



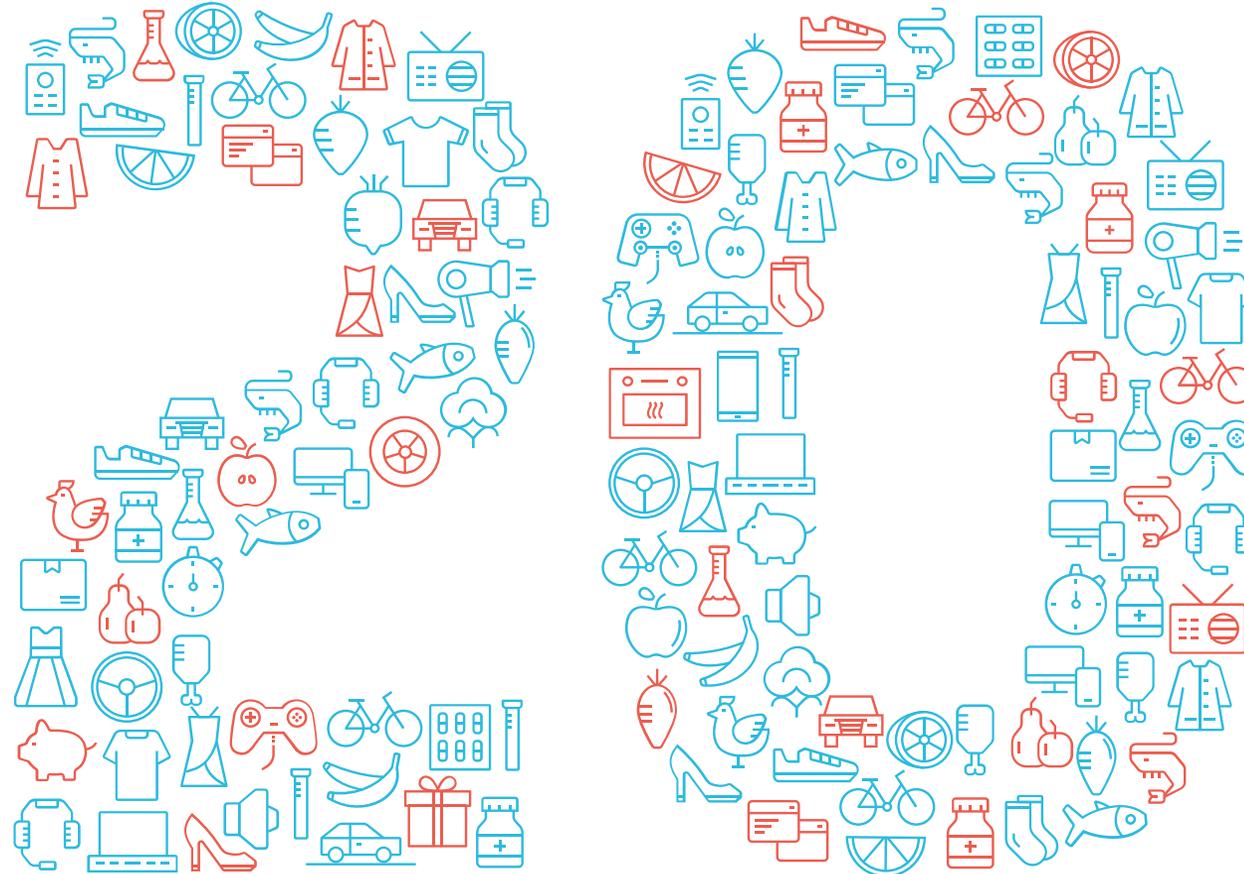
# Decarbonizing maritime transport

- low GHG emission fuels

**ALL THE WAY TO ZERO**



Every day, we help  
our customers  
move almost



%

of the world's food,  
materials and goods –  
items we all depend on  
to live, work and thrive.



# GLOBAL REACH

- 100,000+ Colleagues
- 300+ Offices
- 130+ Countries
  
- 700+ Vessels (calling 400+ Ports)
- 65+ Terminals
- 450+ Warehouses
- Fleet of Aircrafts

# Committed to accelerating a green and equitable energy transition

*"While we take a holistic approach to ESG, our greatest opportunity for change is within the environmental category.*

*In our global operations, we emit millions of tonnes of greenhouse gases every year. We recognise that we are part of the problem. We are, however, also part of the solution and uniquely placed to decarbonise the logistics industry by using our resources and technical expertise.*

*Our efforts must be matched at the industry level in order to successfully accelerate a green and equitable energy transition. Together with industry-leading customers and partners, we're calling for ambitious policy and action to ensure this happens. And we are fully committed to doing our part to make this vision a reality."*

- Vincent Clerc, CEO A.P. Møller - Mærsk



# Maersk targets net zero greenhouse gas emissions across our entire business operations by 2040

2030

2040



- **Ocean:** ~50% reduction\* in emission intensity
- Min. 25% of Ocean cargo transported with green fuels



- **Logistics facilities:** Min 90% green operations\*
- **Landside:** Min 20% of moves of customer's cargo on low/zero emissions technology



- **Air:** Min. 30% of cargo transported with Sustainable Aviation Fuels



- **Terminals:** ~70% emissions reduction\*



0

Net zero across our business and 100% green solutions to customers



\*from 2020 baseline

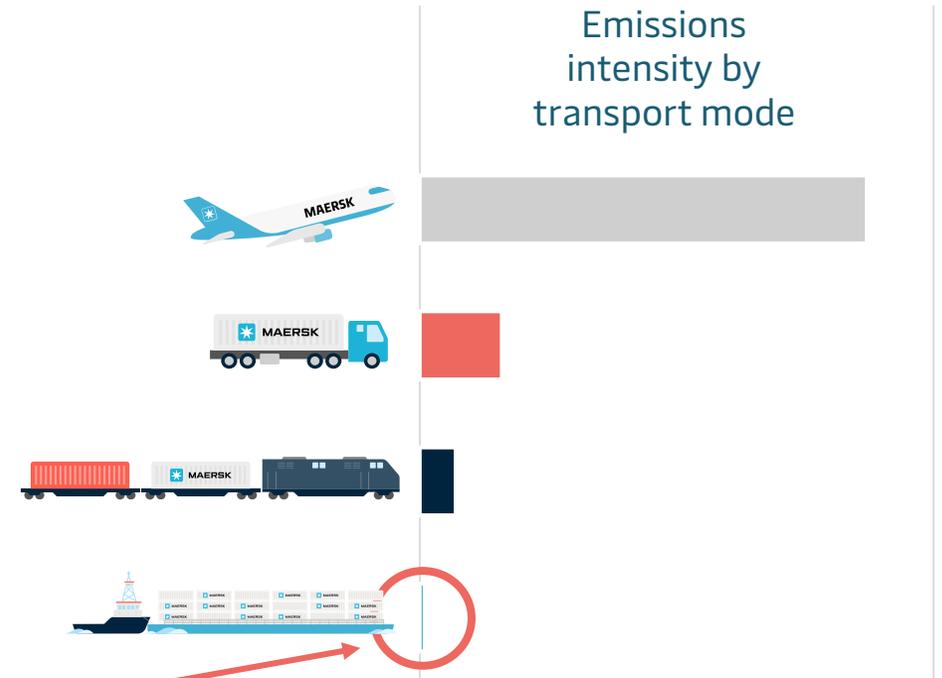
# Solving the scope 3 challenge with low GHG emission Ocean Freight

**Manufacturing and Procurement of Goods** are large causes of GHG emissions for any company

**Logistic emissions** can contribute **significantly** to your company's overall GHG footprint

**Sea freight is the most energy efficient mode of transport, but the amount of ocean transport used means emissions add up**

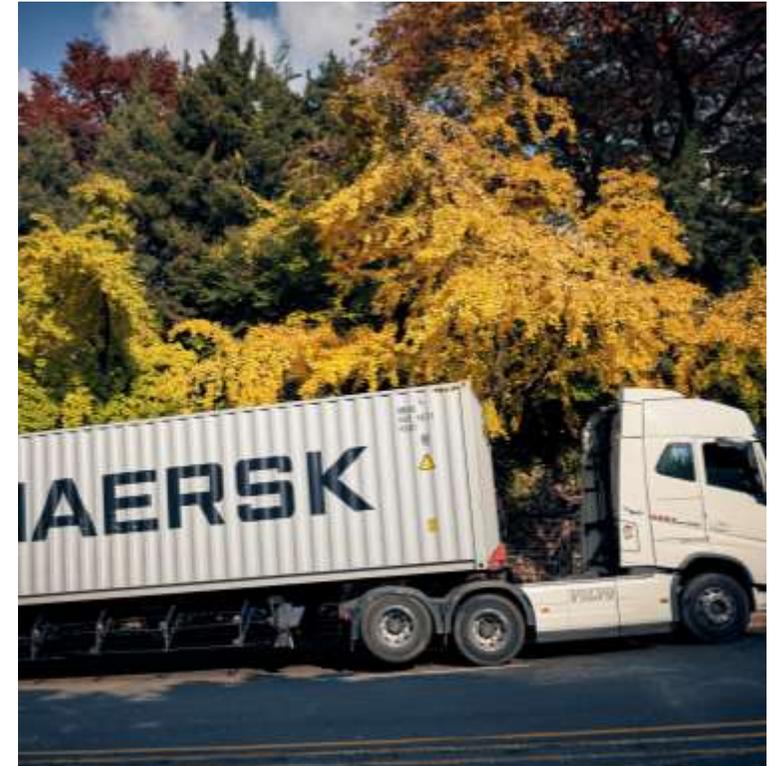
Therefore, **acting on ocean emissions is a quick and impactful strategy to reduce your scope 3 GHG emissions.**



# Maersk definition of green and low emission fuels



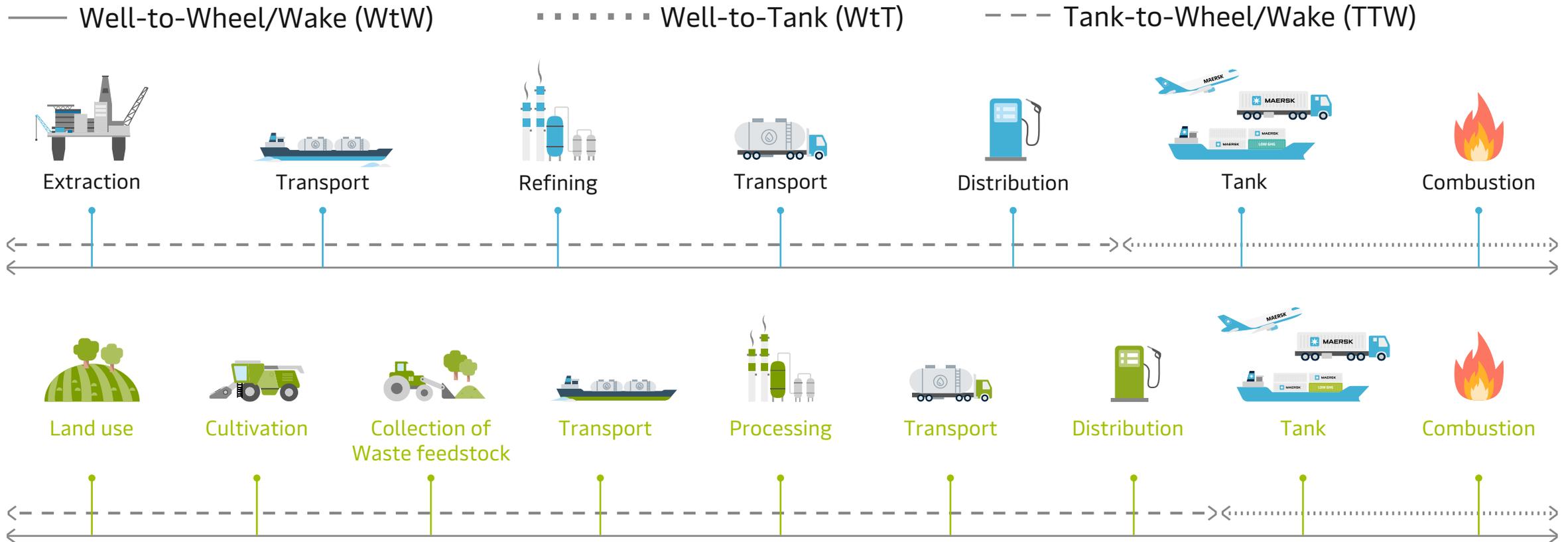
- **Green** is defined as fuels that have low or very low GHG emissions over their life cycle compared to fossil fuels.
- **'Low'** refers to fuels with **65-80%** life cycle GHG reductions compared to fossil fuels
- **'Very low'** refers to fuels with **80-95%** life cycle GHG reductions compared to fossil fuels.



*\*Source: European Commission - The revised [Renewable Energy Directive 2018/2001/EU](#)*

# Maersk evaluates all new fuels on a 'well-to-wake' life cycle basis

**Lifecycle assessment (LCA)** is the compilation and evaluation of the inputs, outputs, and the potential environmental impacts of a product or service throughout its lifecycle.



# To help you reach your decarbonisation goals, we need to look at all levers – both green fuels and energy efficiency

Key Lever	Comments	Key Lever	Comments
Green fuels* 1 2	<ul style="list-style-type: none"> <li>Maersk is currently sourcing <b>biodiesel</b> (from <b>waste feedstocks</b>), and <b>green methanol</b> (<b>bio</b> and <b>e-methanol</b>)</li> <li>We follow a sustainability policy with min. 65% savings</li> <li>We are evaluating the feasibility of using green ammonia and batteries</li> <li><i>Maersk has elected <b>not to procure alternative 'fossil fuels, such as LNG</b> to reach our targets</i></li> </ul>	Efficiency retrofits 5	<ul style="list-style-type: none"> <li>Retrofitting existing vessels with energy efficient technical measures has the potential to save fuel and reduce emissions</li> <li>Examples of such measures include new propellers, air lubrication systems and capacity extensions</li> <li>We are also investigating innovative technologies such as fuel cell engines and wind-assisted propulsion</li> </ul>
Efficient vessel design 3	<ul style="list-style-type: none"> <li>Optimising vessel design has the potential to increase the energy efficiency of vessels</li> </ul>	Network and vessel performance 6	<ul style="list-style-type: none"> <li>Real-time tracking and optimising of our vessel performance and network design, has the potential to reduce fuel needed for the same tasks – reducing emissions</li> </ul>
Shore power 4	<ul style="list-style-type: none"> <li>Connecting to shore power in ports has the potential to reduce emissions and particle pollution</li> </ul>	Offsetting (deselected) 7	<ul style="list-style-type: none"> <li><i>Some companies rely on offsetting to reach <u>decarbonisation</u> targets. <b>We focus on reducing emissions.</b></i></li> </ul>

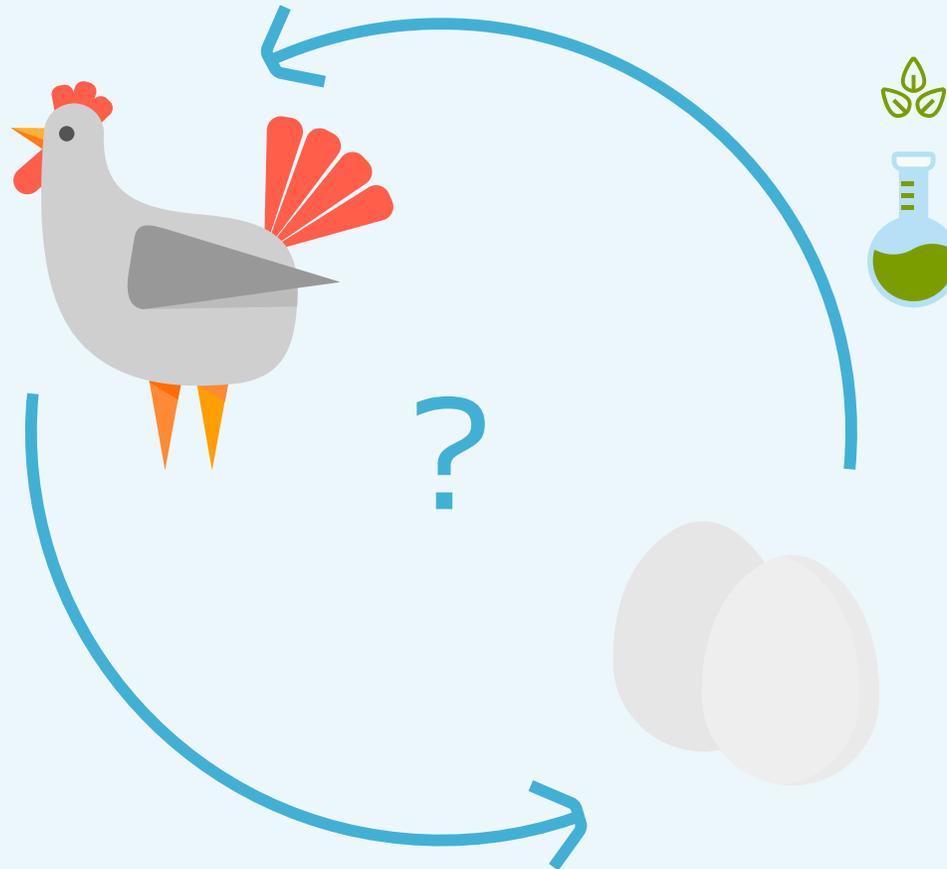


# Breaking the chicken-egg dilemma and leading the way in decarbonizing our industry

Who will build a 'green' ship if there is no green fuel, or fuel infrastructure?



The first ever green fuel powered vessel will sail in July 2023, and 24 large container ships able to sail on green methanol will enter the fleet starting in 2024



Sourcing green methanol at scale

We are building a portfolio of partnerships with global suppliers and securing green methanol for our ships

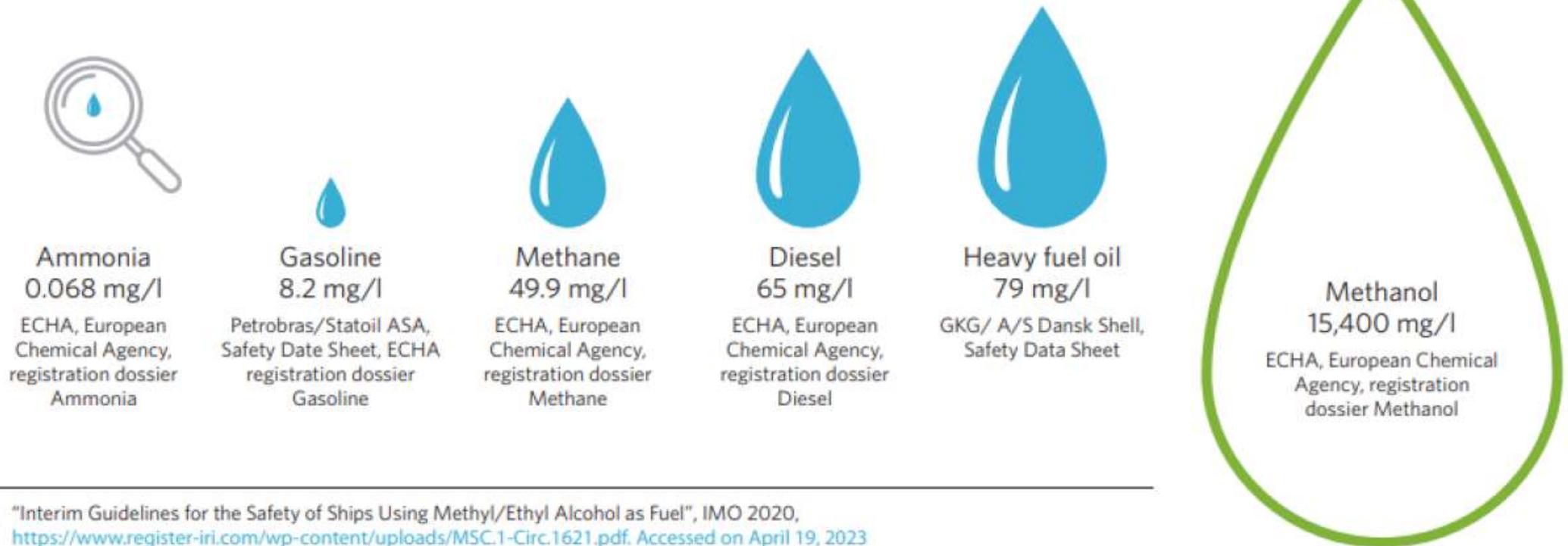
Who will produce green fuels if there are no customers for it?

# Priority fuels for decarbonising shipping

Fuel	Key advantages	Key limitations/risks
 <p>Biodiesel (from waste feedstock)</p>	<ul style="list-style-type: none"> <li>• Biodiesel market already exists</li> <li>• Can be used as drop-in fuel in existing vessels and engines</li> </ul>	<ul style="list-style-type: none"> <li>• Limited availability of suitable biomass feedstock</li> <li>• Price pressure due to competing demand from road transport and aviation</li> </ul>
 <p>Green methanol (bio-methanol and e-methanol)</p>	<ul style="list-style-type: none"> <li>• Can be produced from sustainable biomass and renewable electricity</li> <li>• Vessels running on methanol are already in operation today</li> <li>• Well-known handling</li> </ul>	<ul style="list-style-type: none"> <li>• Bio-methanol: availability of suitable biomass feedstock</li> <li>• E-methanol: availability of biogenic CO<sub>2</sub> source and renewable electricity</li> </ul>
 <p>Green ammonia (e-ammonia)</p>	<ul style="list-style-type: none"> <li>• Can be produced at scale from renewable electricity</li> <li>• Contains no greenhouse gas</li> </ul>	<ul style="list-style-type: none"> <li>• Safety and toxicity challenges</li> <li>• Infrastructure challenges at ports</li> <li>• Future costs depend on cost of renewable electricity and availability of engine (evaluation is still ongoing)</li> </ul>
<ul style="list-style-type: none"> <li>• Engine technology</li> <li>• Toxicity</li> <li>• Handling onboard</li> </ul>	<ul style="list-style-type: none"> <li>• Storage</li> <li>• Energy density</li> <li>• Production pathways</li> </ul>	<ul style="list-style-type: none"> <li>• Cost effectiveness</li> <li>• Chemical simplicity</li> <li>• Regulation</li> <li>• Future-"proof"</li> </ul>

# Comparing toxicity of different future fuels

**Figure 11. Lethal dose to 50 percent (LC50) of a fish population**

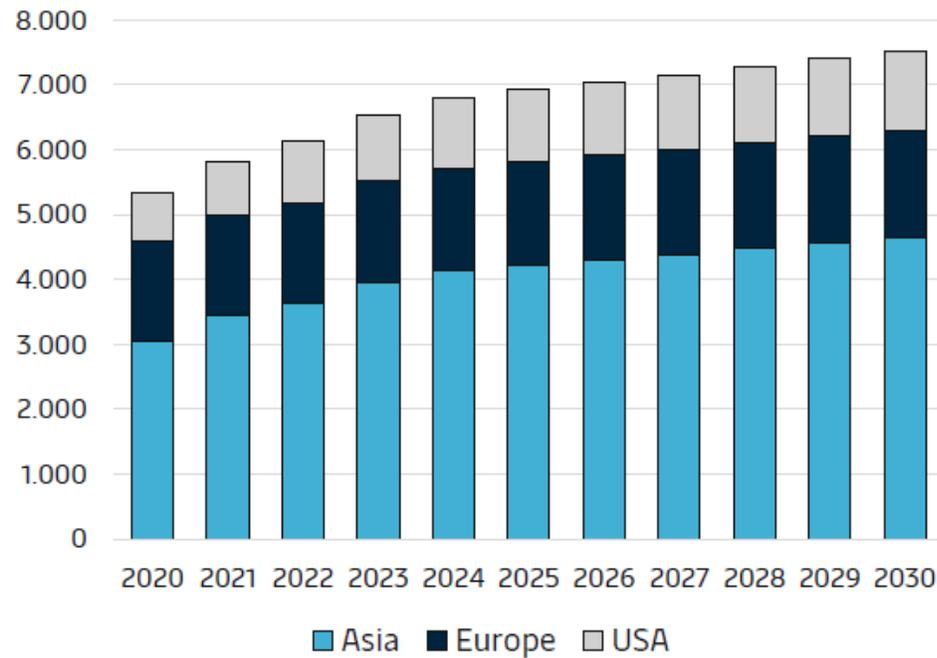


6 "Interim Guidelines for the Safety of Ships Using Methyl/Ethyl Alcohol as Fuel", IMO 2020, <https://www.register-iri.com/wp-content/uploads/MSC.1-Circ.1621.pdf>. Accessed on April 19, 2023

Asia has enormous collections points of waste and residues feedstocks that are used for bio marine bunkers...

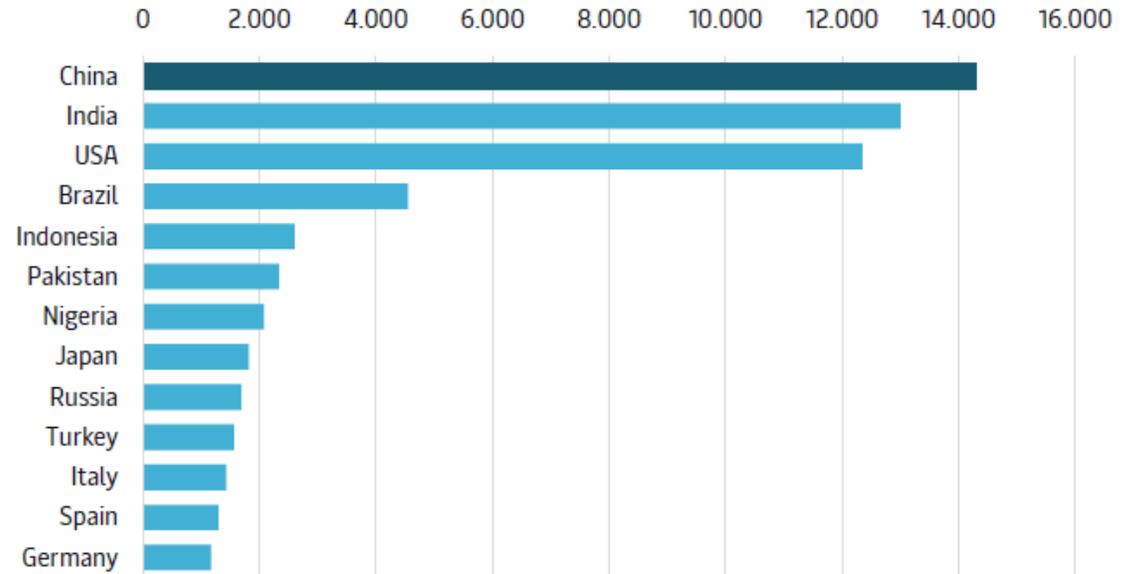
**Supply of Used Cooking Oils**

000 tons



**Top 10 Largest Consumers of Vegetable Oils**

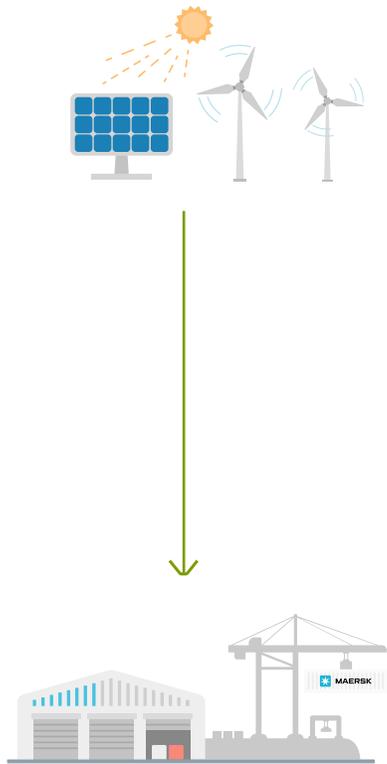
000 tons



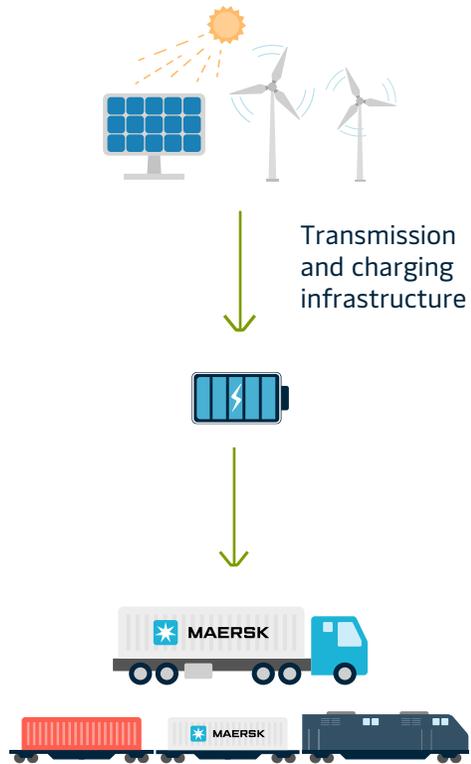
Source: Argus

# Our decarbonisation roadmap from renewables to Power-to-X

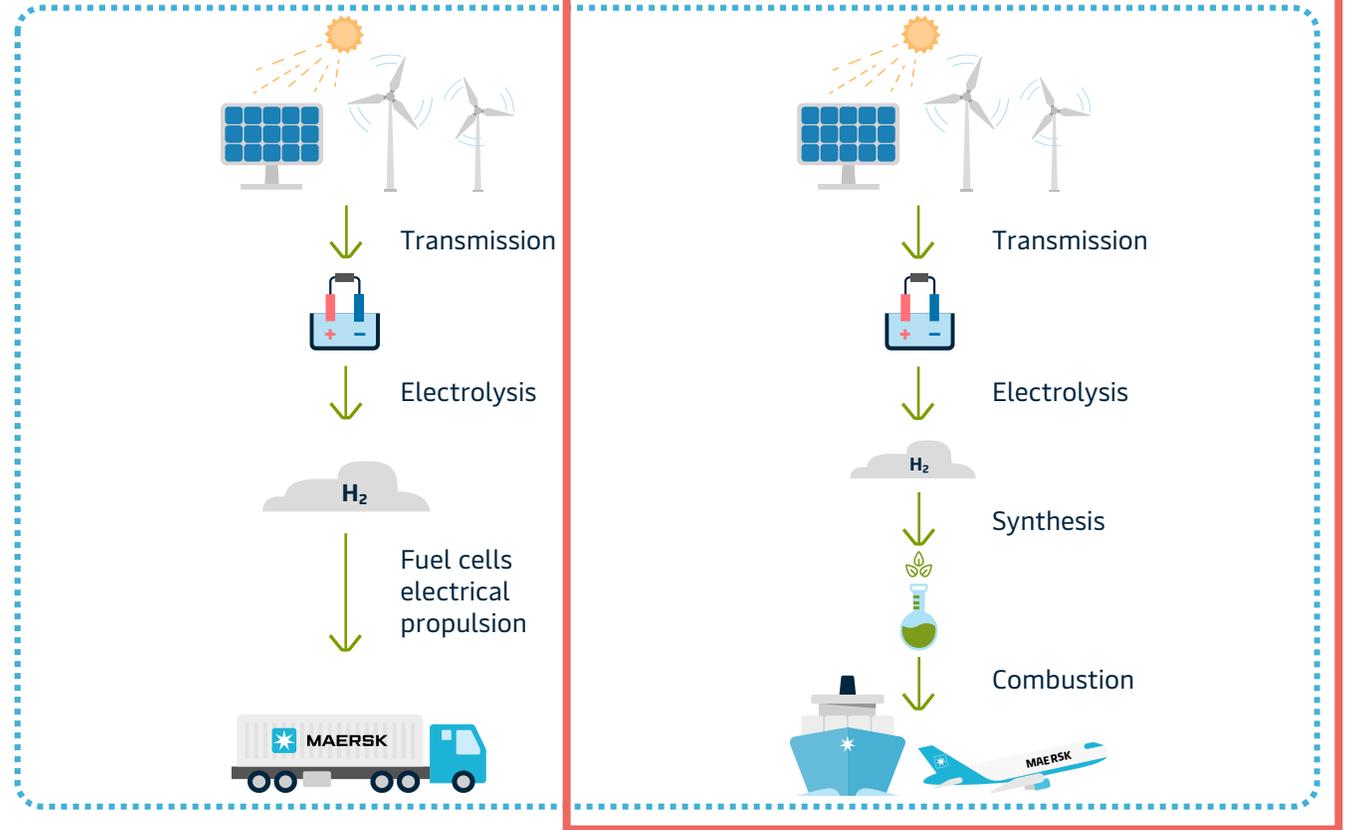
## Direct electrification



## Electric propulsion



## Power-to-X

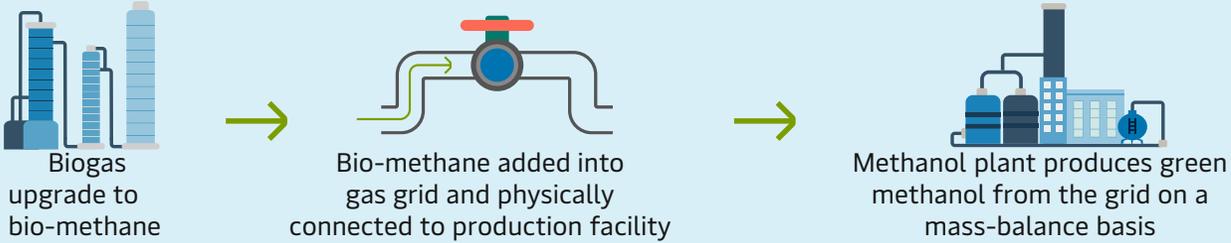
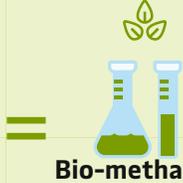
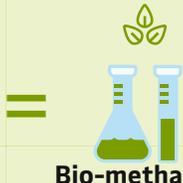
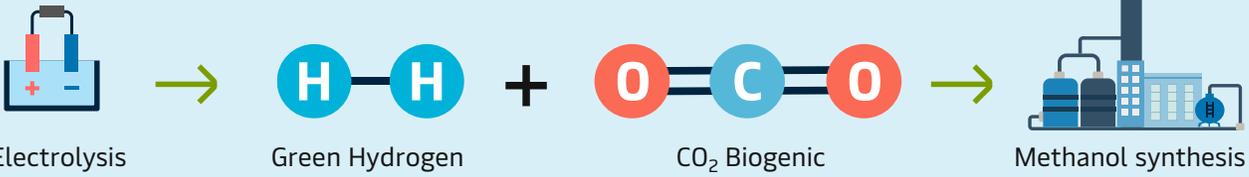


# Pathways to green methanol, the current green fuel choice for Maersk

Learn more about what makes  
green fuels green

Watch Video →



Source	Production	Fuel Type	Min. lifecycle Greenhouse Gas Reduction in REDII
 Waste Biomass	 Biogas upgrade to bio-methane → Bio-methane added into gas grid and physically connected to production facility → Methanol plant produces green methanol from the grid on a mass-balance basis	 Bio-methanol	≥65%
 Waste Biomass	 Gasification → Syngas → Methanol synthesis	 Bio-methanol	≥65%
 Renewable Electricity	 Electrolysis → Green Hydrogen (H-H) + CO <sub>2</sub> Biogenic (O=C=O) → Methanol synthesis	 E-methanol	≥70%

An aerial photograph of a two-lane asphalt road that curves through a dense forest. The trees are mostly green, with some showing autumnal colors. A few cars are visible on the road. The lighting suggests it might be late afternoon or early morning, with long shadows.

## Credibility is key – therefore we developed strict decarbonisation principles

Our decarbonisation guidelines are driven by ambitious targets with a real and significant environmental impact.

- All of our customer decarbonisation offerings allocate **GHG emissions reductions to your transportation**.
- **We don't offer emissions offsetting\*** outside of our own operational boundaries, as our focus is on decarbonising our own supply chain.
- Our GHG emission calculations are in accordance with the industry-leading **GLEC framework\*\*** (aligned with ISO 14083 requirements).
- We consider **all GHG emissions listed in the** Intergovernmental Panel on Climate Change (**IPCC**) not just CO<sub>2</sub> – that's one of the reasons we don't use LNG.
- We quantify GHG emissions on a **Well-to-wake/wheel (WTW)** basis, including upstream emissions of the fuels / energy used.
- For green fuels, we only use **2<sup>nd</sup> generation (waste and residues) fuels**.
- Fuels and energy used in operations (i.e. renewable electricity, biofuels, e-fuels) have to comply with our [Maersk sustainability policies](#).

# All the way to zero – Green Methanol Powered Vessels

## How to benefit?

### Maersk's investments into Methanol-enabled vessels



- In fall 2023, the first (of 25) green methanol-powered Maersk vessels will start its operations.
- All these vessels have dual-fuel capability.

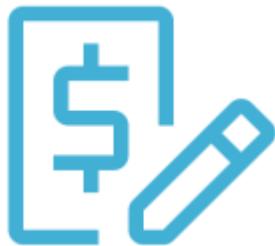
### How can customers benefit?

- **Benefits from the GHG emission reductions** from green methanol-enabled vessels by purchasing Maersk ECO Delivery Ocean.
- Green methanol results in a **lifecycle GHG reduction of at least 65%** vs fossil fuels.
- **Two types of green methanol:** Bio-methanol (based on waste biomass) and e-methanol (produced from waste CO2 and renewable electricity)
- **ECO Delivery is fuel-agnostic.** Green methanol and biodiesel are used (mass-balance principle), and makes emission reductions available on all trades, globally.

In summary, the major changes you will see to your traditional fossil fuel contract with ECO 2.0 adoption:

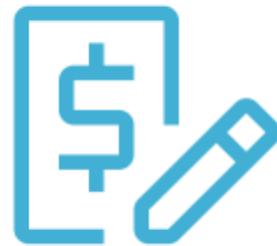
## **\$0 BAF+LSS**

For every container shipped with Maersk ECO Delivery 2.0, you will only pay a green premium and any BAF or LSS charges will be \$0. This is the first ocean product that fully moves away from the fluctuating BAF model.



## **\$0 EU ETS**

Every container shipped with ECO Delivery 2.0 will be exempt from the upcoming EU ETS surcharges beginning on January 1, 2024. More emissions surcharges are soon to follow. Instead of paying rent to continue to emit, invest in strategies to reduce your emissions to avoid these fees!



## **Price transparency and stability**

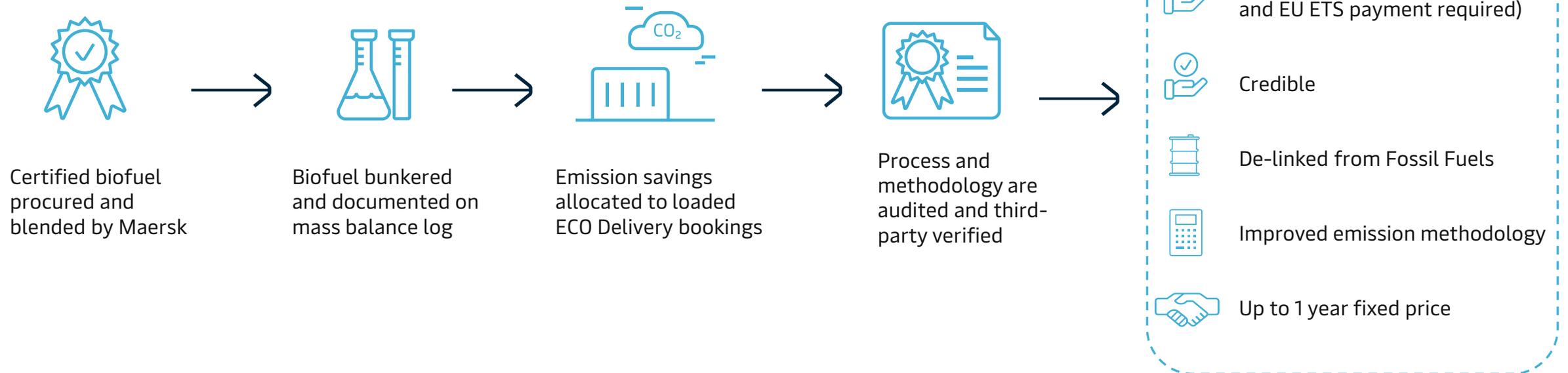
The methodologies for pricing and emissions factors are based on actual data from our own vessels and fuel consumption. Maersk also has long term offtake agreements with green methanol suppliers, giving us greater visibility and transparency into long term pricing.



# Maersk ECO Delivery Ocean: Solves Scope 3 problem in an easy and credible way

The Ocean ECO Delivery product offers emissions reduced shipping based on biofuels enabling immediate and externally verified GHG savings for customers

## How it works



THANK YOU

ALL  
THE  
WAY  
TO  
ZERO