# SAF's Contribution to the Dutch Economy

A study to gain more insight into the direct and indirect contribution of the development, production, distribution, and trading of SAF to the Dutch economy, and what this means for the government's efforts to maintain or stimulate this industry in the Netherlands.

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# List of Acronyms and Key Terms

| Term | Definition | Term | Definition |
|---|---|---|---|
| 1G | First generation SAF (e.g., HEFA) | HEFA-SPK | Hydroprocessed Esters and Fatty Acids Synthetic Paraffinic Kerosene |
| 2G | Second generation SAF (e.g., AtJ, FT) | IATA | International Air Transport Association |
| 3G | Third generation SAF (e.g., eSAF / PtL) | ILUC | Indirect Land Use Change |
| AMS | Amsterdam Airport Schiphol | kT | Thousand tonnes |
| ASTM | ASTM International - formerly the American Society for Testing and Materials | Ktpa | Thousand tonnes per annum |
| AtJ | Alcohol-to-Jet | LHR | London Heathrow Airport |
| BRU | Brussels Airport | LOI | Letter of Intent |
| Capex | Capital Expenditure | LTAG | Long-term Aspirational Goal |
| CO2 | Carbon Dioxide | MinI&W | Ministry of Infrastructure and Water Management |
| EASA | European Union Aviation Safety Agency | MST | Maastricht Aachen Airport |
| EC | European Commission | Mt | Million tonnes |
| EIA | Economic Impact Assessment | Mtpa | Million tonnes per annum |
| EIN | Eindhoven Airport | NL | Netherlands |
| eSAF | electro-Sustainable Aviation Fuel - derived from renewable energy | p.a. | Per annum |
| ETS | Emissions Trading Scheme | PJ | Petajoule |
| EU | European Union | PtL | Power-to-Liquids |
| EU27 | 27 European Union member countries | R&D | Research & Development |
| FDI | Foreign Direct Investment | RCF | Recycled Carbon Fuels |
| FETSA | Federation of European Tank Storage Associations | RED | Renewable Energy Directive |
| FOGs | Fats, Oils or Greases | ReFuelEU | ReFuel EU Aviation Regulation (EU) 2023/2405 |
| FT | Fischer Tropsch | RFNBO | Renewable Fuel of Non-Biological Origin |
| FTE | Full Time Equivalent | RTM | Rotterdam The Hague Airport |
| gCO2e/MJ | Grams of Carbon Dioxide Equivalent Per Megajoule | SAF | Sustainable Aviation Fuel |
| GDP | Gross Domestic Product | SAFc | Sustainable Aviation Fuel Certificate |
| GFT | Gasification Fischer-Tropsch | UCO | Used Cooking Oil |
| GRQ | Groningen Airport Eelde | UNFCC | United Nations Framework Convention on Climate Change |
| GVA | Gross Value Added | WEF | World Economic Forum |

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# 00

# Executive Summary

# The Sustainable Aviation Fuels industry is the link between two very significant industries for the Netherlands: fuel production and aviation

The Netherlands currently achieves significant economic benefits from its role in the import, refining, transportation and use of fossil-based fuels such as diesel, gasoline and kerosene. The refining sector, which is a core part of this ecosystem, is worth approximately €3.8bn p.a., and employs around 5,000 FTE directly and 14,000 FTE indirectly (source: VEMOBIN).

These are linked to but mostly additional to the substantial economic benefits of the aviation sector that comprises the operation of airports, airlines and supply chain. The economic value of the Dutch aviation sector to the national economy is estimated at a comparable size, at €3.25bn pa, employing 26,000 people (source: SEO).

The Netherlands, like other countries in the EU and around the world, has begun to transition to the use of alternative aviation fuels, also called sustainable aviation fuels (“SAF”). These fuels are produced from a variety of non-food feedstocks and using a range of technology pathways but ultimately result in a ‘drop-in’ fuel that is blended with fossil-based jet fuel and can help to meaningfully reduce the lifecycle greenhouse gas emissions of the fuel in its use in aviation. This is widely considered to be the primary lever for decarbonising the aviation industry towards its industry goal of Net Zero by 2050.

Some SAF production already takes place in the Netherlands – with Neste and Chane operating two of the largest plants operational today, and the country has in fact been one of the earliest movers in this space. Investors are also actively considering developing further plants, as they look ahead to a future demand landscape shaped by mandates for the supply of SAFs in the EU and other regions, as well as growing voluntary demand for these fuels.

The Dutch Ministry of Infrastructure and Water Management (“MinI&W”) recognises the confluence of the Netherlands’ strong position, capabilities and infrastructure in fuels and chemicals, aviation, and logistics and transport for fuel products, and has commissioned PA Consulting to conduct this study to assess the economic potential of the future development of the SAF sector.

As part of this evidence base, there is a need to analyse the economic contributions of SAF, exploring its potential to drive sustainability within the aviation sector while fostering growth and competitiveness in the Dutch economy. The SAF space is highly dynamic, and we anticipate further developments in global policies, technology breakthroughs, commercial models and competitive forces through the timeline of the study scope to 2050. This study presents a snapshot and a future view to inform decision-making in 2026 and beyond.

# There is a range of unknown or uncertain factors that will influence future SAF value to the Netherlands, but overall demand growth and the country’s relative competitiveness will be key drivers

The economic benefits (or costs) of transitioning from fossil-based jet fuel to SAF depend on a range of factors e.g. the future demand for aviation services, the role of Dutch airports and airlines in the future aviation industry, the relative cost of SAF and fossil-based jet fuel and the amount of SAF and feedstocks produced in the Netherlands.

The particular types of SAF, whether bio-SAF or eSAF, will also have an impact on the economic benefits. The extent to which the Netherlands is able to maintain its current role in fossil-based jet fuels, while increasing its role in SAFs, will be key. Because of the uncertainty around many of these factors a range of scenarios need to be considered.

The Netherlands' ports, refining, and pipeline infrastructure have enabled it to punch above its weight in the fossil-based jet fuel industry. These advantages can be expected to continue into the future as, despite the growing role for SAF, the overall increase in expected flight and passenger numbers worldwide means that the fossil-based jet fuel industry is likely to remain significant. The Netherlands can continue to derive significant economic benefit from this industry for some time to come.

The Netherlands has the opportunity to be a first, or at least early, mover in the SAF industry, building on the steps already taken. The Netherlands has the potential to be particularly well placed in relation to HEFA, due to its concentration of domestic agriculture and a need to find alternative uses for farm waste.

The Netherlands’ future role in both fossil-based jet fuel and SAF depends on its competitiveness relative to other countries like Germany, Belgium, France, Sweden and the UK.

At the same time, decisions around energy transition, trade policy and technology development in markets as far afield as China, Brazil or the US, will also influence the future potential of SAFs for the Netherlands, with both the fuels industry and the aviation industry being inherently global in nature.

This level of complexity and interconnectedness does not lend itself to simple forecasting or roadmap development. As such, in consultation with MinI&W and the project steering group, the decision was taken to develop a small number of illustrative scenarios, starting with a baseline of what is currently happening and expected to happen in coming years.

This baseline takes as its core the generally accepted tenet of global energy transition progress – at varying speeds in different parts of the world and in different sectors – and ongoing aviation growth – also at different speeds in different sub-segments. This is as well as ongoing operational efficiencies, a suite of incentivising and punitive measures at the EU, national and other levels around not only fuels but aviation.

# Three illustrative scenarios have been developed to help quantify possible industry size and technology mix in Dutch SAF production

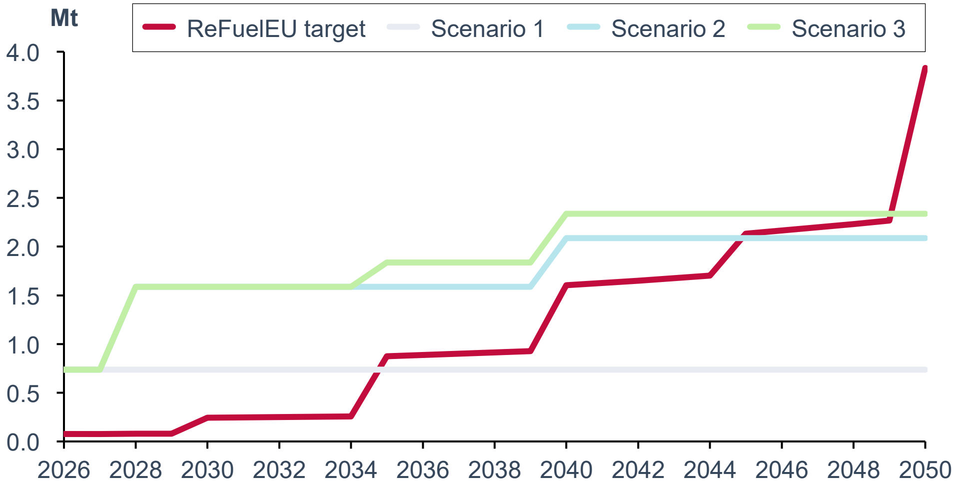
To assess the potential economic benefits of SAF for the Netherlands, we have considered three scenarios going out to 2050:

| **Scenario 1**<br>***Baseline Domestic SAF Production*** | **Scenario 2**<br>***Medium Domestic SAF Production*** | **Scenario 3**<br>***High Domestic SAF Production*** |
|---|---|---|
| *No further policy intervention. Existing interventions / funding would simply expire in the baseline scenario* | *Moderate policy intervention to increase investment attractiveness and address some regulatory permitting challenges* | *Strong and coordinated policy framework addressing multiple parts of the SAF value chain to stimulate supply, including eSAF* |

With Scenario 2 building on Scenario 1, and Scenario 3 building on Scenario 2, the framework enables a clear comparison of how increasing levels of SAF ambition translate into progressively greater economic impacts for the Netherlands.

Scenario 2 takes most advantage of the Netherlands' natural competitiveness in first-generation SAF (1G), but it is constrained ultimately by the limits on the amount of indigenous feedstock which is available for second- and third-generation (2G and 3G) SAF production. Scenario 3 meanwhile goes further, involving the Netherlands playing a greater role in 3G SAF.

The total projected Dutch maximum SAF plant production (based on nameplate capacity) across the three scenarios compared against the Netherlands' ReFuelEU mandated volumes:



The purpose of developing the future scenarios is to inform the economic modelling by providing a set of plausible conditions rather than a single forecast. This approach allows the potential economic impacts of SAF deployment to be assessed under varying circumstances. The scenarios are used to test different future environments, identifying opportunities and trade offs, thereby enabling informed policy decisions that have the potential to maximise economic value for the Netherlands.

# Without further intervention, the total economic value* of the SAF sector is likely to remain around €238m p.a.; however, it could be substantially larger, around €1bn, in a higher scenario with strong and co-ordinated policy support

PA has employed its own "input-output" based Economic Impact Assessment (EIA) approach to evaluate the direct, indirect and induced economic impact of the SAF industry in the Netherlands. This impact is quantified in terms of both Gross Value Added (GVA) and full-time equivalent (FTE) employment annually until 2050 across the three scenarios. The scope of the model encompasses SAF production, feedstock supply as well as storage and transportation. Additionally, we qualitatively assess the broader impacts the SAF industry may have on the Dutch economy. The economic model is informed by a wide range of data sources, with a particular emphasis on utilising data from the Netherlands and operational SAF facilities wherever possible.

The overall economic benefits** for each scenario are summarised below.

| GVA* | 2030 | 2040 | 2050 |
|---|---|---|---|
| Scenario 1 | € 180,700,000 | € 187,900,000 | € 238,700,000 |
| Scenario 2 | € 363,000,000 | € 544,700,000 | € 563,800,000 |
| Scenario 3 | € 363,000,000 | € 921,900,000 | € 941,100,000 |

| FTE* | 2030 | 2040 | 2050 |
|---|---|---|---|
| Scenario 1 | 1,400 | 1,500 | 1,800 |
| Scenario 2 | 3,100 | 4,700 | 4,800 |
| Scenario 3 | 3,100 | 6,400 | 6,600 |

**Includes direct, indirect and induced impact*

*** Rounded numbers*

Our EIA highlights the considerable potential for the Netherlands' SAF industry to make a significant and growing contribution to the Dutch economy by 2050. Across all three scenarios, SAF production represents the largest source of economic value, both in terms of GVA and FTE. In Scenario 1, limited further development of the SAF industry restricts GVA growth to just €238m p.a. by 2050, delivered by existing facilities. By contrast, the introduction of third-generation (3G) SAF technologies in Scenario 3 delivers significant additional economic value, with the industry contributing nearly €1bn GVA and supporting over 6,500 FTE p.a. in Scenario 3.

Realising these greater economic benefits will require the Netherlands to adopt a package of policy measures. Some of these measures should be aimed at different parts of the value chain (including ports, refining, production, transportation, airports and airlines). Some of the measures may focus on improving cost competitiveness or reducing the cost of SAF for end-users, while other measures might be aimed at unlocking development and construction e.g. electricity grid connections, planning permissions etc. We present a long list of potential policy options on pages 69-70. Discussions with a wide range of stakeholders in the SAF industry confirmed that a range of measures would be important to bringing forward quickly the required investments in SAF to enable the Netherlands to secure the estimated economic benefits described above.

# The appropriate mix of SAF-supportive policy measures will consider net economic benefits, practical considerations and the rapidly evolving global policy landscape

There are costs associated with some of these policies, particularly those aimed at reducing the price of SAF or of feedstocks. An assessment of the costs and benefits associated with three potential policy measures has been conducted.

| Policy Measure | Total Cost (2024 prices) | Total Benefit (2024 prices) |
|---|---|---|
| **SAF Revenue Certainty Mechanism** | € 952m | €1.37bn |
| **Blending Credit for SAF** | € 207m | € 309m |
| **Feedstock Development Programme** | € 27m | € 178m |

*Note: initial strategic-level assessment to illustrate 'size of prize'*

These results suggest that policy action to introduce a Revenue Certainty Mechanism (RCM), a Blending Credit, and a targeted feedstock innovation funding programme could deliver significant benefits for the Netherlands, materially outweighing the costs of those policies. There are of course risks associated with all these policies: risks that they may not be successful (e.g. if the strike price fixed under the RCM is not high enough or is superseded by more ambitious schemes in other EU countries) as well as risks that they may cost more than anticipated (e.g. if the volume of SAF produced under the RCM, or blended under the credit, exceeds expectation). For these reasons Dutch policy makers need to consider the design and calibration of these measures carefully. The effectiveness and benefits of these headline policy measures would be enhanced by other measures to unlock speed of development and construction of SAF production facilities, and of supply of suitable feedstocks.

Dutch policy makers would need to move quickly and decisively to secure the estimated economic benefits. Delay may mean that economic benefits are foregone, and that other countries may step into the void. Delay could risk the Netherlands squandering its natural and legacy advantages in the SAF industry. At the same time, developing these detailed designs and making final decisions on these policies will take time. It is a low-regret activity for Dutch policy makers to take, or to accelerate, steps to investigate these options in more detail. We would therefore recommend to MinI&W that it investigates the RCM, Blending Credit and Feedstock Innovation policy schemes, preparing the evidence base to enable it to make informed decisions about these policies at the earliest opportunity, alongside continuing efforts to investigate other measures that could unlock more rapid progress on development and construction of SAF production facilities.

# Research Questions

| | | |
|---|---|---|
| 1 | What is the future potential of the SAF industry in the Netherlands, and can distinctions be made between different production and feedstock pathways? | The Netherlands has the potential to develop a sizeable Sustainable Aviation Fuel (SAF) industry by 2050, with outcomes highly dependent on technology pathways and policy ambition. In the absence of further policy intervention, domestic SAF production remains dominated by first-generation (HEFA) fuels, constrained by limited feedstock availability. Under more ambitious scenarios, the Netherlands could progressively diversify into second-generation (2G) and third-generation (3G / eSAF) pathways, unlocking substantially higher production volumes and economic value, albeit with greater reliance on imported feedstocks and electricity and higher infrastructure and policy trade-offs. |
| 2 | What is the economic earning potential of the SAF industry in the Netherlands? | The economic earning potential of SAF for the Netherlands varies significantly by scenario. By 2050, annual Gross Value Added (GVA) ranges from approximately €240m in the baseline scenario to nearly €1bn under a high-ambition policy framework, supporting up to 6,500 FTEs per year. Cumulatively, the SAF sector could generate around €20bn of GVA and more than 139,000 FTE-years between 2025 and 2050 in the highest-ambition scenario. SAF production accounts for the largest share of this value, while feedstocks and logistics provide smaller but complementary contributions. |
| 3 | How does the potential and earning capacity of SAF compare to the current fossil fuel industry in the Netherlands? | While SAF remains small relative to the Netherlands' current fossil fuel refining and aviation sectors today, its economic potential becomes significant over time. By 2050, the SAF sector could reach approximately 25–30% of the current economic footprint of the Dutch refining sector, helping to offset expected declines in fossil fuel demand. Rather than fully displacing refining activity, SAF has the potential to provide a transition pathway for industrial value creation and employment, leveraging existing infrastructure, skills and port-based logistics. |
| 4 | Which technical and economic developments in the field of SAF are expected to influence earning potential? | The earning potential of SAF is strongly influenced by technological maturity, feedstock availability and input costs. HEFA pathways are currently the lowest-cost option but face feedstock constraints, while 2G and 3G pathways offer greater long-term scalability at higher capital and energy costs. In particular, the future competitiveness of eSAF depends on access to affordable renewable electricity and hydrogen, as well as timely resolution of grid capacity, permitting and nitrogen constraints. These factors shape both the feasibility and economic returns of higher-ambition SAF scenarios. |
| 5 | How do the competitiveness and investment climate for SAF in the Netherlands compare to neighbouring countries? | The Netherlands benefits from strong competitive advantages in ports, refining infrastructure, logistics and aviation demand, positioning it well as a SAF trading and production hub. However, compared with neighbouring countries, its competitiveness is constrained by limited domestic feedstock availability, high electricity costs and complex permitting and grid constraints. Without targeted policy support, SAF investment risks flowing to jurisdictions with lower costs or faster project delivery, despite the Netherlands' strong structural foundations. |
| 6 | What is the direct and indirect contribution of the SAF industry to employment in the Netherlands? | SAF development contributes to employment directly through production facilities and indirectly through supply chains and induced economic activity. By 2050, SAF could support between approximately 1,700 and 6,500 FTEs annually across the scenarios, with high productivity levels relative to the Dutch average. While modest in absolute terms, these jobs generate strong multiplier effects and provide high-value industrial employment aligned with the Netherlands' existing skills base. |
| 7 | What can the government do to strengthen the economic contribution of SAF in the Netherlands? | Government policy is a decisive factor in unlocking the higher economic value of SAF. Without additional intervention, SAF remains a niche sector. More ambitious outcomes require a coordinated package of measures addressing revenue certainty, cost competitiveness, feedstock development, electricity and grid access, and permitting constraints. Evidence from the scenarios shows that only a strong and coordinated policy framework enables the Netherlands to capture the full economic and strategic benefits of SAF. |

# 01

# Introduction and Reading Guide

# Rationale for this economic impact study evaluating the impact of Sustainable Aviation Fuel on the Dutch economy

This study has been commissioned to provide the Ministry of Infrastructure and Water Management with a comprehensive assessment of Sustainable Aviation Fuel (SAF) and its potential contribution to the Dutch economy. It examines global and European developments, the economic and policy landscape, and evaluates opportunities and challenges for scaling SAF production and adoption in the Netherlands. Through scenario analysis and economic impact assessment, the study aims to inform evidence-based policymaking and position the Netherlands as a leader in sustainable aviation.

Global aviation is at a turning point. As international attention intensifies on the urgent need to decarbonise, the industry faces unprecedented pressure to transform its operations and reduce its environmental footprint. Among the various solutions explored, SAF has emerged as the most viable near-term pathway to achieving meaningful emissions reductions in aviation. Beyond its environmental benefits, SAF is increasingly viewed as critical to the industry's resilience and competitiveness.

Governments and industry worldwide are accelerating SAF adoption. The 41st ICAO Assembly adopted a long-term aspirational goal (LTAG) for international aviation of net-zero carbon emissions by 2050 in support of the UNFCCC Paris Agreement's temperature goal. The European Union's ReFuelEU Regulation, alongside ambitious national targets, is tightening the timelines for SAF deployment and sending a clear signal to the market: the transition to sustainable fuels is no longer optional, but a strategic imperative. The Dutch SAF Roadmap underscores the need for integrated policy frameworks and cross-sector collaboration to meet climate goals while supporting economic growth and connectivity.

The economic opportunity presented by SAF is substantial. It can drive industrial growth, innovation, and job creation. Developing a domestic SAF industry will attract investment, create high-value employment, and strengthen the Netherlands' position in a rapidly evolving global market. Scaling SAF will generate ripple effects across the value chain - from feedstock and refining to logistics and distribution - unlocking new opportunities for economic development and exports.

The Netherlands is uniquely positioned to play a strategic role in this transition. Its advanced infrastructure, world-class ports, and established expertise in both petrochemicals and aviation provide a strong foundation for becoming a European hub for SAF production and distribution. Strong policy support and a tradition of public-private collaboration further enhance the Netherlands' ability to attract investment and drive innovation in sustainable fuels. By using these strengths, the Netherlands can both meet its own climate and economic objectives and also contribute meaningfully to the decarbonisation of European and global aviation.

# Reading Guide: SAF’s Contribution to the Dutch Economy

This report has been structured to provide a comprehensive and systematic examination of the opportunities and challenges associated with SAF for the Dutch economy. Readers are encouraged to begin with the Executive Summary, which offers a succinct overview of the principal findings and key recommendations.

Subsequent chapters are organised to progressively build context and understanding. The initial sections present an analysis of the current state of the Dutch aviation sector and the prevailing policy landscape. This is followed by an exploration of potential future scenarios for SAF development in the Netherlands, enabling a forward-looking perspective on possible trajectories.

As the report advances, it presents an economic impact assessment that quantifies the prospective value of SAF, supported by robust modelling and evidence. The final chapters provide a critical review of policy options designed to facilitate the growth of SAF within the Netherlands.

Each section of this report is designed to be read independently; however, taken together, they offer a cohesive foundation for evidence-based decision-making. Readers may consult the table of contents to navigate directly to specific topics of interest or proceed sequentially for a comprehensive understanding of the SAF landscape and its implications for national policy and economic development.

# Research Questions

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# 02

## Baseline

# **Baseline:** Chapter purpose

The aviation sector - including its associated fuels value chain - is facing increasing pressure to decarbonise: in 2021, through the Air Transport Action Group it committed to reaching net zero by 2050. Current projections indicate that aviation emissions could reach 1.8–2 Gt $CO_2$ by that year and SAF is widely recognised as the primary solution to ensuring that these emissions are net-zero. Other measures to reduce emissions will also be necessary including fleet renewal and operational efficiencies. The Netherlands is considering targeted policy interventions aimed at supporting the development and uptake of SAF.

The economic impact of these SAF-related policy interventions is influenced by: 1) the current Dutch economic landscape and dynamics within the Dutch aviation market and petrochemical industry; 2) the global, European, and Dutch policy landscape; and 3) Dutch SAF market dynamics, including the strengths and weaknesses of the Netherlands within the SAF ecosystem. Insights into the current state and dynamics of each area are essential to assess the economic impact of specific SAF policy interventions enacted by the Dutch government.

This baseline chapter therefore aims to establish a foundational understanding of the economic, policy, and SAF landscape that has an influence on the Dutch economic impact of SAF policy interventions.

# **Baseline:** Chapter key messages (1/2)

## 1 **Dutch Economic Landscape:** The Netherlands has a stable and growing economy underpinned by its significant aviation and petrochemical industries: the transition to sustainable aviation fuels will have an impact on both

The Netherlands boasts a strong economy, with a GDP per capita of €63,000, and an unemployment rate of 3.8% (2024). A key driver is the strength of its aviation and refining sectors, with €3.24 billion and €3.8 billion contributed annually by the sectors respectively to the Dutch economy (2024). The Dutch aviation market is anchored by major airports, most notably Amsterdam Schiphol, which handled 66.8 million passengers in 2024, ranking as the fourth-busiest airport in Europe. The national flag carrier KLM is part of one of Europe's largest airline groups, Air France-KLM, with the country offering a comprehensive network of related aviation services. In addition, the fuels value chain benefits from well-developed infrastructure, including a total of 5 refineries and most notably the Port of Rotterdam - the largest port in Europe - occupying a prominent position in global import and export markets. According to the Port of Rotterdam, it provides more than 500,000 jobs and an added value of over €60 billion for the Netherlands. As both the aviation and petrochemical sectors begin to decarbonise and intensify their focus on Sustainable Aviation Fuels (SAF), these changes will have economic implications for the Dutch economy.

## 2 **Global, EU and Dutch SAF Policy:** Global, EU, and national policies are already influencing the scale-up of SAF, with individual countries tailoring their approaches to suit their specific conditions

Globally, SAF policies are evolving rapidly. For example, the United States offers credits to lower SAF costs, Brazil is intensifying its focus on Alcohol-to-Jet (AtJ) technologies, and both the UK and EU have implemented mandated requirements for SAF supply. The EU is one of the most advanced regions, setting strict regulations that govern both SAF production and compliance with feedstock standards - backed by material penalties for non-compliance. For example, ReFuelEU mandates 6% SAF supply by 2030, while the minimum penalty for non-compliance set by the European Commission is equivalent to at least twice the difference between fossil kerosene and the SAF. The Netherlands, as an EU member state, is required to meet these standards at a minimum. Within Europe, member states – in addition to the UK - are tailoring SAF policies to their specific circumstances, taking into account local feedstock availability and technology access. This creates a diverse and competitive landscape within which the Netherlands must position itself effectively and maximise its strengths: this is reflected in the Dutch Government's ambitious SAF Roadmap.

# **Baseline:** Chapter key messages (2/2)

## 3 **Dutch SAF Market Dynamics:** The SAF ecosystem is complex, and its operation within a global marketplace further complicates matters, as competitiveness is shaped by both local and international influences - only some of which are within the Netherlands' control

The Netherlands is strongly positioned to lead Europe in SAF development. Notably through its advanced infrastructure and expertise in petrochemicals, fuel production, logistics, and aviation. Neste operates a SAF facility with a capacity of 450,000 tonnes per annum and has announced plans for expansion, as well as Chane Terminals at its Chane Tankstorage Botlek facility. Other companies, such as Metafuels / Evos and Power2X, are making significant progress, alongside pioneers like SkyNRG whose Delfzijl facility is supported by KLM - a recognised leader in SAF adoption. However, the Netherlands faces hurdles with the development of its SAF sector: for example, grid congestion, complex permitting processes and strict nitrogen emission regulations, challenges that are explored further in this chapter.

Dutch ports offer additional strategic advantages, serving as critical hubs for the receipt, trading, and transportation of feedstocks and SAF. With existing infrastructure and extensive storage facilities, these ports are well-equipped to manage the increasing volume of SAF production. Their favourable location facilitates international trade, enabling both imports and exports of feedstocks. However, domestic feedstock supply remains limited, posing a strategic challenge and creating reliance on imports from countries such as China / Malaysia for used cooking oil (UCO). In contrast, countries like Germany, with low feedstock production but high renewable energy generation, are exploring alternative pathways such as Power-to-Liquid (PtL) fuels. By further enhancing their capabilities, Dutch ports can play an essential role in strengthening the sustainable fuel supply chain and support the Netherlands in achieving its ambitious climate targets.

Looking ahead, to accelerate the transition to sustainable aviation, it is important to consider the Netherlands' sphere of influence within the SAF ecosystem. Strategic policy decisions should reflect national strengths, anticipate supply chain challenges, and align with the evolving international landscape to ensure the country's long-term competitiveness and sustainability in aviation. This setting provides a critical foundation for understanding the SAF trajectory in the Netherlands, to understand the economic opportunity of the transition.

# The Netherlands has a robust economy which is expected to experience moderate growth, with a low unemployment rate of 3.8% (2024)

**Facts on the Dutch economic context in 2024:**

**€ 63,000**
GDP per Capita[1]

**17,940,000**
Dutch population[2]

**11,630,000**
Total number of jobs[3]

**761,000**
Number of jobs in industry[3]

**390,000**
Unemployed people in the Netherlands

**3.8 %**
Unemployment rate of the working population

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[1] *https://www.cbs.nl/en-gb/news/2025/19/gdp-per-capita-netherlands-fourth-in-eu-in-2024*

[2] *https://www.cbs.nl/nl-nl/visualisaties/dashboard-bevolking/bevolkingsteller*

[3] *'Industry' defined by StatLine: https://opendata.cbs.nl/statline/#/CBS/nl/dataset/85920NED/table?ts=1753256127557*

[4] *https://www.cbs.nl/nl-nl/visualisaties/dashboard-arbeidsmarkt/werklozen*

**Various trends are expected to influence the economic context of the Netherlands in the future and therefore need to be considered:**

**Geopolitics**

- Uncertain global geo-political environment causing more unpredictability in the international investment climate, leading to rapid changes in the terms of trade across different nations.
- Recent elections in the Netherlands causing uncertainty around the domestic policy outlook, and the political priorities of an incoming government.[5]

**Economic Growth**

- Moderate growth of the Dutch economy is expected in the mid-long term (2033).[5]
- Salaries will continue to grow, but growth rate will decline (from 6.5% in 2024 to 4.1% in 2026).[5]
- Salary growth is expected to be larger than inflation, putting upward pressure on costs and industry profitability.[5]

**Labour Market**

- Labour market shortages will slightly decrease but will still exist.[5]
- No increase of employment is expected, despite GDP-growth. Higher labour costs are reducing business profitability.[5]
- Unemployment expected to slightly increase to 4.0% in 2026.[5]

[5] *CPB Raming Centraal Economisch plan 2025*

# The Netherlands has a strong aviation sector which is a positive contributor to its economy, with 76.2 million passengers in the Netherlands in 2024

## Facts on the Dutch aviation market in 2024:

**€121 bil.**
*(1.8 M jobs)*
Direct contribution of EU airports to the EU GDP[9]

**€3.24 bil.**
*(26,000 jobs)*
Contribution of Aviation to the Dutch economy[9]

**76.2 mil.**
Aviation passengers in the Netherlands[6]

**66.8 mil.**
Passengers from Schiphol[6]

**665,000**
Flight movements in the Netherlands[7]

**473,815**
Flight movements at Schiphol[8]

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*[6] https://www.cbs.nl/en-gb/news/2025/06/76-million-airline-passengers-in-2024-6-percent-fewer-than-in-2019*
*[7] https://www.cbs.nl/nl-nl/visualisaties/verkeer-en-vervoer/verkeer/vliegbewegingen*
*[8] https://www.schiphol.nl/nl/schiphol-group/verkeer-en-vervoer-cijfers/*
*[9] SEO - The economic and social impact of European airports and air connectivity*
*[10] https://www.cbs.nl/nl-nl/visualisaties/verkeer-en-vervoer/economie/luchtvaart*

## Various trends are impacting the future of the aviation market and the current state of the play:

| | |
|---|---|
| **Contribution to EU GDP** | ▪ The number of direct and indirect jobs based in the EU aviation sector is expected to increase.[9]<br>▪ Exact growth of direct and indirect jobs from aviation depends on investments in sustainability, technological innovation, and effective policy implementation.[9] |
| **Passenger Demand** | ▪ Economic growth will cause passenger demand for aviation to grow towards 2060. Population growth will also induce higher passenger demand.[11]<br>▪ Passenger demand is expected to grow to between 97 million and 132 million passengers in 2060 (based on WLO scenario).[11] This indicates a growth of between 27.3% - 66.7% towards 2060 compared to 2024.[11] |
| **Fleet Renewal & Aircraft Efficiency** | ▪ Fleet renewal is expected to improve fuel efficiency and reduce noise but was only partially factored into recent government measures.[12]<br>▪ ICAO agreed new fuel efficiency and noise standards for aircraft certified from 2029. Aircraft must be 10% more fuel-efficient compared to current standards, and 6 dB quieter, equating to a 30% noise emission reduction.[12] |

*[11] WLO Cahier Mobility*
*[12] https://theicct.org/wp-content/uploads/2025/05/ID-358-%E2%80%93-Noise-standard_ICAO_final.pdf*

# Presence of large refineries and two large ports in the Netherlands positions the country as a (sustainable) fuel hub

**Facts on the Dutch petrochemical industry:**

**5**
Large refineries in the Netherlands

**1.2 – 1.3 mil.**
Oil refining capacity in barrels per day

**141,000**
Barrels of jet fuel produced per day[13]

**72,030**
Barrels of jet fuel consumed per day (2023)[14]

**3,000 – 4,000 (76,000)**
Direct jobs from refinery (downstream jobs)[15]

**192,000 (3.2%)**
Jobs in the Rotterdam Port Area (Dutch GDP)[16]

**Various trends are impacting the future of the refineries and jet fuel market and the current state of the play:**

| | |
|---|---|
| **Refineries in the Netherlands** | ▪ The Netherlands is a major refining hub with **five large refineries;** 1) Shell Pernis, 2) ExxonMobil Rotterdam, 3) BP Rotterdam (Europoort), 4) Gunvor Rotterdam, and 5) Zeeland Refinery (Total/Lukoil) in Vlissingen. These refineries create a competitive position for the Netherlands that is expected to be upheld in the future, assuming they switch to more sustainable practices. |
| **Geo-political Situation** | ▪ With current unpredictable global geo-political situations, the importance of ports and fuel independence is expected to grow.<br>▪ Positioning of the Port of Rotterdam and Port of Amsterdam and associated jet fuel production thus becomes increasingly important. Especially given the role of the Port of Amsterdam and Rotterdam as kerosene trading hubs and the CEPS pipeline for transportation of jet fuel. |
| **Shift to SAF and Biofuels** | ▪ Changing demand in fuel types is pushing companies in the Port of Rotterdam to adjust and is attracting new companies as well.<br>▪ The amount of SAF and bio-fuels that goes through the Port of Rotterdam is expected to increase in the future. |

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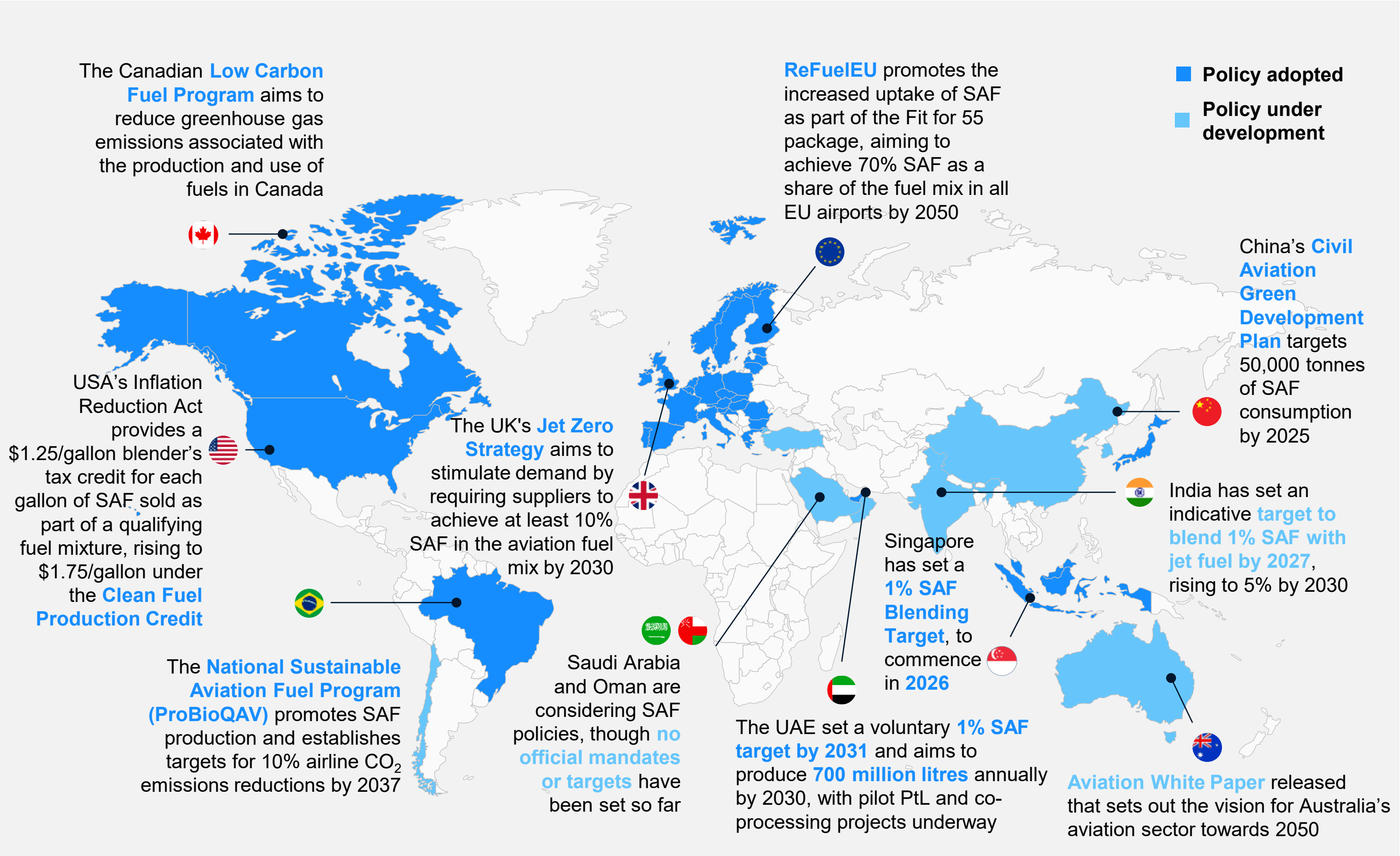
[13] *https://www.indexmundi.com/energy/?product=jet-fuel&graph=production&display=rank*
[14] *https://www.theglobaleconomy.com/netherlands/jet_fuel_consumption/*
[15] *https://vemobin.nl/wp-content/uploads/2020/03/NL5200-34669-Het-belang-van-de-raffinagesector-met-werkgelegenheid_18okt_.pdf#:~:text=,van%20het%20totaal%20in%20Nederland*
[16] *https://www.portofrotterdam.com/en/experience-online/facts-and-figures*

# Globally, SAF policies are increasingly evolving to promote the development and usage of SAF as the primary lever for decarbonising aviation

## Different types of SAF policies evolving globally



🟦 Policy adopted

▨ Policy under development

The Canadian **Low Carbon Fuel Program** aims to reduce greenhouse gas emissions associated with the production and use of fuels in Canada

USA's Inflation Reduction Act provides a $1.25/gallon blender's tax credit for each gallon of SAF sold as part of a qualifying fuel mixture, rising to $1.75/gallon under the **Clean Fuel Production Credit**

The **National Sustainable Aviation Fuel Program (ProBioQAV)** promotes SAF production and establishes targets for 10% airline $CO_2$ emissions reductions by 2037

The UK's **Jet Zero Strategy** aims to stimulate demand by requiring suppliers to achieve at least 10% SAF in the aviation fuel mix by 2030

**ReFuelEU** promotes the increased uptake of SAF as part of the Fit for 55 package, aiming to achieve 70% SAF as a share of the fuel mix in all EU airports by 2050

Saudi Arabia and Oman are considering SAF policies, though **no official mandates or targets** have been set so far

The UAE set a voluntary **1% SAF target by 2031** and aims to produce **700 million litres** annually by 2030, with pilot PtL and co-processing projects underway

Singapore has set a **1% SAF Blending Target**, to commence in **2026**

China's **Civil Aviation Green Development Plan** targets 50,000 tonnes of SAF consumption by 2025

India has set an indicative **target to blend 1% SAF with jet fuel by 2027**, rising to 5% by 2030

**Aviation White Paper** released that sets out the vision for Australia's aviation sector towards 2050

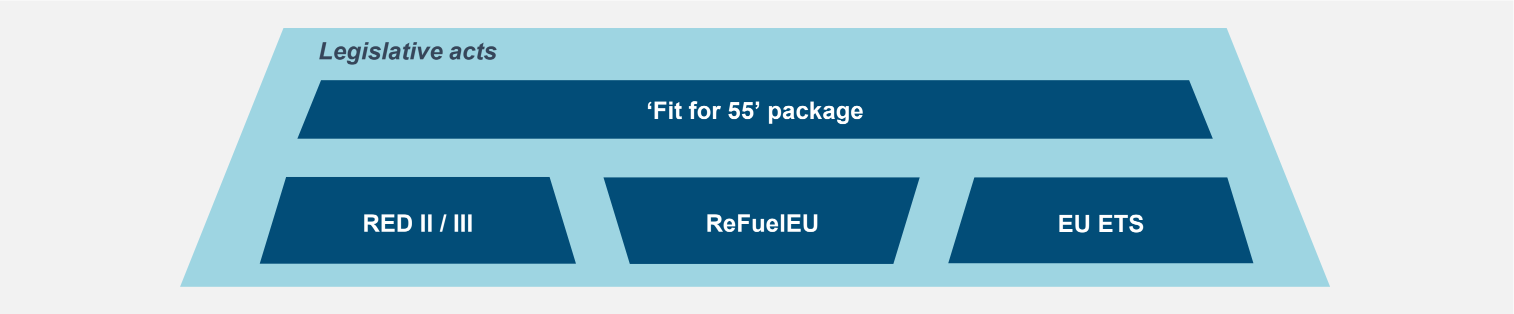
## Key takeaways:

- Globally, governments are either developing or have adopted policies to promote SAF as the primary lever for decarbonising aviation.
- While EU Member States advance SAF mandates in response to ReFuelEU, SAF policy frameworks are emerging beyond Europe and the UK. Countries across the Asia–Pacific, Latin America, and Middle East are increasingly introducing SAF targets, roadmaps and mandates, signalling growing global competition for SAF investment and supply.
- Mandates provide policy certainty for producers as they drive SAF adoption by establishing legally-binding requirements for its supply.
- Governments' voluntary SAF targets are not legally binding and are subject to political cycles that could lead to policy shifts and reduced demand.
- Mandates are therefore defined as a "demand-floor" in their respective regions, while voluntary demand is an indeterminate amount above this floor.

**NB:** Non-exhaustive set of policies highlighted, including in some cases (such as the UK and the US), where multiple initiatives are underway. Does not explicitly show the CORSIA scheme, which applies for all international flights globally.

# The EU has adopted binding SAF policies, setting strict regulations that govern both SAF supply and compliance with feedstock standards

**‘Fit for 55’ Package with a focus on SAF associated Acts**



*Legislative acts*

**‘Fit for 55’ package**

**RED II / III**

**ReFuelEU**

**EU ETS**

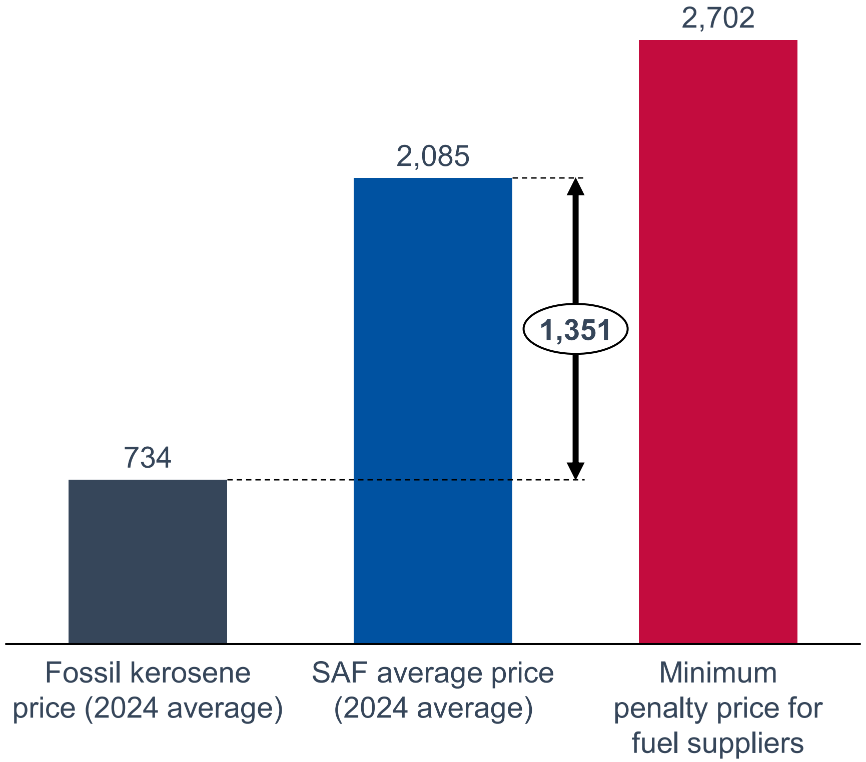
| | |
|---|---|
| **Renewable Energy Directive II / III (RED)** | The RED is the main EU legal framework driving the development of renewable energy. RED III aims to increase the EU's renewable energy share to at least 42.5% by 2030, with the goal of reaching 45%. It also provides sustainability criteria for fuel products, including SAF. Noting SAF deliveries are allowed to count towards national statistics for RED goals, but are not part of the national ‘obligation’ for SAF. Therefore, in the SAF context RED mainly refers to the sustainability framework. |
| **ReFuelEU Aviation** | This act places an obligation on fuel suppliers to ensure a minimum share of SAF is blended into the aviation fuel they provide at EU airports. Starting with 2% in 2025 and reaching 70% by 2050, plus a sub-target for synthetic fuels. ReFuelEU also includes anti-tankering provisions that require aircraft operators to refuel with at least 90% of the fuel needed for a flight at a "Union airport“. |
| **EU Emissions Trading Scheme (EU ETS)** | Under the EU ETS, all airlines operating in Europe, European and non-European alike, are required to monitor, report and verify their emissions, and to surrender allowances against those emissions. Free allowances have been phased out. However, there is a limited amount of 20 million 'SAF allowances' available for early movers on a first come first serve basis. |

**Key takeaways:**

- The ‘Fit for 55’ package is a set of Acts introduced by the European Commission, with an aim to reduce EU GHG emissions by at least 55% by 2030 compared to 1990 levels and put the EU on the path to achieve climate neutrality by 2050.
- The package includes various legislative initiatives across sectors, including energy, transport, and buildings, with a goal to make all sectors of the EU’s economy fit to meet this target. Further, the package includes multiple acts relevant to SAF: Renewable Energy Directive II / III (RED), ReFuelEU and EU ETS.
- All SAF supplied under ReFuelEU and EU ETS must comply with the sustainability and GHG emissions saving criteria for biofuels and other renewable fuels as set out in RED II / III, where specific criteria depends on the fuel type.
- The Netherlands must adhere to EU legislation as a minimum: but cannot place further obligations on fuel suppliers that are in addition to the ReFuelEU Aviation regulation.

# ReFuelEU mandate penalties are burdensome for fuel producers; failing to meet the obligation means paying the penalty while still needing to source the SAF

**Illustration of penalties for obligated parties (fuel suppliers) under ReFuelEU Aviation, in €**



Under Article 12 of ReFuelEU, the minimum penalty for non-compliance set by the European Commission is equivalent to *at least* twice the difference between fossil kerosene and the SAF reference prices published by EASA.

**Key takeaways:**

- Jet fuel suppliers who fail to meet EU mandates must pay the penalties but are not exempted from meeting quotas. Unfulfilled quotas carry over to subsequent years and could again incur a penalty, making non-compliance increasingly costly.

> "…any aviation fuel supplier which has accumulated a shortfall from the obligation…relating to the minimum shares of SAF or of synthetic aviation fuels in a given reporting period, shall supply the market in the subsequent reporting period with a quantity of that respective fuel equal to that shortfall, in addition to their reporting period obligation.
>
> **(EU) 2023/2405 (ReFuelEU), Article 12**

- This means **that there is no "buyout" of the obligation, and the EU's demand signal is very strong: suppliers must supply SAF**.
- Obligated parties can import the SAF to meet the obligation, though imports are required to meet all of the RED standards for SAF.
- The implementing law for the transposition of ReFuelEU was recently published in the 'government gazette', including the legal framework for penalties in the Netherlands.

Sources: EASA, T&E, PA Research & Analysis

# Several countries have introduced national ambitions in addition to ReFuelEU: among other things, these provide clarity on preferred SAF feedstocks

**SAF mandates and national (voluntary/non-binding) targets across the UK, Norway and EU**

| Country / Region | Mandate status | % SAF usage | | | Preferred Pathway | | | Other notes |
|---|---|---|---|---|---|---|---|---|
| | | 2025 | 2030 | 2050 | HEFA | AtJ/FT | PtL | |
| UK | In force<br>(start 2025) | 2% | 10% | 22%<br>(2040 onwards) | ✗ | | ✓ | From 2040, the obligation will stay at 22%<br>Separate obligation on PtL from 2028 that reaches 3.5% of total jet fuel demand in 2040 |
| NO | In force | 0.5%<br>(2022) | 30% | - | ✗ | ✓ | ✗ | eFuels are not included in mandate<br>Crop biofuels are not eligible |
| EU | In force<br>(start 2025) | 2% | 6% | 70% | | | ✓ | eSAF sub-mandate: 1.2% (2030), 10% (2040) & 35% (2050). Food and feed are excluded entirely. However, there is no limit on Annex IXb in ReFuelEU, only in RED III |
| DE | In force<br>(start 2026) | 0.5%<br>(2026) | 2% | - | | | ✓ | Emphasis on PtL fuels, not SAF generated from biological feedstock or waste oils |
| FR | In force | 2% | 5% | 50% | ✗ | ✓ | | Focus on advanced biofuels and exclusion of crop-based biofuels (except sugar molasses) |
| ES | In evaluation | 2% | - | - | | ✓ | | Special focus on waste and residues |
| NL | In evaluation | - | 14% | 100% | ✗ | ✓ | | Not explicitly a mandate; Emphasises advanced biofuels; Excludes crop-based biofuel |
| SE | In force | 5% | 27% | - | | | | Crop fuels likely to be allowed |
| DK | In evaluation | - | 100%<br>domestic | - | | | | Not explicitly a mandate, only that all domestic flights in DK should be "green" by 2030 |
| FI | In force | 12%<br>(2022) | 34% | - | | | | Biofuel obligation, which includes SAF, for all transport in Finland, including aviation |

**Key:** 🟥 **Not eligible/capped** ☐ **Unclear** 🟩 **Preferred**

## Key takeaways:

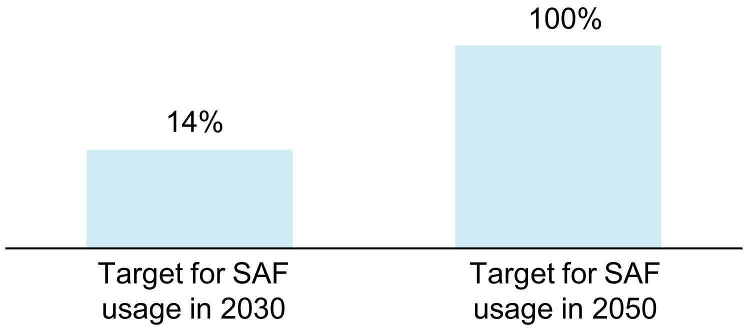
- **ReFuelEU Aviation:** This EU mandate takes precedence over national targets from individual member states, setting out harmonised minimum obligations for all flights departing from EU airports.
- **Mandates contain implications for airport strategies:** e.g., investment into on-site SAF infrastructure, establishing supply chain partnerships, and added competition between airports.
- **Sources of SAF vary in each country:** Local conditions, feedstock availability, technology access, policies and incentives all affect likely SAF production pathways, e.g.
    - Nordic countries can afford high capital expenditure associated with crop biofuels (e.g. SAF via FT and AtJ); Finnish player Neste is very mature in these pathways;
    - Germany's low feedstock production but high renewables generation pushes it to explore alternative pathways like PtL.

# The Netherlands has a SAF roadmap which defines three workstreams with plans to realise the set European and national targets

### Summary of SAF Roadmap and impact on SAF

- Roadmap supporting the Dutch aviation sector in the transition towards sustainable aviation by reducing the reliance on fossil fuels, aligned with the European targets and national ambitions in the Netherlands.
- Developed by a ‘coalition of the willing and able’, consisting of the government and sector parties emphasising the joint ownership of the transition. The ‘willing’ are parties that support the set targets and are focussing on achieving the proposed actions across three workstreams. The ‘able’ indicates those that can contribute and are even necessary to achieve the SAF targets.
- Proposed non-binding targets: 14% SAF usage in 2030 and 100% SAF usage by 2050. The aim is to work towards zero CO2 emissions from aviation in 2070.
- Three objectives are defined. Each objective is translated into a workstream with clear initiatives and a roadmap, focussing on how to overcome key barriers. The three objectives and accompanying workstreams are:
    1. Meet ReFuelEU targets and obligations | Workstream: create an efficient market in which ReFuelEU targets can be realised.
    2. Realise 14% SAF targets for 2030 | Workstream: stimulating additional demand towards 14% target.
    3. Producing SAF in the Netherlands | Workstream: strengthen the Netherlands as a production location for sustainable fuels.
- Recognises the current reliance on HEFA production and the need to invest in other innovative pathways (advanced biofuels and e-SAF) due to feedstock limitations.

### SAF Targets for 2030 and 2050

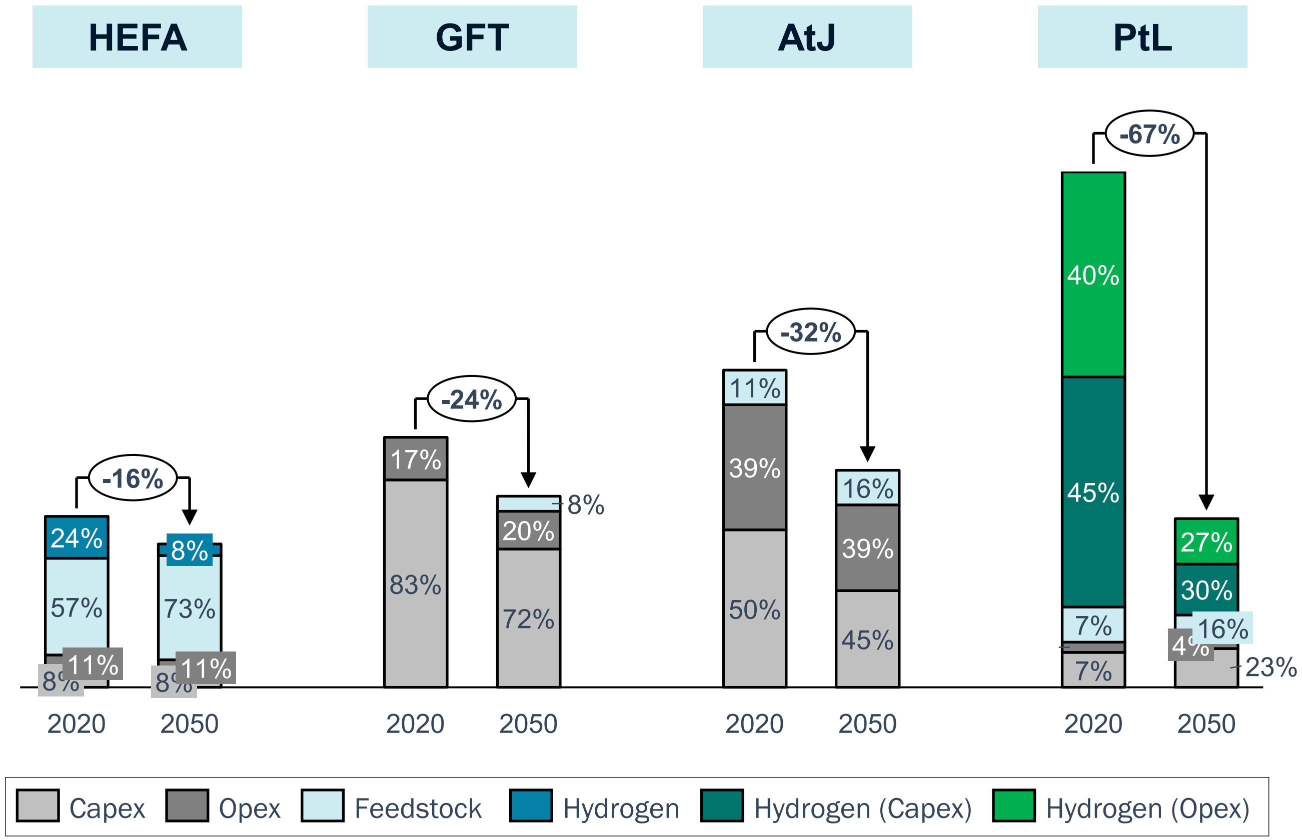


### SAF Targets for 2030 and 2050

- Targets will play a key role in driving the demand for SAF in the Netherlands and EU.
- Investments in SAF production facilities is needed to meet set targets. Uncertainty of SAF demand risks making investments less attractive for investors.
- Due to high costs for renewable energy in the Netherlands, importing feedstock, semi-finished products or SAF needs to be considered.
- Coordination and prioritisation from a political perspective is needed with other sectors for feedstock and renewable energy, with clear link to national and European policies.

# Non-HEFA SAF production is significantly more capital intensive vs. HEFA. For PtL, the key to cost reduction will be ability to reduce price of hydrogen

**SAF production cost breakdown for selected feedstock** (% of total costs)



**Key takeaways:**

- **HEFA** and **PtL** are primarily **driven by feedstock and hydrogen costs**, whereas Gasification Fischer-Tropsch (**GFT)** and **AtJ** are **primarily CAPEX driven.**
- From 2020-2050, **PtL is expected to achieve the most significant cost reduction** with a c.70% decline, driven by a significant hydrogen production cost reduction (from economies of scale and reduced renewable electricity costs).
- **There is uncertainty as to when PtL will reach cost-competitiveness with other pathways**; HEFA is the cheapest today, making it an ideal short-term solution, though will see the lowest cost-reduction long-term. **Thus, the industry is also investing in GFT and AtJ pathways as short-term options.**

Sources: Clean Skies for Tomorrow, PA Research & Analysis

# An assessment of the Netherlands' right-to-win in SAF highlights its strong existing petrochemical infrastructure, though limited domestic feedstock availability (1/3)

**An assessment of the Netherlands' strengths across the SAF value chain:**

| | Feedstock Sourcing | Production Capacity | Blending / Refining Capacity | Distribution: Transport / Storage | Airport Fuel infrastructure / Incentives | Airline Demand |
|---|---|---|---|---|---|---|
| NETHERLANDS STRENGTHS | ▪ For feedstock imports the Netherlands has the port connections to facilitate this. With players such as **Chane** and **Evos** already handling these product types.<br>▪ The entire Dutch waste management sector (all materials) is significant. | ▪ SAF production already in the Netherlands, with Neste and Chane having a combined nameplate capacity of ~730ktpa.<br>▪ With **4+ more planned**, including SkyNRG's DSL-01 which just received **€250 million investment from APG.**<br>▪ Production costs for SAF are largely driven by their production pathways. HEFA is the cheapest (2,085 €/t), with over half the Netherlands' SAF plants currently announced using this pathway. | ▪ Netherlands: **5 refineries**, 61.2 Mt/a primary capacity, 9.44% Percentage of EU, 1 biorefinery.<br>▪ Depending on the site complexity, some refineries can retrofit their existing units to produce renewable fuels.<br>▪ The Netherlands is a key player in the EU industry, strategically positioned in the ARA region.<br>▪ The Port of Amsterdam has an aim to be climate-neutral by 2050. | ▪ Port of Rotterdam is the largest port in Europe, handling 436k tonnes of cargo in 2024.<br>▪ With strong likelihood the Netherlands will need to rely on SAF / feedstock imports, it is well connected through its **ports**. Dutch petrochemical clusters offer expertise grouped together.<br>▪ The Netherlands is well connected internally through its **pipeline network**, such as **CEPS** and **ASP and to** neighbouring countries through CEPS (e.g., France, Germany, etc.). | ▪ **AMS** is a major hub airport consuming **~10Kt of jet fuel per day** and is majority owned by the Dutch Government.<br>▪ Other Dutch airports include **RTM, EIN, MST and GRQ**.<br>▪ AMS has shown commitment to SAF with its incentive scheme, **€15M** to promote SAF between 2022-2024. | ▪ KLM, the Dutch flag carrier, **10% by 2030 SAF target**. With various supporting initiatives such as a SAF surcharge, SkyNRG offtake and corporate SAF programme.<br>▪ Transavia was one of the first budget airlines to implement SAF, using 0.9% in 2023 of total fuel.<br>▪ In 2024, KLM transported 33 million passengers and Transavia ~9.5 million. |

**Key takeaways:**

- In the Netherlands, the existing infrastructure and expertise in petrochemicals, fuel production and logistics, and aviation puts the country in a position to lead Europe in SAF development.
- Companies like Neste and Chane have operational SAF facilities, and KLM is taking an active role in supporting the production and use of SAF.
- Dutch ports have significant potential to serve as hubs for the receipt, trading, and transportation of feedstocks and SAF. With well-developed infrastructure and storage facilities, these ports can efficiently handle the growing volume of SAF production. Their strategic location supports international trade.

# An assessment of the Netherlands' right-to-win in SAF highlights its strong existing petrochemical infrastructure, though limited domestic feedstock availability (2/3)

**An assessment of the Netherlands’ weakness across the SAF value chain**

| | Feedstock Sourcing | Production Capacity | Blending / Refining Capacity | Distribution: Transport / Storage | Airport Fuel infrastructure / Incentives | Airline Demand |
|---|---|---|---|---|---|---|
| NETHERLANDS WEAKNESSES | ▪ NLR expects **biofuel resources** in the Netherlands to supply only a **small portion (~15%)** of demand for aviation fuel by 2050.<br>▪ **Limited electricity grid capacity** forms a bottleneck that hinders the deployment of **new renewable capacity**.<br>▪ While the Netherlands is performing grid upgrades, the country now is **facing electricity cost increases**, as a result. Electricity network rates in the Netherlands are poised to grow annually from **4.8% to 6.7% by 2040.** | ▪ Shell cancelled its Rotterdam facility in September 2025 when it determined that the project would be insufficiently competitive in meeting customer demand for affordable, low carbon products. Other big oil companies are also stepping back from renewable energy.<br>▪ The Netherlands has been struggling with the **impact of nitrogen emissions** since 2019, affecting the development of new infrastructure projects. | ▪ Knock-on effects of shifting from oil refineries to renewable refineries. The refineries are closely integrated with their surroundings. While these integrations have previously been seen as a competitive advantage, they may also pose bottlenecks in the energy transition process. | ▪ Although both the **NATO** and **ASP pipelines** are open-access, due to **limitations of accessing AMS**, it is considered a **restricted market** in this sense. | ▪ AMS operates its fuel infrastructure under a **closed-access model**. Gaining access can require substantial equity investment - up to **€35M**.<br>▪ Closed system reduces supplier diversity, limits airline choice, and can **inflate fuel prices** due to the lack of competition.<br>▪ No administrative system in place yet to trace SAF through the CEPS pipeline. | ▪ Despite KLM’s efforts, in **2024 ‘Dutch court rules KLM advertising campaign was “greenwashing”’.**<br>▪ Fuel costs at AMS already expensive due to jet fuel infrastructure ownership model with AFS. |

**Key takeaways:**

- A key challenge for SAF production in the Netherlands is feedstock availability. The supply of waste oils and fats for HEFA is limited, and advanced bio-feedstocks face competition from other sectors (chemicals, heavy transport, etc.).
- Additionally, the cost of renewable electricity and green hydrogen in the Netherlands is relatively high, making domestic eSAF production less competitive compared to countries with cheaper renewables.
- This issue is exacerbated by further issues such as permitting, restrictive nitrogen laws and limited grid capacity. All of which are key barriers to entry.
- Also, the notable exit of Shell and BP from production of SAF in the Netherlands.

# An assessment of the Netherlands' right-to-win in SAF highlights its strong existing petrochemical infrastructure, though limited domestic feedstock availability (3/3)

**An assessment of the Netherlands vs. key competitors across the SAF value chain**

| | Feedstock Sourcing | Production Capacity | Blending / Refining Capacity | Distribution: Transport / Storage | Airport Fuel infrastructure / Incentives | Airline Demand |
|---|---|---|---|---|---|---|
| **NETHERLANDS VS KEY COMPETITORS** | ▪ China/Malaysia: Large UCO / waste residue suppliers (China UCO exports **2.951Mt**, 2024).<br>▪ Norway/Sweden: Low levelised cost of electricity (PtL).<br>▪ Germany: Green hydrogen strategy.<br>▪ In France, the production of ethanol used in mobility is mainly from wheat, corn and beet. With 12 million hectolitres, France is the 1st European producer of bioethanol.<br>▪ France also has high ambitions for hydrogen, and has committed **~€9 billion to support the sector.** | ▪ Countries (also with mandates) investing in SAF at a production level: France (**4 winning projects of Carb Aero**), Germany (**€350 million**), UK (**RCM and AFF - €228 total spend**).<br>▪ UK has one operational SAF facility operated by Philips 66, though the market is yet to scale significantly as it awaits the RCM.<br>▪ Other countries have less stringent environmental or capacity restrictions compared to the Netherlands. | ▪ **France:** 7 refineries, 58.9 Mt/a primary capacity, 9.09% of EU, 1 biorefinery.<br>▪ **Germany:** 15 refineries, 103.6 Mt/a primary capacity, 15.99% of EU.<br>▪ **UK:** 7 refineries, 58.4 Mt/a primary capacity, 9.01% of EU total<br>▪ **Belgium:** 2 refineries, 32 Mt/a primary capacity, 4.94% of EU. | ▪ The Ports of Antwerp-Bruges, Hamburg and Le Havre-Rouen-Paris all feature in the top 10 European ports by annual cargo tonnage (2024). But, for scale, although Antwerp-Bruges, is second, it handled half the cargo of Rotterdam.<br>▪ France, Belgium, Luxembourg and Germany are all well connected through the CEPS pipeline, with the UK also having a sophisticated pipeline network. | ▪ LHR has similar fuel infrastructure ownership model as AMS.<br>▪ LHR ~€200M total subsidy to airlines using SAF.<br>▪ BRU will incentivise up to €200,000 per airline for SAF use.<br>▪ AMS has significantly smaller incentives totalling €15 million. | ▪ Majority of other competing countries have carriers with strong SAF commitments (i.e., Germany's **DHL** has a **30% by 2030** SAF target, while the UK's **IAG** has announced some of the biggest offtakes to date).<br>▪ Certain competitor nation flag airlines carried higher passenger numbers than KLM in 2024, including British Airways (46.2 million) and Lufthansa Airlines (64.5 million). |

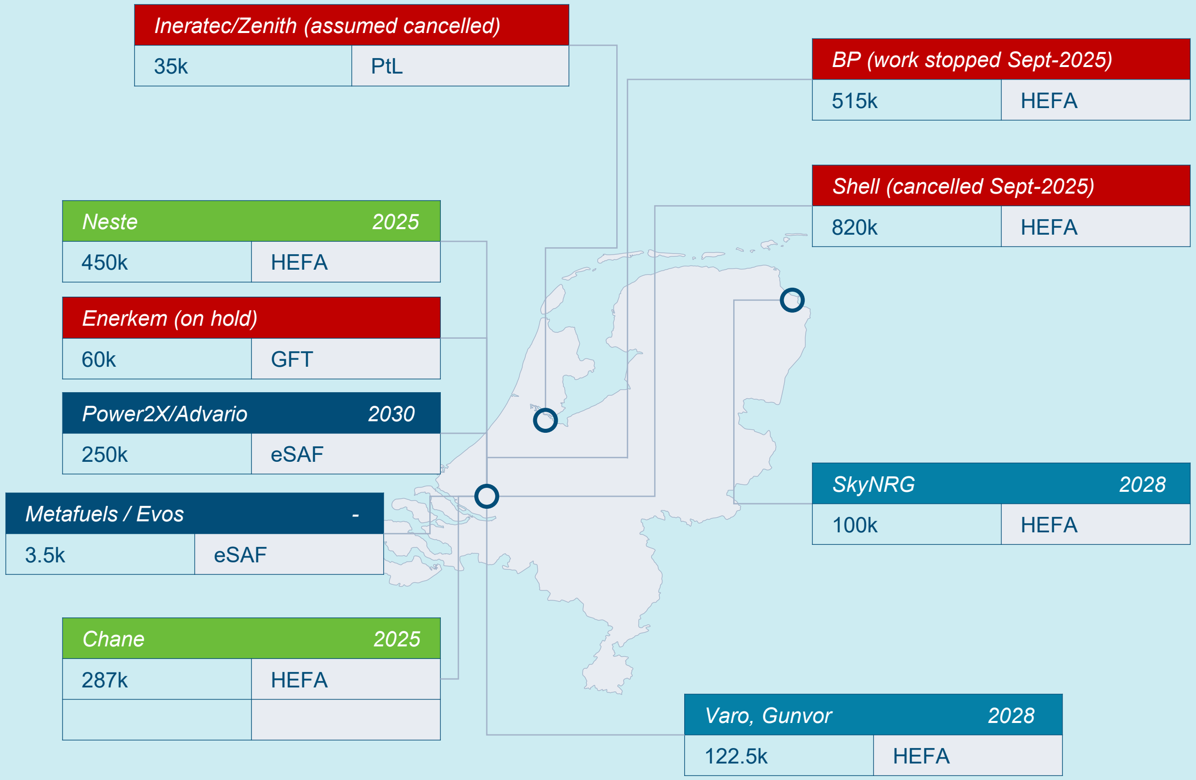
**Key takeaways:**

- Other countries benefit from stronger domestic feedstock production - e.g., France's bioethanol production reduces its reliance on imports.
- Several countries, such as Sweden, have also announced ambitious eSAF strategies.
- The Netherlands, however, faces additional structural barriers - including grid congestion, complex permitting processes, and nitrogen emission constraints.
- Despite its small size, the Netherlands has a large aviation sector, with AMS ranking as the fourth-busiest airport in Europe.
- The country also holds strategic advantages through its major ports and the CEPS pipeline network which supplies jet fuel to multiple neighbouring countries.

Sources: Concawe, Cova, PA Research & Analysis

# The Dutch SAF industry is advancing, with Neste capable of producing 450,000 tonnes annually of SAF, while KLM has a target of 10% SAF by 2030

**Overview of Dutch SAF plants (publicly announced)**



| | | | |
|---|---|---|---|
| *Ineratec/Zenith (assumed cancelled)* | | 35k | PtL |
| *BP (work stopped Sept-2025)* | | 515k | HEFA |
| *Shell (cancelled Sept-2025)* | | 820k | HEFA |
| *Neste* | *2025* | 450k | HEFA |
| *Enerkem (on hold)* | | 60k | GFT |
| *Power2X/Advario* | *2030* | 250k | eSAF |
| *Metafuels / Evos* | *-* | 3.5k | eSAF |
| *SkyNRG* | *2028* | 100k | HEFA |
| *Chane* | *2025* | 287k | HEFA |
| *Varo, Gunvor* | *2028* | 122.5k | HEFA |

🟦 = Initial announcement
🟦 = Front End Engineering Design (FEED)
🟩 = Operating

**Legend:**

| | |
|---|---|
| *[Company]* | *[Operational year]* |
| *[Plant nameplate capacity] t/yr* | *[Pathway]* |

**730ktpa**
Total nameplate capacity of Netherlands' SAF plants in 2025

- Neste is currently producing SAF at its Rotterdam refinery and plans to expand to **2.7mtpa of renewable products by 2027**.
- Other developers have announced SAF plant plans in the Netherlands, which, if fully realised, could result in **national SAF production in excess of ~1mtpa by 2030**. Notwithstanding the cancellation of facilities such as Shell and BP, due to being deemed insufficiently competitive.

**10% by 2030**
KLM SAF uplift target

- **10% SAF by 2030 target**, based on total kerosene consumption (NB. KLM Flight Ops was 3,330k tons of jet fuel in 2024).
- Since 2023, KLM have been adding SAF to flights from AMS.
- **KLM was a co-founder of SkyNRG**, who is developing a new SAF production facility in the Netherlands. KLM has committed to offtaking a significant portion of its production (**~100kpta SAF**).

**2,085 €/ton - 8,470 €/ton**
EASA 2024 SAF production cost estimation range

- EASA's 2024 cost data shows significant variations for SAF production prices, with **aviation biofuels** averaging around **2,085 €/ton**, while synthetic **e-SAF production** ranges from **5,525 €/ton to over 8,470 €/ton** depending on CO2 sourcing.

**15 million €**
AMS SAF incentive scheme total fund

- Between 2022 and 2024, Schiphol encouraged the purchase of SAF by subsidising the additional cost. As a result, more than **40,000 tons of SAF** was used by participating airlines.
- By allocating €15 million, Schiphol offered airlines **500 €/ton** of SAF and **1,000 €/ton** of Synthetic Fuels when refuelling at AMS.

# Not all aspects of the SAF market are under the Netherlands control: therefore,the focus should be on what can be influenced close and far from home

**An assessment of the SAF market related factors the Netherlands has influence over**

| | CLOSE TO HOME | FAR FROM HOME |
|---|---|---|
| **NL GOVERNMENT LEAST INFLUENCE** | ▪ Decisions by oil majors / other organisations with local operations (e.g., Shell cancelling its Rotterdam biofuels facility)<br>▪ Aviation demand trends from major airlines that use Dutch airports (e.g., fleet decisions by KLM)<br>▪ EU-level decisions or competition policies that could impact SAF investments in NL (though partial impact as member state)<br>▪ Local infrastructure / feedstock bottlenecks or disruptions outside government control<br>▪ Inclusion of certain feedstocks within the EU's Renewable Energy Directive | ▪ Global oil prices and commodity markets affecting jet fuel / SAF / feedstock cost competitiveness / production & supply<br>▪ Foreign government SAF subsidies or mandates (e.g., US Inflation Reduction Act / OBBBA, Brazilian AtJ push, potential China SAF mandate, etc.)<br>▪ International SAF certification standards, including new SAF production pathways (e.g., rules set by ICAO, CORSIA, ASTM, etc.)<br>▪ Export restrictions on key inputs/technology from other regions<br>▪ International air traffic and route decisions affecting demand for Dutch airports<br>▪ Global climate events or disruptions (e.g., crop failures or new feedstocks) |
| **NL GOVERNMENT MOST INFLUENCE** | ▪ National proposed target (e.g., the SAF Roadmap) and production incentives (e.g., taxes, subsidies, etc.) to improve the investment attractiveness Supporting domestic SAF R&D, pilot projects, and scale-up funding<br>▪ National feedstock policy (e.g., waste regulation, circular economy rules)<br>▪ Local workforce development and training for SAF sector<br>▪ Infrastructure investment (e.g., pipelines, storage for SAF, ports)<br>▪ Electricity prices (though not easily), in addition to volume of renewable electricity available, and grid connections / capacity<br>▪ Nitrogen threshold value<br>▪ Planning and permitting permissions / processes<br>▪ Access to infrastructure for new SAF entrants | ▪ Advocacy for stronger EU-level SAF mandates, targets or incentives-based approach (e.g., ReFuelEU, EU ETS)<br>▪ Shaping EU-level sustainability criteria and certification for SAF<br>▪ Participation in international SAF alliances and partnerships (e.g., Clean Skies for Tomorrow, ICAO working groups)<br>▪ Promoting Dutch companies for EU grants and flagship projects<br>▪ Bilateral agreements with non-EU countries for SAF imports/exports or knowledge sharing<br>▪ Supporting Dutch businesses to access international SAF markets and scale technologies abroad |

# 03

# Future Scenarios

# **Future Scenarios:** Chapter purpose

The purpose of this chapter is to define and describe the future scenarios, out to 2050, that underpin the economic impact assessment of the Dutch SAF industry. These scenarios provide a set of plausible future conditions rather than a single forecast, allowing for a more robust understanding of how different policy and market environments could shape SAF deployment and its wider economic effects.

By exploring multiple "future worlds," the analysis identifies the opportunities, trade-offs, and policy implications associated with each scenario. This enables evidence-based decision-making and supports the development of interventions that can maximise economic value for the Netherlands.

**What Is a Scenario?**

A scenario represents a potential future state of the world that could affect the Dutch economy, aviation market, or SAF market.

- The baseline scenario reflects a future in which no additional policy interventions are introduced beyond those currently in place.
- Each alternative scenario varies a fixed set of parameters (e.g., production capacity, technology pathways, feedstock imports / exports, and trade-offs) relative to the baseline.

# A set of core dimensions has been developed to shape the scenarios, capturing global outlook for SAF, the Netherlands’ role within the EU, and key domestic factors

| | Dimension | Description |
|---|---|---|
| Global | Jet fuel production | Total global production of conventional jet fuel used for aviation. |
| | SAF production | Total global production of sustainable aviation fuel across all pathways. |
| | SAF demand | Aggregated total global demand for SAF driven by mandates and voluntary commitments. |
| EU | NL in the EU Competitive Position | Relative level of competitiveness of the Netherlands within the SAF market vs other European countries. |
| Netherlands | NL SAF production | Volume of SAF produced domestically within the Netherlands. |
| | Number of NL SAF plants | Count of operational and announced SAF production facilities in the Netherlands. |
| | Volume of SAF imports into NL | Total imported SAF volumes entering the Dutch market. |
| | Volume of SAF exports from NL | Total SAF produced in the Netherlands and exported abroad. |
| | NL feedstocks production | Domestic production of eligible SAF feedstocks in the Netherlands. |
| | Number of NL feedstocks plants | Total number of operational or planned facilities producing SAF feedstocks domestically. |
| | Volume of feedstocks imports into NL | Quantity of feedstocks imported for SAF production within the Netherlands. |
| | Volume of feedstocks exports from NL | Quantity of feedstocks produced in the Netherlands and exported for SAF production elsewhere. |
| | SAF production pathway | SAF production pathways introduced to the scenario (e.g., 1G / 2G / 3G). |
| | Jet fuel refining | Extent of fossil jet fuel refining capacity and activity within the Netherlands. |
| | Trade offs | The extent to which the Dutch Government may need to intervene, as well as the resulting impact on other policies and challenges. |

# Three scenarios have been designed, each representing a different trajectory for the SAF industry and reflecting varying degrees of national ambition

| | Description | **Scenario 1**<br>**Baseline Domestic SAF Production**<br>*No further policy intervention. Existing interventions / funding would simply expire in the baseline scenario* | **Scenario 2**<br>**Medium Domestic SAF Production**<br>*Moderate policy intervention to increase investment attractiveness and address some regulatory permitting challenges* | **Scenario 3**<br>**High Domestic SAF Production**<br>*Strong and coordinated policy framework addressing multiple parts of the SAF value chain to stimulate supply, including eSAF* |
|---|---|---|---|---|
| **Global** | Jet fuel production | Constant | Constant | Constant |
| | SAF production | Constant | Constant | Constant |
| | SAF demand | Constant | Constant | Constant |
| **EU** | NL in the EU Competitive Position | Early first mover in EU 1G production, but not competitive in other SAF pathway markets | Early first mover in EU 1G production, fast follower in the 2G market | Early first mover in EU 1G production, fast follower in the 2G and 3G markets |
| **Netherlands** | NL SAF production | Low | Medium | High |
| | Number of NL SAF plants | Low | Medium | High |
| | Volume of SAF imports into NL | High | Medium | Low |
| | Volume of SAF exports from NL | Low | Medium | Medium |
| | NL feedstocks production | Low | Medium | Medium |
| | Number of NL feedstocks plants | Low | Medium | Medium |
| | Volume of feedstocks imports into NL | Medium | High | High |
| | Volume of feedstocks exports from NL | Low | Low | Low |
| | SAF production pathway | 1G | 2G (+ 1G) | 3G (+ 1G + 2G) |
| | Jet fuel refining | Medium | Medium | Medium |
| | Trade offs | Low | Medium | High |

# The scenarios to 2050 interpret the dimensions differently, resulting in varied responses and outcomes based on their specific market, policy, and technology conditions

|  | **Dimension** |
|---|---|
| Global | Jet fuel production |
|  | SAF production |
|  | SAF demand |
| EU | NL in the EU Competitive Position |
| Netherlands | NL SAF production |
|  | Number of NL SAF plants |
|  | Volume of SAF imports into NL |
|  | Volume of SAF exports from NL |
|  | NL feedstocks production |
|  | Number of NL feedstocks plants |
|  | Volume of feedstocks imports into NL |
|  | Volume of feedstocks exports from NL |
|  | SAF production pathway |
|  | Jet fuel refining |
|  | Trade offs |

**Based on these dimensions, three different scenarios are defined as:**

The **purpose of developing the future scenarios** is to **inform the economic modelling** by providing a set of **plausible conditions** rather than a **single forecast**. This approach allows the **potential economic impacts of SAF deployment** to be assessed under **varying circumstances**. The scenarios are used to **test different future environments**, **identifying opportunities** and **trade offs**, thereby enabling **informed policy decisions** that have the potential to **maximise economic value for the Netherlands**.

## Scenario 1

***Baseline Domestic SAF Production***

*No further policy intervention. Existing interventions / funding would simply expire in the baseline scenario*

## Scenario 2

***Medium Domestic SAF Production***

*Moderate policy intervention to increase investment attractiveness and address some regulatory permitting challenges*

## Scenario 3

***High Domestic SAF Production***

*Strong and coordinated policy framework addressing multiple parts of the SAF value chain to stimulate supply, including eSAF*

# All scenarios position the Netherlands within a global aviation and SAF market, recognising continued international competition as well as trade

**Global context:**

- **Global aviation is on a strong growth trajectory**. IATA projects demand for air travel will continue rising through 2050, with passenger journeys potentially exceeding 10 billion (IATA, 2024). This growth is driven by expanding populations, rising affluence in emerging markets, and increased connectivity - with the fastest volume growth expected in Asia. At the same time, global jet-fuel consumption is expected to climb, driven by more flights (especially long-haul), larger aircraft, and growing cargo operations. This means that even if efficiency gains continue, the absolute quantity of aviation fuel - and thus the decarbonisation challenge - will grow.

- **While the future of SAF carries many uncertainties is its widely recognised as the primary lever for decarbonising aviation.** There is strong alignment among industry bodies on its essential role. According to IATA, SAF could contribute around 65% of the emission reductions required by aviation to reach net-zero $CO_2$ by 2050 (IATA Fact Sheet, 2024). Emerging global mandates reinforce this direction - including the EU's ReFuelEU mandate, binding blending obligations in the UK and Brazil, and proposed mandates in other regions such as in Japan, Malaysia and Türkiye. The voluntary SAF market remains relevant, but mandates will be key to driving global demand.

- **The SAF ecosystem is expected to evolve rapidly over the next two decades**. Advancements are anticipated in alternative production pathways (such as 2G and 3G SAFs), policy instruments, book-and-claim systems, and corporate offtake mechanisms. Although this assessment does not model those long-term transitions explicitly, it acknowledges that ongoing innovation and market evolution will shape national-level outcomes.

- **SAF cost dynamics vary by technology and feedstock pathway.** It is acknowledged that feedstock-driven processes such as HEFA and PtL are heavily influenced by feedstock prices, whereas other technologies are more capital-intensive (Clean Skies for Tomorrow, 2020). However, in our scenario analysis and economic assessment, SAF price is treated implicitly, with the assumption that the market clears at that price - meaning all SAF produced can be sold in equilibrium, reflecting a “price-taker” market structure.

- **Feedstock availability remains an uncertainty**. The sustainability and geographic distribution of specific feedstocks, international trade in waste oils and residues, and potential policy shifts (such as export restrictions) will shape future supply. The industry may face a “HEFA tipping point” around 2030 as conventional feedstocks become constrained, driving diversification toward other pathways such as 2G and 3G SAFs (SkyNRG, 2025).

- **The Netherlands will continue to operate within a global SAF market**. Although small in scale, Dutch SAF production, consumption, and policy will be influenced by global supply, trade, and pricing dynamics. National actions will matter most through their integration into wider European and international systems - contributing to collective progress toward ReFuelEU compliance and the global decarbonisation of aviation.

# Scenario 1 presents the baseline view of how domestic SAF production is likely to evolve to 2050 if no national policies are introduced beyond those already in place

**Scenario 1:**

- **The baseline scenario defines the reference case for SAF in the Netherlands.** It sets out what is likely to happen to domestic SAF production capacity out to 2050 if no major new national-level policies are introduced beyond what already exists. While the government's roadmap outlines a 14% SAF share by 2030, this is target and not a binding mandate. The baseline therefore establishes the economic impact of SAF if the government does not intervene further.

- **Only existing operational projects are included in the baseline.** Plants with operational SAF capacity as of 2025 could include projects such as Neste's Rotterdam plant and Chane's Terminal Botlek SAF facility. With a combined plant nameplate capacity of 730kpta. With this capacity, the Netherlands could theoretically exceed its ReFuelEU obligations three times over in 2030. However, this assumes maximum possible SAF output from each plant, noting most facilities are also capable of producing other renewable fuels.

- **HEFA is assumed to dominate domestic SAF production.** With no policy support for alternatives, all Dutch production in the baseline comes from HEFA pathways. SkyNRG warns of a potential HEFA feedstock tipping point as early as 2030 (Market Outlook, 2025), though Dutch SAF producers report active efforts to expand feedstock sources and improve technology efficiency. Unlocking wider HEFA feedstocks could also strengthen EU supply resilience, reducing reliance on imports and the risk of competition if countries such as China implement their own mandates.

- **Domestic feedstock availability remains limited.** NLR projects that the Netherlands could produce roughly 930k to 1.45 million tonnes of feedstock by 2030, but the share allocated to aviation is unclear (NLR, 2021). The baseline assumes the Netherlands will remain dependent on imported feedstocks, with production concentrated in the HEFA pathway. This reflects the absence of coordinated policy measures to support other parts of the value chain, such as feedstock development and processing capacity.

- **Dutch suppliers could theoretically meet ReFuelEU sub-targets until 2035 with domestic SAF.** However, real market outcomes will be shaped by global dynamics. With companies such as Shell and Neste trading globally, the allocation of SAF within the Netherlands and EU will depend on price, willingness to pay, and the penalty costs of non-compliance under ReFuelEU. While the baseline assumes all supply is sold, historical evidence shows this was not always the case prior to the introduction of mandates (such as Neste's Annual Report in 2024, which noted that they produced 0.5 million tonnes of SAF, but only sold 0.4 million tonnes). Furthermore, as with fossil fuels, the Netherlands primarily serves the EU market via the ARA and CEPS networks, not just the national demand.

- **Infrastructure requirements are relatively modest in the baseline.** SAF production, storage, blending, and distribution require investment in supply chains and facilities, but the limited scale of Dutch production - just two plants using a single pathway - means infrastructure costs remain constrained compared with more ambitious scenarios.

- **No new Dutch policy intervention is assumed.** There are no SAF subsidies, taxes, or regulatory changes (e.g., to nitrogen rules), and therefore no associated repercussions. Without additional policy measures, second- and third-generation SAF pathways are not expected to emerge in the Netherlands under this scenario.

# Scenario 2 builds on the baseline, and Scenario 3 builds further still, illustrating how higher levels of government ambition can unlock greater economic benefits

**Scenario 2:**

- Scenario 2 is where we see some modest policy intervention to increase investment attractiveness and address some regulatory permitting challenges.
- **The second scenario includes higher SAF production, as well as the introduction of the 2G SAF pathways**. An increased number of plants in the second scenario is driven by the introduction of 2G SAF as well as the 1G SAF plants that are only at the announcement stage in the Netherlands today reaching operational stage by the 2030s (noting they are still pre-FID today). This could include plants such as SkyNRG's DSL-01 facility and Varo / Guvnor's. But, the 2G plants are notional and not based on announcements by developers.
- **Increased SAF production in the Netherlands will be facilitated by increased feedstock imports**. It is assumed the Netherlands has limited capability to increase its domestic production of feedstocks, as alluded to in NLR's Dutch feedstock assessment report (NLR, 2021). However, with ports such as the Port of Amsterdam focusing on transitioning to non-fossil based products, it is assumed the ability to import feedstocks into the Netherlands will be possible. While the Netherlands' ability to export feedstocks remains limited.
- **Dutch ability to meet ReFuelEU and export potential increases**. In the second scenario it is projected that the Netherlands can theoretically meets its ReFuelEU bio-SAF sub-target with domestic production, with limited export potential. Like the baseline scenario, the reality is that SAF is a global market not limited by borders and will largely be influenced by price. For the ReFuelEU eSAF sub-target meanwhile, it is assumed that it cannot be met with domestic production, due to there being no Netherlands-based 3G SAF plants.

**Scenario 3:**

- **Scenario 3 explores a high-production future for the Netherlands, introducing eSAF / 3G SAF.** This scenario builds on Scenario 2, assuming a strong and coordinated policy framework that supports significant expansion across the entire SAF value chain. Achieving this outcome would require substantial government intervention, addressing multiple barriers simultaneously - from feedstock development to infrastructure, permitting, and market incentives.
- **Delivering higher SAF production will demand targeted policy action and acceptance of trade-offs**. Scaling 3G SAF production will depend on the availability of key inputs such as green hydrogen and renewable electricity, both of which currently face constraints including complex permitting processes, nitrogen regulations, and grid congestion. Overcoming these barriers will be essential to enable large-scale deployment.
- **Ensuring cost competitiveness will also be critical.** Feedstock availability and price remain key cost drivers for 3G SAF production. A supportive policy environment - including measures to de-risk investment and accelerate infrastructure delivery - will be necessary to maintain competitive production costs. Given the scale of infrastructure and development required, permitting and project delivery timelines will be major determinants of the Netherlands' ability to achieve this high-production scenario.

# In the baseline, Dutch SAF production capacity exceeds national ReFuelEU demand requirements until 2030, before shifting to a reliance on imports

**DESCRIPTION**

A scenario whereby the Dutch Government **'does nothing'**, so takes **no further policy action** beyond existing measures to support the development of a domestic SAF industry. **Only Neste and Chane Terminal's already operational plants are included**. Noting both are **1G SAF (HEFA).** Other announced plants remain excluded, given their current early-stage development (pre-FID or earlier), financing uncertainties, and permitting challenges.

In the baseline scenarios, **Dutch production capacity exceeds the national ReFuelEU SAF demand until 2030** (excluding the eSAF sub-mandate), beyond this point the Netherlands is reliant on SAF imports to allow its fuel suppliers to fulfil ReFuelEU obligations. Throughout the baseline scenario the Netherlands is **fully reliant on imports to fulfil the eSAF sub-mandate,** hence import levels are described as 'high' in the scenario matrix.

**KEY ASSUMPTIONS**

- **Policy**: ReFuelEU SAF met as at a minimum, to avoid the cost of non-compliance.
- **Production**: Includes two 1G SAF plants that are already operational as of 2025.
- **Investment**: Limited investor appetite due to policy uncertainty; early-stage projects remain unable to secure financing.
- **Trade**: Import logistics rely on existing port and distribution infrastructure.

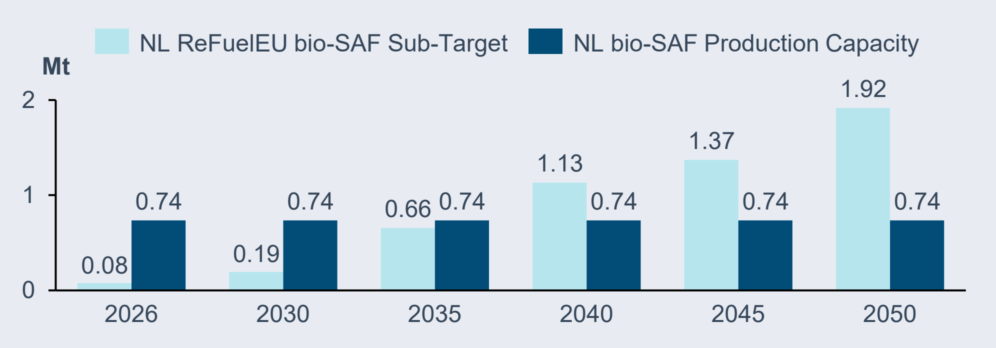
**TRADE OFFS**

**LOW**

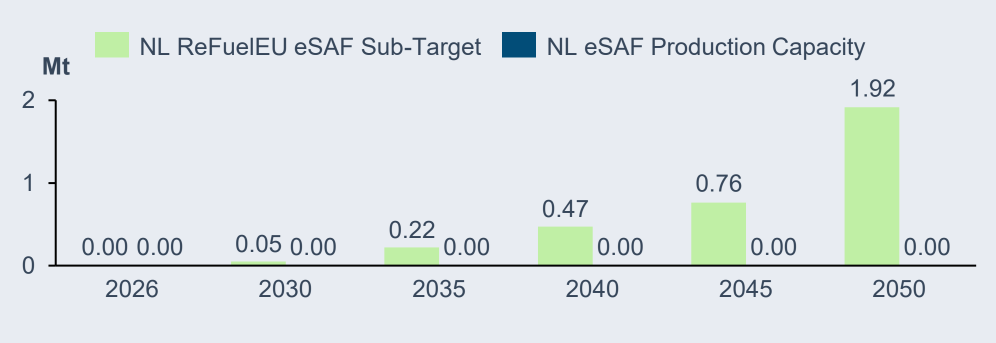
- Limited policy trade offs as the Dutch Government 'does nothing', so no interventions required, with limited negative repercussions to be addressed.
- Lack of support from Dutch government means investors likely look at alternative locations for SAF production.

**NL SAF TRAJECTORY**

**NL BIO-SAF**



**NL eSAF**



**TARGETS/MANDATE**

| | | | | |
|---|---|---|---|---|
| ✓ | ✓ | ✗ | ✗ | ✗ |
| NL SAF Voluntary Target by 2030 | NL ReFuelEU SAF Mandate by 2030 | NL ReFuelEU SAF Mandate by 2050 | NL ReFuelEU eSAF Mandate by 2032 | NL ReFuelEU eSAF Mandate by 2050 |

# Scenario 2 reflects a moderate level of government intervention aimed at stimulating domestic 2G SAF production and strengthening supply resilience

**DESCRIPTION**

The **medium domestic SAF production scenario** is where the Dutch Government introduces a **moderate level of policy intervention** to **stimulate domestic 2G SAF production.** In addition to the baseline facilities, a new 2G SAF production facility is introduced in the 2040s. The addition of increased capacity allows for the Netherlands to meet its ReFuelEU SAF target entirely with domestic SAF production until 2050, with some opportunity for export throughout – providing the Netherlands with further opportunities as a result. The new 2G SAF plant is enabled by **improved access to investment** and **smoother permitting processes**.

Throughout the medium domestic SAF production scenario, the Netherlands **remains fully reliant on imports of 3G to fulfil the eSAF sub-mandate**.

**KEY ASSUMPTIONS**

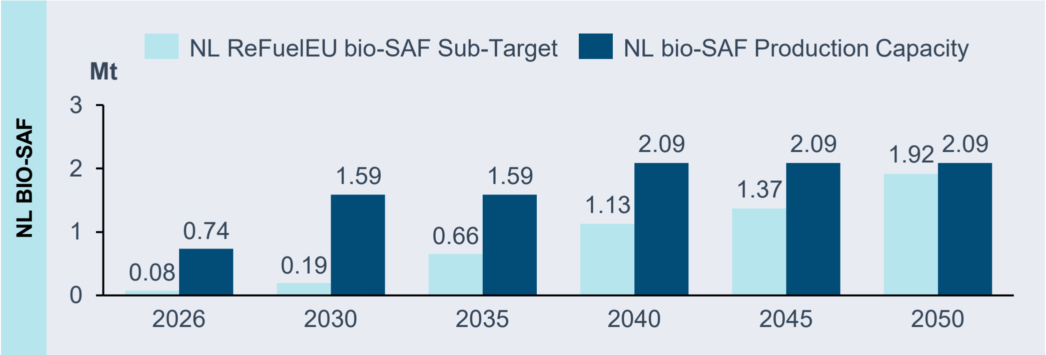
- **Policy**: ReFuelEU SAF met as at a minimum, to avoid the cost of non-compliance.
- **Production:** Includes four 1G SAF plants (accounting for plants already operational and announced, plus those with expansion plant). In addition to that, a new 2G SAF plant introduced in 2040, following the 2030 HEFA tipping point reported by SkyNRG. Imports of feedstock assumed will be strongly relied on to support 2G SAF production.

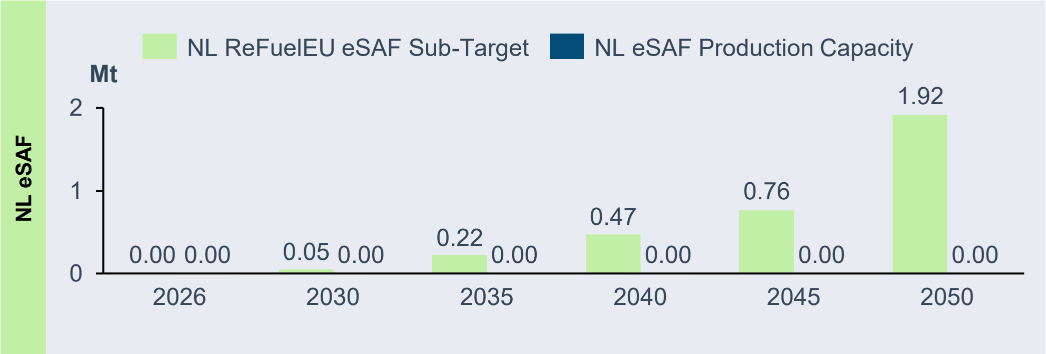
**TRADE OFFS**

**MEDIUM**

- Certain policies to be implemented / changed in the Netherlands to allow for the introduction of the new SAF plants. Noting existing policies have been introduced to protect land, such as those associated with nitrogen.

**NL SAF TRAJECTORY**





**TARGETS/MANDATE**

✓ NL SAF Voluntary Target by 2030

✓ NL ReFuelEU SAF Mandate by 2030

✓ NL ReFuelEU SAF Mandate by 2050

✗ NL ReFuelEU eSAF Mandate by 2032

✗ NL ReFuelEU eSAF Mandate by 2050

# Scenario 3 reflects a strong and coordinated policy framework that positions the Netherlands as a leading, attractive destination for significant SAF investment

**DESCRIPTION**

In this scenario the Dutch Government implements a **strong and coordinated policy framework**, making the Netherlands an **attractive location for SAF investment**. **Permitting is less of a significant barrier**, and **new developers announce 3G SAF plants**, with **capacity to align with the rising ReFuelEU targets** in the 2030s (until the eSAF mandate significantly scales in the 2040s).

**Production includes a diversified mix of pathways**, where the addition of new plants could include those such as Power2X and Metafuels / Evos' announced 3G plants. While the surplus of domestic SAF production provides the Netherlands with an opportunity to export, the potential has been described as 'medium' in the dimensions to reflect a somewhat conservative view.

**KEY ASSUMPTIONS**

- **Policy**: ReFuelEU SAF met as at a minimum, to avoid the cost of non-compliance. Furthermore, necessary policy barriers are addressed by the Dutch Government.
- **Production:** Includes four 1G SAF plants (accounting for plants already operational and announced, plus those with expansion plans). In addition to, a new 2G SAF as well as two 3G SAF plants.
- **Technology:** Methanol-to-Jet (MtJ) production pathway gets approved.

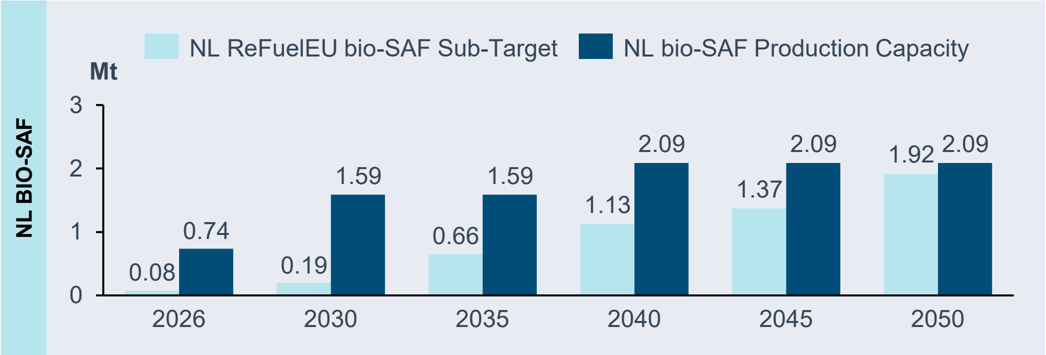
**TRADE OFFS**

**HIGH**

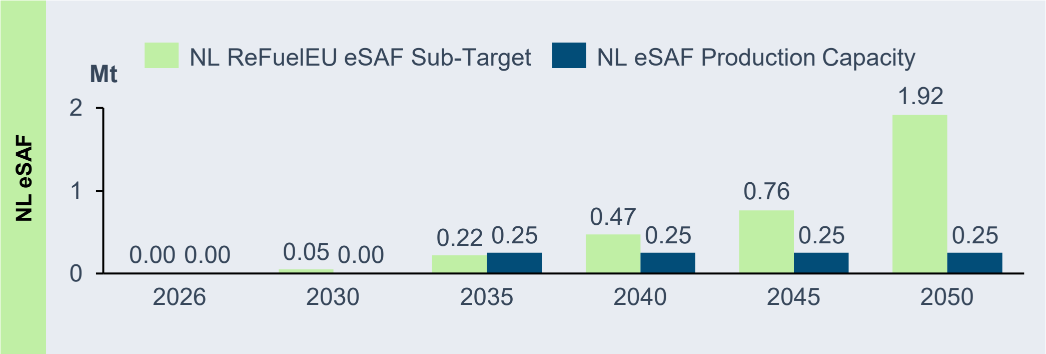
- Multiple policies to be implemented / changed in the Netherlands to allow for plants with a diversified pathway mix. Noting existing barriers to developing new infrastructure, such as grid congestion, nitrogen laws and permitting processes, would likely need to be addressed via policy.
- Meanwhile a subsidy-like policy may be required to ensure the competitive pricing of SAF, especially 3G SAF.

**NL SAF TRAJECTORY**

**NL BIO-SAF**



**NL eSAF**

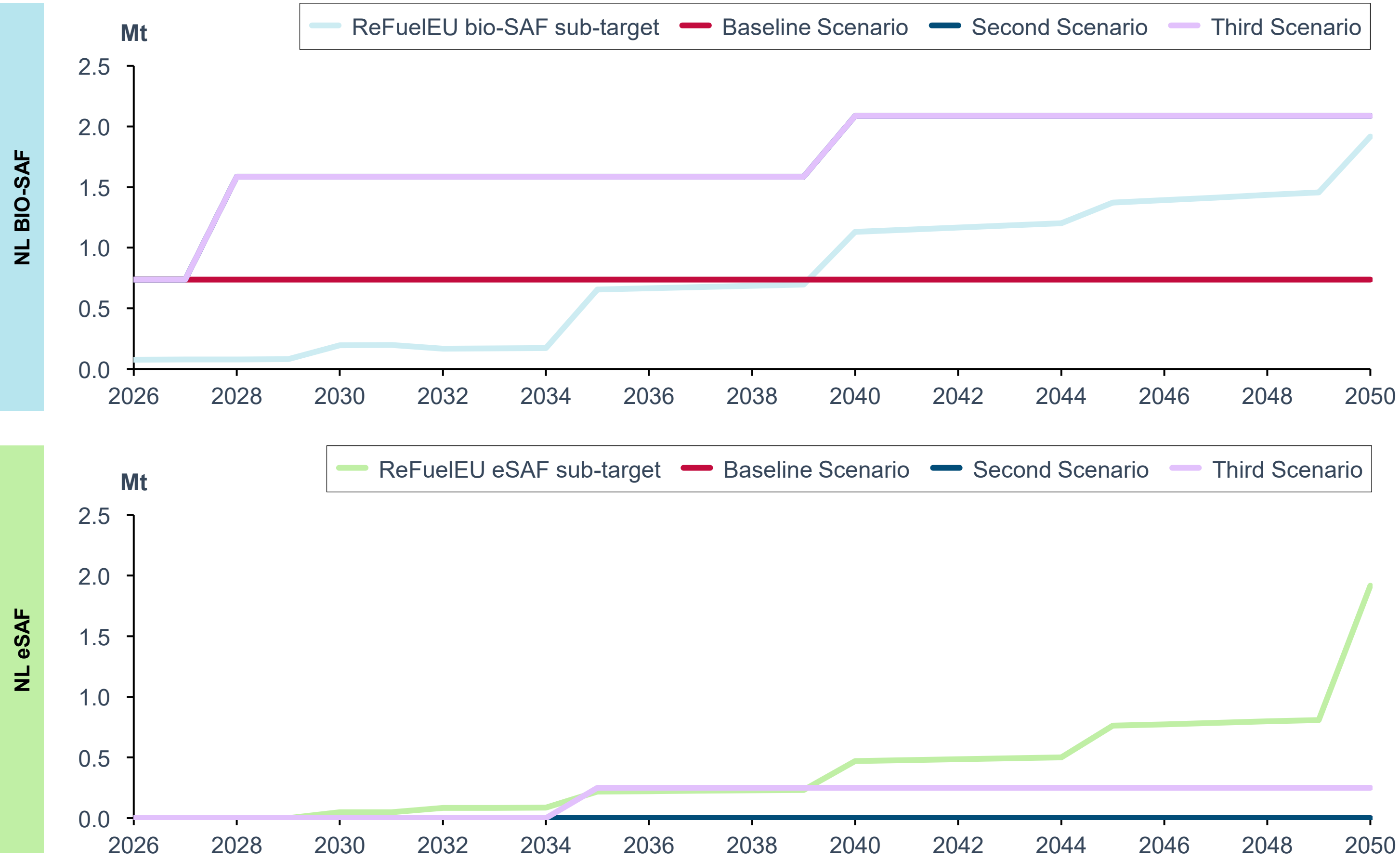


**TARGETS/MANDATE**

| ✓ | ✓ | ✓ | ✓ | ✗ |
|---|---|---|---|---|
| NL SAF Voluntary Target by 2030 | NL ReFuelEU SAF Mandate by 2030 | NL ReFuelEU SAF Mandate by 2050 | NL ReFuelEU eSAF Mandate by 2032 | NL ReFuelEU eSAF Mandate by 2050 |

# To illustrate how these trajectories diverge, the scenarios are compared by plotting projected domestic SAF production against the Netherlands' ReFuelEU volumes

**Projected Dutch maximum SAF plant production (based on nameplate capacity) across the three scenarios compared against the Netherlands' ReFuelEU mandated volumes:**



**Key takeaways:**

- **SAF operates in a global market that transcends national borders:** As such, any assessment of how the Netherlands might meet its ReFuelEU obligations is inherently theoretical, and we base an assumption on the fact domestic plants operate at their full nameplate capacity. In reality, outcomes will depend on market dynamics - including price movements, evolving global demand, and operational efficiencies at production facilities.
- **ReFuelEU bio-SAF sub-target – achievable under baseline conditions**: In the baseline scenario, the Netherlands is projected to be able to meet its ReFuelEU bio-SAF sub-target with domestic production until the late 2030s. This reflects the scale of existing facilities. Under the medium and high scenarios, domestic SAF production exceeds ReFuelEU requirements, creating potential for export to other markets.
- **ReFuelEU eSAF sub-target – unmet without imports**: The eSAF sub-target cannot be achieved domestically in either the baseline or medium scenarios. In the high scenario, planned 3G projects coming online in the 2030s enable the Netherlands to temporarily meet its eSAF obligations with domestic production, though only for a limited period before the mandated target increases significantly.

# 04

# Economic Impact Assessment

# **Economic Impact Assessment:** Chapter purpose

This chapter sets out to quantify the economic value of the scenarios for SAF developed in the preceding chapter. Accelerating the scale-up of the SAF sector represents an economic opportunity for the Netherlands, and this chapter forms the analytical core of the study through assessment of a wide range of economic benefits that the growth of the domestic SAF industry could generate. Using an Input-Output-based Economic Impact Assessment (EIA) framework, we estimate Direct, Indirect, and Induced Economic Impacts - expressed in terms of Gross Value Added (GVA) and Full Time Equivalents (FTEs) – on an annual basis to 2050.

This chapter defines the approach and methodology undertaken, and the key considerations when interpreting the results. Key findings are presented alongside more detailed analysis of distinct parts of the SAF value chain: SAF production, feedstock production and intermediary activity.

While our assessment is undertaken on a gross basis, we also recognise the importance of understanding the relative economic value of SAF in comparison to existing fossil fuel activities. Accordingly, we contextualise our findings by comparing projected SAF impacts with the existing economic footprint of the jet fuel sector.

Beyond quantitative indicators, the chapter incorporates the wider economic impacts associated with SAF deployment. This includes potential benefits around strategic autonomy, R&D spillovers, downstream opportunities and exports, and global competitiveness.

# This Economic Impact Assessment provides a strategic-level projection of the gross economic impact of the SAF sector across each of the three scenarios

Understanding the potential economic impact of SAF activity in the NL is complex and **subject to considerable uncertainty**. Factors such as energy and fuel market dynamics, global and EU policy landscapes, SAF and feedstock technological advancements, and the geo-political landscape all interact to shape market outcomes. Whilst three scenarios have been developed to manage this uncertainty and articulate three potential pathways, care should be taken when interpreting the results of the Economic Impact Assessment of these scenarios and the below **analytical considerations recognised.**

Based on these factors, the results of this EIA are robust at an order of magnitude level and should be used to **inform the overall potential market opportunity** and guide the level of ambition in policymaking. The assessment focuses on quantifying the value of SAF production, providing an indicative valuation of feedstock, transport and logistics, rather than estimating all possible impacts. There are additional benefits, such as wider economic impacts, downstream impacts and energy security, that are challenging to quantify, and these have been considered qualitatively. Should more SAF facilities become operational and related activities become more developed, an **updated Economic Impact Assessment** should be undertaken to reflect the more accurate and updated data.

| | |
|---|---|
| **Limited data availability** | ▪ The SAF market is still in its early stages of development, **publicly available data is limited**, and the most pertinent information remains proprietary to private businesses. Whilst interviews with these businesses have helped to fill some of these data gaps, a **number remain** – such as feedstock collection and SAF transportation employment figures.<br>▪ The data inputs for this EIA therefore necessarily draw on a range of existing data sources and subject matter expertise, and rely on a number of assumptions or benchmarked estimates where robust publicly available or proprietary data is unavailable. Wherever possible, these assumptions were formed by aggregating, averaging or otherwise translating multiple data sources rather than relying on a single piece of input data. |
| **Varying maturity of SAF technology pathways and feedstock varieties** | ▪ The **SAF value chain is diverse and complex**, covering a wide range of production pathways and feedstock varieties. This means that analysis identifying economic impacts for one feedstock variety (such as HEFA where there is stronger data availability) cannot be simply applied to other feedstock varieties which are at a lower stage of maturity (such as e-SAF).<br>▪ Whilst we have developed bespoke analysis of the economic impact of SAF production and feedstock production to 1G, 2G and 3G segments, it should be recognised that the analysis of proven 1G technologies such as HEFA is more robust than analysis of less mature 2G and 3G technologies. |
| **Isolating the attribution to SAF of joint facilities and infrastructure** | ▪ The development of SAF production facilities is **heavily intertwined with production facilities for other use cases** in adjacent sectors. For example, a SAF plant may deliver increased capacity of both SAF and renewable diesel. In some circumstances, SAF production uses the same co-processing and blending facilities as for other petroleum feedstocks such as crude oil. Equally, the storage, logistics and transportation infrastructure to deliver feedstock to blending facilities and to deliver blended SAF to end customers shares a range of infrastructure with the jet fuel sector.<br>▪ This makes it **challenging to disentangle and isolate the additional value SAF provides**. In these circumstances, in our analysis we have sought to “isolate” the SAF employment and value-added by taking proportions of the overall economic impact informed by evidence. It should be recognised that these estimations hold a **high-level of uncertainty**. The wider synergies with other industrial sectors and an analysis of the potential interactions between the SAF sector and existing jet fuel industry in the NL is also addressed qualitatively within the EIA. |

# Our EIA Methodology covers Direct, Indirect, Induced and Wider Impacts

Our EIA methodology uses **Input-Output based economic analysis** to quantify the impacts from development of the SAF industry in the Netherlands. Our approach considers the following impacts:

Captured Quantitatively

Captured Qualitatively

## 1 Direct Impacts

**Direct impacts** refers to the additional economic activity generated by SAF production, underlying feedstock production and the transport and storage of SAF products. We:

- Analyse data to estimate the number of FTEs associated with **a typical SAF plant** of a specific size – both in **construction** and **operation.**
- Approximate how **FTEs may change** over increased levels of production. Use **GVA per employee** from CBS to translate FTE into GVA.
- Apply scenario **projections for NL SAF production and facility construction** up to 2050 to forecast annual FTEs.
- Repeat for **NL SAF feedstock and logistics industries** to assess the economic impact of SAF feedstock producers and intermediaries.

## 2 Indirect Impacts

**Indirect impacts** refer to the additional economic activity this leads to in the supply chain. We:

- **Estimate Type I Multipliers through** analysis of CBS Input-Output Tables.
- **Triangulate this against** existing EIAs, adjacent sector EIAs, and international Input-Output databases (Belgium, Denmark, UK and Scotland).

## 3 Induced Impacts

**Induced impacts** refer to the ripple effects from higher spending across the broader economy. We:

- **Construct Type II GVA and Employment Multipliers** through applying benchmarked Type I – Type II ratios to Type I Multiplier from Stage 2.
- **Benchmark data** sourced from existing SAF EIAs, adjacent sector EIAs, and international Input-Output databases.

## 4 Wider Impacts

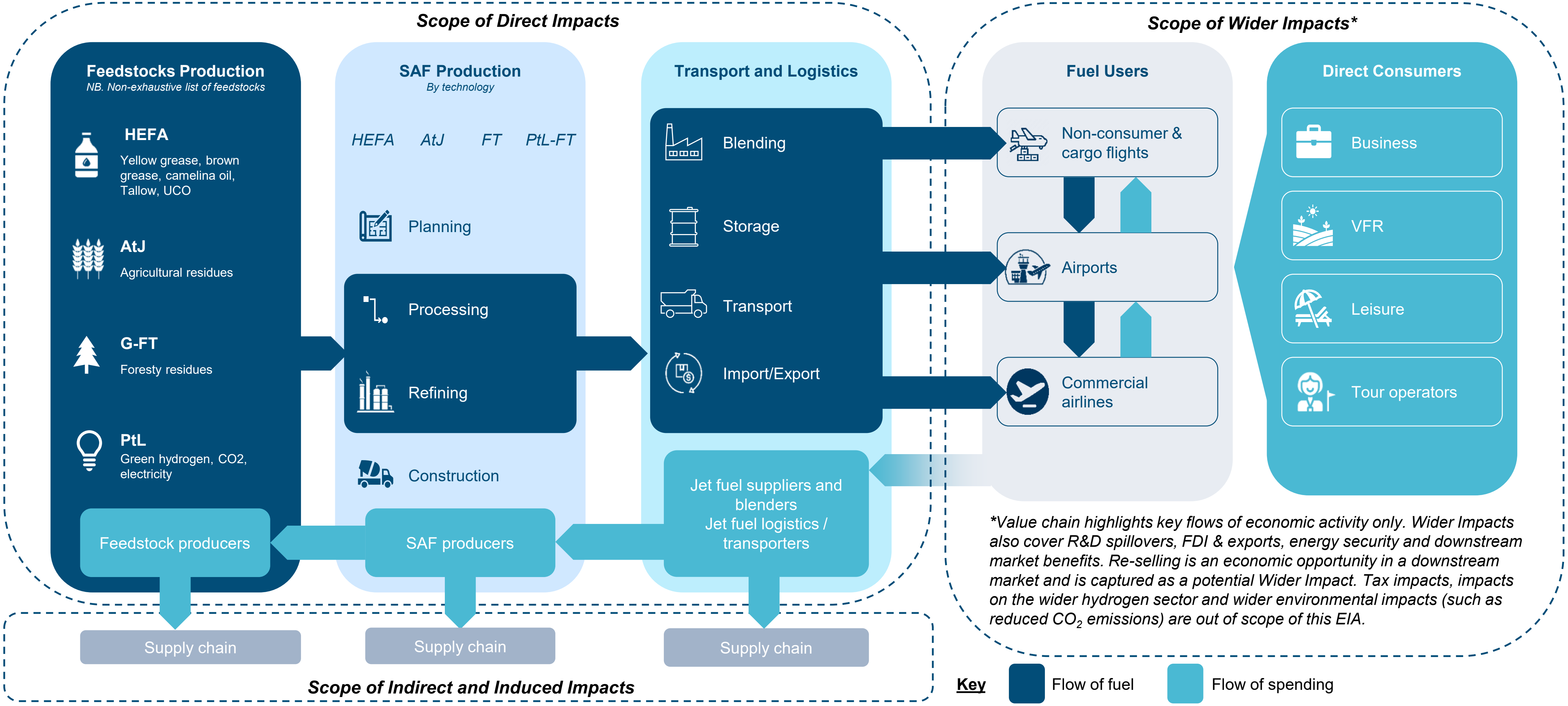
**Wider impacts** refers to the positive knock-on impacts for downstream markets and potential opportunities for additional R&D, FDI and exports.

- Identify **potential wider impacts** through interviews and desk-based research and conduct **illustrative qualitative case studies.**

Estimate impacts for **each scenario** (x3)

Compare to economic footprint of **jet fuel industry**

# The scope of the Direct, Indirect and Induced Impacts focuses on SAF production, feedstock supply and storage and transportation



*Scope of Direct Impacts*

**Feedstocks Production**
*NB. Non-exhaustive list of feedstocks*

**HEFA**
Yellow grease, brown grease, camelina oil, Tallow, UCO

**AtJ**
Agricultural residues

**G-FT**
Foresty residues

**PtL**
Green hydrogen, CO2, electricity

Feedstock producers

**SAF Production**
*By technology*

*HEFA* *AtJ* *FT* *PtL-FT*

Planning

Processing

Refining

Construction

SAF producers

**Transport and Logistics**

Blending

Storage

Transport

Import/Export

Jet fuel suppliers and blenders
Jet fuel logistics / transporters

Supply chain

Supply chain

Supply chain

*Scope of Indirect and Induced Impacts*

*Scope of Wider Impacts**

**Fuel Users**

Non-consumer & cargo flights

Airports

Commercial airlines

**Direct Consumers**

Business

VFR

Leisure

Tour operators

**Value chain highlights key flows of economic activity only. Wider Impacts also cover R&D spillovers, FDI & exports, energy security and downstream market benefits. Re-selling is an economic opportunity in a downstream market and is captured as a potential Wider Impact. Tax impacts, impacts on the wider hydrogen sector and wider environmental impacts (such as reduced $CO_2$ emissions) are out of scope of this EIA.*

**Key** ■ Flow of fuel ■ Flow of spending

*Source: PA Consulting EIA Framework*

# The EIA draws on a wide range of data sources – where possible, data from the Netherlands and existing SAF facilities has been prioritised

The following table outlines the key data sources used in this EIA. Where possible, we have **prioritised data from the Netherlands and existing operational SAF facilities**. However, limited availability of data has necessitated using a wide range of data points from outside the Netherlands and from tangential industries where relevant. Insights from stakeholder interviews have also informed the EIA.

| Model Area | Data Sources | How it is used in the EIA model |
|---|---|---|
| **Jet Fuel Demand** | PA estimate informed by: Research on infrastructure for sustainable aviation fuels - MinI&W (2024); Air Passenger Demand Forecast - IATA (2025); Environmental Trends in Aviation - ICAO (2022) | Used to project NL SAF demand which informs imports/exports and storage and transport activity associated with this. |
| **SAF Feedstock Production** | Feedstocks for sustainable aviation fuels in the Netherland - NLR (2020); SAF Market Outlook - SkyNRG (2024); Chane data; Amsterdam Biodiesel (2010); Attero (2024); AEB Amsterdam (2024); Quatra; Technip Energies (2024); SAF Occupation Opportunities - Rhodium Group (2023); Power2X data; CBS | Used to estimate domestic feedstock production in the NL. The difference between domestic feedstock and feedstock required for domestic production is assumed to be imported. |
| **SAF Production Plants** | Sustainable Aviation Fuel for the Future - Iowa RFA (2024); SkyNRG data; Neste data; Power2X data; Spain: Study on the impacts related to the ecological transition in the aviation sector - PwC (2023); SAF Occupation Opportunities - Rhodium Group (2023) | Used to estimate NL SAF production. It is assumed that SAF production is first consumed domestically with all excess exported and sold at the prevailing market price. |
| **SAF Storage and Transport** | Economic impact of biodiesel on the US economy - GlobalData (2024); VOTOB; FETSA | Used to estimate imports and exports of feedstock and SAF based on domestic consumption and informs calculation of associated SAF storage and transport employment. |
| **Type I and II Multipliers** | NL CBS Input-Output Tables (2023); Denmark Multiplier Tables (2019); Belgium Multiplier Tables (2020); Scotland Multiplier Tables (2021); UK Multiplier Tables (2019); benchmarked against similar studies/industries | Used to estimate Indirect and Induced impacts of SAF activity that is catalysed by Direct Impacts. |

*NB. Figures are reported on an aggregated and anonymised basis so individual facilities cannot be identified.*
*Data sources have been used to inform a generalised and simplified economic model of a SAF plant and associated operations.*

# **Executive Summary**: The economic impact of SAF growth varies significantly across the three scenarios

## SAF has the potential to provide >139,000 FTEs and c.€20bn of Gross Value Added (GVA) in the NL cumulatively over 2025-50

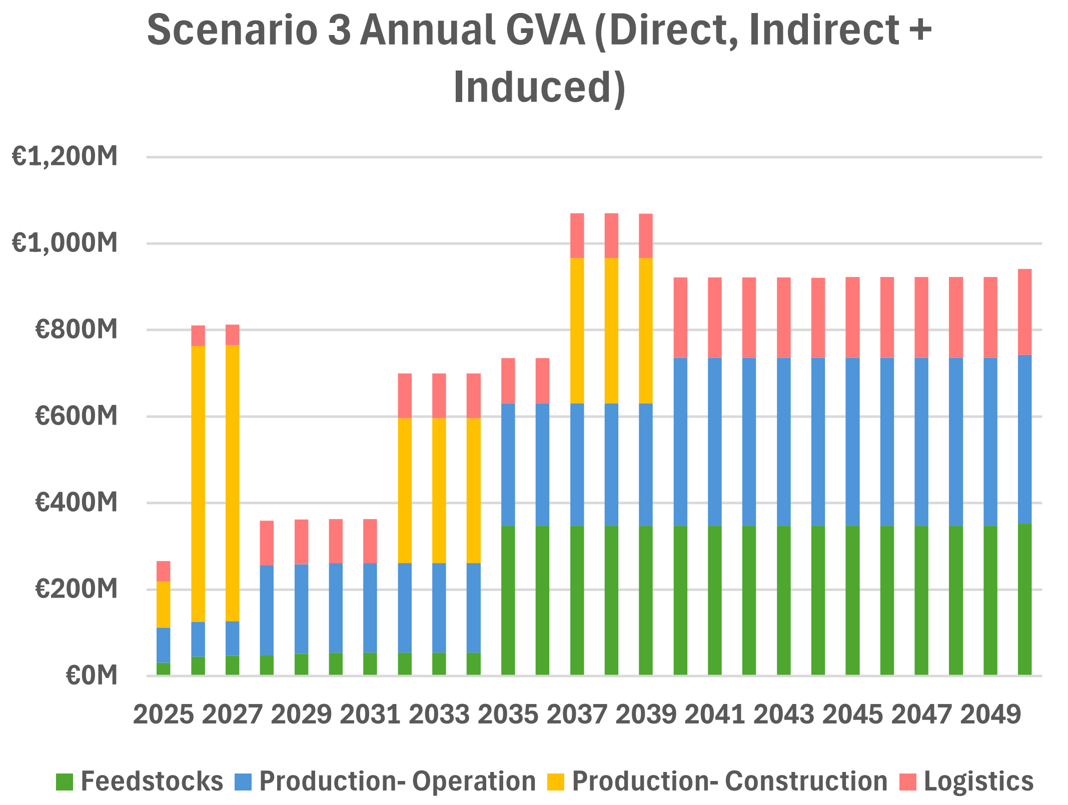
The gross **economic impact of SAF ranges considerably** across the scenarios. Considering Direct, Indirect and Induced Impacts together, Scenario 1 sees SAF deliver roughly 1,700 FTEs and €239m GVA annually by 2050. Scenario 2 would see this economic impact expand to c.4,800 FTEs and €564m GVA per year by 2050. Scenario 3 could see SAF contribute nearly €1bn of GVA annually by 2050, equating to 6,500 FTEs per annum – equivalent to c.25-30% of the economic footprint of the NL refining sector today highlighting the large potential economic value.

**Cumulatively from 2025 to 2050**, in Scenario 3 where the NL implements a strong and coordinated policy framework to support SAF, the industry has the potential to deliver over **139,000 FTEs and roughly €20bn in GVA** over this period (including Direct, Indirect and Induced Impacts). If the de-industrialisation of the refining sector across the EU continues, SAF may provide a home for jobs that would otherwise be lost from the NL refining sector.

The **biggest contributor to GVA is SAF production facilities** (see right). This comes through both (i) the construction of new SAF production plants which provides a significant short-term boost and (ii) the ongoing operation of these facilities which sustains the economic impact over the longer-term. The NL is generally expected to **rely on feedstock imports** – the only sizeable economic opportunity from domestic feedstocks is in Scenario 3 where jobs are created in the supply chain to provide electricity into e-SAF facilities. The economic impact of SAF **storage, logistics and transportation** is relatively low given the usage of existing infrastructure.

Beyond the quantified impacts, it is important to recognise the broader benefits that SAF growth could bring, including greater **strategic autonomy, R&D spillovers and improved exports and global competitiveness.**

These results are of a **similar order of magnitude as studies in other countries**. For example, the US SAF industry could support c.650,000 FTE and c.$61bn of GVA over a 25-year period.[1] In Spain, SAF could provide an estimated c.270,000 FTE and c.€43bn of GVA cumulatively.[2] The lower overall economic impact for the NL may relate to the lower size of the NL economy and the more constrained domestic feedstock opportunity.



*All monetised values in this report are quoted at 2024 prices, undiscounted*

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[1] *Sustainable Aviation Fuel for the Future, 2024, Iowa RFA*

[2] *Spain: Study on the impacts related to the ecological transition in the aviation sector, PwC*

# In Scenario 3, SAF could deliver a total 6,500 FTEs annually by 2050, and could become a c.€1bn sector in the Netherlands

| | *Per Annum* | 2030 | 2035 | 2040 | 2045 | 2050 | Non-monetised Impacts | |
|---|---|---|---|---|---|---|---|---|
| **Scenario 1** | **Total FTE** | **1,424** | **1,406** | **1,487** | **1,552** | **1,791** | Strategic Autonomy | Low |
| | Direct | 408 | 393 | 427 | 456 | 567 | | |
| | Indirect | 588 | 591 | 604 | 615 | 657 | R&D Spillovers | Low |
| | Induced | 428 | 423 | 455 | 481 | 567 | | |
| | **Total GVA (Mil)** | **€ 181** | **€ 175** | **€ 188** | **€ 199** | **€ 239** | Downstream Markets | Low |
| | Direct | € 113 | € 110 | € 116 | € 121 | € 140 | | |
| | Indirect | € 40 | € 38 | € 42 | € 46 | € 58 | Global Competitiveness | Low |
| | Induced | € 28 | € 27 | € 30 | € 32 | € 41 | | |
| **Scenario 2** | **Total FTE** | **3,067** | **3,049** | **4,662** | **4,677** | **4,804** | Strategic Autonomy | Low |
| | Direct | 741 | 725 | 1,097 | 1,100 | 1,152 | | |
| | Indirect | 1,403 | 1,409 | 2,160 | 2,171 | 2,225 | R&D Spillovers | Medium |
| | Induced | 924 | 915 | 1,405 | 1,407 | 1,428 | | |
| | **Total GVA (Mil)** | **€ 363** | **€ 357** | **€ 545** | **€ 546** | **€ 564** | Downstream Markets | Medium |
| | Direct | € 236 | € 233 | € 352 | € 353 | € 362 | | |
| | Indirect | € 76 | € 74 | € 116 | € 116 | € 121 | Global Competitiveness | Medium |
| | Induced | € 51 | € 49 | € 77 | € 77 | € 81 | | |
| **Scenario 3** | **Total FTE** | **3,067** | **4,803** | **6,412** | **6,427** | **6,555** | Strategic Autonomy | Medium |
| | Direct | 741 | 1,147 | 1,517 | 1,520 | 1,572 | | |
| | Indirect | 1,403 | 2,229 | 2,979 | 2,990 | 3,044 | R&D Spillovers | High |
| | Induced | 924 | 1,428 | 1,916 | 1,918 | 1,939 | | |
| | **Total GVA (Mil)** | **€ 363** | **€ 735** | **€ 922** | **€ 923** | **€ 941** | Downstream Markets | High |
| | Direct | € 236 | € 465 | € 584 | € 585 | € 593 | | |
| | Indirect | € 76 | € 165 | € 206 | € 207 | € 212 | Global Competitiveness | High |
| | Induced | € 51 | € 104 | € 132 | € 132 | € 136 | | |

## FTE & GVA

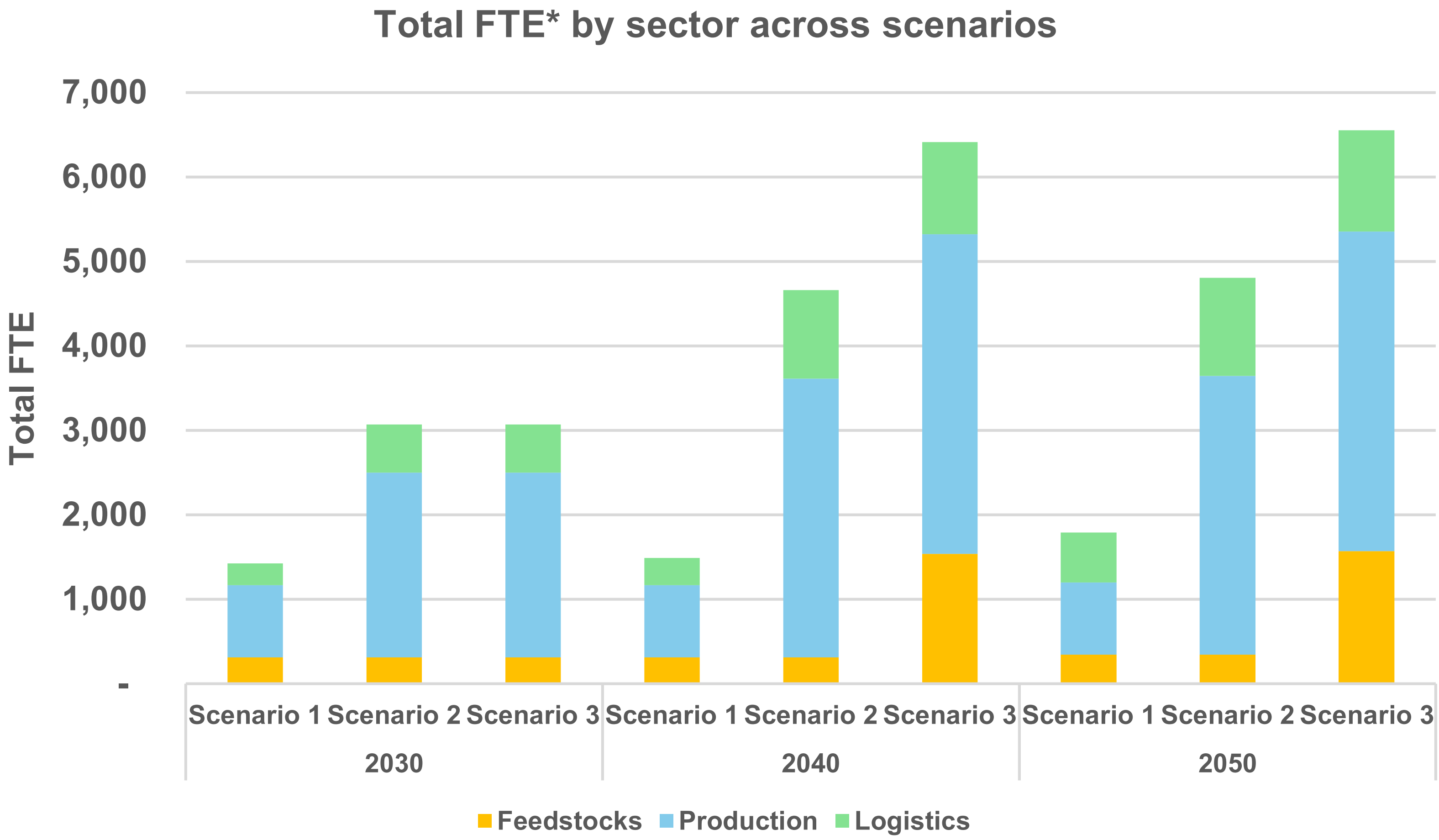
- In Scenario 1, **no new SAF facilities are built** and the jobs associated with existing SAF and feedstock facilities remain relatively small scale. The only growth in FTE and GVA comes from the required increases in imports of SAF to meet ReFuelEU.
- In comparison to Scenario 1, Scenario 2 sees **nearly twice the number of jobs**, primarily from production activity, given 1G and 2G feedstock capacity still remains limited. Much of the increase in GVA comes in the period prior to 2040 when production ramps up, reflecting **limited opportunities for long-term growth** once these plants are operational.
- Scenario 3 reflects the potential for **longer-term value to be derived from electricity generation** for the 3G pathway alongside the short-term growth from 1G and 2G production expansion. The SAF industry is nearly a **€1bn industry by 2050**.

*Note: We present the results of sensitivity testing in the appendix*

# Whilst the number of jobs provided by SAF is relatively modest in terms of the overall NL economy, these are highly productive and deliver large multiplier effects

## EMPLOYMENT

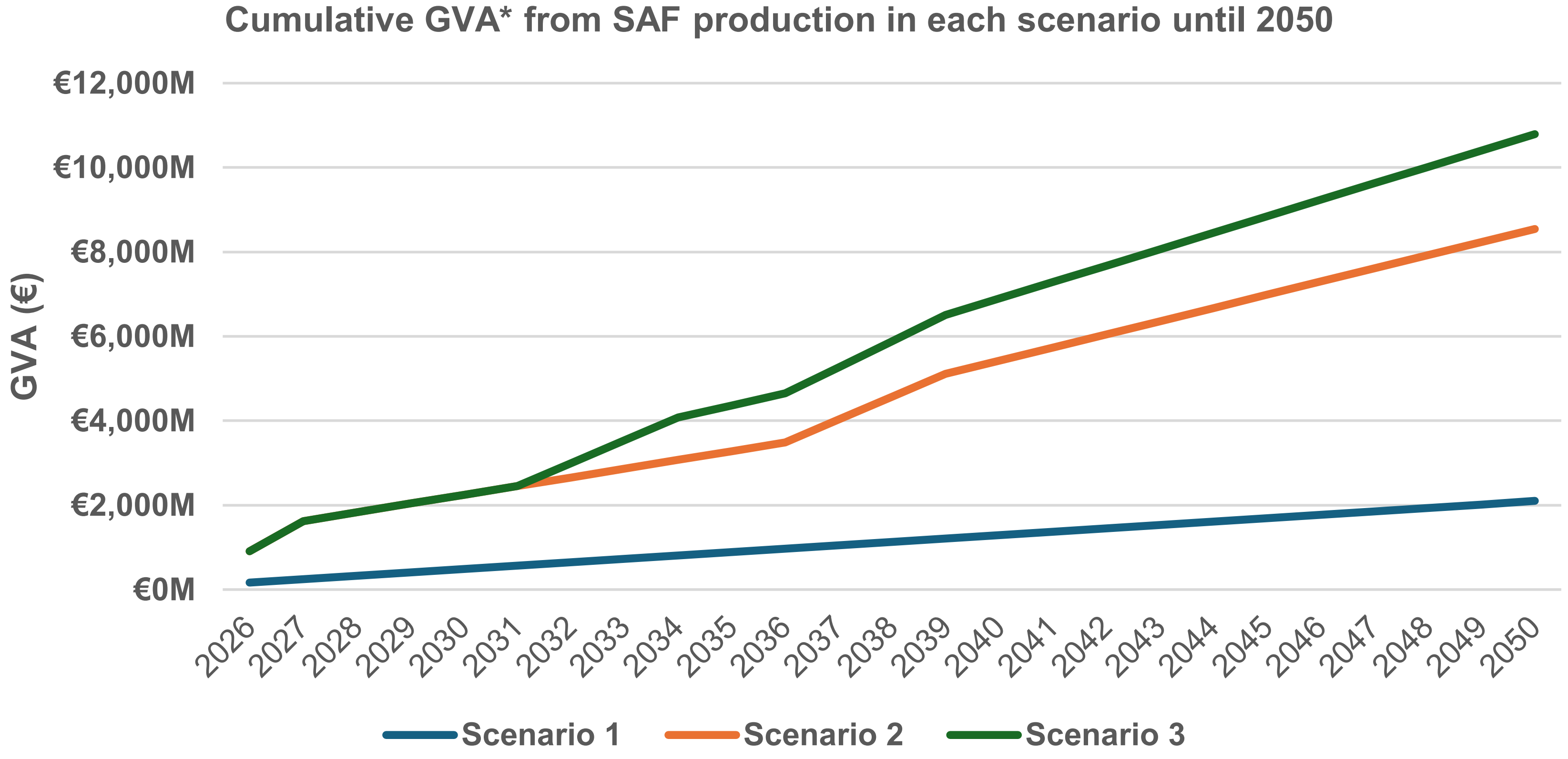
- The **jobs associated with SAF are well-compensated and highly productive**, with high levels of GVA per worker. Average GVA per SAF employee is **up to 2x higher than for the average Dutch worker** reflecting the higher productivity of SAF workers and higher levels of value-added produced in the industrial sector. Their relative economic contribution is therefore significant.
- The average Indirect Multiplier across SAF activities is 1.58, meaning **for every €1 of output produced by the SAF sector, another €1.58 is created in the supply chain**. For key parts of the value chain, such as SAF storage, the multiplier is larger, reflecting the significant domestic presence of logistics companies in the supply chain.
- The limited development of the SAF industry in the Baseline constrains employment to 1,000-2,000 FTEs per annum, to keep existing plants operational and import HEFA-based feedstocks.
- Higher employment in Scenarios 2 and 3 is **driven by additional SAF production**.
- Scenario 3 benefits from additional jobs associated with **domestic electricity generation** for the 3G pathway. This represents the only scenario which delivers a significant employment opportunity from **domestic feedstock production.**



** FTE in this graph relates to operational workers only – no construction workers are included. FTEs include Direct, Indirect and Induced FTEs.*

# GVA from SAF production is delivered in the short-term through construction of new SAF plants, and in the longer-term through ongoing annual production volumes

Cumulative GVA* from SAF production in each scenario until 2050



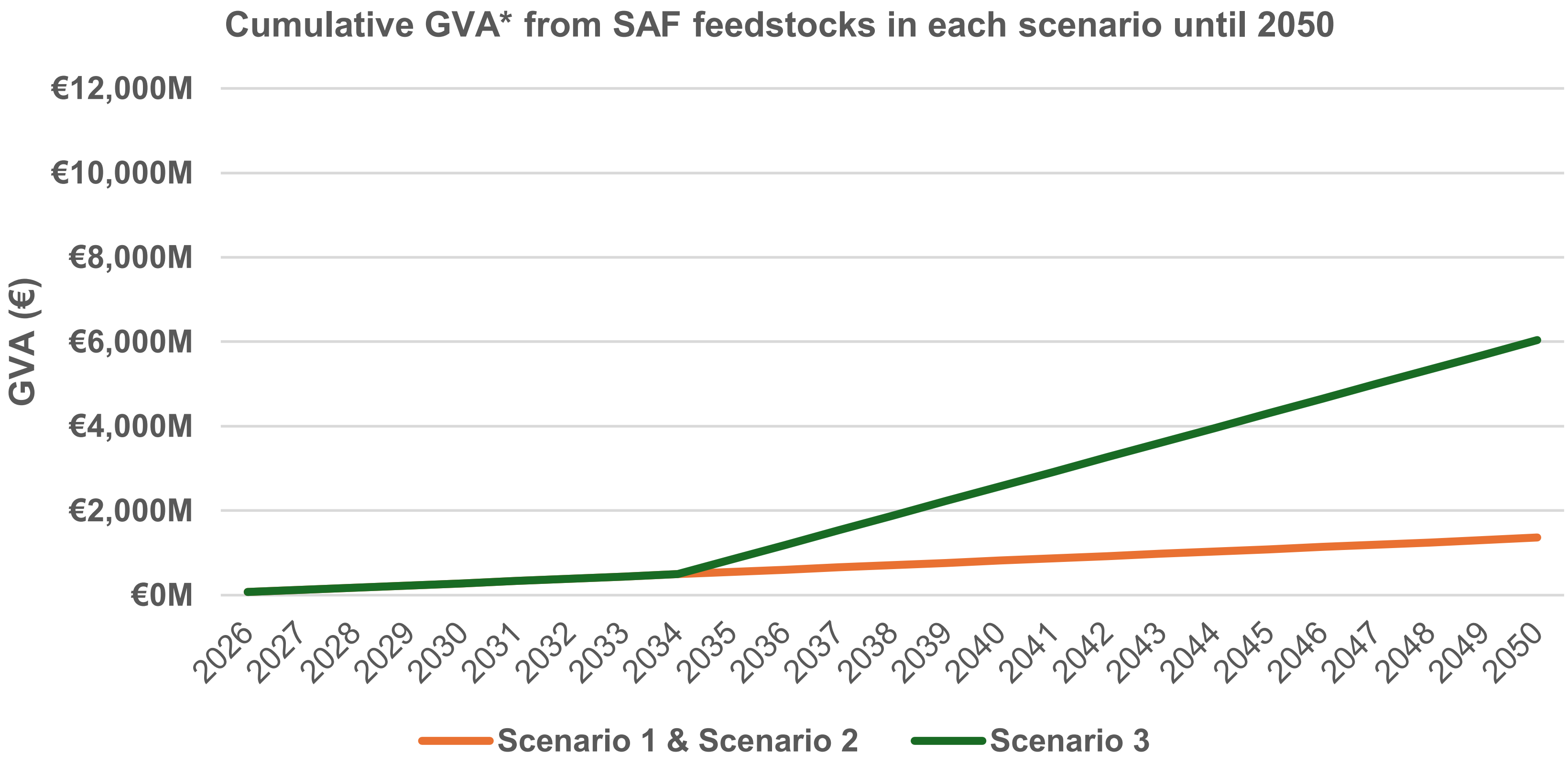
** Includes Direct, Indirect and Induced GVA*

*** Includes construction GVA*

## SAF PRODUCTION

- **Construction activity provides a short-term boost to GVA** over the three-year period during which SAF facilities are built.
- This is followed by a relatively constant annual increase in GVA reflecting **the operational production activities** to deliver the new annual levels of expected SAF output.
- In Scenario 1, the reliance of SAF production on the two existing 1G plants means there is no increase in annual GVA beyond current levels, resulting in **limited economic impact**.
- The increase in cumulative GVA in 2026-27 in Scenarios 2 and 3 reflects the construction of two additional 1G plants and expansion of an existing 1G plant, delivering an additional 850kT of SAF.
- Once operational, the employment of new workers to operate the new plants leads to **higher annual GVA contributions than Scenario 1**.
- There is no further increase in SAF capacity in Scenario 2 until the introduction of a 500kT 2G plant in 2040, for which construction is assumed to start in 2037. **This additional SAF pathway drives a significant increase in annual GVA compared to the Baseline Scenario.**
- Scenario 3 builds on Scenario 2 by also assuming a 250k 3G plant begins operations in 2035, with construction beginning in 2031. **This accelerates the economic impact compared to the other scenarios**.

# GVA from feedstock production is constrained in Scenarios 1 and 2 – in Scenario 3 electricity production delivers a significant impact



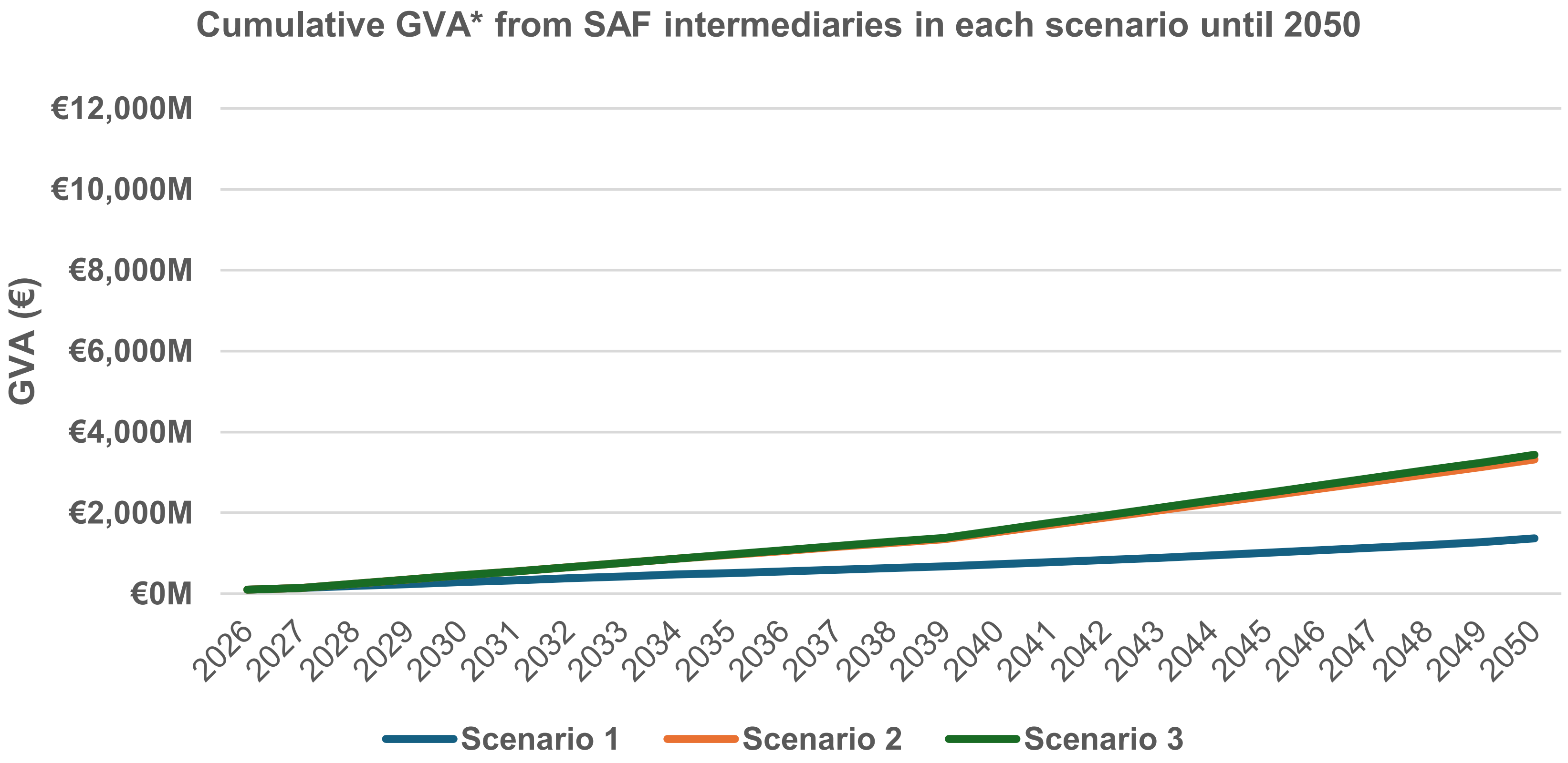
** Includes Direct, Indirect and Induced GVA*

*Note: Scenario 1 and 2 share the same line. This chart captures SAF feedstock production only – the economic Impact associated with the import of feedstocks is captured in logistics segment (see next slide).*

## SAF FEEDSTOCKS

- Across all scenarios, **limited potential for domestic production of feedstocks is observed.**
- In Scenarios 1 and 2, domestic SAF feedstock capacity does not grow beyond 2030. In these scenarios, the feedstocks are **recycled waste products and so do not drive any additional economic impact** aside from the activities required to collect and transport these.
- The increase in SAF production seen in these scenarios relies on feedstocks being imported and so **there is significant leakage of economic value outside the NL.** The economic activity associated with imports is captured in the logistics and infrastructure analysis (see next slide).
- The increase in GVA from feedstocks in Scenario 3 is due to the introduction of **a major 3G plant in 2035**, for which we assume the NL will domestically generate a proportion of the electricity, and this will be from new sources.
- A much larger economic impact from SAF could be seen if the NL could **shift from imports to domestic production of feedstocks.**
- However, a range of stakeholders have expressed **concerns around the current high price of electricity** in comparison to potential competitors and **foresee eMethanol for eSAF being imported** rather than produced in the NL.

# GVA from SAF intermediaries such as transport and logistics companies delivers the lowest economic impact due to the presence of existing jet fuel infrastructure



** Includes Direct, Indirect and Induced GVA*

## SAF LOGISTICS

- Stakeholders and existing industry analysis[1] indicate that additional investment in new infrastructure for the transport, blending, and storage of SAF may be limited due to the **ability to utilise existing jet fuel infrastructure**, such as the CEPS pipeline and storage facilities at the Ports of Amsterdam and Rotterdam. Our analysis assumes that existing infrastructure is sufficient to facilitate the movement of SAF around the NL in order to meet demand.
- The economic impact from SAF transport, blending and storage therefore is likely to come not through new infrastructure but through marginal increases in activity for a relatively small number of **SAF intermediaries already established in the SAF logistics value chain** who often can flexibly process SAF alongside other products.
- The additional GVA in Scenarios 2 and 3 is mostly **driven by the import of feedstocks for SAF production and export of excess SAF** which exceeds the Netherland's domestic demand beyond the ReFuelEU mandate.
- This additional economic impact is driven by **higher exports.** In Scenario 3 nearly half of SAF production over time is exported, compared to one third in Scenario 1.
- The ability for eSAF to **use existing NL electricity infrastructure** in Scenario 3 limits any additional economic benefits that might otherwise be driven by increased feedstock requirements.

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[1] *It is 'unclear current capacity of fuel blending capacity across the EU… would suffice for additional blending activities under SAF'. Study supporting the impact assessment of the ReFuelEU Aviation initiative, 2021*

# Nearly all NL crude oil is imported today – SAF from domestic feedstocks is an opportunity to exert strategic autonomy in fuel production

## Scenario Assessment of Impact on Strategic Autonomy:

**Scenario 1:** Assessment Rating: Low Impact

In Scenario 1, the NL has limited domestic SAF production and is required to import SAF from the 2030s to meet the ReFuelEU mandate. Any domestic production of SAF also requires the import of feedstocks. This leaves the NL more exposed to external fuel shocks.

**Scenario 2:** Assessment Rating: Low Impact

In Scenario 2, the NL increases its domestic SAF production with new 1G plants and an additional 2G plant. This reduces the NL's import reliance on bio-SAF. However, the ongoing need to import feedstocks for these plants as well as the lack of synthetic SAF still leaves the NL exposed to external fuel shocks.

**Scenario 3:** Assessment Rating: Medium Impact

The NL's potential to produce domestic electricity for eSAF production provides an improved level of strategic autonomy in this SAF pathway. Similar to Scenario 2, the residual high level of import reliance of feedstocks for 1G and 2G plants limits the improvement in strategic autonomy to a 'Medium' level in Scenario 3.

### Strategic Autonomy*

In an increasingly volatile world, economic security and resilience is increasingly important for policy-making. A domestic SAF market has the potential to improve the NL's self-sufficiency in aviation fuels, protecting against external economic shocks and supporting economic stability.

The NL's current positioning in the jet fuel market provides an example model that could be replicated in SAF. The NL **is currently a major refining hub and net exporter of jet fuel**. Whilst this plays a positive role in developing strategic autonomy, nearly all the crude oil needed for the refining sector is imported, which weakens strategic autonomy.

If SAF industry growth could rely on domestically produced feedstocks, this would therefore likely to represent an increase in strategic autonomy versus this status quo.

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** The definition of Strategic Autonomy is drawn from TNO (Insight into costs and benefits of strategic autonomy, 2024): "The ability to safeguard public interests and be resilient in an interconnected world as a global player, in cooperation with international partners, based on its own insights and choices."*

# Cutting edge SAF research and development, particularly in 2G and 3G SAF technologies, can lead to positive spillovers in the wider economy

## Scenario Assessment of Impact on R&D Spillover Effects:

**Scenario 1:** Assessment Rating: Low Impact

There is limited further technological progress in the SAF industry in Scenario 1, with early-stage investors looking elsewhere. R&D is likely to be located outside the NL, limiting the opportunity for wider spillover effects and leaving Dutch industries to be followers rather than leaders in potential future SAF innovations.

**Scenario 2:** Assessment Rating: Medium Impact

The growth of 2G SAF production in this Scenario offers the opportunity for new R&D investment in areas such as AtJ SAF. This may be supported through innovative new HEFA feedstocks (such as cover crops) across the higher number of 1G plants. The NL could take a leading role in harnessing these developments and benefit from the wider spillover impacts.

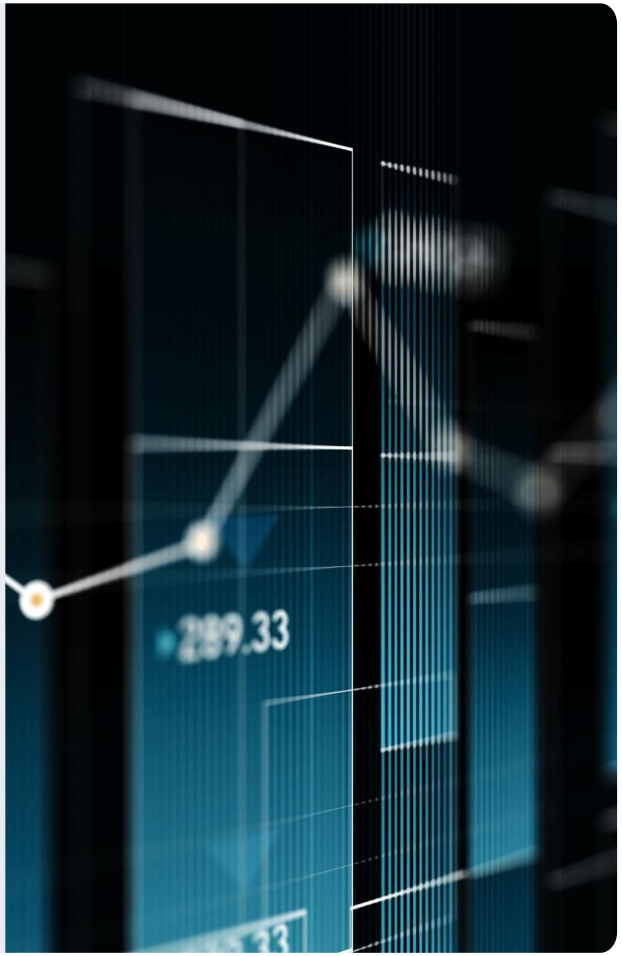
**Scenario 3:** Assessment Rating: High Impact

The presence of both bioSAF and eSAF production in this scenario positions the NL as a strong European hub for SAF. R&D spending is expected to cluster close to these facilities and additional R&D spend by the public and private sector is therefore expected to be the greatest in this scenario, providing the NL with an opportunity to be a leader in clean energy innovation.

### Research and Development Spillover Effects

SAF is still in the early stages of development, and the **cutting-edge nature of new 2G and 3G SAF pathways could lead to new innovations.** These innovations produce learnings and knowledge that could lead to positive spillovers in other low-carbon sectors.

In early 2025, Pratt & Whitney announced a European Technology and Innovation Centre will be located in the Netherlands, aiming to advance technologies in sustainable aviation. They cite the collaboration opportunities in the NL as key driver of location choice. Growth in the SAF industry will help to accelerate the innovations from such R&D centres. Existing port, aviation and logistics infrastructure also provide **ideal conditions for pilot projects and test beds.** Clean aviation innovation could also encourage potential new R&D beyond SAF to locate in the NL.



# Downstream players such as Schiphol Airport could see new growth opportunities catalysed from increased SAF activity, subject to passenger movement caps

## Scenario Assessment of Impact on Downstream Markets:

**Scenario 1:** Assessment Rating: Low Impact

A limited volume of SAF production is likely to constrain economic opportunities in downstream markets. With the NL likely a net importer of SAF over the longer-term, SAF re-fuelling opportunities at Schipol may be limited. Other opportunities such as linked commodity trading activity may also be limited with supporting industries locating closer to SAF production in other countries.

**Scenario 2:** Assessment Rating: Medium Impact

Higher levels of domestic production of bioSAF will likely spur some economic opportunities in downstream markets. This may provide the critical mass of SAF production for instance for Schipol to become a regional re-fuelling hub. However, the need to import eSAF might constrain overall downstream opportunities.

**Scenario 3:** Assessment Rating: High Impact

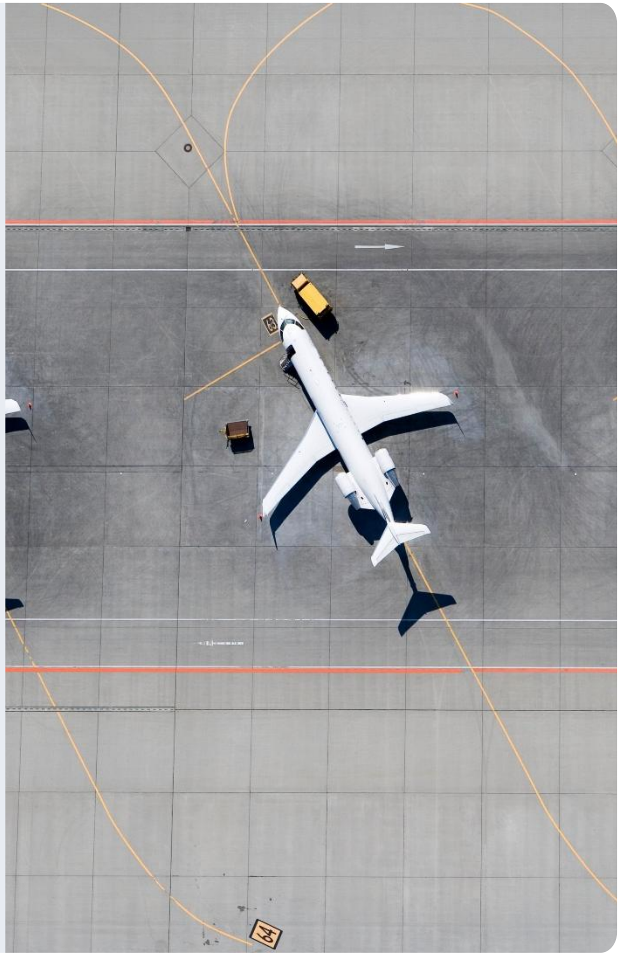
High levels of SAF production, diversified across bioSAF and eSAF, is likely to encourage significant investment in downstream markets. Schipol could have the potential to become a global SAF re-fueling hub and ancillary industries such as commodity trading are likely be drawn to the NL. This scenario supports a strong and growing domestic aviation sector.

### Downstream Markets Impact

The NL has the opportunity to develop a **first-mover advantage to become a hub for SAF in Europe.** This could create significant economic opportunities in downstream markets.

For example, **Schiphol has the potential to become a major SAF re-fueling hub**. The NL's existing port infrastructure and direct pipeline to Schiphol provide a strong foundation for growth. In combination with close proximity to the SAF industry and jet fuel refining sector, this could be attractive to international airlines.

Re-fuelling growth at Schipol could go hand-in-hand with further growth in the Dutch aviation sector and support greater passenger flows, but this is **subject to future passenger movement caps**. Price impacts are more uncertain and SAF could spur lower or higher airfare prices depending on industry costs and global, regional and national carbon regulation.



# Growth of SAF clusters could improve the Netherlands global competitiveness and open new inward investment opportunities

## Scenario Assessment of Impact on Global Competitiveness:

**Scenario 1:** Assessment Rating: Low Impact

With limited production of SAF, the NL SAF industry is not globally competitive over the longer-term. The NL cedes ground to other European countries in attracting internationally mobile SAF companies and investment is not mobilised from adjacent sectors.

**Scenario 2:** Assessment Rating: Medium Impact

Strong levels of 1G and 2G SAF production boost NL exports. Companies in adjacent industries may collocate to take advantage of synergies with the SAF industry. Improved industrial infrastructure as part of SAF industry growth could attract other industries who could co-locate near these facilities, improving the NL's global competitiveness in SAF.

**Scenario 3:** Assessment Rating: High Impact

The addition of eSAF production in this scenario opens up the potential for synergies with a new range of adjacent industries who would benefit from more electricity-based infrastructure. This scenario is consistent with lower electricity prices (from increased electricity production or policy support). Strong expertise and infrastructure across both bioSAF and eSAF makes NL very attractive to global SAF companies.

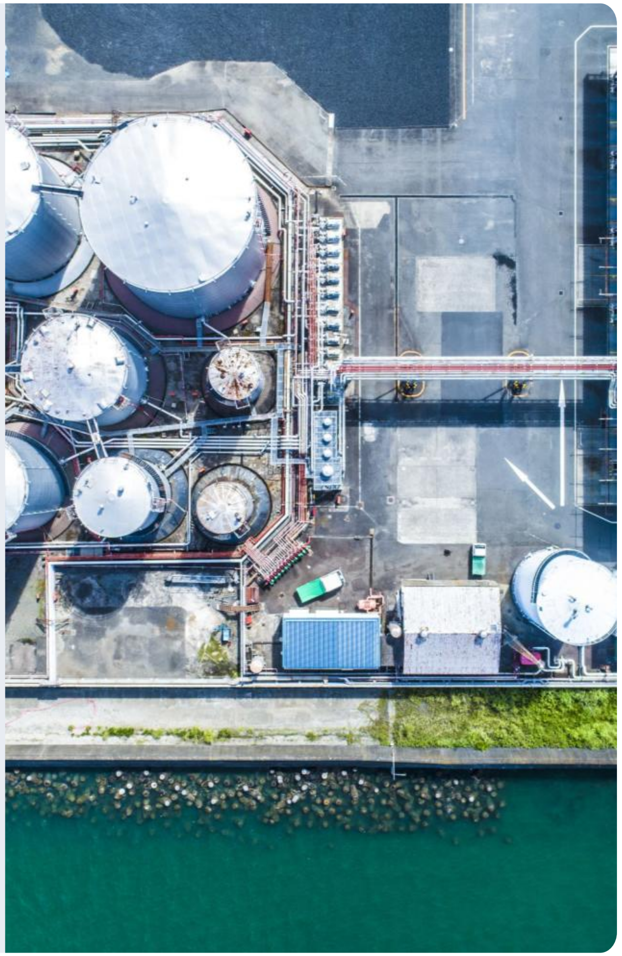
### Exports and Global Competitiveness

Higher SAF production opens up new sources of **export earnings**. Becoming a European hub for SAF could lead to an improved business and investment climate, **attracting new FDI into the Netherlands**. Companies such as Neste, SkyNRG and Chane have already invested in SAF in the Netherlands.

Companies in adjacent industries may also **co-locate to take advantage of synergies** with the SAF industry (such as in the Port of Rotterdam which is already a kerosene hub).

Interviews indicated that a key strength of the NL is its well-established refining industry and associated infrastructure, particularly connections to Europe (such as through the CEPS pipeline).

Companies that can **flexibly handle SAF and other biofuel and chemical products** are particularly likely to see attractive new investment opportunities.

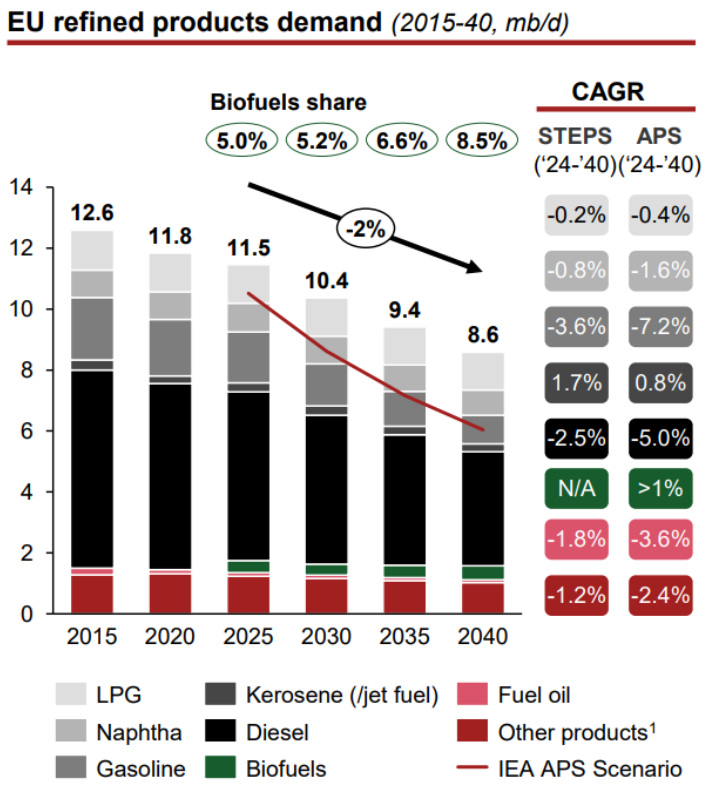


# SAF growth may displace some Dutch refining activity at the margin, but could also provide a home for jobs that would otherwise be lost

- The NL has a strong refining sector, **supporting roughly 5,000 FTEs Directly and contributing approximately €3.8bn Direct, Indirect and Induced Added Value to the economy annually**. This equated to roughly 0.36% of NL GDP in 2019.[1] Bio-refineries which are able to produce SAF are likely to represent only a small subset of this footprint at present, which would continue in Scenario 1, due to limited development of the SAF industry. The Dutch refining sector also leads to additional activity in the wider Dutch economy, generating an estimated **14,000 FTEs indirectly in the supply chain**.[1] These jobs have been created in supporting industries such as chemicals and the transport and logistics sector which have grown alongside refining facilities.
- The strong port infrastructure that has built up around the refining industry makes the NL a leading trading nation for jet fuel. The Port of Rotterdam estimates that they handle **25% of EU jet fuel demand, with 8 million tonnes of jet fuel refined in the Port and a further 3 million tonnes imported.**

[1] *Future of refining in the Netherlands, 2024, VEMOBIN*

- In Europe, overall demand for traditional refinery products, which includes fossil jet fuel, is expected **to decline by 2-4% annually up to 2040**, with biofuel demand increasing over this period. As production of refined products decreases, an increasing demand for SAF and similar nature of the skills required in the industry means it **has the opportunity to provide a home for some jobs which would otherwise be lost in the NL**.
- Whilst growing NL SAF production volumes may displace some NL jet fuel refining volume at the margin, **these displacement impacts are considered to be small** in the context of a large NL refining sector. This is driven more by broader regional and global refining demand trends and supported by continued growth in aviation demand.
- IATA state *'Europe faces a persistent and widening deficit in jet fuel supply as its own production declines… while demand grows steadily'*.[2] The Netherlands therefore has the potential to at the same time broadly maintain its globally competitive refining industry and the employment it supports, whilst accommodating SAF industry growth. Whilst global jet fuel and SAF demand is uncertain and is shaped by a range of underlying factors, this is the core expectation from the study.



*Graph: Future of refining in the Netherlands, 2024, VEMOBIN*

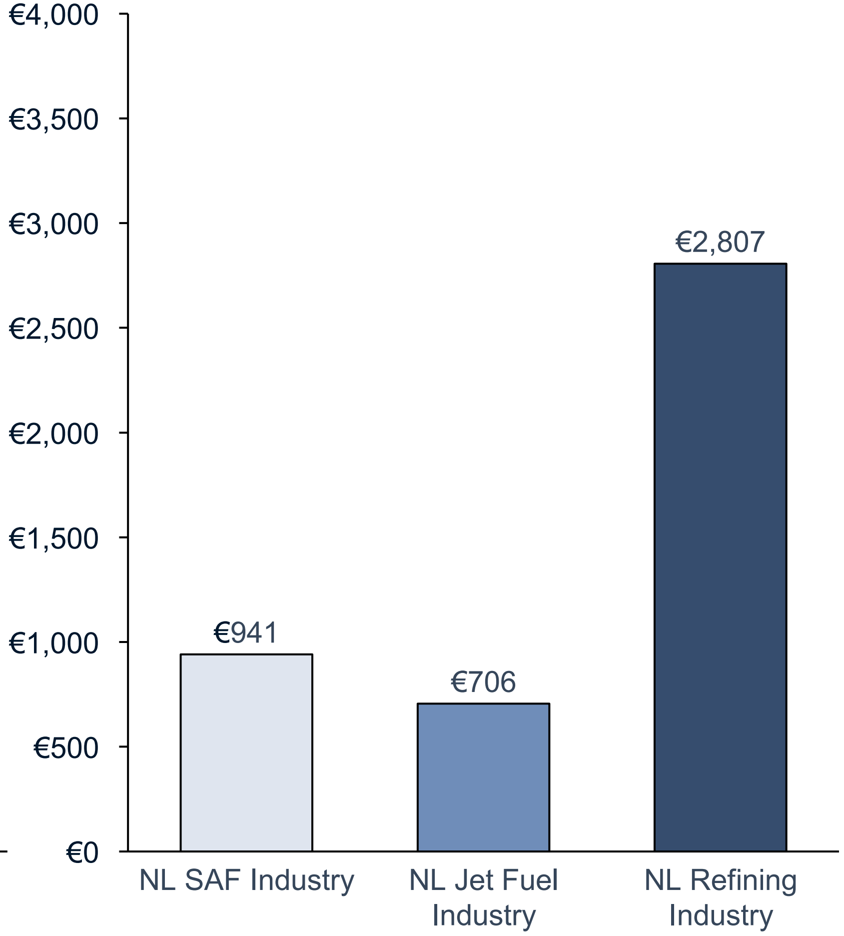
[2] *Europe's widening jet fuel deficit: challenges for airlines' fuel supply security, 2025, IATA*

# The SAF industry is likely to grow to be larger than the Netherlands jet fuel industry by 2050 as demand for traditional refined products declines

- In 2025, SAF remains small compared to the Netherland's overall refining sector. Our analysis estimates that SAF supports ~900 FTE in 2025, both directly and indirectly**,** whilst broader refining provides employment for around 19,000 FTEs.[1] In GVA terms, economic output delivered by **SAF is equivalent to less than 5% of the economic output** produced by the Dutch refining industry. By comparison, **jet fuel production accounts for c.16%** of domestic refining output today.[2]
- NL refining and jet fuel forecasts are highly uncertain. The most reliable data is provided VEMOBIN for the EU-27 who forecast a decline in demand for EU refining products of ~2% p.a. in 2025-2040. At the same time, VERMOBIN expect jet fuel demand to grow by ~2% p.a. with the sector contributing a growing share of NL refining output.
- Overall, the economic output provided by the NL SAF and Refining Industry combined is broadly similar between 2025 and 2050 - €4.0bn compared to €3.8bn. However, the **SAF sector is much larger – equivalent to c.33% of economic output** produced by the Dutch refining industry.
- In line with the findings shared on Slide 62, this analysis shows that the growth of the SAF sector helps to absorb the fall in economic output expected in the Dutch refining industry and **preserve industrial employment** in the NL.

**2025 SAF, Jet Fuel & Refining Industry Total GVA**
*(Direct, Indirect + Induced, 2024 prices, millions)*

**2050 Scenario 3 SAF, Jet Fuel & Refining Industry Total GVA**
*(Direct, Indirect + Induced, 2024 prices, millions)*



[1] *Future of refining in the Netherlands, 2024, VEMOBIN*

[2] *Decarbonisation options for the Dutch refinery sector, 2020, PBL & TNO*

# Conclusions and next steps for the economic impact assessment

**CONCLUSIONS**

- This EIA finds strong evidence that the development and growth of the SAF industry could deliver a sizeable economic impact for the NL. **Scenario 3 results in SAF delivering nearly €1bn of GVA annually by 2050, equating to 6,500 FTEs**.
- This is equivalent to c.**25-30% of the economic footprint of the NL refining sector today**. Whilst SAF may displace some Dutch refining activity at the margin, these displacement impacts are considered to be small in the context of a large NL refining sector and demand that is driven by broader global trends. Overall, SAF jobs are expected to be largely additional, **providing a home for refining jobs that could otherwise be lost.**
- If the NL enacts no further policy interventions to support the SAF sector, an economic impact from SAF will still be delivered through existing SAF production facilities, but it will be much lower. **Scenario 1 results in SAF delivering around 1,700 FTEs and €240m GVA annually by 2050.**
- Whilst the number of jobs provided by SAF is relatively modest in terms of overall NL economy, these are high-wage and high-productivity jobs. **Average GVA per SAF employee is 2x higher than for the average Dutch worker.**
- Growth in the SAF industry is also expected to deliver large multiplier effects in the underpinning supply chain. Our study finds that **for every €1 of output produced by the SAF sector, another €1.58 is created in the supply chain.**
- The **biggest contributor to GVA is SAF production – accounting for half of total economic value**. This comes through both the construction of new SAF production plants and the ongoing operation of these facilities which sustains the economic impact.
- Our study finds the most significant limiting factor to delivering economic impact from SAF is the low domestic feedstock capacity for 1G and 2G pathways. The greatest opportunity in this area lies in the production of domestic electricity for eSAF which could deliver **€4.5m additional GVA cumulatively by 2050**.
- The economic impact of SAF **storage, logistics and transportation** is relatively low given the usage of existing jet fuel infrastructure.
- Beyond the quantified impacts, it is important to recognise the wider benefits that SAF growth could bring, including greater **strategic autonomy, R&D spillovers and improved exports and global competitiveness.**
- Realising these benefits will require NL to implement a strong and coordinated policy framework to support SAF industry development across the value chain (feedstocks, production, blending etc.) – Chapter 5 addresses this challenge.

## Recommended Next Steps

- Continue to refine estimates if/when additional and higher quality data becomes available.
- Review sensitivity analysis of critical assumptions and parameters underpinning modelling to understand uncertainty (see Appendix).
- Compare the benefits from additional SAF activity to the policy costs to inform policy effectiveness analysis (see Chapter 4)
- Develop policy proposals and add delivery plans to SAF Roadmap for realising the benefits

# 05

## Policy

# **Policy:** Chapter purpose

The purpose of this chapter is to identify and evaluate potential policy interventions that the Ministry of Infrastructure and Water Management could introduce to support the scale-up of SAF in the Netherlands. These interventions are designed to address the key challenges and barriers that hinder progress towards national and EU decarbonisation goals, as well as the realisation of wider economic benefits. The analysis is informed by insights gathered through engagement with project stakeholders, which included representatives from across the SAF value chain.

The chapter outlines a long list of possible policy measures - including subsidies, grants for research and development (R&D), loan guarantees, and penalties - and considers where these could be most effectively targeted across the SAF value chain. The chapter concludes with an assessment of shortlisted interventions through a cost-benefit analysis, estimating their potential economic impact and alignment with existing EU policy frameworks such as the Renewable Energy Directive (RED), ReFuelEU SAF Mandate, and the EU Emissions Trading System (ETS).

# Before exploring potential Dutch SAF policy measures, it is important to first reflect on the key barriers and themes identified through the stakeholder engagement

## Key blockers identified during the stakeholder engagement to accelerating SAF scale-up in the Netherlands:

| | |
|---|---|
| **Permitting and Regulatory Barriers** | A major challenge cited by almost all stakeholders is the difficulty in acquiring permits for new SAF production facilities, retrofitting existing infrastructure, and co-processing. Environmental regulations, especially concerning nitrogen deposition, were identified as particularly stringent in the Netherlands compared to neighbouring countries like Belgium or France. |
| **High Energy and Production Costs** | The Netherlands faces high energy prices, which significantly impact the viability of eSAF projects. Stakeholders mentioned, while Rotterdam and Amsterdam have logistical advantages, the cost of production is higher than in other regions, especially Asia and some parts of Europe. This affects the competitiveness of Dutch SAF producers, leading to increased imports. |
| **Uncertainty and Lack of Policy Stability** | Interviewees stressed that stable, long-term policies and clear government support are essential for the sector's growth. The current SAF mandate trajectory within the EU and the Netherlands - particularly the large jumps in required percentages - was described as problematic, creating uncertainty for investors and making it difficult for producers to plan investments. |
| **Skills Shortages and Workforce Development** | A shortage of skilled labour for developing, engineering, and operating new SAF facilities was recognised as a barrier to scaling the industry. With increasing technical demands - especially for advanced fuels and new pathways - there is concern that Europe, and the Netherlands specifically, lacks sufficient qualified engineers and operators to meet future needs. |
| **Competition from Overseas (Especially China and the rest of Asia)** | Stakeholders noted that the rapid build-out of SAF capacity in China, and cheaper production costs in Asia, present a threat. Europe's slower permitting processes and higher costs risk the region falling behind, with Chinese producers potentially meeting European SAF demand at lower prices. |

| | |
|---|---|
| **Feedstock Availability and Value Chain Security** | Access to sustainable feedstocks - whether bio-based or for eSAF - is a challenge. The Netherlands would need to import significant feedstock volumes due to limited domestic supply, adding complexity and dependence on global markets. Building a resilient and locally anchored value chain is seen as strategically important for energy security and for maximising economic benefit. |
| **Infrastructure Constraints (Electricity Grid, Storage, Logistics)** | Grid congestion and electricity distribution limitations restrict the ability to develop new production capacity, particularly for eSAFs which require large amounts of clean electricity. Additional infrastructure investments are needed to support sector growth. |
| **Revenue Certainty** | A lack of revenue certainty creates risk for new projects reaching FID. Stakeholders are concerned that insufficient demand signals or incentives, particularly in the intermediary years before long-term mandates ramp up, may stall sector growth. |
| **Policy Coordination and Financial Incentives** | Interviewees advocated for targeted financial support, streamlined permitting, and recycling of revenues (i.e., those from EU ETS or ticket levies) back into SAF development / infrastructure. Clear national policies and incentives would help reduce investment risk and stimulate both supply and demand. |
| **Maintaining Industrial Capacity and Energy Security** | The decline in European refining and industrial capacity were identified as posing a risk to energy autonomy and broader economic stability. SAF was identified as a way to preserve high-value jobs and industrial activity, but only if supportive conditions are in place. |

# A long list of potential policy interventions has been developed, covering measures across the full SAF value chain and aligned with the 3 future scenarios

**An assessment of policy mechanisms has been conducted with consideration of the SAF value chain and three scenarios:**

| | *Feedstock Production / Supply* | *SAF Production* | *SAF Blending / Storing* | *Transportation / Distribution* | *Airport Fuelling Operations* | *Fuel Suppliers* | *Airline Demand / Offtake* |
|---|---|---|---|---|---|---|---|
| **Scenario 1**<br>*Baseline Domestic SAF Production* | 1. RED feedstock criteria | 2. Sustainable Transport Investment Plan (STIP) | 3. 14% SAF blending target (SAF Roadmap) | | | 4. ReFuelEU<br>5. NL-level ReFuelEU non-compliance penalty | 6. EU ETS |
| **Scenario 2**<br>*Medium Domestic SAF Production* | Scenario 1 SAF policies continue into Scenario 2 | | | | | | |
| | 7. Funding for feedstock technology R&D<br>8. Access to power grid | 9. Nitrogen threshold reduction for SAF projects<br>10. Permit regulatory acceleration scheme<br>11. Production grant<br>12. Production funding<br>13. Funding for SAF technology R&D | 14. SAF blending credit<br>15. Infrastructure investment support | 16. CEPS pipeline NL SAF discount | 17. AMS Government-funded SAF incentive scheme reinstated<br>18. Airports $CO_2$ cap | 19. SAF supply embargo for certain countries | 20. SAF revenue certainty mechanism<br>21. Corporate offtake facilitation programme |
| **Scenario 3**<br>*High Domestic SAF Production* | Scenario 1 & 2 SAF policies continue into Scenario 3 | | | | | | |
| | 22. Feedstock development programme<br>23. Feedstock subsidies<br>24. Workforce skills promotion for eSAF | 25. SAF cluster development program<br>26. National eSAF production target | | | | | |

*NB. Baseline policies are already in effect.*

# SAF related policy mechanisms long-list for the Netherlands (1/2)

| # | Policy Name | Purpose | Impact |
|---|---|---|---|
| 1 | **RED Feedstock Criteria** | Ensure SAF feedstocks meet EU sustainability standards under the Renewable Energy Directive. | Promotes sustainability, prevents use of high-ILUC or unsustainable materials, and provides regulatory certainty for producers. |
| 2 | **Sustainable Transport Investment Plan (STIP)** | Channel funding into low-carbon transport infrastructure, including advanced SAF value chain development (incl. 3G SAF). | Creates regulatory clarity and industrial incentives that ensure green fuel production contributes to domestic growth and job creation. |
| 3 | **14% SAF Blending Target (SAF Roadmap)** | Established national SAF target that exceeds the EU's ReFuelEU mandate. | Provides a demand signal for industry and contributes to an improvement in investor confidence. |
| 4 | **ReFuelEU Aviation Regulation** | Obligates fuel suppliers to provide a defined minimum SAF blend at EU airports. | Ensures baseline demand for SAF and creates a stable market environment for producers. |
| 5 | **National-Level ReFuelEU Non-Compliance Penalty** | Penalise fuel suppliers financially for failing to meet the ReFuelEU SAF blending mandates at the national level. | Strengthens compliance, discourages underperformance, and maintains market integrity. |
| 6 | **EU Emissions Trading System (ETS)** | Internalise aviation carbon costs and incentivise airlines to decarbonise through SAF use. | Stimulates green investment in companies to reduce their carbon intensity and contributed to helping finance the aviation energy transition. |
| 7 | **Funding for Feedstock Technology R&D** | Support innovation in advanced feedstock processing and pre-treatment technologies. | Expands available feedstock pool, reduces import dependence, and strengthens domestic supply resilience. |
| 8 | **Access to Power Grid** | Prioritise grid connection for SAF and eSAF projects using renewable electricity. | Enables faster deployment of eSAF plants and reduces project delays caused by grid congestion. |
| 9 | **Nitrogen Threshold Reduction for SAF Projects** | Adjust nitrogen regulations to ease permitting constraints for SAF and renewable energy facilities. | Accelerates project delivery timelines and unlocks stalled infrastructure investments. |
| 10 | **Permit Regulatory Acceleration Scheme** | Streamline and prioritise permitting for SAF and feedstock related infrastructure. | Reduces administrative bottlenecks, bringing projects to market faster and lowering risk. |
| 11 | **Production Grant** | Provide direct capital grants for new or expanding SAF production facilities. | Lowers upfront investment barriers and stimulates early commercial deployment. |
| 12 | **Production Funding Mechanism** | Introduce revenue support to guarantee price stability for SAF producers. | Reduces exposure to market volatility, encouraging long-term production growth. |
| 13 | **Funding for SAF Technology R&D** | Finance R&D into next-generation (2G/3G) SAF technologies. | Promotes technological advancement, cost reduction, and leadership in innovative SAF pathways. |

*NB. Baseline policies are already in effect.*

# SAF related policy mechanisms long-list for the Netherlands (2/2)

| # | Policy Name | Purpose | Impact |
|---|---|---|---|
| 14 | **SAF Blending Credit** | Provide tax or credit-based incentives for suppliers meeting or exceeding blending mandates. | Reduces effective SAF cost for obligated parties and encourages early market participation. |
| 15 | **Infrastructure Investment Support** | Fund the development of SAF-related logistics, storage, and distribution infrastructure. | Strengthens supply chain resilience and lowers transport and handling costs for producers. |
| 16 | **CEPS Pipeline NL SAF Discount** | Offer reduced transport costs for SAF through the CEPS. | Improves SAF competitiveness versus fossil fuels by lowering distribution costs to airports. |
| 17 | **AMS Government-Funded SAF Incentive Scheme (Reinstated)** | Reinstate the previous subsidy scheme to support SAF deliveries at AMS. | Directly boosts SAF uptake at the national hub, setting a visible precedent for market activation. |
| 18 | **Airports $CO_2$ Cap** | Introduce emissions caps for airports, including flight departures. | Encourages airlines and airports to invest in SAF and other low-carbon solutions to remain compliant. |
| 19 | **SAF Supply Embargo for Certain Countries** | To restrict or prohibit the use of SAF supplied from specific countries that do not meet Dutch or EU sustainability, traceability, or geopolitical standards. | Enhances supply-chain integrity and reduces reliance on regions with higher sustainability or geopolitical risks; may tighten supply and increase SAF prices if embargoed countries are major producers. |
| 20 | **SAF Revenue Certainty Mechanism** | Establish a price floor or guaranteed revenue stream (e.g. Contracts for Difference). | Increases investor confidence and enables financing of first-of-a-kind SAF facilities. |
| 21 | **Corporate Offtake Facilitation Programme** | Support the formation of long-term offtake agreements between corporates and SAF producers. | Provides stable demand and accelerates market formation through voluntary private sector participation. |
| 22 | **Feedstock Development Programme** | Promote cultivation, collection, and conversion of domestic feedstocks suitable for SAF. | Expands domestic feedstock availability, reducing import dependence and improving supply security. |
| 23 | **Feedstock Subsidies** | Provide financial support for producers or collectors of advanced waste and residue feedstocks. | Lowers feedstock costs, making SAF production more economically viable and scalable. |
| 24 | **Workforce Skills Promotion for eSAF** | Develop targeted training and education programmes for the emerging eSAF sector. | Builds the skilled labour base needed for large-scale production and long-term sector growth. |
| 25 | **SAF Cluster Development Programme** | Support creation of regional SAF clusters integrating feedstock, production, and logistics. | Fosters industrial synergies, reduces costs through co-location, and accelerates ecosystem development. |
| 26 | **National eSAF Production Target** | Provide a clear national target for domestic eSAF production. | Accelerates the development of domestic eSAF capacity by providing an investment signal and aligning stakeholders around a level long-term synthetic fuel vision. |

# These policy interventions have subsequently been assessed against defined evaluation criteria, such as affordability, value for money, and feasibility

| Key criteria and success factors | Description |
|---|---|
| **Strategic Fit and National Needs** | Assesses how well the intervention supports national SAF deployment goals and aligns with the Netherlands' wider climate, industrial, and energy policy priorities. |
| **Potential Value for Money*** | Evaluates the cost-effectiveness of the intervention in enabling SAF production and uptake, including broader economic, environmental, or industrial benefits. |
| **Supplier Capacity and Capability** | Considers whether producers and suppliers have - or can reasonably develop - the capability, technology readiness, and financing to scale SAF within the Netherlands. |
| **Potential Affordability** | Assesses the financial viability of the intervention for government and market actors, including risks of market distortion, long-term fiscal burden, and compliance with state aid rules. |
| **Feasibility for the Dutch Government** | Evaluates the administrative, regulatory, and political feasibility of implementing the intervention, including complexity, stakeholder alignment, and enforcement requirements. |
| **Time to Realisation** | Assesses the expected speed at which the intervention could influence SAF production or uptake, considering development cycles, permitting, and infrastructure readiness. |

Each policy intervention on the long-list has been evaluated against the criteria to assess its strategic alignment with national needs, value for money, supplier capacity and capability, and its potential affordability and feasibility for scaling SAF production and use in the Netherlands. These criteria are consistent with those outlined in a typical project business case. Further, a weighting was applied to each criteria to reflect their relative importance to the Dutch economy.

The results of this assessment have informed a prioritised shortlist of policy options best suited to maximise economic value, accelerate SAF deployment, and strengthen the Netherlands' competitive position within the evolving SAF landscape.

NB. *The policies outlined in Scenario 1 have not been assessed against the criteria as they are already in effect. Dynamic impacts from these interventions (such as from alternative sources of funding) are not in the scope of this analysis. The 'fiscal multiplier' will differ across alternative revenue mechanisms, and these should be explored in greater detail in future analysis.*

**A high-level qualitative VfM assessment was used, giving higher scores to interventions that consistently generate economic value, could significantly impact major sources of GVA or FTE, or deliver multiple benefits.*

# The ‘SAF Revenue Certainty Mechanism’, ‘SAF Blending Credit’ and ‘Feedstock Development Programme’ were identified as the shortlisted policy measures

| *Note: 5 indicates a high score, while 1 indicates a low score** | **Weighting** | **SAF Revenue Certainty Mechanism** | **SAF Blending Credit** | **Feedstock Development Programme** |
|---|---|---|---|---|
| **Strategic Fit and National Needs** | 17% | 3.5 | 3.3 | 4.3 |
| **Potential Value for Money** | 19% | 2 | 2.5 | 2.3 |
| **Supplier Capacity and Capability** | 12% | 3.3 | 1.8 | 2.8 |
| **Potential Affordability** | 14% | 2.3 | 2.8 | 3.5 |
| **Feasibility for the Dutch Government** | 22% | 2 | 2.8 | 3.5 |
| **Time to Realisation** | 15% | 2.8 | 3.5 | 1.8 |
| **Weighted Total** | | 2.55 | 2.79 | 3.03** |

High

Low

The shortlisted policy measures are those that performed strongest against the assessment criteria, reflecting both their higher impact potential and their generally higher associated costs. They also offer meaningful opportunities for a cost–benefit analysis (CBA), providing insight into how targeted interventions could help to accelerate the scaling of the Dutch SAF market.

It is important to acknowledge, however, that establishing the third scenario - and, to a degree, the second - will require a coordinated and multi-layered policy effort. The introduction of a single new mechanism, or even two, will not by itself unlock rapid market growth. A consistent theme throughout stakeholder engagement was the need to resolve underlying structural barriers, particularly the nitrogen threshold constraints and associated permitting challenges. While these elements did not score highly in the quantitative criteria and therefore are not included in the CBA, stakeholders consistently highlighted them as critical enablers for sector development. Accordingly, they will be reflected in our final recommendations.

Finally, it should be noted that the CBA is indicative and represents a high-level assessment of potential policy impacts. Advancing any of these measures would require detailed policy design and coordination by the Dutch Government, including activities such as price forecasting, legal and regulatory review, and further market testing with industry stakeholders.

**Please find a detailed overview of the scoring criteria in the appendix.*
***Please note, the feedstock development programme was a request as per the Ministry of I&W.*

# **Short-Listed Option 1:** SAF Revenue Certainty Mechanism (1/2)

## DESCRIPTION

A SAF revenue certainty mechanism provides long-term stability for producers by reducing exposure to price volatility and demand risk. Typically involving tools such as contracts for difference, guaranteed offtake agreements, or minimum price floors that ensure producers receive a predictable revenue stream regardless of fluctuations in fossil jet fuel markets. By de-risking investment and improving project bankability, the mechanism encourages the development of new SAF production facilities and accelerates scale-up. It also offers confidence in future income to financiers and project developers, helping to unlock capital for emerging technologies and ensuring a more consistent supply of SAF over time. Notably, it can be a mechanism funded by industry.

## KEY ASSUMPTIONS*

- **Revenue Certainty Mechanism Type:** Contracts for Difference scheme
- **Agreed strike price:** Levelised cost of SAF production respective of the pathway. Noting EASA references average SAF prices range from €2,714 - €8,470 (2024).
- **Market price of SAF:** Assumes the market price of jet fuel, based on the rationale that the objective for SAF pricing is to close the price gap between SAF and jet fuel. Noting EASA references a CAF average price baseline of €734 (2024).
- **Number of rounds and contracts awards:** 1 round with 2 contracts awarded to individual developers with facilities in the Netherlands (for a 15-year contract period)
- **SAF project production pathways:** 2G and 3G only (non-HEFA derived fuel)

## EXAMPLE

**UK SAF Revenue Certainty Mechanism (RCM)**

The bill will establish a guaranteed ‘strike price’ mechanism. Where a government-owned company would enter into a contract with a SAF producer for a defined period. The contract would set a price (strike price) that the producer would receive when it sells SAF. When the producer sells SAF: if the market price was lower than the agreed ‘strike price’ the producer would be paid the difference up to the strike price (or reverse). SAF producers would bid for a limited number of contracts that would be issued in rounds. The government has said that the first round of RCM contracts will be offered for UK projects producing 2G or 3G SAF. Status: Levy Design Consultation.

## MECHANISM FEASIBILITY

Revenue certainty mechanisms of various kinds have been widely used in the Netherlands and internationally. This suggests that an RCM for SAF is feasible. Implementation may require new legislation to be passed, and the RCM would need to be designed and projects selected to receive the RCM (discussed in more detail further below) which would take time, but precedent from other countries and sectors indicates that this is a feasible pathway that could be adopted for SAF.

## KEY BARRIERS ADDRESSED

A SAF revenue certainty mechanism directly addresses investor risk arising from policy uncertainty, volatile fuel prices, and weak near-term demand signals. By providing predictable, long-term revenue support—such as price floors or guaranteed offtake—it reduces exposure to market volatility and improves project bankability, helping producers reach final investment decision. This is particularly important in the context of high production costs, infrastructure constraints, and long development timelines identified by stakeholders as key barriers to SAF scale-up.

## TIME TO LAUNCH POLICY

A SAF revenue certainty mechanism typically requires a medium to long lead time to establish, given the complexity of policy design and financial structuring. Development would involve defining the appropriate instrument (e.g. contracts for difference or offtake guarantees), undertaking price forecasting and market analysis, ensuring compliance with state aid and competition rules, and consulting extensively with industry and financiers. A process for selecting projects to receive a SAF RCM also needs to be designed and implemented. As a result, design and approval could take several years, with implementation aligned to longer-term SAF production timelines and investment cycles.

*NB. Prices included in the assumptions are theoretical and used for indicative purposes.*

# **Short-Listed Option 1:** SAF Revenue Certainty Mechanism (2/2)

COST BENEFIT ANALYSIS

COST

**Total Cost: € 952m *(2024 prices)***

The cost calculations were based on the assumption that two 15-year contracts were awarded: one to a 2G SAF developer and one to a 3G SAF developer, both intending to produce SAF in the Netherlands. In this example, the theoretical SAF plant capacities are 500,000 and 250,000 tonnes per year, respectively. Each producer operated a facility of a different size and negotiated a distinct strike price within their contract, reflecting differences in technology.

BENEFIT

**Total Benefits: €1.37bn *(2024 prices)***

Revenue certainty mechanisms are considered to be highly-effective policy tools for overcoming uncertainty in innovative new sectors by providing industry with confidence in price and demand levels. This would be a key factor in incentivising industry to bring forward investment in 2G and 3G SAF production facilities. It is reasonable to assume that the measure could enable the delivery of half the production associated with 2G and 3G plants from 2035, and a quarter of the domestic feedstock production required as an input over this period. The GVA benefit would be equivalent to €1.37bn of GVA benefits.

VFM ASSESSMENT

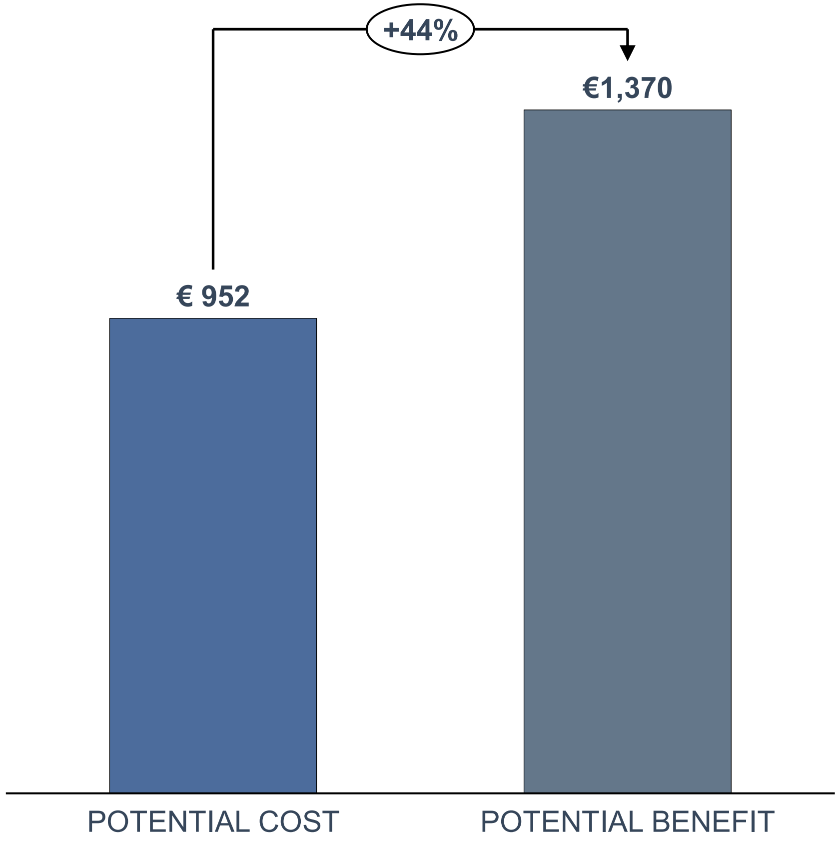
**Illustrative Benefit-Cost-Ratio:** 1.4

**Illustrative VfM Rating:** Medium-High

**Narrative:** A SAF revenue certainty mechanism is a costly policy measure but has the potential to deliver sizeable benefits through significant increases in 2G and 3G SAF production and the increase in GVA and employment this leads to. These mechanisms are being actively developed across a range of Net Zero industries globally.

COST BENEFIT ANALYSIS RESULTS

**Results of the SAF Revenue Certainty Mechanism Cost Benefit Analysis**
*(2024 prices, millions)*
,



# **Short-Listed Option 2:** Blending Credit for SAF (1/2)

### DESCRIPTION

A SAF blending credit is designed to incentivise producers and blenders by providing a financial reward - typically per tonne of SAF that is produced and blended into the fuel supply. By helping to narrow the cost gap between SAF and conventional jet fuel, the credit strengthens the commercial viability of SAF production and encourages scaling across the supply chain. The mechanism can take the form of a tax incentive, tradable certificate, or direct payment, allowing it to be adapted to different regulatory and fiscal contexts. By offering predictable, performance-based support tied to actual SAF volumes blended, the credit promotes sustained investment, increases supply availability, and supports steady progress towards national SAF deployment goals.

### KEY ASSUMPTIONS*

- **Base credit amount:** €50 per tonnes of SAF (no bonus credit amount)
- **Eligible recipients:** Producers and blenders of SAF-kerosene fuel mixtures for aviation. The blending credit is designed to be focussed on importing of 3G e-SAF into the NL, to target economic value which can be accessed through SAF blending, storage and transportation.
- **Eligible SAF:** To qualify, fuel must be compliant with the Renewable Energy Directive’s SAF eligibility criteria
- **Credit duration:** 20-years

### EXAMPLES

**Sustainable Aviation Fuel Credit**

The policy environment in the US is a primary driver of SAF growth. The Inflation Reduction Act of 2022 introduced a blender’s tax credit for SAF, offering up to $1.75 per gallon for fuels achieving at least a 50% lifecycle GHG reduction. The One Big Beautiful Bill Act reduced and capped this tax credit at $1 per gallon, but extended it through Dec. 31, 2029. The RFS provides renewable identification numbers (RINs) for renewable jet fuel, creating a secondary revenue stream for producers. California’s LCFS offers additional credits based on carbon intensity, further improving project economics for SAF producers in or supplying to California.

### MECHANISM FEASIBILITY

A blending credit scheme has been implemented in other countries and versions of similar sorts of schemes (where fixed amounts of money are paid to qualifying parties provided they satisfy eligibility criteria) have been used in the Netherlands, EU and internationally. This suggests that a blending credit for SAF is feasible, though the design of the scheme would have to be done carefully to ensure compliance with EU State Aid rules. Implementation may require new legislation to be passed, and the blending credit would need to be designed and projects selected to receive the blending credit which would take time, but precedent from other countries and sectors indicates that this is a feasible pathway that could be adopted for SAF.

### KEY BARRIERS ADDRESSED

A SAF blending credit supports producers by narrowing the cost gap between SAF and conventional jet fuel. By linking support to actual volumes produced and blended, the mechanism strengthens demand certainty in the early years of mandate ramp-up and helps offset high energy and production costs highlighted by stakeholders. This creates a clearer investment signal while encouraging capacity utilisation and supply chain development.

### TIME TO LAUNCH POLICY

A SAF blending credit can generally be designed and implemented over a shorter to medium timeframe. As a volume-based incentive, it builds on relatively well-established policy concepts and can be integrated into existing fiscal or regulatory frameworks. Key steps include defining eligibility criteria, credit values, and verification requirements, alongside budgetary approval. Once designed, the mechanism can be deployed relatively quickly, making it well suited to stimulating near-term SAF supply and scaling activity.

*NB. Prices included in the assumptions are theoretical and used for indicative purposes.*

# **Short-Listed Option 2:** Blending Credit for SAF (2/2)

COST BENEFIT ANALYSIS

COST

**Total Cost: € 207m *(2024 prices)***

The total cost has been estimated by applying a methodology similar to that used in the US SAF tax credit, where a fixed monetary value is linked to each unit of fuel. While the US credit is defined in dollars per gallon, the Netherlands would use Euros per tonne. Converting the US reference value of approximately $1 per gallon results in an equivalent of roughly €250 per tonne of SAF. As this figure is relatively high, a moderated value of €50 per tonne has been applied to provide a more realistic cost estimate. It is assumed that the credit would apply to imported SAF so that NL retains its strong positioning in the ports, refining, blending and pipeline parts of the value chain.

BENEFIT

**Total Benefits: € 309m *(2024 prices)***

The blending credit is expected to be a material factor influencing companies to invest in the NL blending, storage and transportation sector to take advantage of the importing opportunity. In anticipation of a blending credit being implemented, firms are anticipated to bring forward capital investment required to build the blending infrastructure needed to receive the benefit from 2030. If this measure was responsible for delivering 10% of the additional GVA seen in the NL SAF blending, storage and transportation sector from 2030 estimated in the High Opportunity Scenario, this would deliver **€309m of GVA benefits,** with other factors responsible for the remaining economic value.

VFM ASSESSMENT

**Illustrative Benefit-Cost-Ratio: 1.5**

**Illustrative VfM Rating:** High

**Narrative:** Overall, we expect this measure could deliver High VfM by supporting the NL’s strong position as an importer/exporter of fossil fuel products in a SAF future. This will encourage continued use of NL ports, blending infrastructure and pipelines (CEPS) in preference to foreign SAF producers shipping SAF directly to third countries.

COST BENEFIT ANALYSIS RESULTS

**Results of the Blending Credit for SAF Cost Benefit Analysis**
*(2024 prices, millions)*

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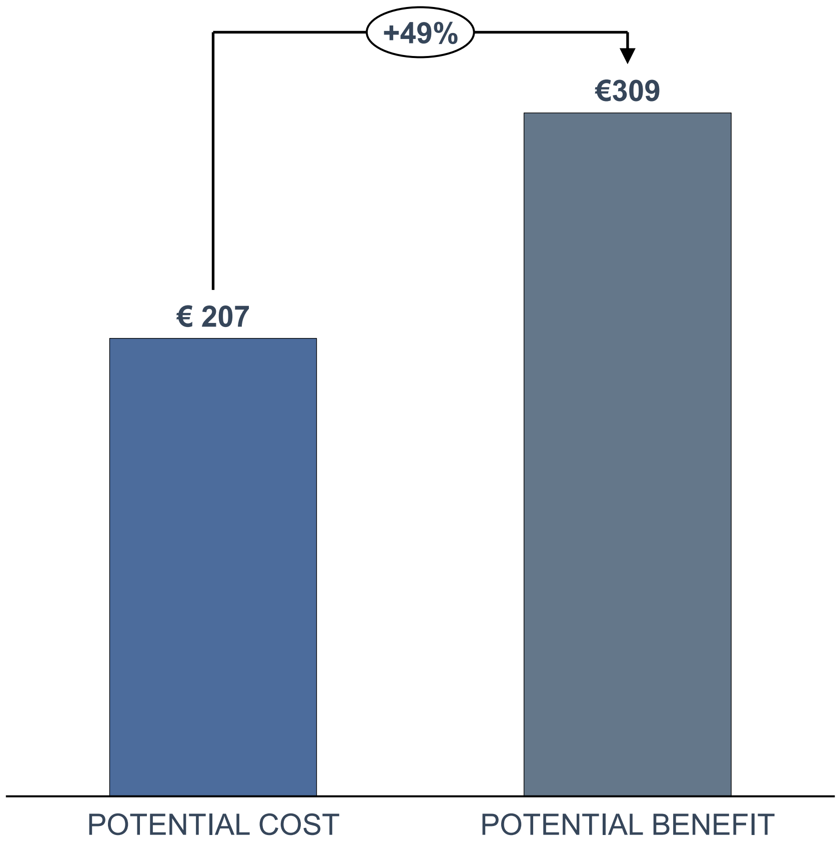

# **Supplementary Short-listed Option:** Feedstock Development Programme (1/2)

## DESCRIPTION

A feedstock development programme focuses on expanding the availability, sustainability, and diversity of raw materials needed for SAF production. It typically includes funding for R&D, support for advanced agricultural practices, investment in waste collection and processing infrastructure, and the creation of certification frameworks to ensure environmental integrity. Programmes typically encourage the commercialisation of non-food feedstocks - such as agricultural residues, municipal solid waste, and advanced biogenic materials - while identifying regionally viable supply chains that minimise land-use impacts. By strengthening the entire upstream ecosystem, a feedstock development programme enhances supply security, reduces costs over time, and ensures that SAF growth remains aligned with sustainability goals.

## KEY ASSUMPTIONS*

- **Type:** Development programme investment
- **Number of projects:** 8 projects
- **Funding allocated per project:** € 4,000,000
- **SAF project production pathways feedstock types:** All pathways applicable under the Renewable Energy Directive Criteria
- **Eligible feedstock development programmes:** Including schemes that support research and development - such as initiatives aimed at improving feedstock processing efficiency and identifying new feedstock sources - as well as programmes designed to scale up Dutch domestic feedstock production

## EXAMPLES

**Regional Resource Hubs for Purpose-Grown Energy Crops**

The US's Department of Energy Bioenergy Technologies Office provided $29 million in funding to the scheme. With the schemes aim to drive R&D and the demonstration of low-carbon-intensity, purpose-grown energy crops critical to accelerating a clean energy economy.

**Biomass Feedstocks Innovation Programme: Phase 1 & 2 projects**

The programme is a £36 million programme, funded through the UK's Department for Energy Security. It is a demonstration initiative to showcase innovations in land-based biomass feedstock production to support the development of the UK biomass industry.

## MECHANISM FEASIBILITY

A feedstock development programme is fundamentally a scheme for providing grant funding to qualifying projects that meet an eligibility criteria. As such, the scheme is similar to many other schemes adopted in the Netherlands, EU and internationally. There may be a need to pass new legislation to implement the scheme, but the availability of precedent schemes suggests that this would be a feasible pathway for adoption in SAF.

## KEY BARRIERS ADDRESSED

A feedstock development programme tackles one of the most persistent structural challenges to SAF scale-up: limited access to sustainable, affordable feedstocks. By supporting feedstock innovation, supply chain development, and domestic value creation, the programme reduces reliance on imports and mitigates exposure to global price volatility. Over time, this strengthens value chain security, improves cost competitiveness, and supports energy security and industrial resilience - key themes consistently raised through stakeholder engagement.

## TIME TO LAUNCH POLICY

A feedstock development programme typically has a medium-term policy development horizon, with benefits accruing over the longer term. While programme design - such as funding structures, sustainability criteria, and research or infrastructure support - can be established relatively quickly, translating this into increased feedstock availability requires time for project development, supply chain build-out, and technology maturation. As such, the programme is best viewed as a foundational, enabling measure that supports sustained SAF growth over the medium to long term.

*NB. Prices included in the assumptions are theoretical and used for indicative purposes.*

# **Supplementary Short-listed Option:** Feedstock Development Programme (2/2)

COST BENEFIT ANALYSIS

COST

**Total Cost: € 27m *(2024 prices)***

International examples of R&D feedstock programmes have typically involved funding levels of between € 25-40m (see bottom-left). On this basis, we assume a policy cost for this measure of € 32m in nominal terms. Based on the design of these programmes, we would assume 8 individual projects are supported by the R&D programme, at the cost of €4m each. As part of the modelling, we assume that the R&D programme releases funding in equal parts across a five-year period between 2030-2034.

BENEFIT

**Total Benefits: € 178m *(2024 prices)***

There is broad consensus on the economic theory around how public R&D investment delivers significant long-term benefits – for example recent studies suggest an 8:1 ratio, **implying that €1 spent on R&D would deliver €8 of economic value.** Alongside driving productivity savings or opening revenue opportunities for the recipient, benefits are often realised through wider spillovers diffusing beyond the original project. In the context of SAF feedstock R&D, we expect that R&D will support bringing new 2G and 3G feedstocks on stream from 2035, supporting growth of domestic feedstock production and the associated GVA and employment.

TARGETS/MANDATE

**Illustrative Benefit-Cost-Ratio:** 6.5

**Illustrative VfM Rating:** Very High

**Narrative:** An R&D programme focussed on SAF feedstocks has the potential to offer Very High VfM, targeting a known constraint in the NL around domestic feedstock capacity. The R&D programme will need to be designed and targeted at the most promising existing projects to deliver the benefits in practice.

COST BENEFIT ANALYSIS RESULTS

**Results of the Feedstock Development Programme Cost Benefit Analysis** *(2024 prices, millions)*

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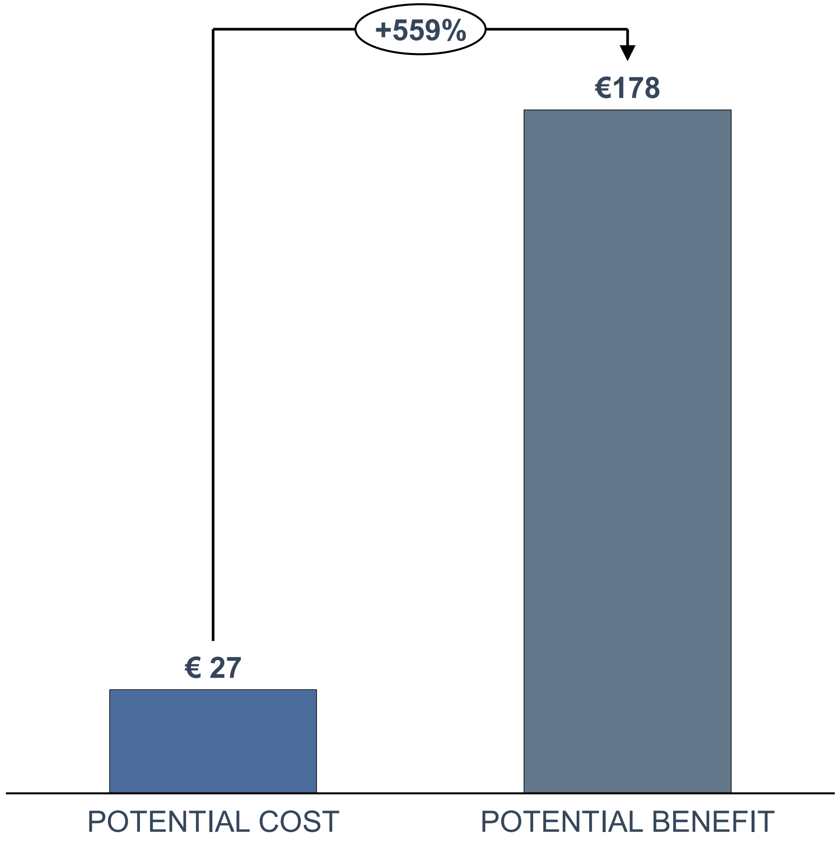


# Policy conclusions and recommended next steps (1/2)

Our analysis demonstrates that building a domestic SAF industry could deliver significant economic benefits for the Netherlands. However, these benefits are not guaranteed. SAF remains materially more expensive than conventional jet fuel, and stakeholders highlighted a range of structural barriers that continue to constrain investment. At the same time, the Netherlands faces increasing competitive pressure from neighbouring and peer countries. While it benefits from world-class port infrastructure and strong access to imported feedstocks, other EU countries - such as Spain and France - enjoy greater availability of domestic feedstocks, a key determinant of SAF production costs, while Nordic countries benefit from lower-cost renewable electricity. These structural advantages are increasingly shaping the European SAF investment landscape and risk eroding the Netherlands' relative competitiveness without targeted policy intervention.

Although the Netherlands retains many strengths - including an established energy and chemicals cluster, a skilled workforce, and a strong aviation ecosystem - recent exits by major oil companies, notably BP and Shell, expose a growing vulnerability in the Dutch SAF market. These withdrawals reflect wider industry pressures, including high feedstock costs, policy uncertainty, and shareholder expectations for higher returns, and raise concerns over a potential domino effect that could further weaken investor confidence. With more than one million tonnes of anticipated European SAF capacity now cancelled, timely and coordinated policy action will be critical to stabilise the investment climate, prevent further market exits, and ensure the Netherlands remains a credible and competitive location for SAF deployment.

Some of these measures should be aimed at different parts of the value chain (including ports, refining, production, transportation, airports and airlines). Some of the measures may focus on improving cost competitiveness or reducing the cost of SAF for end-users, while other measures might be aimed at unlocking development and construction e.g. electricity grid connections, planning permissions etc.

The costs associated with some of these policies, particularly those aimed at reducing the price of SAF or of feedstocks, are presented on prior slides.

These results suggest that policy action to introduce a Revenue Certainty Mechanism (RCM) aimed at HEFA, a Blending Credit aimed at 2G and 3G SAF and a targeted feedstock innovation funding programme could deliver significant benefits for the Netherlands, materially outweigh the costs of those policies.

There are of course risks associated with all these policies: risks that they may not be successful (e.g. if the strike price fixed under the RCM is not high enough, or is superseded by more ambitious schemes in other EU countries) as well as risks that they may cost more than anticipated (e.g. if the volume of SAF produced under the RCM, or blended under the credit, exceeds expectation). For these reasons Dutch policy makers need to consider the design and calibration of these measures carefully.

# We have also assessed the non-monetised wider impacts of the shortlisted policy options

| | Option 1: SAF Revenue Certainty Mechanism | Option 2: Blending Credit for SAF | Supplementary Option: Feedstock Development Programme |
|---|---|---|---|
| **Strategic Autonomy** | Assessment Rating: Medium Impact<br>By supporting the development of domestic SAF production facilities, this policy improves the Netherlands strategic autonomy. However, the increased production will still require significant levels of imported feedstocks and electricity for eSAF, limiting strategic autonomy gains. | Assessment Rating: Low Impact<br>The credit applies to imported SAF and therefore is expected to incentivise imports of SAF. Whilst there may be strategic autonomy gains from the NL operating as a logistics, blending and trading hub, any rise in reliance on imports would be expected to reduce strategic autonomy overall. | Assessment Rating: High Impact<br>If innovation increases the availability of domestic feedstocks for use in SAF production, this will reduce the Netherland's reliance on imported feedstocks, which is currently a major constraint on strategic autonomy. NL-owned R&D could also be adopted globally, further boosting strategic influence. |
| **R&D Spillover Effects** | Assessment Rating: Medium Impact<br>The policy does not directly promote increased levels of R&D, as it focuses on reducing exposure to price volatility for producers. The policy however does provide positive incentives for R&D as it reduces risk in production and improves potential Return on Investment. | Assessment Rating: Low Impact<br>The policy focuses on incentivising blending of SAF in the NL - this is a relatively mature industrial process with limited potential for new R&D. Making end-to-end production of SAF less costly may influence R&D levels marginally. However, given the focus on SAF imports any spillovers would likely accrue outside the NL | Assessment Rating: High Impact<br>This policy is specifically designed to encourage additional R&D in SAF feedstocks. The resulting innovations would be expected to lead to spillover effects - such as reducing feedstock production costs or uncovering new feedstock varieties. This could also lead to spillovers in adjacent industries. |
| **Downstream Markets** | Assessment Rating: High Impact<br>The policy is likely to increase SAF production volumes which is expected to have a strong positive impact on downstream market opportunities. Plentiful domestic supply of SAF, for example, would support the development of Schiphol as a refuelling hub, and would support the NL aviation sector in wider transition to SAF | Assessment Rating: High Impact<br>Increasing the volume of SAF blending in the NL will strengthen the overall jet fuel supply value chain and will reinforce the Netherland's existing strong infrastructure and pipeline network. Adjacent industries could grow around blending activities, such as SAF commercial trading or wider storage/logistics activity. | Assessment Rating: Medium Impact<br>Any growth in domestic feedstock availability would naturally SAF production volumes, alongside wider opportunities in downstream markets in the value chain. For example, additional activity could be stimulated in the transport, storage and logistics activities supporting delivery of feedstocks to NL and global customers. |
| **Global Competitiveness** | Assessment Rating: Medium Impact<br>Greater SAF production could create the critical mass required to draw energy companies in SAF or adjacent fuels to the country. This could relate to production activity or wider elements of the value chain. The policy does not address the issue of feedsocks which limits the gains to global competitiveness. | Assessment Rating: Medium Impact<br>The credit incentives the import of SAF into the NL from other countries, which may also encourage supporting economic activities to follow. This is likely to improve the overall global competitiveness of the overall NL SAF value chain - but additional policies would be needed to incentivise domestic production more broadly. | Assessment Rating: High Impact<br>If the R&D programme is large-scale and successful, the NL could become a regional R&D hub, particularly given the presence of strong academic institutions and existing industrial facilities, drawing in global investment. Other industries using the same feedstocks as SAF, such as biodiesel, could also be attracted. |

# Policy conclusions and recommended next steps (2/2)

The effectiveness and benefits of these headline policy measures would be enhanced by other measures to unlock speed of development and construction of SAF production facilities (e.g. nitrogen rules, planning permits, grid connections), and of supply of suitable feedstocks. Achieving a first mover advantage may depend on these measures being introduced so that Netherlands can build its SAF industry at pace. Of course, there may be downsides to these policy measures e.g. if SAF producers are prioritised in the electricity grid connections queue then some other party will be de-prioritised with an associated opportunity cost. For this reason, Dutch policy makers should consider these potential policy measures in detail too.

Dutch policy makers would need to move quickly and decisively to secure the estimated economic benefits. Delay may mean that economic benefits are foregone, and that other countries may step into the void. Delay could risk the Netherlands squandering its natural and legacy advantages in the SAF industry.

At the same time, developing these detailed designs and making final decisions on these policies will take time. It is a low-regret activity for Dutch policy makers to take, or to accelerate, steps to investigate these options in more detail.

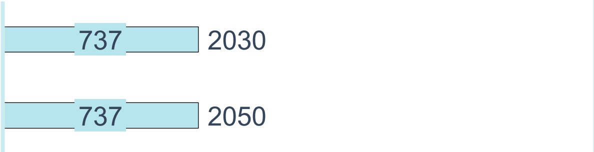
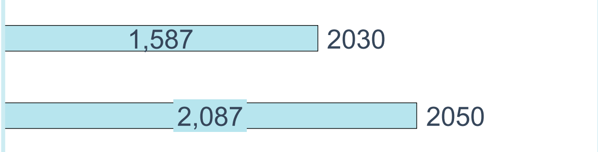
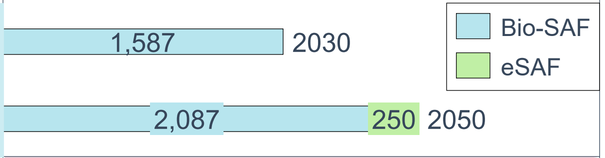
We would therefore recommend to MinI&W that it investigates the RCM, Blending Credit and Feedstock Innovation policy schemes, preparing the evidence base to enable it to make informed decisions about these policies at the earliest opportunity, alongside continuing efforts to investigate other measures that could unlock more rapid progress on development and construction of SAF production facilities. Some potential next steps could be:

- **For RCM:** undertake a further study comparing the levelized cost of SAF with the cost of jet fuel to enable a more accurate estimate of the required SAF strike price and associated top up payments (a cost to the Dutch government) and the details of the allocation of risks under the RCM required to bring forward investment. Risk allocation will directly influence required rates of return which feed into the levelized cost of SAF. A thorough review of international precedents for RCM should also be undertaken to ensure lessons are learned.
- **For Blending Credit:** undertake a further study comparing the cost of 2G and 3G SAF imported to Netherlands versus Germany and other EU countries, net of any other cost advantages Netherlands may have e.g. from its existing port infrastructure. Additional consultation with foreign SAF producers and importers could be undertaken to help inform the design of the Blending Credit. This will enable a better cost to the Dutch government of this policy to be estimated. A thorough review of international precedents for Blending Credits should also be undertaken to ensure lessons are learned.
- **For the Targeted Feedstock Innovation Funding Programme:** undertake further investigation of the potential types of innovation which may be possible in feedstocks and their likelihood of success and impact (e.g. volume of additional feedstock which could become available) to inform the possible design of such a programme. Work on the eligibility criteria for innovators to receive the funding could also be undertaken. A thorough review of international precedents for TFIFPs should also be undertaken to ensure lessons are learned.

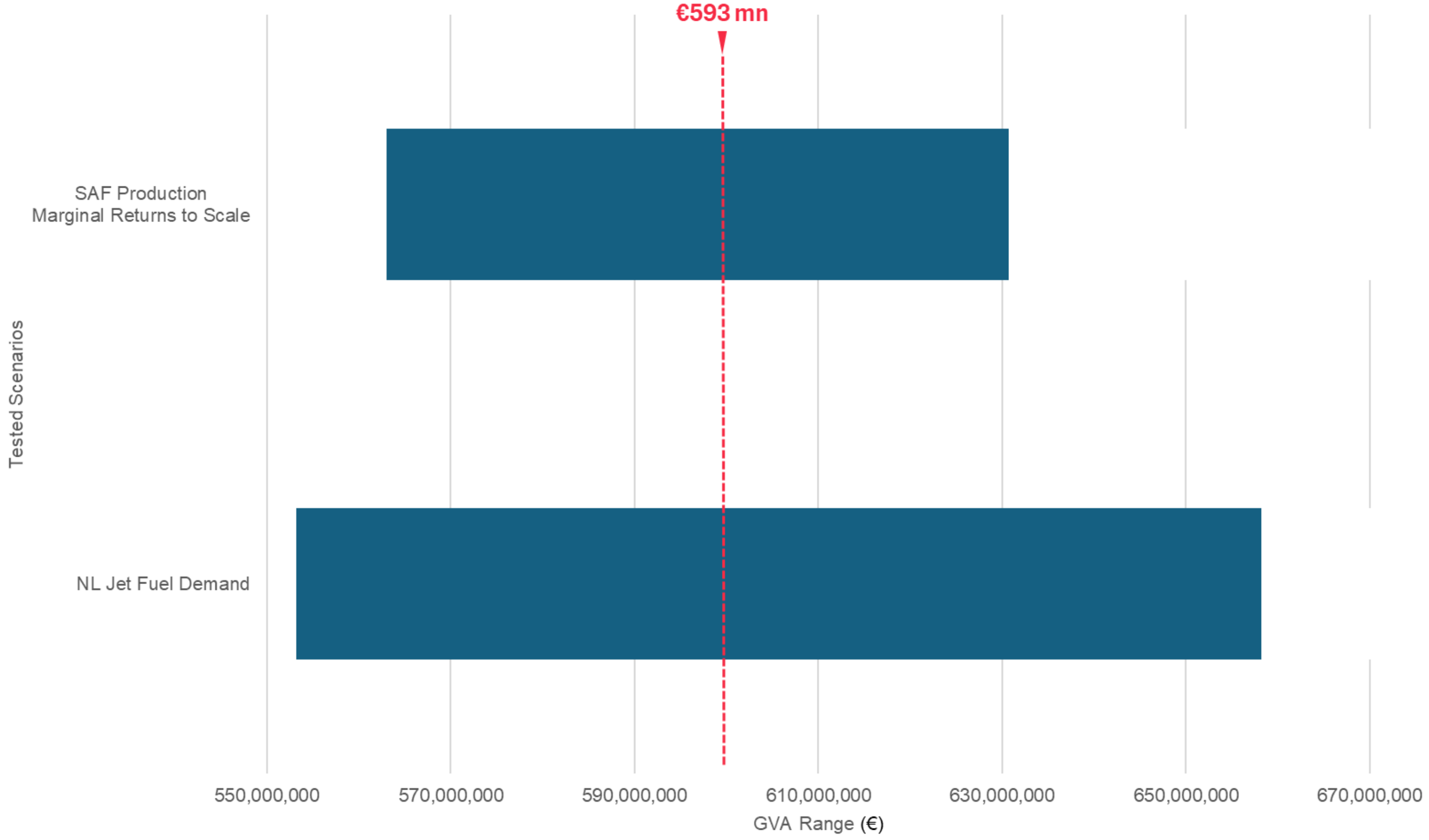
# 06

# Appendix

# In each scenario, the responses to the defined dimensions vary, reflecting the specific conditions of their envisioned "future-worlds"

| | **Scenario 1**<br>**Baseline Domestic SAF Production** | **Scenario 2**<br>**Medium Domestic SAF Production** | **Scenario 3**<br>**High Domestic SAF Production** |
|---|---|---|---|
| | *“No further policy intervention“. Existing interventions / funding would simply expire in the baseline scenario* | *Moderate policy intervention to increase investment attractiveness and address some regulatory permitting challenges* | *Strong and coordinated policy framework addressing multiple parts of the SAF value chain to stimulate supply, including eSAF* |
| NL strategic autonomy | Early first mover in EU 1G production, but not competitive in other SAF pathway markets | Early first mover in EU 1G production, fast follower in the 2G market | Early first mover in EU 1G production, fast follower in the 2G and 3G markets |
| NL SAF production 2030 / 2050 (thousand tonnes) | <br>737 2030<br>737 2050 | <br>1,587 2030<br>2,087 2050 | <br>1,587 2030<br>2,087 250 2050<br>Bio-SAF<br>eSAF |
| NL SAF import / export potential | Imports: **high**<br>Exports: **low** | Imports: **medium**<br>Exports: **medium** | Imports: **low**<br>Exports: **medium** |
| New SAF production pathway introduced into the NL scenario | **First** generation SAF technologies | **Second** generation SAF technologies | **Third** generation SAF technologies |
| Trade offs | Limited policy trade offs as the Dutch Government ‘does nothing’ | Certain policies to be implemented / changed in the Netherlands with **some repercussions and drawbacks** | Certain policies to be implemented / changed in the Netherlands with **multiple repercussions and drawbacks** |

# Economic Model Sensitivity Testing – Scenario 3 Direct GVA Range in 2050



*SAF Production Marginal Returns to Scale scenarios specified as: Low Scenario: 1% annual improvement in ratio of workers to SAF tonnes. High Scenario: 1% annual worsening in ratio of workers to SAF tonnes. NL Jet Fuel Demand scenarios specified as: Low Scenario: 0% annual growth in jet fuel demand, 0.96% efficiency gains and 10% reduction in SAF production. High Scenario: 5% annual growth in jet fuel demand, 0.96% efficiency gains and 10% increase in SAF production.*

- It is important to assess how **changes to the underlying parameters and assumptions** in the EIA model could affect the economic impact estimates. To assess this, sensitivity analysis has been performed for two critical assumptions to assess the potential range around Direct GVA estimated in 2050 in Scenario 3
- Overall, this analysis suggests a potential range of **Direct GVA of between c.€550m and c.€660m**, in comparison to the **central estimate of €593m.**
- **Sensitivity 1:** The EIA **assumes no productivity improvements** over time at SAF production facilities. However, **increasing economies of scale and learning over time** as SAF production becomes more established could lead **to increasing marginal returns to scale.** On the other hand, **difficulties in expanding production and diseconomies of scale** could also lead to **decreasing marginal returns to scale**. This is assessed through **varying the ratio of workers to tonnes of SAF produced**
- **Sensitivity 2:** The Dutch government has recently **limited flight movements at Schiphol to 478,000 per year** to reduce noise pollution in the surrounding area. Caps will constrain domestic NL demand for jet fuel. Alternatively, new government policy could feasibly be enacted relaxing these constraints, seeing NL jet fuel demand increase. The EIA **assumes 2.5% annual growth in aviation demand**. In the sensitivity testing, we explore 0% (to reflect flight cap) and 5% growth (to reflect ambitious growth) in jet fuel demand. This sensitivity also applies a **10% reduction and 10% boost** respectively in domestic SAF production. This reflects the fact that reduced/increased flight movements at Schiphol and changes to a large market in such close proximity may **likely shock producers' confidence** and lead to changes in production.
- In reality, production losses in the downside sensitivity could **be mitigated if producers found new export markets** to replace lost demand from reduced domestic growth - however, the 'worst-case scenario' is modelled for the purposes of sensitivity testing.

*Note: This analysis considers changes to underlying parameters in isolation. A dynamic model is required for a more detailed assessment of interconnected effects.*

# Economic Model Scenario Overview – GVA per Worker & Multipliers

GVA per worker has been calculated from CBS (2023) data. This was applied to FTE numbers to estimate GVA impacts:

| | Gross value added at basic prices | Compensation of employees | Compensation per FTE | GVA:Compensation of Employees | GVA per worker (2023 prices) | GVA per worker (2024 prices) |
|---|---|---|---|---|---|---|
| **SAF Feedstocks- crops** | € 17,903,000,000 | € 4,148,000,000 | € 51,100 | 4.32 | € 220,550.46 | € 227,828.62 |
| **SAF Feedstocks- waste** | € 76,770,000,000 | € 35,588,000,000 | € 77,300 | 2.16 | € 166,750.62 | € 172,253.39 |
| **SAF Feedstocks- electricity** | € 21,408,000,000 | € 3,138,000,000 | € 99,500 | 6.82 | € 678,806.88 | € 701,207.51 |
| **SAF Production** | € 2,686,000,000 | € 640,000,000 | € 124,000 | 4.20 | € 520,412.50 | € 537,586.11 |
| **eSAF Production** | € 7,441,000,000 | € 4,805,000,000 | € 105,800 | 1.55 | € 163,841.37 | € 169,248.14 |
| **SAF Construction** | € 15,960,000,000 | € 6,929,000,000 | € 75,600 | 2.30 | € 174,134.22 | € 179,880.65 |
| **SAF Logistics- transport** | € 15,894,000,000 | € 10,377,000,000 | € 66,000 | 1.53 | € 101,089.33 | € 104,425.28 |
| **SAF Logistics- storage** | € 17,733,000,000 | € 8,430,000,000 | € 78,300 | 2.10 | € 164,708.65 | € 170,144.03 |
| **Average worker** | € 944,801,000,000 | € 489,436,000,000 | € 71,400 | 1.93 | € 137,829.65 | € 142,378.03 |

To estimate indirect and induced figures, an average multiplier to the Direct Impacts was applied. This multiplier was informed by the following multipliers:

**1. Type I Output multipliers were constructed from CBS (2023) Input-Output tables (examples):**

| *2023* | Product | Type I Multipliers - Output |
|---|---|---|
| **SAF Feedstocks- crops** | Crop, animal production, hunting and related activities | 1.72 |
| **SAF Feedstocks- waste** | Wholesale trade, except of motor vehicles and motorcycles | 1.41 |
| **SAF Feedstocks- electricity** | Energy supply | 1.41 |
| **SAF Production** | Manufacture of coke and refined petroleum products | 1.19 |
| **eSAF Production** | Manufacture of chemicals and chemical products | 1.65 |
| **SAF Construction** | Construction of buildings | 2.00 |
| **SAF Logistics- transport** | Land transport and transport via pipelines | 1.59 |
| **SAF Logistics- storage** | Warehousing and support activities for transportation | 1.68 |

**2. Multipliers from other countries informed Type I and Type II Employment Multipliers and Type II Output Multipliers[1]:**

Scotland: Supply, Use and Input-Output Tables: 1998-2021 - gov.scot
Denmark: Multiplier Tables: Statistical presentation - Statistics Denmark
Belgium: Input-output tables: Multipliers 2020 | Federal Planning Bureau
UK: FTE multipliers and effects, reference year 2019 - Office for National Statistics

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[1] *Type II Output Multipliers were constructed by applying the ratio of Type I and Type II Output Multipliers from the benchmark countries to Type I Output Multipliers calculated from CBS*

**Sources** Sustainable Aviation Fuel for the Future – Iowa RFA (2024); SkyNRG data; Neste data; Power2X data; Spain: Study on the impacts related to the ecological transition in the aviation sector - PwC (2023); SAF Occupation Opportunities - Rhodium Group (2023);

# Economic Model Scenario Overview – SAF Production

| **Scenario 1**<br>Baseline Domestic SAF Production | **Scenario 2**<br>Medium Domestic SAF Production | **Scenario 3**<br>High Domestic SAF Production |
|---|---|---|

**1. SAF production volumes:**

| Scenario 1 | Scenario 2 | Scenario 3 |
|---|---|---|
| • c.700k tonnes of annual SAF production in NL is estimated based on production at existing facilities.<br>• This figure remains constant throughout until 2050 with no growth in production. | • c.700k tonnes annually of SAF production (Scenario 1 level) is constant until 2028. In 2028, two additional SAF plants come into operation, increasing total production to c.1,600k tonnes annually.<br>• In 2040, a 2G plant begins operating, producing 500k tonnes SAF annually and bringing total NL production to c.2,100k tonnes p.a. which continues until 2050. | • The same level of 1G and 2G SAF production is assumed as per Scenario 2.<br>• In 2035, 250k tonnes of eSAF production annually becomes available, which continues until 2050. |

**2. FTE estimates (operation):**

- Employment ratios per 100k tonnes SAF are estimated and then applied to tonnes SAF production.
- Ratio is informed by production volumes and employee figures at existing SAF plants (Neste, Chane), stakeholder interviews and benchmarking.
- Where SAF is produced alongside other products, SAF as a % of total production is estimated and this ratio is used to estimate total plant employees.
- Example ratio: 75 FTE per 100k tonne SAF (published in SkyNRG report).

**3. FTE estimates (construction):**

| Scenario 1 | Scenario 2 | Scenario 3 |
|---|---|---|
| • No new SAF production plants are built and therefore there is no new employment associated with construction. | • Data relating to numbers of construction workers and construction periods from announced NL SAF plant constructions (SkyNRG, Neste) were benchmarked against global studies (i.e. Iowa SAF Study construction ratios) to inform construction FTEs. | • Construction ratios were applied as in Scenario 2, adjusted to reflect general construction FTE ratios informed by Rhodium Group study.<br>• Figures benchmarked and sense-checked against multiple other sources. |

Please note exact inputs cannot always be provided due to retain confidentiality of stakeholder data.

Sources

Feedstocks for sustainable aviation fuels in the Netherland – NLR (2020); SAF Market Outlook- SkyNRG (2024); Chane data; Amsterdam Biodiesel data (2010); Attero (2024); AEB Amsterdam (2024); Quatra; Technip Energies (2024); SAF Occupation Opportunities - Rhodium Group (2023); Power2X data; CBS

# Economic Model Scenario Overview – SAF Feedstocks

**Scenario 1**
Baseline Domestic SAF Production

**Scenario 2**
Medium Domestic SAF Production

**Scenario 3**
High Domestic SAF Production

## 1. Feedstock volumes:

- From 2030 estimated NL feedstock volumes (NLR) an estimated proportion (%) that is attributable to aviation was calculated (SkyNRG) – see table, right.
- A 5% CAGR was interpolated from 2025 to 2030 to reach these volumes. No growth in feedstock volumes were assumed from 2030 onwards.
- The same feedstock volumes were used for Scenario 1 and 2 as it is assumed that no additional feedstock capacity can be accessed for 1G and 2G pathways beyond 2030.

| Feedstock | Aviation % Claim | 2030 Total for SAF (tonnes) |
|---|---|---|
| UCO | 50% | 70,500 |
| MSW | 20% | 120,000 |
| Energy Crops | 20% | 90,130 |

- The same feedstock volumes as Scenarios 1 and 2 were assumed to 2030. Feedstock volumes increase by the addition of electricity as a feedstock for eSAF.
- For 250k tonnes eSAF production, we apply an industry ratio of power to tonnes SAF produced to estimate electricity required as an input (7.5 TWh for 250k tonne SAF- Power2X).
- 50% of this electricity is assumed to be domestically produced and 50% can be attributed as ‘new economic activity’ catalysed through SAF production.

## 2. FTE estimates:

- For each feedstock type, a ratio of Direct FTE per tonne of feedstock for production/collection was estimated based on a range of sources:
  - UCO: Ratio of FTEs per 100k feedstock was calculated using Amsterdam Biodiesel collection data, Quatra data and attribution of % of activity to NL. (Example ratio: 63 FTE per 100k biodiesel (Amsterdam Biodiesel data))
  - MSW: Ratio of FTEs per 100k feedstock was informed by analysing selection of example MSW collection companies – the tonnes of waste collected and their employee numbers.
  - Energy crops: Ratio informed by agricultural workers per SAF production plant data (e.g. Rhodium Group analysis).
- The collection of feedstock was estimated for ‘waste’ feedstocks – no original production of the feedstock was captured as production would occur regardless of its use in SAF.
- Figures benchmarked, adjusted and sense-checked against multiple other sources.

- The same FTE estimates for 1G and 2G feedstocks were used as in Scenarios 1 and 2.
- CBS data was used to estimate (1) the FTE employed in energy sector in NL and (2) total NL electricity production as proportion of total NL energy supply.
- The % from (2) was applied to (1) to estimate a ratio of FTEs per 100m kWH power.

Please note exact inputs cannot always be provided due to retain confidentiality of stakeholder data.

Sources

Research on infrastructure for sustainable aviation fuels - MinI&W (2024); Air Passenger Demand Forecast - IATA (2025); Environmental Trends in Aviation - ICAO (2022); Economic impact of biodiesel on the US economy – GlobalData (2024); VOTOB; FETSA

# Economic Model Scenario Overview – SAF intermediaries

| **Scenario 1**<br>Baseline Domestic SAF Production | **Scenario 2**<br>Medium Domestic SAF Production | **Scenario 3**<br>High Domestic SAF Production |
|---|---|---|

**1. Jet fuel demand:**

- NL jet fuel demand of c.4m tonnes in 2025 is estimated to grow at 2.5% annually, adjusted for 0.96% efficiency gains, to project annual demand to 2050 (broadly in line with IATA's European forecast).
- The ReFuelEU mandate % are applied to jet fuel demand to estimate SAF demand in the NL.

**2. Feedstock and SAF volumes:**

- Logistics, storage and transportation of SAF and SAF feedstocks is modelled which is required to facilitate (1) domestic production and consumption and (2) imports and exports.
- All domestic feedstock is utilised for domestic SAF production – any shortfall in feedstock required for SAF production that cannot be met by domestic feedstock supply is imported
- All domestic SAF production is first consumed within NL to meet domestic demand – any excess is exported.
- Finished SAF is imported to meet domestic demand (in line with the ReFuelEU mandate) if domestic SAF production is not sufficient.

**3. SAF intermediaries FTE estimates (operational workers):**

- Logistics, storage and transportation employment ratios associated with domestic production of SAF and SAF feedstocks is estimated through data provided by interviewees, and this is applied to SAF production volumes in each scenario. Example ratio: 2-5 FTEs per 100k tonne SAF.
- Logistics, storage and transportation employment ratios associated with import and export of SAF and SAF feedstocks is estimated through benchmarked data from the GlobalData Economic Impact Assessment of biodiesel. These were then adjusted for the SAF industry based on insights from interviewees. This ratio is then applied to estimated SAF import and export volumes.
- When applying multipliers to Direct FTE estimates relating to import activity, an adjustment is applied to account for leakage effects (e.g. the greater expected inputs from overseas supply chain.)

Please note exact inputs cannot always be provided due to retain confidentiality of stakeholder data.

# Economic Model Scenario Overview – SAF Production Import/Export Volumes

**ReFuelEU Mandates:**

| | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|
| BioSAF % | 4.8% | 15.0% | 24.0% | 27.0% | 35.0% |
| eSAF % | 1.2% | 5.0% | 10.0% | 15.0% | 35.0% |

**Scenario 1 Import/Export Volumes (tonnes):**

| | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|
| BioSAF Produced | 737,000 | 737,000 | 737,000 | 737,000 | 737,000 |
| BioSAF Imported | - | - | 459,069 | 713,713 | 1,290,487 |
| BioSAF Exported | 531,202 | 43,632 | - | - | - |
| BioSAF % Exported | 72% | 6% | 0% | 0% | 0% |
| eSAF Produced | - | - | - | - | - |
| eSAF Imported | 51,450 | 231,123 | 498,362 | 805,951 | 2,027,487 |

**Scenario 2 Import/Export Volumes (tonnes):**

| | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|
| BioSAF Produced | 1,587,000 | 1,587,000 | 2,087,000 | 2,087,000 | 2,087,000 |
| BioSAF Imported | - | - | - | - | - |
| BioSAF Exported | 1,381,202 | 893,632 | 890,931 | 636,287 | 59,513 |
| BioSAF % Exported | 87% | 56% | 43% | 30% | 3% |
| eSAF Produced | - | - | - | - | - |
| eSAF Imported | 51,450 | 231,123 | 498,362 | 805,951 | 2,027,487 |

**Scenario 3 Import/Export Volumes (tonnes):**

| | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|
| BioSAF Produced | 1,587,000 | 1,587,000 | 2,087,000 | 2,087,000 | 2,087,000 |
| BioSAF Imported | - | - | - | - | - |
| BioSAF Exported | 1,381,202 | 893,632 | 890,931 | 636,287 | 59,513 |
| BioSAF % Exported | 87% | 56% | 43% | 30% | 3% |
| eSAF Produced | - | 250,000 | 250,000 | 250,000 | 250,000 |
| eSAF Imported | 51,450 | - | 248,362 | 555,951 | 1,777,487 |
| eSAF Exported | - | 18,877 | - | - | - |
| eSAF % Exported | 0% | 8% | 0% | 0% | 0% |

# Economic Model Scenario Overview – SAF Feedstock Import Volumes

**Scenario 1 Import Volumes:**

| | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|
| UCO Produced | 70,500 | 70,500 | 70,500 | 70,500 | 84,600 |
| MSW Produced | 120,000 | 120,000 | 120,000 | 120,000 | 120,000 |
| Energy Crops Produced | 90,130 | 90,130 | 90,130 | 90,130 | 90,130 |
| 1G Feedstock Imported | 1,444,587 | 1,444,587 | 1,444,587 | 1,444,587 | 1,430,487 |
| 2G Feedstock Imported | - | - | - | - | - |

**Scenario 2 Import Volumes:**

| | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|
| UCO Produced | 70,500 | 70,500 | 70,500 | 70,500 | 84,600 |
| MSW Produced | 120,000 | 120,000 | 120,000 | 120,000 | 120,000 |
| Energy Crops Produced | 90,130 | 90,130 | 90,130 | 90,130 | 90,130 |
| 1G Feedstock Imported | 3,191,974 | 3,191,974 | 4,219,848 | 4,219,848 | 4,205,748 |
| 2G Feedstock Imported | - | - | 2,723,722 | 2,723,722 | 2,723,722 |

**Scenario 3 Import Volumes:**

| | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|
| UCO Produced | 70,500 | 70,500 | 70,500 | 70,500 | 84,600 |
| MSW Produced | 120,000 | 120,000 | 120,000 | 120,000 | 120,000 |
| Energy Crops Produced | 90,130 | 90,130 | 90,130 | 90,130 | 90,130 |
| 1G Feedstock Imported | 3,191,974 | 3,705,911 | 4,733,786 | 4,733,786 | 4,719,686 |
| 2G Feedstock Imported | - | - | 2,723,722 | 2,723,722 | 2,723,722 |

*% domestic feedstocks aviation can claim increases in 2050*

# Economic Model Scenario Overview – Feedstock FTE

**Scenario 1 Feedstock FTE:**

| | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 188 |
| Indirect | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 103 |
| Induced | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 53 |

**Scenario 2 Feedstock FTE:**

| | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 168 | 188 |
| Indirect | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 103 |
| Induced | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 49 | 53 |

**Scenario 3 Feedstock FTE:**

| | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct | 168 | 168 | 168 | 168 | 168 | 418 | 418 | 418 | 418 | 418 | 418 | 418 | 418 | 418 | 418 | 418 | 418 | 418 | 418 | 418 | 437 |
| Indirect | 93 | 93 | 93 | 93 | 93 | 706 | 706 | 706 | 706 | 706 | 706 | 706 | 706 | 706 | 706 | 706 | 706 | 706 | 706 | 706 | 716 |
| Induced | 49 | 49 | 49 | 49 | 49 | 413 | 413 | 413 | 413 | 413 | 413 | 413 | 413 | 413 | 413 | 413 | 413 | 413 | 413 | 413 | 417 |

# Economic Model Scenario Overview – Production FTE

## Scenario 1 Production FTE:

| | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 |
| Indirect | 455 | 455 | 455 | 455 | 455 | 455 | 455 | 455 | 455 | 455 | 455 | 455 | 455 | 455 | 455 | 455 | 455 | 455 | 455 | 455 | 455 |
| Induced | 282 | 282 | 282 | 282 | 282 | 282 | 282 | 282 | 282 | 282 | 282 | 282 | 282 | 282 | 282 | 282 | 282 | 282 | 282 | 282 | 282 |

## Scenario 2 Production FTE:

| | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct | 298 | 298 | 298 | 298 | 298 | 298 | 298 | 1,033 | 1,033 | 1,033 | 450 | 450 | 450 | 450 | 450 | 450 | 450 | 450 | 450 | 450 | 450 |
| Indirect | 1,165 | 1,165 | 1,165 | 1,165 | 1,165 | 1,165 | 1,165 | 1,919 | 1,919 | 1,919 | 1,759 | 1,759 | 1,759 | 1,759 | 1,759 | 1,759 | 1,759 | 1,759 | 1,759 | 1,759 | 1,759 |
| Induced | 724 | 724 | 724 | 724 | 724 | 724 | 724 | 1,149 | 1,149 | 1,149 | 1,092 | 1,092 | 1,092 | 1,092 | 1,092 | 1,092 | 1,092 | 1,092 | 1,092 | 1,092 | 1,092 |

## Scenario 3 Production FTE:

| | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct | 298 | 298 | 1,033 | 1,033 | 1,033 | 450 | 450 | 1,185 | 1,185 | 1,185 | 602 | 602 | 602 | 602 | 602 | 602 | 602 | 602 | 602 | 602 | 602 |
| Indirect | 1,165 | 1,165 | 1,919 | 1,919 | 1,919 | 1,357 | 1,357 | 2,111 | 2,111 | 2,111 | 1,951 | 1,951 | 1,951 | 1,951 | 1,951 | 1,951 | 1,951 | 1,951 | 1,951 | 1,951 | 1,951 |
| Induced | 724 | 724 | 1,149 | 1,149 | 1,149 | 861 | 861 | 1,286 | 1,286 | 1,286 | 1,229 | 1,229 | 1,229 | 1,229 | 1,229 | 1,229 | 1,229 | 1,229 | 1,229 | 1,229 | 1,229 |

*Includes construction FTE*

# Economic Model Scenario Overview – Logistics FTE

## Scenario 1 Logistics FTE:

| | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct | 124 | 124 | 127 | 127 | 127 | 108 | 108 | 107 | 107 | 107 | 143 | 144 | 145 | 147 | 148 | 171 | 173 | 175 | 177 | 179 | 263 |
| Indirect | 41 | 41 | 41 | 41 | 41 | 44 | 44 | 44 | 44 | 44 | 57 | 58 | 58 | 59 | 59 | 67 | 68 | 69 | 69 | 70 | 100 |
| Induced | 96 | 96 | 99 | 99 | 99 | 91 | 91 | 91 | 90 | 90 | 123 | 124 | 126 | 127 | 128 | 149 | 151 | 152 | 154 | 156 | 232 |

## Scenario 2 Logistics FTE:

| | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct | 274 | 274 | 277 | 277 | 277 | 258 | 258 | 258 | 257 | 257 | 479 | 478 | 478 | 477 | 476 | 481 | 481 | 480 | 480 | 479 | 514 |
| Indirect | 145 | 145 | 146 | 146 | 146 | 151 | 151 | 152 | 152 | 152 | 308 | 308 | 309 | 309 | 309 | 319 | 320 | 320 | 321 | 321 | 363 |
| Induced | 151 | 151 | 153 | 153 | 153 | 142 | 142 | 142 | 142 | 141 | 264 | 263 | 263 | 263 | 262 | 265 | 265 | 265 | 264 | 264 | 283 |

## Scenario 3 Logistics FTE:

| | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct | 274 | 274 | 277 | 277 | 277 | 279 | 278 | 278 | 277 | 276 | 497 | 497 | 496 | 496 | 495 | 500 | 500 | 499 | 499 | 498 | 532 |
| Indirect | 145 | 145 | 146 | 146 | 146 | 165 | 165 | 165 | 165 | 165 | 321 | 322 | 322 | 322 | 323 | 333 | 333 | 334 | 334 | 334 | 377 |
| Induced | 151 | 151 | 153 | 153 | 153 | 154 | 153 | 153 | 152 | 152 | 274 | 274 | 273 | 273 | 273 | 275 | 275 | 275 | 275 | 274 | 293 |

# Economic Model Scenario Overview – Feedstock GVA

## Scenario 1 Feedstock GVA:

| € Mil | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 32 |
| Indirect | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 15 |
| Induced | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 12 |

## Scenario 2 Feedstock GVA:

| € Mil | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 29 | € 32 |
| Indirect | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 14 | € 15 |
| Induced | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 11 | € 12 |

## Scenario 3 Feedstock GVA:

| € Mil | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct | € 29 | € 29 | € 29 | € 29 | € 29 | € 204 | € 204 | € 204 | € 204 | € 204 | € 204 | € 204 | € 204 | € 204 | € 204 | € 204 | € 204 | € 204 | € 204 | € 204 | € 207 |
| Indirect | € 14 | € 14 | € 14 | € 14 | € 14 | € 86 | € 86 | € 86 | € 86 | € 86 | € 86 | € 86 | € 86 | € 86 | € 86 | € 86 | € 86 | € 86 | € 86 | € 86 | € 88 |
| Induced | € 11 | € 11 | € 11 | € 11 | € 11 | € 56 | € 56 | € 56 | € 56 | € 56 | € 56 | € 56 | € 56 | € 56 | € 56 | € 56 | € 56 | € 56 | € 56 | € 56 | € 58 |

# Economic Model Scenario Overview – Production GVA

**Scenario 1 Production GVA:**

| € Mil | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct | € 63 | € 63 | € 63 | € 63 | € 63 | € 63 | € 63 | € 63 | € 63 | € 63 | € 63 | € 63 | € 63 | € 63 | € 63 | € 63 | € 63 | € 63 | € 63 | € 63 | € 63 |
| Indirect | € 12 | € 12 | € 12 | € 12 | € 12 | € 12 | € 12 | € 12 | € 12 | € 12 | € 12 | € 12 | € 12 | € 12 | € 12 | € 12 | € 12 | € 12 | € 12 | € 12 | € 12 |
| Induced | € 6 | € 6 | € 6 | € 6 | € 6 | € 6 | € 6 | € 6 | € 6 | € 6 | € 6 | € 6 | € 6 | € 6 | € 6 | € 6 | € 6 | € 6 | € 6 | € 6 | € 6 |

**Scenario 2 Production GVA:**

| € Mil | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct | € 160 | € 160 | € 160 | € 160 | € 160 | € 160 | € 160 | € 292 | € 292 | € 292 | € 242 | € 242 | € 242 | € 242 | € 242 | € 242 | € 242 | € 242 | € 242 | € 242 | € 242 |
| Indirect | € 30 | € 30 | € 30 | € 30 | € 30 | € 30 | € 30 | € 163 | € 163 | € 163 | € 46 | € 46 | € 46 | € 46 | € 46 | € 46 | € 46 | € 46 | € 46 | € 46 | € 46 |
| Induced | € 16 | € 16 | € 16 | € 16 | € 16 | € 16 | € 16 | € 87 | € 87 | € 87 | € 24 | € 24 | € 24 | € 24 | € 24 | € 24 | € 24 | € 24 | € 24 | € 24 | € 24 |

**Scenario 3 Production GVA:**

| € Mil | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct | € 160 | € 160 | € 292 | € 292 | € 292 | € 214 | € 214 | € 346 | € 346 | € 346 | € 296 | € 296 | € 296 | € 296 | € 296 | € 296 | € 296 | € 296 | € 296 | € 296 | € 296 |
| Indirect | € 30 | € 30 | € 163 | € 163 | € 163 | € 47 | € 47 | € 179 | € 179 | € 179 | € 62 | € 62 | € 62 | € 62 | € 62 | € 62 | € 62 | € 62 | € 62 | € 62 | € 62 |
| Induced | € 16 | € 16 | € 87 | € 87 | € 87 | € 24 | € 24 | € 94 | € 94 | € 94 | € 32 | € 32 | € 32 | € 32 | € 32 | € 32 | € 32 | € 32 | € 32 | € 32 | € 32 |

*Includes construction GVA*

# Economic Model Scenario Overview – Logistics GVA

## Scenario 1 Logistics GVA:

| € Mil | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct | € 21 | € 21 | € 22 | € 22 | € 22 | € 18 | € 18 | € 18 | € 18 | € 18 | € 24 | € 25 | € 25 | € 25 | € 25 | € 29 | € 29 | € 30 | € 30 | € 30 | € 45 |
| Indirect | € 14 | € 14 | € 15 | € 15 | € 15 | € 13 | € 13 | € 12 | € 12 | € 12 | € 17 | € 17 | € 17 | € 17 | € 17 | € 20 | € 20 | € 20 | € 21 | € 21 | € 31 |
| Induced | € 11 | € 11 | € 11 | € 11 | € 11 | € 9 | € 9 | € 9 | € 9 | € 9 | € 12 | € 12 | € 13 | € 13 | € 13 | € 15 | € 15 | € 15 | € 15 | € 15 | € 23 |

## Scenario 2 Logistics GVA:

| € Mil | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct | € 47 | € 47 | € 47 | € 47 | € 47 | € 44 | € 44 | € 44 | € 44 | € 44 | € 81 | € 81 | € 81 | € 81 | € 81 | € 82 | € 82 | € 82 | € 82 | € 82 | € 87 |
| Indirect | € 32 | € 32 | € 32 | € 32 | € 32 | € 30 | € 30 | € 30 | € 30 | € 30 | € 56 | € 56 | € 56 | € 55 | € 55 | € 56 | € 56 | € 56 | € 56 | € 56 | € 60 |
| Induced | € 24 | € 24 | € 24 | € 24 | € 24 | € 22 | € 22 | € 22 | € 22 | € 22 | € 41 | € 41 | € 41 | € 41 | € 41 | € 42 | € 42 | € 42 | € 42 | € 42 | € 45 |

## Scenario 3 Logistics GVA:

| € Mil | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 | 2049 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct | € 47 | € 47 | € 47 | € 47 | € 47 | € 47 | € 47 | € 47 | € 47 | € 47 | € 85 | € 85 | € 84 | € 84 | € 84 | € 85 | € 85 | € 85 | € 85 | € 85 | € 91 |
| Indirect | € 32 | € 32 | € 32 | € 32 | € 32 | € 32 | € 32 | € 32 | € 32 | € 32 | € 58 | € 58 | € 58 | € 58 | € 58 | € 58 | € 58 | € 58 | € 58 | € 58 | € 62 |
| Induced | € 24 | € 24 | € 24 | € 24 | € 24 | € 24 | € 24 | € 24 | € 24 | € 24 | € 43 | € 43 | € 43 | € 43 | € 43 | € 43 | € 43 | € 43 | € 43 | € 43 | € 46 |

# Scoring Criteria

| Key criteria and success factors | 1: Very low | 2: Low | 3: Moderate | 4: High | 5: Very high |
|---|---|---|---|---|---|
| **Strategic Fit and National Needs** | The intervention has little to no alignment with national SAF goals or broader policy priorities. | The intervention shows limited alignment with strategic priorities and would offer marginal contribution to SAF objectives. | The intervention supports some strategic aims but lacks clear or comprehensive alignment with broader policy needs. | The intervention aligns well with national SAF ambitions and broader policy goals, offering meaningful strategic value. | The intervention is strongly aligned with all key strategic priorities and directly advances core national SAF objectives. |
| **Potential Value for Money** | The intervention delivers minimal benefit relative to cost and shows weak economic justification. | The intervention may generate some value but is unlikely to be cost-effective overall. | The intervention has a balanced cost–benefit profile, with reasonable but not strong value for money. | The intervention provides strong benefits that justify the cost and offers good economic value. | The intervention delivers substantial benefits relative to cost and represents excellent value for money. |
| **Supplier Capacity and Capability** | Required supplier capability is largely absent and unlikely to develop in the near term. | Supplier capability exists only in limited pockets and would require significant effort to scale. | Some capacity exists, and suppliers could scale with targeted support. | Suppliers have strong existing capability and are well positioned to scale effectively. | Suppliers already have extensive capability and capacity to deliver at scale with minimal barriers. |
| **Potential Affordability** | The intervention is financially difficult to sustain and poses major affordability concerns. | The intervention is challenging to afford and may risk long-term fiscal strain or market distortion. | The intervention is broadly affordable but may require trade-offs or careful financial management. | The intervention is financially manageable with limited risks or budgetary pressure. | The intervention is easily affordable and presents minimal financial or state-aid risks. |
| **Feasibility for the Dutch Government** | Implementation is highly complex, politically challenging, or faces major legal and regulatory barriers. | Implementation is possible but would require significant effort, coordination, or regulatory change. | Implementation is feasible with manageable complexity and some policy adjustments. | Implementation is straightforward with clear regulatory pathways and strong stakeholder support. | Implementation is simple, low-risk, and fully aligned with existing regulatory frameworks. |
| **Time to Realisation** | The intervention would take a long time to influence SAF deployment due to major development or permitting constraints. | The intervention could have an effect but only in the medium-to-long term. | The intervention would begin delivering benefits within a reasonable timeframe | The intervention is likely to generate impact relatively quickly after implementation. | The intervention would deliver rapid, near-term impact with minimal delay. |

# Bringing Ingenuity to Life.

**About PA.**

We believe in the power of ingenuity to build a positive human future.

As strategies, technologies, and innovation collide, we create opportunity from complexity.

Our diverse teams of experts combine innovative thinking and breakthrough technologies to progress further, faster. Our clients adapt and transform, and together we achieve enduring results.

We are about 4,000 strategists, innovators, designers, consultants, digital experts, scientists, engineers, and technologists. And we have deep expertise in consumer and manufacturing, defence and security, energy and utilities, financial services, government and public services, health and life sciences, and transport.

Our teams operate globally from offices across the UK, Ireland, US, Nordics, and Netherlands.

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