

IMPACT OF A CO₂ CEILING ON AIRLINE MARKET ACCESS AT SCHIPHOL

NOTE

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Management summary

About this study

This study analyses the impact of the proposed carbon dioxide (CO₂) ceiling for departing international flights from the Netherlands. The legal and economic aspects of this proposed ceiling are studied via desk research with respect to their interaction with other (sustainability) policies, its effect on airlines, business strategies and competition outcomes. The study has been commissioned by the Ministry of Infrastructure and Water Management (hereafter: "I&W") and aims to support I&W in identifying the possible adverse consequences (and potential mitigation measures) of the CO₂ ceiling for the exercise of the rights contained in international aviation agreements.

The CO₂ ceiling sets an CO₂ emission target for flights departing the Netherlands with the aim of gradually phasing out emissions by 2070. The ceiling sets CO₂ emission targets for 2030, 2050 and 2070, with a linear transition path and three-year enforcement periods. As such, the ceiling could potentially affect the capacity declaration of the relevant airports over time.

A binding CO₂ ceiling resulting in a reduction of slot capacity can be considered more probable than not. This conclusion is based on the model outcomes in two previous studies commissioned by I&W and external developments, namely: the recently announced and higher than earlier anticipated number of 478,000 yearly air transport movements (ATMs) allowable under the noise cap at Schiphol and the faster than in earlier studies anticipated ATM recovery from the COVID-19 pandemic years.

Economic theory suggests that a binding CO₂ ceiling that substantially reduces the slot capacity would provide a greater incentive to airlines with a higher share in slots than those with a minor share. The incentive and ability to reduce CO₂ emissions depend on the airlines' market position. More likely than not, the CO₂ ceiling would affect the business strategies and potentially the market position of airlines operating at Schiphol.

This study has been executed between Q3 2024 and Q1 2025, using the available insights available up until Q4 2024. For this desk research, no new forecasts, modelling results or flanking policies (such as a distance-based ticket tax) are considered. The starting point of the analysis are the forecasts presented in two previous studies executed by CE Delft in 2022. Below we summarise our main findings per research question.

What consequences does the introduction of the CO₂ ceiling have for the rights contained in the EU-US treaty?

From a legal perspective, the introduction by the Netherlands of a CO₂ ceiling does not immediately appear to have a direct consequence for the EU-US Air Transport Agreement. Although EU and US airlines have the rights to operate unlimited scheduled international air services, the exercise of such rights is dependent upon available capacity, access to which is allocated via a corresponding slot at congested airports. While not affecting traffic rights, the CO₂ ceiling may lead to a reduction in the number of slots available at Dutch airports. Recent experiences with the announced reduction of ATMs at Schiphol have shown that there would likely be a strong international reaction to limiting the number of slots. As a party to the agreement, the Netherlands must not unilaterally place limitations on the volume of traffic or aircraft type unless environmental reasons exist (Article 3(4)). Furthermore, subject to Article 15(2), the Netherlands may be asked to provide a description of the evaluation of any adverse effects of the measures. Additionally, if the European Commission finds that a binding CO₂ ceiling is not justified by environmental reasons, it may launch infringement proceedings against the Netherlands.

Are these consequences the same for parties from other countries?

From a legal perspective, the consequences flowing from the introduction by the Netherlands of a CO₂ ceiling differ from State to State. It depends on the terms of the agreement between a State and the Netherlands (bilaterally) or the Netherlands (as part of the EU). For an example at the more stringent end of the spectrum, the Canada-EU Agreement on Air Transport has similar provisions to the EU-US Air Transport Agreement mentioned above, but with an important qualifier on environmental reasons as 'local air quality and noise' (Article 13(2)), which could be interpreted as linked to a CO₂ ceiling. This agreement requires the parties to exchange information on changes to domestic law by way of the Joint Committee (Article 17(6)). For another example, the bilateral air services agreement between the Netherlands and Brazil, which entered into force in 2021, provides that any measure that either State takes in relation to the environment must (merely) be 'fully consistent with their rights and obligations under international law' (Article 18(2)).

From the economic perspective, the consequences of the CO₂ ceiling depend on aviation regulation nationally and internationally as well as the demand for aviation services. The models from the two previous studies by CE Delft in combination with the current status of the proposed noise cap as well as the faster than expected demand recovery after COVID-19, suggest that the CO₂ ceiling would be binding from the year of its introduction, i.e. 2025 until 2045, and would require a cut in the number of historical slots of about 5 to 6 per cent in the first enforcement period of the ceiling. A binding CO₂ ceiling might result in a capacity reduction during which the proportion of historical (slot) rights between airlines remains constant. In such a circumstance, it is to be expected that airlines and alliances with a larger share of flights and emissions at Schiphol would be proportionally more affected than airlines with small shares or future new entrants. Furthermore, foreign airlines operating a minority share of flights from the Netherlands have alternatives to use other airports in Europe or other fleet composition, whereas the home-based carrier would not have this option.

How do the effects relate to aviation treaties?

From the legal perspective, access to airports should be granted by the Netherlands on a non-discriminatory basis to aircraft of any other contracting State of the Convention on International Civil Aviation (Chicago Convention) 1944 (Article 15). This duty flows from the guiding principle of non-discrimination and equal treatment that guides the Chicago System of international air law and practice (Article 11). In addition to non-EU/EEA airlines, the effect of a CO₂ ceiling might limit the exercise of traffic rights for EU/EEA airlines, which prompts questions over the legitimacy of such a measure under EU law. With that said, the exercise of traffic rights granted via the Air Services Regulation 1008/2008 is subject to EU, national, regional and local operational rules relating to, among other things, protection of the environment and allocation of slots (Article 19(1)). A Member State may adopt temporary environmental measures that limit or refuse the exercise of traffic rights if they are non-discriminatory and do not distort competition between airlines (Article 20).

From the economic perspective, the CO₂ ceiling and its effect are interrelated with national and international sustainability regulation. Most sustainability regulations affect the costs of airline inputs or increase passenger duties whereas the ceiling affects the availability of slots.

Can these consequences be justified? If not, what mitigating measures can be taken?

From a legal perspective, at international level ICAO Member States must apply laws and regulations in a non-discriminatory manner, without distinction as to nationality of aircraft (Chicago Convention, Article 11). Therefore, any consequences on airport (and consequently market) access may be justified on the basis that the CO₂ ceiling will apply to all airlines, Dutch, European and others. Under EU law, the Netherlands must notify the European Commission and other Member States of the (binding) CO₂ ceiling at least three months before the action (limiting

or refusing the exercise of traffic rights) enters into force, an appropriate justification for the measure must be given, and the Netherlands will most likely be required to produce evidence of a 'serious environmental problem' (Articles 20(1) and 20(2) of the Air Services Regulation).

From the economic perspective, the effect of a binding CO₂ ceiling would imply a reduction of anticipated airport capacity at Schiphol by up to 6 per cent. Airlines can adjust their routes, fleet and fuel blending to stay under the ceiling, but the incentives and ability to adapt differs substantially between airlines.

What timing of the adverse effects can be mapped out?

From the economic perspective, the amount of initial overshoot of the modelled CO₂ emissions above the CO₂ ceiling in the previous studies amounts to about 20,000 ATMs if introduced in 2025. When this reduction persists over a sufficiently long period of time, this may lead to a loss of historical slot claims if no other measures are taken by airlines. For most if not all scenarios of the previous CE Delft studies, the CO₂ ceiling is binding if it were introduced by 2025 since the ATM cap for noise currently considered is above the modelled CO₂ ceiling which is about 450,000 ATMs. The first emission target year of the CO₂ ceiling is 2030, under which the modelled permissible ATMs would be 25,000 to 35,000 flights below the noise cap. In this case, the CO₂ ceiling would be binding from 2030 onwards.

1 Introduction

Background

To meet the CO₂ reduction targets dictated by the Civil Aviation Policy Memorandum (Luchtvaartnota 2020-2050), a CO₂ ceiling for departing flights from the Netherlands is proposed in the same memorandum. In this way, CO₂ would become a factor for the development of Dutch civilian airports, akin to noise and (external) safety (Luchtvaartnota, 2020). The Dutch government made a preliminary decision in introducing and formulating this CO₂ ceiling in 2023 (I&W, 2023). The CO₂ ceiling specifies emission targets but does not specify an amount of air transport movements (ATMs). The number of ATMs may develop within the boundaries set by these CO₂ emission targets or any other targets. The CO₂ ceiling might provide a cap on the ATMs to ensure that CO₂ emissions from (international) flights departing from the Netherlands remain within the imposed limit (I&W, 2023).

The Ministry of Infrastructure & Water Management (hereafter: "I&W") commissioned SEO Amsterdam Economics to study the economic and legal impacts for airlines of the proposed CO₂ ceiling. I&W formulated three so-called CO₂ ceiling scenarios:

- A. CO₂ ceiling legislation is adopted, but is not/never becomes the binding restriction (given flanking policy measures and exogenous demand and supply developments);
- B. CO₂ limits are laid down in the separate airport decisions, but these are not/never become the binding restriction; or
- C. CO₂ limits are laid down in the separate airport decisions, and these limits (possibly) become binding, requiring the sector to take measures.

We address all three CO₂ ceiling scenarios, but the majority of the analysis pertains to CO₂ ceiling Scenario C. Furthermore, we focus on the airport option because it is the suggested policy alternative by I&W. In two earlier studies commissioned by I&W, CE Delft (2022a; 2022b) shows for various scenarios that under a set of flanking policy alternatives and exogenous growth forecasts, there might be periods that the CO₂ ceiling is binding.

The CE Delft studies discuss a strategic response from airlines, but do not include an analysis on the impact for individual airlines. I&W commissioned SEO Amsterdam Economics to study these more individual impacts. This research note is the result of our study. It focuses on the interplay of the precise implementation of the CO₂ ceiling (the measures) in combination with the expected economic circumstances, the flanking policy alternatives and the expected strategic behaviour of airlines and possible effects on the exercise of the rights contained in international aviation agreements. The study specifically considers the EU-US Air Transport Agreement because of its significance, but equally reflects on upon the broader international context (e.g. for intra-EU trade).

Research questions

Against this background, I&W specifically poses the following main question: "What effects does the introduction of a CO₂ ceiling have on market access for carriers from other countries" and the associated sub-questions:

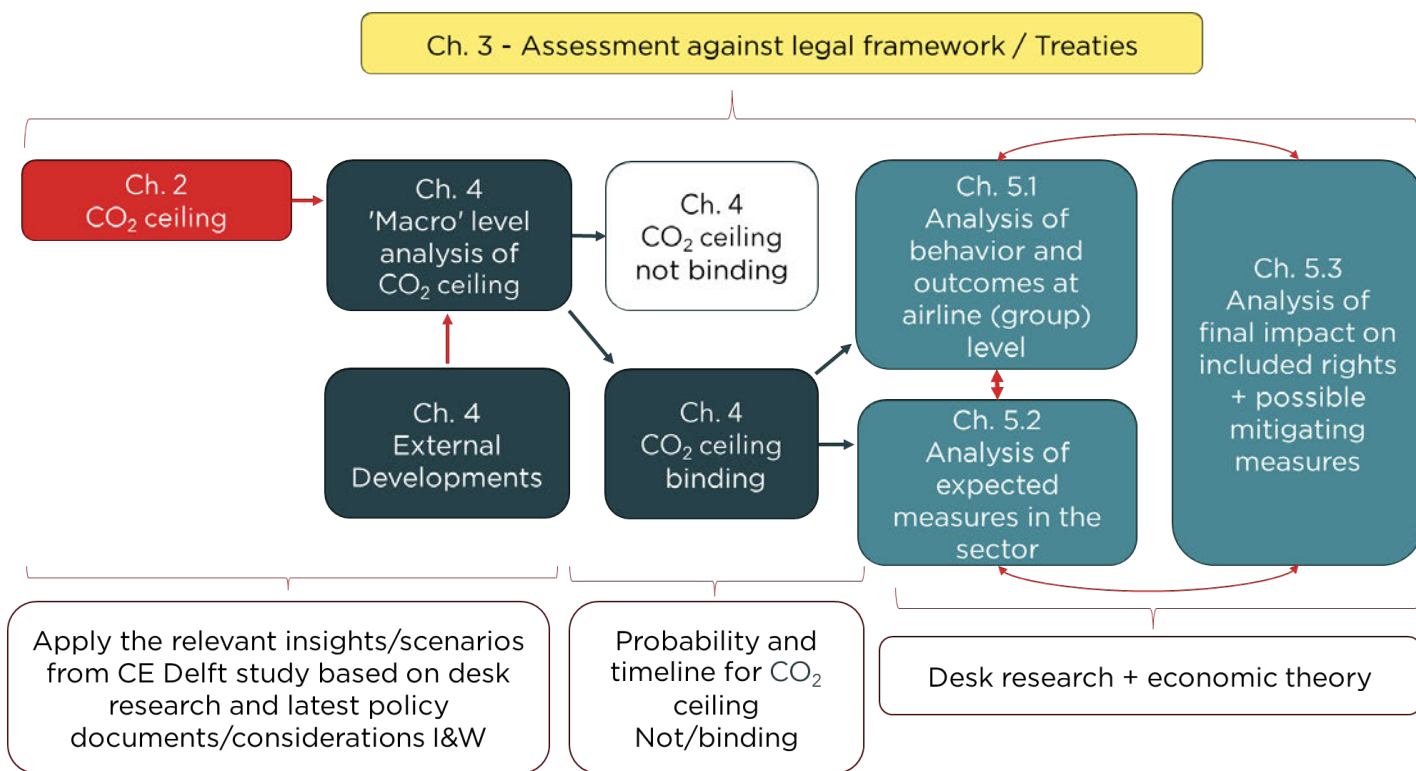
1. What consequences does the introduction of the CO₂ ceiling have for the rights contained in the EU-US treaty?
2. How do the effects relate to aviation treaties?
3. Are these consequences the same for parties from other countries?
4. Can these consequences be justified? If not, what mitigating measures can be taken?
5. What timing of the adverse effects can be mapped out?

In the overarching research question, the economic and legal context merge. From an economic perspective, the relevant question is to what extent (certain) airlines are confronted with an uneven playing field as a direct result of the CO₂ policy as against the scenario without the intended CO₂ policy.

Research structure and reading guide

This research note answers the research question in four chapters according to the research structure as depicted in Figure 1. Chapter 2 gives a concise introduction to the CO₂ ceiling and related policies that address aviation sustainability in the national and international contexts. In Chapter 3 we provide in-depth legal context of the ceiling with respect to other treaties. Chapter 4 considers the evidence about the impact of the ceiling on the aviation sector given current available details of the ceiling and exogenous developments. These developments include, among others, demand and connectivity recovery from COVID-19, economic growth scenarios, and other policy instruments having an impact on the ATM levels at Schiphol. In Chapter 5 we explore the impacts of a CO₂ ceiling on the sector in general and airlines, specifically.

Figure 1 The research structure connects the approach to the separate chapters and research questions



Source: SEO Amsterdam Economics (2024)

Research scope and uncertainty

This study has been limited to desk research study. As a result, we base our analysis on the current state of affairs regarding Dutch aviation policy, the provisional CO₂ ceiling legislation and the anticipated policies regarding the capacity at Schiphol (noise) and the future of Lelystad Airport. We note that in the upcoming year(s) important legislative and policy decisions will be taken, for example about Dutch airport decrees and the introduction of a distance-based ticket tax. These decisions may influence the impact of the CO₂ ceiling as a binding restriction for air transport movements. This also holds true for any potential updates of the CO₂ ceiling policy and relevant accompanying law.

Our analysis considers the information available up until mid-September 2024. The use of WLO (Welvaart en Leefomgeving) scenarios provides another uncertainty. CE Delft has based their studies on these scenarios. These scenarios - including those that are aviation-specific- are almost ten years old now and currently being updated.¹ As we detail further in Chapter 3, a major consequence is that the applied (aviation-specific) WLO scenarios to assess whether the CO₂ ceiling may be binding include predicted levels of ATM from 2023 onwards that are well below the actual realised levels of ATM in most recent years. A direct implication is that it is highly likely that the CO₂ ceiling will be binding - hence having a potentially larger impact on airline market access and competition than previously concluded based on the scenario analyses. At the same time, it also increases the incentives for airlines to avoid the ultimate consequence of lower levels of available ATM. The ability of airlines to avoid a binding CO₂ ceiling by adopting sustainability measures that go beyond government mandated regulation and thereby individually reducing collective emissions is addressed within this research. In our research note, we do not provide new forecasts and hence rely on the forecast results - both for the constrained and unconstrained number of ATM per airport - as reported in the CE Delft (2022a; 2022b) studies.²

Finally, our study does not evaluate the CO₂ ceiling itself, and it focuses mainly on Schiphol. The latter follows naturally from the fact that intercontinental flights from the Netherlands are mainly departing from Schiphol and hence may impact agreements with countries outside of Europe.

¹ See <https://www.pbl.nl/publicaties/wlo-2024-hoe-combineren-we-de-klimaattransitie-in-de-mobiliteit-met-een-bruikbare-bandbreedte>.

² We thank CE Delft for providing us with the underlying data from the figures in their reports.

2 CO₂ ceiling policy

The airport option is the preferred option

The CO₂ ceiling is a policy proposal by the Dutch government to limit CO₂ emissions. The Inspectie Leefomgeving en Transport (ILT) will supervise airports as they consider this CO₂ target when communicating their capacity declaration. To safeguard the goals set out in the Civil Aviation Policy Memorandum, three different instruments were considered:

- airport options via a national CO₂ ceiling divided over airports and embedded in airport permits;
- fuel supplier options via a fossil fuel ceiling; and
- airline options via a tradable permit system akin to a closed emissions trading system (ETS) for airlines/flights departing from Dutch airports.

The airport alternative yields a ceiling comparable to how noise and local air quality may limit the capacity declaration (in ATM) for airports (CE Delft, 2022a). The CE Delft study concludes that the airport option is relatively easy to implement in cases where the CO₂ ceiling does not become restrictive. When the ceiling does become restrictive, it has a higher impact on the aviation sector, particularly if ATMs have to be reduced.

Levels of the ceiling

As the Civil Aviation Policy Memorandum entails goals for 2030, 2050 and 2070, the reduction path for the CO₂ emissions is aligned to these goals. The goals will be connected linearly in the CO₂ ceiling for a gradual reduction, see Figure 2 (I&W, 2023).³ This research note and all conclusions hereinafter are based on the CO₂ ceiling milestones presented in Figure 2.

The CO₂ ceiling proposed by the I&W will be enforced by the ILT given an enforcement period of three years. This enforcement period gives airports more flexibility in case the CO₂ reduction is too high in one year because of unexpected circumstances and to give airlines and airports the opportunity to take measures after an exceedance to ultimately get below the ceiling. Enforcement will take time, and there will be no immediate reduction in the number of aircraft movements after one enforcement period. Until 2070, there are 14 enforcement periods anticipated beginning in 2030. Each period includes six IATA scheduling seasons.

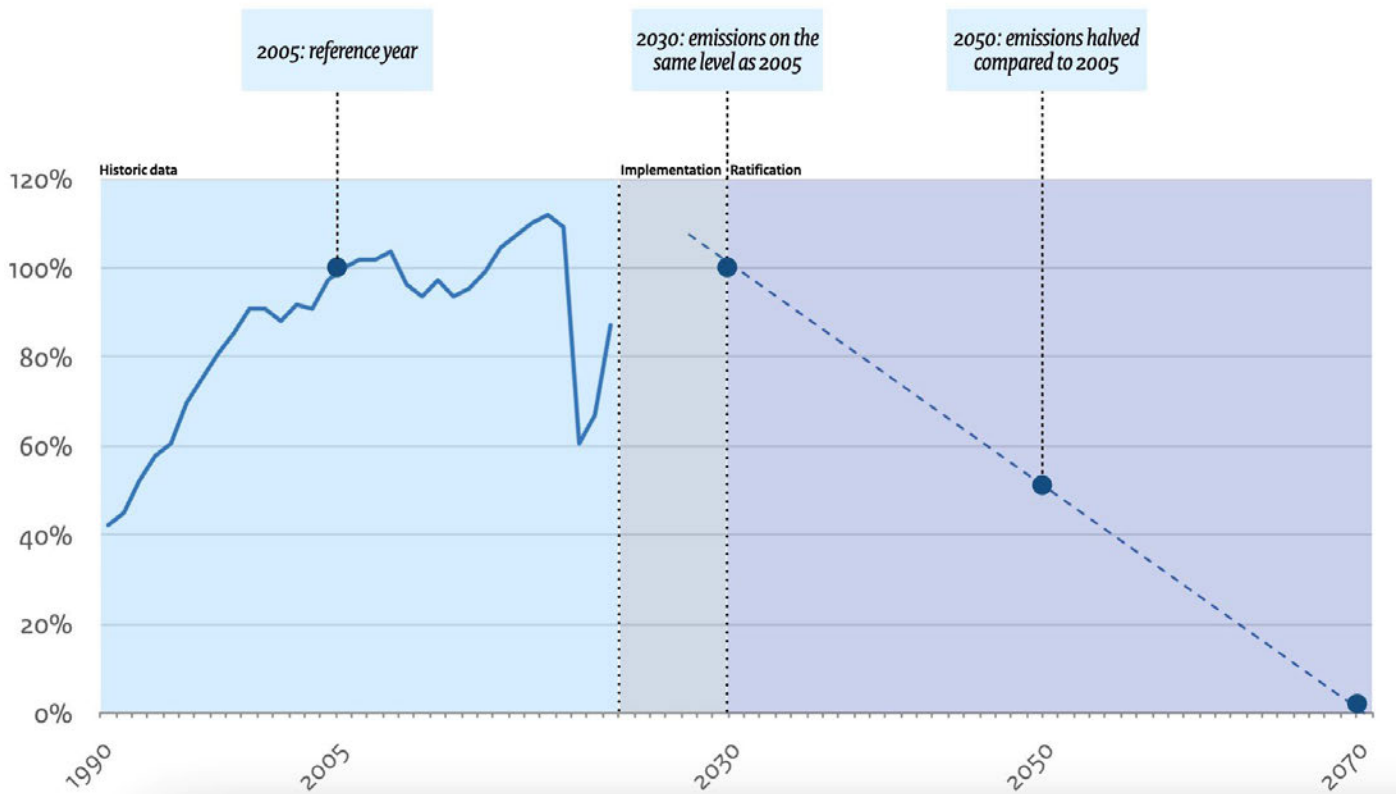
The monitoring and forecasting of emissions are important. It allows for gaining insights in future emissions and to anticipate potential exceedances in a timely manner. For monitoring emissions, the modelling of CO₂ emissions is a "suitable and desirable" method.⁴ Although the measures to be taken are not yet made explicit, the measures taken by the ILT based on the Amendment to the Aviation Act (I&W, 2024) may include:

- addressing or informing the airport;
- issuing an administrative warning/call;
- enhanced supervision (requiring additional information from the airport);
- order under penalty; and/or
- an instruction to carry out specific actions that contribute to reducing CO₂ emissions to a level below the limit.

³ The Civil Aviation Policy Memorandum contains the aim to limit CO₂ emissions of Dutch aviation to 2005 levels by 2030, reduce them by at least 50 per cent (relative to 2005) by 2050 and to zero by 2070 at the latest. On face value, this applies a lower intermediate reduction threshold to aviation than the 55 per cent reduction in greenhouse gas emissions by 2030 compared to 1990 levels from Fit for 55 at the EU level. However, the latter is a sector overarching target with potential leeway towards hard to abate sectors such as aviation.

⁴ See <https://www.rijksoverheid.nl/documenten/kamerstukken/2023/12/12/voortgang-co2-plafond-per-luchthaven>.

Figure 2 In the anticipated reduction path CO₂ emissions for departing flights should gradually be lowered to zero in 2070



Source: I&W (2003), Wijziging van de Wet luchtvaart - CO₂-plafond voor de luchtvaart

If a measure that has been imposed has not been followed up, an administrative fine can be imposed. From the operations perspective, the aviation sector (i.e. airlines) may contribute with measures in case there is a threat of exceeding the ceiling, or actual exceeding it. Given the (historical) number of ATMs, airlines may choose different routes (shorter distances), a different fleet usage (lower emissions) or a different fuel mix (sustainable aviation fuel (SAF) uptake). Finally, the ceiling might also impact the maximum number of allowable flight movements.

Implementation coordinated versus non-coordinated airports

In the airport option, the government installs a CO₂ ceiling individually at the Dutch airports (Schiphol, Rotterdam/The Hague, Eindhoven, Maastricht Aachen, Groningen Eelde and Lelystad Airport) based on historical emissions, the emission targets as set in the Civil Aviation Policy Memorandum and a distribution key amongst the Dutch airports. Airports model and forecast the CO₂ emissions of departing international flights. Generally, airlines inform airports about planned operations one year before the start of an IATA season (CE Delft, 2022a). If the modelled CO₂ emissions exceed the CO₂ ceiling, airports would warn the airlines and, if necessary, adjust their capacity declaration. The policy articulates several ways in which the airports could keep their emissions within the limit.

Schiphol, Eindhoven and Rotterdam/The Hague are slot coordinated airports. Groningen and Maastricht are not coordinated. For coordinated airports, the airport drafts the capacity declaration for each IATA scheduling season. In the proposed policy, the three coordinated airports will be responsible to set or adjust their capacity declaration considering the airport specific targets as dictated by the CO₂ ceiling. The independent slot coordinator (in the

Netherlands: ACNL) then allocates the slots to the airlines using a set of pre-determined slot allocation rules. These rules include, amongst others, prioritising of historical claims on slots, new entrant status and year-round operations.⁵

Irrespective of whether an airport is coordinated, each airport can devise individual incentives to reduce CO₂ emissions. Incentives can include differentiation in airport charges (as is already being done according to certain aircraft types their level of noise pollution) or a SAF stimulation fund, which would need to be evaluated for compliance with European regulations (I&W, 2023).

What if the number of flights (slots) exceeds CO₂ ceiling adjusted declared capacity?

During the process to arrive at a reduction of the (declared) capacity of Schiphol to limit the noise levels, the Dutch slot coordinator ACNL drafted a specific policy about how to allocate slots in case the number of slots subject to historical claims exceeds the declared capacity, see ACNL (2023). This policy rule is in accordance with Article 1:3 (4) in conjunction with Article 4:81 of the Dutch AWB (“Algemene wet bestuursrecht”, in English: General Administrative Law Act).

ACNL (2023, p.7) will use the principle of proportionality as included in the best practice paper for managing temporary capacity reduction (17 July 2020) issued by the World Airport Slot Board (WASB). This paper contains the following principle: “Any mandatory schedule reductions must be spread across all affected airlines that utilise the affected infrastructure, in a fair, transparent, and non-discriminatory manner by a slot coordinator acting independently.” It also contains this provision: “The required schedule reductions will be measured based on a defined time period where congestion occurs and/or as a total per day, providing that a fair distribution of cancellations across carriers is ensured” ACNL (2023, p7).

In the working procedure published for the summer 2025, ACNL reconfirms their policy in case of exceedance of historical slot claims with respect to Schiphol’s declared capacity.⁶ In Article 4.6, ACNL states: “If not all slots with historic rights can be allocated due to a newly introduced or a revised coordination parameter, ACNL will apply the Policy Rule ‘Slot allocation in case of exceedance of historic rights’. In such cases and if applicable, ACNL will publish a separate supplementary Working Procedure on the application of this Policy Rule for the respective airport.” The statement does not differentiate as to the cause of the change in the newly introduced or revised coordination parameter. Hence, this would also be valid for a change in the parameter due to the implementation of the CO₂ ceiling for the Dutch aviation sector. This policy rule published by ACNL in 2023 states that: “ACNL will use the principle of proportionality as included in the best practice paper for managing temporary capacity reduction (17 July 2020) issued by the World Airport Slot Board (WASB).” As a result, we will evaluate the impact on (specific) airlines in this report using the policy rule as explained above.

⁵ See <https://slotcoordination.nl/slot-allocation/allocation-process/>.

⁶ See <https://slotcoordination.nl/wp-content/uploads/2024/09/20240911-WP-Slot-Allocation-S25-v1.0.pdf>.

3 Legal aspects

Compatibility and Paris Agreement

Here we identify the issues of compatibility with relevant international and EU law that might arise on the introduction of a CO₂ ceiling as a measure to reduce in-sector emissions. The CO₂ ceiling, the slot capacity and historical slot rights are linked through regulation but at the same time independent concepts legally.

With the aim of reaching the legally binding commitments agreed in the Paris Agreement 2015 the UN Framework Convention on Climate Change (UNFCCC) and the European Climate Law 2021 impose legal obligations on the Netherlands, the other Member States of the EU and the EU institutions to reach climate neutrality by 2050.⁷ The European Climate Law sets out a binding EU-wide target of a net domestic reduction in greenhouse gas emissions by 2030. The European Climate Law sets out the procedural requirements for Member States to reduce emissions over time at EU-level. This requires the Member States to adopt national laws and measures to facilitate emission reductions, which includes placing restrictions on private entities that are not directly covered by the Paris Agreement. The introduction of a novel CO₂ ceiling at Dutch airports as applied to departing international flights would constitute a national administrative measure adopted by the Netherlands to tackle greenhouse gas (CO₂) emissions, which can be justified both by the Paris Agreement and the European Climate Law. Only the emissions that are actually emitted within the territory of a State, which includes its territorial airspace, are deemed as the emissions of that State, for which the State can be held responsible under international law.⁸ By contrast, aviation emissions occurring outside the territory of any State, in international airspace over the High Seas, are ‘international emissions’ and thus not covered by the Paris Agreement. Instead, these emissions are to be dealt with by way of ICAO as agreed by parties to the Kyoto Protocol 2002 to the UNFCCC (Article 2.2).⁹

Relevant international law

With 193 State signatories, the Convention on International Civil Aviation (Chicago Convention) 1944 is the *magna carta* of civil aviation. Article 1 recognises that every State has complete and exclusive sovereignty in the airspace above its territory. For scheduled international air services, the sovereign airspace of a State is *de jure* closed by Article 6 which provides that such services can only be operated with the special permission or authorisation granted by that State and in accordance with the terms of such permission or authorisation as typically secured through air services agreements (ASAs) that are negotiated bilaterally or multilaterally with other States. At first glance, the introduction of a CO₂ ceiling by the Netherlands would be consistent with its exercise of sovereignty.¹⁰ In its aviation relations with other States, the Netherlands has added environmental (best effort) obligations only in recent times through bilateral agreements on the one hand, and comprehensive agreements with non-EU and EEA States (‘third countries’) as negotiated by the European Commission under mandates from European Council, on the other hand.

On examination of a selection of semi-recent bilateral ASAs between the Netherlands and Cote d’Ivoire (entered into force in 2024) Sri Lanka (2024), Angola (2024), Guyana (2023), Brazil (2021), Chile (signed in 2021, not yet in force), Kuwait (2020), Uruguay (2018) and Vietnam (2012), it is evident that each State party may unilaterally impose

⁷ See https://unfccc.int/sites/default/files/english_paris_agreement.pdf for the Paris Agreement 2015. In particular Article 2(2) on Climate Neutrality and Article 4 on Intermediate Climate Goals of the European Climate Law 2021 are relevant for the legal obligation, see <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32021R1119>.

⁸ See *the Trail Smelter Arbitration - U.S. v Canada*, https://legal.un.org/riaa/cases/vol_III/1905-1982.pdf

⁹ See https://treaties.un.org/doc/Treaties/1998/09/19980921%2004-41%20PM/Ch_XXVII_07_ap.pdf

¹⁰ *Vis-à-vis* non-EU countries; the competence to regulate transport is shared between the EU and the Member States (Article 4(2)(g) TFEU).

restrictions on traffic volume, service frequency, or the types of aircraft operated by the designated airlines of the other States if necessary for environmental reasons (see Legal Appendix).

Similar provisions also exist in the so-called comprehensive agreements between the EU on the one hand and non-EU/EEA ('third') countries on the other hand, including the EU-ASEAN Comprehensive Air Transport Agreement (signed in 2022, not yet in force), the EU-Armenia Common Aviation Agreement (signed 2021, not yet in force), the Canada-EU Agreement on Air Transport (2019), and the US-EU Air Transport Agreement (2022). In these agreements, the parties further agree to cooperate and exchange information relating to environmental protection and related measures. If the Netherlands aims to impose a CO₂ ceiling at airports, this matter can be addressed in the Joint Committees established by each of the agreements, during which information can be exchanged, including updates on laws, regulations and policies. The parties are expected to consult each other on environmental matters, including any planned measures that may significantly impact the international air services covered by the relevant agreement. It should be noted that the ICAO Member States adopted a Long Term Global Aspirational Goal (LTAG) at the 41st Session of the Assembly in September 2022 for international aviation to reach net zero carbon emissions by 2050 in support of the Paris Agreement. Among others, the LTAG applies to the Netherlands and wider EU.

There do not appear to be any issues to raise on points of international law for CO₂ ceiling in Scenario A of implementation in which the legislation for the CO₂ ceiling is adopted but no binding effects occur. The same is true for a CO₂ ceiling Scenario B, in which CO₂ limits have been included in airport decisions although no binding effects occur. Hence, no issues are anticipated so long as there is no clear risk of disruption to the competitive environment between airlines. For CO₂ ceiling Scenario C, when the CO₂ ceiling is exceeded and binding effects may occur, this may result in a disruption to competition. For instance, if the CO₂ ceiling leads to a reduction in the number of airport slots available at a Dutch airport resulting in a limitation to market access, this may have implications for the relevant provisions in the ASAs or comprehensive agreements. Such a limitation must be applied in a fair and non-discriminatory manner.

For the purposes of pinpointing relevant provisions, competition concerns may arise in the following comprehensive agreements:

- US-EU Air Transport Agreement: there may be a lack of 'fair and equal opportunity' to compete (Article 2 of the Agreement and Articles 1 and 2(4) of Annex 2).
- Canada-EU Agreement on Air Transport: the 'non-discriminatory basis' might be called into question on airport usage, and airlines may not have a 'fair and competitive environment' for the operation of their services (Articles 11 and 14).
- EU-ASEAN Comprehensive Air Transport Agreement (not yet in force): one or more air carriers could 'abuse a dominant position', instances of 'discrimination or unfair practices' might arise, and/or air carriers may face 'obstacles to doing business' (Articles 2(g)(ii), 8 and 9).

EU law

In principle, a CO₂ ceiling imposed by the Netherlands could be seen as a means by which to meet their country's legally binding climate goals under the European Climate Law,¹¹ specifically Article 2(2) on Climate Neutrality¹² and Article 4 on Intermediate Climate Goals,¹³ which requires EU Member States to adopt domestic laws and measures

¹¹ See Regulation (EU) 2021/1119.

¹² Member States shall take the necessary measures at national level to enable the collective achievement of the climate-neutrality objective.

¹³ Member States shall prioritize swift and predictable emission reduction and enhance removals by natural sinks.

to facilitate emission reductions, including through restrictions on private entities not directly covered by the Paris Agreement. Therefore, a CO₂ ceiling could help the Netherlands discharge its duty under EU and international treaty law by creating a regulatory framework for private actors to reduce their (in-sector) emissions. While private initiatives to cut emissions are commendable, they are not legally binding or harmonised across the EU, which does already now, or could in future, lead to anti-competitive behaviour or conflicts with other EU and national rules. For the sake of free market competition and consumer protection, a harmonised regime at the State level is therefore desirable in the European context.

A CO₂ ceiling might fall within the scope of Article 20(1) of the Air Services Regulation 1008/2008, which provides that a State may limit or refuse the exercise of traffic rights in the event of a serious environmental problem, this holds in particular 'when other modes of transport provide appropriate levels of service'. While CO₂ ceiling Scenario A and CO₂ ceiling Scenario B of implementation of the CO₂ ceiling would not impact on traffic rights ('the provision of intra-Community air services by a Community carrier' (Article 15)), the effect of a CO₂ ceiling Scenario C could result in the reduction of airports slots that are available to airlines, restricting access to routes thus *prima facie* in violation of the Air Services Regulation. An 'environmental' exception may be sought by the Netherlands using Article 20 of the Regulation. It would be important to produce evidence of a true CO₂ problem for which within-sector solutions or actions are needed, and the measure cannot be related to other emission problems, such as noise emissions, as this is already regulated under the Balanced Approach Regulation.¹⁴ The scope of the CO₂ ceiling should therefore be predetermined.

If the operations at an airport are subject to a CO₂ ceiling, all subsequent capacity declarations must take this cap into account. This would also mean that the slot coordinator would have to distribute slots accordingly. The advantage of this would be that the airport could, without violating the principles of the Slot Regulation,¹⁵ actively integrate environmental considerations within the capacity allocation.

If, following the integration of a CO₂ ceiling in Scenario C, the new declared capacity, is significantly lower than the current operational capacity, this will lead to a negative slot pool. This would mean that the slot coordinator would have to either redistribute historical slots or reduce the historical slots of each user proportionately (using the "capacity haircut" metaphor). This may also mean that there will not be any slots available for new entrants. This is also reflected under the Policy Rule (September 2023) issued by ACNL, which opts for a proportionate reduction of slots among the incumbent users.

If this measure is adopted in connection with Article 20 of the Air Services Regulation, the Netherlands must inform the Commission three months before the entry into force of the binding (CO₂ ceiling Scenario C) measure that may limit or refuse the exercise of traffic rights, providing appropriate justification. If the limitation or refusal violates EU law, the Commission has the power to suspend the measure. Given that the ceiling could be interpreted as an environmental measure that could indirectly, though not intentionally, affect the exercise of traffic rights, the Dutch Government should consider consultations with the Commission before introducing a CO₂ ceiling (given the probability of ending up in Scenario C). In any case, the measure must be 'non-discriminatory, shall not distort competition between air carriers, shall not be more restrictive than necessary to relieve the problems, and shall have a limited period of validity, not exceeding three years, after which it shall be reviewed' (Article 20 of the Regulation). This could pose an issue for the (in CO₂ ceiling Scenario C) binding nature of the CO₂ ceiling as the Commission in its review may choose not to renew the 'environmental' exception.

¹⁴ See Regulation (EU) No 598/2014.

¹⁵ See Regulation (EC) No 793/2004, as amended.

Implementation of the CO₂ ceiling through legislation would potentially serve as a legal basis for the slot coordinator to apply and prioritise certain secondary allocation criteria under the Worldwide Airport Slot Guidelines (WASG).¹⁶ In 2021, when ACNL made use of secondary allocation criteria in a new policy rule to prioritize 'connectivity' under Article 8.4.1 of the WASG, the judge overruled ACNL's policy rule on the grounds that the WASG does not prioritise any of the criteria and that the connectivity element was chosen for the economic well-being of the airport without thinking about its users. However, if the Netherlands introduces a CO₂ ceiling (CO₂ ceiling Scenario B binding on the coordinator and CO₂ ceiling Scenario C possible binding effects), the slot coordinator might argue that the administrative decree or subsequent rule serves as a legal basis to prioritise 'environmental considerations' while distributing slots at Dutch airports, due to the CO₂ ceiling being implemented in national law. This may need to be tested by a court, but the general outcome of the case between IATA and ACNL from 2021 may provide for the said (same) reasoning.¹⁷

It is important that the CO₂ ceiling should not dictate details as to what may serve as exceptions, for example via market-based measures (MBMs) or SAF. This is because a competence issue could arise whereby the European Commission might find that establishing a CO₂ ceiling with criteria that are like the EU Emissions Trading Scheme (ETS) may in turn be seen as expanding the scope of the ETS, already established by way of an EU Directive. If the CO₂ ceiling appears to resemble an extension of the scope of the EU ETS, such a step would need to follow the ordinary legislative procedure rather than via unilateral State action. One possible way to circumvent this problem, however, would be to utilise Article 114(4) of the Treaty on the Functioning of the European Union (TFEU) to argue that there is a necessity to introduce a national measure based on scientific evidence, such as emissions data. In such cases, the State must notify the Commission of the problem before introducing the domestic measure, and the Commission has six months to approve or reject the measure.

Relationship to EU ETS

Article 193 TFEU clarifies that measures adopted under Article 192 TFEU shall not prevent a Member State from maintaining or introducing more stringent protective measures. Such measures must be compatible with the treaties and shall be notified to the Commission. Article 192 TFEU provides that, through the ordinary legislative procedure, the European Parliament and the Council are to decide what action must be taken to achieve the objectives under Article 191 TFEU establishing the objectives to which the EU's environmental program must contribute. Article 193 TFEU lays down the 'minimum harmonisation principle,' in accordance with which the EU provides for a minimum level of harmonization and a Member State may go beyond this level, for instance by increasing the intensity or the degree of protection, through a national measure.

The EU ETS Directive was adopted under Article 192(1) TFEU, evidencing that this matter can fall within the legal basis for environmental policy. While the Directive does not explicitly dispose of a provision which authorises a Member State to adopt more stringent measures, according to the jurisprudence of the Court of Justice of the European Union (CJEU) a Member State may, by way of Article 193 TFEU, adopt stricter measures. Such measures must, however, remain consistent with the EU treaties. For example, if the new measure in question is fundamentally incompatible with internal market legislation it may be deemed *ultra vires*.

In principle, the Netherlands can create a CO₂ ceiling at its airports without undermining the EU ETS system on the following reasons:

¹⁶ See <https://www.iata.org/en/programs/ops-infra/slots/slot-guidelines/>.

¹⁷ See *Rechtbank Noord-Holland*, 12 November 2021, ECLI:NL:RBNHO:2021:10269.

- Dutch airports can be subject to an CO₂ ceiling without affecting the EU ETS given that no trading would occur. This can already happen without going through the Article 193 TFEU exemption. The CO₂ ceiling can be created as an administrative domestic measure.
- However, if the CO₂ ceiling resembles a cap-and-trade system, then it is important to prevent double imposition for airlines that are already legally subject to the EU ETS as this could be deemed disproportionate under EU law, notably when international airlines are not, or only partially, subject to the EU ETS under the current rules.

Even if the EU ETS system were potentially to be affected, the Netherlands could rely on Article 114(4) TFEU (on approximation of laws) to argue that it is a necessity to introduce the national measure based on scientific evidence (if available). The Netherlands must notify the Commission of the problem before introducing the domestic measure. The Commission may take six months to approve or reject the measure.

4 Analysis of the CO₂ ceiling

Current supply of US based carriers

In line with the focus on the EU-US aviation agreements, we briefly describe the current market for US-bound flights departing from Schiphol. To do so, we look at the supply, market access and number of competitors at the different routes for the winter season 2023 and summer season 2024.

Based on the OAG schedules, there are four US based carriers operating flights from Schiphol: American Airlines (Oneworld), Delta Air Lines (SkyTeam), United Airlines (Star Alliance) and JetBlue Airways. The former three airlines are full-service carriers whilst the latter is considered a low-cost carrier. The four carriers together serve 16 destinations. All these destinations are in the United States including, for example, New York, Atlanta, Boston, Washington, Orlando, Chicago and Dallas.

In the period November 2023 – November 2024, American Airlines scheduled around 480 flights with a portfolio of two destinations. In the same period, Delta Airlines scheduled around 5,700 flights over nine destinations. United Airlines scheduled around 1,700 flights over five destinations. JetBlue scheduled about 750 flights to Boston and New York. Hence, in total there are about 8,500 departing flights from Schiphol operated by US based carriers in the most recent one-year period. In total, there are about 230,000 departing flights from Schiphol that period. Hence, the market share of US carriers measured in the number of operated departing flights lies between three and four percent.

Next to these US carriers, Air France-KLM is the only other carrier operating direct flights to the US destinations from Schiphol. Air France-KLM serves 9 of the 16 destination airports in the United States. Accounting for the SkyTeam alliance membership of Delta Air Lines, Air France-KLM competes with the other three US carriers on the Boston, Washington, Houston, New York, Chicago and San Francisco market. In the Washington, Houston and Chicago markets, United Airlines and Air France-KLM have about an equal market share in direct flights operated. In the San Francisco market, the market share of Air France-KLM is about 60 per cent (40 per cent United Airlines), whereas in Boston and New York markets SkyTeam (Delta Air Lines and Air France-KLM) competes with JetBlue. In both markets the SkyTeam partners have a market share of about 70 to 80 per cent.

Available information to determine (timing of) potential adverse effects for carriers

In our analysis of the impacts for airlines, we first determine whether the CO₂ ceiling will be the binding factor leading to, for example, a loss in growth potential for carriers at Schiphol, or even a forced reduction in the number of ATMs as compared to the current levels with or without consequences for slots with historical claims.

As discussed earlier in this note, I&W commissioned two impact studies concerning the CO₂ ceiling for Dutch aviation. Both studies are from CE Delft, CE Delft (2022a) and CE Delft (2022b), respectively. The first report was published in October 2022 (CE Delft, 2022a) and includes 54 possible baseline scenarios. These 54 baseline scenarios differ in their assumptions towards economic state of the world (WLO scenarios high and low), European Fit for 55 Policy (reduced, proposed or increased ambition), national SAF blending policy (reduced, proposed or increased ambition) and airport capacity (low, middle and high). Hence, multiplying these dimensions yields 2*3*3*3 in total 54 baseline scenarios. These scenarios are a baseline in the sense they do not include yet any policy choices regarding the CO₂ ceiling policy. For each of the 54 scenarios, CE Delft (2022a) forecasts the number of years the CO₂ emissions levels of Dutch aviation would exceed the pre-defined ceiling. Box 1 details the target levels of CO₂ emissions levels used in the CE Delft study. In CE Delft (2022b), another eight scenarios are considered.

Box 1 The emission level in 2030 needs to be at the 2005 level

The pre-defined ceiling follows from the targets set by the Luchtvaartnota 2020-2050 as the following minimum requirements:

- 2030: reduction to the 2005 CO₂ emissions levels;
- 2050: reduction to half of the 2005 CO₂ emissions levels;
- 2070: reduction to zero.

In absolute numbers, the 2005 CO₂ emissions levels from Dutch aviation (i.e. departing flights) were equal to 11.06 Mton CO₂, implying required levels of 11.06 Mton CO₂ and 5.53 Mton CO₂ in 2030 and 2050 respectively (CE Delft 2022a). The CO₂ emissions levels in 2024 are set equal to 12.03 Mton CO₂. Both the policy documents regarding CO₂ emissions levels and the study by CE Delft (2022a) assume annual linear decrease of CO₂ emissions levels to meet the target in 2030, 2050 and 2070.¹⁸ Consequently, the proposed cumulative CO₂ budget (ceiling) results in a pathway with an average reduction of 163 kt CO₂/year for the period 2024 to 2030, and 276 kt CO₂/year for the period from 2030 to 2070 (CE Delft, 2022a, Appendix C).

Source: SEO Amsterdam Economics, adapted from CE Delft (2022a)

To evaluate the potential adverse effects of the introduction of a CO₂ ceiling, we look at - in our view - the most relevant scenarios out of the in total 62 (54 + 8) scenarios. We use these scenarios and the most recent insights of the noise capacity limit at Schiphol, i.e. between 475,000 and 485,000 movements - to evaluate the potential adverse effects.¹⁹ The here considered scenarios from the CE Delft studies are:

- **Baseline scenario 2/4 in CE Delft (2022b)** - WLO high, Fit for 55 as proposed, reduced ambition regarding national SAF blending and low airport capacity with 440,000 movements at Schiphol and no opening of Lelystad Airport (2) / opening Lelystad Airport in 2025 (4);²⁰
- **Baseline scenario 22/23 in CE Delft (2022a)** WLO high, Fit for 55 as proposed, reduced ambition regarding national SAF blending and low airport capacity with 500,000 movements at Schiphol and no opening of Lelystad Airport (22) / opening Lelystad Airport in 2025 (23).

The main difference between the two sets of scenarios - i.e. between baseline scenario 2 and 4 in CE Delft (2022b) on the one hand and between scenario 22 and 23 in CE Delft (2022a) on the other hand - is the opening of Lelystad Airport, which is assumed to happen in the upper bound in 2025. However, for the analysis of Schiphol this makes no substantial difference. Please note that the reference scenario in CE Delft (2022a) is their scenario 23.²¹

Assumption on exogenous factors as detailed in CE Delft studies

Before looking at specific outcomes of these scenarios, we briefly discuss why the chosen scenarios are the most relevant ones per each dimension:

¹⁸ Please note that the time horizon applied in the study by CE Delft (2022a) does not include 2050-2070. AEOLUS traffic forecasts for that time period are not available.

¹⁹ This bandwidth has been communicated by I&W in September 2024. In December 2024 I&W communicated the outcome of the balanced approach procedure to boil down to a restricted number of 478,000 yearly air transport movements from next year onwards. Since 478,000 lies in the bandwidth of 475,000 and 485,000, no further changes in our current analysis were considered. Please see, <https://www.rijksoverheid.nl/documenten/kamerstukken/2024/12/06/definitieve-berekeningen-balanced-approach-procedure>.

²⁰ Please note that the most recent insights of the noise capacity limit at Schiphol show a higher than 440,000 movements, however the other scenarios in CE Delft (2022b) consider a growth in capacity to 630,000 movements. These scenarios we consider less relevant in the current policy context.

²¹ In CE Delft (2022b), one out of the eight additional scenarios has been modelled in the main impact assessment analysis, however results for all scenarios are given in Appendix C of that report. The primal scenario used in CE Delft (2022b) is one with high airport capacity, i.e. with a growing airport capacity of Schiphol to 630,000 flights in 2050. This scenario we consider not relevant in the current policy context.

- **Economic outlook:** two scenarios/levels are used, WLO Low and WLO High. These scenarios are developed by CPB/PBL in 2016. In WLO Low there is slow economic and demographic growth, less international cooperation and ambition to reach climate goals, leading to an increase in global temperature. In WLO High, economic and demographic growth is twice higher and this scenario assumes continuous international cooperation to reach climate goals. Currently, CPB/PBL are developing new WLO scenarios which may impact the (unconstrained) aviation demand forecasts. In anticipation of the new WLO scenario, we conjecture that the WLO High scenario – assuming a two percent annual GDP growth and continued population growth – should be considered the most likely long-term outcome considering development over the last 30 years, please see Box 2 for some additional consideration on the use of WLO Low.

Box 2 Using a WLO Low scenario would underestimate the adverse effects of the CO₂ ceiling for airlines

All the scenarios explicitly modelled in the studies by CE Delft (2022a; 2022b) take WLO High as the economic outlook. The overview table in CE Delft (2022a) shows that in WLO Low the CO₂ ceiling is only binding if Fit for 55 ambitions are reduced. Reduced Fit for 55 ambitions are, however, given the currently available information not a plausible scenario any longer. Hence, for all relevant WLO Low scenarios, CE Delft (2022a) finds that the CO₂ ceiling is not binding. In CE Delft (2022b) the CO₂ ceiling is only binding assuming Schiphol's capacity to increase after 2029 gradually to 630,000 flights in 2050. We do not consider this scenario relevant in the current policy context.

In our opinion, one should not focus on the WLO Low scenarios given the current available information about realised air transport movements from 2023 onwards. The WLO low scenarios as applied in the CE Delft studies predict ATMs of about 370,000 a year at Schiphol in the period 2024-2030. The reality in 2024 is different: in the period august 2023-august 2024 Schiphol reports nearly 470,000 air transport movements²² and in the recent operational year Schiphol declared a capacity of about 484,000 slots to ACNL (SEO et al., 2024). The reported qualitative effects on how binding the CO₂ ceiling would be in WLO Low in the CE Delft scenarios – i.e. no impact or only moderate impact on less growth – are crucially subject to the underestimate of the unconstrained air transport movements in WLO Low. Using these insights now, given the current knowledge about the latest number of air transport movements, would lead to an underestimate of the impact of the CO₂ ceiling at Schiphol for airlines and airline market access.

SEO Amsterdam Economics

- Regarding **Fit for 55** three different levels – reduced ambition, as proposed ambition and increased ambition – are used. We follow the CE Delft (2022a) and consider the assumption that Fit for 55 continues as proposed the most likely.²³
- Regarding **National SAF blending** three different levels – reduced ambition, as proposed ambition and increased ambition – are used. We consider it less likely that the national SAF blending will outperform the European ambition. Both the as proposed ambition and the increased ambition are assuming a SAF blending outperforming the European target, this is unlikely given investments in SAF capacity and SAF price forecasts. As a result, we mainly focus on the scenarios under the assumption of a reduced (European) ambition.
- Regarding **airport capacity** at least three scenarios (low, middle and high) are included. In CE Delft (2022a), the low airport capacity scenario is defined as a maximum capacity of Schiphol of 500,000 movements, no opening of Lelystad Airport and no additional capacity at Eindhoven Airport. The middle airport capacity scenario assumes a constant airport capacity of Schiphol of 500,000 movements, but an opening of Lelystad Airport and gradually expanding to 45,000 movements in 2050 and a gradually increase of the capacity at Eindhoven to 55,000 by 2050. In the high airport capacity scenario, Schiphol's capacity gradually increases to

²² See <https://www.schiphol.nl/nl/schiphol-group/verkeer-en-vervoer-cijfers/>.

²³ Reforms were published in the Official Journal of the European Union (EC, 2023; Ruiz P., 2023) and 05/2023: Directive 2023/958 revising the EU-ETS for aviation adopted by EU Parliament and the Council, see Ruiz (2023); EC (2023a) and EC (2023b).

630,000 movements a year in 2050, the conditions for the other airports are equal to the ones in the medium capacity scenario.

Airport capacity in flight movements is a key factor for (analysing) impacts

The airport capacity is one of the key drivers to determine whether the CO₂ ceiling may become binding in future years. The intuition is that if the airport capacity will be high in future years – disregarding the CO₂ ceiling policy – the probability of the CO₂ ceiling to be binding increases, and the other way around.

In 2022, the Dutch government announced to reduce Schiphol's capacity to 440,000 movements.²⁴ To account for this announced capacity limit, the I&W commissioned CE Delft an update to the first study. In this second study, CE Delft (2022b) redefines the airport capacity scenarios as follows:

- A low-capacity scenario with Schiphol having 440,000 movements and no opening of Lelystad Airport;
- A first middle capacity scenario with Schiphol having 440,000 movements and opening of Lelystad Airport in 2025;
- A second middle capacity scenario with Schiphol being restricted to 440,000 movements until 2029 and gradually growing to 630,000 movements afterwards and no opening of Lelystad Airport;
- A high-capacity scenario with Schiphol being restricted to 440,000 movements until 2029 and gradually growing to 630,000 movements afterwards and opening of Lelystad Airport in 2025.

In September 2024, however, I&W informed the House of Representatives about the state of affairs regarding Schiphol's capacity development. To realise the set noise targets, a maximum capacity of 475,000 to 485,000 movements was considered. In December 2024, I&W communicated the outcome of the balanced approach procedure to boil down the restricted number to 478,000 ATMs per year. This most recent number of ATM sits in the range of the in September 2024 communicated 475,000 and 485,000 ATMs, hence no further changes in our current analysis were considered.

Out of the three formulated CO₂ ceiling scenarios – Scenario A, Scenario B and Scenario C – the latter one seems to be most likely given the current developments in the level of (realised) demand and supply at Schiphol measures in the number of ATMs and the outcome of the balanced approach stipulating that due to noise considerations the number of transport movements will be limited to 478,000 a year.

Difference between constrained and unconstrained air transport movements & CO₂ ceiling

Both CE Delft studies modelled three main CO₂ ceiling policy options: the airport options, the fuel supplier options and the airline options. In December 2023, I&W informed the House of Representatives about the progress regarding the CO₂ ceiling in the Dutch aviation sector.²⁵ From the progress update, it follows that the government chooses the airport option in which the national CO₂ ceiling gets divided over airports and embedded in airport permits.²⁶ The airports will be faced with a 3-year compliance cycle. CE Delft (2022a; 2022b) modelled this policy option. Therefore, we will focus on the impact of the CO₂ ceiling given this policy option.

Looking at the impact, we first outline our expectations based on the available data and model simulations for which years the CO₂ ceiling is binding and what this means for the total number of ATMs and – subsequently – for slots with

²⁴ See <https://www.rijksoverheid.nl/documenten/kamerstukken/2022/06/24/hoofdlijnenbrief-schiphol>.

²⁵ See <https://www.rijksoverheid.nl/documenten/kamerstukken/2023/12/12/voortgang-co2-plafond-per-luchthaven>.

²⁶ Embedded here means that the airport's capacity declaration will be adjusted for the CO₂ ceiling, but that separate CO₂ emissions levels will not become a separate capacity parameter.

historical claims. In the next Chapter, we detail for the most common types of airlines (business models and characteristics) at Schiphol how the ceiling might impact them.

Table 1 shows for all years from 2025 to 2050 the number of yearly movements at Schiphol for the baseline scenario 23 as presented in CE Delft (2022a) in the first column.²⁷ This scenario predicts that air transport movements are reaching the baseline capacity limit of 500,000 movements at Schiphol between 2030 and 2031.²⁸

Table 1 With a noise ceiling of 478,000 ATMs, the anticipated CO₂ ceiling would be binding for now until 2045

	Baseline scenario (23)	Balanced approach (noise) ceiling		CO ₂ ceiling	CO ₂ ceiling binding?	
	Original	475	485	Strict allocation	475	485
2025	435,482	475,000	485,000	463,636	Yes	Yes
2026	444,916	475,000	485,000	460,650	Yes	Yes
2027	455,539	475,000	485,000	458,008	Yes	Yes
2028	467,376	475,000	485,000	455,341	Yes	Yes
2029	480,462	475,000	485,000	453,025	Yes	Yes
2030	494,838	475,000	485,000	450,317	Yes	Yes
2031	500,000	475,000	485,000	452,428	Yes	Yes
2032	500,000	475,000	485,000	453,812	Yes	Yes
2033	500,000	475,000	485,000	455,624	Yes	Yes
2034	500,000	475,000	485,000	457,453	Yes	Yes
2035	500,000	475,000	485,000	459,020	Yes	Yes
2036	500,000	475,000	485,000	461,497	Yes	Yes
2037	500,000	475,000	485,000	463,977	Yes	Yes
2038	500,000	475,000	485,000	466,512	Yes	Yes
2039	500,000	475,000	485,000	468,998	Yes	Yes
2040	500,000	475,000	485,000	472,232	Yes	Yes
2041	500,000	475,000	485,000	469,815	Yes	Yes
2042	500,000	475,000	485,000	467,526	Yes	Yes
2043	500,000	475,000	485,000	465,268	Yes	Yes
2044	500,000	475,000	485,000	463,600	Yes	Yes
2045	500,000	475,000	485,000	461,262	Yes	Yes
2046	500,000	475,000	485,000	484,569	No	No
2047	500,000	475,000	485,000	500,000	No	No
2048	500,000	475,000	485,000	500,000	No	No
2049	500,000	475,000	485,000	500,000	No	No
2050	500,000	475,000	485,000	500,000	No	No

Source: CE Delft (2022a, columns 1 and 4), I&W (columns 2 and 3), compiled by SEO Amsterdam Economics (2024)

In the second and third column the by I&W communicated bandwidth of the balanced approach outcome of a restricted capacity of 475,000 to 485,000 movements is shown. As mentioned earlier, the most recent outcome of the balanced approach procedure boils down to a capacity limit of 478,000 annual ATMs. The fourth column shows the by CE Delft reported anticipated CO₂ ceiling in annual air transport movements per year in the so-called scenario 23.²⁹ The last two columns indicate whether the CO₂ ceiling is the binding restriction. In other words, the CO₂ ceiling would be the binding restriction in case the ceiling sets a lower limit of ATMs compared to the balanced approach (noise) ceiling either/or the original capacity limit of 500,000 movements. Whether the ceiling is actually binding - irrespective of the underlying determining factor of the ceiling - obviously also depends on the unrestricted demand

²⁷ We thank CE Delft for providing us with the underlying data from the figures in their reports.

²⁸ Please note that the predicted levels of air transport movements are lower than realized in previous years (up to 2025). The main reason is the underestimate of the recovery path after COVID-19.

²⁹ The numbers in Table 1 are originally reported in CE Delft (2022a, page 71) in Figure 42.

forecast. For example, given the forecasts in CE Delft for 2025, the CO₂ ceiling would be the binding restriction (because 463,636 movements are lower than the anticipated noise ceiling of 478,000 movements or the current limit of 500,000 movements) but would not be binding because the anticipated unrestricted demand of 435,482 movements is below the CO₂ ceiling.

The overview given in Table 1 shows that the anticipated restriction following from the CO₂ ceiling would constitute the binding restriction on air transport movements from the start (i.e. 2025) until 2046. This finding seems to be in line with the original CE Delft (2022a) study indicating that their baseline scenario (scenario 23) would be a binding factor for 15 years or more. From 2046 onwards, the number of anticipated ATMs to remain within the CO₂ emission targets may increase to 484,569 movements whereas the anticipated noise capacity limit would yield a lower limit of (currently) 478,000 movements. The steep increase in the allowable number of flights under the CO₂ ceiling in 2046 follows directly from the assumption on the steep increase of SAF uptake from 2046 onwards. Of course, it is possible that the noise limit in the future (2046 or earlier) would yield a different (potentially higher) limit due to technological improvements.

Table 1 shows the qualitative, robust conclusion that the CO₂ ceiling might have adverse effects on airline market access at Schiphol given a noise ceiling of 475,000 to 485,000 air transport movements for the upcoming decade. What are the ultimate consequences for airlines with respect to having to give up historical claims to slots in case of a binding CO₂ ceiling? The current number of slots in 2025 is about 484,000 ATMs.³⁰ Depending on the exact date of introducing the CO₂ ceiling and a transition period, the first moment in time enforcement of the ceiling might occur around plus five years after the introduction. For illustration purposes, assume this would be in 2031. In 2031, the number of allowable air transport movements are about 452,000. If in the period until 2031 no additional slot capacity would become available, a reduction from 484,000 to 452,000 would be, in the upper limit, needed around 2031. This would yield a reduction of about 6 to 7 per cent in number of slots. If considering the recently announced noise capacity limit, one would expect the maximum decrease of air transport movements to go from 478,000 to 452,000, implying a decrease of about 5 to 6 per cent. In this way, for each year (enforcement period) one can derive the implied decrease in air transport movements needed to meet the targets of the CO₂ ceiling.

Hence, in the above example airlines may face towards 2030 a reduction of about 5 to 6 per cent in ATMs at Schiphol because of implementation of the CO₂ ceiling around 2025. For US carriers, the potential decrease in capacity may result in a reduction from 8,500 annual departing flights from Amsterdam to about 8,000 departing flights from Amsterdam, approximately the 5 to 6 per cent uniform cut.

³⁰ See, for example, Schiphol's runway usage forecast at <https://www.schiphol.nl/en/you-and-schiphol/gebruiksprognose-alles-wat-je-maar-wilt-weten/> and the statements around the capacity declaration.

5 Economics and CO₂ ceiling

Airline and alliance reaction

According to economic theory, airlines are profit maximizing rational decision-making business entities. Within given economic constraints and based on the information available to them, they will try to adjust operations to new regulation, such as a CO₂ ceiling. While other sustainability regulation such as EU ETS and SAF affect the cost of inputs and thereby operations, the CO₂ ceiling implies ultimately a potential capacity limit. A (threat of a potential) capacity limit or reduction may also (indirectly) affect the cost of doing business.

The main avenues for airlines and airline alliances to affect their CO₂ emissions without reducing the number of operations include aircraft fleet replacement, changes to the fleet through other means (such as leasing), route length adjustments (in terms of destinations) and fuel blending with SAF. We show the ability of airlines and alliances to affect CO₂ emissions according to their market presence and type of operations at Schiphol. In Table 2, we distinguish between: the full-service home carrier, alliance partners of the full-service home carrier, other (visiting) full-service carriers, alliance partners of other (visiting) full-service carriers, low-cost carriers with a base at Schiphol, other low-cost carriers/charter airlines (visiting), other airlines (e.g. freighters) and (potential) new entrants. Table 2 lists per type of airline/alliance the main ways of being able to affect CO₂ emissions and the from economic theory anticipated incentives for these types of airlines to strategically affect CO₂ emissions to be lower (or higher) than set targets.

Table 2 The ability of airlines to affect the total CO₂ emissions at Schiphol is limited by their market share

Airline/Alliance	Share of flights AMS	Share of CO ₂ emissions	Ability to affect CO ₂ emissions	Incentive to affect CO ₂ emissions
FSC & home carrier	High	Very high	Fleet replacement (limited) and mix (limited) Route adjustment (medium) Renewable fuel (high)	High
Alliance partner of home carrier	High	High	Fleet replacement (limited) and mix (high) Route adjustment (limited) Renewable fuel (high)	Medium
LCC & home carrier	Medium	Medium	Fleet replacement (limited) and mix limited) Route adjustment (limited) Renewable fuel (high)	High
Large FSC (visiting)	Medium	Medium	Fleet replacement (limited) and mix (high) Route adjustment ((limited) Renewable fuel (high)	Medium to Limited
Alliance partner FSC (visiting)	Medium	Medium	Fleet replacement (limited) and mix (high) Route adjustment ((limited) Renewable fuel (high)	Medium to Limited
LCC/Charter (visiting)	Medium	Medium	Fleet replacement (limited) and mix (limited) Route adjustment (high) Renewable fuel (high)	Medium
Other airlines (e.g. Freighters)	Very low	Very low	Fleet replacement (limited) and mix (high) Route adjustment ((limited) Renewable fuel (high)	Limited
New entrants	None	None	Market access blocked	NA

Source: SEO Amsterdam Economics (2024)

The home carrier and its alliances partners have the highest share of flights and emissions due to their high market share (approximately 60 per cent). The ability to replace their fleet with newer, less polluting aircraft is limited due

to the production backlog of aircraft manufacturers.³¹ This concern is shared among all airlines. To obtain newer aircraft through leasing contracts might be possible but runs into the same concern about the production backlog. Route adjustments, in particular focusing on short- and mid-haul destinations, are *a priori* possible but since passenger demand determines market outcomes it is questionable to what extent major gains can be truly made without ending up inducing high levels of carbon leakage.³² Lastly, the use of SAF blending could reduce tank-to-wing CO₂ emissions substantially when abstracting from cost and supply side constraints. Any increase in SAF uptake, however, would need to be large to stay within the CO₂ ceiling.³³

Airlines with a large market share will try to avoid large reductions in ATM capacity from the ceiling. Airlines with higher share of ATM will lose more slots (in absolute terms) in case of ATM reduction than those with lower shares. This implies they may have a larger incentive to avoid overshooting the ceiling. Since the years of consecutive loss in slots is expected to last over an extended period, this would result in a long-term reduction of ATM and therefore the permanent loss of those historical slot claims given current regulation. At a time when the ATM cap would once more increase, for example from 2040 onwards, new entrants would most likely benefit from the new entrant rule (50 per cent of available slots to new entrants) whilst the incumbent airlines face therefore a disadvantage as their ability to regain historical slots would be limited.³⁴ A permanent loss of slots at a capacity restricted airport would be seen as a reduction in immaterial assets to the airline. If a slot would also be viewed by a court as a good (asset), a right or property of an airline, a loss thereof may lead that airline to claim for compensation, even at the European Court of Human Rights.

Hence, airlines with historically large market shares would presumably and based on economic incentives take more action to avoid ATM losses in the time until 2040. The economic intuition behind is briefly explained in Box 3.

Box 3 Economic theory suggests that airlines with major shares of flights at Schiphol have a high incentive to ensure staying within the CO₂ ceiling.

We setup a micro economic model (available upon request) to explore airline behaviour in case of a binding CO₂ ceiling. The model shows that the airlines behaviour differs between variants of the CO₂ ceiling, where airlines only take action when there is a credible loss of slots instead of “only” a reduction in capacity growth. However, we find that in a CO₂ ceiling Scenario C with a potential slot loss, for the airline to take sustainability action, the expected loss must be high enough such that the airline’s expected profit decreases beyond the increases from scarcity rent.

It is the airline with the majority of slots that has the highest incentive to take sustainability action as the threat of losing slots and therefore later profits is the highest. This is also supported by the academic literature where airlines will internalize external cost such as runway congestion fully when they are a monopoly and partially when there is a Cournot oligopoly, see Brueckner (2006).

Source: SEO Amsterdam Economics (2024)

³¹ See <https://www.adsgroup.org.uk/knowledge/q1-2024-sees-aircraft-backlog-at-a-record-high-while-production-challenges-cause-a-lag-in-deliveries/>.

³² If flight routes from Amsterdam are replaced by shorter, indirect routes, than a transfer of the CO₂ emissions accounted at Amsterdam is transferred to other countries and airports, i.e. carbon leakage.

³³ Back-on-the-envelope calculations based on the necessity to reduce about 25,000 out of 485,000 slots, suggest that if the home carrier with 60 per cent of slots was aiming to reduce these emissions itself (i.e. internalization), it would need to exceed the 6 per cent SAF content mandated by Refuel EU in 2030 by an additional 6 per cent, thereby doubling the SAF uptake for this airline. Given an assumed price premium of SAF of factor four and assuming 30 per cent fuel cost for airlines, this would increase cost of this airline by about 2 percent in comparison to the competition, everything else being equal and abstracting from any further SAF incentives (such as SAF allowances).

³⁴ When new slots are allocated and slots (series) with valid historical claims have been accounted for, at least 50 per cent of the other slots have to be allocated to new entrants (given sufficient demand by new entrants).

The long-term effect of a binding CO₂ ceiling on the home carrier as it is proposed is beyond the scope of this study. Similarly, it is unclear to what extent airline alliances, especially that of the home carrier would be incentivised to cooperate on staying below the CO₂ ceiling. Note that alliance partners might also face environmental regulation in other markets thereby limiting their ability to react to regulation in the Netherlands. Additionally, airlines and alliances that have the ability to affect their CO₂ emissions through choosing indirect routes instead of direct routes might limit their emissions from flights departing from the Netherlands.³⁵ On the one hand, the potential of carbon leakage by rerouting may imply that the CO₂ ceiling could therefore fail the test of proportionality as it may not be suitable for achieving the aims sought. On the other hand, diverting traffic elsewhere within the EU would amount to carbon leakage only for the Netherlands and not the EU.

A reduction of slot capacity would most likely result in airlines reducing their least profitable routes and operations first. To what extent these ramifications can be distinguished between Full-Service Carriers (FSC) and Low-Cost Carriers (LCC) remains speculative. Note that LCCs are generally considered more flexible in routing and operations and have threatened to move away from airports with regulation that add extra cost. FSC are less footloose, usually operate routes with comparably higher emissions that also add larger revenues per passenger to them. As such, route optimisation for them would occur under a spectrum of considerations.

Competition

A binding CO₂ ceiling affects airline competition for several reasons. Firstly, the ability to limit market entry to new entrants as long as the CO₂ ceiling is binding reduces competition which may benefit the incumbents. This likely implies that incumbents have an incentive to ensure the CO₂ ceiling is (almost) binding unless other constraints are dominant (e.g. other regulation). Obviously, for the incumbent airlines there is a trade-off between not being able to increase their operations themselves on the one hand and maintaining scarcity and market presence on the other hand. Second, when the CO₂ ceiling is no longer binding, the conditions under which new slots are issued will affect competition in comparison with the historical situation if historical slot claims have been permanently lost at that point. Thirdly, airlines with larger market shares might be attracted to compete on routes that were previously served by competitors that lost their slots, for example the home carrier on routes to the US. Fourthly, airlines with small market shares at Schiphol might have their slots reduced below a from the operational and business perspective viable number of flights per week, thereby being forced to exit this airport market altogether. All four competition outcomes may happen but remain uncertain in their probability to occur due to their complex interaction.

Institutional strategies of airlines

Given the design of the CO₂ ceiling there are three institutional economic strategies the airlines could adopt, in particular those with larger market share:

- **Holdup strategy** Since the CO₂ ceiling is an indirect instrument, the airlines might favour a holdup strategy where a process is delayed achieving strategic objectives. The supervision periods of three years are substantial and the enforcement actions that can be taken by the ILT seem rather mild - recommendations and ultimately a fine - and are targeted towards the airport. As such, practically speaking and considering that unfavourable ATM decisions might be legally challenged as well as the incentive by the airport to err on the side of optimism, it is not unlikely that the ATM limit (given the CO₂ ceiling) might be exceeded multiple times in a row. By the time that an assessment/verdict has been reached, the situation on the ground might have arguably shifted (e.g. economic, business and political climate, fleet technology and fuel availability) so that this overshoot occurs anew. Furthermore, the inclusion of unforeseeable circumstances as a reason to relax the CO₂ ceiling might

³⁵ A (gradual) shift of the hub operation for some specific long-destinations of Air France-KLM at Schiphol towards Paris Charles de Gaulle would be an example of such a potential reaction.

give room to exceed the ceiling over an extended period. Similarly, airlines can claim that planned CO₂ capacity reductions as result of the ceiling do not fully account for their own ambitions in the next year (e.g. SAF and operation of a cleaner fleet). In addition, with the indirect CO₂ ceiling, the chance of exactly reaching the ceiling is almost inexistent. This implies that one first needs to determine the error margin for a decision whether to take action. For example, when the CO₂ ceiling is exceeded within an error tolerance of 1 per cent, with a model that has an error margin of 2 per cent, does this mean no action is taken or needs to be taken? While these aspects are mostly practical details, it is possible that some of those aspects would lead to legal challenges and ongoing discussions between stakeholders resulting in delays of the CO₂ ceiling implementation (and enforcement).

- **Rent seeking** as a strategy is well established in the economic literature and in the transport sector, in particular with firms that can claim to be of national relevance. Even in the case that airlines with a large share or substantial political influence could achieve the CO₂ emissions required, it might be advantageous to (temporarily) exceed the ceiling as this allows for negotiations which might result in favourable treatment.
- **Dynamic strategy** that are time-inconsistent might provide an advantage to airlines. Since a reduction of slots might be related to cost and strategy factors on the business level of airlines, stakeholders that can affect the outcome, usually those with larger market share, can choose opportunistic moments to exceed and comply with the CO₂ ceiling.

An option not explored in previous studies regarding the CO₂ ceiling is the intensity of slot use. In the event of a binding CO₂ ceiling, it might be advantageous for the airline with larger historical slot shares to use the 80/20 rule to avoid exceeding the ceiling and thereby losing slots. This undue advantage is precisely what air services agreements aim to outlaw. A study of such a hypothetical option is beyond the scope of this research note.³⁶

Policy interaction and upcoming policy decisions

While the Chapter 3, does not find conflict of the CO₂ ceiling with other policies on the national, European and supranational level, it cannot be ruled out that those might arise due to upcoming policy changes. Without the ambition to be exhaustive, we provide some examples here:

- Current ongoing discussions on the EU level about an EU ETS scope expansion, also regarding CORSIA might affect the CO₂ ceiling. Similarly, SAF allowances that affect the price of SAF and the quantity of EU ETS available to aviation might make achieving the CO₂ ceiling easier, comparable with the introduction of the European tax directive on aviation fuel and the discussion about a Dutch distance-based aviation tax. The extent to which upcoming EU measures or measures outside the EU have interaction affects with the CO₂ ceiling such as double counting or double taxation is difficult to predict.
- There are non-CO₂ greenhouse gas emissions investigations ongoing in the Netherlands and at the EU level. Some of the proposed measures might require or incentive airlines to avoid non-CO₂ by flying longer distances and thereby emitting more CO₂. A potential conflict between the Dutch CO₂ ceiling and non-CO₂ greenhouse gas emissions regulation at the EU level could arise.
- The aim of the Dutch CO₂ ceiling is to reduce aviation emissions to zero by 2070. The aim of the EU regulation is to achieve NetZero CO₂ emissions by 2050. In 2050, both policies allow for positive CO₂ emissions from aviation. At the EU level there are discussions to remove carbon from the atmosphere through direct air carbon capture and storage DACCS or other carbon removal technologies (e.g. carbon capture utilization) to achieve NetZero emissions whereas the Dutch CO₂ ceiling does not consider this option.

³⁶ There is evidence that slot use of airlines at Schiphol is almost 100 per cent in the past (non-COVID) years, see SEO et al. (2024). As such airlines could reduce their use below the declared capacity by the airport. In such a hypothetical scenario the declared capacity could remain at higher levels than the CO₂ ceiling would permit otherwise. The legal and economic feasibility of such an option is unknown.

6 Conclusion

This study and main outcome

This study analyses the impact on airlines of the proposed CO₂ ceiling for departing international flights from the Netherlands. The study has been executed in Q3 2024 till Q1 2025, using the available insights available up until Q4 2024. For this desk research, no new forecasts, modelling results or flanking policies (such as a distance-based ticket tax) are considered. The starting point of the analysis are the forecasts presented in two previous studies executed by CE Delft in 2022.

The CO₂ ceiling sets an CO₂ emission target for flights departing the Netherlands gradually phasing out emissions by 2070. The ceiling sets CO₂ emission targets for 2030, 2050 and 2070, with a linear transition path and three-year enforcement periods. As such, the ceiling could potentially affect the capacity declaration of the relevant airports over time.

The Ministry of Infrastructure & Water Management (I&W) commissioned SEO Amsterdam Economics to study the economic and legal impacts for airlines of the proposed CO₂ ceiling. I&W formulated three so-called CO₂ ceiling scenarios:

- A. CO₂ ceiling legislation is adopted, but is not/never becomes the binding restriction (given flanking policy measures and exogenous demand and supply developments);
- B. CO₂ limits are laid down in the separate airport decisions, but these are/never become the binding restriction; and
- C. CO₂ limits are laid down in the separate airport decisions, and these limits (possibly) become binding, requiring the sector to take measures.

A binding CO₂ ceiling - i.e. Scenario C - resulting in a reduction of slot capacity at Schiphol can be considered more probable than not. This conclusion is based on the model outcomes in two previous studies commissioned by I&W and external developments, namely: the recently announced and higher than earlier anticipated number of 478,000 yearly ATMs allowable under the noise cap at Schiphol and the faster than in earlier studies anticipated ATM recovery from COVID-19.

Given a noise ceiling of 478,000 ATMs, the anticipated CO₂ ceiling would be binding from the moment of introduction until 2045. This might ultimately imply a reduction of about 5 to 7 per cent of the current historical slot claims at Schiphol around 2030.

Legal perspective

In principle, a CO₂ ceiling imposed by the Netherlands could be seen as a means in which to meet its legally binding climate goals under the European Climate Law, specifically Article 2(2) on Climate Neutrality and Article 4 on Intermediate Climate Goals, which requires EU Member States to adopt domestic laws and measures to facilitate emission reductions. A CO₂ ceiling might fall within the scope of Article 20(1) of the Air Services Regulation 1008/2008, which provides that a State may limit or refuse the exercise of traffic rights in the event of a serious environmental problem.

There, hence, do not appear to be any issues to raise regarding international or EU law for CO₂ ceiling Scenario A and CO₂ ceiling Scenario B so long as this does not disrupt the competitive environment between airlines. For CO₂ ceiling Scenario C, however, the possible legal consequences will vary by the terms of air services agreements. Also,

unless the Netherlands secures an 'environmental' exception under EU law, CO₂ ceiling Scenario C implementation could trigger a response from the European Commission and/or other Member States.

If the CO₂ ceiling results in a lower declared capacity and subsequently in a uniform reduction of air transport movements, competition at the route level may change. US carriers mainly compete at Schiphol with the home carrier. With a uniform cut, the home carrier needs to give up more capacity but can distribute amongst a wider route portfolio. In line with economic theory, the home carrier would give up relatively more European flights/destinations and none or only a few intercontinental (US) flights. This may have an impact on the route level for intercontinental (US) routes. The market share of the (Dutch) home carrier may increase for these routes, whereby impacting on the existing competitive environment and possibly going so far as to call into question antitrust immunity that presently covers most joint operations. While the fundamental requirement in Article 2 of the EU-US Air Transport Agreement that both sides must allow airlines 'a fair and equal opportunity' to compete for international air services is not defined, a binding CO₂ ceiling that produces this effect may very well be interpreted by some US airlines as contravening this requirement.

Economic perspective

Clearly, also from the economic perspective, the consequences for airlines differ greatly between a ceiling that is binding and one that is not binding. A ceiling that is not binding or will most unlikely become binding (CO₂ ceiling Scenario A and B) does not yield economic incentives for the sector beyond a monitoring tool of CO₂ emissions and the communication of a future sustainability aspiration of the sector. A binding ceiling (Scenario C), however, can result in a reduction of air transport movements or a limitation of growth.

The threat of a reduction in slots gives an incentive to airlines with large share of slots to (partially) internalise the environmental cost. Economic theory suggests that a binding CO₂ ceiling that substantially reduces the slot capacity would provide a larger incentive to airlines with a higher share in slots than those with a minor share. The explanation for the larger incentive is based on the slot allocation rules. Anticipating a proportional cut of historical slots per airline as the ultimate measure to meet the target sets by the CO₂ ceiling in combination with the forecast that from 2046 onwards more air transport movements are allowed again - due to assumed SAF-uptake - implies that the incumbent airline may not benefit from the new entrant rules at the moment the slots become available again in the future.

In general, given a total amount of ATMs, carriers can take other measures to reduce CO₂ emissions. They may, for example, implement route changes (shorter distances), improve fleet usage (cleaner planes) and fuel usage (SAF uptake). The availability and plausibility of these strategies does differ between the different types of users (carriers) of Schiphol. Carriers with larger shares of slots have a larger ability and incentive to adopt than those with smaller shares. Measures with a potential impact on costs and profitability may have a competitive effect if not all carriers are able or willing to take measures at a same efficiency level.

Literature

- ACNL (2023). Policy Rule. Slot allocation in case of exceedance of historic rights. Airport Coordination Netherlands.
- Akkoord Duurzame Luchtvaart (2019). The Netherlands accelerates towards sustainable aviation.
- Brueckner, J. K. (2002). Airport congestion when carriers have market power. *American Economic Review* 92(5).
- CE Delft (2022a). Impacts of a CO₂ ceiling for Dutch aviation.
- CE Delft (2022b). Updated impacts of a CO₂ ceiling for Dutch aviation.
- European Commission. (2023a). Commission Implementing Regulation (EU) 2023/2122 of 17 October 2023 amending Implementing Regulation (EU) 2018/2066 as regards updating the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament.
- European Commission. (2023b). Regulation (EU) 2023/2405 of the European Parliament and of the Council of 18 October 2023 on ensuring a level playing field for sustainable air transport (ReFuelEU Aviation).
- I&W (2020). Verantwoord vliegen naar 2050: Luchtvaartnota 2020-2050, Den Haag: Ministerie van Infrastructuur en Waterstaat.
- I&W (2023). Kamerbrief. Principebesluit CO₂-plafond luchtvaart. 17 maart 2023.
- I&W (2024). Wijziging van de Wet luchtvaart.
- Ruiz, P. (2023). The End of Free EU ETS Rights: the Carbon Bill Reshaping European Industry. Retrieved from Rabobank: <https://www.rabobank.com/knowledge/d011384876-the-end-of-free-eu-ets-rights-the-carbon-bill-reshaping-european-industr>
- SEO & CE Delft & Significance (2023). Schiphol: Krimpen of verduurzamen. Maatschappelijke kosten en baten van minder vluchten versus milieumaatregelen. SEO-rapport 2023-27. Amsterdam: SEO Economisch Onderzoek.
- SEO, IIAS, Beelining & To70 (2023). Slotmobiliteit op Schiphol: een rol voor slothandel? SEO-rapport 2024-145. Amsterdam: SEO Economisch Onderzoek.

Appendix A Legal context competition

Air Transport Agreement between the United States of America and the European Community and its Member States ('EU-US Air Transport Agreement')

Date of signing : 25 & 30 April 2007
 EIF : Yes
 Available at : [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02007A0525\(01\)-20100624](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02007A0525(01)-20100624)

Article Number	Fair Competition Provisions
Article 2	Each Party shall allow a fair and equal opportunity for the airlines of both Parties to compete in providing the international air transportation governed by this Agreement.
Article 15(2)	When a Party is considering proposed environmental measures at the regional, national, or local level, it should evaluate possible adverse effects on the exercise of rights contained in this Agreement, and, if such measures are adopted, it should take appropriate steps to mitigate any such adverse effects. At the request of a Party, the other Party shall provide a description of such evaluation and mitigating steps.
Annex 2	<p>Article 1 The cooperation as set forth in this Annex shall be implemented by the Department of Transportation of the United States of America and the Commission of the European Communities (hereinafter referred to as the Participants), consistent with their respective functions in addressing competition issues in the air transportation industry involving the United States and the European Community</p> <p>Article 2(4) The purpose of this cooperation is: [...] to promote compatible regulatory approaches to agreements and other cooperative arrangements through a better understanding of the methodologies, analytical techniques including the definition of the relevant market(s) and analysis of competitive effects, and remedies that the Participants use in their respective independent competition reviews.</p>

Agreement on Air Transport between Canada and the European Community and its Member States

Date of signing : 17 December 2009
 EIF : Not yet
 Available at : [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22010A0806\(01\)](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22010A0806(01))

Article Number	Fair Competition Provisions
Article 11	(1) Each Party shall ensure that airports, airways, air traffic control and air navigation services, civil aviation security, ground handling, and other related facilities and services that are provided in its territory shall be available for use by the airlines of the other Party on a non-discriminatory basis at the time arrangements for use are made. (2) To the fullest extent possible, Parties shall take all reasonable measures to ensure effective access to facilities and services, subject to legal, operational and physical constraints and on the basis of fair and equal opportunity, and transparency with respect to the procedures for gaining access. (3) Each Party shall ensure that its procedures, guidelines and regulations to manage slots applicable to airports in its territory are applied in a transparent, effective and non-discriminatory manner. (4) If a Party believes that the other Party is in violation of this Article, it may notify the other Party of its findings and request consultations under paragraph 4 of Article 17 (Joint Committee).
Article 14 (1),(2),&(4)	(1) The Parties acknowledge that it is their joint objective to have a fair and competitive environment for the operation of the air services. The Parties recognise that fair competitive practices by airlines are most likely to occur where these airlines operate on a fully commercial basis and are not state subsidised. They recognise that matters, such as, but not limited to the conditions under which airlines are privatised, the removal of competition distorting subsidies, equitable and non-discriminatory access to airport facilities and services and to computer reservation systems are key factors to achieve a fair and competitive environment. (2) If a Party finds that conditions exist in the territory of the other Party that would adversely affect a fair and competitive environment and its airlines' operation of the air services under this Agreement, it may submit observations to the other Party. Furthermore, it may request a meeting of the Joint Committee. The Parties accept that the degree to which the objectives in the Agreement related to a competitive environment may be undermined by a subsidy or other intervention is a legitimate subject for discussion in the Joint Committee. (4) The Parties recognise the cooperation between their respective competition authorities as evidenced by the Agreement between the Government of Canada and the European Communities regarding the Application of their competition laws, done at Bonn on 17 June 1999.

Comprehensive Air Transport Agreement between the Member States of the Association of Southeast Asian Nations, and the European Union and its Member States (AE CATA)

Date of signing : 17 October 2022
 EIF : Not yet
 Available at : https://transport.ec.europa.eu/system/files/2022-12/2022_EU%E2%80%93ASEAN_Comprehensive_Air_Transport_Agreement.pdf

Article Number	Fair Competition Provisions
Article 8(1), (2), (7)-(10)	<ol style="list-style-type: none"> (1) The Parties agree that it is their joint objective to have a fair and competitive environment in which the air carriers of the Parties enjoy fair and equal opportunities to compete in the provision of air transport services. (2) In order to attain the objective referred to in paragraph 1 of this Article, the Parties shall: [...] <ol style="list-style-type: none"> (c) eliminate, within their respective jurisdictions, all forms of discrimination or unfair practices which would adversely affect the fair and equal opportunity of the air carriers of another Party to compete in providing air transport services. For the avoidance of doubt, nothing in paragraph 2(c) of this Article shall include the conduct described in paragraph 1(g) of Article 2; (7) If one or several Parties (hereinafter referred to collectively as “the initiating party” for the purposes of this Article) consider that their air carriers' fair and equal opportunities to compete are adversely affected by: <ol style="list-style-type: none"> (a) discrimination or unfair practices prohibited under paragraph 2(c) of this Article....it may proceed in accordance with paragraphs 8 to 10 of this Article. (8) The initiating party shall submit a written request for consultations to the Party or Parties concerned (hereinafter referred to collectively as “the responding party” for the purposes of this Article). Consultations shall start within a period of thirty (30) days from the date of receipt of the request, unless otherwise agreed by the said parties. (9) If the initiating party and the responding party fail to reach agreement on the matter within sixty (60) days from the date of receipt of the request for consultations, the initiating party may take measures against all or some of the air carriers of the responding party which have engaged in the contested conduct or which have benefited from the discrimination, unfair practices, or subsidies in question. (10) The measures taken pursuant to paragraph 9 of this Article shall be appropriate, proportionate, and restricted in their scope and duration to what is strictly necessary to mitigate the injury to the air carriers of the initiating party and remove the undue advantage gained by the air carriers of the responding party.
Article 9	<ol style="list-style-type: none"> (1) The Parties agree that obstacles to doing business encountered by their air carriers would hamper the benefits to be achieved by this Agreement. The Parties agree to cooperate in removing such obstacles where such obstacles may hamper commercial operations, create distortions to competition, or affect equal opportunities to compete.

- Article 2(g)(ii)
- (2) The Joint Committee shall monitor the progress made in effectively addressing obstacles to doing business encountered by air carriers of the Parties.
 - (g) "competition law" means law which addresses, within the jurisdiction of a Party, the following conduct, where it may affect air transport services to, from, or within that Party:
 - (ii) abuses by one or more air carriers of a dominant position.
-

Appendix B Legal context environment

Comprehensive Air Transport Agreement between the Member States of the Association of Southeast Asian Nations, and the European Union and its Member States (AE CATA)

Date of signing : 17 October 2022
 EIF : Not yet entered into force
 Available at : https://transport.ec.europa.eu/system/files/2022-12/2022_EU%E2%80%93ASEAN_Comprehensive_Air_Transport_Agreement.pdf

Article Number	Environmental Provisions
Article 3(8)	Each Party shall allow each air carrier to determine the frequency and capacity of the international air transport it offers based on commercial considerations. Consistent with this right, no Party shall unilaterally limit the volume of traffic, frequency or regularity of service, routing, origin and destination of traffic, or the aircraft type or types operated by the air carriers of another Party, except for customs, technical, operational, air traffic management safety, environmental or health protection reasons, in a non-discriminatory manner, or unless otherwise provided for in this Agreement.
Article 17	<ol style="list-style-type: none"> (1) The Parties agree to cooperate on matters concerning air navigation services, including their safety oversight. They agree to address any policy issues relating to the performance of air traffic management, with a view to optimising overall flight efficiency, reducing costs, minimising environmental impact, and enhancing the safety and capacity of air traffic flows between the existing air traffic management systems of the Parties. (2) The Parties agree to encourage their competent authorities and air navigation service providers to cooperate on ensuring interoperability between the air traffic management systems of the Parties and explore further integration of the Parties' systems, to reduce the environmental impact of aviation, and to share information where appropriate. (3) The Parties agree to promote cooperation between their air navigation service providers in order to exchange flight data and coordinate traffic flows to optimise flight efficiency, with a view to achieving improved predictability, punctuality, and service continuity for air traffic. (4) The Parties agree to cooperate on their air traffic management modernisation programmes, including both development and deployment activities, and to encourage cross-participation in validation and demonstration activities.
Article 18	<ol style="list-style-type: none"> (1) The Parties support the need to protect the environment by promoting the sustainable development of aviation. The Parties intend to work together to identify issues related to the impacts of international aviation on the environment. (2) The Parties recognise the importance of working together and with the global community, to consider and minimise the effects of aviation on the environment. (3) The Parties reiterate the importance of tackling climate change and towards this end, agree to cooperate in addressing greenhouse gas (hereinafter referred to as "GHG") emissions associated with aviation, both at domestic and international levels.

- (4) The Parties agree to exchange information and have regular dialogue among experts to enhance cooperation to address the environmental impact of international aviation including in areas such as research and development, sustainable aviation fuels, noise related matters, and on other measures aimed at addressing GHG emissions, taking into account their multilateral environmental rights and obligations.
- (5) The Parties recognise the need to take appropriate measures to prevent or otherwise address the environmental impacts of air transport provided that such measures are fully consistent with their rights and obligations under international law.

- Article 23 (1) and (4)
- (1) A Joint Committee composed of representatives of the Parties shall be responsible for overseeing the administration of this Agreement and ensuring its proper implementation.
 - (4) For the purpose of the proper implementation of this Agreement, the Joint Committee shall: (a) exchange information, including on changes to laws, regulations, and policies of the respective Parties which may affect air services, as well as statistical information for the purpose of monitoring the development of air services under this Agreement...

- Article 24(7)
- This Agreement shall not preclude consultation and discussions between the competent authorities of the Parties outside the Joint Committee, including in the fields of air transport development, security, safety, environment, social policy, air traffic management, aviation infrastructure, competition matters, and consumer protection. The Parties shall inform the Joint Committee of the outcome of such consultations and discussions which may have an impact on the interpretation or application of this Agreement.
-

Common Aviation Area Agreement between the European Union and its Member States, of the one part, and the Republic of Armenia, of the other part

- Date of signing : 15 November 2021
- EIF : The agreement will apply when the ratification procedures are completed by both sides (pending notification of the completion of national and EU procedures and official ratification by Armenia). Armenia has committed to implementing the EU aviation *acquis*.
- Available at : [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22021A1201\(01\)](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22021A1201(01))

Article Number	Environmental Provisions
Article 1	The objective of this Agreement is the creation of a common aviation area between the Parties based on progressive market opening, liberalisation of air carrier ownership and control, fair and equal conditions of competition, non-discrimination and common rules, including in the areas of safety, security, air traffic management, social aspects and the environment. To this end, this Agreement sets out the rules applicable between the Parties. These rules include the provisions laid down by the legislation specified in Annex II.
Article 2(14)	“user charge” means a charge imposed on air carriers for the provision of airport, airport environmental, air navigation or aviation security facilities or services, including related services and facilities.
Article 3(4)	Each Party shall allow air carriers to determine the frequency and capacity of the international air transport that they offer based on commercial considerations in the marketplace. Consistent with this right, neither Party shall unilaterally limit the volume of traffic, frequency or regularity of service, routing, origin or destination of traffic, or the aircraft type or types operated by the air carriers of the other Party, except for customs, technical, operational, air traffic management safety, environmental or health protection reasons or unless otherwise provided for in this Agreement
Article 16(2)	The Parties shall cooperate in the field of air traffic management with a view to extending the Single European Sky to Armenia in order to enhance current safety standards and overall efficiency of general air traffic operations in Europe, to optimise air traffic control capacities, to minimise delays and to increase environmental efficiency. To this purpose, Armenia shall be involved as observer in the Single Sky Committee and other Single European Sky related bodies from the date of entry into force of this Agreement. The Joint Committee shall be responsible for monitoring and facilitating cooperation in the field of air traffic management.
Article 17	<ul style="list-style-type: none"> (1) Subject to the transitional provisions set out in Annex I, the Parties shall ensure that their relevant legislation, rules or procedures comply with the regulatory requirements and standards relating to air transport specified in Annex II, Part E. (2) The Parties support the need to protect the environment by promoting the sustainable development of aviation. The Parties intend to work together to identify issues related to the impacts of aviation on the environment.

- (3) The Parties recognise the importance of working together in order to consider and minimise the effects of aviation on the environment in a manner consistent with the objectives of this Agreement.
- (4) The Parties recognise the importance of tackling climate change and therefore of addressing greenhouse gas emissions associated with aviation, both at domestic and international levels. They agree to step up cooperation on these matters, including through relevant multilateral arrangements, particularly the implementation of the global market-based measure that was agreed at the 39th ICAO Assembly and the use of the mechanism established by Article 6(4) of the Paris Agreement under the United Nations Framework Convention on Climate Change in the development of global market-based measures to address greenhouse gas emissions in the aviation sector and any other aspect under that Article of particular relevance for international aviation emissions.
- (5) The Parties undertake to exchange information and have regular direct communication and dialogue among experts to enhance cooperation on addressing aviation environmental impacts, including:
 - (i) on research and development with regard to environmentally friendly aviation technology;
 - (i) in air traffic management innovation with a view to reducing the environmental impacts of aviation;
 - (i) on research and development of sustainable alternative fuels for aviation;
 - (i) on issues dealing with the environmental effects of aviation and mitigation of climate-related emissions of aviation; and
 - (i) in noise mitigation and monitoring, with a view to reducing the environmental impacts of aviation.
- (6) The Parties shall also, in compliance with their multilateral environmental rights and obligations, effectively enhance cooperation, including financial and technological, in relation to measures aimed at addressing greenhouse gas emissions from international aviation.
- (7) The Parties recognise the need to take appropriate measures to prevent or otherwise address the environmental impacts of air transport provided that such measures are fully consistent with their rights and obligations under international law.

Article
23(1)

A Joint Committee composed of representatives of the Parties is hereby established. It shall be responsible for overseeing the administration of this Agreement and shall ensure its proper implementation. It shall make recommendations and take decisions where expressly provided in this Agreement.

Agreement on Air Transport between Canada and the European Community and its Member States

Date of signing : 17 December 2009
 EIF : The agreement is not yet in force.
 Decision 2010/417/EC entered into force on 30 November 2009. This decision authorized the signing and provisional application of the agreement by the EU. Decision (EU) 2019/702 entered into force on 15 April 2019. This decision concluded the agreement on behalf of the EU.
 Available at : [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22010A0806\(01\)](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22010A0806(01))

Article Number	Environmental Provisions
Article 13(2)	Each Party shall allow any airline of the other Party to determine the frequency and capacity of the air services it offers under this Agreement based upon the airline's commercial considerations in the market place. No Party shall unilaterally limit the volume of traffic, frequency or regularity of service, or the aircraft type or types operated by the airlines of the other Party, nor shall it require the filing of schedules, programmes for charter flights, or operations plans by airlines of the other Party, except as may be required for technical, operational or environmental (local air quality and noise) reasons under uniform conditions consistent with Article 15 of the Convention.
Article 15	The Parties shall cooperate on addressing safety oversight and policy issues relating to air traffic management, with a view to optimising overall efficiency, reducing cost, and enhancing the safety and capacity of existing systems. The Parties shall encourage their air navigation service providers to continue to collaborate on interoperability to integrate both sides' systems where possible further, to reduce the environmental impact of aviation, and to share information where appropriate.
Article 17(1)&(6)	<ul style="list-style-type: none"> (1) The Parties hereby establish a committee composed of representatives of the Parties (hereinafter referred to as the Joint Committee). (6) The Joint Committee shall foster cooperation between the Parties and may consider any matter related to the operation or implementation of this Agreement, including, but not limited to:... (b) exchanging information, including advising as to changes to domestic law and policies, which affect the Agreement
Article 18	<ul style="list-style-type: none"> (1) The Parties recognise the importance of protecting the environment when developing and implementing international aviation policy. (2) Without prejudice to the rights and obligations of the Parties under international law and the Convention, each Party within its own sovereign jurisdiction shall have the right to take and apply the appropriate measures to address the environmental impacts of air transport provided that such measures are applied without distinction as to nationality. (3) The Parties recognise that the costs and benefits of measures to protect the environment must be carefully weighed in developing international aviation policy. When a Party is considering proposed environmental measures, it should evaluate possible adverse effects on the exercise of rights contained in this Agreement, and, if such measures are adopted, it should take appropriate steps to mitigate any such adverse effects. (4) The Parties recognise the importance of working together, and within the framework of multilateral discussions, to consider the effects of aviation on the environment and the

economy, and to ensure that any mitigating measures are fully consistent with the objectives of this Agreement.

- (5) When environmental measures are established, the aviation environmental standards adopted by the International Civil Aviation Organisation in Annexes to the Convention shall be followed except where differences have been filed.
 - (6) The Parties shall endeavour to consult each other on matters of the environment, including on planned measures likely to have a significant effect on the international air services covered by this Agreement, with a view to achieve compatible approaches to the extent possible. Consultations shall start within 30 days of receipt of such a request, or any other period of time where mutually determined.
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Air Transport Agreement between the United States of America and the European Community and its Member States

- Date of signing : 25 & 30 April 2007
- EIF : The agreement entered into force on 29 June 2020. However, it has provisionally applied since 30 March 2008 (Article 25 of the Air Transport Agreement). The Protocol amending the Air Transport Agreement entered into force on 5 May 2022.
- Available at : [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02007A0525\(01\)-20100624](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02007A0525(01)-20100624)

Article Number	Environmental Provisions
Article 1(10)	'User charge' means a charge imposed on airlines for the provision of airport, airport environmental, air navigation, or aviation security facilities or services including related services and facilities.
Article 3(4)	Each Party shall allow each airline to determine the frequency and capacity of the international air transportation it offers based upon commercial considerations in the marketplace. Consistent with this right, neither Party shall unilaterally limit the volume of traffic, frequency or regularity of service, or the aircraft type or types operated by the airlines of the other Party, nor shall it require the filing of schedules, programs for charter flights, or operational plans by airlines of the other Party, except as may be required for customs, technical, operational, or environmental (consistent with Article 15) reasons under uniform conditions consistent with Article 15 of the Convention.
Article 12(2)	User charges imposed on the airlines of the other Party may reflect, but shall not exceed, the full cost to the competent charging authorities or bodies of providing the appropriate airport, airport environmental, air navigation, and aviation security facilities and services at the airport or within the airport system. Such charges may include a reasonable return on assets, after depreciation. Facilities and services for which charges are made shall be provided on an efficient and economic basis.
Article 15	<ol style="list-style-type: none"> (1) The Parties recognise the importance of protecting the environment when developing and implementing international aviation policy, carefully weighing the costs and benefits of measures to protect the environment in developing such policy, and, where appropriate, jointly advancing effective global solutions. Accordingly, the Parties intend to work together to limit or reduce, in an economically reasonable manner, the impact of international aviation on the environment. (2) When a Party is considering proposed environmental measures at the regional, national, or local level, it should evaluate possible adverse effects on the exercise of rights contained in this Agreement, and, if such measures are adopted, it should take appropriate steps to mitigate any such adverse effects. At the request of a Party, the other Party shall provide a description of such evaluation and mitigating steps. (3) When environmental measures are established, the aviation environmental standards adopted by the International Civil Aviation Organization in annexes to the Convention shall be followed except where differences have been filed. The Parties shall apply any environmental measures affecting air services under this Agreement in accordance with Article 2 and Article 3(4) of this Agreement.

- (4) The Parties reaffirm the commitment of Member States and the United States to apply the balanced approach principle.
 - (5) The following provisions shall apply to the imposition of new mandatory noise-based operating restrictions at airports which have more than 50 000 movements of civil subsonic jet aeroplanes per calendar year.
 - (a) The responsible authorities of a Party shall provide an opportunity for the views of interested parties to be considered in the decision-making process.
 - (b) Notice of the introduction of any new operating restriction shall be made available to the other Party at least 150 days prior to the entry into force of that operating restriction. At the request of that other Party, a written report shall be provided without delay to that other Party explaining the reasons for introducing the operating restriction, the environmental objective established for the airport, and the measures that were considered to meet that objective. That report shall include the relevant evaluation of the likely costs and benefits of the various measures considered.
 - (c) Operating restrictions shall be (i) non-discriminatory; (ii) not more restrictive than necessary in order to achieve the environmental objective established for a specific airport; and (iii) non-arbitrary.
 - (6) The Parties endorse and shall encourage the exchange of information and regular dialogue among experts, in particular through existing communication channels, to enhance cooperation, consistent with applicable laws and regulations, on addressing international aviation environmental impacts and mitigation solutions, including:
 - (a) research and development of environmentally friendly aviation technology;
 - (b) improvement of scientific understanding regarding aviation emissions impacts in order to better inform policy decisions;
 - (c) air traffic management innovation with a view to reducing the environmental impacts of aviation;
 - (d) research and development of sustainable alternative fuels for aviation; and
 - (e) exchange of views on issues and options in international fora dealing with the environmental effects of aviation, including the coordination of positions, where appropriate.
 - (7) If so requested by the Parties, the Joint Committee, with the assistance of experts, shall work to develop recommendations that address issues of possible overlap between and consistency among market-based measures regarding aviation emissions implemented by the Parties with a view to avoiding duplication of measures and costs and reducing to the extent possible the administrative burden on airlines. Implementation of such recommendations shall be subject to such internal approval or ratification as may be required by each Party.
 - (8) If one Party believes that a matter involving aviation environmental protection, including proposed new measures, raises concerns for the application or implementation of this Agreement, it may request a meeting of the Joint Committee, as provided in Article 18, to consider the issue and develop appropriate responses to concerns found to be legitimate.
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Article
18(1),
(3)&(4)

- (1) A Joint Committee consisting of representatives of the Parties shall meet at least once a year to conduct consultations relating to this Agreement and to review its implementation.
 - (3) The Joint Committee shall review, as appropriate, the overall implementation of the Agreement, including any effects of aviation infrastructure constraints on the exercise of rights provided for in Article 3, the effects of security measures taken pursuant to Article 9, the effects on the conditions of competition, including in the field of Computer Reservation Systems, and any social effects of the implementation of the Agreement. The Joint Committee shall also consider, on a continuing basis, individual issues or proposals that either Party identifies as affecting, or having the potential to affect, operations under the Agreement, such as conflicting regulatory requirements.
 - (4) The Joint Committee shall also develop cooperation by: [...] (j) fostering expert-level exchanges on new legislative or regulatory initiatives and developments, including in the fields of security, safety, the environment, aviation infrastructure (including slots), and consumer protection;
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Air Services Agreement between the Kingdom of the Netherlands and the Republic of Cote d'Ivoire

Date of signing : 23 May 2024
 EIF : This Agreement shall enter into force on the first day of the second month following the date of the later written notification through diplomatic channels by which the Contracting Parties have informed each other that the formalities and constitutional requirements for its entry into force in their respective countries have been complied with - Article 25(2)
 Available at : <https://wetten.overheid.nl/BWBV0007062/2024-05-23>

Article Number	Environmental Provisions
Article 10(2)	User Charges imposed on the Airline(s) of the other Contracting Party may reflect, but shall not exceed, the full cost to the competent charging authorities or bodies of providing the appropriate airport, airport environmental, air navigation and aviation security facilities and services at the airport or within the airport system. Such full cost may include a reasonable return on assets, after depreciation. Facilities and services for which charges are made shall be provided on an efficient and economic basis.
Article 20	<p>1e Contracting Parties support the need to protect the environment by promoting the sustainable development of aviation.</p> <p>1e Contracting Parties recognize the need to take appropriate measures to prevent or otherwise address the environmental impact of air transport provided that such measures are fully consistent with their rights and obligations under international law.</p> <p>1e Contracting Parties recognize the importance of tackling climate change and therefore of addressing greenhouse gas (GHG) emissions associated with aviation, both at domestic and international levels. They agree to step up cooperation on these matters, including through relevant multilateral arrangements, particularly the use of the Sustainable Development Mechanism established by Article 6 of the Paris Agreement under the United Nations Framework Convention on Climate Change in the development of international global market based measures such as the Carbon Offsetting and Reduction Scheme (CORSIA) for international aviation currently under development by the International Civil Aviation Organization, to address GHG emissions in the aviation sector and any other aspect under the said Article 6 of particular relevance for international aviation emissions.</p>

Services Agreement between the Kingdom of the Netherlands and the Democratic Socialist Republic of Sri Lanka

Date of signing : 22 February 2023
 EIF : 01 January 2024
 Available at : <https://wetten.overheid.nl/BWBV0006987/2024-01-01>

Article Number	Environmental Provisions
Article 8(3)	Each Contracting Party shall allow each Designated Airline to determine the frequency and Capacity of the International Air Services it offers based upon commercial considerations in the marketplace. Consistent with this right, neither Contracting Party shall unilaterally limit the volume of traffic, frequency or regularity of service, or the aircraft type(s) operated by the Designated Airline(s) of the other Contracting Party, except as may be required for customs, technical, operational, or environmental reasons under uniform conditions consistent with Article 15 of the Convention.
Article 10(2)	User Charges imposed on the Designated Airline(s) of the other Contracting Party may reflect, but shall not exceed, the full cost to the competent charging authorities or bodies of providing the appropriate airport, airport environmental, air navigation and aviation security facilities and services at the airport or within the airport system. Such full cost may include a reasonable return on assets, after depreciation. Facilities and services for which charges are made shall be provided on an efficient and economic basis taking into account national regulations in force.
Article 19	<ol style="list-style-type: none"> (1) The Contracting Parties support the need to protect the environment by promoting the sustainable development of aviation. (2) The Contracting Parties recognize the need to take appropriate measures to prevent or otherwise address the environmental impact of air transport provided that such measures are fully consistent with their rights and obligations under international law. (3) The Contracting Parties recognize the importance of tackling climate change and therefore of addressing greenhouse gas (GHG) emissions associated with aviation, both at domestic and international levels. They agree to step up cooperation on these matters, including through relevant multilateral arrangements, particularly the use of the Sustainable Development Mechanism established by Article 6 of the Paris Agreement under the United Nations Framework Convention on Climate Change in the development of international global market based measures such as the Carbon Offsetting and Reduction Scheme (CORSIA) for international aviation currently under development by International Civil Aviation Organization, to address GHG emissions in the aviation sector and any other aspect under the said Article 6 of particular relevance for international aviation emissions.

Air Services Agreement between the Kingdom of the Netherlands and the Cooperative Republic of Guyana

Date of signing : 08 December 2021
 EIF : 01 October 2023
 Available at : <https://wetten.overheid.nl/BWBV0006945/2023-10-01>

Article Number	Environmental Provisions
Article 8(3)	Each Contracting Party shall allow each Designated Airline to determine within the limits of the existing entitlements that have been agreed upon by the Contracting Parties, the frequency and Capacity of the International Air Services it offers based upon commercial considerations in the marketplace. Consistent with this right, neither Contracting Party shall unilaterally limit the volume of traffic, frequency or regularity of service, or the aircraft type(s) operated by the Designated Airline(s) of the other Contracting Party, except as may be required for customs, technical, operational or environmental reasons under uniform conditions consistent with Article 15 of the Convention.
Article 10(2)	User Charges imposed on the Airline(s) of the other Contracting Party may reflect, but shall not exceed, the full cost to the competent charging authorities or bodies of providing the appropriate airport, airport environmental, air navigation and aviation security facilities and services at the airport or within the airport system. Such full cost may include a reasonable return on assets, after depreciation. Facilities and services for which charges are made shall be provided on an efficient and economic basis.

Air Services Agreement between the Kingdom of the Netherlands and the Republic of Chile

Date of signing : 24 May 2021
 EIF : This Agreement shall enter into force on the first day of the second month following the date of the later written notification through diplomatic channels by which the Contracting Parties have notified each other that the formalities and constitutional requirements for its entry into force in their respective countries have been complied with - Article 24
 Available at : <https://wetten.overheid.nl/BWBV0006907/2021-05-24>

Article Number	Environmental Provisions
Article 10(2)	User Charges imposed on the Designated Airline(s) of the other Contracting Party may reflect, but shall not exceed, the full cost to the competent charging authorities or bodies of providing the appropriate airport, airport environmental, air navigation and aviation security facilities and services at the airport or within the airport system. Such full cost may include a reasonable return on assets, after depreciation. Facilities and services for which charges are made shall be provided on an efficient and economic basis taking into account national regulations in force.
Article 16	(1) The Contracting Parties support the need to protect the environment by promoting the sustainable development of aviation. (2) The Contracting Parties recognize the need to take appropriate measures to prevent or otherwise address the environmental impact of air transport provided that such measures are fully consistent with their rights and obligations under international law.

Agreement between the Kingdom of the Netherlands and the State of Kuwait for Air Services between and beyond their respective Territories

Date of signing : 16 October 2019
EIF : 1 October 2020
Available at : <https://wetten.overheid.nl/BWBV0006849/2020-10-01>

Article Number	Environmental Provision
Article 8(3)	Each Contracting Party shall allow each Designated Airline to determine the Capacity of the International Air Services it offers based upon commercial considerations in the marketplace. Consistent with this right, neither Contracting Party shall unilaterally limit the volume of traffic, frequency or regularity of service, or the aircraft type(s) operated by the Designated Airline(s) of the other Contracting Party, except as may be required for customs, technical, operational or environmental reasons under uniform conditions consistent with Article 15 of the Convention.

Air Services Agreement between the Kingdom of the Netherlands and the Federative Republic of Brazil

Date of signing : 8 July 2019
 EIF : 1 July 2021
 Available at : <https://wetten.overheid.nl/BWBV0006834/2021-07-01>

Article Number	Environmental Provisions
Article 9(2)	User Charges imposed on the Designated Airline(s) of the other Contracting Party may reflect, but shall not exceed, the full cost to the competent charging authorities or bodies of providing the appropriate airport, airport environmental, air navigation and aviation security facilities and services at the airport or within the airport system. Such full cost may include a reasonable return on assets, after depreciation. Facilities and services for which charges are made shall be provided on an efficient and economic basis taking into account national regulations in force.
Article 18	(1) The Contracting Parties support the need to protect the environment by promoting the sustainable development of aviation. (2) The Contracting Parties recognize the need to take appropriate measures to prevent or otherwise address the environmental impact of air transport, provided that such measures are fully consistent with their rights and obligations under international law.

Air Services Agreement between the Kingdom of the Netherlands and the Republic of Angola

Date of signing : 9 October 2018
 EIF : 1 August 2024
 Available at : <https://wetten.overheid.nl/BWBV0006773/2024-08-01>

Article Number	Environmental Provisions
Article 8(3)	Each Contracting Party shall allow each Designated Airline to determine the frequency and Capacity of the International Air Service it offers based upon commercial considerations in the marketplace. Consistent with this right, neither Contracting Party shall unilaterally limit the volume of traffic, frequency or regularity of service, or the aircraft type(s) operated by the Designated Airline of the other Contracting Party, except as may be required for customs, technical, operational or environmental reasons under uniform conditions consistent with Article 15 of the Convention.
Article 10(2)	User Charges imposed on the Airline of the other Contracting Party may reflect, but shall not exceed, the full cost to the competent charging authorities or bodies of providing the appropriate airport, airport environmental, air navigation and aviation security facilities and services at the airport or within the airport system. Such full cost may include a reasonable return on assets, after depreciation. Facilities and services for which charges are made shall be provided on an efficient and economic basis.

Air services agreement between the Kingdom of the Netherlands and the Oriental Republic of Uruguay

Date of signing : 12 December 2016
 EIF : 01 December 2018
 Available at : <https://wetten.overheid.nl/BWBV0006658/2018-12-01>

Article Number	Environmental Provisions
Article 8(3)	Each Contracting Party shall allow each Designated Airline to determine the frequency and capacity of the international air transportation it offers based upon commercial considerations in the marketplace. Consistent with this right, neither Contracting Party shall unilaterally limit the volume of traffic, frequency or regularity of service, or the aircraft type(s) operated by the Designated Airline(s) of the other Contracting Party, except as may be required for customs, technical, operational, or environmental reasons under uniform conditions consistent with Article 15 of the Convention.
Article 10(2)	User Charges imposed on the Airline(s) of the other Contracting Party may reflect, but shall not exceed, the full cost to the competent charging authorities or bodies of providing the appropriate airport, airport environmental, air navigation, and aviation security facilities and services at the airport or within the airport system. Such full cost may include a reasonable return on assets, after depreciation. Facilities and services for which charges are made shall be provided on an efficient and economic basis.

Protocol amending the Agreement between the Kingdom of the Netherlands and the Socialist Republic of Vietnam for air services between and beyond their respective territories

Date of signing : 28 September 2011

EIF : 8 August 2012

Available at : <https://wetten.overheid.nl/BWBV0005505/2012-08-08> (consolidated text with Agreement between the Kingdom of the Netherlands and the Socialist Republic of Vietnam for air services between and beyond their respective territories 1993

Article Number	Environmental Provision
Article 10bis(2)	User charges imposed on the designated airline(s) of the other Contracting Party may reflect, but shall not exceed, the full cost to the competent charging authorities of providing the appropriate airport, environmental, air navigation and aviation security facilities and services at the airport or within the airport system. Such full cost may include a reasonable return on assets, after depreciation. Facilities and services for which charges are made shall be provided on an efficient and economic basis.