



A.P. Moller - Maersk

Green Financing Second Opinion

November 15, 2021

A.P. Moller – Maersk A/S (“Maersk”) is a Danish shipping company operating the world’s largest fleet of container vessels. It has set a target for its fleet to become carbon neutral by 2050. Working towards this goal, it has announced that it will launch at least nine dual-fuel vessels that can run on methanol and conventional fuel, and is working to secure a supply of green methanol (bio-methanol and e-methanol) to fuel them. Maersk has sister and daughter companies involved in global offshore marine services, including the oil and gas industry.

Proceeds will mainly finance investments in the methanol vessels at first, with more going to green methanol procurement in later issuances. The framework also includes expenditures for dual-fuel ship retrofits, low-carbon land transportation, and logistics centers. The vessels designed for methanol represent an important and innovative step towards decarbonizing deep-sea shipping, a hard-to-abate sector. Maersk expects that its strategy will create demand and incentivize the scaling of green methanol supply, a key barrier to its wider uptake. Maersk is the first in the sector to commission low-carbon ships at scale. Maersk has the ambition to fuel the ships with green methanol, but if supply is insufficient, the ships will run on fossil fuels until the gap is filled.

A general risk with biofuel is that its production may increase competition for land and contribute to land-use change, as well as cause substitution effects; Maersk is working actively to ensure the sustainability of its bio-methanol. This involves collaborating with potential suppliers, an external consultant, and an NGO. For bio-methanol from waste, this land use change risk currently appears low based on published research but may increase as production is scaled up. E-methanol may avoid these problems.

In 2021, Maersk launched a new decarbonization unit with more than 40 full-time equivalent positions, and it has formed a decarbonization steering committee with executive membership. Maersk is part of several sectoral decarbonization initiatives and discloses in line with TCFD. It conducts scenario analysis to assess physical and transition climate risks, but policies to address resilience in the supply chain are not fully developed. The decarbonization unit holds veto power over asset selection. Maersk has committed to transparent proceeds and impact reporting that will be externally reviewed.

While CICERO Green has not assessed the whole framework against the EU Taxonomy, the new vessels and vessel retrofits project categories likely align with the relevant EU Taxonomy Technical screening criteria. However, these project categories partially meet the Do No Significant Harm criteria for climate change adaptation, as per the information available today.

Based on the overall assessment of the eligible green assets under this framework and governance and transparency considerations, Maersk’s green financing framework receives a **CICERO Medium Green** shading and a governance score of **Excellent**.

SHADES OF GREEN

Based on our review, we rate the Maersk’s green financing framework **CICERO Medium Green**.

Included in the overall shading is an assessment of the governance structure of the green financing framework. CICERO Shades of Green finds the governance procedures in Maersk’s framework to be **Excellent**.



GREEN BOND AND LOAN PRINCIPLES

Based on this review, this Framework is found in alignment with the principles.





Contents

1	Terms and methodology	3
	Expressing concerns with 'Shades of Green'	3
2	Brief description of Maersk's green financing framework and related policies	4
	Environmental Strategies and Policies	4
	Use of proceeds	7
	Selection	7
	Management of proceeds	8
	Reporting	8
3	Assessment of Maersk's green financing framework and policies	10
	Overall shading	10
	Eligible projects under the Maersk's green financing framework	10
	Background	15
	EU Taxonomy	16
	Governance Assessment	17
	Strengths	18
	Weaknesses	18
	Pitfalls	18
	Appendix 1: Referenced Documents List	20
	Appendix 2: EU Taxonomy criteria and alignment	21
	Sea and coastal freight water transport, vessels for port operations and auxiliary activities	21
	Retrofitting of sea and coastal freight and passenger water transport	27
	Appendix 3: About CICERO Shades of Green	31



1 Terms and methodology

This note provides CICERO Shades of Green's (CICERO Green) second opinion of the client's framework dated November 2021. This second opinion remains relevant to all green bonds and/or loans issued under this framework for the duration of three years from publication of this second opinion, as long as the framework remains unchanged. Any amendments or updates to the framework require a revised second opinion. CICERO Green encourages the client to make this second opinion publicly available. If any part of the second opinion is quoted, the full report must be made available.

The second opinion is based on a review of the framework and documentation of the client's policies and processes, as well as information gathered during meetings, teleconferences and email correspondence.

Expressing concerns with 'Shades of Green'

CICERO Green second opinions are graded dark green, medium green or light green, reflecting a broad, qualitative review of the climate and environmental risks and ambitions. The shading methodology aims to provide transparency to investors that seek to understand and act upon potential exposure to climate risks and impacts. Investments in all shades of green projects are necessary in order to successfully implement the ambition of the Paris agreement. The shades are intended to communicate the following:

CICERO Shades of Green



Dark green is allocated to projects and solutions that correspond to the long-term vision of a low carbon and climate resilient future. Fossil-fueled technologies that lock in long-term emissions do not qualify for financing. Ideally, exposure to transitional and physical climate risk is considered or mitigated.



Medium green is allocated to projects and solutions that represent steps towards the long-term vision, but are not quite there yet. Fossil-fueled technologies that lock in long-term emissions do not qualify for financing. Physical and transition climate risks might be considered.



Light green is allocated to projects and solutions that are climate friendly but do not represent or contribute to the long-term vision. These represent necessary and potentially significant short-term GHG emission reductions, but need to be managed to avoid extension of equipment lifetime that can lock-in fossil fuel elements. Projects may be exposed to the physical and transitional climate risk without appropriate strategies in place to protect them.

Examples



Wind energy projects with a strong governance structure that integrates environmental concerns



Bridging technologies such as plug-in hybrid buses



Efficiency investments for fossil fuel technologies where clean alternatives are not available

Sound governance and transparency processes facilitate delivery of the client's climate and environmental ambitions laid out in the framework. Hence, the governance aspects are carefully considered and reflected in the overall shading of the green financing framework. CICERO Green considers four factors in its review of the client's governance processes: 1) the policies and goals of relevance to the green financing framework; 2) the selection process used to identify and approve eligible projects under the framework, 3) the management of proceeds and 4) the reporting on the projects to investors. Based on these factors, we assign an overall governance grade: Fair, Good or Excellent. Please note this is not a substitute for a full evaluation of the governance of the issuing institution, and does not cover, e.g., corruption.



2 Brief description of Maersk's green financing framework and related policies

A.P. Moller – Maersk (“Maersk”) is a Danish shipping company headquartered in Copenhagen operating in 130 countries with more than 80 000 employees. Maersk is a publicly listed company on Nasdaq Copenhagen, with A.P. Moller Holding A/S as its largest shareholder, owning 42.09% of the share capital and 51.70% of votes (per 30.09.2021). A.P. Moller Holding A/S is the parent company of the A.P. Moller Group, which consists of Maersk, Danske Bank, Faerch Group, Maersk Drilling, KK Wind Solutions, Maersk Product Tankers, Maersk Tankers and A.P. Moller Capital.

Maersk has shared that it has two subsidiaries with activities relating to fossil fuels. Maersk Oil Trading is an actor in the bunker fuel and lubricants market, mainly serving as the bunker fuel procurement entity for Maersk. Maersk Supply Services (MSS), is an offshore marine services and solutions provider that serves the energy sector, including oil and gas. According to Maersk, MSS has reduced its oil and gas exposure in the last few years and is expanding into new sectors, e.g., wind, ocean cleaning, decommissioning etc. Maersk has clarified that there are no internal loans or overlaps in personnel between itself and other subsidiaries of A.P. Moller Holding A/S.

In 2016, Maersk embarked on a transformation from a diversified conglomerate to a focused and integrated global container logistics company comprising four business segments: Ocean, Logistics & Services, Terminals & Towage, and Manufacturing & Other. Its integrated platform offers customers end-to-end logistics products and services, from ocean and air transport to inland transportation, warehousing, and distribution. The company's Ocean activities are the largest in the world, currently owning 308 container vessels and chartering another 428, and carrying around one fifth of the world's containers to over 300 ports around the world. The containers move a wide variety of intermediate and final goods, reflecting the composition of global industry.

The company is growing its landside logistics, expanding its product portfolio to all relevant markets. In addition, Maersk expects to continue to acquire capabilities and growth platforms, particularly within warehousing and distribution, air freight and as customs services. As part of Maersk's strategy for end-to-end logistics, its daughter company Stair Air A/S operates a fleet of 15 Boeing 767 cargo planes and has ordered two Boeing 777 planes to be delivered in 2024. Maersk recently agreed to acquire (pending regulatory approval) Senator Air, a company focusing on air and sea freight. Maersk Supply Service A/S is a 100% owned subsidiary of Maersk, mainly services offshore and gas exploration and extraction. Another 100% owned subsidiary is Maersk Oil Trading and Investments A/S, which serves as the fuel procurement entity for Maersk and is the world's largest commercial buyer of marine fuel.

Environmental Strategies and Policies

Climate goals and strategy

Maersk's top sustainability priority is taking leadership on decarbonization of logistics. In 2018, it set a target for net-zero emissions from its ocean activities by 2050. It is investigating how to expand the target to cover all operations and value chains across all emissions scopes. An intermediate target for 2030 is to reduce CO₂ emissions per cargo tonne mile by 60% below 2008 levels. Maersk has shared that it may be possible to meet this target without investment in new low-carbon vessels.



Maersk is a signatory to the Business Ambition for 1.5°C, the Getting to Zero coalition, and the Transform to Net Zero Initiative. It is engaging with the Science-Based Target Initiative on establishing a methodology for shipping, after which it will communicate on a Paris-aligned emission reduction target.

In 2021, Maersk launched a new decarbonization function with more than 40 full-time equivalent positions, to ensure collaboration and embed the strategy across the company. It has also appointed a decarbonization steering committee with executive membership.

Reporting and progress

Maersk has reduced its CO₂ emissions per cargo tonne mile by 46.3% between 2008 and 2020. The main factors leading to the efficiency improvement are deployment of larger, more modern vessels, slower speed, and energy efficiency retrofits of the fleet. The reduction achieved from 2019 to 2020 was 2.5%.

It has published annual sustainability reports since 2009, measuring progress against key performance indicators. In 2020, 64% of GHG emissions were Scope 1 (own operations), 36% Scope 3 (value chain) and less than 1% Scope 2 (electricity). The reports are guided by the TCFD recommendations and SASB's reporting framework, and Maersk also discloses to CDP. Furthermore, Maersk has been a signatory to the UN Global Compact since 2009, and its sustainability reporting is in accordance with UN Global Compact's Advanced Level and verified by an external auditor. The company will also report to the Climate Action 100+ net zero company benchmark launched in 2021. Material sustainability issues are assessed annually, drawing on outcomes from engagement with stakeholders including customers, investors, employees, authorities and NGOs/thought leaders. In 2020, the company analyzed 1.5, 2- and 3-degree climate scenarios, assessing how these might impact the sector until 2040, including both physical and transition risks. A detailed assessment at the Maersk company level will be undertaken in 2021 and 2022.

Maersk ECO-delivery

In 2019, the company created Maersk ECO Delivery product, offering carbon-neutral transportation services to its clients. This is a form of internal offsetting scheme, whereby the GHG emissions related to the specific cargo is offset on a mass balance basis through the use of externally certified (International Sustainability & Carbon Certification or Roundtable on Sustainable Biofuels) biodiesel from waste feedstock like cooking oil to power vessels somewhere in Maersk's fleet. According to Maersk, the offsets are externally audited by PwC.

Decarbonizing ships

Maersk has identified four potential fuels that could decarbonise their fleet: biodiesel, green methanol, ammonia, and lignin-enhanced alcohols. It is collaborating with fuel suppliers to support the scaling of production and the roll out of necessary infrastructure at ports to encourage their uptake.

In February 2021, Maersk announced that it will in 2023 launch a dual-fuel feeder vessel purpose-built to run on methanol as well as conventional fuel oil. This is 7 years ahead of a target set in 2018, and it will be the world's first methanol-powered container ship. The ship is scaled to fit the largest available dual-fuel engine currently on the market, and its capacity will be 2 000 twenty-foot equivalent (TEU). The company has the ambition to operate it on green methanol (bio-methanol or e-methanol), making it the first carbon-neutral ship in its class, according to Maersk. It has identified a partner company to deliver the 10 000 tonnes of e-methanol needed annually for this vessel.

In August 2021, the company announced it will launch a series of eight dual-fuel ocean-going container vessels (each approximately 16 000 TEU) starting from 2024, with an option of four additional vessels. This requires an engine ten times more powerful than for the first ship. Maersk intends to operate the vessels on carbon neutral e-methanol or sustainable bio-methanol as soon as possible. With some modifications, the engines could also run on



lignin-enhanced alcohols, but this technology is not yet fully mature. Biodiesel can be used without modification. The ships will not have scrubbers, so conventional fuel used would have to comply with sulphur regulations.

The amounts of green methanol required to run all new ships is several times greater than current global production. Maersk recognizes this as the biggest challenge in its decarbonization strategy and is working actively with potential suppliers to secure green methanol supply.

The estimated CO₂ savings from the ships will be included in the ECO-delivery scheme.

Decarbonization of land-based activities and supply chain

Maersk also explores solutions for tackling GHG emissions in business activities along the value chain. This is particularly important because emissions from its logistics supply chain are expected to increase as Maersk plans to expand its activities on land without significant asset ownership, thus expecting Scope 3 emissions to grow.

Maersk is currently creating baseline values for its emissions from other sources than marine fuel (vessel construction, operation other than fuel, maintenance, and recycling) in order to prioritise the reduction efforts. The company will engage with shipyards the baseline values have been established (Q1 2022).

The company is working towards integrating environmental criteria into its procurement tenders. It also co-led the work of a UN Global Compact Action Platform to develop a guidance for shipyards, expected to be published in 2021, that establishes common standards for environmental performance.

Decarbonisation partnership

In June 2020, Maersk was among the founding members of the Maersk Mc-Kinney Moller Center for Zero Carbon Shipping, a multi-disciplinary research and development center tasked with advancing the development of new energy systems and fuel technologies for shipping. The center will also work on the design of financial mechanisms, regulatory frameworks, and decarbonization pathways to enable the transformation of global shipping.

Air pollution

Maersk strives to be an industry leader on reducing emissions of local air pollutants and supports regulation of such emissions. Its emissions of sulphur decreased from 569 000 tonnes in 2019 to 102 000 tonnes in 2020, as IMO's legislation requiring the global fleet to sail on fuels with 0.5% sulphur content came into force. Compliance can be achieved either by using low-sulphur fuel or by installing scrubbers to clean the exhaust. Maersk recognizes that the use of scrubbers is debated. It complies partly through using low-sulphur fuel and partly through installing scrubbers on a number of its vessels.

Marine environment

Maersk has a target of zero non-contained oil spills above 10 m³. In 2020, there were two such spills above this limit, and a total volume of hydrocarbon spills of 131 m³. The company has a zero-dumping policy for waste at sea. It is on track to comply with the Ballast Water Management Convention requiring ballast water systems on all ships by 2024; the share of compliant ships in 2020 was 28%. The company sails at reduced speeds in areas where orca whales have been observed to reduce noise that confuses their communication.

The company has contributed to the UN Global Compact's guidance for the shipping industry to support implementation of the Sustainable Ocean Principles, which it participated in establishing in 2019.



Ship recycling

Maersk has the ambition to create opportunities for responsible ship recycling globally for the benefit of workers and the environment. It has initially concentrated efforts in the Alang region in India, including providing healthcare access to the wider area. The company co-founded the Ship Recycling Transparency Initiative in 2018 and remains a steering group member. All vessels sent for recycling in 2020 went to yards complying with Maersk's Responsible Ship Recycling Standard and one vessel went to a yard in Turkey that complies with the EU Ship Recycling Regulation in addition.

Use of proceeds

The framework will allow Maersk to issue a variety of sustainable financing instruments including bonds, loans, project finance and any other types of financial instruments (together referred as "Green Financing Instruments"). Assets will be owned by Maersk or its subsidiaries. Maersk has clarified that there are no internal loans between itself and other subsidiaries of A.P. Moller Holding A/S.

An amount at least equivalent to the net proceeds from the issuance of the Green Financing Instrument will be applied for the financing and/or refinancing of new and/or existing assets complying with the criteria specified in Table 1. The lookback period for re-finance is of up to 36 months. The green project categories are Clean Transportation and Green Buildings. Maersk informs that the first bond issuance will mainly finance new dual-fuel vessels.

Eligible assets may include fixed assets, capital and operating expenditures. Initially, CAPEX will be the main share, while OPEX may later constitute a larger share, in the form of green methanol procurement for the dual-fuel vessels. Eligible OPEX excludes all administrative costs. Also eligible are acquisitions of "Pure Player" companies, defined as having at least 90% of its revenue derived from activities falling in any of the below Green Categories. Eligible assets will not serve the production, storage, or transport of fossil fuels.

Selection

The selection process is a key governance factor to consider in CICERO Green's assessment. CICERO Green typically looks at how climate and environmental considerations are considered when evaluating whether projects can qualify for green finance funding. The broader the project categories, the more importance CICERO Green places on the governance process.

Maersk has established a Green Finance Committee ("GFC") to identify and select the eligible assets, consisting of representatives from the following departments: Treasury & Risk, Finance, Decarbonization, Corporate Sustainability. It is chaired by the Head of Treasury & Risk. External expertise will be sought where required.

The committee will be responsible for:

- Reviewing, selecting and validating the eligible assets.
- Monitoring the asset portfolio during the life of the Green Financing Instruments
- Verifying and providing annual reporting on allocation and impact of the net proceeds raised through the Green Financing Instruments
- Monitoring the on-going evolution of the GBPs, particularly in relation to disclosure and reporting, to ensure Maersk is in-line with best market practices

The committee will meet at least semi-annually, to review proposed allocations and ensure that these are in line with the Framework. Decisions will be by unanimous consensus.



The process for the evaluation and selection of eligible assets will be as follows:

- A list of potential eligible assets is identified by the relevant business functions and the decarbonization function, based on internal expertise.
- The list of potential eligible assets is then submitted to the GFC for validation with the eligibility criteria and selection.
- Once an eligible asset is selected by the GFC, Treasury will keep track, monitor and follow up on each eligible asset, and will maintain a register (the “Green Finance Register”) to keep track of the eligible projects.
- Semi-annually, the GFC will review the register of eligible assets and determine if the projects still align with the eligibility criteria or if any reallocation of proceeds is necessary.

Management of proceeds

CICERO Green finds the management of proceeds of Maersk to be in accordance with the Green Bond and Green Loan Principles.

An amount at least equivalent to the net proceeds of the Green Financing Instrument issued under the framework will be managed and overseen by Maersk’s Treasury. Proceeds will be allocated to the entire portfolio of eligible assets. All relevant information regarding the issuance of Green Financing Instruments and eligible assets (re)financed will be monitored and documented via a “Green Finance Register”.

Maersk’s Treasury will ensure that the portfolio of eligible assets is equal to or greater than the amount of Green Financing Instrument proceeds.

Pending full allocation, proceeds will be held in bank accounts or invested on a temporary basis in sovereign bonds, in accordance with relevant internal cash management policies, Maersk informs.

In case of divestments or if an eligible asset no longer meets the eligibility criteria, the proceeds will be reallocated to other eligible assets. Maersk will use its best efforts to substitute any projects that the GFC deems no longer meet the eligibility criteria, as soon as practical once an appropriate substitution option has been identified.

Reporting

Transparency, reporting, and verification of impacts are key to enable investors to follow the implementation of green finance programs. Procedures for reporting and disclosure of green finance investments are also vital to build confidence that green finance is contributing towards a sustainable and climate-friendly future, both among investors and in society.

Maersk will publish annually an Allocation Report and an Impact Report, the latter subject to the availability of suitable information and data, and permitted disclosure in accordance of relevant confidentiality agreements and competitions issues. The reports will be publicly available on Maersk website. Wherever possible, Maersk intends to align portfolio reporting with the approach described in ICMA’s handbook titled “Harmonized Framework for Impact Reporting” (April 2020). The Head of Treasury and Risk will be responsible for overseeing the reporting process, with the Decarbonization unit and several other units contributing. Reporting will be reviewed by an external auditor.

The Allocation Report will include: 1) an overview of the Green Financing Instruments outstanding; 2) the total amount of proceeds allocated to green eligible assets, per category; 3) the proportion of the proceeds allocated to financing vs refinancing; and 4) the balance of unallocated proceeds invested in cash and/or cash equivalents.



The Impact Report will provide information on the associated environmental impact metrics and outcomes of the Green Financing Instruments, subject to the availability of suitable information and data. Examples of impact indicators that may be reported are listed in the framework.

Allocation and impact reporting will be provided at least per project category. Due to the confidentiality of contracts, Maersk may not be able to provide precise reporting per project. However significant individual assets such as vessels, will be mentioned individually in the report, the company informs.



3 Assessment of Maersk’s green financing framework and policies

The framework and procedures for Maersk’s green financing instruments’ investments are assessed and their strengths and weaknesses are discussed in this section. The strengths of an investment framework with respect to environmental impact are areas where it clearly supports low-carbon projects; weaknesses are typically areas that are unclear or too general. Pitfalls are also raised in this section to note areas where Maersk should be aware of potential macro-level impacts of investment projects.

Overall shading

Based on the project category shadings detailed below, and consideration of environmental ambitions and governance structure reflected in Maersk’s green financing framework, we rate the framework **CICERO Medium Green**.

Eligible projects under the Maersk’s green financing framework

At the basic level, the selection of eligible project categories is the primary mechanism to ensure that projects deliver environmental benefits. Through selection of project categories with clear environmental benefits, green financing instruments aim to provide investors with certainty that their investments deliver environmental returns as well as financial returns. The Green Bonds Principles (GBP) state that the “overall environmental profile” of a project should be assessed and that the selection process should be “well defined”.

Category	Eligible project types	Green Shading and some concerns
Clean Transportation	<p>Investments and / or expenditures connected to the acquisition of dual-fuel container vessels, optimized for carbon-neutral methanol</p> <ul style="list-style-type: none"> • All vessels will be able to run on carbon neutral fuel as well as conventional (fossil, low sulphur fuel. The first series of vessels are built for methanol, and future carbon neutral fuels may include ethanol, lignin fuels and ammonia. • Maersk intends to only use green methanol, defined as bio-methanol and e-methanol with very high GHG emission reduction compared to regular fuels (at least 86% 	<p>Medium Green</p> <p>Investments and / or expenditures connected to the acquisition of dual-fuel container vessels, optimized for carbon-neutral methanol & Investments and / or of expenditures connected to the procurement of carbon neutral methanol</p> <ul style="list-style-type: none"> ✓ Green methanol is an emerging fuel technology, whose potential for contributing to decarbonizing the transport sector (particularly aviation and long-distance shipping) is recognized by IRENA¹ and the IPCC² (see Background).

¹ IRENA (International Renewable Energy Agency) 2021: Innovation Outlook – Green methanol.

² IPCC 2018: Mitigation Pathways Compatible with 1.5°C in the Context of Sustainable Development. Chapter 2 in: *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*



well-to-wake GHG reduction is achievable for green methanol).

- The dual-fuel setup is optimized for methanol as methanol tank sizes allow for a full roundtrip on one methanol bunkering; tanks for conventional fossil fuels are smaller, requiring more frequent bunkering in cases where qualified methanol is unavailable.
- Maersk aims for carbon-neutral methanol to be available in sufficient volumes for each vessel and from the start of each vessel's operations, or as soon as possible thereafter.

Investments and / or of expenditures connected to the procurement of carbon neutral methanol

- All methanol procured for the 1+8 committed and future dual-fuel container vessels optimized for carbon-neutral methanol and retrofitted vessels will be green methanol (e-methanol or bio-methanol).
- E-methanol will be based on green hydrogen and carbon from biomass or e.g. pulp and paper production with point-source carbon capture (BEC).
- Bio-methanol will be based on sustainable organic waste and waste biomass from forestry and agriculture.
- To ensure the sustainability of biomass feedstocks, sustainability assessment criteria and methodology have been developed in cooperation with an external consultancy company combined with work done by an NGO with strong expertise in this field.
- Maersk is aware that the sourcing of certain waste biomass by fuel suppliers may carry

- ✓ Maersk recognizes that it will be challenging to secure enough green methanol to fully power all ships from their launch.
- ✓ If Maersk does not succeed in sourcing sufficient green methanol, the ships will run on conventional fuel oil, possibly with some share of biodiesel until green methanol can be sourced.
- ✓ Risks of direct and indirect land-use change (LUC) have been found to put into question the climate benefits from other forms of biofuels and bioenergy.³ Maersk's intention to use only waste, residual products, or by-products as feedstock minimizes this risk. However, the risk remains that this sourcing valorizes waste or residual products from activities in forestry and agriculture linked with LUC. Risks of indirect LUC and substitution effects also remain depending on feedstock used.
- ✓ Maersk has clarified that the GHG reduction estimate in its framework is based on EU RED II benchmarks, and that it believes higher reductions are possible.
- ✓ Published research on green methanol's climate credentials is relatively scarce, with more studies available for bio-methanol than e-methanol.
- ✓ One academic study estimates that bio-methanol reduces the life-cycle contribution to global warming by around 80% compared with heavy fuel oil if sourced from primary wood⁴, while another estimates around 90% when sourced from waste⁵. These studies do not assess LUC effects. A

³ IPCC, 2019: Interlinkages Between Desertification, Land Degradation, Food Security and Greenhouse Gas Fluxes: Synergies, Trade-offs and Integrated Response Options. Chapter 6 in: *Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems*.

⁴ Brynolf et al. 2014: Environmental assessment of marine fuels: liquefied natural gas, liquefied biogas, methanol and bio-methanol. *Journal of Cleaner Production* 74, pp 86-95.

⁵ Balcombe, P. et al. 2019, How to decarbonize international shipping: Options for fuels, technologies and policies, *Energy Conversion and Management* 182, 72-88



the risk of causing substitution effects. Maersk includes these risk considerations when engaging with suppliers.

- Maersk will strive to ensure that biomass feedstocks are not transported over long distances
- E-methanol and bio-methanol cause at least 86-89% GHG emissions reductions on a well-to-wake basis compared to conventional fossil fuels

Investments and/or expenditures connected to retrofitting existing container vessels with a dual-fuel set-up, optimized for carbon-neutral methanol

- All plans and intentions stated above apply to retrofitted vessels

Investments and / or expenditures connected to carbon-neutral land-based transportation

- Low/zero-carbon -carbon land-based light/medium/heavy-duty vehicles that emit less than 1g CO₂/kWh (or 1g CO₂ /km for certain N₂ vehicles)
 - Pure battery-electric light and heavy trucks
- Related infrastructure, such as electric charging stations and enforcements of electricity infrastructure with the purpose of enabling the electrification of transportation as well as renewable electricity installations
- Light/medium/heavy-duty trucks which run on green hydrogen
- Related infrastructure, such as green hydrogen fueling stations and procurement of green hydrogen. All assets that fall under the green framework will run on green

working paper⁶ finds that bio-methanol production has low indirect LUC impacts due to the low economic value of the feedstock; it estimates life-cycle emissions to be 70-80% lower than those from marine diesel. This calculation may, however, change if the feedstock increases in value as production is scaled up. However, neither study accounts for substitution effects.

- ✓ Once it has actually sourced green methanol, Maersk will be able to assess whether the specific source is aligned with the EU Taxonomy criteria for biofuel.
- ✓ Burning of bio-methanol causes a temporary increase in CO₂ concentrations in the atmosphere until the CO₂ is reabsorbed through regrowth; Maersk's use of waste, residual and byproducts, in particular from short-rotation agriculture, likely limit the extent of this effect.
- ✓ E-methanol production is electricity-intensive. Research reviewed by IRENA¹⁰ suggests that e-methanol production using renewable energy has the potential to come close to carbon neutral on a life-cycle basis, depending on which biogenic CO₂ source is used. However, as e-methanol has not yet been produced at industrial scale, actual emissions reductions are still uncertain.
- ✓ Maersk informs that its draft future fuels policy excludes all feedstock of fossil origin, e.g. from plastic waste and cement plants. Maersk intends to require that electricity must be renewable and

⁶ Zhou et al. 2020: The potential of liquid biofuels in reducing ship emissions. International Council on Clean Transportation Working Paper 2020-21.

¹⁰ IRENA and Methanol Institute, 2021: *Innovation Outlook : Green methanol*.

IPCC, 2019: Interlinkages Between Desertification, Land Degradation, Food Security and Greenhouse Gas Fluxes: Synergies, Trade-offs and Integrated Response Options. Chapter 6 in: *Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems*.



hydrogen produced via 1) electrolysis using renewables, or 2) from biomass gasification in compliance with local regulations and APMM standards on feedstock.

additional (the latter excludes nuclear and hydro power).

- ✓ Maersk sees e-methanol as having a greater GHG reduction potential and better long-term scalability than bio-methanol. The company therefore has a preference for e-methanol, but the balance will also depend on price and availability.
- ✓ Running on methanol would effectively reduce local air pollution, as it is a clean-burning fuel that contains no sulphur and emits less NOx and particulate matter compared with heavy fuel oil and diesel.
- ✓ Fuel spills would have less impact with methanol than with conventional fuel, as it dissolves easily, biodegrades and does not bioaccumulate.
- ✓ Maersk's current plans focus on new ships. Retrofits are less economical but may be included in the future.
- ✓ Maersk informs that it also plans to start addressing emissions other than from fuel (such as from ship construction) in 2022 (see p. 5).
- ✓ The vessels will be recycled in compliance with Maersk's Responsible Ship Recycling Standard.

Investments and / or expenditures connected to zero-carbon land-based transportation

- ✓ According to Maersk, its criteria exclude internal combustion engine vehicles, including those powered by most biofuels.
- ✓ Electrification is widely regarded as key for decarbonizing land transport.
- ✓ Hydrogen has particular potential for contributing to decarbonizing heavy vehicles, when produced as specified in this framework.
- ✓ Maersk informs that the APMM standards on feedstock referred to here



will be set by the same team and with the same ambition level as the standards for bio-methanol, discussed above.

Green
buildings



Investments and / or expenditures connected to green logistic-centers

- Logistic-centers include, but are not limited to, warehouses, depots and cold-storage facilities in locations across the globe
- None of the facilities use fossil-based heating systems
- All logistic-centers will have a minimum certification level of BREEAM “Excellent” or LEED “Platinum”
- At least 50% of the electricity demand of each building, regardless of where in the world it is located, will be covered with renewable electricity from on- or offsite production. The purchase of carbon-offsets is not permitted to meet this requirement.
- Whenever technically feasible, Maersk commits to always select electric equipment over alternatives that run on fossil fuels (e.g. fork lifts, cranes)
- All assets financed under this framework will feature one or more of the following characteristics:
 - On-site renewable energy production
 - Charging stations for electric cars, delivery vans or trucks

Medium Green

- ✓ Maersk informs that both new buildings and renovation is eligible under this category, but that it expects to focus activities on new buildings first and expand to renovations later. Maersk confirms that facilities using fossil fuel-based district heating/cooling systems are also ineligible.
- ✓ Maersk has shared that it will not use proceeds under this framework to finance fossil-powered equipment, both movable and immovable, which may be part of logistics-centres or other types of buildings that qualify under this framework. If for any reason the fossil equipment cannot be valued separately from the building itself, such buildings will not be financed with green proceeds at all.
- ✓ In addition to climate issues, the certification schemes (in particular BREEAM) cover a broader set of issues that are important to overall sustainable development, e.g. responsible sourcing of building materials. Such considerations are important for reducing buildings’ embodied emissions.
- ✓ These certification levels alone, however, do not ensure improved energy efficiency. Additional energy efficiency requirements are therefore important.
- ✓ Maersk confirms that cold storage assets falling under this framework will use CO2 as refrigerant, and that this is a global standard. This avoids leakage of hydrofluorocarbon (HFC) refrigerants with high global warming potential.
- ✓ Maersk has shared that it is assessing the physical impacts of climate change on 75 of its key land-based assets, including logistics centres, and that it also includes



physical climate risks in its annual rotating loss prevention surveys of physical assets.

Table 1. Eligible project categories

Background

Emissions from shipping account for 3% of global GHG emissions and have increased in recent years (IMO 2020)¹¹. This share is expected to increase further as shipping volumes are projected to grow and as other sectors can decarbonize more easily. International shipping is not covered by the Paris Agreement but regulated under the International Maritime Organization (IMO). The initial IMO Strategy on reduction of GHG emissions from ships (2018¹², to be revised in 2023) contains three targets:

1. Reduce carbon intensity by at least 40% by 2030, pursuing efforts towards 70% by 2050, compared to 2008.
2. Total GHG emissions should peak as soon as possible and fall by at least 50% by 2050 compared to 2008.
3. Phase out emissions as soon as possible within this century

The demand for seaborne trade is projected to grow by 39% until 2050 (IMO 2018). The 2050 target thus requires approximately 30%–40% share of carbon-neutral fuels in world fleet energy, in addition to improving energy efficiency (IMO 2018). Zero-emissions technologies so far have only been implemented for short distances and small ships, while 80% of the sector's emissions are from long-distance freight. Developing zero-emissions technologies for long distance trade is therefore necessary for reaching the IMO targets. Green methanol is one potential such technology.

Currently, methanol is mostly produced from fossil fuels and mostly used in the chemical industry. Green methanol includes bio-methanol and green e-methanol, both of which are chemically identical to methanol from fossil fuel sources. Bio-methanol is produced from biomass. Potentially sustainable biomass feedstocks include forestry and agricultural waste and by-products, biogas from landfill, sewage, municipal solid waste and black liquor from the pulp and paper industry. Green e-methanol is obtained by using CO₂ captured from renewable sources (bioenergy with carbon capture and storage or direct air capture) and hydrogen produced with renewable electricity.

Less than 200 000 tonnes of green methanol are produced annually, mostly bio-methanol¹³ but plants that are planned or under construction will increase the capacity manifold. Production costs are currently high. Maersk has informed that the price is currently 2-3 times higher than for conventional fuel. IRENA estimates that green methanol could be cost-competitive by 2050 or earlier, given the right policies.

Around two dozen dual fuel ships running on methanol are in currently in operation globally, the first through retro-fit in 2015, but they use methanol from fossil fuel sources, which has been estimated to cause even higher GHG emissions than heavy fuel oil (Brynnolf et al 2014). In addition to the dual-fuel engine, dedicated tanks and fuel systems are required for ships to run on methanol.

¹¹ IMO (2018). Implementing the initial IMO strategy on reduction of GHG emissions from ships.

¹² IMO (2020). Fourth IMO GHG study. MEPC 75/7/15.

¹³ IRENA 2021



EU Taxonomy

The EU Taxonomy Regulation¹⁴ is a classification system establishing a list of environmentally sustainable economic activities. The regulation defines six environmental objectives. To be considered sustainable, an activity must substantially contribute to at least one of the six environmental objectives¹⁵ without harming the other objectives (“Do No Significant Harm”), while complying with minimum social safeguards¹⁶. So far, the European Commission has adopted delegated acts under the regulation that set out the technical screening criteria for the climate mitigation and adaptation objectives, respectively. The DNSH-criteria are developed to make sure that progress against one objective is not made at the expense of others and recognizes the relationships between different environmental objectives. CICERO Shades of Green has provided an assessment of taxonomy alignment for only the two categories listed below, and not for the other categories of the framework.

- Sea and coastal freight water transport, vessels for port operations and auxiliary activities
- Retrofitting of sea and coastal freight and passenger water transport

Detailed comments on alignment as well as thresholds and NACE-codes are given in the table below and in Appendix 2.

CICERO Green assesses that the two selected project categories are likely aligned with EU the Technical Screening Criteria for Climate Change Mitigation in the EU Taxonomy. However, for the retrofitting of sea and coastal freight and passenger water transport activity, the issuer informed that it has not yet identified the vessels that will be retrofitted, but that it will base such future activities on the Taxonomy criteria.

Maersk appears to be likely meet several of the DNSH-criteria. CICERO Green has however identified gaps in pertaining to some of the DNSH-criteria, as summarized below.

Main gaps

Climate change adaptation

In 2020, Maersk conducted scenario analysis across 1.5, 2- and 3-degree climate scenarios, assessing how these might impact the sector until 2040, including both physical and transition risks. A detailed assessment of climate impacts at the Maersk company level will be undertaken in 2021 and 2022, with a 10-15 years perspective, particularly in the context of new projects. The issuer has also informed that it is actively assessing physical climate risks for 75 of its key land-based assets (logistics centres and ports) using different scenarios and time frames, and also includes physical climate risks in its annual rotating loss prevention surveys of physical assets. It also mentioned that it aims to develop mitigation and adaptation strategies in response to the identified physical climate risks. Furthermore, Maersk informs us that, if taxonomy-reporting will require an assessment of the resiliency on an asset level, Maersk will do so.

Regarding its vessels and water transport assets, the issuer mentioned that it does not believe that physical climate risks will materially affect the performance of the economic activity during the expected lifetime of the new ships beyond what can be remedied through existing technology. The issuer further mentioned that it does not have a standardized and systematic approach to climate change adaptation for its vessels.

¹⁴ Regulation EU 2020/852 <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R0852&from=EN>

¹⁵ The six environmental objectives as defined in the proposed Regulation are: (1) climate change mitigation; (2) climate change adaptation; (3) sustainable use and protection of water and marine resources; (4) transition to a circular economy, waste prevention and recycling; (5) pollution prevention and control; (6) protection of healthy ecosystems.

¹⁶ Alignment with the OECD Guidelines for Multinational Enterprises and UN Guiding Principles on Business and Human Rights, including the International Labour Organisation’s (‘ILO’) declaration on Fundamental Rights and Principles at Work, the eight ILO core conventions and the International Bill of Human Rights.



To be fully aligned with the DNSH-requirement related to climate change adaptation, Maersk needs to demonstrate that climate risk assessments, and implementation of adaptation solutions, where needed, are carried out systematically for the relevant project categories, i.e., clean transportation (investments and / or expenditures connected to the acquisition of dual-fuel container vessels, designed for carbon-neutral methanol). CICERO Green recognizes the effort of Maersk to assess and mitigate climate risks related to its land-based assets where required.

Alignment with minimum social safeguards

To qualify as a sustainable activity under the EU regulation certain minimum social safeguards must be complied with. CICERO Green has assessed the company's social safeguards with a focus on human and labor rights. We take the sectoral, regional and judicial context into account and focus on the risks likely to be the most material social risks. The most relevant risks for Maersk are related to shipbuilding and recycling, working conditions of seafarers, cargo management, subcontractors' working conditions, data ethics, and local community impacts near terminals. The issuer has strong internal policy, employees code of conduct, and suppliers code of conduct in place to respect human rights. In areas where the company is at risk of causing, contributing or being linked to adverse impacts on human rights, it has mainstreamed human rights and social risks due diligence into key business processes for responsible business practices, which is overseen by the Executive Board.

Governance Assessment

Four aspects are studied when assessing the Maersk's governance procedures: 1) the policies and goals of relevance to the green financing framework; 2) the selection process used to identify eligible projects under the framework; 3) the management of proceeds; and 4) the reporting on the projects to investors. Based on these aspects, an overall grading is given on governance strength falling into one of three classes: Fair, Good or Excellent. Please note this is not a substitute for a full evaluation of the governance of the issuing institution, and does not cover, e.g., corruption.

Maersk has set a target for net-zero emissions from its ocean activities by 2050. It is engaging with the Science-Based Targets Initiative on establishing a methodology for shipping, after which it will communicate on a Paris-aligned emissions reduction target. The framework is strongly aligned with Maersk's strategy of driving innovation on low-carbon shipping fuel. Maersk is the first in the sector to commission low-carbon ships at scale in order to trigger increased supply of green methanol, a key barrier to its wider uptake.

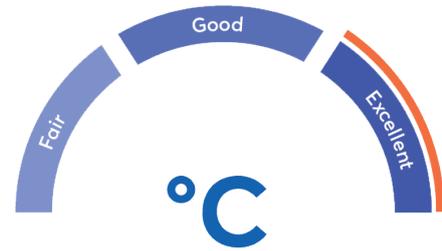
In 2021, Maersk launched a new decarbonization function with more than 40 full-time equivalent positions and it has also appointed a decarbonization steering committee with executive membership. Maersk's reporting is in accordance with the relevant voluntary frameworks, including TCFD, and it conducts scenario analysis across a range of scenarios for both transition and physical climate risks. In addition, Maersk has shared that it is assessing the physical impacts of climate change on 75 of its key land-based assets in collaboration with an academic partner over short and longer-term timeframes, and also includes physical climate risks in its annual rotating loss prevention surveys of physical assets. It has been ranked number one of the 18 largest shipping companies on climate governance and strategy by CDP in 2019.¹⁷

¹⁷ CDP (2019). A sea change. Which shipping companies are ready for the low-carbon transition? Executive Summary.



Maersk has established a Green Finance Committee to select and monitor eligible assets. Decisions are by consensus, which means that representatives from the Decarbonization unit have veto power. The company has committed to reporting on a range of indicators of impact from the financed projects, and reports will be reviewed by an external auditor.

The overall assessment of Maersk's governance structure and processes gives it a rating of **Excellent**.



Strengths

The ships to be financed under this framework would constitute an important step towards decarbonizing deep-sea shipping, which is a particularly challenging sector. No existing container ship has been designed to run on renewable fuel. While dual-fuel methanol engines are in operation on some other types of ships, the majority of the ships under this framework would also be many times larger than the existing ships. Furthermore, the investment in vessels is coupled with an ambition to procure green methanol that is supported by robust biofuels and future fuel policies, as opposed to fossil-based methanol used in current dual-fuel ships. Maersk is the first in the sector to commission low-carbon ships at scale. As per Maersk's expectation, this strategy would incentivize the scaling up of global production and distribution of green methanol, thereby addressing a key barrier to its wider adoption.

Maersk is working actively with potential suppliers, an external consultant, and an NGO to ensure the bio-methanol supply is as sustainable as possible, showing awareness of potential substitution and land use change effects. E-methanol could avoid these problems provided Maersk fully implements and enforces the draft future fuels policy shared with us.

Overall, Maersk shows a strong commitment to decarbonizing their main business activity, in being willing to take on higher investment and operating costs than for fossil-fuel powered ships.

Weaknesses

There are no material weaknesses perceived at this time.

Pitfalls

The dual-fuel vessels can by design run also on fossil fuels. Given that demand from the new ships would outstrip current global supply of green methanol, there is a risk that the ships will be fuelled partly by fossil fuel, particularly in the short term as it takes time to scale up supply. Maersk is addressing this challenge by collaborating with fuel suppliers to support the scaling of production and the roll out of necessary infrastructure at ports.

A risk with biofuel in general is that its production may increase competition for land and contribute to land-use change. For bio-methanol from waste, this risk appears currently low based on published research, but may increase as production is scaled up.

In some cases, burning of bio-methanol causes a temporary increase in CO₂ concentrations in the atmosphere until the CO₂ is reabsorbed through regrowth, although Maersk's intention to only use waste, residual and byproducts, in particular from short-rotation agriculture, would limit the extent of this effect. Green methanol is not 100% carbon neutral on a well-to-wake basis as long as there are fossil fuel elements in the supply chain, such as for transport of the fuel.



Maersk has conducted scenario analysis for physical and climate transition risks and is currently commissioning a study on climate impact at the company level. However, policies to address resilience in the supply chain for green methanol, other fuels, and other key inputs are not fully developed.

While not a part of the framework, it is a pitfall that Maersk have been expanding their air freight services as part of their strategy to provide end-to-end logistics services, given air transportation's substantial emissions. Maersk has emphasized that its air freight will need to be decarbonized in line with their company-wide decarbonization targets. This is positive, although we note that air transportation is also a hard-to-abate sector with its own challenges.



Appendix 1: Referenced Documents List

Document Number	Document Name	Description
1	A.P Moller – Maersk A/S Green Financing Framework	
2	A.P Moller – Maersk A/S 2020 Sustainability Report	
3	A.P Moller – Maersk A/S UN Global Compact Index 2020	
4	A.P Moller – Maersk A/S ESG data overview 2020	
5	Maersk biofuels sourcing policy	Not public. Shared via e-mail 08.11.2021.
6	Maersk policy for future fuels (draft)	Not public. Shared via e-mail 08.11.2021.

Appendix 2: EU Taxonomy criteria and alignment

Complete details of the EU taxonomy criteria are given in [taxonomy-regulation-delegated-act-2021-2800-annex-1_en.pdf \(europa.eu\)](https://eur-lex.europa.eu/eli/reg/2021/2800/annex_1)

Sea and coastal freight water transport, vessels for port operations and auxiliary activities

Framework related activity	Clean Transportation		
Taxonomy activity	6.10 Sea and coastal freight water transport, vessels for port operations and auxiliary activities (NACE codes: H50.2, H52.22 and N77.34)		
	EU Technical Screening Criteria for Climate Change Mitigation	Comments on alignment	Alignment
Substantial contribution to climate change mitigation	<p>1. The activity complies with one or more of the following criteria:</p> <p>(a) the vessels have zero direct (tailpipe) CO₂ emissions;</p> <p>(b) until 31 December 2025, hybrid and dual fuel vessels derive at least 25 % of their energy from zero direct (tailpipe) CO₂ emission fuels or plug-in power for their normal operation at sea and in ports;</p> <p>(c) where technologically and economically not feasible to comply with the criterion in point (a), until 31 December 2025, and only where it can be proved that the vessels are used exclusively for operating coastal and short sea services designed to enable modal shift of freight currently transported by land to sea, the vessels have direct (tailpipe) CO₂ emissions, calculated using the International Maritime Organization (IMO) Energy Efficiency Design Index (EEDI)¹⁸, 50 % lower than the average reference CO₂ emissions value defined for heavy duty vehicles (vehicle sub group 5- LH) in accordance with Article 11 of Regulation 2019/1242;</p> <p>(d) where technologically and economically not feasible to comply with the criterion in point (a), until 31 December 2025, the vessels have an attained Energy Efficiency Design Index (EEDI) value 10 % below the EEDI requirements applicable on 1 April 2022¹⁹ if the</p>	<p>Relevant background information Maersk has set a target of net-zero CO₂ emissions from ocean transport operations by 2050. In February 2021, Maersk announced that it will in 2023 launch a dual-fuel feeder vessel that can run on methanol as well as conventional low sulphur fuel oil. The company has the ambition to operate it on green methanol (bio-methanol or e-methanol) and has identified a partner company to deliver the 10 000 tonnes of e-methanol needed annually. In August 2021, the company announced it will launch a series of eight dual-fuel ocean-going container vessels starting from 2024. It intends to operate the vessels on carbon neutral e-methanol or sustainable bio-methanol as soon as possible.</p> <p>Information provided by the issuer The methanol vessels are container ships and thus not dedicated to the transport of fossil fuel.</p> <p>Methanol is a fuel from renewable sources and a biofuel under the Renewable Energy Directive 2018/2001, which follows from article 2 of the Directive and can be seen</p>	Likely aligned.

¹⁸ Energy Efficiency Design Index (version of [adoption date]: <http://www.imo.org/ft/MediaCentre/HotTopics/GHG/Pages/EEDI.aspx>)

¹⁹ EEDI requirements as agreed by the Marine Environment Protection Committee of the International Maritime Organization on its seventy-fifth session.

	<p>vessels are able to run on zero direct (tailpipe) CO₂ emission fuels or on fuels from renewable sources²⁰.</p> <p>2. Vessels are not dedicated to the transport of fossil fuels.</p>	<p>clearly from annex III, under the heading “renewable fuels that can be produced from various renewable sources, including biomass”. The vessel will be able to run on fuels from renewable sources.</p> <p>For the EEDI value, the issuer refers to two supporting documents which demonstrate that both types of methanol vessels (feeder vessel and larger vessels) have an EEDI well below the requirements applicable on 1 April 2022. The issuer informed that the calculations are based on conventional fuel (marine gas oil). The issuer is working on calculations based on methanol which will provide an even better EEDI value.</p>	
	EU Taxonomy DNSH-criteria	Comments on alignment	Alignment
Climate change adaptation	<p>The physical climate risks that are material to the activity have been identified (chronic and acute, related to temperature, wind, water, and soil) by performing a robust climate risk and vulnerability assessment with the following steps²¹:</p> <p>(a) screening of the activity to identify which physical climate risks from the list in Section II of this Appendix may affect the performance of the economic activity during its expected lifetime;</p> <p>(b) where the activity is assessed to be exposed to physical climate risks, a climate risk and vulnerability assessment to assess the materiality of the physical climate risks on the economic activity;</p> <p>(c) an assessment of adaptation solutions that can reduce the identified physical climate risk.</p> <p>The climate projections and assessment of impacts are based on best practice and available guidance and take into account the state-of-the-art science for vulnerability and risk analysis and related methodologies in line with the most recent Intergovernmental Panel on Climate Change reports, scientific peer-reviewed publications, and open source or paying models.</p> <p>For existing activities and new activities using existing physical assets, the economic operator implements physical and non-physical solutions (‘adaptation solutions’), over a period of time of up to five years, that reduce the most important identified physical climate risks</p>	<p><u>Information provided by the issuer</u></p> <p>The issuer does not believe that physical climate risks from the list in Section II of Appendix A will materially affect the performance of the economic activity during the new ships’ expected lifetime beyond what can be remedied through existing technology. While maintenance is needed occasionally, this is considered standard practice.</p> <p>The issuer further mentioned that it does not have a standardized and systematic approach to climate change adaptation yet. However, in 2020, the company analyzed 1.5, 2- and 3-degree climate scenarios, assessing how these might impact the sector until 2040, including both physical and transition risks. A detailed assessment of climate impacts at the Maersk company level will be undertaken in 2021 and 2022, with a 10-15 years perspective, particularly in the context of new projects.</p> <p>Maersk informs us that, if taxonomy-reporting will require an assessment of the resiliency on an asset level, Maersk will do so.</p>	Likely partially aligned.

²⁰ Fuels that meet the technical screening criteria specified in sections 3.10 and 4.13 of this Annex.

²¹ The Taxonomy is referring to Appendix A in the Taxonomy Annex 1.

	<p>that are material to that activity. An adaptation plan for the implementation of those solutions is drawn up accordingly.</p> <p>For new activities and existing activities using newly built physical assets, the economic operator integrates the adaptation solutions that reduce the most important identified physical climate risks that are material to that activity at the time of design and construction and has implemented them before the start of operations.</p> <p>The adaptation solutions implemented do not adversely affect the adaptation efforts or the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities; are consistent with local, sectoral, regional or national adaptation strategies and plans; and consider the use of nature-based solutions or rely on blue or green infrastructure to the extent possible.</p>		
<p>Sustainable use and protection of water and marine resources</p>	<p>Environmental degradation risks related to preserving water quality and avoiding water stress are identified and addressed with the aim of achieving good water status and good ecological potential as defined in Article 2, points (22) and (23), of Regulation (EU) 2020/852, in accordance with Directive 2000/60/EC of the European Parliament and of the Council²² and a water use and protection management plan, developed thereunder for the potentially affected water body or bodies, in consultation with relevant stakeholders.</p> <p>Where an Environmental Impact Assessment is carried out in accordance with Directive 2011/92/EU of the European Parliament and of the Council²³ and includes an assessment of the impact on water in accordance with Directive 2000/60/EC, no additional assessment of impact on water is required, provided the risks identified have been addressed²⁴.</p>	<p>Information provided by the issuer</p> <p>Risks to water quality and water stress are very limited due to the nature of deep-sea shipping and addressed through operational decisions.</p> <p>Point 22 concerns bodies of water such as lakes, reservoirs, streams. Deep sea shipping does not present a risk to water quality and water stress in such areas as these do not allow for operation of vessels due to physical constraints.</p> <p>Point 23 concerns artificial bodies of water created by human activity and heavily modified bodies of water substantially changed by human activity. 2000/60/EC Article 4, paragraph 3a allows for port facilities and navigation to be designated by Member States as artificial or heavily modified bodies of water under Annex V where changes to the shaping of the landscape by water, especially by rain and by rivers, are not possible without adverse effect on e.g., navigation. The operation of methanol vessels does not alter the composition of the ecoregions mentioned in Annex II 1.2.4 for Coastal</p>	<p>Likely aligned.</p>

²² Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (OJ L 327, 22.12.2000, p. 1).

²³ Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (OJ L 26, 28.1.2012, p. 1).

²⁴ The Taxonomy is referring to Appendix B in the Taxonomy Annex 1.

		<p>Waters in System A (e.g., North Atlantic Ocean). Nor do they alter the factors mentioned in System B such as water temperature and tidal range.</p> <p>The issuer informed that it is difficult to envisage a situation where an Environmental Impact Assessment under 2011/92/EU would be required to be applied to the operation of the methanol vessels, particularly considering that these are not built for inland waterways.</p> <p>In the event that such an Environmental Impact Assessment was to be applied to the methanol vessels, Maersk confirmed that it would take necessary steps to address the risks identified, if any.</p>	
<p>Transition to a circular economy</p>	<p>Measures are in place to manage waste, both in the use phase and in the end-of-life of the vessel, in accordance with the waste hierarchy.</p> <p>For battery-operated vessels, those measures include reuse and recycling of batteries and electronics, including critical raw materials therein.</p> <p>For existing ships above 500 gross tonnage and the new-built ones replacing them, the activity complies with the requirements of Regulation (EU) No 1257/2013 of the European Parliament and of the Council²⁵ relating to the inventory of hazardous materials. The scrap ships are recycled in facilities included on the European List of ship recycling facilities as laid down in Commission Decision 2016/2323²⁶.</p> <p>The activity complies with Directive (EU) 2019/883 of the European Parliament and of the Council²⁷ as regards the protection of the marine environment against the negative effects from discharges of waste from ships.</p> <p>The ship is operated in accordance with Annex V to the International Convention for the Prevention of Pollution from Ships of 2 November 1973 (the IMO MARPOL Convention), in particular with a view to</p>	<p><u>Relevant Background information</u></p> <p>Maintenance and end-of life management of vessels should be performed in compliance with EU and national legislation on hazardous waste generation, management and treatment, including:</p> <ul style="list-style-type: none"> ▪ Regulation (EU) No 1257/2013 on ship recycling <ul style="list-style-type: none"> - Vessels sailing under Flag state of an EU member State can only be recycled at facilities included in the European list of ship recycling facilities ('the European List'), as describe in Article 16 (2) of the above regulation. - Facilities need to be approved by the Individual Member States (for yards within the EU) or the Commission (for yards in third states). - All vessels, irrespective of their flag, entering European ports will need to carry an Inventory of Hazardous Materials (IHM). ▪ Waste Framework Directive (2018/028) and MARPOL Annex V related to prevention of pollution by waste. 	<p>Likely aligned.</p>

²⁵ Regulation (EU) No 1257/2013 of the European Parliament and of the Council of 20 November 2013 on ship recycling and amending Regulation (EC) No 1013/2006 and Directive 2009/16/EC (OJ L 330, 10.12.2013, p. 1)

²⁶ Commission Implementing Decision 2016/2323 establishing the European List of ship recycling facilities pursuant to Regulation (EU) No 1257/2013 of the European Parliament and of the Council on ship recycling (OJ L 345, 20.12.2016, p. 119)

²⁷ Directive (EU) 2019/883 of the European Parliament and of the Council of 17 April 2019 on port reception facilities for the delivery of waste from ships, amending Directive 2010/65/EU and repealing Directive 2000/59/EC (OJ L 151, 7.6.2019, p. 116).

	<p>producing reduced quantities of waste and to reducing legal discharges, by managing its waste in a sustainable and environmentally sound manner.</p>	<ul style="list-style-type: none"> ▪ Revised Port Reception Facility Directive (EU) 2019/883 <p><u>Information provided by the issuer</u> Methanol vessels will be built in full compliance with the above mentioned regulatory instruments, according to the issuer..</p> <p>With regards to Directive 1257/2013, the methanol vessels will from delivery from the newbuilding shipyard be equipped with an Inventory of Hazardous Materials in full compliance as per current regulations</p> <p>The issuer informed that the new methanol vessels will be fully compliant with the IMO and EU regulations on garbage (waste).</p> <p>The issuer informed having strict policy when it comes to recycling and end use.</p>	
<p>Pollution prevention and control</p>	<p>As regards the reduction of sulphur oxides emissions and particulate matters, vessels comply with Directive (EU) 2016/802 of the European Parliament and of the Council²⁸, and with Regulation 14²⁹ of Annex VI to the IMO MARPOL Convention. Sulphur in fuel content does not exceed 0,5 % in mass (the global sulphur limit) and 0,1 % in mass in emission control area (ECA) designated in the North and Baltic Seas by the IMO³⁰.</p> <p>As regards nitrogen oxides (NOx) emissions, vessels comply with Regulation 13³¹ of Annex VI to IMO MARPOL Convention. Tier II NOx requirement applies to ships constructed after 2011. Only while operating in NOx emission control areas established under IMO rules, ships constructed after 1 January 2016 comply with stricter engine requirements (Tier III) reducing NOx emissions³².</p>	<p><u>Relevant background information</u> Discharges of black and grey water are regulated by Annex IV of the International Convention for the Prevention of Pollution from Ships (MARPOL), Directive 2011/92/EU, Directive 2000/60/EC and Directive 2008/105/EC.</p> <p><u>Information provided by the issuer</u> The vessels will be built in full compliance with mentioned applicable regulations.</p> <p>With regards to NOx emissions, the engines will be Tier III engines reducing NOx emissions. Engines will be constructed in 2023 and 2024 respectively.</p>	<p>Likely aligned.</p>

²⁸ Directive (EU) 2016/802 of the European Parliament and of the Council of 11 May 2016 relating to a reduction in the sulphur content of certain liquid fuels (OJ L 132, 21.5.2016, p. 58).

²⁹ [http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Pages/Sulphur-oxides-\(SOx\)-%E2%80%93-Regulation-14.aspx](http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Pages/Sulphur-oxides-(SOx)-%E2%80%93-Regulation-14.aspx)

³⁰ As regards the extension of the requirements applying in Emission Control Area to other Union seas, countries bordering the Mediterranean Sea are discussing the creation of relevant ECA under the legal framework of the Barcelona Convention.

³¹ [http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Pages/Nitrogen-oxides-\(NOx\)-Regulation-13.aspx](http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Pages/Nitrogen-oxides-(NOx)-Regulation-13.aspx)

³² In Union seas, the requirement is applicable as of 2021 in the Baltic and North Seas.

	<p>Discharges of black and grey water comply with Annex IV to the IMO MARPOL Convention.</p> <p>Measures are in place to minimise toxicity of anti-fouling paint and biocides as laid down in Regulation (EU) No 528/2012, which implements in Union law the International Convention on the Control of Harmful Anti-fouling Systems on Ships adopted on 5 October 2001³³.</p>	<p>Any discharge overboard will comply with MARPOL Annex IV</p> <p>The antifouling system used on the methanol vessels will follow both IMO guideline and EU regulations on the subject.</p>	
<p>Protection and restoration of biodiversity and ecosystems</p>	<p>Releases of ballast water containing non-indigenous species are prevented in line with the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM).</p> <p>Measures are in place to prevent the introduction of non-indigenous species by biofouling of hull and niche areas of ships taking into account the IMO Biofouling Guidelines³⁴.</p> <p>Noise and vibrations are limited by using noise reducing propellers, hull design or on-board machinery in line with the guidance given in the IMO Guidelines for the Reduction of Underwater Noise³⁵.</p> <p>In the Union, the activity does not hamper the achievement of good environmental status, as set out in Directive 2008/56/EC, requiring that the appropriate measures are taken to prevent or mitigate impacts in relation to that Directive's Descriptors 1 (biodiversity), 2 (non-indigenous species), 6 (seabed integrity), 8 (contaminants), 10 (marine litter), 11 (Noise/Energy) and as set out in Commission Decision (EU) 2017/848 in relation to the relevant criteria and methodological standards for those descriptors, as applicable.</p>	<p>Information provided by the issuer</p> <p>The issuer informed that the methanol vessels are built fully compliant with:</p> <ul style="list-style-type: none"> • Vessels will be compliant with both IMO and US ballast water regulations in force at the time of the build. • The vessels take into account the IMO Biofouling guidelines. <p>As the vessels are not yet built, the issuer cannot ascertain the noise level and thus do not yet know whether corrective action would be needed as per regulation. However, the issuer informed that it recognized that underwater noise from human activity is of growing concern, and thus that it follows developments at the IMO concerning underwater noise and will comply with any regulation introduced. The issuer further mentioned that Maersk policy is to sail at slower speeds in areas where species affected by underwater noise have been identified.</p> <p>Maersk has a zero-dumping policy, obligating all vessels to store waste and discard it when in a port with adequate facilities.</p> <p>The issuer mentioned committing to the IMO Ballast Water Management Convention by incorporating ballast water management into its policies and procedures with the aim to prevent impacts related to non-indigenous species, seabed integrity, and marine litter.</p>	<p>Likely aligned.</p>

³³ International Convention on the Control of Harmful Anti-fouling Systems on Ships of 5 October 2001.

³⁴ IMO Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species, resolution MEPC.207(62).

³⁵ IMO Guidelines for the Reduction of Underwater Noise from Commercial Shipping to Address Adverse Impacts on Marine Life, (MEPC.1/Circ.833)

Retrofitting of sea and coastal freight and passenger water transport

Framework related activity	Clean Transportation		
Taxonomy activity	6.12 Retrofitting of sea and coastal freight and passenger water transport (NACE Codes: H50.10, H50.2, H52.22, C33.15, N77.21 and N.77.34)		
	EU Technical Screening Criteria for Climate Change Mitigation	Comments on alignment	Alignment
Substantial contribution to climate change mitigation	<p>1. Until 31 December 2025, the retrofitting activity reduces fuel consumption of the vessel by at least 10 % expressed in grams of fuel per deadweight tons per nautical mile, as demonstrated by computational fluid dynamics (CFD), tank tests or similar engineering calculations.</p> <p>2. Vessels are not dedicated to the transport of fossil fuels.</p>	<p><u>Information provided by the issuer</u> The issuer has not yet identified the vessels that will be retrofitted. For such an activity, the issuer informed that it will be based on the Taxonomy criteria. This needs to be done on a per vessel basis as the exact conditions around a retrofit will vary considerably. This also applies to the fields below according to the issuer.</p>	Likely aligned.
	EU Taxonomy DNSH-criteria	Comments on alignment	Alignment
Climate change adaptation	<p>Please see under Sea and coastal freight water transport, vessels for port operations and auxiliary activities.</p>	<p><u>Information provided by the issuer</u> The issuer does not believe that physical climate risks from the list in Section II of Appendix A will materially affect the performance of the economic activity during its expected lifetime beyond what can be remedied through existing technology. While maintenance is needed occasionally, this is considered standard practice.</p> <p>The issuer further mentioned that it does not have a standardized and systematic approach to climate change adaptation yet. However, in 2020, the company analyzed 1.5, 2- and 3-degree climate scenarios, assessing how these might impact the sector until 2040, including both physical and transition risks. A detailed assessment of climate impacts at the Maersk company level will be undertaken in 2021 and 2022, with a 10-15 years perspective, particularly in the context of new projects.</p> <p>Maersk informs us that, if taxonomy-reporting will require an assessment of the resiliency on an asset level, Maersk will do so.</p>	Likely partially aligned.

<p>Sustainable use and protection of water and marine resources</p>	<p>Please see under Sea and coastal freight water transport, vessels for port operations and auxiliary activities.</p>	<p><u>Information provided by the issuer</u> Risks to water quality and water stress are very limited due to the nature of deep-sea shipping and addressed through operational decisions.</p> <p>Point 22 concerns bodies of water such as lakes, reservoirs, streams. Deep sea shipping does not present a risk to water quality and water stress in such areas as these do not allow for operation of vessels due to physical constraints.</p> <p>Point 23 concerns artificial bodies of water created by human activity and heavily modified bodies of water substantially changed by human activity. 2000/60/EC Article 4, paragraph 3a allows for port facilities and navigation to be designated by Member States as artificial or heavily modified bodies of water under Annex V where changes to the shaping of the landscape by water, especially by rain and by rivers, are not possible without adverse effect on e.g., navigation. The operation of methanol vessels does not alter the composition of the ecoregions mentioned in Annex II 1.2.4 for Coastal Waters in System A (e.g., North Atlantic Ocean). Nor do they alter the factors mentioned in System B such as water temperature, tidal range.</p> <p>The issuer informed that it is difficult to envisage a situation where an Environmental Impact Assessment under 2011/92/EU would be required to be applied to the operation of the methanol vessels, particularly considering that these are not built for inland waterways.</p> <p>In the event that such an Environmental Impact Assessment was to be applied to the methanol vessels, Maersk confirmed that it would take necessary steps to address the risks identified, if any.</p>	<p>Likely aligned.</p>
<p>Transition to a circular economy</p>	<p>Please see under Sea and coastal freight water transport, vessels for port operations and auxiliary activities.</p>	<p><u>Relevant Background information</u> Maintenance and end-of life management of vessels should be performed in compliance with EU and national legislation on hazardous waste generation, management and treatment, including:</p> <ul style="list-style-type: none"> ▪ Regulation (EU) No 1257/2013 on ship recycling - Vessels sailing under Flag state of an EU member State can only be recycled at facilities in the European list of ship recycling facilities (‘the 	<p>Likely aligned.</p>

		<p>European List'), as describe in Article 16(2) of the above regulation.</p> <ul style="list-style-type: none"> - Facilities need to be approved by the Individual Member States (for yards within the EU) or the Commission (for yards in third states). - All vessels, irrespective of their flag, entering European ports will need to carry an Inventory of Hazardous Materials (IHM). <ul style="list-style-type: none"> ▪ Waste Framework Directive (2018/028) and MARPOL Annex V related to prevention of pollution by waste. ▪ Revised Port Reception Facility Directive (EU) 2019/883. <p><u>Information provided by the issuer</u> Methanol vessels will be built in full compliance with the above-mentioned regulatory instruments, according to the issuer.</p> <p>With regards to Directive 1257/2013, the methanol vessels will from delivery from the newbuilding shipyard be equipped with an Inventory of Hazardous Materials in full compliance as per current regulations</p> <p>The new methanol vessels will be fully compliant with the IMO and EU regulations on garbage (waste).</p> <p>The issuer informed having strict policy when it comes to recycling and end use.</p>	
<p style="text-align: center;">Pollution prevention and control</p>	<p>Please see under Sea and coastal freight water transport, vessels for port operations and auxiliary activities.</p>	<p><u>Relevant background information</u> Discharges of black and grey water are regulated by Annex IV of the International Convention for the Prevention of Pollution from Ships (MARPOL), Directive 2011/92/EU, Directive 2000/60/EC and Directive 2008/105/EC.</p> <p><u>Information provided by the issuer</u> The vessels will be built in full compliance with mentioned applicable regulations.</p> <p>With regards to NOx emissions, the engines will be Tier III engines reducing NOx emissions. Engines will be constructed in 2023 and 2024 respectively.</p>	<p>Likely aligned.</p>

		<p>Any discharge overboard will comply with MARPOL Annex IV</p> <p>The antifouling system used on the methanol vessels will follow both IMO guideline and EU regulations on the subject.</p>	
<p>Protection and restoration of biodiversity and ecosystems</p>	<p>Please see under Sea and coastal freight water transport, vessels for port operations and auxiliary activities.</p>	<p>Information provided by the issuer</p> <p>The issuer informed that the methanol vessels are built fully compliant with:</p> <ul style="list-style-type: none"> • Vessels will be compliant with both IMO and US ballast water regulations in force at the time of the build. • The vessels take into account the IMO Biofouling guidelines. <p>As the vessels are not yet built, the issuer cannot ascertain the noise level and thus do not yet know whether corrective action would be needed as per regulation. However, the issuer informed that it recognized that underwater noise from human activity is of growing concern, and thus that it follows developments at the IMO concerning underwater noise and will comply with any regulation introduced. The issuer further mentioned that Maersk policy is to sail at slower speeds in areas where species affected by underwater noise have been identified.</p> <p>Maersk has a zero-dumping policy, obligating all vessels to store waste and discard it when in a port with adequate facilities.</p> <p>The issuer mentioned committing to the IMO Ballast Water Management Convention by incorporating ballast water management into its policies and procedures with the aim to prevent impacts related to non-indigenous species, seabed integrity, and marine litter.</p>	<p>Likely aligned.</p>

Appendix 3: About CICERO Shades of Green

CICERO Green is a subsidiary of the climate research institute CICERO. CICERO is Norway's foremost institute for interdisciplinary climate research. We deliver new insight that helps solve the climate challenge and strengthen international cooperation. CICERO has garnered attention for its work on the effects of manmade emissions on the climate and has played an active role in the UN's IPCC since 1995. CICERO staff provide quality control and methodological development for CICERO Green.

CICERO Green provides second opinions on institutions' frameworks and guidance for assessing and selecting eligible projects for green bond investments. CICERO Green is internationally recognized as a leading provider of independent reviews of green bonds, since the market's inception in 2008. CICERO Green is independent of the entity issuing the bond, its directors, senior management and advisers, and is remunerated in a way that prevents any conflicts of interests arising as a result of the fee structure. CICERO Green operates independently from the financial sector and other stakeholders to preserve the unbiased nature and high quality of second opinions.

We work with both international and domestic issuers, drawing on the global expertise of the Expert Network on Second Opinions (ENSO). Led by CICERO Green, ENSO contributes expertise to the second opinions, and is comprised of a network of trusted, independent research institutions and reputable experts on climate change and other environmental issues, including the Basque Center for Climate Change (BC3), the Stockholm Environment Institute, the Institute of Energy, Environment and Economy at Tsinghua University, the International Institute for Sustainable Development (IISD) and the School for Environment and Sustainability (SEAS) at the University of Michigan.

