

【欧州】 【Common】

Common - EU decarbonization policy: Improving the climate and environmental performance of airspace management - the long road to implementing the new Single European Sky legislation

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【概要 : Summary】

The persistent fragmentation of European airspace and insufficient airspace capacity – worsened by increasing air traffic before but also after the COVID-19 pandemic – force aircraft to operate on less fuel-efficient routes in Europe, resulting in an increase of kerosene consumption and higher GHG emissions in the EU’s aviation sector.

To address these challenges, the European Commission launched the Single European Sky (SES) initiative already in 1999. It aimed to alleviate airspace congestion and to reduce GHG emissions by enhancing air traffic management (ATM) performance and air navigation services.

However, more than two decades later, the completion of the SES is still pending. Although the European Commission introduced a proposal under the SES 2+ reform in 2013 to revitalise the SES plans to modernize the air traffic system, the proposal remained blocked by some EU Member States and negotiations stalled in 2015. Recognizing the need for renewed efforts against the backdrop of the introduction of the European Green Deal’s targets, the European Commission introduced the recast of the SES initiative, aiming for significant reductions in aviation emissions. On 22 September 2020, the Commission

presented an amended SES proposal, COM(2020) 579 final, to recast the implementation of the SES 2+, seeking to establish a more efficient ATM system, and thereby to reduce GHG emissions and air pollution but also to enhance capacity and achieving cost-efficiency gains in aviation.

On 6 March 2024, the Council of the European Union and the European Parliament reached a provisional agreement on the updated SES framework, which has meanwhile been approved. Regulation (EU) 2024/2803 establishes the rules for the effective functioning of the SES, to reinforcing air traffic safety standards while contributing to more sustainability in the aviation sector by optimizing flight routes, minimizing flight delays, and lowering CO₂ emissions associated with air traffic in Europe. The new SES regulation lays the groundwork for achieving its objectives and enhancing ATM performance and air navigation services. However, its overall success remains uncertain, as it will highly depend on the EU Member States’ implementation of decisive measures to improving the ATM system, and thereby to ultimately also improve the aviation sector’s sustainability.

【記事 : Article】

1. Background of the Single European Sky reform (SES)

According to the Performance Review Body (PRB) of the Single European Sky's 2023 Monitoring Report, air traffic in Europe increased in 2023, reaching 91% of 2019 levels (PRB 2024). However, as developments in both pre-pandemic and post-pandemic periods show, insufficient airspace capacity has led to air traffic delays and disruptions, as well as negative environmental impacts due to the increase of emissions. The EU aviation sector accounts for 14.4% of the transport sector's GHG emissions (Council of the EU 2024a). This is driven by increasing inefficiencies across the air transport system, while air traffic has nearly returned to the pre-pandemic levels, causing aircraft to operate on fuel-inefficient routes and congestion in the sky (European Commission n.d.).

Consequently, the air traffic management (ATM) system faces multiple challenges, including air traffic control (ATC) capacity shortages, integrating new entrants such as drones into EU airspace, and ensuring safety and security as digitalization and cyber threats increase (European Commission n.d.).

At the same time, to achieve the 2050 climate neutrality and net-zero GHG emissions targets as outlined in the European Green Deal (COM (2019) 640 final), the transport sector must reduce its GHG emissions by 90% (COM (2019) 640 final). This goal includes also to reduce GHG emissions in the aviation sector. To achieve this, the ATM performance must be improved, and the 2019 European Green Deal explicitly calls for a restart of the Single European Sky initiative: "In aviation, work on adopting the Commission's proposal on a truly Single European Sky will need to restart, as this will help achieve significant reductions in aviation emissions" (COM (2019) 640 final).

The European Commission proposed the first Single European Sky (SES) initiative already in

1999 to address the inefficiencies and fragmentation of European airspace. The SES initiative aimed to enhance the performance of air traffic management (ATM) and air navigation services (ANS), while mitigating aviation's environmental impact by reducing air pollution and GHG emissions through better integration of European airspace (Council of the EU 2021a, 2024). However, it was not until 2004 that the SES I initiative was officially launched to address airspace fragmentation and to improve ATM's performance and thereby also environmental sustainability (European Commission n.d.).

2. The SES initiative's legal framework and its limited achievements

The overarching goal of the entire SES reform is to improve the performance, organization, and management of EU airspaces and ANS delivery, thereby increasing capacity, reducing costs, and enhancing the system's adaptability, while minimizing aviation's environmental and climate impact (Council of the EU 2024). The first SES I legislative package in 2004 was followed by SES II in 2009, marking the last major legislative development within the SES framework to date (Council of the EU 2024).

According to the European Parliament (2023), the SES initiative and its regulatory framework have achieved some progress. The SES has helped improving EU air traffic operations and has facilitated the restructuring of European airspace and ANS delivery by implementing measures such as separating regulatory functions from service provision, enabling flexibility in the civil and military use of airspace, ensuring equipment interoperability, and establishing harmonized classification of upper airspace, as well as the introduction of a common charging scheme for ANS, and standardized licensing requirements for air traffic controllers (European Parliament 2023). The initiative has also established "key components", including

the role of the network manager, currently filled by Eurocontrol, which is tasked with improving the performance of the EU aviation network (European Parliament 2023).

Despite these improvements, the SES initiative has faced significant delays, particularly in deploying basic elements such as the creation of Functional Airspace Blocks (FABs), which addresses airspace fragmentation by organizing it based on traffic flows rather than national borders (European Parliament 2023, 2024a).

The Single European Sky 2+ (SES 2+) reform, first proposed by the European Commission in 2013, aimed to modernize ATM systems and address capacity challenges. Although the Council reached a partial general approach in December 2014, the reform was delayed for more than a decade due to political disagreements, particularly between the UK (then an EU member) and Spain over the applicability of the rules to Gibraltar airport (Soone 2024).

Since the SES 2+ negotiations stalled in 2015, the development of mechanisms to adapt capacity more efficiently to fluctuating demand or varying geographical needs – an improvement that would have directly contributed to the objectives of the European Green Deal and the reduction of CO₂ emissions in the aviation sector – never materialised (Antolini 2021, European Parliament 2024b).

3. Monitoring the capacity problems of air navigation services

According to the Performance Review Body (PRB) of the Single European Sky's 2023 Monitoring Report's evaluation, whether EU Member States met their targets regarding safety, environment, capacity, and cost-efficiency in aviation, in 2023, Air Navigation Service Providers (ANSPs) handled 9.1 million flights compared to 8.3 million flights in 2022, and 9.9 million flights in the last pre-pandemic year 2019 (PRB 2024). While 2023 air traffic still remains below

traffic movements in Europe in 2019, and some ANSPs continue to underinvest in staff and in capacity projects, it is important to acknowledge that COVID-19 did impact on the ability of ANSPs to undertake their ATCO training plans (PRB 2024). Air traffic in Europe also continues to be impacted by Russia's ongoing war of aggression against Ukraine, and a significant shift in traffic has taken place, leading to unexpected increases in air traffic for some Member States and complicating capacity planning (PRB 2024).

According to the PRB's 2023 report, the EU-wide capacity performance continues to deteriorate, with several Member States failing to implement adequate measures to meet air traffic demand, even though traffic levels were 4% below the 2023 forecast (PRB 2024). The average en route ATFM delay was 1.84 minutes per flight, exceeding the EU-wide target by 1.34 minutes and surpassing 2019 levels (PRB 2024). Six out of 13 Member States that failed to meet capacity targets experienced double-digit traffic growth compared to 2022. However, four Member States missed their capacity targets despite traffic demand remaining at or below forecasted levels (PRB 2024). Terminal capacity performance deteriorated compared to 2022 by 60%, mainly due to disruptions, adverse weather, and non-ATC issues at airports (PRB 2024). All-cause departure delays reached 19.23 minutes per flight, a slight increase of 0.2 minutes per flight from 2022 (PRB 2024). The interdependence between capacity and environmental performance is evident, as poor capacity performance translates into worsened environmental outcomes. This is underlined by the failure to meet the 2022 environmental target (PRB 2024). Airspace users were forced to fly longer routes and burn additional fuel at higher costs to navigate congested airspace (PRB 2024).

2023 also marked the first full year of the effects of Russia's war of aggression against

Ukraine on environmental performance. The EU-wide horizontal flight efficiency (KEA) performance target was missed in 2023, with a result of 2.99% compared to the target of 2.40%, with higher KEA values indicating poorer performance – the worst result since 2016 (PRB 2024). Therefore, the PRB continues to urge ANSPs and Member States to take swift action to implement capacity-related measures (PRB 2024).

4. Unlocking the SES reform's potential:

The new SES legislative framework

The European Green Deal, adopted by the Commission in December 2019, highlighted the need to resume work on the implementation of the SES initiative as it is believed to have a significant potential to reduce aviation emissions in Europe (European Source Online 2024). In September 2020, the European Commission presented an amended proposal for the SES, COM (2020) 579 final, accompanied by a proposal amending the European Union Aviation Safety Agency (EASA)'s Basic Regulation as regards the capacity of EASA to act as the Performance Review Body (Soone 2024, European Commission n.d., Council of the EU 2021b).

The amended proposal on the implementation of the Single European Sky (recast) (COM (2020) 579 final) aims to enhance the performance, organization, and management of European airspace while improving air navigation services to increase capacity, lower costs, and boost adaptability (COM (2020) 579 final). It also prioritizes the reduction of the aviation sector's environmental and climate impact, consistent with the European Green Deal (Council of the EU 2021a, 2024b).

COM (2020) 579 final contains several improvements compared to the last SES proposal of 2013, and specifically addresses several controversial issues, including the unbundling of air navigation service providers (ANSPs) and the concept of Functional Airspace Blocks (FABs).

Notably, the proposal COM (2020) 579 final no longer mandated the use of FABs, which was a significant change from the 2013 proposal (European Parliament 2024, Soone 2024).

After several years of negotiations, the European Parliament and the Council of the European Union reached a provisional agreement on the recast of the SES package on 6 March 2024. The agreement retained the key SES objectives, particularly addressing air space capacity needs and mitigating the climate and environmental footprint of air transport. On 26 September 2024, the Council of the European Union approved the regulation's final text, followed by the European Parliament's approval on 22 October 2024 (Soone 2024).

Accordingly, Regulation (EU) 2024/2803 of 23 October 2024 on the implementation of the Single European Sky (recast) was published in the Union's Official Journal on 11 November 2024 (Regulation (EU) 2024/2803). Regulation (EU) 2024/2803 lays down the rules for the creation and effective functioning of the SES to reinforce air traffic safety standards, to contribute to the sustainable development of the air transport system and to improve the overall performance of air traffic management and air navigation services in Europe (Regulation (EU) 2024/2803). The SES comprises of a coherent pan-European network, a progressively more integrated airspace, network management and air traffic management systems, based on safety, efficiency, interoperability and technological modernisation (Regulation (EU) 2024/2803).

FABs are maintained with the view to fostering the performance of the air traffic management network within the SES. Joint performance plans are reinstated as a basis for enhanced cooperation and coordination in FABs across national borders (Regulation (EU) 2024/2803, Council of the EU 2021a, 2021b).

Member States may merge economic and safety oversight functions in the same administrative

entity, and they may authorise the opening of certain air navigation services to market conditions (Soone 2024). The air navigation service providers and the national supervisory authority can be part of the same organisation as long as they are functionally separated and fulfil independence requirements (Soone 2024). An independent advisory Performance Review Board (PRB) is established as a stable and permanent entity, which will help the Commission and the EU Member States to take decisions on the implementation of these plans. The PRB will also advise the Commission on the implementation of Performance and Charging Schemes (European Parliament 2024a). The Commission will adopt EU-wide performance targets for air navigation services, addressing areas such as capacity, cost efficiency, climate, and environmental impacts. The performance of these services will be reviewed at least every three years to ensure accountability and progress (European Parliament 2024a, Soone 2024).

Regulation (EU) 2024/2803 will enter into force on the twentieth day following that of its publication in the Official Journal of the European Union. Accordingly, Regulation (EU) 2024/2803 becomes binding and directly applicable in all EU Member States from 1 December 2024, with some provisions being phased in at later dates (Regulation (EU) 2024/2803).

5. Conclusion and considerations

The Single European Sky (SES) initiative aims to reform the EU's air traffic control architecture to address current and future capacity and safety needs as well as the lack of sustainability of the air travel in Europe. This target involves improving the overall performance of air traffic management (ATM) and air navigation services (ANS). Although the SES was presented in 1999 and new rules followed in 2004, a critical reform step envisaged in 2013 was delayed by more than a decade. As a result of the delay, the current

EU airspace structure remains inefficient, leading to longer flight paths, detours, and increased GHG emissions. It was only with the adoption of proposal COM (2020) 579 final, with the final text being approved by the Council and European Parliament, and the publication of Regulation (EU) 2024/2803 in October 2024, that progress on the implementation of the SES initiative resumed.

The enforcement of Regulation (EU) 2024/2803 will include binding SES rules, targets and incentives to enhance flight efficiency and thereby it is expected to reduce environmental impacts of air traffic. A new independent advisory body, the Performance Review Board, will support the European Commission and Member States with their decision-making tasks to implement these SES reform plans. The updated rules also aim to improve the environmental and climate performance of airspace management. This includes extending binding targets to terminal services and to encouraging environmentally responsible behaviour by airspace users, e.g. airlines.

However, it remains uncertain whether this introduction of new measures based on the SES reform will truly end air travel's inefficiencies, solve the capacity problem, reduce the waist of energy due to longer flight paths, delays and detours, and finally achieves efficient, sustainable and environmentally friendly air travel in Europe.

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