2024). Green Hydrogen Incentives Law – Government of Egypt. https://www.oecd.org/content/dam/oecd/en/about/programmes/cefim/green-hydrogen/2024-case-studies/Green-hydrogen-incentives-law-case-study-2024.pdf

Ogbugo, M., Davis, W., Omoju, O., Luke, D. & Aggad, F. (2024). Navigating climate action: Assessing the economic impacts and trade-offs of a shipping carbon tax for African states, Africa Policy Research Institute. https://afripoli.org/navigating-climate-action-assessing-the-economic-impacts-and-trade-offs-of-a-shipping-carbon-tax-for-african-states

Ouki, M. (2025). North Africa Gas: Producers aim to preserve export role, The Oxford Institute for Energy Studies. https://www.oxfordenergy.org/wpcms/wp-content/uploads/2025/01/North-Africa-Gas.pdf

Prevljak, N. (2023). SCZONE, Scatec ink $1.1 billion MoU for green bunkering in East Port Said, Offshore Energy. https://www.offshore-energy.biz/sczone-scatec-ink-1-1-billion-mou-for-green-bunkering-in-east-port-said/

Ship & Bunker (2024). CMA CGM to take on synthetic LNG and methanol in Morocco. https://shipandbunker.com/news/emea/280458-cma-cgm-to-take-on-synthetic-lng-and-methanol-in-morocco

Bibliography

Ship & Bunker (2025). LR joins Egyptian green ammonia bunkering project. https://shipandbunker.com/news/emea/168171-lr-joins-egyptian-green-ammonia-bunkering-project

Smith, T., Frosch, A., Fricaudet, M., Langer, P., Cooper, T., Rehmatulla, N., & Oluteye, D. (2025). An overview of the discussions from IMO's Marine Environment Protection Committee Extraordinary Session and Intersessional Working Group on GHGs 20th session. UCL Energy Institute. https://www.shippingandoceans.com/post/post-mortem-on-imo-s-net-zero-framework-discussions-ucl-readout

Smith, T. & Spiegelenberg, F. (2026). Uncertainty at the IMO: Three scenarios and their consequences for shipping's transition, Global Maritime Forum. https://globalmaritimeforum.org/insight/three-scenarios-and-their-consequences-for-shippings-transition/

Solutions for Our Climate (2026). Korea's Green Shipping Corridor Support Act passed – A meaningful step toward maritime decarbonization. https://forourclimate.org/newsroom/1187

Stratiotis, E. (2018). Fuel costs in ocean shipping, More Than Shipping. https://www.morethanshipping.com/fuel-costs-ocean-shipping/

Suez Canal Authority (2026). A new strategy to endorse an eco-friendlier maritime transportation. https://www.suezcanal.gov.eg/English/About/SuezCanal/Pages/greencanal.aspx

T&E & Hydrogen Europe (2021). Joint industry letter. https://uploads.transportenvironment.org/production/files/2021_03_Joint_industry-NGO20letter_shipping.pdf

T&E (2023). How does FuelEU Maritime work? T&E explainer of the new EU shipping fuel Regulation. https://te-cdn.ams3.cdn.digitaloceanspaces.com/files/202307_FUEM_Explainer_Briefing_2023_TE.pdf

T&E (2026). Climate impact of shipping. https://www.transportenvironment.org/topics/ships/climate-impact-shipping

T&E (2026). International Maritime Organisation. https://www.transportenvironment.org/topics/ships/international-maritime-organisation

T&E (2026). Who is responsible for international shipping and aviation pollution? One more chance: Including shipping and aviation emissions in upcoming Paris climate plans. https://www.transportenvironment.org/topics/ships/shipping-and-aviation-emissions-allocation

Tanger Med Port Authority (2024). Tanger Med pot complex achieves 100% green electricity supply. https://www.tangermedport.com/en/tanger-med-port-complex-achieves-100-green-electricity-supply/

Bibliography

Tanger Med Port Authority (2026). Tanger Med, bunkering port on the Strait of Gibraltar. https://www.tangermedport.com/en/service/bunkering/

The Africa Green Hydrogen Alliance (AGHA) (2026). Green Hydrogen Organisation. https://gh2.org/agha

Trading Economics (2026). Credit rating | Africa. https://tradingeconomics.com/country-list/rating?continent=africa

Transformer Magazine (2023). Egypt achieves lowest renewable power prices. https://transformers-magazine.com/tm-news/egypt-achieves-lowest-renewable-power-prices/

United Nations Conference on Trade and Development (2025). Shipping data: UNCTAD releases new seaborne trade statistics. https://unctad.org/news/shipping-data-unctad-releases-new-seaborne-trade-statistics

Waldman, S. (2026). It's not just oil. Here comes Hormuz inflation, Politico. https://www.politico.com/news/2026/03/14/hormuz-inflation-helium-fertilizer-00828680

World Bank (2026). Gateway to green energy: Moroccan ports as hubs for hydrogen fuel development and trade. https://openknowledge.worldbank.org/entities/publication/c1c4c4f8-649f-4907-950a-0119108b869f

World Bank (2026). Setting sail: The maritime sector: driving jobs and development. https://www.worldbank.org/en/news/immersive-story/2026/03/06/ports-and-jobs-ida-miga-ifc?cid=ECR_LI_Worldbank_EN_EXT_profilesubscribe