SAF roadmap – The Netherlands

April 2025

Commissioned by:

Ministerie van Infrastructuur en Waterstaat

Prepared by:

Deloitte. to70

Preface

Aviation connects the Netherlands to the world and holds considerable societal importance, both socially and economically. The Netherlands boasts a large and innovative aviation sector. Despite its modest size, it serves as a hub for people, trade and investment. However, aviation also negatively affects the climate and environment. To ensure the aviation sector thrives in the future, it must undergo an energy transition and reduce its reliance on fossil fuels.

The utilisation of Sustainable Aviation Fuels (SAF) is vital for mitigating aviation's adverse effects and presents additional opportunities in terms of supply security and future economic potential. Due to its petrochemical cluster, capacity for innovation, infrastructure, and geographical location, the Netherlands is well-positioned to become a leading player in SAF.

This roadmap offers a perspective for action on the opportunities and challenges of SAF production and uptake for the Netherlands. It establishes the foundation for the solutions and initiatives required from 2025 to 2035 to meet set objectives, ambitions, and European commitments.

The Ministry of Infrastructure and Water Management (I&W) has engaged Deloitte and To70 to develop a SAF roadmap. This roadmap is the product of collaboration among government, industry stakeholders, and societal organisations, serving as a revitalised starting point for the Dutch aviation sector to expedite SAF adoption. In this roadmap, Dutch opportunities and challenges regarding SAF production and uptake are translated into initiatives and with this roadmap the government gives effect to the Coalition Agreement.

This SAF roadmap results from a short-term process aimed at creating a roadmap as collaboratively as possible among public and private organisations. It represents the initial step in a continuous process of further development and specification.

Table of contents

1	Introduction and objectives	*This roadmap was drawn up with involvement from public and private organisations within the aviation sector and defines three objectives:* *1. Complying with EU obligations* *2. Stimulating additional demand for up to 14% SAF by 2030* *3. Strengthening the Netherlands as a production location for SAF*	4
2	Policy framework	*The scaling up of SAF takes place within the framework of global agreements, European regulations, and the translation of these into Dutch laws and policy (objectives).*	9
3	SAF production pathways and available feedstocks	*HEFA is currently the most widely used production pathway; however, feedstock availability is limited, so a focus on innovative bio-SAF and e-SAF is also necessary.*	17
4	Refining sector	*The Netherlands has a strong refining sector and can harness its talent, location, and infrastructure for SAF production, contributing to security of supply and future economic potential.*	21
5	Barriers to achieving the objectives	*Six barriers have been identified that make it harder to achieve the set objectives:* • *Limited market and consumer demand* • *Complex SAF traceability* • *Required investments in assets and infrastructure* • *Dependence on imported feedstocks or semi-finished products* • *Legislation and regulations* • *Interaction with sustainability efforts in other sectors*	27
6	Roadmap with initiatives	*For each objective, a dedicated workstream with the necessary initiatives has been set up:* • *Workstream 1: 'Creating an efficient market to meet ReFuelEU obligations'* comprises 5 initiatives, with I&W as the foreseen lead. • *Workstream 2: 'Stimulating additional demand towards the 14% target'* also comprises 5 initiatives, with the DLT as the foreseen lead. • *Workstream 3: 'Strengthening the Netherlands as a production hub'* comprises 8 initiatives, with Ministry of Climate Policy and Green Growth (CPGG) as the foreseen lead.	34
	Appendix	• *Action cards* • *List of abbreviations*	41

In-depth elaboration (sections 2–4)

1 | Introduction

This roadmap has been drawn up by I&W, together with public and private organisations in the aviation sector, and has three objectives.

1.1 Rationale for the SAF roadmap
1.2 Parties involved
1.3 Objectives: meeting EU obligations and Dutch targets, and strengthening the Netherlands as a production location
1.4 Follow-up and joint coordination

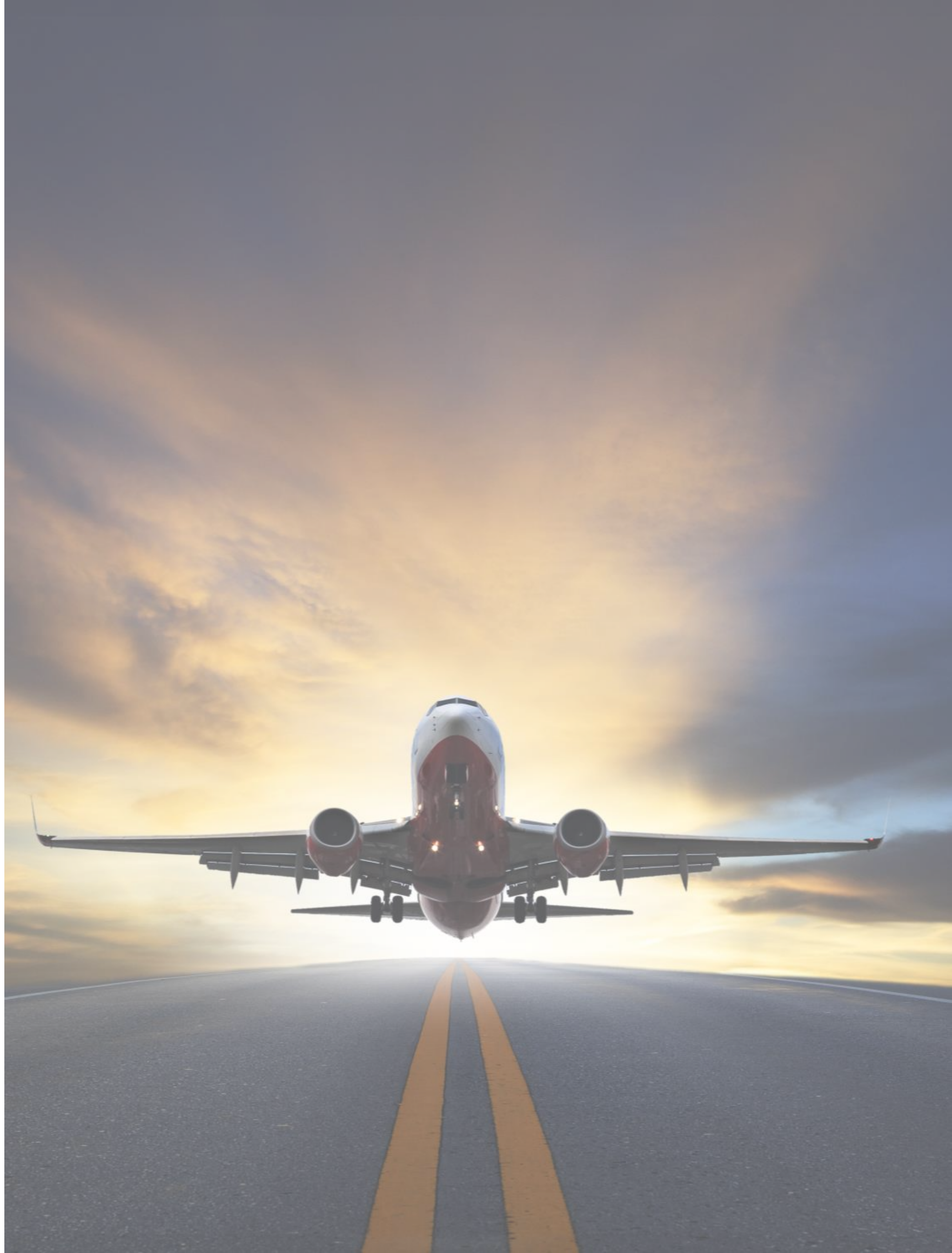
1.1 Rationale for the SAF roadmap

In 2019, Dutch companies, governmental bodies, and research institutions convened at the *Duurzame Luchtvaarttafel* (DLT) to formulate the *Akkoord Duurzame Luchtvaart*. This agreement included, among other commitments, targets for emission reduction within commercial aviation: reducing CO_2 emissions by 2030 to the levels of 2005, cutting emissions by 50% by 2050, and achieving zero CO_2 emissions by 2070. The DLT also established the working group *Duurzame Brandstoffen* (WDB), which initially set the direction for the development of SAF in the Netherlands through its WDB Action Programme[1]. This working group set goals for sustainable fuel uptake: 14% by 2030, increasing to 100% by 2050. Subsequently, the Ministry of Infrastructure and Water Management (I&W) focused on advocating for ambitious blending obligations at the European level.

By the end of 2023, the European Union adopted the European Commission's ReFuelEU Aviation proposal (hereafter referred to as "ReFuelEU"), which establishes mandatory blending requirements for SAF. These stipulations introduce an increasing legal minimum share of sustainable fuels within the total aviation fuel mix.

To enable the Netherlands to meet the European SAF requirements optimally, I&W is spearheading the advancement of SAF. Within its Government Programme, the Cabinet declared plans to devise a strategy for the aviation energy transition and to draft a SAF roadmap. For this roadmap, I&W is taking a leadership role, collaborating with industry and other stakeholders to identify and prioritise the necessary initiatives, thereby collectively achieving the shared objectives (see section 1.3).

This roadmap thus plays a crucial role in realising the energy transition within aviation and industry, while retaining sector competitiveness.



Sources: 1) https://www.rijksoverheid.nl/documenten/kamerstukken/2021/03/08/actieprogramma-duurzame-brandstoffen

1.2 Parties involved

In the Netherlands, a diverse array of stakeholders is engaged in the development, knowledge building, production, distribution, and utilisation of SAF. These include airlines, fuel producers and suppliers, airports, research institutions, societal organisations, and government bodies. The SAF roadmap was prepared by Deloitte and To70 at the initiative of the Ministry of Infrastructure and Water Management (I&W), supported by these stakeholders in a "coalition of the willing and able." The parties are "willing" in that they endorse the SAF objectives and are actively working towards fulfilling the European requirements. They are "able" because they possess the capacity, or are crucial, to advance the use of SAF in the Netherlands. The parties listed on this page contributed to the creation of this roadmap and will be invited to participate in the further development and implementation phases. Additionally, stakeholders not yet involved in this roadmap are encouraged to join the follow-up process. In this document, "we" refers to the collective of these parties.

Furthermore, there is interaction with other initiatives, such as the DLT, *GroenvermogenNL*, and Project SkyPower. Throughout the process, an external advisory panel, comprising Prof. Gert Jan Kramer, Coby van der Linde, and Jaco Stremler, provided feedback on a draft version of the SAF roadmap.

Parties involved

Public organisations

Ministerie van Infrastructuur en Waterstaat
Ministerie van Klimaat en Groene Groei
Ministerie van Defensie
Rijksdienst voor Ondernemend Nederland
NATO OTAN DPO Defensie Pijpleiding Organisatie

Private organisations

AFS Aircraft Fuel Supply B.
alcoenergy sustainable pioneers | Rotterdam
bp
chane
corendon
EindhovenAirport
groenvermogennl
KLM
metafuels
NESTE
nlr
Platform Hernieuwbare Brandstoffen.
Port of Amsterdam
POWER2X Leading in energy
Q8
Rotterdam The Hague Airport
Schiphol Group
Shell
SKYNRG
TU Delft
TUI
transavia
VARO
VEMOBIN

1.3 Objectives: meeting EU obligations and Dutch targets, and strengthening the Netherlands as a production location

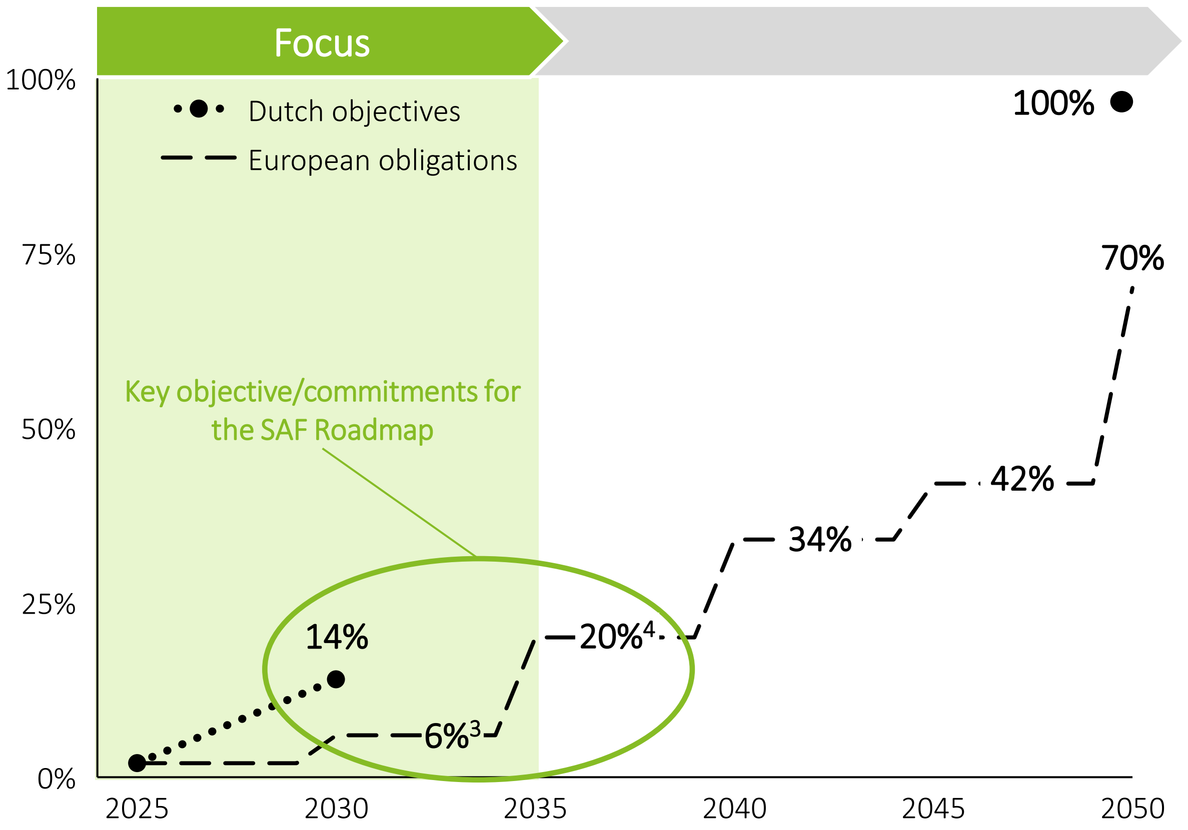
This SAF roadmap aims to enhance the use and production of SAF in the Netherlands. Throughout the SAF roadmap, SAF is defined as fuels for aviation made from sustainable bio-based feedstocks (bio-SAF) and synthetic fuels derived from hydrogen and captured CO_2 (e-SAF)[1]. In the future, hydrogen and electricity may also serve as sustainable energy carriers and be recognised under ReFuelEU, although their impact up to 2035 is anticipated to be limited. Therefore, this roadmap is primarily focused on scaling up SAF.

The SAF roadmap is guided by three key objectives. Firstly, it aims to comply with the statutory requirements set forth in ReFuelEU, which mandates a 6% blending by 2030 and 20% by 2035. ReFuelEU also includes a specific mandate for blending e-SAF (see Chapter 2). Secondly, the roadmap aligns with the targets established in the *Akkoord Duurzame Luchtvaart*, namely a 14% SAF blending by 2030. This voluntary target supports the aviation sector in preparing for higher European obligations. It allows the Netherlands to build on its current pioneering role[2] in Europe, progress towards stricter (European) requirements, strive for the Dutch goal of 100% sustainable aviation by 2050, and bolster its position as a producer of aviation fuels. This leads to the third objective: solidifying the Netherlands as a production hub to enhance supply security and strategic autonomy while increasing the nation's economic potential.

Beyond these objectives, the roadmap considers the quality of life and environmental factors by aiming to reduce harmful non-CO_2 emissions, such as particulate matter and contrails, and minimise CO_2 emissions across the entire chain of fuel production and uptake.

The SAF roadmap principally focuses on activities over the next 10 years that will facilitate compliance with the European blending obligations of 6% by 2030 and 20% by 2035, in addition to achieving the Dutch target of 14% by 2030, as illustrated in Figure 1.

Figure 1. Fuel blending objectives and obligations relevant for the SAF roadmap[3]



Note: 1) See chapter 3, REDIII and ReFuelEU for precise definitions 2) Based on current SAF production plans in NL relative to European demand, see Chapter 4 3) Including a sub-mandate for e-SAF of 1.2% in 2030 and 2% in 2032 4) Including a sub-mandate for e-SAF of 5%

1.4 Follow-up and joint coordination

This roadmap acts as a revitalised starting point for the Dutch aviation sector, with the aim of accelerating the adoption of SAF and promoting their production in the Netherlands. The roadmap outlines various initiatives that involved parties may pursue, either collectively or individually. During the follow-up process, these initiatives will require further feasibility assessments, detailed planning, and decision-making in collaboration with relevant stakeholders. Therefore, it is vital to define the necessary procedural steps to facilitate this elaboration and enable the monitoring of progress for these initiatives.

The initiatives are organised into three workstreams (see Chapter 6), with different parties expected to take the lead. Based on their existing focus areas, it is logical that I&W, the DLT, and the Ministry of Climate Policy and Green Growth (CPGG) serve as the primary leads to advance these workstreams from the roadmap. Additionally, the further development of certain initiatives will require the involvement of other departments.

A sensible initial step is for the designated leads to respond to the SAF roadmap through a cabinet response (I&W, CPGG) and appraisal (DLT), with a reflection on the coordinating role envisioned for them and outline their intended approach to adopting it. Subsequently, the necessary process agreements can be established in consultation with various stakeholders, including, but not limited to, I&W, DLT, and CPGG. The intention is to align the roadmap as closely as possible with existing initiatives, such as the taskforce exploring the future of fuel and chemical feedstock production, and the development of the carbon chain within the Nationaal Plan Energiesysteem (NPE)[1] . Where initiatives (partially) overlap with ongoing projects, the roadmap serves to reinforce the identified opportunities and challenges surrounding SAF.

Furthermore, for each distinct initiative, the parties required for collaboration have been identified. These parties must be consulted on their contributions to advancing the initiatives where they are mentioned. Such discussions are best conducted by the designated leads for each workstream. The newly appointed leads are encouraged to proactively further develop the workstreams of the SAF roadmap, particularly when new circumstances or opportunities arise.

The designated leads will jointly manage the SAF roadmap. Together with all participating parties, they can regularly monitor progress. If achieved results or external developments necessitate changes, the roadmap or its priorities may be adjusted accordingly.

Note: 1) Nationaal Plan Energiesysteem, Rijksoverheid

2| Policy framework

The scaling up of SAF takes place within global agreements, European regulations and the translation of these into Dutch laws and policies.

2.1 Global framework of agreements and standards
2.2 European legal framework
2.3 Dutch policy and implementation of European legislation

2.1 Global framework of agreements and standards

Globally, various (voluntary) agreements and objectives have been established in collaboration with the International Civil Aviation Organization (ICAO) under the United Nations. The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) offers a financial incentive for airlines[1]. In 2022, ICAO also initiated the Assistance, Capacity-building, and Training (ACT) - SAF programme, which supports feasibility studies, training, and collaborative efforts.

ICAO Long-Term Aspirational Goal Net-Zero 2050

In 2022, ICAO adopted the Long-Term Aspirational Goal (LTAG), a long-term objective aimed at supporting the Paris Agreement (UNFCCC) to achieve "net-zero" emissions by 2050. Additionally, during the ICAO Conference on Aviation Alternative Fuels (CAAF)/3[2] in 2023, an ambition was declared to reduce CO_2 emissions in international aviation by 5% by 2030. The focus is on increasing the use and production of SAF and low-carbon aviation fuels (LCAF). Even though the LTAG and CAAF/3 are non-binding, they serve as guidelines for states to implement national policy measures[3].

CORSIA was established by ICAO to aid in the reduction of CO_2 emissions in international aviation. It acts as a financial incentive, focusing on offsetting the growth of aviation emissions using credits and the deployment of SAF. Under this programme, airlines must purchase emission allowances for CO_2 emissions exceeding a certain baseline level per airline. Airlines that use SAF meeting ICAO's specific sustainability criteria are required to purchase fewer emission credits, depending on their baseline and SAF usage. This reduces SAF costs and provides an incentive to lessen environmental impact. However, according to Carbon Market Watch, the reduction in SAF costs due to CORSIA has been minimal in practice[4], thereby limiting the anticipated effect on blending. Nonetheless, CORSIA ensures transparency and consistency by establishing a standard methodology for monitoring, reporting, and verification (MRV).

Sources: 1) Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) 2) Third ICAO Conference on Aviation and Alternative Fuels (CAAF/3) 3) ICAO SAF 4) Policy brief: EU-ETS vs CORSIA: Which better navigates the turbulence of the climate crisis?

2.1 Global framework of agreements and standards

International standard for quality of aviation fuels ASTM

Globally, the technical certification of new SAF production pathways is conducted by the American Society for Testing and Materials (ASTM). Through these fuel specifications, the aviation sector ensures an international standard for the quality of aviation fuels. ASTM oversees technical standards that guarantee SAF is safe and reliable for use in commercial aviation. ASTM certification mandates that Synthetic Blended Components (SBCs, i.e. pure SAF), when blended with fossil kerosene, are fully compatible with existing aircraft engines (drop-in fuels) and meet rigorous criteria for performance, energy density, and safety. This certification standard ensures that SAF adheres to the same high-quality standards globally, irrespective of its production location.

Over the past 15 years, 11 SAF production pathways have been certified via the ASTM system, including three co-processing pathways. The Hydroprocessed Esters and Fatty Acids (HEFA) production pathways currently dominate SAF production. Alongside the 11 certified production pathways, another 11 are under review by ASTM. This review is taking place in the United States, although Europe is also working to establish a SAF Clearing House to support the accelerated certification of new production pathways through the ASTM system.

SBC must always be blended with fossil kerosene before it can be utilised in aircraft, with maximum blending percentages dependent on the production pathway, as indicated in Figure 2. The limitation on SAF blending is primarily due to the absence of aromatics in the fuel. Research is being conducted into 100% SAF that meets ASTM specifications for aviation fuels. Concurrently, tests are underway with the latest aircraft engines to ensure they can operate on 100% SBC, which contains low levels of aromatics. The use of existing infrastructure will allow 100% SBC only when all aircraft engines are suitable for it. Due to the gradual phase-out of older aircraft types and engines, typically over approximately 35 years, this transition will be protracted. For the next 10 years in this roadmap, the assumption is that all SBC has already been "blended" into SAF and is thus certified as conventional aviation fuel, transported through pipelines and by train, ship, or truck.

Figure 2. SAF production pathways certified by ASTM

ASTM-ref.	Conversion process	Abbr.	Possible feedstocks	Max. blend
ASTM D7566 Appendix A1	Fischer-tropsch hydroprocessed synthetic paraffinic kerosene	FT	Coal, natural gas, bio-feedstocks	50%
ASTM D7566 Appendix A2	Synthesised paraffin kerosene from hydroprocessed esters and fatty acids	HEFA	Vegetable oils, animal fats, used cooking and frying oils	50%
ASTM D7566 Appendix A3	Synthesised iso-paraffins from hydroprocessed fermented sugars	SIP	Biomass used for sugar production	10%
ASTM D7566 Appendix A4	Synthesised kerosene with aromatics derived by alkylation of light aromatics from non-petroleum sources	FT-SKA	Coal, natural gas, bio-feedstocks	50%
ASTM D7566 Appendix A5	Alcohol-to-jet synthesised paraffin kerosene	ATJ-SPK	Ethanol, isobutanol and isobutene from bio-feedstocks	50%
ASTM D7566 Appendix A6	Catalytic hydrothermolysis fuel	CHJ	Vegetable oils, animal fats, used cooking and frying oils	50%
ASTM D7566 Appendix A7	Synthesised paraffin kerosene from hydroprocessed esters and fatty acids	HC-HEFA-SPK	Algae	10%
ASTM D7566 Appendix A8	Synthesised paraffin kerosene with aromatics	ATJ-SKA	C2–C5 alcohols from bio-feedstocks	10%
ASTM D1655 Appendix A1	Co-hydroprocessing of esters and fatty acids in a conventional petroleum refinery	-	Vegetable oils, animal fats, and used cooking and frying oils from bio-feedstocks processed with petroleum	5%
ASTM D1655 Appendix A1	Co-hydroprocessing of Fischer-Tropsch hydrocarbons in a conventional petroleum refinery	-	Fischer-Tropsch hydrocarbons co-processed with petroleum	5%
ASTM D1655 Appendix A1	Co-processing of HEFA	-	Hydroprocessed esters/fatty acids from bio-feedstocks	10%

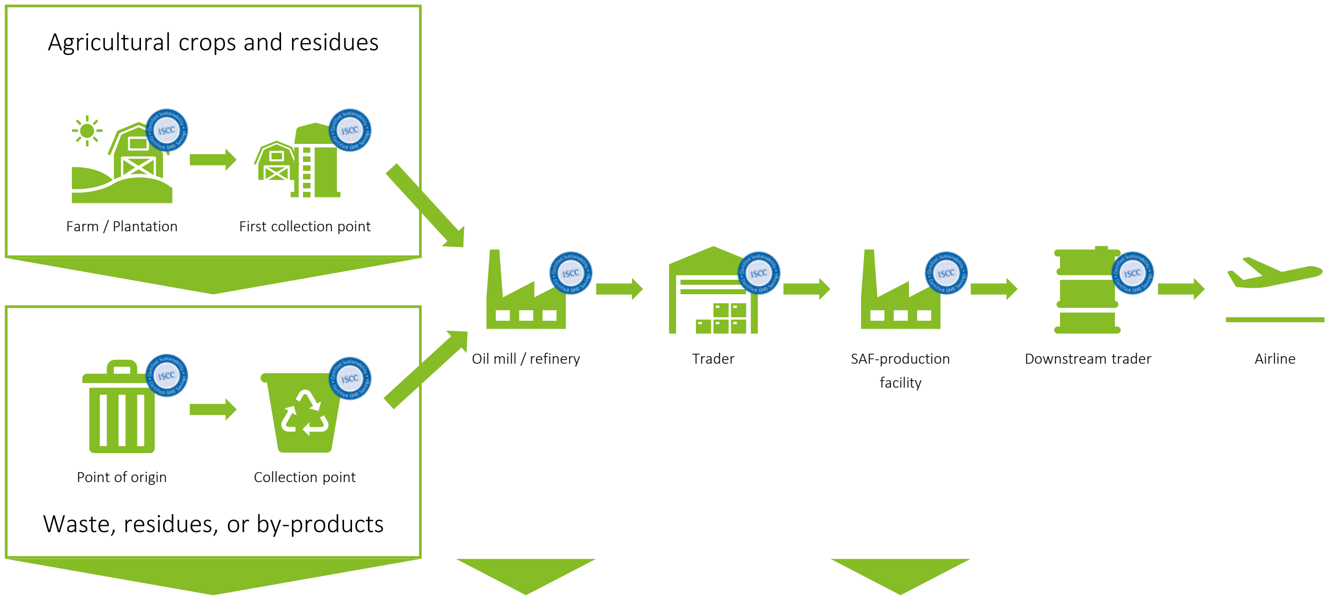
2.1 Global framework of agreements and standards

Sustainability certification of SAF by ISCC or RSB

Beyond the technical certification of the production process to meet aviation fuel standards, SAF is also certified against sustainability criteria. Different sets of requirements have been established depending on the policy framework within which SAF is utilised. For example, there are ICAO/CORSIA-compliant standards, as well as standards compliant with the European Union (EU) Renewable Energy Directive (RED) II/III. To fulfil obligations, fuels must meet RED criteria. Thus, the Dutch implementation of this legislation will adhere to European law. Under European regulations, food and feed crops do not qualify as feedstock for SAF production, reducing their economic value. As a result, SAF from the US or Brazil is generally prohibited, as primary agricultural crops like corn and sugarcane are often employed in SAF production. The sustainability certification of SAF is conducted by independent organisations such as the International Sustainability and Carbon Certification (ISCC), the Roundtable on Sustainable Biomaterials (RSB), or ClassNK SCS. These bodies certify the entire SAF supply chain based on adherence to EU RED or CORSIA criteria.

Several public-private partnerships and foundations are committed to the development, scaling, and certification of SAF, including the Commercial Aviation Alternative Fuels Initiative (CAAFI), Sustainable Aviation Buyers Alliance (SABA), and the Roundtable on Sustainable Biomaterials (RSB). These organisations aim to promote SAF uptake and ensure traceability, compensating for the absence of a comprehensive global legal framework.

Figure 3. SAF sustainability certification from source to fuel by ISCC



Raw material production and collection

- Emissions from raw material cultivation
- Emissions from direct land-use change (DLUC)
- Emission savings from soil carbon accumulation
- Emissions from upstream transport

Processing: upstream and downstream transport and distribution

- Emissions from processing
- Emission savings from carbon capture and storage
- Emissions from transport and distribution (upstream and downstream)
- Emissions from combustion

2.2 European legal framework

ReFuelEU Regulation and RED Directive

As part of the European Commission's Fit for 55 programme, several policy measures have been introduced at the European level to enhance the sustainability of Europe's industry and economy. Sustainable Aviation Measures targeting the aviation sector aim in part to stimulate demand and scale up the production of SAF. This includes the ReFuelEU legislation, the tightening of the Renewable Energy Directive (RED) for sustainability criteria for SAF, and the Fuels Eligible for ETS (FEETS). Collectively, these measures are designed to boost SAF production, delivery, and use in Europe, leading to a significant positive impact on emission reduction.

Firstly, ReFuelEU has been implemented as an instrument intended to elevate the demand and production of SAF, thereby providing the market with the impetus to increase SAF production as efficiently as possible. ReFuelEU mandates fuel suppliers to provide a binding percentage of SAF to EU airports falling under its jurisdiction (see sidebar). Airlines are required under ReFuelEU to refuel at least 90% of the necessary fuel per route they fly at EU airports[1,2] over the course of a year, factoring in safety margins. Additionally, EU airports impacted by ReFuelEU (such as Schiphol, Rotterdam The Hague Airport, and Eindhoven in the Netherlands) must undertake all necessary measures to ensure airlines' access to aviation fuels with a minimum SAF percentage.

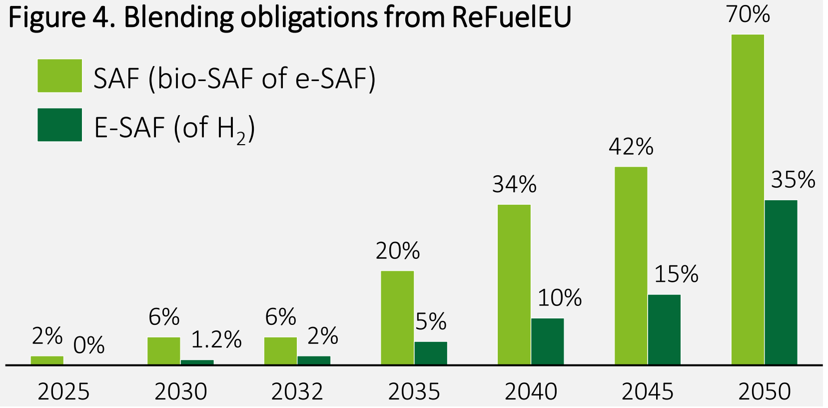
ReFuelEU specifies which types of SAF are included under the obligation and refers to the RED II/III frameworks for the eligible feedstocks. As part of ReFuelEU, the "Flight Emissions Label" has been introduced, a voluntary standard established by the European Union Aviation Safety Agency (EASA) which outlines the climate impact per flight.

The Renewable Energy Directive, or RED II/III, is an EU-wide directive applicable to all sectors, setting targets for the use of renewable energy. The EU-wide objective for 2030 is 42.5% renewable energy across all sectors, with a specific target of 29% renewable energy for transport. The RED also provides frameworks for the feedstocks that can be used for SAF production and specifies the minimum emission reduction required for those fuels compared to fossil kerosene. While member states have some flexibility in their interpretation, they are encouraged to promote advanced biofuels and synthetic fuels for SAF.

Obligations of ReFuelEU until 2050

ReFuelEU imposes obligations on fuel suppliers to blend a certain percentage of SAF, starting at 2% in 2025 and increasing to 70% by 2050 in five-year increments, with sub-obligations for synthetic kerosene starting in 2030[2]. This also includes an anti-tankering obligation of 90% of the total annual fuel volume on a route. This ensures that airlines do not tank fuel for economic reasons[3]. These obligations facilitate a steady increase in the demand for SAF. In addition to the obligations, there are also measures such as the Fuels Eligible for ETS (FEETS) (see p. 15), in the form of 20 million SAF permits.

Figure 4. Blending obligations from ReFuelEU



Sources: Aviation fuels & emissions trading – calculating the price difference between eligible fuels and kerosene (detailed rules). Consolidated text: Regulation (EU) 2023/2405 of the European Parliament and of the Council of 18 October 2023 on ensuring a level playing field for sustainable air transport (ReFuelEU Aviation) Note: 1) Union airports 2) This obligation applies to all airports with a minimum of 800,000 passengers or 100,000 tonnes of freight. 3) This obligation applies to all airlines with at least 500 commercial passenger flights, or 52 commercial freight flights form European airports that fall under the obligation.

2.2 European legal framework

Stimulating Measures: ETS Zero Rating, FEETS, and the EU Innovation Fund
To support airlines grappling with higher costs for SAF, two measures have been introduced under the EU Emission Trading System (ETS). Firstly, a "zero rating" has been established within the ETS for SAF, meaning airlines are exempt from purchasing emission allowances for emissions from SAF, irrespective of the emission reductions achieved.

Additionally, under Fuels Eligible for ETS (FEETS), 20 million EU-ETS allowances are allocated to airlines for purchasing SAF, providing €1.6 billion[1] in support between 2024 and 2030. Airlines can apply for financial assistance based on SAF acquired from 1 January 2024 for flights within the EU and refuelled at European airports from which they operate. Only SAF meeting specific criteria qualifies for support under the EU-ETS SAF allowance programme (see sidebar).

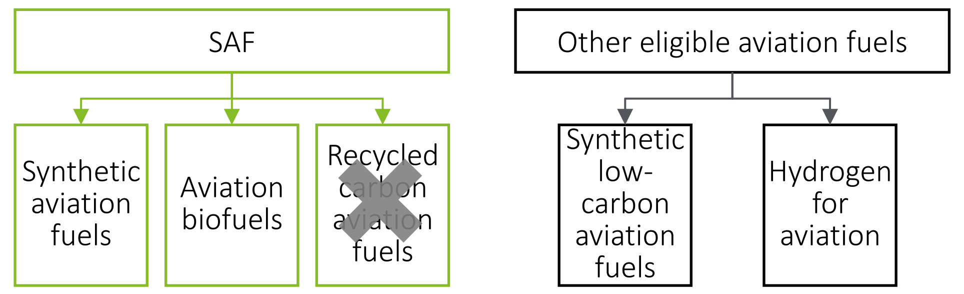
The covered price difference may vary depending on the type of feedstock and where the SAF is refuelled (see sidebar). If the number of applications for SAF allowances within a year exceeds availability, the commission will apply an allocation reduction factor to distribute support proportionately among airlines.

Furthermore, the European Innovation Fund allows EU-ETS funds to be requested for establishing large-scale energy projects. The aviation sector is eligible for funding from the EU-ETS. In the past year, only one grant was awarded to the Aura Aero initiative for electric aviation. Moving forward, it is expected that SAF refining will have a higher likelihood of receiving support.

EU ETS SAF allowance support

Financial support= (market price of eligible fuel – (fossil fuel price + ETS price + possible minimum EU taxation on kerosene))* percentage of the price difference covered (see table below)

Fuels eligible for support under the EU ETS SAF allowances



Eligible fuel	The price difference that is covered by FEETS
Renewable hydrogen and advanced fuels with a zero emission factor.	70%
Renewable fuels of non-biological origin with a zero emission factor (based on Article 25 of EU Directive 2018/2002).	95%
All types of SAF that are eligible for subsidies and are fuelled at airports on islands, small airports (non-union airports), and airports in so-called “outermost regions.”	100%
All other eligible fuels	50%

Sources: COMMISSION DELEGATED REGULATION (EU) of 6.2.2025 supplementing Directive 2003/87/EC of the European Parliament and of the Council by laying down detailed rules for the yearly calculation of price differences between eligible aviation fuels and fossil kerosene and for the EU-ETS allocation of allowances for the use of eligible aviation fuel. Note: 1) Based on an EU-ETS price of €80 / tonne.

2.2 European legal framework

SAF reporting and prices

When fuel producers fail to meet the minimum SAF blending obligations, they incur a penalty that is at least twice the price difference between the average annual price per tonne of conventional aviation fuel and SAF, multiplied by the volume of fuel not utilised (see ReFuelEU). Furthermore, they must fulfil the obligation in the following year. In order to determine the penalties, the European Union Aviation Safety Agency (EASA) monitors SAF market prices in the annual SAF State of Market report. The inaugural report for 2024, which examines the SAF market for 2023, has recently been published[1]. It reveals that the direct price of bio-SAF is three times higher than conventional fuel, while synthetic SAF can be up to nine times more expensive. Moreover, the actual costs for fuels, which currently lack a market price for airlines, often exceed the prices reported by EASA. This discrepancy arises because these figures only reflect production costs, excluding blending, logistics, and market dynamics.

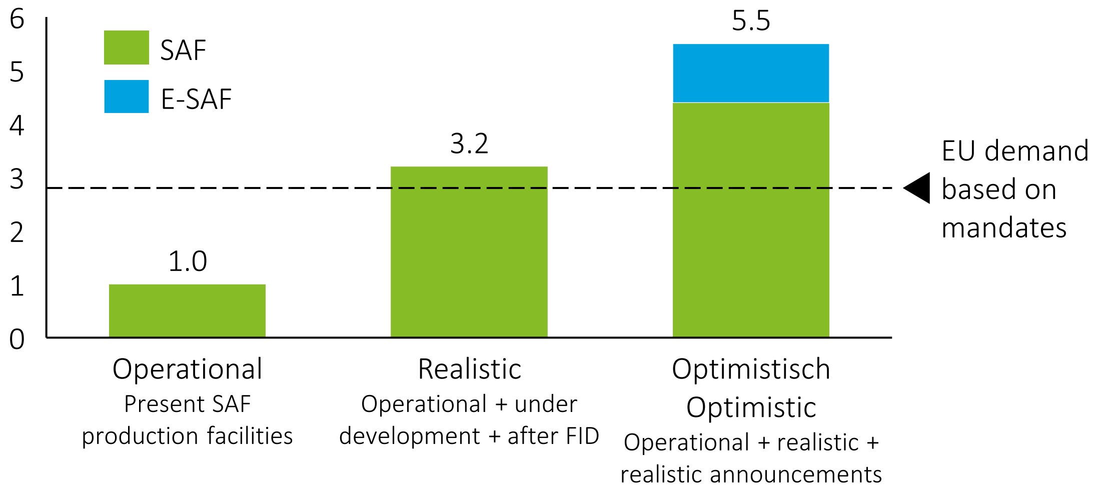
The report also anticipates whether there will be sufficient SAF production within the EU to meet the ReFuelEU obligations. It indicates that enough SAF will be available in Europe by 2025, but by 2030, adequate production will only be possible under an optimistic scenario for both bio-SAF and synthetic SAF.

The report for 2024[3] states that SAF prices remain approximately three times higher than those of conventional aviation fuel, consistent with 2023.

Figure 5. Reference prices for aviation fuels in 2024[2]

Aircraft fuel category	2024 reference price
Conventional aviation fuel	€ 734 / tonne
SAF from bio-based feedstock	€ 2,085 / tonne
SAF from advanced bio-based feedstock	€ 2,715 / tonne[1]
SAF based on "recycled carbon"	€ 2,280 / tonne[1]
Synthetic aviation fuels	€ 7,695 / tonne[4]

Figure 6. SAF production in the EU in 2030 (Mt)



Sources: 1) State of the EU SAF market in 2023 | EASA 2) Directive (EU) 2023/2413 of the European Parliament and of the Councilof 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652 3) 2024 Aviation Fuels Reference Prices for ReFuelEU Aviation| EASA Note: 4) expected production price, no market price available, see also Skypower for price projections.

2.3 Dutch policy and implementation of European legislation

Dutch objective: climate neutral by 2050, CO_2-free by 2070

In the Netherlands, the objectives for aviation and aviation fuels are further detailed in the Aviation Note[1]:

> *"The ambition is to align the climate objectives of the aviation sector with those of the EU and the national climate agreement (translating the Paris Agreement) to be as near to climate-neutral as possible by 2050. [...] The target is for 14% of all aviation fuel in the Netherlands to be sustainable by 2030. By 2050, the goal is for 100% of total fuel consumption to be sustainable."*

The Netherlands Environmental Assessment Agency (PBL) has outlined the requirements to achieve CO_2-free aviation from the Netherlands by 2050[2]. This includes, among other measures, tightened policies such as accelerating the SAF blending obligation to 100% by 2050, providing subsidies for developing SAF based on bio feedstocks, and scaling up various SAF production pathways. The Ministry of Infrastructure and Water Management (I&W) has already launched the programme "*Stimulering Duurzame Luchtvaartbrandstoffen*" (SDL) in this context.

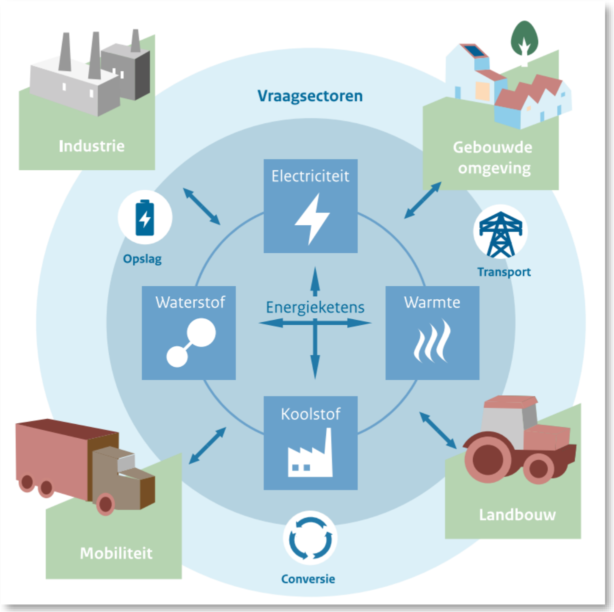
Implementation of European legislation

The Netherlands plans to incorporate the ReFuelEU regulation and FEETS stimulating initiatives into national legislation by 2025. I&W is coordinating this effort with involved parties by clarifying the penalty system and appointing the Dutch Emissions Authority and the Human Environment and Transport Inspectorate as competent enforcement authorities. The European Commission has stated that member states cannot impose a higher binding national blending percentage, meaning that additional SAF uptake can only be achieved through stimulating measures or initiatives from the sector, government, and joint contributions.

Beyond aviation: a comprehensive view of all sectors and energy chains

The Nationaal Plan Energiesysteem (NPE)[3] provides a holistic view of the energy needs across various user sectors in relation to supply scaling. SAF demand and supply are included in the NPE as part of the carbon chain. A key consideration is that sustainable fuel production in the Netherlands must fit within the capacity of the entire energy system. Due to this, and the potentially lower costs of renewable energy elsewhere, the NPE has indicated that large-scale synthetic fuel production in the Netherlands based on domestic feedstocks is impractical. Additionally, the issue of increasing energy demand can be considered in the context of the European Energy Efficiency Directive. The Climate Fund supports the development of sustainable fuels, aiming to scale up technologies for SAF production, such as the gasification of bio feedstocks and specific processes like Alcohol-to-Jet and e-SAF. I&W aligns this support within the Programme for Sustainable Aviation Fuels Development (PSDL) as closely as possible with the needs of future producers.

Figure 7. Interaction between sectors in the Nationaal Plan Energiesysteem[3]



Sources: 1) LuchtvaartNota 2020-2050; Innovatiestrategie voor de luchtvaart 2) Climate-neutral aviation by 2050 3) Nationaal Plan Energiesysteem, RIjksoverheid

3 | SAF production pathways and available feedstocks

HEFA is currently the most used production pathway; the availability of feedstock is limited; therefore, innovative bio-SAF and e-SAF are also needed.

3.1 Production pathways
3.2 Feedstocks and availability

3.1 Production pathways

SAF from bio-based feedstock

Numerous technological solutions are available for converting various bio-based feedstocks into SAF. One such option is co-processing, which involves integrating biological material into an existing refinery. This method, however, is limited: the maximum permissible proportion under ASTM specifications is 5-10% for usable kerosene (see p.11). Consequently, this technique is only viable for the short term and is not applied on a large scale[1]. For the long term, alternative production pathways are required, as illustrated in Figure 8.

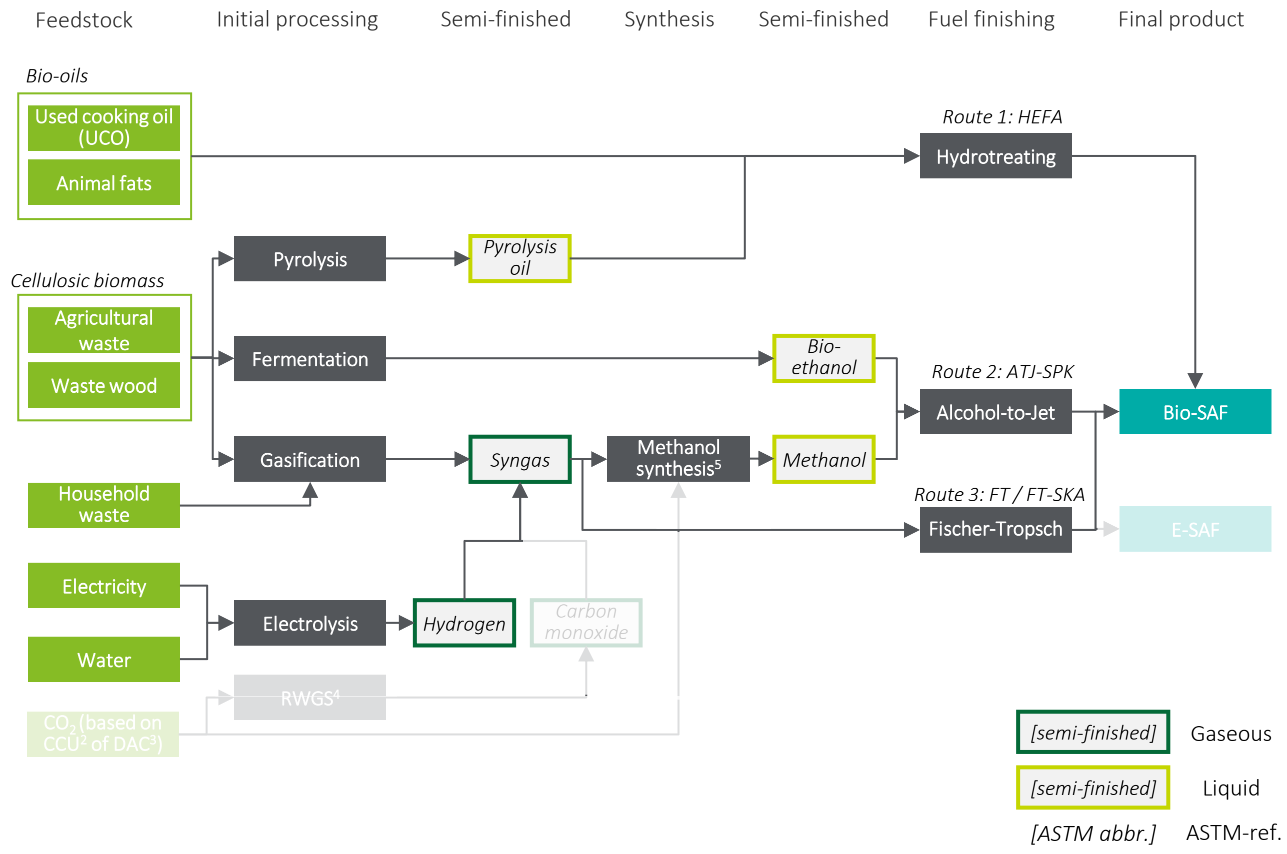
HEFA-Bio SAF is the current standard

In Hydroprocessed Esters and Fatty Acids (HEFA) SAF production, vegetable fats and animal fats, such as used cooking oil (UCO), are processed into SAF. A similar technique is already in use at scale for producing hydrotreated vegetable oil (HVO100) fuel for trucks, among other applications (i.e., renewable diesel). The conversion of fats and oils into fuel is chemically straightforward and energy-efficient, making HEFA cheaper than other SAF production pathways.

Advanced biofuels utilise different waste streams

Bio-SAF can also be produced from other bio feedstocks. Agricultural waste and waste wood, for example, from forestry, are rich in lignocellulose. If the sugars can be extracted, they can be fermented into alcohol, which can then be converted into SAF through the Alcohol-to-Jet process. Currently, various thermochemical technologies are being developed to transform lignocellulose into SAF. Another option is the gasification of household waste or other bio feedstocks. The resulting syngas can be converted into SAF with hydrogen using the Fischer-Tropsch process. Due to the conversion to gas, transport relies on pipelines or local production. The complexity of the various process steps renders these advanced biofuels relatively expensive, leading to limited production worldwide.

Figure 8. Simplified overview of bio-SAF production pathways[1]



Sources: 1) Sustainable Aviation Fuel Market Outlook 2024 | SkyNRG. Note: 1) ASTM certified for 50% blending 2) Carbon Capture and Utilization 3) Direct Air Capture 4) Reverse Water-Gas Shift 5) Methanol-to-jet is in the pipeline for ASTM approval (IEA)

3.1 Production pathways

E-SAF: the least emissions but also the most expensive

SAF can also be produced from sustainable electricity and captured CO_2. Additionally, CO_2 can be directly extracted from the air using Direct Air Capture (DAC), a promising technology currently under development and applied on a limited scale.

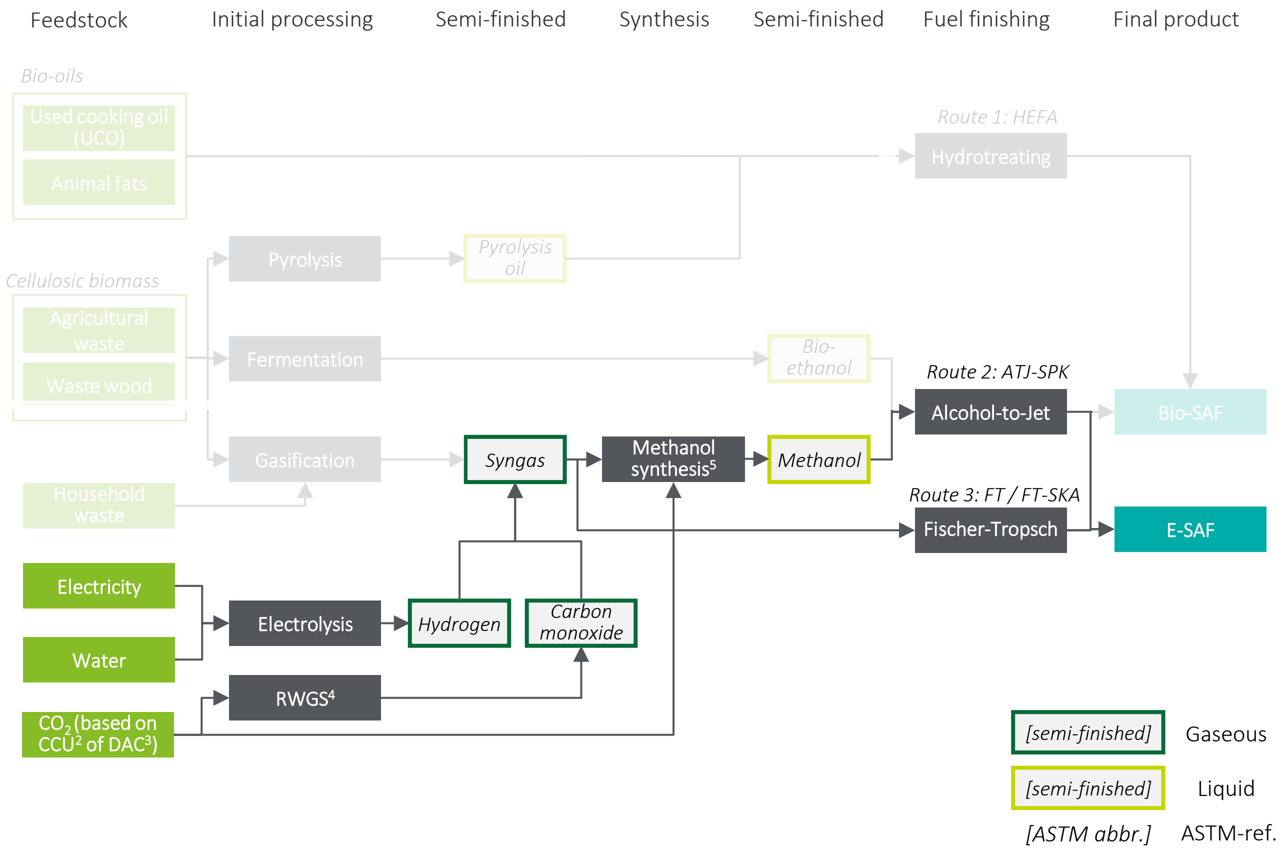
CO_2 can be combined with hydrogen in a Fischer-Tropsch process to produce e-SAF. Due to the processing in gas form, production must occur close to the source of sustainable energy. Alternatively, the semi-finished product e-methanol can be produced, which is already a useful fuel; for example, ships can operate on it. Being a liquid, e-methanol is easier to transport by ship. It can be upgraded to e-SAF through an Alcohol-to-Jet process. The process steps are similar to those for advanced biofuels, but capturing CO_2 and producing the required hydrogen makes the process energy-intensive and costly.

Because the feedstocks for e-SAF are synthetic[1], it is possible to achieve nearly 100% CO_2 reduction, provided all processes are powered by renewable energy. Additionally, e-SAF emits fewer non-CO_2 emissions, such as particulate matter, making its use less harmful to the environment and potentially reducing contrail formation in higher atmospheric layers.

Hydrogen and possible new technologies in the future

As the global demand for sustainable fuels rises, technologies continue to be developed. Although ReFuelEU obligations can be met through the direct use of hydrogen, it is anticipated that hydrogen and other new energy carriers will not significantly contribute to the energy mix until 2035. At this stage, it is essential to persist in researching and developing, while maintaining flexibility in production locations, production pathways, feedstocks, policies, and incentives.

Figure 9. Simplified overview of e-SAF production pathways[2]



Note: 1) unless CO2 of biological origin is used 2) ASTM certified max 50% blending 3) Carbon Capture and Utilisation 4) Direct Air Capture 5) Reverse Water-Gas Shift 6) Methanol-to-jet is in the pipeline for ASTM approval (IEA)

3.2 Feedstocks and availability

Feedstock limitations for various production pathways

The feedstocks required for different SAF production pathways each have their limitations[1]. Below is an overview:

HEFA biofuel: limited availability of waste oils and fats

Used cooking oil and waste fats utilised for HEFA will be available in limited quantities in the future. Currently, a significant portion of these feedstocks is imported from countries such as China. It is anticipated that by 2050, approximately 1,500 PJ of feedstock will be available globally, while the Netherlands will require 150 PJ. It seems unlikely that Dutch aviation can secure 10% of this global supply, necessitating alternative feedstocks to meet SAF demand.[1]

Advanced biofuels: sufficient feedstock available, but many competing applications

In the Netherlands, and globally, there is ample agricultural waste, wood waste, and household waste suitable for producing SAF.[1] Some feedstocks have a low energy density, making transport costly. These transport costs could potentially be reduced after certain processing steps (in the form of semi-finished products). However, it remains uncertain how much of these feedstocks can be converted into bio-SAF at a competitive price. Nonetheless, some advanced biofuels can utilise existing production methods and facilities, such as those used for HEFA.

E-SAF production: dependent on sustainable electricity costs

The costs of e-SAF are currently largely influenced by the cost of electricity for capturing CO_2 and producing hydrogen. In the Netherlands, these costs are expected to stay relatively high due to reliance on offshore wind. Other countries with solar, onshore wind, hydropower, or geothermal energy may be able to produce at lower costs. The impact of other location factors (capital costs, risks, availability of human capital, etc.) will determine production locations. It might become advantageous to produce e-methanol abroad and process it into e-SAF in the Netherlands.

Use of bio feedstocks

The sustainability framework[2] states that bio feedstocks should be utilised as efficiently as possible through cascading. Aviation, like shipping and heavy transport, is identified as a sector where bio feedstocks serve as a bridging application in the transition from fossil to renewable energy sources. ReFuelEU mandates a focus on both biofuels and synthetic fuels for aviation's energy transition.

Sources: 1) Report on Barrier Analysis of Supply and Demand for Sustainable Energy Carriers in Aviation, publication expected Q1 2025 2) Sustainability Framework for Bio Feedstocks | Ministry of Infrastructure and Water Management

4 | Required and possible development of the refining sector

The Netherlands has a strong refining sector and can leverage its talent, location, and infrastructure for the production of SAF.

4.1 The Dutch refining sector
4.2 Possible development of the Dutch refining sector

4.1 The Dutch refining sector

The Dutch refining sector: a leading force in Europe and globally

The Dutch refining sector is among the most advanced in Europe and worldwide. It occupies a central role as a logistics hub for refining and distributing oil products, bolstered by its favourable geographic location, robust port infrastructure, local knowledge and expertise, and stable business climate. Additionally, innovative projects are being implemented in the Netherlands, particularly concerning hydrogen production and CO_2 storage.

High production capacity leads to significant kerosene exports

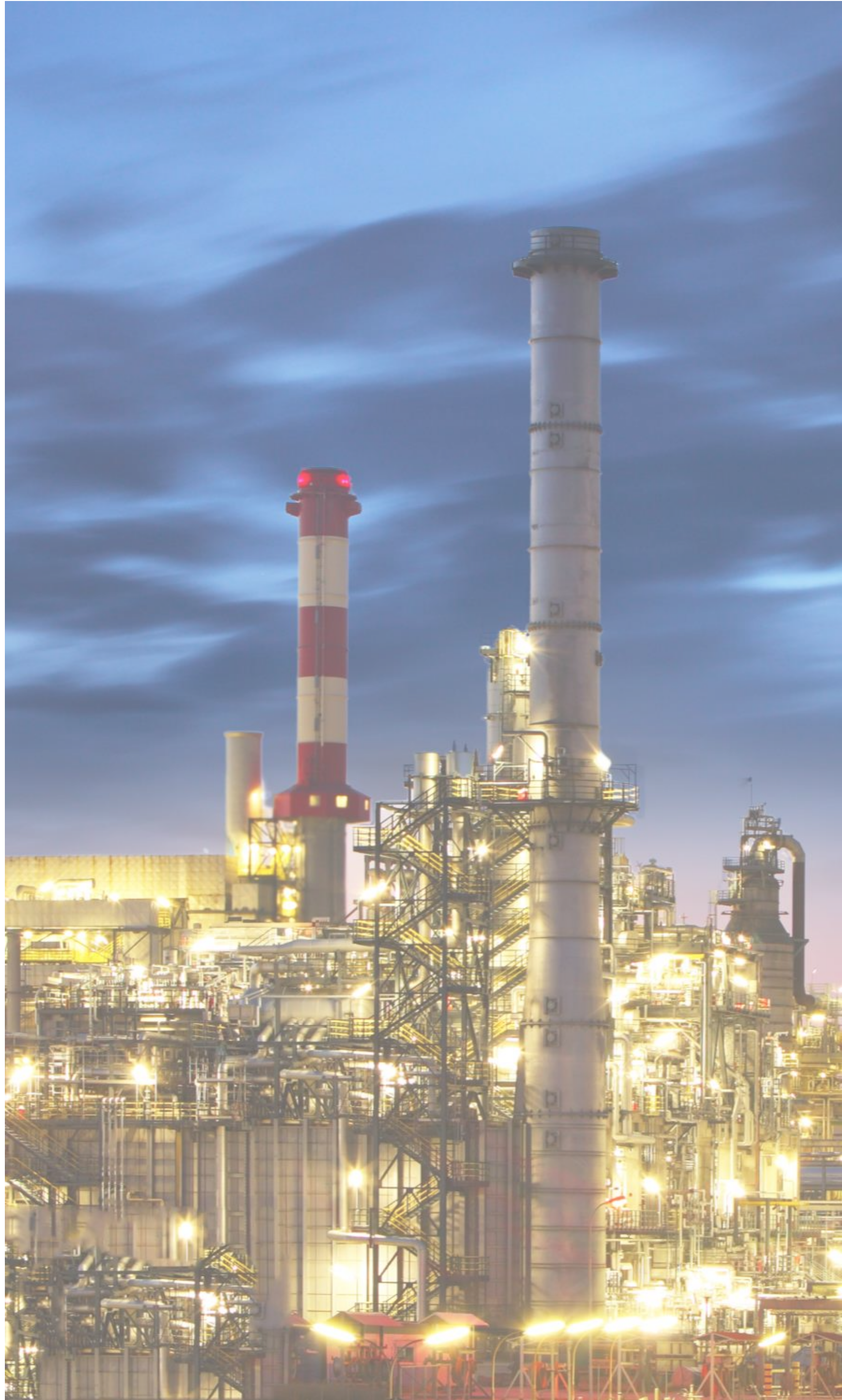
The Netherlands houses six refineries, accounting for about 10% of European refining capacity, with two of them being the largest in Europe[1,2]. Furthermore, the largest bio-refining capacity is situated in the Netherlands. These refineries produce a diverse array of products, including kerosene, gasoline, diesel, LPG, heating oil, biofuels, and feedstocks for the chemical industry. These products are manufactured through various refining processes, primarily hydro-cracking and hydrotreating. Five of the six refineries possess a hydrotreating unit, while three feature a hydro-cracking unit. The Dutch production capacity, based on these processes, exceeds national demand, making the Netherlands a net exporter of oil products. A substantial portion of the refining output is exported to other countries in Europe, North America, and Asia. Additionally, integrated chemical complexes have developed around the refineries, producing chemical products as a basis for further processing into end products.

The Dutch petrochemical cluster is a notable kerosene-producing region, with the Dutch refining sector producing an exceptionally high volume of kerosene. For instance, although the total production capacity of oil products is about 40% of German production capacity, Dutch refineries produce nearly twice as much kerosene in absolute terms as their German counterparts. A portion of this kerosene is exported; more than 40% of the kerosene produced in the Netherlands, Germany, and Belgium is exported, making this region a significant kerosene-producing area.[3]

Strategic decisions and future prospects

Over the past decade, refining capacity has been idled or closed in Europe and the Netherlands. Strategic decisions regarding reduction or conversion to sustainable alternatives appear to have been deferred for Dutch refineries, which are among the most competitive in Europe. This is particularly true for decisions where the future profitability of new activities, such as the production of bio-SAF and e-SAF, has yet to be demonstrated.

Note: 1) Of which five are still in operation at the beginning of 2025 2) PBL, Decarbonisation options for the Dutch refinery sector, 2020 3) UN Energy Statistics, unstats.un.org



4.2 Possible development of the Dutch refining sector

Anticipated demand for bio-SAF and E-SAF in the Netherlands

Based on ReFuelEU, a significant demand for bio-SAF and e-SAF is expected to emerge in the Netherlands. Purely considering ReFuelEU and current WLO scenarios, a demand of approximately 3 PJ is anticipated in 2025 (2%). This demand is projected to increase to potentially more than 30-40 PJ by 2035 (20%)[1]. Alongside this expected production of kerosene, questions arise regarding the role the Dutch petrochemical industry will play in SAF production. The government has indicated that the Netherlands aims to: 1) support the greening of fossil refining capacity, partly through tailored agreements (*Maatwerkaanpak*), and 2) encourage the development of (new) sustainable fuels and feedstocks production (such as SAF)[2], for instance through the SDL Programme.

Production pathways for E-SAF and bio-SAF

Three main production pathways[3] for e-SAF and bio-SAF are influenced by feedstocks, infrastructure, knowledge, business climate, and geographic location. As detailed in Chapter 3, these pathways include: the Hydroprocessed Esters and Fatty Acids (HEFA) pathway (ASTM-ref. HEFA), which is currently the most widely used route, utilising vegetable oils and animal fats to produce bio-SAF; the Alcohol-to-Jet route (ASTM-ref. ATJ-SPK), producing SAF from alcohols such as ethanol and methanol, which can be of biogenic origin, like bio-ethanol derived from agricultural waste streams, or synthetic origin, such as e-methanol produced from electricity, via hydrogen combined with a carbon source like CO_2; and the Fischer-Tropsch process (ASTM-ref. FT / FT-SKA), using syngas, a mixture of CO and hydrogen, among other components, which can be of synthetic origin, similar to e-methanol, or biological origin, through the gasification of bio feedstocks. Both the Alcohol-to-Jet and Fischer-Tropsch processes can produce e-SAF and bio-SAF, depending on the feedstock origin entering the process.

Factors influencing SAF production value chain development

The development of the SAF production value chain depends on numerous factors, including access to sufficient, affordable green electricity, sustainable carbon, and bio feedstocks, and the potential for infrastructure (re)use, local knowledge and expertise, business climate, geographic location, and international competition. As SAF blending obligations are defined in percentages, the absolute demand evolution (from flights, expressed in passenger kilometres) is also crucial. The outcomes of these factors on the business case for large-scale production capacity investments and how the value chain will evolve remain uncertain at this point. Roughly four potential configurations of the SAF value chain can be distinguished, each with varying roles for the petrochemical cluster in the Netherlands (see Figure 10).

Sources: 1) Report on Barrier Analysis of Supply and Demand for Sustainable Energy Carriers in Aviation, publication expected Q1 2025, 2015; 2) https://www.rijksoverheid.nl/documenten/kamerstukken/2024/03/18/voortgang-maatwerkafspraken-maart-2024 Note: 3) In addition to HEFA co-processing

Figure 10. Possible role of the Netherlands in the value chain

Value chain configuration	Description	Possible role of Dutch petrochemical cluster
Full local production	Full local production of SAF based on local feedstocks	Production, storage, and export of bio-SAF and e-SAF based on local feedstocks
Import of feedstocks	Production of e-SAF and bio-SAF based on imported feedstocks	Import of feedstocks; conversion of energy carriers; and production, storage, and export of bio-SAF and e-SAF.
Import of semi-finished products	Production of e-SAF and bio-SAF based on imported semi-finished products	Import of semi-finished products; storage of semi-finished products; production, storage, and export of e-SAF and bio-SAF based on semi-finished products (e.g., methanol).
Import of SAF	Import of e-SAF and bio-SAF	Storage of e-SAF and bio-SAF

4.2 Possible development of the Dutch refining sector

Potential significant role for SAF production in the Netherlands via imported liquid semi-finished products

It appears that local feedstocks (bio feedstocks, hydrogen, and electricity) will be insufficiently available in the Netherlands or remain more costly compared to other regions globally and in Europe[1]. Consequently, SAF production based on imported feedstocks, semi-finished products, or import of SAF itself may prove to be economically more viable. The competitive capacity of SAF production using imported feedstocks or semi-finished products versus direct SAF production (whether domestically or abroad) remains uncertain. This will depend on factors such as the types of SAF, the concentration of bio feedstocks (specific to bio-SAF), the cost of renewable electricity at particular locations (specific to e-SAF), and local capabilities for import, storage, and processing. When large-scale import by sea becomes relevant, the port infrastructure in the Netherlands is ideally suited for the import of these feedstocks and/or semi-finished products.

The extent of imports also influences the role the Dutch petrochemical cluster plays in various production pathways. The Fischer-Tropsch process production pathway relies on syngas production and thus hydrogen. Gaseous energy carriers such as syngas and hydrogen are inherently less efficient to transport by sea due to their lower energy density or require additional conversion steps to be transported in liquid form. As a result, this production pathway will depend on (potentially more costly) locally produced or pipeline-imported hydrogen. In contrast, the Alcohol-To-Jet process relies on the production of alcohols like methanol, which are liquid. This makes sea import more efficient, providing Dutch ports with a comparative advantage for SAF production via the Alcohol-To-Jet pathway.

Sources: 1) Knelpuntenanalyse duurzame luchtvaartbrandstoffen https://www.tweedekamer.nl/downloads/document?id=2025D16095

4.2 Possible development of the Dutch refining sector

Clustering effects, knowledge and expertise, and existing infrastructure create a comparative advantage for the Netherlands

The Dutch port areas (Rotterdam, Amsterdam, Zeeland, Groningen) possess additional comparative advantages beyond their favourable location for imports. Cluster effects, such as synergies between different clusters, can lead to reduced production costs through economies of scale. These effects can be realised due to the proximity of various petrochemical products' manufacturing sites and their efficient connectivity to diverse markets.

The knowledge and expertise inherent in the Dutch petrochemical cluster also offer a comparative advantage over other locations. This advantage consists of two facets: the local knowledge and expertise held by employees, universities, and research institutes, and the global knowledge and expertise of large international energy companies that can utilise this at specific sites, such as the Dutch petrochemical cluster. Furthermore, international companies can more readily organise foreign production and the import of semi-finished products.

The extent to which existing production facilities can be repurposed for the production of bio-SAF and e-SAF remains uncertain. While many new investments appear necessary, the existing infrastructural connections (kerosene pipelines usable for bio-SAF and e-SAF distribution) between the ports, the refineries, Schiphol, and international airports offer a significant comparative advantage. Constructing such pipelines is costly, and alternatives like road transport increase operational expenses. The existence of these infrastructural connections provides a further comparative advantage for SAF production in the Netherlands.

These advantages are evident in both the ports of Rotterdam and Amsterdam, where several biofuel production facilities can be easily adapted for SAF production. Additionally, pipelines from both Amsterdam and Rotterdam to Schiphol facilitate the import of feedstocks and semi-finished products.

Integral vision needed

This year, I&W will investigate the direct and indirect contributions to the economy from SAF production, trading, and distribution. This includes not only their financial value but also contributions to employment, competitiveness, and the investment climate. If further development of local production of SAF is deemed desirable and promising, it must be assessed whether policy actions are needed to ensure that postponed projects can proceed and that the production of e-SAF/SAF can be successfully initiated. Additionally, this theme will be incorporated into policy development for the energy transition and industrial greening within the Ministry of Climate Policy and Green Growth (CPGG).

4.2 Possible development of the Dutch refining sector

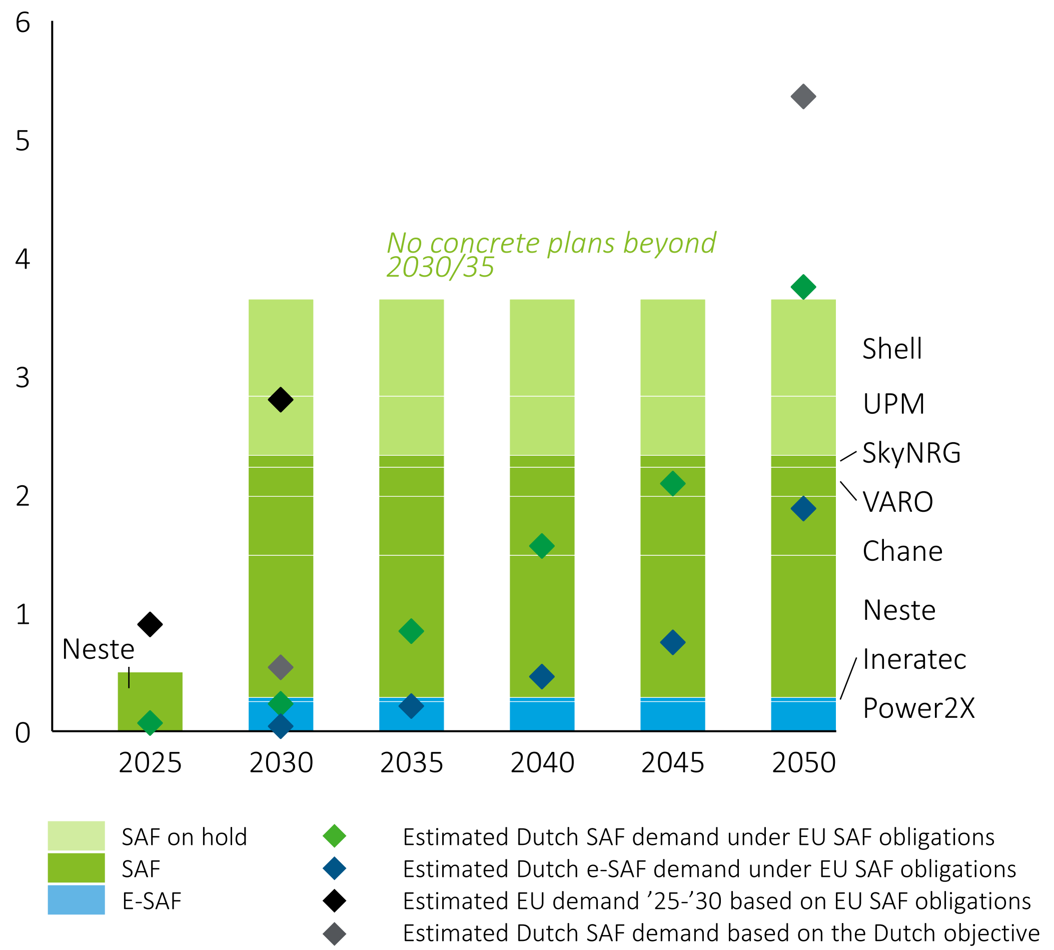
Main production plans for SAF in the Netherlands[1]

Currently, there are several large-scale plans in progress to produce SAF in the Netherlands:

1. Neste from Finland has been producing up to 0.5 Mt of SAF annually since 2025 within its existing Rotterdam refinery capacity. This capacity is set to increase to 1.2 Mt/y by 2027.
2. Chane is expanding its distillation (and storage) terminal in Rotterdam from a capacity of 0.2 Mt per year to nearly 0.65 Mt/y of SAF feedstock, resulting in 0.25 Mt/y of SAF production[2].
3. VARO Energy and Gunvor Group are planning a large-scale SAF production facility with a capacity of 0.35 Mt/y at the Gunvor Energy Rotterdam site.
4. SkyNRG, in collaboration with KLM and SHV Energy, announced a SAF plant in 2019, which is to be constructed in Delfzijl and is expected to produce 0.1 Mt/y of sustainable kerosene.
5. Power2X and Advario are developing an e-SAF production and storage hub in Rotterdam with a capacity of 0.25 Mt. E-SAF will be produced here using imported methanol and locally produced green hydrogen.
6. Ineratec plans to produce 0.035 Mt/y of e-SAF in the Port of Amsterdam.
7. Shell has suspended the construction of a bio-SAF plant in Rotterdam with a capacity of 0.82 Mt/y.
8. UPM has recently postponed the investment decision for a bio-SAF plant with a capacity of 0.5 Mt/y in Rotterdam.

This current production is more than adequate for 2025, and the announced production plans, in theory, could sufficiently meet the Dutch SAF demand for 2030 and 2035. The question remains whether these plans will materialise, whether there will be sufficient feedstocks, and whether the produced fuels will stay within the Netherlands. E-SAF production heavily relies on a limited number of plans. Nonetheless, the collective SAF projects underscore the ambition and position of the Netherlands as a significant prospective hub in the production and distribution of SAF for both domestic and European demand.

Figure 11. Planned or operational SAF production capacity in the Netherlands (Mt)[1]



Sources: 1) Production plans of 0.01 million tonnes or more, based on public business plans. In addition to these plans, there are some smaller-scale production plans, such as Metafuels. Note: 2) Actual SAF production depends on the yield from the feedstock (25% - 70%).

5 | Barriers to achieving the objectives

Six barriers have been identified that hinder the achievement of the objectives

5.1 Limited market and consumer demand
5.2 Traceability of SAF
5.3 Required investments in assets and infrastructure
5.4 Dependence on imported feedstocks or semi-finished products
5.5 Legislation and regulation
5.6 Interaction with the sustainability of other sectors

5.1 Limited market and consumer demand

High prices, insufficient recognition, and low confidence limit voluntary demand for SAF

While ReFuelEU imposes obligations for SAF blending, voluntary uptake of SAF remains beneficial beyond these obligations. Apart from the essential reduction of CO_2 emissions to meet climate objectives and the drive to stimulate the SAF value chain in the Netherlands, voluntary SAF uptake facilitates the ramping up of production in anticipation of higher mandatory blending levels (such as the 20% target set for 2035 by ReFuelEU).

Currently, voluntary demand (demand exceeding European obligations) for SAF is minimal, whether from individuals, companies, or governments. Although organisations and individual travelers can choose to book flights with an additional SAF charge, this option is seldom exercised. Several factors discourage travelers from adding the SAF charge, with the primary factor being the significant price disparity between current kerosene and SAF prices. Additionally, there is often a lack of consumer confidence that purchasing SAF will genuinely lead to CO_2 reductions.

Since the price difference between kerosene and SAF is a critical factor hindering voluntary demand, overcoming this barrier is essential to increase the SAF blending percentage beyond 6%. To achieve the 14% target, an additional 8% is required. Based on kerosene sales in 2023[1] and the price difference between SAF and kerosene, this translates to approximately €450 million – €500 million annually needing to be covered by the value chain (including government and consumers). A small portion of this amount will be voluntarily covered; however, to achieve full coverage, revenue from existing levies, rebate schemes, and Contracts-for-Difference[2] (CfD) will be necessary.

Raising awareness through communication about the importance and positive climate impact of SAF can enhance understanding. In turn, this may lead to increased confidence in the feedstocks' origins and their effectiveness in reducing CO_2 emissions.

Source: 1) CBS, Deloitte analysis Note: 2) a CfD (Contract for Difference) is a contract between the government and private parties that establishes a fixed price for a product for a certain period, thereby creating investment certainty.

5.2 Traceability of SAF

Reporting requirements for SAF usage and engine certification necessitate SAF traceability

Presently, it is essential to physically measure the amount of SAF used in the supply chain to adhere to EU legislation[1]. There are two key reasons for this requirement.

Firstly, airlines must report the quantity of SAF used, along with the origin of the feedstocks. This necessitates precise tracking of the various fuel sources. At Schiphol, kerosene is supplied via pipeline, ideally mixed with SAF at the pipeline's inlet. This method eliminates the need for separate transportation of SAF by trucks, inland vessels, or dedicated pipelines. However, mixing SAF in the pipeline network complicates traceability and the assurance of its origin, necessitating a monitoring process that satisfies the legislator, certification bodies, and safety authorities (particularly concerning REDIII, ReFuelEU, and EU-ETS requirements). This is simpler for national pipeline systems like the Amsterdam Schiphol Pipeline (ASP) than for international systems such as the Central European Pipeline System (CEPS).

Secondly, most aircraft engines are compatible with ASTM-certified fuel, but this certification restricts SAF usage to a maximum of 50%. Thus, the blending and monitoring process must ensure that no more than 50% SAF is present in each aircraft.

Currently, various regulations impose differing requirements on monitoring, such as the specific point in the chain (storage, pipeline, wing) where SAF percentages must be guaranteed. Furthermore, there are multiple SAF registration systems with limited coordination (for instance, the linkage between UDB, EU-ETS, Register for Energy for Transport (REV), and CSRD reporting), necessitating enhanced transparency and traceability.

Note: 1) see ReFuelEU and EU-ETS

5.3 Required investments in assets and infrastructure

Substantial investments required amid limited incentives and market demand

The production of SAF necessitates new facilities, partially reliant on new infrastructure and supply routes. Technically, no additional infrastructure is required for SAF delivery. The existing Central European Pipeline System (CEPS), which crosses national borders, can serve a substantial market. However, the administrative operation of the CEPS pipeline for SAF transport does not currently align with national SAF responsibilities. By implementing mass balancing, national obligations could be more easily fulfilled.[1]

The required development time for new production sites is roughly 6 to 8 years from the announcement year, with costs reaching billions of euros. This demands substantial investments from companies and loans from banks and other external investors.

To meet the initial targets for e-SAF by 2030, funding and financing for large projects must be secured by 2026. This poses a barrier during the design phase (FEED phase), as tens of millions of euros are required without sufficient guarantees from project developers for financiers. This uncertainty prevents buyers from committing to long-term commitments. Consequently, investment decisions are postponed, leading to cancelled or delayed production plans.

Innovative bio-SAF production is also likely necessary by 2035, but investing in such production capacity is risky due to complex market dynamics, resulting in significant uncertainty.

For the continued financing of production sites, investors lack sufficient guarantees. Airlines cannot enter into long-term contracts due to substantial uncertainty regarding price developments of (innovative) bio-SAF and new e-SAF, as the risk that they will face a higher cost price than competitors due to excessively high fuel prices is too great.

Finally, the current ReFuelEU structure, with five-year blocks for blending percentages, does not align with the gradual scaling up of production capacity, and the initial steps are insufficient for rapid scaling.

Note: 1) Mass balancing refers to the process in which the amount of fossil and non-fossil materials is carefully recorded when they are blended, ensuring that the ratio of the sources used in the total mass of the final product can be guaranteed.

5.4 Dependence on import

Dependence on imports for SAF production in the Netherlands

Similar to how the Netherlands currently imports oil, it may also largely rely on imports from other countries for SAF production within its borders. Although there are ample feedstocks for innovative bio-SAF domestically, questions remain about their applicability and availability for SAF production.[1] Additionally, the relatively high costs of green energy in the Netherlands, such as hydrogen production and CO_2 capture for e-SAF, may render e-SAF production less competitive compared to other countries.

Therefore, three alternative configurations to local production appear more promising: importing feedstocks, semi-finished products, or the end product itself. It remains uncertain which of these supply chains will become dominant. This uncertainty should be considered in the context of the government's aspiration for energy independence. Subsidy programmes for various production pathways and semi-finished products are currently being developed, and decisions are yet to be made regarding the steps in the production pathways. These choices can impact the final costs and availability of SAF in the Netherlands.

Furthermore, as SAF production pathways diversify, the demand on import, storage, transshipment, and blending infrastructure increases. These conditional aspects must be accounted for when planning new production capacity. Additional capacity is also required for blending SAF, as different types of SAF are not presently permitted to be blended together.

Source: 1) Knelpunten analyse luchtvaartbrandstoffen: https://www.tweedekamer.nl/downloads/document?id=2025D16095

5.5 Legislation and regulation

Laws and regulations limiting the scaling up of SAF

The demand for SAF is currently driven almost entirely by laws and regulations, notably the ReFuelEU regulation. Components of this regulation could benefit from optimisation or better alignment with other legislative frameworks. One example is the five-year incremental increase in blending percentages; in practice, scaling investments and production volumes at this rate is challenging. Another example is the prohibition on increasing blending obligations at or by individual airports. Additionally, the current structure of ReFuelEU does not differentiate between the sustainability levels of various types of SAF, apart from the sub-mandate for e-SAF. This lack of differentiation discourages investment in more sustainable, yet relatively more expensive, fuel production methods. The evaluation scheduled for 2027 presents an opportunity to amend ReFuelEU, provided the Dutch government can reach consensus with other EU member states. It is important to also consider the position of first movers and existing SAF production capacities.

Within broader legislation, two fundamental barriers exist. Firstly, collaboration in the sector must not infringe on competition rules, making companies and national governments particularly cautious. The possibilities for state aid are similarly restricted by these regulations, as well as the EU state aid, although exceptions exist for sustainability initiatives.

Furthermore, the level playing field is a significant consideration. Regulations must ensure fair competition both domestically and internationally. European rules can potentially favour airports, fuel suppliers, and primarily airlines outside the EU, especially concerning routes between the US and Asia.

Achieving a European level playing field also necessitates alignment regarding feedstock use, production locations, market creation, mitigation of foreign state aid, as well as production subsidies and scalability among different European countries.

5.6 Interaction with the decarbonisation of other sectors

Interaction with other sectors: synergies and competition

The development of SAF is interconnected with other sectors engaged in the energy transition, which require similar feedstocks for steel, chemicals, and transport, including electricity, hydrogen, biofuels, and synthetic fuels. This interconnection allows for synergies in the production of new semi-finished products usable across multiple applications, thereby enabling economies of scale. Additionally, sectors can exchange knowledge to further stimulate the energy transition.

Conversely, competition may arise for sustainable feedstocks and semi-finished products. These feedstocks may become scarce as multiple sectors claim them, and limited resources such as physical space, nitrogen allowances, connection capacity to the electricity grid, and technical personnel are essential for decarbonising various sectors. Coordinating and prioritising among different sectors is thus a broad and complex task. Aviation is particularly dependent on this prioritisation as it is one of the few sectors without a viable alternative to liquid carbon fuels.

Ultimately, prioritisation regarding feedstocks and the other elements mentioned requires political decisions based on a holistic perspective of the future of the (refining) sector, alongside coherent national and European policies.

6 | Roadmap with initiatives

This chapter discusses the development of the SAF roadmap, the structure of the SAF roadmap with the three workstreams, and the initiatives themselves

6.1 Development of the roadmap
6.2 Roadmap
Appendix: Workstreams with initiatives

6.1 Development of the roadmap

Formulating initiatives to increase SAF uptake in the Netherlands

The objectives (Ch. 1) and the barriers (Ch. 5) have been utilised to formulate a longlist of potential initiatives aimed at enhancing SAF uptake in the Netherlands. This list was compiled with contributions from the aviation sector. These initiatives were collectively evaluated based on preliminary indications of their expected impact, complexity, and implementation costs, which led to the prioritisation of key actions for the coming years. The initiatives were further mapped out onto different timelines, taking into account necessity and dependencies. Three interrelated workstreams have been identified.

Goal	Barriers to overcome	Workstream in the roadmap
Achieve ReFuelEU obligations	• Limited traceability of SAF • Lack of efficient and coherent legislation and regulation	*Create an efficient market for the realisation of ReFuelEU obligations*
Achieve 14% SAF target in 2030	• Limited market and consumer demand at current price point (and limited private/public funds to stimulate demand)	*Stimulate additional demand towards the 14% target*
Produce SAF in the Netherlands	• Required investments in production facilities • Dependence on imported feedstocks and semi-finished products • Interaction with other sectors	*Strengthen the Netherlands as a production location for sustainable fuels*

1) Parties invited by the Ministry of Infrastructure and Water Management (I&W) at the information meeting consist of public and private organisations from the value chain.

6.2 Roadmap

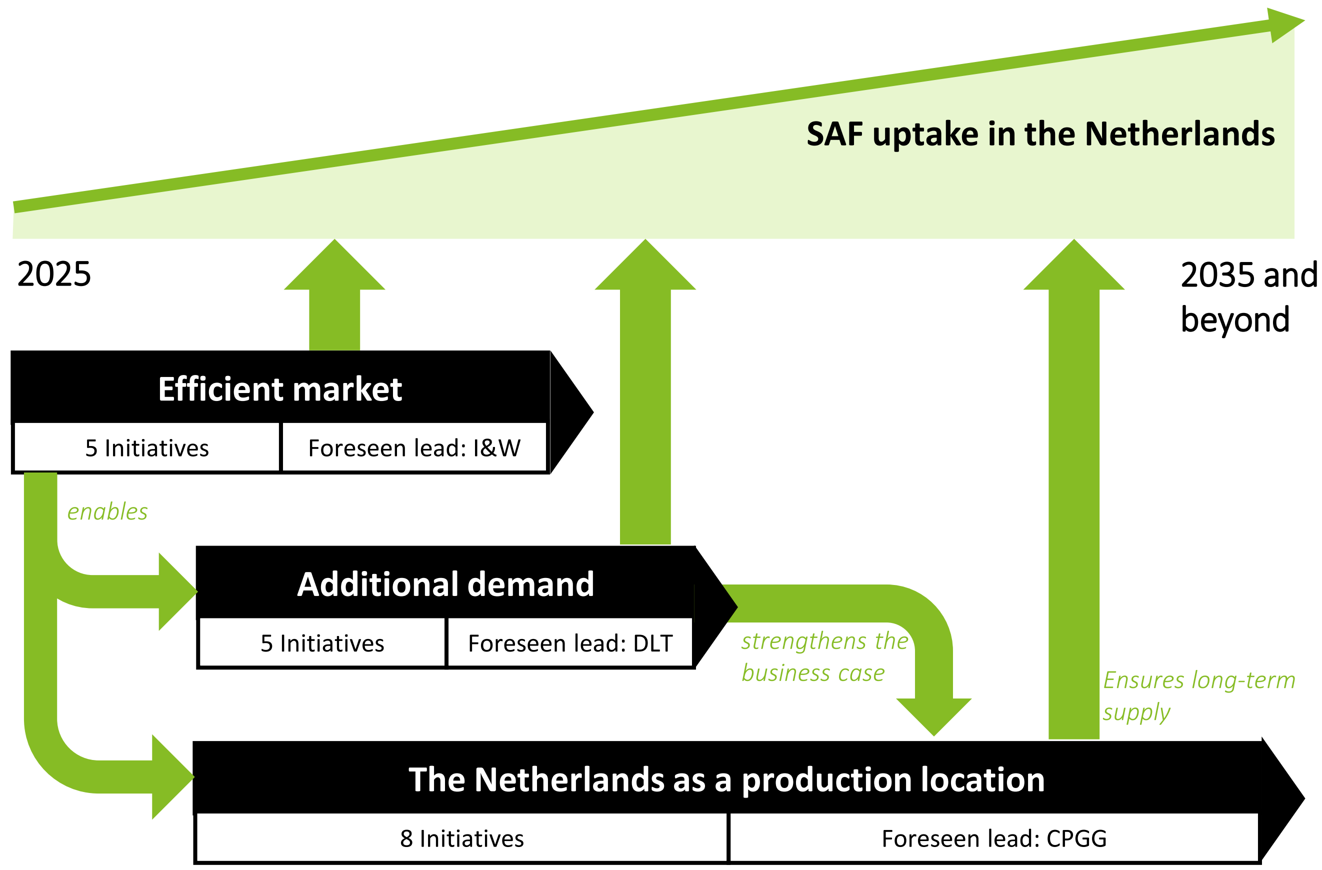
The SAF roadmap: three workstreams of interconnected activities

1. Efficient market to meet ReFuelEU obligations
This workstream encompasses several initiatives aimed at the efficient implementation of the ReFuelEU legislation. It includes the utilisation of existing pipelines and contributing towards a unified stance for the ReFuelEU evaluation in 2027. This workstream serves as the foundation for the remainder of the roadmap.

2. Stimulating additional demand towards the 14% target
The significant price disparity between kerosene and SAF results in limited uptake of flights partially relying on SAF by both individuals and businesses. This workstream comprises initiatives designed to encourage SAF uptake by narrowing price gaps, enhancing transparency, and securing commitment from (business) travelers. This increased demand can bolster the business case for producing SAF within the Netherlands.

3. Strengthening the Netherlands as a production location for sustainable fuels
The Dutch petrochemical cluster provides the location, infrastructure, and expertise necessary for SAF production, competing with other global locations. This workstream includes initiatives essential to enable private party production and create the necessary conditions, such as permits and subsidies. With this production capacity, the Netherlands can ensure a sufficiently long-term supply of SAF, contributing to security of supply and future earning potential.

Figure 12. Interrelation of the workstreams in the roadmap

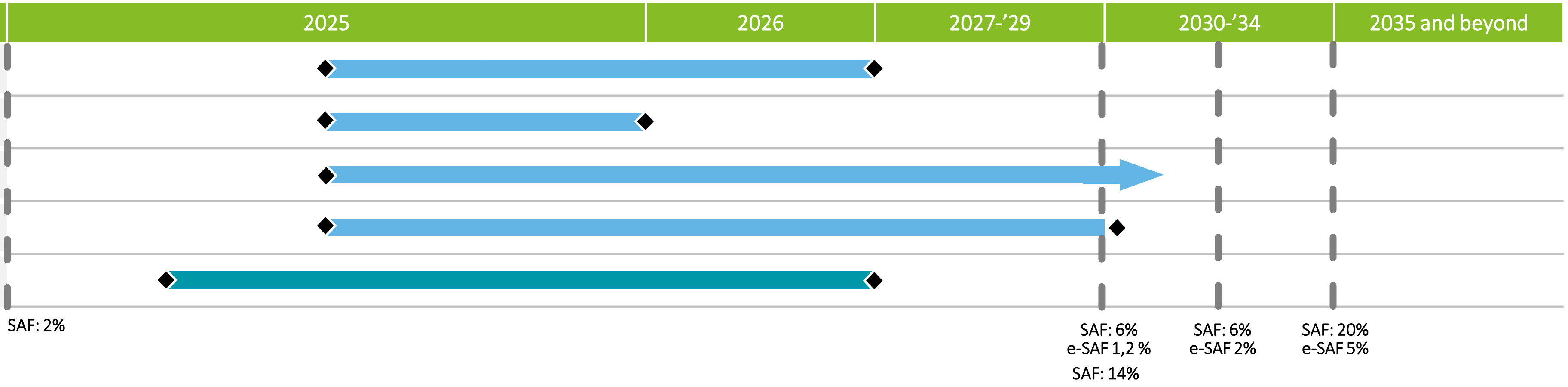


SAF-roadmap

Legend[1]
- Public parties
- Joint
- Private parties
- Obligations / objectives
- Indicative dependency

Workstream 1: Creating an efficient market that enables the realisation of ReFuelEU obligations

	No.	Initiative
Creating an efficient market that enables the realisation of ReFuelEU obligations	1	Streamline EU registration system
	2	Realise int. mass-balancing CEPS
	3	Establish international cooperation and align interdepartmental policy
	4	Align bio-feedstock policy
	5	Consolidate joint input for the ReFuelEU evaluation



Objectives and obligations — Europe / The Netherlands

Developing and refining frameworks for an efficient SAF market

This workstream is centred on developing and refining the conditions and legal frameworks necessary to establish an efficient SAF market. These frameworks are crafted to support the broader energy transition, with particular emphasis on mobility and aviation. They are designed for three key areas at both the European and national levels. The activities within this workstream ensure that all relevant rules and definitions are harmonised and that European legislation is implemented effectively.

At the national level (Initiative 4), we align our policies with existing approaches and definitions. Collaboratively with neighbouring countries (Initiatives 2 and 3), we exchange knowledge and utilise pipeline systems. At the European level (Initiative 5), we work to ensure that ReFuelEU continues to align with Dutch aspirations and objectives.

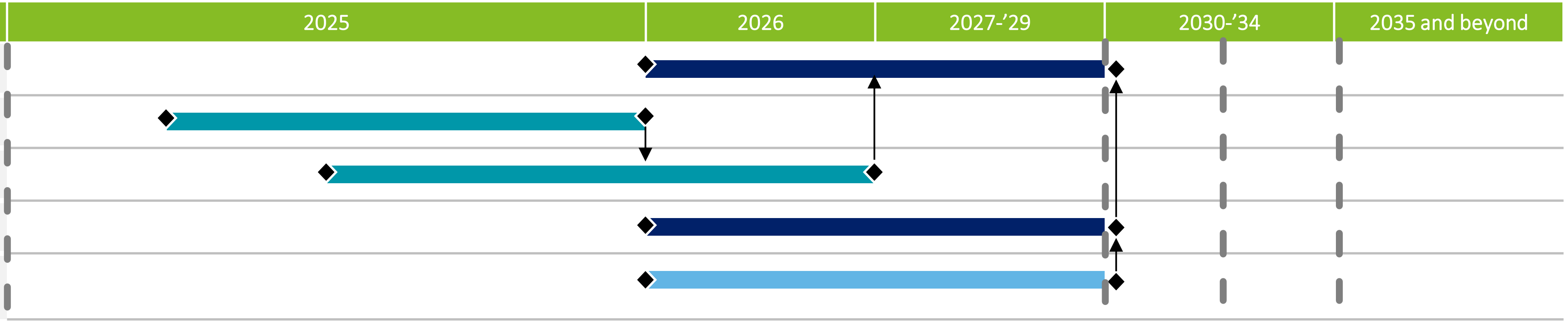
The Ministry of Infrastructure and Water Management (I&W) is the designated lead for this workstream, gathering all necessary input from other sector stakeholders.

Note: 1) Highlighted period indicates the time period in which the greatest activity is expected for this initiative

SAF-roadmap

Workstream 2: Stimulate additional demand towards the 14% target

	No.	Initiative
Stimulate additional demand towards the 14% target	6	Stimulate voluntary demand by market parties
	7	Clarify 14% target
	8	Increase trustworthiness, credibility, and transparency
	9	Explore use of charges in value chain to subsidise SAF use
	10	Explore (emission-dependent) use of government levies and channel back budget



Objectives and obligations		2025	2030	2030-'34	2035 and beyond
	Europe	SAF: 2%	SAF: 6% e-SAF 1.2 %	SAF: 6% e-SAF 2%	SAF: 20% e-SAF 5%
	The Netherlands		SAF: 14%		

Stimulating additional SAF demand beyond ReFuelEU obligations

This workstream aims to further enhance SAF demand in the Netherlands, exceeding the ReFuelEU obligations. The target is to achieve 14% SAF uptake in the Netherlands by 2030, requiring an additional demand of 8%. Based on current benchmarks, this is estimated to cost approximately €500 million per year (see Chapter 5.1). These costs can be shared among consumers, private sector entities, and the government.

Voluntary consumer demand

Currently, employers and consumers exhibit limited willingness to reduce flight emissions by purchasing SAF. We can stimulate this demand through existing partnerships and purchasing consortia (Initiative 6). To facilitate this, it is crucial to clarify the requirements for additional SAF, such as production location and permitted feedstocks (Initiative 7). This clarity ensures consistency and facilitates certification, enhancing reliability (Initiative 8), thereby providing businesses and consumers with assurance that the additional costs genuinely contribute to lower CO_2 emissions.

Financial incentives for additional SAF demand

In addition to voluntary demand, it is possible to stimulate SAF demand by redirecting revenues from surcharges and existing levies into SAF production. This approach can be employed by private entities (Initiative 9), as demonstrated by Schiphol. Governments can establish similar mechanisms using levies (Initiative 10), thereby enabling aviation ETS allowances to contribute to increased demand. Coordinating these instruments within the workstream is crucial, particularly concerning the definitions of SAF compared to voluntary SAF and SAF required by ReFuelEU.

Achieving the 14% target through these initiatives remains highly challenging. Feasibility will depend on the outcomes of exploratory studies (Init. 9 and 10).

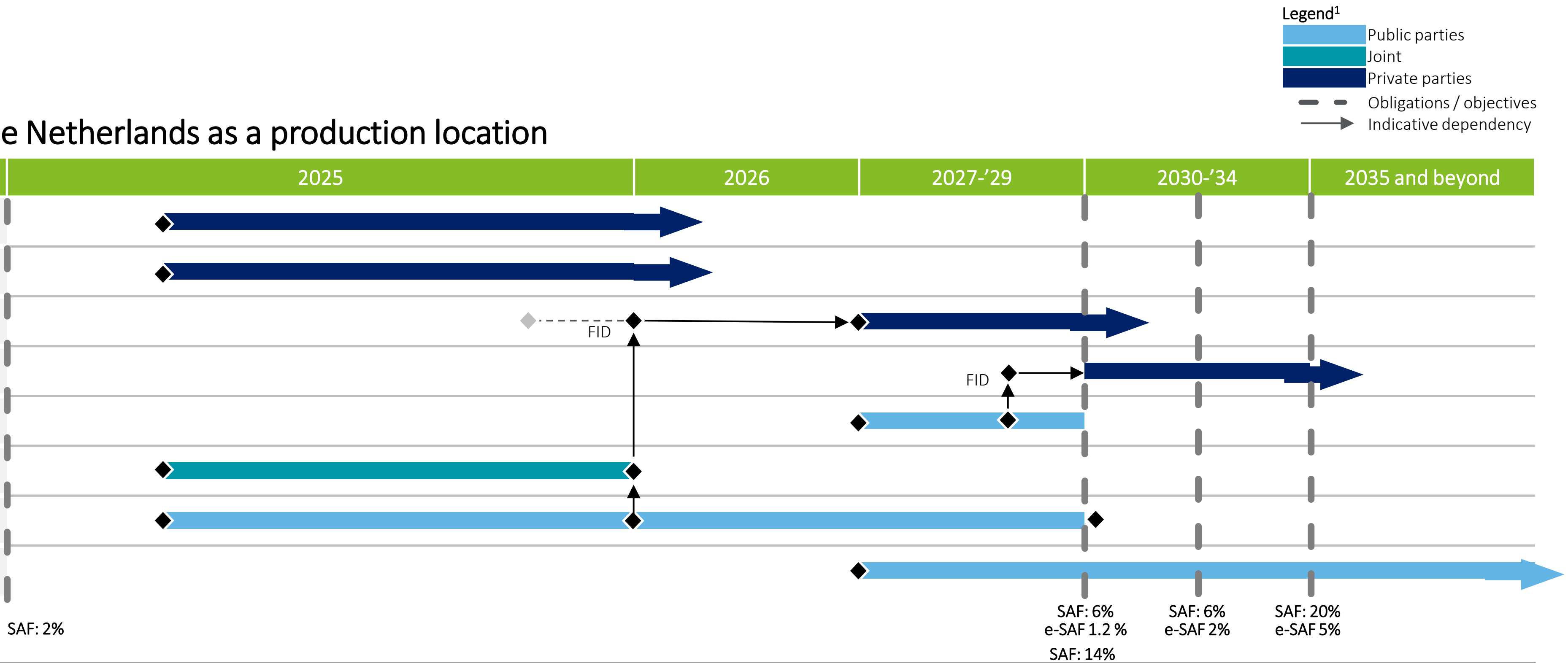
The DLT is the designated lead for this workstream.

Note: 1) Highlighted period indicates the time period in which the greatest activity is expected for this initiative

SAF-roadmap

Workstream 3: Strengthening the Netherlands as a production location

	No.	Initiative
Strengthening the Netherlands as a production location	11	Explore economic feasibility of co-processing
	12	Build HEFA-SAF production capacity with flexible input and output
	13	Build E-SAF production capacity with flexible input and output
	14	Build production capacity advanced bio-SAF with flexible input and output
	15	Drive new production paths (PtL, AtJ)
	16	De-risk long-term contracts
	17	Create starting condition for production sites
	18	Support import of feedstock and semi-finished products



Objectives and obligations — Europe / The Netherlands

Strengthening the Netherlands as a production hub for SAF

The petrochemical cluster in the Netherlands offers the location, infrastructure, and expertise required to produce SAF, competing with other sites globally. This workstream encompasses initiatives necessary to enable private production, alongside supportive measures such as permits and subsidies where needed.

Cohesion with other sectors

SAF production is integrated within the broader manufacturing processes for other fuels, plastics, and more. It is logical to align this workstream with wider energy transition and industry decarbonisation policies, both coordinated by the Ministry of Climate Policy and Green Growth (CPGG). Given the uncertainties in supply and demand, new production sites will be established to be as adaptable as possible, concerning both the type of feedstocks they utilise and the fuels they produce. Encouragement is given to importing relevant feedstocks and semi-finished products (Initiative 18) as necessary for the broader energy transition.

Timelines and dependencies of four SAF production processes

1. Co-processing (Init. 11): This process can be initiated by the private sector without requiring significant investments.

2. HEFA-SAF production (Init. 12): This is now becoming available in large volumes. A key step involves ensuring a sufficient market, for instance via the CEPS pipeline system (Init. 2), and promoting additional demand (workstream 2).

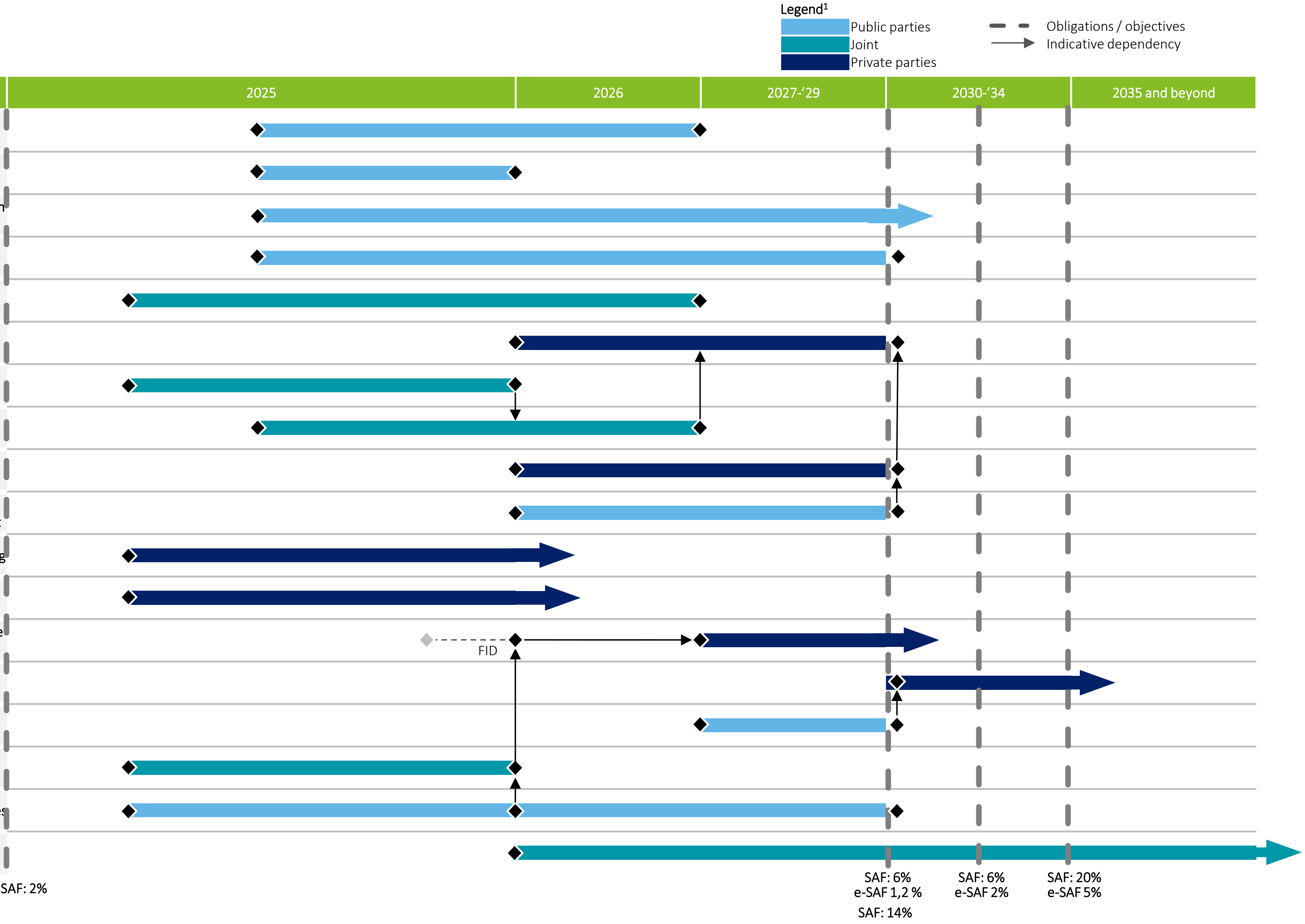
3. E-SAF production: E-SAF will be needed from 2030 onwards due to the e-SAF sub-mandate. To commence production on time, a Final Investment Decision (FID) must be made by late 2025 or early 2026 (Init. 13). This will necessitate long-term purchase agreements with airlines, although the associated risks present challenges for both parties. Therefore, government support, including from the EU, may be essential to mitigate some of these risks (Init. 16). Additionally, baseline conditions for production sites, such as permits and power connections, are required (Init. 17).

4. Advanced bio-SAF production (Init. 14): This is likely to be necessary after 2035 if there is insufficient HEFA feedstock available to meet the SAF mandate. Through the Climate Fund, the government is supporting the scaling up of essential technologies (Init. 15), including via the SDL Programme.

Note: 1) Highlighted period indicates the time period in which the greatest activity is expected for this initiative

SAF-roadmap

Workstream	No.	Initiative
Creating an efficient market that enables the realisation of ReFuelEU obligations	1	Streamline EU registration system
	2	Realise int. mass-balancing CEPS
	3	Establish international cooperation and align interdepartmental policy
	4	Align bio-feedstock policy
	5	Consolidate joint input for the ReFuelEU evaluation
Stimulate additional demand towards the 14% target	6	Stimulate voluntary demand by market parties
	7	Clarify 14% target
	8	Increase trustworthiness, credibility, and transparency
	9	Explore use of charges in value chain to subsidise SAF use
	10	Explore (emission-dependent) use of government levies and channel back budget
Strengthening the Netherlands as a production location	11	Explore economic feasibility of co-processing
	12	Build HEFA-SAF production capacity with flexible input and output
	13	Build E-SAF production capacity with flexible input and output
	14	Build production capacity advanced bio-SAF with flexible input and output
	15	Drive new production paths (PtL, AtJ)
	16	De-risk long-term contracts
	17	Create starting condition for production sites
	18	Support import of feedstock and semi-finished products



Objectives and obligations

Appendix

Action cards per workstream

SAF-roadmap

Workstream	No.	Initiative	Description
Creating an efficient market that enables the realisation of ReFuelEU obligations	1	Streamline EU registration system	Ensure a well-functioning EU-wide registration system (UDB), connected to other systems (such as REV), legislative processes (such as EU-ETS), clear definitions, reporting requirements (such as CSRD), public oversight, and a clear record of both voluntary and mandatory uptake. Additionally, harmonisation of how SAF deliveries to airports and uptake by airlines are registered throughout the EU is essential, with the EU-wide register being fed by data recorded per Member State and per airport.
	2	Realise int. mass-balancing CEPS	Develop an administrative solution so that SAF in the CEPS pipeline is traceable and counts towards the designated blending obligations/objectives in the country where the SAF is delivered. Permitting mass balancing makes it simpler to meet national obligations.
	3	Establish international cooperation and align interdepartmental policy	Establish joint research projects and explore joint (European) funding opportunities between the Netherlands and key partners such as France, Germany, and the Benelux region. Contribute to various interdepartmental programmes, such as the Taskforce on Fuel Production and international initiatives within CAEP, FTG, the EU, and RLCFA, and build on existing government declarations with Germany and France, using these for further bilateral collaboration in SAF.
	4	Align bio-feedstock policy	Ensure that Dutch legislation and regulations on bio-based feedstocks are not stricter than necessary and remain in line with other EU Member States' interpretations. Additionally, identify which legislation and regulations can be streamlined if they unnecessarily drive up costs for feedstocks, such as waste and residual streams and innovative feedstocks. The Netherlands is also committed to robust and workable sustainability requirements consistent with the bio-based feedstock sustainability framework. Moreover, efforts should be made to establish harmonised and consistent European policy (e.g. RED, EU-ETS etc.). For instance, set up a (European) helpdesk to assess feedstock sustainability.
	5	Consolidate joint input for the ReFuelEU evaluation	Form consensus for the ReFuelEU evaluation to create a level playing field, clear (reporting) obligations, and more certainty (e.g. adjusting targets, adapting the stepwise increase in blending requirement, levelling the playing field, avoiding unnecessary feedstock restrictions, and allowing mass balancing).
Stimulate additional demand towards the 14% target	6	Stimulate voluntary demand by market parties	Encourage voluntary demand among (business) travellers (and/or private jet users) by forming a consortium of companies committed to sustainable flying and/or by requiring sustainable flying within government procurement processes and official travel.
	7	Clarify 14% target	Clarify the 14% target and the SAF definition by, for example, differentiating among SAF types based on their (production) origin. Doing so can help reduce the price gap between kerosene and different SAF types. In that context, also consider the possibility of limiting (the growing) energy demand, for instance via the European Energy Efficiency Directive. Moreover, it may be worth allowing a broader RED feedstock base than ReFuelEU currently permits for usage above 6%, in order to reduce the price difference.
	8	Increase trustworthiness, credibility, and transparency	Ensure there is effective, objective, and balanced communication about SAF's role in mitigating aviation's negative climate impact. In doing so, monitor how the European Flight Emissions Label actually operates and, where necessary, use European governing bodies to promote the necessary improvements that enhance reliability. Additionally, investigate how employers can claim their SAF usage under the CSRD, and guarantee sufficiently effective (public) market oversight—also part of the first workstream.
	9	Explore use of charges in value chain to subsidise SAF use	Explore how the (additional) revenues from existing levies in different parts of the value chain—such as producers, airlines, and fuel suppliers—can help reduce the price premium of SAF, with attention to demonstrable additional volumes above the mandatory quantities. For example, explore how an instrument such as the Schiphol SAF contribution for voluntary demand can be continued with additional financing until 2035, and establish a comparable programme at other Dutch airports.
	10	Explore (emission-dependent) use of government levies and channel back budget	Explore how existing (CO_2 emission-based) levies, EU-ETS levies, and airline taxes received by the government could help scale up SAF using a revenue recycling mechanism, similar to the net revenue approach applied to the heavy goods vehicle levy. Investigate more broadly how (EU) budgets—such as funds from the EU ETS Innovation Fund, the Connecting Europe Facility (CEF), and new schemes (e.g. Contract for Difference [CfD] or national SAF allowances for non-EU-ETS destinations)—could be deployed to enhance the sustainability of Dutch aviation.
Strengthening the Netherlands as a production location	11	Explore economic feasibility of co-processing	Explore the costs of delivering bio-SAF in the short term via co-processing in existing facilities. If this proves cost-effective compared to blended HEFA bio-SAF, it can add to production capacity. This is an initiative that parties must undertake individually. However, it remains only a temporary solution, given the continued reliance on fossil fuels, and therefore there is no government role here.
	12	Build HEFA-SAF production capacity with flexible input and output	Bring (the necessary) HEFA-SAF production facilities to market in the Netherlands (by individual parties, approximately 1.52 Mt of HEFA-SAF — Neste, VARO / Gunvor, and SkyNRG), ensuring as much flexibility as possible in the types of feedstock that can be used to produce a wide range of mobility fuels, thus reducing strategic dependency.
	13	Build E-SAF production capacity with flexible input and output	Bring (the necessary) e-SAF production facilities to the market in the Netherlands (by individual parties, approximately 0.25 Mt e-SAF – Advario / Power2X), ensuring as much flexibility as possible in the type of feedstock and added value for sustainable growth. This will strengthen competitiveness, reduce strategic dependency, and safeguard the long-term position of Dutch aviation and the fuels and chemical industry. Rotterdam is an attractive location but faces strong competition, for example from Antwerp.
	14	Build production capacity advanced bio-SAF with flexible input and output	Bring the necessary innovative bio-SAF production facilities to the market in the Netherlands, ensuring as much flexibility as possible in terms of the feedstock used, thereby allowing the production of a broad range of mobility fuels and reducing strategic dependency. Where relevant, leverage any Alcohol-to-Jet facilities built for e-SAF production.
	15	Drive new production paths (PtL, AtJ)	Stimulate new technologies (such as PtL and AtJ) by employing subsidies (SDL Programme, DEI+) for development and scaling, for instance during the FEED phase (including the "GroenvermogenNL" growth fund programme for e-SAF). Investigate how to provide price certainty (e.g. via CfD) and explore operating subsidies such as SDE++, for example to encourage the use of (innovative) feedstocks. TU Delft is setting up a Centre of Excellence to share knowledge, support industry in developing expertise, and accelerate the progress of new technologies.
	16	De-risk long-term contracts	Establish an intermediary at the European level that can conclude long-term contracts with producers and sell SAF to airlines through short-term contracts (this could be a CfD-type system similar to H2Global for hydrogen). This arrangement sufficiently reduces the risks for both airlines and producers, enabling them to proceed with investment decisions.
	17	Create starting condition for production sites	Prevent project delays and cancellations by providing governmental assistance with nitrogen/nature permits and prioritising network connections.
	18	Support import of feedstock and semi-finished products	Encourage the import and trade relationships of Dutch bio- and e-SAF feedstocks and semi-finished products, and promote collaboration around policy agendas, such as the Nationaal Plan Energysysteem, to support the development of import, storage, transshipment, and export infrastructure, ensuring a reliable supply of feedstocks. In addition, maintain long-term favourable import duties on semi-finished products by continuing current policies.

Workstream 1

Creating an efficient market that enables the realisation of ReFuelEU obligations

Initiative 01. Streamline EU registration system

Brief description

Ensure a well-functioning EU-wide registration system (UDB), connected to other systems (such as REV), legislative processes (such as EU-ETS), clear definitions, reporting requirements (such as CSRD), public oversight, and a clear record of both voluntary and mandatory uptake. Additionally, harmonisation of how SAF deliveries to airports and uptake by airlines are registered throughout the EU is essential, with the EU-wide register being fed by data recorded per Member State and per airport.

Timeline

Start date: 2025

End date: 2026 - 2027

Contribution to increased blending

How does this initiative contribute to higher blending?
Not directly, except by preventing double counting within or outside the EU.

Is there an additional benefit?
Greater transparency regarding the contribution of SAF towards CO_2 reduction objectives, and increased efficiency of supervision and compliance.

Initial indication of complexity, risks, and costs at the system level

Key activities

1. Harmonisation of registrations for RED, ReFuelEU, and EU-ETS: well established at the national level (NEa) but unclear at EU level.
2. Transparency of SAF data is needed on a per-airport basis for ReFuelEU and a per-Member State basis for airlines (ETS and additional uptake).
3. Realising uniformity in units to simplify registration.

Required collaborating parties

I&W, CPGG, AFS, airports, NEa, suppliers and European Commission

Initiative 02. Realise international mass-balancing CEPS

Brief description

Develop an administrative solution so that SAF in the CEPS pipeline is traceable and counts towards the designated blending obligations/objectives in the country where the SAF is delivered. Permitting mass balancing makes it simpler to meet national obligations.

Timeline

Start date: 2025

End date: 2025

Contribution to increased blending

How does this initiative contribute to higher blending?
By enabling traceability in the CEPS pipeline, SAF can be transported more efficiently and flexibly on a large scale

Is there an additional benefit?
It enhances the business case and the Netherlands' unique selling point, and unlocks future earning potential by facilitating supply to the hinterland.

Initial indication of complexity, risks, and costs at the system level

Key activities

1. Realise an amendment to the EU-ETS Directive so that mass-balancing is permitted and ensure the missing link with EU-ETS in registration systems is established.
2. Create a level playing field with other EU Member States by reconsidering the national C-14 obligation.
3. Broaden the focus to the generic pipeline system (CEPS, SEPS, PPS, NIPS).

Required collaborating parties

I&W, Ministry of Defence, Defence Pipeline Organisation, European Commission, CEPS Member States, NEa, Vopak, and fuel producers

Note: 1) Mass-balancing refers to the process in which the amount of fossil and non-fossil materials, when they are mixed, is carefully recorded, ensuring that the ratio of resources used in the total mass of the end product is guaranteed.

Initiative 03. Create international cooperation and align interdepartmental policy

Brief description

Establish joint research projects and explore joint (European) funding opportunities between the Netherlands and key partners such as France, Germany, and the Benelux region. Contribute to various interdepartmental programmes, such as the Taskforce on Fuel Production and international initiatives within CAEP, FTG, the EU, and RLCFA, and build on existing government declarations with Germany and France, using these for further bilateral collaboration in SAF.

Timeline

Start date: 2025

End date: 2026

Contribution to increased blending

How does this initiative contribute to higher blending?
Through optimal synergies among Member States, improving international standards, strengthening public-private collaboration, and removing barriers to financing.

Is there an additional benefit?
Early joint position-setting, which leads to more effective engagement at the EU level.

Initial indication of complexity, risks, and costs at the system level

Simple – Very complex

Risk-free – Risky

Low costs <€10M – High costs > € 100M

Key activities

1. Focus on researching how other countries intend to develop their market
2. Leverage the French–Dutch innovation pact
3. Make use of the German–Dutch governmental declaration to establish a joint position

Required collaborating parties

I&W, CPGG, Ministry of Foreign Affairs, Ministry of Economic Affairs, and strategic partners in the field of SAF

Initiative 04. Align bio-feedstock policy

Brief description

Ensure that Dutch legislation and regulations on bio-based feedstocks are not stricter than necessary and remain in line with other EU Member States' interpretations. Additionally, identify which legislation and regulations can be streamlined if they unnecessarily drive up costs for feedstocks, such as waste and residual streams and innovative feedstocks. The Netherlands is also committed to robust and workable sustainability requirements consistent with the bio-based feedstock sustainability framework. Moreover, efforts should be made to establish harmonised and consistent European policy (e.g. RED, EU-ETS etc.). For instance, set up a (European) helpdesk to assess feedstock sustainability.

Timeline

Start date: 2025

End date: 2027-2030

Contribution to increased blending

How does this initiative contribute to higher blending?

A broader feedstock base offers choices, reduces dependency on specific materials, increases availability, and lowers costs.

Is there an additional benefit?

Optimal use of existing feedstocks supports sustainability, ensures security of supply, and strengthens strategic autonomy.

Initial indication of complexity, risks, and costs at the system level

Simple — Very complex

Risk-free — Risky

Low costs <€10M — High costs > € 100M

Key activities

1. The Ministry is conducting an analysis of the approved feedstocks used in other Member States. This analysis can be broadened by also consulting producers and suppliers about which feedstocks they see emerging in the market from which SAF can be produced. This should result in an expansion of Annex 5 of the "Regeling Energie Vervoer".
2. Bottlenecks and their exact causes must be identified and then addressed in a targeted manner.

Required collaborating parties

I&W, Ministry of Agriculture, Fisheries, Food Security and Nature (AFFN), fuel producers, and possibly research institutes (such as universities)

Initiative 05. Consolidate joint input for the ReFuelEU evaluation

Brief description

Form consensus for the ReFuelEU evaluation to create a level playing field, clear (reporting) obligations, and more certainty (e.g. strengthen targets, adapting the stepwise increase in blending requirement, levelling the playing field, avoiding unnecessary feedstock restrictions, and allowing mass balancing).

Timeline

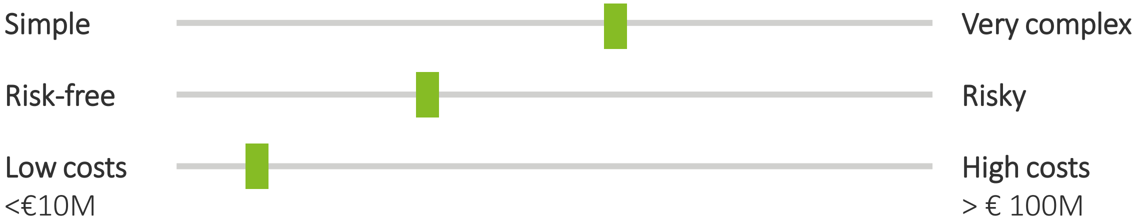
Start date: 2025

End date: 2027

Contribution to increased blending

How does this initiative contribute to higher blending?
This initiative supports an improved ReFuelEU Regulation that enables the SAF market to be scaled up more efficiently and steadily.
Is there an additional benefit?
Predictability for the stakeholders in the supply chain provides certainty to invest, ensuring there is sufficient supply both now and in the future.

Initial indication of complexity, risks, and costs at the system level



Key activities

1. Clear vision/input from the Netherlands (i.e. the SAF Roadmap) for the ReFuelEU Aviation evaluation in 2027
2. Securing support for this vision/input from other European stakeholders is a key follow-up activity
3. A key dependency is that the European Commission and the other Member States must be convinced.

Required collaborating parties

DLT, I&W and the sector

Workstream 2

Stimulate additional demand towards the 14% target

Initiative 06. Stimulate voluntary demand by market parties

Brief description

Encourage voluntary demand among (business) travellers (and/or private jet users) by forming a consortium of companies committed to sustainable flying and/or by requiring sustainable flying within government procurement processes and official travel.

Timeline

Start date: 2025

End date: 2026

Contribution to increased blending

How does this initiative contribute to higher blending?
By explicitly creating voluntary demand, more SAF is used than just the obligation set out by ReFuelEU.

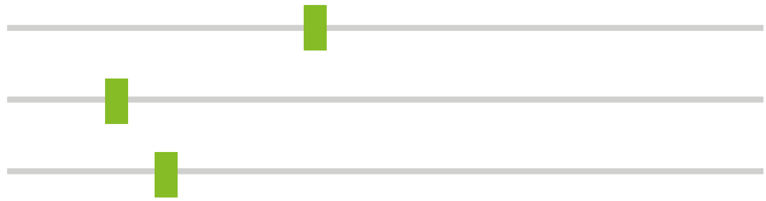
Is there an additional benefit?
A voluntary demand can fulfil the role of 'launching customer' for advanced (often more expensive) forms of SAF.

Initial indication of complexity, risks, and costs at the system level

Simple — Very complex

Risk-free — Risky

Low costs <€10M — High costs > € 100M



Key activities

1. Ensure that the voluntary uptake of SAF by companies and individuals is recorded separately (possibly through the NEa) to guarantee that this voluntary uptake results in additional blending of alternative fuels.
2. Bring together existing initiatives that organise voluntary demand.
3. Investigate the allocation mechanism for credits associated with SAF uptake.

Required collaborating parties

I&W, NEa, and existing collaborative initiatives such as AndersReizen

Initiative 07. Clarify 14% target

Brief description

Clarify the 14% target and the SAF definition by, for example, differentiating among SAF types based on their (production) origin. Doing so can help reduce the price gap between kerosene and different SAF types. In that context, also consider the possibility of limiting (the growing) energy demand, for instance via the European Energy Efficiency Directive. Moreover, it may be worth allowing a broader RED feedstock base than ReFuelEU currently permits for usage above 6%, in order to reduce the price difference.

Timeline

Start date: 2025

End date: 2026

Contribution to increased blending

How does this initiative contribute to higher blending?
Further clarification of the 14% target clarifies previously made agreements, provides additional focus, and makes discussions about financing instruments (for instance, initiatives 9 and 10) more tangible.

Is there an additional benefit?
A clear delineation of the 14% can ensure broader support for the objective.

Initial indication of complexity, risks, and costs at the system level

Simple — Very complex

Risk-free — Risky

Low costs <€10M — **High costs** > € 100M

Key activities

- Discuss and concretise the 14% target with the parties involved in the DLT, creating renewed commitment to this goal.
- Link the clarification of the 14% target (e.g. regarding the origin of the SAF) to the broader financing needs for additional SAF deployment.

Required collaborating parties

DLT, I&W, and sector organisations

Initiative 08. Increase trustworthiness, credibility, and transparency

Brief description

Ensure there is effective, objective, and balanced communication about SAF's role in mitigating aviation's negative climate impact. In doing so, monitor how the European Flight Emissions Label actually operates and, where necessary, use European governing bodies to promote the necessary improvements that enhance reliability. Additionally, investigate how employers can claim their SAF usage under the CSRD, and guarantee sufficiently effective (public) market oversight—also part of the first workstream.

Timeline

Start date: 2025

End date: Consistent over the years

Contribution to increased blending

How does this initiative contribute to higher blending?
It stimulates voluntary demand.
Is there an additional benefit?
It creates clarity and a sense of urgency among the parties that must meet the SAF obligations.

Initial indication of complexity, risks, and costs at the system level

Key activities

1. Explore how climate benefits can be communicated within existing marketing legislation (for instance, through the registration of voluntary demand).
2. Discuss at the European level the possibility of applying an EU eco-label to promote reliability.
3. Validate that market oversight is sufficiently addressed within Workstream 1. Examine possible safeguarding measures for voluntary SAF uptake in CO_2 accounting, see initiative 6.

Required collaborating parties

Collaborating public and sector organisations, and specifically DLT, NEa, and societal organisations

Initiative — 09. Explore use of charges in value chain to subsidise SAF use

Brief description

Explore how the (additional) revenues from existing levies in different parts of the value chain, such as producers, airlines, and fuel suppliers, can help reduce the price premium of SAF, with attention to demonstrable additional volumes above the mandatory quantities. For example, explore how an instrument such as the Schiphol SAF contribution for voluntary demand can be continued with additional financing until 2035, and establish a comparable programme at other Dutch airports.

Timeline

Start date: 2025

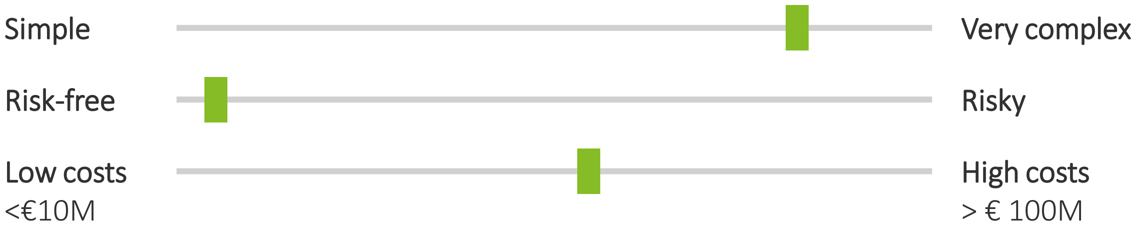
End date: 2026

Contribution to increased blending

How does this initiative contribute to higher blending?
SAF becomes more affordable in the Netherlands for airlines; an additional incentive on top of the ETS should be considered.

Is there an additional benefit?

Initial indication of complexity, risks, and costs at the system level



Key activities

1. Explore various levies in the value chain among producers, airlines and fuel suppliers, and how these can be utilised.
2. Organise stakeholder support for the SAF contribution among airports.

Required collaborating parties

Collaborating airports in the Netherlands, airlines, and fuel suppliers in the Netherlands.

Initiative

10. Explore (emission-dependent) use of government levies and channel back budget

Brief description

Explore how existing (CO_2 emission-based) levies, EU-ETS levies, and airline taxes received by the government could help scale up SAF using a revenue recycling mechanism, similar to the net revenue approach applied to the heavy goods vehicle levy. Investigate more broadly how (EU) budgets—such as funds from the EU ETS Innovation Fund, the Connecting Europe Facility (CEF), and new schemes (e.g. Contract for Difference [CfD] or national SAF allowances for non-EU-ETS destinations), could be deployed to enhance the sustainability of Dutch aviation.

Timeline

Start date: 2026

End date: 2027

Contribution to increased blending

How does this initiative contribute to higher blending?

Passengers pay a levy for the share of fossil kerosene used by their flight, making fossil kerosene more expensive compared to SAF. The money collected can then be proportionally distributed to airlines that have used more SAF than required.

Is there an additional benefit?

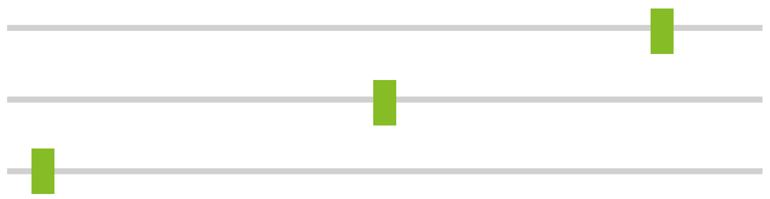
-

Initial indication of complexity, risks, and costs at the system level

Simple — Very complex

Risk-free — Risky

Low costs <€10M — High costs > € 100M



Key activities

1. A data system for airports to track and report how much fossil kerosene and SAF has been fuelled.
2. Check whether a conflict arises with ReFuelEU regulation.
3. Explore national SAF allowances comparable to European SAF allowances; a FEETS-type instrument for non-EU-ETS destinations. By using CO_2 reduction as the basis, issues with the volumes mandated by ReFuelEU are avoided.

Required collaborating parties

I&W, CPGG, the Ministries of Economic Affairs and Finance, and DLT for joint input to political decision-making.

Workstream 3

Strengthening the Netherlands as a production location

Initiative 11. Explore economic feasibility of co-processing

Brief description

Explore the costs of delivering bio-SAF in the short term via co-processing in existing facilities. If this proves cost-effective compared to blended HEFA bio-SAF, it can add to production capacity. This is an initiative that parties must undertake individually. However, it remains only a temporary solution, given the continued reliance on fossil fuels, and therefore there is no government role here.

Timeline

Start date: 2025

End date: 2025

Contribution to increased blending

How does this initiative contribute to higher blending?
Increasing production capacity in the Netherlands improves security of supply during the transition.

Is there an additional benefit?
-

Initial indication of complexity, risks, and costs at the system level

Simple	▮ (at the Simple end)	Very complex
Risk-free	▮ (at the Risk-free end)	Risky
Low costs <€10M	▮ (at the Low costs end)	High costs > € 100M

Key activities

1. Identify possible production locations and suitable sustainable bio-based feedstocks
2. Individually calculate the cost price by each party and compare it with the price of bio-SAF
3. Determine next steps

Required collaborating parties

Dutch refining sector

Initiative: 12. Build HEFA-SAF production capacity with flexible input and output

Brief description

Bring (the necessary) HEFA-SAF production facilities to market in the Netherlands (by individual parties, approximately 1.52 Mt of HEFA-SAF, Neste, VARO / Gunvor, and SkyNRG), ensuring as much flexibility as possible in the types of feedstock that can be used to produce a wide range of mobility fuels, thus reducing strategic dependency.

Timeline

Start date: 2025

End date: 2026

Contribution to increased blending

How does this initiative contribute to higher blending?
Production capacity in the Netherlands ensures the availability of SAF for Dutch aviation.

Is there an additional benefit?
Future earning potential.

Initial indication of complexity, risks, and costs at the system level

Simple — Very complex

Risk-free — Risky

Low costs <€10M — High costs > € 100M

Key activities

1. Organise starting conditions (nitrogen, grid connection, Initiative 17)
2. Increase demand (Initiative 6) and the market (Initiative 2) to ramp up production
3. Accelerated increase of the ReFuelEU obligation (Initiative 5)
4. Begin production by suppliers and encourage additional suppliers

Required collaborating parties

Neste, VARO/Gunvor, SkyNRG, and other potential HEFA-SAF producers.

Initiative

13. Build E-SAF production capacity with flexible input and output

Brief description

Bring (the necessary) e-SAF production facilities to the market in the Netherlands (by individual parties, approximately 0.25 Mt e-SAF – Advario / Power2X), ensuring as much flexibility as possible in the type of feedstock and added value for sustainable growth. This will strengthen competitiveness, reduce strategic dependency, and safeguard the long-term position of Dutch aviation and the fuels and chemical industry. Rotterdam is an attractive location but faces strong competition, for example from Antwerp.

Timeline

Start date: 2027

End date: 2030

Contribution to increased blending

How does this initiative contribute to higher blending?
Production capacity in the Netherlands creates the availability of SAF for Dutch aviation; current plans are sufficient for approximately 40% of European demand.

Is there an additional benefit?
Strengthens our earning potential, increases security of supply, and contributes to establishing a green methanol hub for the Dutch fuels and chemical industry.

Initial indication of complexity, risks, and costs at the system level

Simple	marker near right end	Very complex
Risk-free	marker near right end	Risky
Low costs <€10M	marker near right end	High costs > € 100M

Key activities

1. ASTM approval for the methanol-to-jet pathway, expected mid-2025
2. Financial certainty through offtake agreements (Initiative 16)
3. Starting conditions ensured (Initiative 17)
4. Final Investment Decision as soon as possible

Required collaborating parties

Power2X / Advario and other potential e-SAF producers (such as Metafuels), as well as e-SAF customers and potential green methanol users in the cluster.

Initiative 14. Build production capacity advanced bio-SAF with flexible input and output

Brief description

Bring the necessary innovative bio-SAF production facilities to the market in the Netherlands, ensuring as much flexibility as possible in terms of the feedstock used, thereby allowing the production of a broad range of mobility fuels and reducing strategic dependency. Where relevant, leverage any Alcohol-to-Jet facilities built for e-SAF production.

Timeline

Start date: 2030

End date: 2035

Contribution to increased blending

How does this initiative contribute to higher blending?
Production capacity in the Netherlands ensures the availability of SAF for Dutch aviation.

Is there an additional benefit?
Security of supply and strengthened earning potential; by focusing on innovation, the Netherlands can become a global leader.

Initial indication of complexity, risks, and costs at the system level

Simple — Very complex

Risk-free — Risky

Low costs <€10M — High costs > € 100M

Key activities

1. Clarity about possible and permitted feedstocks and production pathways, as well as their economic feasibility
2. Stimulation of new production pathways (Initiative 15)

Required collaborating parties

Future producers (TBD), Ministry of AFFN (nitrogen), network operators, local authorities and provinces (grid capacity).

Initiative — 15. Drive new production paths (PtL, AtJ)

Brief description

Stimulate new technologies (such as PtL and AtJ) by employing subsidies (SDL Programme, DEI+) for development and scaling, for instance during the FEED phase (including the "GroenvermogenNL" growth fund programme for e-SAF). Investigate how to provide price certainty (e.g. via CfD) and explore operating subsidies such as SDE++, for example to encourage the use of (innovative) feedstocks. TU Delft is setting up a Centre of Excellence to share knowledge, support industry in developing expertise, and accelerate the progress of new technologies.

Timeline

Start date: 2027

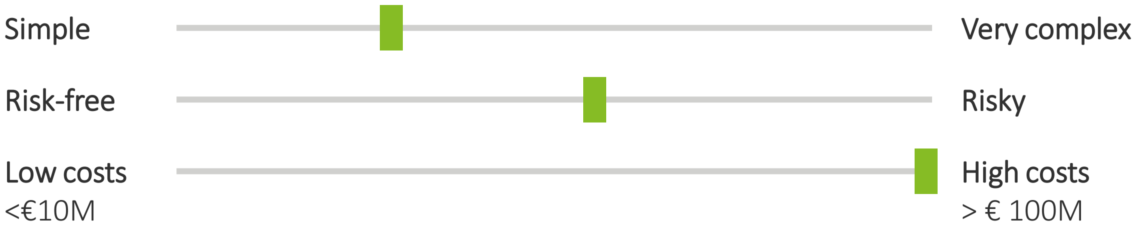
End date: -2030-'35

Contribution to increased blending

How does this initiative contribute to higher blending?
This action makes it cheaper and less risky to produce SAF from new feedstocks and semi-finished products, meaning that the blend rate is not restricted by the availability of HEFA feedstocks.

Is there an additional benefit?
Development in the Netherlands strengthens our competitiveness and earning potential, and supports strategic autonomy.

Initial indication of complexity, risks, and costs at the system level



Key activities

1. SDL programme
   - €300m to stimulate new e-SAF and AtJ production capacity
   - Explore how to support SAF production operations (e.g. SDE++, CfD)
   - Identify possible new production pathways
2. Invest €600M in the gasification of biogenic/mixed waste streams and €90M in biopyrolysis
3. Compare these instruments with incentives offered by other countries
4. Support new production pathways (e.g., e-lipids) within the existing DEI+ scheme
5. Create a Centre of Excellence for knowledge sharing

Required collaborating parties

I&W, CPGG, TU Delft, GroenvermogenNL, TNO, industry, and research institutes.

Initiative 16. De-risk long-term contracts

Brief description

Establish an intermediary at the European level that can conclude long-term contracts with producers and sell SAF to airlines through short-term contracts (this could be a CfD-type system similar to H2Global for hydrogen). This arrangement sufficiently reduces the risks for both airlines and producers, enabling them to proceed with investment decisions.

Timeline

Start date: 2025

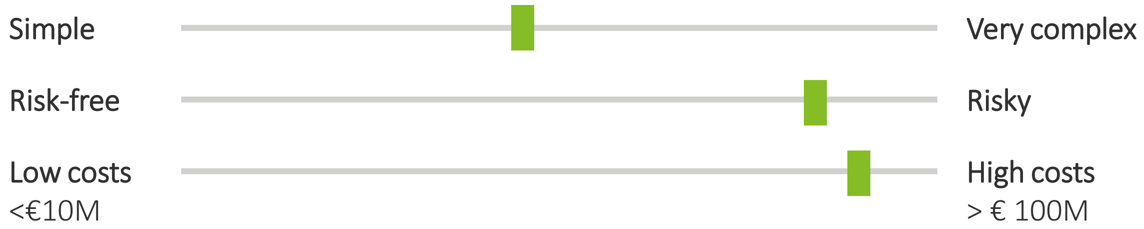
End date: 2026

Contribution to increased blending

How does this initiative contribute to higher blending?
Greater certainty for airlines and producers regarding price and availability.

Is there an additional benefit?
Due to reduced financial risks, investments are encouraged, leading to greater security of supply.

Initial indication of complexity, risks, and costs at the system level



Key activities

1. Use a CfD model (e.g., similar to H2Global) for EU-SAF.
2. Propose at EU level, for instance, to use EU-ETS revenues to capitalise an intermediary between producers and airlines.
3. Focus on the necessary EU support for NL/EU production facilities for SAF, and provide input in the relevant working groups and EU governmental bodies.

Required collaborating parties

SkyPower (via KLM and other involved parties), CPGG, I&W (Ministry of Infrastructure and Water Management), EC (European Commission), and fuel producers.

Initiative 17. Create starting condition for production sites

Brief description

Prevent project delays and cancellations by providing governmental assistance with nitrogen/nature permits and prioritising network connections.

Timeline

Start date: 2025

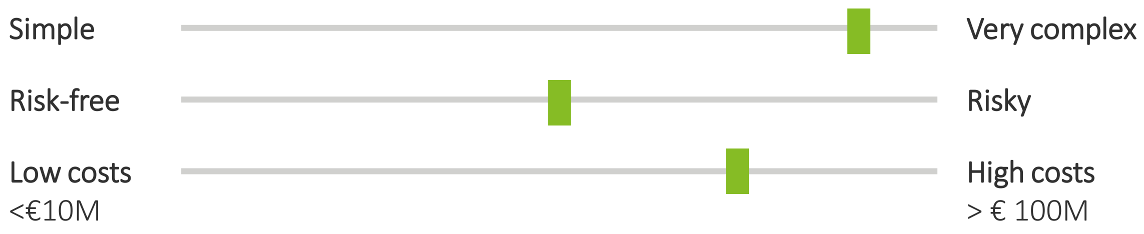
End date: 2027

Contribution to increased blending

How does this initiative contribute to higher blending?
Production facilities can be realised (more quickly), thereby increasing production capacity.

Is there an additional benefit?
-

Initial indication of complexity, risks, and costs at the system level



Key activities

1. Provide nitrogen/environmental permit capacity
2. Resolve local grid congestion
3. Reduce (transmission) energy costs for green hydrogen
4. Ensure access to infrastructure (including CEPS, see Initiative 2) and provide clear communication about the subsidies available for production projects

Required collaborating parties

CPGG, I&W, Ministry of Economic Affairs, and fuel producers.

Initiative — 18. Support import of feedstock and semi-finished products

Brief description

Encourage the import and trade relationships of Dutch bio- and e-SAF feedstocks and semi-finished products, and promote collaboration around policy agendas, such as the Nationaal Plan Energysysteem, to support the development of import, storage, transshipment, and export infrastructure, ensuring a reliable supply of feedstocks. In addition, maintain long-term favourable import duties on semi-finished products by continuing current policies.

Timeline

Start date: 2026

End date: 2030

Contribution to increased blending

How does this initiative contribute to higher blending?
By encouraging the import of feedstocks/semi-finished products, it contributes to security of supply.

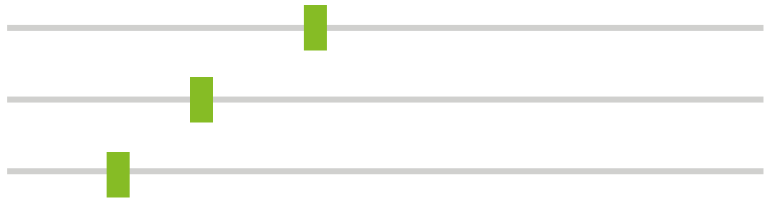
Is there an additional benefit?
By promoting the import of feedstocks/semi-finished products, you stimulate economic activity around the processing of feedstocks and semi-finished products.

Initial indication of complexity, risks, and costs at the system level

Simple — Very complex

Risk-free — Risky

Low costs <€10M — High costs > € 100M



Key activities

1. Identify future countries offering attractive feedstocks and semi-finished products.
2. Develop structural trade relationships.
3. Invest in local storage and production.
4. Explore whether regulatory barriers hindering imports (e.g. veterinary checks on UCO) can be removed.
5. Prevent dumping of end products from other over-subsidised markets.

Required collaborating parties

CPGG and Ministry of Foreign Affairs, Port of Rotterdam/Amsterdam, Chane, Vopak, feedstock and fuel producers, and suppliers of semi-finished products.

List of abbreviations

H_2	Hydrogen
ACT-SAF	Assistance, Capacity-building and Training for Sustainable Aviation Fuels
AFFN	Ministry of Agriculture, Fisheries, Food Security and Nature
ASP	*Amsterdam Schiphol Pijpleiding*
ASTM	American Society for Testing and Materials
AtJ	Alcohol-to-Jet
CAAF	Conference on Aviation Alternative Fuels
CAAFI	Commercial Aviation Alternative Fuels Initiative
CAEP	Committee on Aviation Environmental Protection
CEPS	Central Europe Pipeline System
CfD	Contracts for Difference
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
CPGG	Ministry of Climate Policy and Green Growth
CSRD	Corporate Sustainability Reporting Directive
DAC	Direct Air Capture
DEI+	*Demonstratie Energie- en Klimaatinnovatie*
DLT	*Duurzame Luchtvaarttafel*
DLUC	Direct-land-use-change
EASA	European Union Aviation Safety Agency
EU	European Union
EU-ETS	European Union - Emissions Trading System
FEED	Front-End Engineering Design
FEETS	Fuels Eligible for ETS

FTG	Fuels Task Group
HEFA	Hydroprocessed Esters and Fatty Acids
HVO	Hydrotreated vegetable oil
ICAO	International Civil Aviation Organization
IEA	International Energy Agency
I&W	Ministry of Infrastructure and Water Management
ISCC	International Sustainability and Carbon Certification
LCAF	Low-carbon aviation fuels
LTAG	Long-term Aspirational Goal
MRV	Monitoring, reporting and verification
NPE	National Plan Energysystem
PtL	Power to Liquid
RED	Renewable Energy Directive
REV	Register Energie voor Vervoer
RFNBO	Renewable Fuels of Non-Biological Origin
RLCFA	Renewable and Low-Carbon Fuels Value Chain Industrial Alliance
RSB	Roundtable on Sustainable Biomaterials
SDL	*Stimulering Duurzame Luchtvaartbrandstoffen*
SABA	Sustainable Aviation Buyers Alliance
SAF	Sustainable Aviation Fuel
SDE++	*Stimulering Duurzame Energieproductie*
UDB	Union Database for Biofuels
UNFCCC	United Nations Framework Convention on Climate Change
WLO	*Welvaart en Leefomgeving*


Deloitte.
to70
Ministerie van Infrastructuur
en Waterstaat

Deloitte.