



**RENEWABLE AND LOW-CARBON FUELS
VALUE CHAIN INDUSTRIAL ALLIANCE**

**ANNUAL PROGRAMME
FOR 2023 – 2024**

**TO BE ENDORSED AT THE GENERAL ASSEMBLY
OF 16 OCTOBER 2023**

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CONTEXT

The [‘Sustainable and Smart Mobility Strategy’ together with its Action Plan](#) presented by the European Commission on 9 December 2020 lays the foundation for the decarbonisation of the EU transport system and, as outlined by the European Green Deal, transport overall needs a 90% cut in emissions by 2050 compared to 1990 levels, delivered by a smart, competitive, safe, accessible and affordable transport system. On 14 July 2021, the European Commission presented a package of proposals to make the EU’s climate, energy, land use, industrial ecosystems, transport, and taxation policies fit for reducing net greenhouse gas emissions by at least 55 % by 2030, compared with 1990 levels – the Fit for 55 Package. Among its objectives, it foresees a faster roll-out of zero - and low-emission vehicles and related infrastructure as well as renewable and low-carbon transport fuels to support the transition to climate neutrality. Most proposals from this Package have reached an agreement among the co-legislators of the European Union in the year 2023 and will be implemented as of 2024. The **Renewable Energy Directive** has been revised, with increased objectives for the use of renewable energy in transport sector – aiming for at least 29% share of renewable energy used in transport by 2030, or a reduction of GHG of 14.5% in transport energy use. Specific provisions also incentivize the use of renewable and low carbon fuels in transport. Regarding air transport, the [ReFuelEU Aviation](#) will oblige aviation fuel suppliers to blend increasing levels of sustainable aviation fuels and synthetic aviation fuels in jet fuel supplied at EU airports. Similarly, the [FuelEU Maritime](#) Regulation will stimulate the uptake of sustainable maritime fuels and zero-emission technologies by setting a maximum limit on the greenhouse gas content of energy used by ships calling at European ports.

On 6 April 2022, Commissioner for Transport and Mobility, Adina Vălean, launched the “Renewable and Low-Carbon Fuels Value Industrial Alliance” (RLCF Alliance) as a flanking measure to the Refuel EU aviation and Fuel EU maritime initiatives. The ultimate objective of the Alliance is to ensure that aviation and waterborne transport have sufficient access to renewable and low carbon fuels, while taking into account the future use of these fuels in road transport, and thus contribute to the reduction in the transport sector’s greenhouse gas (GHG) emissions by 90 percent by 2050.

The first year of operation of the Alliance first year of operation of the Alliance was primarily devoted to **governance**, with the creation of a robust and representative membership covering as much of the RLCF value chain and as many countries as possible (still going-on), the creation and composition of round tables (see below), and the identification and launch of various work streams in line with the work programme. The roundtables have started their work with positive contributions from a core group of workstream leaders and contributors in each one of them. First tasks performed included the building of a common knowledge database (report and studies) on feedstock, sustainable aviation fuels and sustainable maritime fuels, the identification of technological pathways for maritime and aviation sectors, first estimation of the demand for RLCF in the aviation and maritime sector to give visibility and certainties to investors, identification of enabling conditions for each sector and gaps in standardisation and certification to be filled; as well as the assessment of the relevant public and private funding instruments and opportunities to allow for the upscale of these technologies with the creation of a concrete funding toolbox for members.

Another key deliverable of the Alliance was the preparation of a pipeline of investment and R&D projects that will gather the members contributions with a view to create and give visibility to industry projects, with associated tools (including financial) to deploy towards their implementation.

Since the publication of the Commission’s “Fit for 55 Package”, the geopolitical landscape has changed dramatically with implications for energy security and raw material dependencies. In fulfilling its five objectives, the RLCF Value Chain Alliance has the potential to contribute to the EU’s strategic autonomy in the energy sector, supporting the clean energy transition of the key industrial sectors for a more resilient European energy system. By providing concrete contribution to the decarbonisation of the aviation and maritime sectors, the RLCF Value Chain Alliance has a unique role in promoting an integrated European strategy for the uptake of the renewable fuels aiming at the twin objective of the climate neutrality and the strengthening of the European resilience.

Since the launch of the membership call in 2022, more than 220 business and organisations have become members of the Alliance. Four roundtables of experts were set up in November 2022, each comprising approximately 45 members aiming to deliver on the key objectives of the Alliance. Progress of the work in the Roundtables has been presented to all members in March 2023 at the dedicated RLCF Alliance workshop, as well as to High-Level Steering Group representatives in June 2023. The latter have agreed on a second year of operation for the Renewable Low Carbon Fuel Value Chain Industrial Alliance and tasked the Secretariat to develop the Work Programme for 2023-2024.

The following contributions from the High-Level Steering Group, the Chairs/Vice Chairs of the Roundtables and the inputs gathered from members via the Survey on Future Priorities, the RLCF Alliance were taken into consideration:

- **Launch call for project pipeline open to members of the RLCF Alliance.**
- **Active monitoring of project deployment:** the pipeline of projects will give the Commission an operational tool to engage with Member States in discussions on the progress implementation, as well as continued market awareness of overall proximity to the assumed targets in the new legislative framework. The Roundtables might play a role in identification of unforeseen challenges.
- **Introducing a RCLF Alliance label** associated to the projects in the pipeline in order to improve their visibility and create incentives for industrial actors to disclose projects within the RLCF framework. Specific scope and criteria to be developed by the alliance Steering Group.
- **Improving engagement rate:** raising the motivation of members to actively participate in the Alliance’s work and contribute to the proposed ad-hoc exercises will be key to progress with some deliverables.
- **Filling the Membership Gap** by encouraging industrial sectors that are part of the renewable fuels value chain (e.g. chemicals, agriculture and tourism/consumers etc) that are not sufficiently represented. Encourage the active participation of the EU Member States in the Alliance work.
- **Identification of gaps in support and input to design of new instruments:** depending on the progress in deployment of the production and uptake of renewable and low-carbon fuels, additional support schemes might be necessary.
- **Encouraging the interaction with other EU/International initiatives and High-level officials** to raise awareness.

THE ALLIANCE WORK PROGRAMME

The first annual Work Programme of the RLCF Alliance built on the Alliance Declaration that was presented on the 6 of April 2022 and the Memorandum of Understanding with FuelsEurope, Hydrogen Europe, Safran and Fincantieri and the European Commission to kick off and support the works of the Alliance.

Significant progress has been made in achieving the 2022 – 2023 work plan deliverables. While some objectives in the Work Plan require ongoing attention due to slower-than-expected progress in certain areas, there are several positive developments to highlight. At the same time, the interests of Members of the Roundtables have diverged into some areas not provided for in the original work programme. Therefore, a flexible approach on the work programme regarding the evolution of interest of the stakeholders in the Alliance, might also provide a benefit. This might also apply to the roundtables' deliverables which may need an update not only to reflect their actual achievement but also to take note of the evolution of the discussions and the interests of the Alliance Members.

The Work Programme for year 2023-2024 builds on the past Working Programme 2022-2023 and its objectives and updates it.

The Members of the RLCF Alliance gathered at its second General Assembly are invited to endorse the present draft Work Programme.

The annual Work Programme addresses a long-term and a short-term objective:

- **Long-term: create a robust Alliance structure to support a sufficient and adequate access of aviation and waterborne transport to renewable and low-carbon fuels while taking into account that, in the transitional phase, they will continue to play an important role in the decarbonisation of road transport.** The Alliance will therefore contribute to the long-term objectives of emission reduction in the transport sector in line with the EU climate ambition.
- **Short-term: establish a clear set of tasks and deliverables for the coming year.** To get the Alliance effectively going, the Work Programme addresses the operational and concrete activities to implement the five specific objectives identified in the Alliance Declaration.

The Alliance Declaration outlines the following five specific objectives:

Objective 1: Building on the sustainable feedstock and production pathways eligible towards the decarbonisation targets put forward in FuelEU Maritime and ReFuelEU Aviation, the Alliance shall:

- i. leverage on work done in other initiatives¹, identify transport fuels which are most economically and environmentally suitable (including consideration for the zero-pollution ambition²) for scaling up, and
- ii. evaluate strong and weak points of the value chain (including systemic, technological, geographical and workforce related ones) and assess investment needs.

Objective 2: For the purpose of accelerating market entry of new innovative fuels and associated technologies, the Alliance will assess the enabling conditions, such as those relating to demand and supply side including local availability of feedstock, adequately trained workforce and industry knowledge base in Member States. It will also identify gaps in standardisation, safety assessments, and make sure all stakeholders in the value chains are aware of any downstream certification requirements³. This assessment will feed into and inform relevant policy debates.

Objective 3: Identifying and assessing existing relevant public and private financing opportunities as well as determining the suitability of additional instruments for de-risking investments for scaling up the production and crowding in private investments (in particular in relation to cross-border projects, including possible Important Projects of Common European Interest) and drawing conclusions on their suitability.

Objective 4: Create a pipeline of investment projects (including high TRL level R&D activities) based on prioritisation established under Objectives 1 and 2 and the self-assessment tools in order to increase their visibility and credibility. In the development of such pipeline, the Alliance will pay particular attention to focus on projects that are compatible with the transition to low- and zero-emission mobility. Ongoing processes to develop and subsequently deploy technologies for zero-emission vessels and aircraft shall not be negatively impacted.

Objective 5: Looking at creating synergies with different transport modes and ensuring availability of resources for renewable and low-carbon fuels for aviation and waterborne transport (notably in cooperating with the European Clean Hydrogen Alliance and ensuring consistency between hydrogen production capacity increases and different utilisation pathways in transport, such as for e-fuels).

Work carried out in the context of the Alliance should enable its members to make substantive progress on the five core objectives by mid-2024, including the project pipeline of investments as foreseen under Objective 4.

¹ Such as European Sustainable Shipping Forum, Aviation Round Table, ETIP Bioenergy and similar.

² The European Commission action plan “Towards a Zero Pollution Ambition for air, water and soil – building a Healthier Planet for Healthier People” adopted on 12 May 2021.

³ A pilot project for the EU “Clearing House” for aviation fuels certification is in preparation by DG MOVE and EASA. The Alliance will provide input into the design of this clearing house as well as contribute to the monitoring of implementation and evaluation of the pilot project results.

TOWARDS THE PIPELINE OF PROJECTS

To this end, the European Commission has tasked a consortium led by PWC, following a call for tenders, to support in the set-up of a call for industrial projects beginning 2024 reflecting the vision and technological pathways discussed in the relevant operational structures of the Alliance. The contractors will be tasked to deliver three specific objectives for the Alliance:

- **Design, develop deploy and maintain a project database** for the Alliance’s pipeline, facilitating information sharing among members and promoting renewable and low carbon fuels projects;
- **Arrange and organise matchmaking sessions** to boost sustainable and low-carbon fuel technology development and implementation in maritime and aviation transport;
- **Produce the Alliance newsletter** for increased RLCF Alliance support and visibility, sharing regulatory updates, funding opportunities, innovations, and events relevant to members.

The call for the project pipeline will be based on objective criteria based on the output from the 4 roundtables of the Alliance. All projects meeting the latter will be included in the pipeline, following initial screening by the contractors and verification by the European Commission. The delivery of the database for the call of projects is expected in January 2024, and remain open for the lifespan of the Alliance. Matchmaking events will help submitted projects to find new investors or partners to reach sufficient maturity and feasibility to be implemented, as well as get visibility.

The project pipeline will take due consideration of existing databases, such as the European Clean Hydrogen Alliance, concerning the availability of hydrogen as a feedstock for the production of renewable and low-carbon fuels. The project pipeline will provide visibility to the ongoing and foreseen industry efforts. It will also be instrumental to the identification of the gaps in the value chain and the bottlenecks (feedstocks, infrastructures, etc) to be addressed through the Alliance operational structures.

In the coming months the RLCF will expand the educational role of the alliance continuing the organization of regular webinars, presentation of projects, presentation of studies etc. The RLCF Alliance will also engage with national governments to increase awareness on the work of the Alliance at every level, notably in the context of the future Net-Zero Platform set by the Net Zero industry Act and the platform set by the STEP regulation. along with EU institutions as necessary.

The Steering Group will also assess the feasibility of Introducing a **RCLF Alliance label** associated to the projects in the pipeline to improve their visibility and create incentives for industrial actors to disclose projects within the RLCF framework. Specific scope and criteria to be developed by the alliance Steering Group.

The RLCF Alliance stands also ready to engage with national governments and EU services.

THEMATIC ROUNDTABLES

In order to ensure continuity of the work carried out in the first year of operation of the Alliance, the Work Programme proposes to keep into place the operational structures that will adequately tackle the specific challenges the maritime and aviation sector are confronted with, as well as the most relevant cross-cutting issues that need to be addressed to facilitate the availability and use of renewable and low carbon fuels. The General Assembly is thus invited by the Steering Group to re-endorse the following four roundtables:

1. Roundtable 1 - The availability of feedstocks, synergies among sectors and the so-called “Just transition”
2. Roundtable 2 - Production pathways and value chain – Aviation
3. Roundtable 3- Production pathways and value chain – Waterborne Transport
4. Roundtable 4 - Access to public and private finance

Each roundtable is composed of selected stakeholders from relevant value chains along key fuel technologies and modes (aviation and waterborne), and key common challenges and horizontal issues, e.g. access to feedstock, access to finance, synergies with road transport, etc. based on an open call for participants. The selection of the members of the thematic roundtables is conducted by the European Commission assisted by the Steering Group and paying particular attention to ensure (at all times):

- a high level of expertise;
- geographic balance, favouring underrepresented regions of the EU;
- representation of large, medium and small enterprises;
- contribution from other stakeholders, including financial market actors, non-governmental organisations and other social partners.

Thematic roundtables operate on the basis of specific Terms of Reference, developed on the basis of a model submitted by the Steering Group, consistently with the objectives of the Alliance and the Work Programme. Each roundtable has elected a Chair and a Vice Chair in November 2022, at the occasion of their kick-off meeting. The Chairs and Vice Chairs are responsible for the internal coordination within their roundtable and can organise the work under various sub-groups or workstreams delegated to different members. Chairs and Vice Chairs of each roundtable regularly update their counterparts as well as the Steering Group of the progress made towards the Alliance’s deliverables, during Coordination meeting held approximately every three months. At this occasion, the Steering Group presents the strategic perspective of the Alliance and the critical next steps to undertake in the following weeks. These regular meetings have proved effective in maintaining good internal communication within the Alliance’s operational structure and into resolving potential difficulties; and shall be reconducted in the second term of the Alliance.

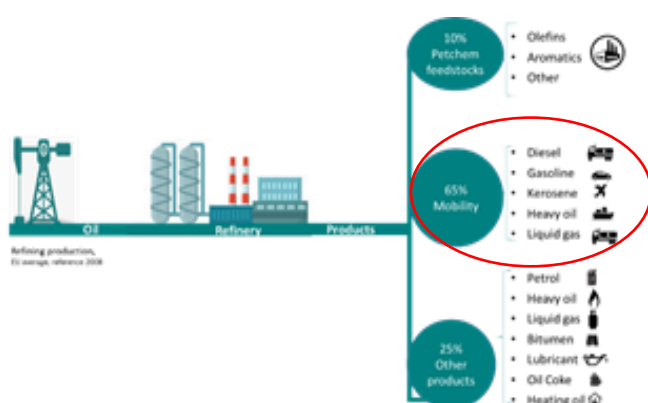
A top-up exercise conducted in May 2023 led to the selection of additional members for each roundtable, filling in the gaps in representativity of sectors or geographical imbalances identified by the Steering Group and the roundtable Chairs. Another review of the roundtable membership shall be

conducted in the second year of the operation of the Alliance, to ensure admission of newest members into roundtables and an appropriate working commitment from every roundtable member. The active and concrete participation of all roundtable members in the Alliance’s work and contribution to the proposed ad-hoc exercises is crucial for the progress of the various tasks and to deliver on the various requests from the members of the Alliance.

ROUNDTABLE 1: THE AVAILABILITY OF FEEDSTOCKS, SYNERGIES AMONG SECTORS AND THE JUST TRANSITION”

- *Take stock of the current energy demand and the availability of resources to support the EU climate ambition.*

Roundtable 1 on feedstock and synergies is invited to take stock of the current energy demand and the availability of resources to support the energy transition of the fuel industry and the decarbonisation of transport. Currently, a wide array of products from the refining of crude oil fulfils the vast majority of the energy needs for transport of citizens and businesses alike. To satisfy the market demand, about 65% of the crude oil processed in EU refineries is transformed into (mostly liquid) fuels for transport, about 10% provide petrochemical feedstocks, and about 25% is employed for other products. To comply with the European Green Deal many technologies are needed and it will be essential to develop an effective industrial cooperation in Europe, supported by the relevant R&D frameworks. Many technologies and diversified feedstocks are needed to develop and scale-up in a sustainable way to support the European Green Deal objective and it will be essential to develop an effective industrial cooperation in Europe across the whole value chain, supported by the right R&D frameworks.



To enable the decarbonisation by 2050 of the aviation and maritime sector - without excluding the fact that in the medium term different renewable and low-carbon fuels will continue to play an important role in the decarbonisation of road transport - a critical technologies must be deployed at scale.

To this end, Participants in Roundtable 1 are invited to reflect on the deployment of renewable and low carbon fuels technologies and synergies considering the following elements as a starting point consistently with the Renewable Energy Directive (2018/2001 EU), the regulations ReFuelEU Aviation FuelEU Maritime. The table below refers to various fuel technologies allowed by the above mentioned legislations.

| Type of fuels | Feedstock / sources | RED II(i) | ReFuelEU Aviation | FuelEU Maritime |
|---|---|-----------|-------------------|-----------------|
| 1. Biofuels | Food and feed crop ^[1] | X | | |
| | Annex IX A (Advanced biofuels) | X | X | X |
| | Annex IX B (Used cooking oil, Animal fats Cat 1 & 2) | X | X | X |
| | Other non-food and non-feed residues or feedstocks not in Annex IX for biofuel production | X | X ^[2] | X |
| 2. Recycled Carbon Fuels (RCF) | Liquid or solid waste streams of non- renewable origin which are not suitable for material recovery or from waste processing gas and exhaust gas of non-renewable origin which are produced as an unavoidable and unintentional consequence of the production process in industrial installations | X | X | X |
| 3. Renewable Fuels of Non-Biological origin (RFNBO) | Energy content derived from renewable sources other than biomass | X | X | X |
| 4. Other low carbon fuels ^[3] | Low carbon hydrogen (encompassing fossil-based hydrogen with carbon capture and electricity-based hydrogen, with significantly reduced full life-cycle greenhouse gas emissions compared to existing hydrogen production) | | X ^[4] | X |

^[1] Low-carbon fuels' means recycled carbon fuels as defined in Article 2 of 'Includes only 'low-carbon hydrogen for aviation' and derived 'synthetic low-carbon aviation fuels' that are of non-biological origin, the energy content of which is derived from non-fossil non-renewable low-carbon sources, which meet lifecycle emissions savings threshold of 70%.

^[2] Low-carbon fuels' means recycled carbon fuels as defined in Article 2 of 'Includes only 'low-carbon hydrogen for aviation' and derived 'synthetic low-carbon aviation fuels' that are of non-biological origin, the energy content of which is derived from non-fossil non-renewable low-carbon sources, which meet lifecycle emissions savings threshold of 70%.

Roundtable 1 on the "Availability of feedstocks, synergies among sectors and the so-called Just transition" will be invited to work on the following objectives:

- i. **Supply, demand and the key technology option for the renewable fuel production:** the current supply of liquid fuels, mostly of fossil origin, in EU road, aviation and maritime transport is currently about 370 Mtoe/y. The demand for liquid fuels is expected to decline (ref. CCW/FuelsEurope and IEA energy outlook, 2021). This is the result of various drivers such as the implementation of energy efficiency measures as well as the penetration of alternative technologies, such as electrification or gaseous fuels while the renewable fuels and the e-fuels are progressively replacing fossil fuels in liquid fuel usage, contributing to the 2050 climate neutrality objective.
- ii. Participants in Roundtable 1 are also invited to identify **key actions to speed up the replacement of the (fossil) liquid demand with the non-fossil and sustainable one** and recognise how would be possible to reach the maximum efficiency of the decarbonisation with lower costs (in terms of Euro/ton CO₂) through the competition of alternative solutions.
- iii. Participant in Roundtable 1 will continue considering the availability of sustainable feedstock, the enabling conditions for the market scale, the bottlenecks in the value chain and opportunities for domestic supply and/or for imports.
- iv. Roundtable 1 will also consider the **risks and the potential unexpected challenges of technical feasibility, costs and unintended consequences for the society** and discuss mitigating actions and strategies for the industry. In the short to medium term, renewable fuels alternative to petroleum based liquid fuels such as advanced biofuels and e-fuels will be more expensive to produce than the petroleum based equivalent. Therefore, the affordability of these alternative fuels needs to be achieved and, in the short term, improved. *How ensure that nobody is really left behind to have a “just transition”?*

Assess and exploit the synergies of all transport sectors

Decarbonisation is expected to be a simultaneous process where transport modes (road, aviation and maritime transport) will progress in parallel, including the segment of construction vehicles and agriculture machineries. Decarbonisation is also becoming a topic of interest for the military and defence sectors and their transition, although characterized by different requirements and needs, should also be considered.

Assessing the technological path and the associated costs

To enable by 2050 aviation and maritime to reach the climate neutrality, a combination of critical technologies must be deployed at industrial scale. The combination of options practically available will be different from site to site, dictated by different factors such as existing configuration, location and proximity to other industries.

The development at industrial scale of renewable and low-carbon fuels needs a number of “enablers”, including (but not limited to):

- Support R&D frameworks to develop an effective industrial cooperation and industrial ecosystems in Europe to boost a combination of multiple technologies;
- Facilitate industrial cooperation and partnerships by cataloguing technology needs of RLCF Alliance members
- Enabling international regulatory frameworks for the promotion of the renewable and low-carbon technologies;

Finally, the Roundtable will discuss about the costs that the transition of the industry along the whole value chain towards these technologies will imply and liaise with Roundtable 4 on these topics. EU research and development programmes (e.g. the Innovation Fund) are expected to trigger further development and investments in the renewable and low-carbon technologies, potentially reducing the production costs in the coming years (e.g. CAPEX reduced due to the development and scaling up of the technologies).

Building on the elements above, Participants in the Roundtable 1 will develop a shared vision on the availability of feedstock, technologies and processes, the production capacity and renewable and low-carbon fuel quantities, also identifying the different renewable and low-carbon fuel pathways.

ROUNDTABLE 2: PRODUCTION PATHWAYS AND VALUE CHAIN – AVIATION

Sustainable aviation fuels (SAF) are an immediate and available solution that has been identified as one of the most promising ways to reduce meaningfully the environmental footprint of aviation in the short to medium term. By 2050 the aviation sector may need around 400-500Mt/year of SAF worldwide to achieve its net-zero emission objective. However, today, global production is estimated to provide less than 0,1 % of the aviation needs. This very low level of production results in particular from too limited investments and no efficient incentives to use SAF as they remain too expensive and therefore uncompetitive for final users - air operators mainly, but also aircraft and engine manufacturers - without policy support.

ReFuelEU Aviation Regulation (in the final stage of adoption at the time of drafting) will provide a predictable and long-term regulatory framework for the large scale deployment and uptake of SAF.

The Alliance, supported by its members, will continue to work on the relevant enabling conditions and measures to ensure that SAF production capacities in Europe will grow quickly and consistently with the blending mandate trajectory set in the ReFuelEU Aviation and beyond if relevant. The Roundtable will continue to focus on identifying and addressing all the existing obstacles to SAF mass deployment and production. Finally, as SAF deployment is a global challenge, participants in the roundtable are invited to promote and support international cooperation with relevant similar Alliances around the world and international organizations (ICAO, ECAC, IMO). The 2023-2024 work programme will build on the work already accomplished during the first year of the Alliance and taking advantage of all potential synergies between the thematic roundtables.

RT2 activities and initiatives should be geared toward achieving the following tasks:

- ***Keep up to date the established common knowledge base (stocktaking exercise)***

The Roundtable 2 should periodically review and keep up to date the common knowledge base established in the first year of the Alliance with particular regard to the information needed by industrial partners and potential investors to understand and invest in the SAF Market.

- ***Elaborate a roadmap for scaling up SAF: taking into consideration the diverse maturity of SAF pathways (certified and new ones)***

Existing SAF pathways do not have the same level of technological development, and commercial maturity, certification status in terms of aviation safety, environmental benefits (different level of emission gains) or industrialisation timeframe, scalability and different economic viability (cost competitiveness).

In order to build an optimised and rational investment strategy that reconciles both the objective of rapidly increasing their availability on the market with their technological and commercial maturation, it is first necessary to build a clear and common roadmap for the rapid development and commercialisation of the different SAF production pathways.

In 2023, the Roundtable started to produce an assessment of the existing certified SAF pathways in order to build a SAF deployment roadmap that would clarify the sequencing of the technological and commercial maturation of each pathway as of today until 2030 (expected timing for the commercial full-scale deployment of synthetic fuels on the SAF market). The roadmap should identify, for each of SAF pathway (certified and new ones), the technological and economic barriers to be removed and the R&D activities necessary to make rapid progress towards their introduction on the market. In addition, other barriers are considered, including the analysis of the existing and required logistics and infrastructures along the entire value chain, standardisation and certification, skills, etc for the production and supply of SAF across Europe (including in smaller airports) and its regions. It should also identify the strengths and weaknesses, opportunities and risks of the SAF Value Chain in Europe, with due consideration of Europe's regional differences, for each of the SAF pathway.

This work should also assess the potential of environmental benefits of various SAF production pathways, and take stock of gaps and differences in terms of SAF sustainability assessments (e.g. difference in Life Cycle Assessment approaches) to allow investors and value chain stakeholders make the right decisions.

The roadmap will propose a short and efficient action plan to unlock the potential of the identified SAF pathways (R&D, business model and sustainability understanding, identification of gaps in the value chain and industrial projects). For each SAF pathway, the roadmap should answer to this question: *what are the steps to be taken and the obstacles to overcome in order*

to move towards full scale production and reach economies of scale? how to unlock SAF production with viable business models across various regions of Europe? what bottlenecks needs to be overcome to ensure availability and supply of SAF in all European airports in medium and long term?

At the end, the main objectives of the roadmap should be to complete and accelerate the transition to the market of industrial processes in their late R&D stage (with a strong focus on the development of demonstrators, first of kind production plants...) and to build a viable business model for their full-scale deployment across Europe. The roadmap would also identify opportunities and barriers for Member States for creating a SAF value chain production.

This work stream should be restarted with the support of all the experts of the Roundtable.

- ***Supporting the creation of a dynamic European SAF market***

Roundtable 2 has started the work on the market levers needed to future boost the supply and demand for SAF in the European Union.

The Roundtable is invited to continue and finalize the assessment of the demand stemming from the regulatory requirements, but also additional demand potential from industry voluntary commitments. It should further examine additional supply/demand required to meet national and sectorial aspirational targets, including comparison of scenarios in various sectoral decarbonisation roadmaps;

Based on the previous identification of gaps in the value chain and actions needed to overcome those, the Roundtables will quantify investment needed to reach the various demand scenarios. It should also qualitatively and quantitatively assess the investments needed at the level of each SAF production pathway (certified and new ones) taking account of specific feedstock technologies and process as well as geographical and regional factors.

As a consequence of this work, the Roundtable will coordinate with Roundtable 1 towards a production ambition for the Alliance for SAF within the EU by year, based on the demand and feedstock available.

The Commission may consult the Roundtable on its work on the study on a possible revision SAF supply flexibility mechanism under the ReFuelEU Aviation Regulation and the members are invited to contribute to this work by sharing their knowledge and experience on industry-driven initiatives on that subject, notably as concerns so-called “**book and claim**” initiatives.

The Roundtable may also consider the needs to develop guidelines and contract templates for medium and long-term supply of SAF.

The Roundtable is also invited to contribute to the work of Roundtable 4 by exploring the possibility of creation of a SAF revenue mechanism, including financial and market-based incentives to close the price gap between SAF and fossil fuels, increase affordability of SAF and

further accelerate the deployment and uptake of SAF (e.g. contract for difference mechanism of SAF, feed in tariffs).

Similarly to the Roundtable 3, action plan on the “economical” levers outlined below, the Roundtable will provide the Roundtable 4 indications on the relevant economic aspects of SAF production (this may include cost structure breakdown, total ownership costs according to the SAF technological pathway).

- ***Facilitating the certification of new SAF pathways (EU Clearing House)***

The Roundtable is also expected to follow-up and contribute to the facilitation of new SAF pathways certification through the **EU Clearing House** initiative led by EASA.

The certification of new sustainable aviation fuels performed by standardization bodies such as ASTM International and DEF STAN, is on the critical path before any market deployment. However, this certification process, that takes place today mainly in the US under the ASTM International leadership, can be complex, expensive and often very long, potentially discouraging small European producers from innovating. Cost and duration of the certification process must be reduced in order to foster innovation and support a diverse mix of additional pathways that lower the cost of SAF with a high potential for emissions reductions. As such, support for these companies in their certification process is necessary.

With this view and in order to help European producers to innovate, the Roundtable will support initiatives from the regulation authorities, in particular EASA, to simplify, streamline and to coordinate better from a European stakeholders point of view, the SAF certification process and seek opportunities to simply and streamline that process. This might include actively updating and engaging European stakeholders on fuel specification activities to ensure European stakeholders are engaged, well informed and that their views are passed on to the standardization bodies like ASTM.

In coordination with EASA, the Roundtable will discuss the opportunity and challenge pertaining to a stronger European coordination and communication on SAF certification which can be fed into the work of an EU Clearing House for SAF, being implemented by EASA. Relevant stakeholders in the SAF certification process (fuels producers, test laboratories, engine manufacturers...) should be associated.

- ***Feeding the investment projects pipeline with SAF***

The Roundtable is invited to take stock of the results of its work, in particular with respect to the identification of the production potentials, with the SAF roadmap and production targets and potential demand, the gaps and investment priorities along the SAF value chain in order to help the Steering Group in identifying the selection criteria (i.e. elaborating standard scheme to build the pipeline) for the first call for proposal for investments expected in Q1 2024, and identify the type of industrial and R&D SAF projects to feed the initial investment pipeline.

Finally, the Roundtable will map the announced and launched SAF projects in Europe⁴. Such map should outline key technological and commercial characteristics of the project, including information on the technology and commercial readiness levels, feedstock and production pathway, GHG reduction potential.

- **Engage on the promotion of renewable and low-carbon fuels for maritime and air transport under the EU's Global Gateway.** The EU's Global Gateway initiative was released in 2021 with the goal to narrow the international gap in infrastructure investment. The initiative will improve trade with international partners and invest, among others, in green energy and transport infrastructure. In 2023, a Global Gateway flagship initiative on a Green Maritime Corridor was proposed and further initiatives could be envisaged on sustainable aviation fuels. In this context, the network, knowledge, and expertise of the RLCF Alliance can prove a crucial resource for the definition of future EU engagement on sustainable and alternative fuels for the shipping and aviation sectors.

ROUNDTABLE 3: PRODUCTION PATHWAYS AND VALUE CHAIN – WATERBORNE TRANSPORT

Unlike aviation, maritime transport can use a wider variety of RLCF as energy carriers in different combination of energy conversion systems. Distinct factors may interact in the technical/operational decision to use different RLCF, including operating profile of the ships, fuel availability along the route/ports of call of the ship, safety/risk analysis aspects, amongst others. Assessing the feasibility of utilization of different RLCFs in the maritime segment, and developing their value chain, in a context where the end users/maritime operators have multiple options, is one of the key objectives of Roundtable 3. The large volumes of expected RLCF demand from shipping, only for compliance with FuelEU GHG intensity targets, will pose a challenge to the industry. In order to address the challenge, the Roundtable will continue to look at the important relevance of distinct pathways, oil/biomass fuels based, renewable synthetic and, as appropriate, methanol/methane and ammonia and hydrogen in line with the technology neutrality basis of Fuel.

With the publication of the FuelEU Maritime,⁵ it became also clear the need to look specifically at the use of Renewable Fuels of Non-Biological Origin (RFNBOs), not only due to the specific incentive mechanism introduced (multiplier) but also due to the potential for a mandatory sub-target from 1st

⁴ Such as: [Initiatives and Projects \(icao.int\)](https://www.icao.int/initiatives-and-projects/) – more information [here](#) and map [here](#).

⁵ **FuelEU Maritime Regulation (Regulation (EU) 2023/1805 of the European Parliament and of the Council of 13 September 2023 on the use of renewable and low-carbon fuels in maritime transport, and amending Directive 2009/16/EC) published on 22 September 2023.**

<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32023R1805>

January 2034 which may impact significantly the strategies for compliance. To this end, the Work Plan for 2023/24 includes specific consideration for the use of such fuels. It is relevant to understand how the demand will likely develop in view of the particular reward provided by the multiplier⁶. In addition, RT3 will also consider the impact of a possible sub-target⁷ from 1 January 2034.

The work of Roundtable 3 allowed, during 2022/23, to develop knowledge on 1) Supply and demand of marine RLCF, with a dedicated analysis developed; 2) GHG Fuel Certification, in cooperation with the ESSF⁸; 3) Fuel Supply Contract templates; 4) Commercial pipeline database and 5) Identification of wider regulatory gaps/constraint.

The Roundtable will continue to work on the relevant enabling conditions and measures to ensure that RLCF for shipping will be accessible, technically viable and available, consistently with the requirements defined by FuelEU Maritime. The Roundtable will continue to focus on identifying and addressing all the existing obstacles to RLCF marine fuels deployment and accessibility, remarkably fuels quality standards, GHG marine fuels certification. Finally, as RLCF marine fuels deployment is a global challenge, participants in the roundtable are invited to promote and support international cooperation with relevant similar Alliances around the world and international organizations, specifically IMO or ISO. The 2023-2024 work programme will build on the work already accomplished during the first year of the Alliance and taking advantage of all potential synergies between the thematic roundtables.

RT3 activities and initiatives should proceed, building up on the work done so far, towards the achievement of the following tasks:

- ***Keep up to date the established common knowledge basis (stocktaking exercise)***, mapping the state of the art of the adoption of RLCF, available data and studies, and the opportunities arising from these fuels in the short, medium, long term, and the technological, regulatory, and permitting barriers hindering their early uptake. This exercise has been undertaken under the first year of operation of the Alliance, with the collection of several studies and references available in the public and scientific domain. Notwithstanding, the work towards this task is considered a continuous effort, given the constant evolution of the sector and the increasing uptake of RLCF in waterborne transport.
- ***Development of a mapping exercise of Technology and Commercial Readiness Levels for different Fuel Products, considering the different possible pathways for their production, distribution, bunkering, and use of RLCF in ships and shipping.*** Following the assessment of the Roundtable, Technology Readiness Levels were not considered to be a major challenge to

⁶ **A multiplier of “2” shall be applied to all energy used provided by RFNBOs, until 31 December 2033.**

⁷ **A possible subtarget of 2% RFNBOs will be applicable as of 1 January 2034, if the share of RFNBOs in the maritime bunker fuel mix is less than 1% for the reporting period of 2031.**

⁸ **European Sustainable Shipping Forum**

decarbonization of shipping nor, in particular, for compliance with targets defined by FuelEU Regulation, both in terms of fuels or energy conversion technologies. Notwithstanding this, the Roundtable acknowledges the need for continued efforts for research and pilot projects to demonstrate the market readiness of innovative fuels systems and energy conversion technologies. Building on the common knowledge basis exercise, Roundtable 3 worked on a database matching production, technology and infrastructure with potential investments needs. The demand potential and identification of quantitative targets led to supply indicators by fuel technology. Based on this work, the Alliance assessed the feasibility of utilisation of different RLCF in the waterborne segment. Since the maritime value chain could rely on a large variety of RLCF (i.e. biofuels, synthetic fuels, methanol, ammonia, hydrogen) with different feedstock, infrastructure (depending also on ports size) and transportation needs, a discussion on the maturity of fuel uptake in ports and onboard ships and prioritisation of fuel pathways shall be initiated, based on criticalities assessment above, also considering the role of LNG as a transitional maritime fuel. After having assessed fuel opportunities, maturity and upstream value chain potential, members shall target those technological constraints that are hindering the development of a RLCF value chain - in particular, technologies and strategies to ensure sufficient availability of fuels at ports.

- ***Contribution to the development of a RLCF certification framework which is compatible to the requirements of the FuelEU Maritime, including both fuel quality and sustainability certification.***
Fuel Certification is a key building block of the FuelEU Maritime, being the key element of evidence for operators to demonstrate compliance with the provisions of the regulation. A sound, verifiable, enforceable certification framework that is able to operate at international level is of primary relevance for FuelEU. In addition, quality standards for fuels need to be ensured considering existing ISO standards. Experience in Fuel Certification schemes operating currently in the aviation sector should be taken as reference and work in cooperation with existing international certification companies accredited today under RED was undertaken to address the specific aspects of the maritime sector. A dedicated workstream under the roundtable 3 has contributed to the better knowledge of the issues at stake, gathering certification companies of the sector and beyond, and liaising with the ESSF on this topic. This work shall be further continued in the framework of FuelEU Implementation with increased links with DG-ENER, international bodies and certification companies, ensuring complementarity between the EU and IMO level. The topic of GHG Fuel Certification will be also of central relevance to the IMO ongoing work on the Interim Guidelines for GHG Life Cycle Assessment of marine fuels. The work currently ongoing at IMO is strongly based in the same Life-Cycle based assessment of marine fuels, with fuels certification being a key building block to the implementation of such methodology.
- ***Development of Guidance for drafting of Fuel Supply Contract templates for Maritime Operators***
The Alliance identifies the relevant best-practices with respect to the establishment of

contractual relations between maritime operators and fuel suppliers with a view to prepare the sector for a contract-based fuel supply to shipping as a mitigating measure to reduce the risk of non-availability. This was tackled under a dedicated workstream in this roundtable with the most prominent contracting companies of the sector – with the aim to identify the gaps preventing RLCF offtake agreements and accelerate RLCF contracts establishment. Further work is needed on this point to develop a balanced guidance to the drafting of fuel supply contracts of fixed term.

- ***Support the identification and the use of a common pipeline of both existing and new investment projects suitable for development and bankable for financing. Contextually, ensuring alignment of industrial projects to enable new value chains.*** In particular, the Roundtable will support the Steering Group in identifying the selection criteria for the first call for proposal for investments expected by 2024, with a focus on projects with the highest maturity aiming at upscaling RLCF production, logistics and technology development and bankable by design. Matching sessions shall be facilitated between the alliance stakeholders proposing those projects and public and private financing Institutions (i.e. within the framework of the Financial Roundtable), in order to support their early start. Project pipelines, based on priorities identified and on financial schemes to build up a project portfolio, shall be further developed in 2024 and onwards.

In addition to the above tasks, in particular for the forthcoming period of 2023/24, the Roundtable 3 will further:

- **Assess the potential for the use of RFNBOs in compliance strategies with FuelEU Maritime for the period of 2025 to 2034 and beyond.** With the incentive mechanism of a “multiplier” for renewable synthetic fuels introduced in the FuelEU, the Roundtable will assess the potential for uptake of these fuels, considering compatibility/blendability of RFNBO products with existing fuel systems. The use of RFNBOs in a period where the availability will be still in the early scaling-up stages may be a challenge but, in the way it is introduced in the Regulation, also an opportunity that the Roundtable will assess with a view to consider relevant enablers for appropriate use of the incentive mechanism. This task may gain advantage from knowledge developed in the Supply-Demand assessment and Fuel Supply contracts.
- **Engage on the promotion of renewable and low-carbon fuels for maritime and air transport under the EU’s Global Gateway.** The EU’s Global Gateway initiative was released in 2021 with the goal to narrow the international gap in infrastructure investment. The initiative will improve trade with international partners and invest, among others, in green energy and transport infrastructure. In 2023, a Global Gateway flagship initiative on a Green Maritime Corridor was proposed and further initiatives could be envisaged on sustainable aviation fuels. In this context, the network, knowledge, and expertise of the RLCF Alliance can prove a crucial

resource for the definition of future EU engagement on sustainable and alternative fuels for the shipping and aviation sectors. To a greater extent, the Roundtable will assess the relevance of green corridors in the deployment and scalability of RLCF for maritime transport.

- **Identify gaps and challenge in terms of Safety and Certification of alternative fuels in shipping.** In line and complementarity with Objective 13, and in close cooperation with the relevant Commission services and Expert Groups (DG-MOVE, European Sustainable Shipping Forum, Passenger Ship Safety expert group), and taking special consideration to the work ongoing at the International Maritime Organization map the relevant challenges that require further action towards completeness of the safety and quality certification for different alternative fuels and energy systems. The work should focus on the safe measures for use, bunkering and handling of fuels of lower-flashpoint and containing other distinctive hazardous properties and should start by the identification of gaps not addressed already or initiated at IMO. The relevant deliverable for this task should consider of a list of relevant points to be addressed/submitted, in cooperation and collaboration with Commission and existing Member States/Industry to IMO consideration for further work. In addition to the safety provisions for the use of alternative fuels, also the certification of fuels quality for marine use.
- **Assess challenges specifically related to the deployment of Alternative Fuels Infrastructure in Ports,** notably those related to the interoperability, interconnectivity and safety of ship-shore fuel handling operations. To this end, the Roundtable 3 will work specifically with the elements that relate to port infrastructure.

Similarly, to the prioritization exercise done by the Roundtable for the work during 2022/23, a prioritization will also be developed for the work in 2023/24, taking into account available resources/expertise in the group, guidance from the Chair an input from the General Assembly and the Commission.

In addition to the tasks identified above, Roundtable 3 has worked on the identification of remaining regulatory gaps and implementing issues. The work will continue in 2024.

Note: Where relevant, the Roundtable 3 should ensure contact and cooperation with other relevant bodies such as European Maritime Safety Agency or the European Sustainable Shipping Forum.

ROUNDTABLE 4: ACCESS TO PUBLIC AND PRIVATE FINANCE

This thematic Roundtable is dedicated to the identification and, if necessary, the improvement and possible creation of funding and financing frameworks and instruments. The Roundtable is open to the participation of public and private financing organisations, funding authorities, corporates, associations, and other members of the Alliance involved or interested in funding and financing of renewable and low carbon fuels projects for the aviation and waterborne sectors.

Key elements of the workflow include, but are not limited to, the following:

- **Structuring the participation of the financial institutions and fora in the works of the Alliance** on a permanent basis so that they can provide their expertise concerning the types of projects they may be interested in financing, and the criteria they should respond to. This was delivered in the first year of the Alliance with integration of many financial institutions in the Roundtable, and the delivery of a high-level financial model from upstream production to end users of RLCF, bankability criteria for projects, analysis of risk assessment by financial institutions. This work will be continued on the second year of the Alliance.
- **Engaging with EU, national and regional authorities providing public funding to understand the availability and suitability of the different funding instruments and schemes for renewable and low carbon fuels projects**, with a particular focus on the maritime and aviation sector, and the conditions that apply. This ongoing work will lead to a Funding and Financing Investment De-risking Guide (or Compass), to be delivered in Q4 2023/Q1 2024 (see Annex A), summarizing all available public funding in the area of renewable and low carbon fuels, with relevant information and contacts.
- To make sure the Alliance can address the funding and financing needs efficiently, it is of utmost importance to stimulate the interest of the financial community in the works of the Alliance. To this end the Alliance is **mapping the relevant public and private financial institutions and undertakes reach out activities to invite them to become members of the Alliance**. Roundtable 4 led outreach activities to the EBRD and EIB with dedicated webinars opened to all participants of the Alliance and will continue this work in cooperation with the financial community throughout its second year of operation. Dedicated exchanges on future design of financing and funding instruments, such as the Innovation Fund or the Hydrogen Bank, were also undertaken.
- Building on the analysis of the existing funding opportunities and investments needed in coherency with the three Roundtables, the Alliance will also **assess potential funding gaps and the need for additional new financing and de-risking instruments or products** outlining the main characteristics of such possible instruments/products. In this respect the Roundtable is assessing in particular the use of (carbon) contracts for difference, double auction schemes to bridge the gap between supply side offtake and demand side offtake or similar supporting mechanisms (such as feed in tariffs, revenue certainty mechanisms) and their relevance to minimize price uncertainty and stabilize and/or put a floor to project's cash flows.
- The Alliance is also **seeking advice from the financial community in preparation of the investment projects call (in view of the first project pipeline)**. Particular focus should be given to the financial sustainability requirements, and the contractual framework with a view to facilitate the future financing of the projects embedded in the pipeline.

ANNEX A. OVERVIEW OF ACTIONS

| OBJECTIVE | ACTION | DELIVERABLE | WHO | TIMEFRAME |
|---|--|--|---|------------------------------|
| Objective 1: identify transport fuels which are most economically and environmentally suitable & evaluate strong and weak points of the value chain | 1. Keep up to date the established common knowledge basis | Database of existing studies and reports | All RTs | Ongoing |
| | 2. Expand the educational role of the Alliance: organize regular webinars, presentation of projects, studies | | Steering Group | Ongoing |
| | 3. Elaborate a roadmap to scale up RLC fuels taking into consideration the diverse maturity of fuel pathways, and different techno-economic and geographic factors | RLCF roadmap | RT 1 Feedstocks RT 2 Aviation RT 3 Waterborne | Ongoing Q4 2023 |
| | 4. Identify gaps in the value chain and quantify investment needs taking account of specific technologies and geographies | Analysis of the EU supply chain and action plan | RT 1 Feedstocks RT 2 Aviation RT 3 Waterborne | Ongoing Q4 2023 / Q1 2024 |
| | 5. Update the RLCF demand forecast | Map and quantify the investment needs across the value | | |
| | 6. Define production objectives for RLCFs within the EU by year, based on demand and feedstock available | | | |
| | 7. Develop a mapping exercise of Technology and Commercial Readiness Levels for different Fuel Products, considering the different possible pathways for their production, distribution, bunkering/storage, and use of RLCF in shipping and aviation | Technology mapping | RT 1 Feedstock RT 2 Aviation RT 3 Waterborne | Q4 2023 |
| Objective 2: assess the enabling conditions & identify gaps in standardisation, safety assessments, and raise awareness on certification requirements | 8. Facilitate the certification of new RLCF pathways and contribute to the development of the EU Clearing House | Clearing House design and assessment | RT 1 Feedstock RT 2 Aviation | Q1 2024 |
| | 9. Contribute to the COM work on SAF supply flexibility mechanisms | Input on flexibility mechanisms | | |

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|--|--|---|---------------------------------------|----------------------------|
| | | | | |
| | 10. Assess the coherency and synergies among regulatory frameworks and existing certifications | Regulatory & certification readiness framework assessment | RT 2 Aviation RT 3 Waterborne | Q2 2024 |
| | 11. Contribute to the development of a RLCF certification framework which is compatible to the requirements of the FuelEU and from the IMO, including both fuel quality and sustainability certification. | Organisation of a workshop with ESSF | RT 3 Waterborne | Q4 2023/Q1 2024 |
| | 12. Develop guidance for drafting Fuel Supply Contract templates for maritime operators and a global framework for renewable contracts | Guidance document from best practices | RT3 Waterborne | Q2 2024 |
| | 13. Identify gaps in the framework for the use of RLCF/SAF by maritime transport and by aviation, including aspects related to production and infrastructure, safety measures for operations | Report on bottlenecks and possible recommendations | RT 2 Aviation RT3 Waterborne | Q1 2024 |
| Objective 3: Identifying and assessing existing relevant public and private financing opportunities | 14. Identification of existing funding opportunities and de-risking gaps, including at Member State level, and if necessary, identify needs and characteristics for new instruments, that can meet the identified investment needs. 15. Identify existing and explore new financing initiatives to accelerate transactions between investee and investor and use feedback gathering arguments for additional support mechanisms, where necessary, for key elements in the value chain.. | Financing and de-risking and Funding guide | RT 4 Access to Finance | Ongoing Q4 2023/Q1 2024 |
| | 16. Identify enabling condition for setting up a certainty revenue mechanism for SAF in the EU | Works on double auction mechanism | RT2 Aviation RT4 Access to finance | Q2 2024 |
| | 17. Engage on the promotion of renewable and low-carbon fuels for | Promotion of RLCF under | RT2 Aviation | Q4 2023-Q1 2024 |

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|---|---|--|--|------------|
| | maritime and air transport under the EU's Global Gateway | Global Gateway | RT3 Waterborne | |
| Objective 4: Create of a pipeline of investment projects | 18. Launch a call for industrial and R&D RLCF projects to feed the initial investment pipeline. Matchmaking events to ensure meetings of partners and investors | Project self-assessment tool | Steering Group & contractors | Q1 2024 |
| | 19. Translate the project collection into a working document, and adapt if needed project mappings and findings of RTs 1, 2 and 3 | Map of RLCF projects with key characteristic | Steering Group RT 1 Feedstock RT2 Aviation RT3 Waterborne | Q2 Q3 2024 |
| | 20. Monitoring of project deployment and identification of unforeseen challenges of projects in the pipeline | Market awareness of overall proximity to the targets | Steering Group RT1 Feedstock RT2 Aviation RT3 Waterborne RT4 Access to finance | Q3/Q4 2024 |
| | 21. Working on introducing an RLCF Alliance label associated to projects on the project pipeline | Improving visibility and incentives to participate in the pipeline | Steering Group & contractors | Q1/Q2 2024 |
| Objective 5: creating synergies with different transport modes | 22. Develop a complete supply chain and end use vision, including other transport modes | Assess the synergies and find ways to value them in tasks relating to objectives 1, 2 and 3 | RT 1 Feedstock | Q2 2024 |
| | 23. Develop an assessment of the social implications of the energy transition | Social dimension of the energy transition: implications on jobs and economic value – opportunities | RT 1 Feedstock | Q3/Q4 2024 |

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|--|--|--|----------------|------|
| | | and shortcomings Affordability of transport | | |
| | 24. Ensure synergies and interaction of the Alliance with other key EU legislative initiatives | Net-Zero Europe Platform | Steering Group | 2024 |

ANNEX B. MEMBERSHIP

STEERING GROUP OF THE ALLIANCE:



FINCANTIERI

FuelsEurope



SAFRAN

MEMBERS OF THE ALLIANCE (AS OF 9 OCTOBER 2023) – 233 MEMBERS

- | | | |
|---|---|---|
| ✓ A.P. Møller – Mærsk A/S | ✓ Air Liquide | Productos Petróíferos |
| ✓ ACI EUROPE (Airports Council International) | ✓ AIRBUS | ✓ AOP ASSARMATORI SHIPOWNERS ASSOCIATION |
| ✓ ACT group | ✓ aireg – Aviation Initiative for Renewable Energy in Germany e.V. | ✓ Associação de Bioenergia Avançada (ABA) |
| ✓ Aena SME S.A. | ✓ Airlines International Representation in Europe | ✓ Assonave |
| ✓ AerCap Ireland Ltd. | ✓ Airport Regions Council | ✓ ATOZ Aviation Finance S.à r.l |
| ✓ Aeroporti di Roma Spa | ✓ Airpetro – Energia em Evolução | ✓ ATR |
| ✓ Aerospace and Defence Industries Association of Europe (ASD) | ✓ Argent Energy NL | ✓ Auris BioEnergy Inc. |
| ✓ Air and Space Academy | ✓ Asociación Española de Operadores de | ✓ Autorités françaises |
| ✓ Air France-KLM | | ✓ Ballard Power Systems Europe |

- ✓ **BIMCO**
- ✓ **Bioledger Ltd.**
- ✓ **BNP Paribas**
- ✓ **Boeing International Corporation**
- ✓ **BP plc**
- ✓ **Bse Methanol GmbH**
- ✓ **BTG Biomass Technology Group BV**
- ✓ **Bureau Veritas Marine & Offshore**
- ✓ **CAPHENIA GmbH**
- ✓ **Carbon Engineering**
- ✓ **Cargolux Airlines International S. A.**
- ✓ **CENA (Centre of Competence for Climate, Environment and Noise Protection in Aviation) as part of Hessen Trade & Invest GmbH**
- ✓ **CEPSA**
- ✓ **CETENA SPA**
- ✓ **Chantiers de l'Atlantique**
- ✓ **CIMAC e.V.**
- ✓ **Circtec Ltd**
- ✓ **Clariant**
- ✓ **Clean Air Task Force (CATF)**
- ✓ **CLIA Europe**
- ✓ **CO2 Value Europe**
- ✓ **Coalition for the energies of Tomorrow in Transport and Supply Chain**
- ✓ **Concawe**
- ✓ **Corncern Achema Group**
- ✓ **Costa Group**
- ✓ **Crédit Agricole Corporate and Investment Bank**
- ✓ **Cyprus Shipping Chamber**
- ✓ **Damen Research Development & Innovation BV**
- ✓ **Danish Shipping**
- ✓ **Danske Maritime**
- ✓ **DASSAULT AVIATION**
- ✓ **Deutsche Post DHL Group**
- ✓ **Deutsches Zentrum für Luft – und Raumfahrt (German Aerospace Center)**
- ✓ **Dimeta**
- ✓ **Dirección General de la Marina Mercante**
- ✓ **easyJet Europe Airline GmbH**
- ✓ **EBB – European Biodiesel Board**
- ✓ **Ecospray Technologies s.r.l.**
- ✓ **ECSA – European Community Shipowners' Association**
- ✓ **EDL Anlagenbau Gesellschaft mbH**
- ✓ **eFuel Alliance**
- ✓ **Electricité de France (EDF)**
- ✓ **Electriq Global Ltd.**

- | | | |
|--|--|--|
| ✓ Elyse Energy | Alternative Powertrain Manufacturers (EUROMOT) | Supply Association |
| ✓ en2x - Wirtschaftsverband Fuels und Energie e. V. | ✓ European Bank for Reconstruction and Development | ✓ European Regions Airline Association Ltd. (ERA) |
| ✓ Enagás S.A. | ✓ European Barge Union | ✓ European Sea Ports Organisation (ESPO) |
| ✓ ENERGIA | ✓ European Biogas Association | ✓ European Union Aviation Safety Agency |
| ✓ Enerkem inc. | ✓ European Boating Industry | ✓ Evergreen marine corp. |
| ✓ ENGIE | ✓ European Business Aviation Association – EBAA | ✓ EWABA |
| ✓ Eni S.p.A. | ✓ European Cockpit Association | ✓ Exolum Corporation S.A. (Exolum) |
| ✓ Ente Nazionale per l'Aviazione Civile | ✓ European Confederation of Fuel Distributors (ECFD) | ✓ ExxonMobil Petroleum & Chemical BV |
| ✓ Environmental Defense Fund Europe | ✓ European Dredging Association (EuDA) | ✓ Fertilizers Europe |
| ✓ ePURE - European renewable ethanol | ✓ European Energy A/S | ✓ FETSA Federation of European Tank Storage Associations |
| ✓ ETIP Bioenergy | ✓ European Onshore Power | ✓ Fincantieri S.p.A |
| ✓ EU IWT Platform | | ✓ FinCo Fuel Group |
| ✓ EUROCONTROL | | ✓ Fraunhofer-Gesellschaft zur |
| ✓ Eurofuel | | |
| ✓ Eurogas | | |
| ✓ European Association of Internal Combustion Engine and | | |

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|---|---|--|--|
| | ✓ Förderung der angewandten Forschung e.V. | ✓ Grimaldi Euromed SpA | ✓ Infinium Operations, LLC |
| ✓ French ministry of defense | | ✓ Groupe ADP | ✓ Inter IKEA Group |
| ✓ Frontier Fuels | | ✓ HELLENiQ Energy | ✓ International Air Transport Association (IATA) |
| ✓ FuelsEurope | | ✓ Hycamite TCD Technologies Ltd | ✓ International Association of Classification Societies Ltd. (IACS) |
| ✓ GE Aviation | | ✓ Hydrogen Europe | ✓ International Chamber of Shipping |
| ✓ General Aviation Manufacturers Association (GAMA) | | ✓ Hydrogenious LOHC Technologies GmbH | ✓ Intesa Sanpaolo |
| ✓ GICAN, Groupement des Industriels de la Constructions et des Activités Navales | | ✓ IBERIA LAE SA Operadora Unipersona | ✓ ITA AIRWAYS |
| ✓ Goldman Sachs | | ✓ IFP Energies nouvelles | ✓ KHIMOD |
| ✓ GoodFuels | | ✓ Impact on sustainable aviation e.Ve. | ✓ Kuwait Petroleum International Aviation Company Limited |
| ✓ GoodFuels B.V. | | ✓ IMT School for Advanced Studies Lucca | ✓ Kuwait Petroleum Research and Technology (Q8Research) |
| ✓ Grand Port fluvio-maritime de l'Axe Seine | | ✓ Indian Register of Shipping | ✓ Kvasir Technologies ApS |
| ✓ Green Enesys Deutschland GmbH | | ✓ IndustriAll European Trade Union | ✓ LanzaJet |
| ✓ Greenergy Fuels Ltd | | ✓ Industrie De Nora Spa | ✓ LanzaTech UK Ltd |
| ✓ Greenture S.p.A. | | ✓ INERATEC GmbH | ✓ Leonardo S.p.A. |

- ✓ **Liquid Gas Europe**
- ✓ **Liquid Wind**
- ✓ **Lloyd's Register Group Limited**
- ✓ **LUXAIR**
- ✓ **Mabanaft GmbH & Co.KG**
- ✓ **Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping**
- ✓ **MAN Energy Solutions**
- ✓ **Meridiam**
- ✓ **MEROCO, a.s.**
- ✓ **Meyer Werft GmbH & Co. KG**
- ✓ **MGH Energy**
- ✓ **Mittelstandsverb and abfallbasierter Kraftstoffe e.V. (MVaK)**
- ✓ **MOL Group**
- ✓ **MSC Mediterranean Shipping Company S.A.**
- ✓ **MTU Aero Engines**
- ✓ **Natixis Investment Managers**
- ✓ **NAVANTIA, S.A, S.M.E**
- ✓ **Neste**
- ✓ **Nextchem Spa**
- ✓ **Nexxoil GmbH**
- ✓ **NISA Nordic Initiative for Sustainable Aviation**
- ✓ **Nordic Electrofuel AS**
- ✓ **Norsk e-Fuel AS**
- ✓ **OCIMF**
- ✓ **Orano**
- ✓ **P2X-Europe GmbH & Co. KG**
- ✓ **PKN Orlen SA**
- ✓ **Politecnico di Torino**
- ✓ **Polskie Linie Lotnicze LOT S.A.**
- ✓ **Port Network Authority of the Eastern Adriatic Sea**
- ✓ **port of amsterdam NV**
- ✓ **Port of Antwerp - Bruges**
- ✓ **Port of Barcelona**
- ✓ **Power to X Hub**
- ✓ **Pratt & Whitney**
- ✓ **Preem AB**
- ✓ **Proman AG**
- ✓ **QUATRA**
- ✓ **RENK Group**
- ✓ **REPSOL**
- ✓ **RINA Consulting SpA**
- ✓ **Rolls-Royce**
- ✓ **Royal Belgian Shipowners Association**
- ✓ **Royal Caribbean Group**
- ✓ **RSB - Roundtable on Sustainable Biomaterials Association**
- ✓ **SAFRAN**
- ✓ **Sasol**
- ✓ **SEA Europe**
- ✓ **SEA \ LNG Limited**

- ✓ **SERVICIOS Y ESTUDIOS PARA LA NAVEGACION AEREA Y LA SEGURIDAD AERONAUTICA SME MP SA (SENASA)**
- ✓ **SFS Ireland**
- ✓ **Shell**
- ✓ **SkyNRG**
- ✓ **Snam S.p.a**
- ✓ **SNPAA**
- ✓ **Société Générale**
- ✓ **Sotacarbo - Società Tecnologie Avanzate Low Carbon S.p.A.**
- ✓ **SOWAER**
- ✓ **Stena Oil AB**
- ✓ **Stichting Projecten Binnenvaart - Expertise & Innovation Centre inland Barging (EICB)**
- ✓ **The Methanol Institute**
- ✓ **Topsoe A/S**
- ✓ **TotalEnergies S.E.**
- ✓ **Tree Energy Solutions**
- ✓ **TUI AG**
- ✓ **Turkish Shipbuilders' Association**
- ✓ **U.S. Grains Council**
- ✓ **Ufip Energies et Mobilités**
- ✓ **ULPower Aero Engines NV**
- ✓ **Union of Greek Shipowners**
- ✓ **Unione Energie per la Mobilità - unem**
- ✓ **Uniper SE**
- ✓ **UPEI, Europe's Independent Suppliers Association**
- ✓ **UPM Biofuels**
- ✓ **VDMA Power-to-X for Applications**
- ✓ **Velocys PLC**
- ✓ **Verband Deutscher Reeder e.V. / German Shipowners' Association**
- ✓ **Verband für Schiffbau und Meerestechnik e.V. (VSM)**
- ✓ **Viridi RE**
- ✓ **Voestalpine**
- ✓ **Wizz Air Innovation Ltd**
- ✓ **World Economic Forum's Clean Skies for Tomorrow Coalition**
- ✓ **World Shipping Council**
- ✓ **Yara**
- ✓ **Zukunft - Umwelt - Gesellschaft (ZUG) gGmbH**