Newsletter
Issue 2 / March 2025

The Future of Maritime and Aviation Regulations: COCPIT Insights

We are pleased to share the second Cocpit newsletter, highlighting the project's progress toward increasing microalgae feedstock for sustainable fuel production.

CONTENT

1. Introduction

As the world increasingly focuses on sustainability and reducing carbon emissions, the regulation of Sustainable Aviation Fuels and maritime industries has become a critical area of development.
The term SAF refers to:

- Synthetic aviation fuels from renewable hydrogen and captured carbon
- Advanced biofuels from waste and residues
- Biofuels produced from oils and fats
- Recycled carbon aviation fuels

In parallel, the maritime sector is making significant progress toward adopting sustainable fuels. Both national and international maritime regulations, such as the International Maritime Organization strategy for reducing greenhouse gas emissions from ships, are driving a transition towards cleaner energy.

These regulations aim to accelerate the transition to cleaner energy sources, enhance environmental performance, and ensure long-term industry compliance with climate goals. Within the COCPIT project, these regulations are in line with the objective of promoting research, development and implementation of sustainable fuels, supporting the transition of the aviation and marine sectors towards zero-carbon alternatives. Focusing on circularity and sustainable raw materials, COCPIT's work contributes to the regulatory push for greener fuels, ensuring that the use of renewable energy is central to the hardest to decarbonise sectors: aviation and shipping.
This newsletter will provide an overview of the latest regulatory developments and discuss their potential impact on the future of these industries.

2. Regulatory Updates in the Aviation Sector

In 2019, the EU launched the European Green Deal, a plan for Europe to become climate neutral by 2050. These targets became binding with the Climate Law proposed in 2019 and adopted in 2021. In 2021, the European Commission presented the **Fit for 55** package, a set of proposals to meet the objectives of the Green Deal.

The Fit for 55 covers a range of sectors, including energy and transport. For aviation, the most relevant regulation that is part of the package is **ReFuelEU Aviation**. The RefuelEU Aviation Regulation sets minimum mandates of SAF that fuel suppliers must make available at EU airports. From 2025, it is expected that at least 2% of fuel will be SAF, with a progressive increase to 70% by 2050. To do this, EU airports must facilitate access to the infrastructure needed to deliver, store and refuel aircraft with SAF, and operators of aircraft departing from EU airports must refuel with the aviation fuel needed to operate the flight. This avoids excessive emissions related to extra weight and minimises the risks of carbon losses caused by so-called "tankering" practices.

In the context of ReFuel Aviation and beyond, the European Commission has foreseen a central role for **EASA** (European Union Aviation Safety Agency), an agency established in 2002 and still active as the authority that regulates aviation and the approval of sustainable aviation fuels, ensuring compliance with airworthiness standards.

The RefuelEU Aviation is not the first regulation to have entered the field of European sustainability.

Already in 2005, the European Commission presented the ETS (Emission Trading System), a market-based mechanism that aims to reduce greenhouse gas emissions from energy and industrial sectors, and is one of the key tools in the EU's efforts to combat climate change and achieve its emissions reduction targets. The ETS, once Europe launched the Green Deal with the Fit for 55, was at the heart of this strategy, in particular with the extension of the system to the maritime sector and new industrial categories.

Under this system, companies must monitor and report their emissions annually and surrender sufficient allowances to fully account for their annual emissions. The price of allowances is determined by the EU carbon market, which is subject to a robust set of control rules.

In this context, another piece of EU legislation is the **Renewable Energy Directive** (RED). The directive was revised for the third time in 2023 and to date **REDIII** represents an ambitious update of EU legislation on renewable energy, aiming to accelerate the energy transition through stricter targets, simplified administrative procedures, promotion of specific technologies and increased cooperation between Member States.

Source: CANVA

Following Russia's invasion of Ukraine, the EU launched the **REPowerEU** plan in May 2022. This plan aims to save energy by promoting energy efficiency measures and encouraging responsible energy consumption; diversify energy supply by exploring alternative sources and strengthening partnerships with reliable suppliers; produce clean energy by accelerating the deployment of renewable energy technologies.

At the international level, **CORSIA** (Carbon Offsetting and Reduction Scheme for International Aviation) was officially approved in June 2018 by the **ICAO** (International Civil Aviation Organization) as part of the global effort to regulate CO_2 emissions from civil aviation. This initiative was developed in response to the growing recognition of aviation's contribution to global emissions and its impact on climate change. CORSIA is a key component of the broader framework established by ICAO to reduce aviation's environmental footprint, with a particular focus on the sector's international operations.

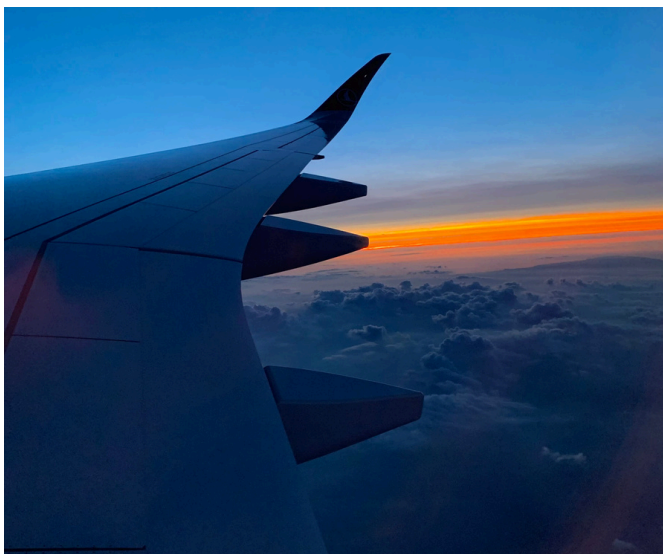
CORSIA operates alongside the European Union's regulatory measures, which include the Emissions Trading System (ETS) for aviation. Under the EU framework, several European and international aircraft operators are already subject to emissions trading, which places a price on carbon emissions and incentivizes airlines to reduce their carbon footprint. The ETS and CORSIA together create a comprehensive approach that addresses both national and international emissions from aviation.

The primary goal of CORSIA is to ensure that CO_2 emissions from the international aviation sector remain below 2020 levels.

To achieve this, the scheme incentivizes airlines to adopt a combination of strategies, including the use of Sustainable Aviation Fuels (SAFs), operational efficiency improvements, and the implementation of emissions compensation mechanisms, such as carbon offsetting. These measures are designed to drive innovation within the industry, accelerate the transition to low-carbon technologies, and foster global cooperation on climate action.

While CORSIA sets a global target for emissions reduction, the European Union is taking an approach of setting specific targets for aviation emissions and supporting these targets with tangible measures.

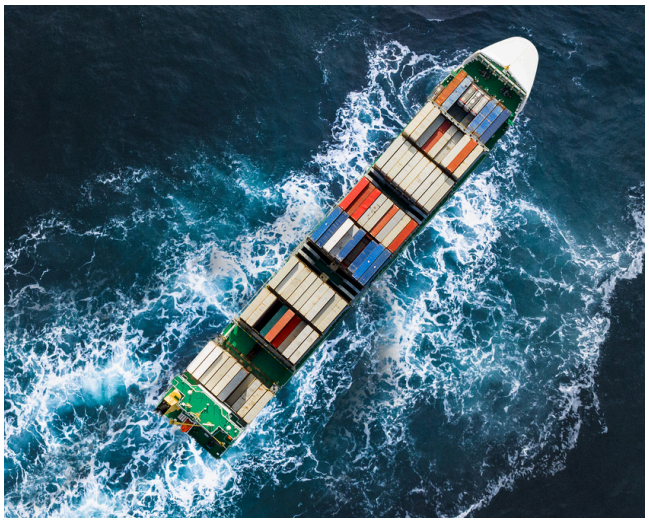
In summary, while CORSIA offers a global framework for addressing the aviation sector's environmental impact, the EU's efforts, including the promotion of SAFs and the implementation of the Emissions Trading System, underscore the union's commitment to achieving carbon neutrality in aviation by fostering innovation, collaboration, and the adoption of sustainable technologies on a global scale.



Source: CANVA

3. Regulatory Updates in the Maritime Sector

Maritime transportation is a large and growing source of greenhouse gas emissions.
Since January 2024 the Emissions Trading System has been extended to cover CO_2 emissions from all large ships (of 5 000 gross tonnage and above) entering EU ports, regardless of the flag they fly.
Emissions from maritime transport are included in the overall ETS cap, which defines the maximum amount of greenhouse gases that can be emitted under the system. The cap is reduced over time to ensure that all ETS sectors contribute to the EU's climate objectives.
The Fit for 55 package also includes regulations relating to the maritime sector, such as **RefuelEU Maritime.** The Regulation is fully applied from 1 January 2025 as part of the strategy to achieve the objective of climate neutrality by 2050 and aims to reduce CO_2 emissions, promote cleaner fuels, monitor and report CO_2 emissions of shipping companies (providing verifiable data on an annual basis) and adopt solutions to offset emissions that cannot be eliminated.



Source: CANVA

The International Maritime Organization plays a key role in addressing carbon pollution in the maritime industry. The IMO works to regulate and reduce greenhouse gas emissions from ships through a range of initiatives. These include setting mandatory targets for reducing emissions, implementing energy efficiency measures, and promoting the use of cleaner fuels.
Key actions include:

• IMO Data Collection System: That requires owners of large ships engaged in international maritime transport to report information on their ships' fuel consumption to flag States. Flag States, in turn, report the aggregated data to the IMO.

• Greenhouse Gas Strategy: This strategy sets a target of net zero emissions from ships by 2050. Indicative control points have also been agreed to reduce greenhouse gas emissions from ships by at least 20% - aiming for 30% - in 2030 and by at least 70% - aiming for 80% - in 2040, both compared to 2008 levels.

• Adoption of additional measures: The IMO has reached a consensus on the need to adopt additional greenhouse gas reduction measures by 2025 to achieve the agreed targets. These measures should include a standard regulating the gradual reduction of the greenhouse gas intensity of marine fuels and a maritime greenhouse gas pricing mechanism.

This document cites information whose sources are: European Commission website; European Union Aviation Safety Agency website; International Maritime Organization website; International Civil Aviation Organization website

4. Unlocking the potential of microalgae

Source: CANVA

The knowledge and study around the topic of algae and their role in reducing CO_2 were also examined and explored in 2019, when the European Commission brought forward an initiative that aims to unlock the potential of algae also for the biofuel sector. The adopted Communication entitled **Towards a Strong and Sustainable EU Algae Sector** aims to exploit the potential of algae as a renewable resource to address challenges such as food security, decarbonisation and economic growth. The document identifies obstacles to the growth of the sector, including high production costs, poor market knowledge and a fragmented regulatory framework. The Communication proposes 23 actions to improve governance, support businesses, fill knowledge gaps and increase public awareness of the benefits of algae.

The development of the algae sector in the EU aligns with European environmental objectives in several ways as algae can contribute to the achievement of EU objectives in terms of:

- Decarbonisation
- Zero pollution
- Circularity

Algae can in fact replace fossil fuel-based products and serve as a raw material for several products including biofuels.
This initiative is part of the European Green Deal and aims to turn environmental challenges into business opportunities, stimulating job creation and the regeneration of marine ecosystems. By 2027, the Commission will assess the progress made in implementing this Communication.
The American Society for Testing and Materials (ASTM) has specified with the **ASTM D7566** standard that aviation biofuels can be derived from various biomass sources, including advanced ones such as algae, provided that the resulting fuel meets certain standards of thermal stability, viscosity, melting point, and sulfur content, among other criteria.

There are some European projects using algae as biomass, which are part of the SUSTAFUELS Cluster, together with COCPIT:

ALFAFUELS
FUELGAE
SUSALGAEFUEL

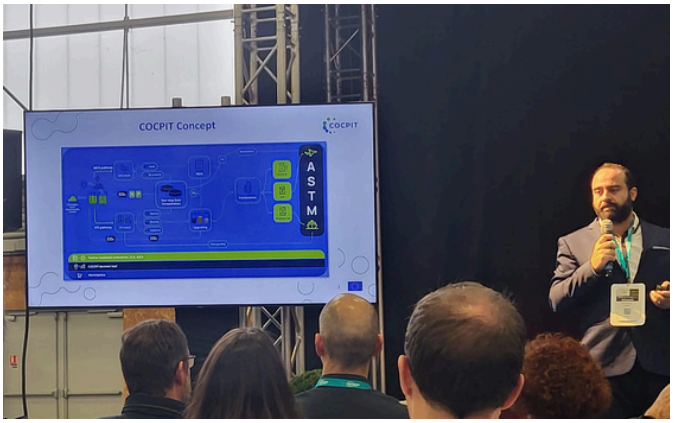
5. Project presentation at BIO360 Expo and upcoming events

In the first 18 months of the project, COCPIT was presented at various national and international conferences. The most recent presentation took place at the Bio360 Expo, a conference focused on renewable carbon, bioenergy, and bioeconomy.

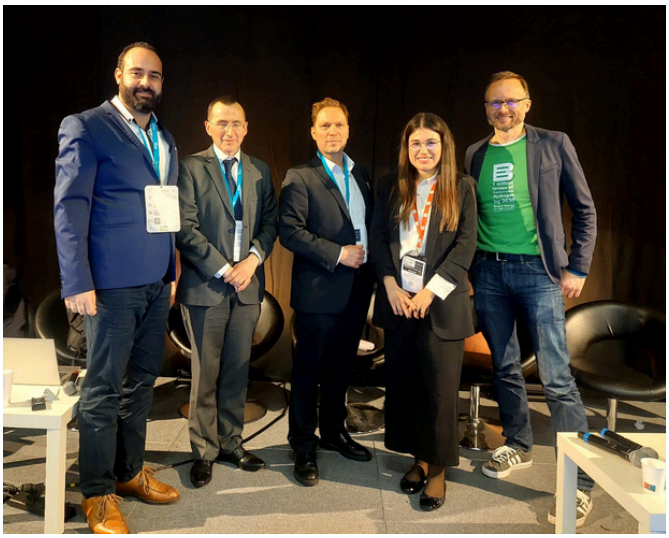
Held on February 5-6 2025 in Nantes, France, Bio360 Expo offered a unique opportunity to connect with international professionals from diverse multidisciplinary fields.

During the event, Sary Awad, project coordinator from IMT Atlantique, presented COCPIT, emphasizing the role of circularity within the project's research. Following this, he moderated a session on the same topic, discussing the potential of Sustainable Aviation Fuels (SAF) as a solution to contribute to a cleaner sky and reduce the carbon footprint of aviation.

The Bio360 Expo proved to be an ideal setting for fostering valuable discussions on the future of bioeconomy and sustainability, with a strong focus on reducing carbon emissions and advancing cleaner energy alternatives. By engaging with global experts, COCPIT was able to demonstrate its commitment to innovative solutions that support a sustainable transition.



Bio360 Expo, Nantes, France.
Sary Awad - Cocpit presentation
Source: Bio360 Expo



Bio360 Expo, Nantes, France.
Sary Awad and other presenters on the topic SAF - Towards a cleaner sky
Source: Bio360 Expo

Following the closure of the first 18 months of the project, COCPIT will be presented at the next edition of EUBCE 2025, in Valencia. During the 33th edition of the conference, some of the partners of the COCPIT consortium will take part in two parallel events. One of these is the event organized by the M²ARE project in collaboration with 3 other European projects, to delve into the topic of maritime fuels.

M²ARE is an European funded project that aims to decrease the use of fossil fuels in the maritime sector using renewable sources to produce "Maritime Methanol".

The second event will be a workshop organized with some members of the Advisory Board. The aim is to delve deeper into the topic of the regulations active to date in the SAF sector and the possible evolution in the near future.

EUBCE 2025
33rd European Biomass Conference & Exhibition
9 - 12 June, Valencia Conference Centre, Spain

COCPIT

cocpit-horizon.eu

info@cocpit-horizon.eu

@COCPIT_Project

COCPIT Project

The COCPIT project started in October 2023 and will end in September 2027. Coordinated by IMT ATLANTIQUE the project consortium is composed of 11 partners from 6 EU countries, selected to meet the technical scope of the project providing complementary and interdisciplinary expertise.

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