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Performance Review Body
Advice on the Union-wide target ranges for RP4

Annex IV – Common Project 1 performance impact

September 2023

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CP1 Performance Impact

September 2023

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Introduction

Pursuant to Commission Implementing Regulation (EU) No 409/2013 of 3 May 2013, the SESAR Deployment Manager (SDM) is responsible for the management level of SESAR deployment governance and associated tasks and plays an important role at the implementation level.

The SDM is responsible, inter alia, for developing, proposing, maintaining and implementing the SESAR Deployment Programme (SDP), a comprehensive and structured workplan to all operational stakeholders involved in the deployment of Regulation (EU) No 2021/116, the so-called Common Project One (CP1).

The Common Project 1 Regulation sets different target deadlines for its implementation, the final one is on the 31 of December 2027: this date is well within the timeframe (2025-2029) of Reference Period 4 (RP4) as described by the Performance Scheme. Therefore, **the full potential of Common Project 1 will be materialised during RP4, also in terms of operational and performance benefits**.

A summary of the implementation and industrialisation target dates for each ATM Functionality (AF) and sub-ATM Functionality (sub-AF), as laid down in the CP1 Regulation, is provided in Figure 1 below.

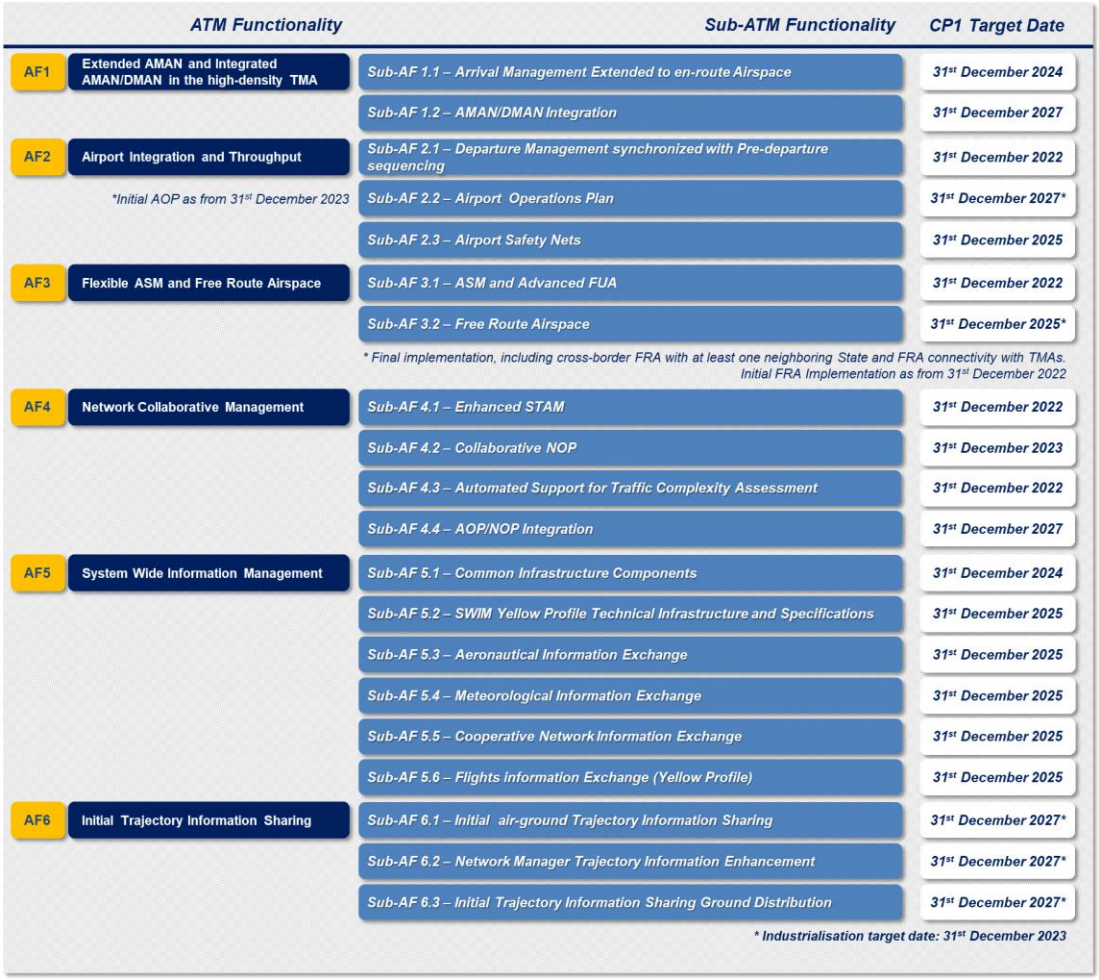

Figure 1 – Common Project 1 Regulation deadlines and target dates

The Common Project One was adopted by the Commission after positive opinion of the EU Member States and supported by the operational stakeholders on the basis of a Cost Benefit Analysis (CBA) that demonstrated a positive Net Present Value (NPV).

The benefits calculated in the CP1 CBA are reflecting the CP1 impact on operational performance: they illustrate that the **CP1 has a substantial contribution** across several Network Performance elements, most notably in **airspace capacity** because of fewer delays, and enhanced **flight efficiency** due to more efficient routes.

Given the synchronicity between CP1 implementation and RP4, **CP1 contribution to performance could be taken into account in the target setting of RP4**. As the proposals of targets is strictly conducted by the Performance Review Body (PRB), SDM's role is limited to supporting the PRB by providing the impact on Network Performance measured in the different Key Performance Areas (KPAs) by the different Key Performance Indicators (KPIs) described in the SESAR Deployment Programme (SDP) performance methodology.

The performance improvements that are estimated by the SDM across the different KPIs may not be directly applicable to the indicators that are defining performance in the Performance and Charging scheme. This results from the different purposes of SDM's and PRB's assessments: SDM estimates benefits to calculate CBAs of the CP1 or of the implementation projects, thus **considers benefits against a "do-nothing" ("no CP1") scenario**. This is different from the PRB approach, where the purpose is to show targets in absolute values across the RP4 timeframe. Therefore, SDM inputs are not directly applicable in the definition of the targets for RP4, particularly for the Capacity KPA where CP1 En-Route ATFM delays savings are stemming from simulations from the Network Manager in which the do-nothing scenario confirms a strong increase of these delays in case no CP1 investment is made.

As ground and terminal-related performance are not subject to Union-wide targets, benefits stemming from ATM Functionalities AF1 and AF2[1], although very significant, will not be described in this Annex. The document will focus on the expected savings in **capacity and flight efficiency / environment[2] driven by ATM functionalities AF3 and AF4[3]**, which include in particular the implementation of a full cross border free route airspace by the end of 2025. Within this scope, CP1 savings are not geographically limited, as the Regulation is fully covering the Member States airspaces. Besides, this specific scope is by far the largest contributor to CP1 performance impact, with benefits representing around 85% of CP1 total benefits.[4]

A qualitative description of CP1 expected benefits on **Safety** will also be provided, to highlight the importance of safety investments in the CP1 despite the absence of quantification or monetisation in the CP1 CBA.

[1] AF1: Extended AMAN and integrated AMAN/DMAN in the high density TMA / AF2: Airport Integration and Throughput

[2] The two KPAs are linked, as CO2 savings may only be generated by flight efficiency savings (minutes and fuel savings)

[3] AF3: Flexible ASM and Free Route Airspace / AF4: Network Collaborative Management

[4] AF5/6 benefits were not calculated in the CP1 CBA

1. Background

The CP1 replacing and improving the Pilot Common Project (PCP) was adopted in February 2021. Its final implementation date is December 2027. Within the overall PCP/CP1 technical and geographical scope, the projects awarded by CINEA and coordinated by SDM represent the largest subset, currently around 70% of the CP1 costs and 80% of the CP1 benefits[5]. Their status in June 2023 is as follows:

- 340 ATM modernisation projects (267 completed, 73 ongoing) spread across the 6 ATM Functionalities
- 94 beneficiaries spread in 26 EU Member states plus UK
- 2.7 billion EUR of total investment
- 1.3 billion EUR of EU grants

The latest Monitoring Exercise recently conducted by SDM (status in December 2022) shows that the overall CP1 implementation is well underway, after a significant acceleration occurred during 2022: with the final Regulation deadline set for end of 2027, around 31% of its technical scope is already deployed and entered into operations. The first 4 sub-AFs with regulatory deadline in December 2022 had a compliance rate of 85% in December 2022 and will reach 100% within 2023. The percentage of CP1 which is either already completed or on-going is now 76%, a +8 percentage points increase compared to 2021. Furthermore, operational Stakeholders have already planned to deploy an additional 15% of CP1 scope. Conversely, there is a lack of specific plans only for the remaining 9%, which does not necessarily entail a future non-compliance with CP1.

Within the initial Connecting Europe Facility (CEF) regulation, the successive Transport Calls (2014, 2015, 2016, 2017 Blending Call and 2017) have awarded **EUR 1.3 billion of grants to the PCP/CP1**, leveraging EUR 2.7 billion of investments into ATM modernization. Those past calls have demonstrated a high level of engagement by the ATM industry, all calls being systematically oversubscribed[6] with high quality and relevance projects, confirming grants as a highly attractive incentive to ATM community.

Grants were concentrated on **ground related projects (airport and mainly ANSPs)**, eligible to a funding of up to 50%, rather than on airborne related projects eligible to a funding of up to 20%. According to the Performance and Charging Regulation (EU) 2019/317, the States/ANSPs have to return the funds received through Union assistance programs through a reduction of the unit rates (Article 25-3). SDM is supporting PRB in the reconciliation with the tables used by States/ANSPs to report the amounts received per project, by forwarding to the PRB the relevant data such as planned costs, amounts granted, and actual amounts received.

Within the current CEF regulation (CEF2), the Transport Call 2022 published by in September 2022 is expected to mobilize an additional amount of around EUR 160 million of stakeholders' investment engaging 41 operational stakeholders (Airlines, Airports, ANSPs, Military Authorities and NM) from 22 EU Member States. The Implementation proposal submitted by SDM ("CLEAN ATM proposal") was awarded by CINEA and approved by the EU Member States on 21 June 2023 with a funding envelope of EUR 71 million and shall now be officially adopted by the European Commission.

Regarding future CEF2 calls (Calls 2023 and 2024), if any, the allocation of the Union financial support in the Transport sector is not yet known, nor the part attributed to the implementation of SESAR and ATM

[5] Source: SDM Execution Progress Report Edition 2022-1 from November 2022

[6] Except the 2017 Blending Call, with an envelope of only EUR 40 million for ATM, that was a first attempt to activate financial instruments complementing EU grants.

systems. However, as the CP1 Regulation mandates CP1 investments from ATM operational stakeholders estimated to be in total EUR 3.8 billion and considering the investments already made to date, the needs for financing to complete CP1 are still considerable.

2. Methodology

SDM's performance assessment and CBA methodology contributes to ensure that all benefits expected from the whole CP1 implementation will materialise whilst not exceeding the estimated cost. This includes:

- The use of Key Performance Indicators (KPIs) and their corresponding metrics and monetisation values that allow quantifying benefits;
- The monitoring of the CP1 benefits in a full life-cycle mode, from an initial 'top-down' approach to a 'bottom-up' approach conducted with the Implementation Projects Partners (IPPs) during the execution phase, and a "final check" (ex post assessment) after the projects are completed.

KPAs, KPIs and their monetisation

The Key Performance Areas (KPAs) that are monitored at deployment level are those of the SES performance regulation (EU IR 2019/317) and those reflected in the ATM Master Plan.

There are six Key Performance Areas (KPAs) where direct and quantifiable benefits for the European ATM and aviation are foreseen:

KPAs	Targets
Cost Efficiency (ANS productivity)	Reduced en-route and TMA costs
Capacity	Reduced departure delays
Operational Efficiency	Reduced flight time and fuel burn
Environment	Reduced CO_2 emissions
Safety	High standards
Security	High standards

Table 1 - KPAs

As Safety and Security are not monetised at this stage, the monetised benefits come from the following KPAs: Cost Efficiency (ANS productivity), Capacity, Operational Efficiency and Environment.

The following table gives the Key Performance Indicators (KPIs) used by SDM, in relation to their KPAs.

KPAs	KPIs
Cost Efficiency (ANS productivity)	Gate to Gate ANS cost (in €)
Capacity	Departure Delay (in minute): • Airport ATFM Delay • En-Route ATFM Delay • ATC Delay
	Cancellations (in number of events)
Operational Efficiency	Flight Time (in minute): • Unimpeded ASMA[7] Time • Additional ASMA Time • Unimpeded Taxi-in Time • Additional Taxi-in Time • Unimpeded Taxi-out Time • Additional Taxi-out Time • Horizontal Flight Time
	Fuel consumption (in tons of fuel)
Environment	CO_2 emissions (in tons of CO_2)

Table 2 - KPAs and KPIs

The detailed definition of the KPIs is in line with Implementing Regulation (EU) No 2019/317 and the Performance Review Unit dashboard (PRU), which can be found on the website of the PRU.

The Table above does not mention the master KPI "Horizontal Flight Efficiency" which measures the savings in Nautical Miles during the horizontal phase of the flight, because these Nautical Miles savings are converted into the following three categories of savings: minutes (KPI "Horizontal Flight Time"), tons of Fuel (part of the KPI "Fuel consumption") and tons of CO_2 (part of the KPI "CO_2 emissions").

It must be stressed that "En-Route ATFM delay" savings are calculated in reference to a "do-nothing" (or "no-CP1") scenario which foresees a strong increase of these delays in case no CP1 investment is made.

Figure 2 below shows the KPIs grouped by the operational environment to which they are related. KPIs shown in green refer to "strategic" inefficiencies, for example due to current airspace design, and refer to delay reductions included in airline schedules (flight plan).

KPIs shown in blue refer to "tactical" inefficiencies caused by unpredictable delays on the day of operations that exceeds the delay buffer foreseen in the flight plan.

[7] ASMA: Arrival Sequencing and Metering Area

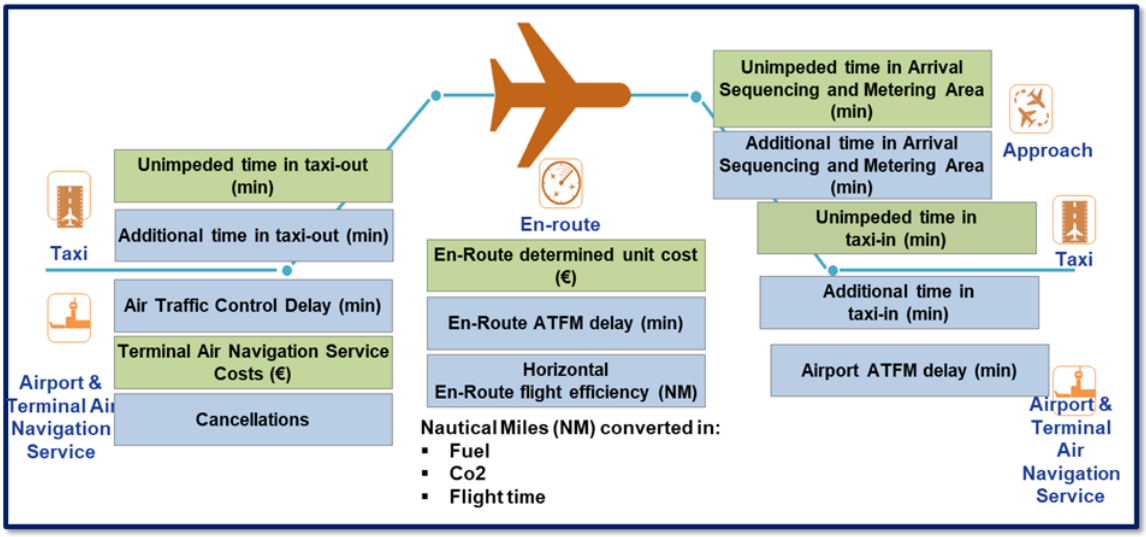

Figure 2 - KPIs and related operational environments

For each KPI, improvements can be monetised by multiplying the savings (expressed in their respective unit) by a valorisation factor: euros per minute, euros per ton of fuel or ton of CO_2 etc. It should be noted that the valorisation factors currently in use in the Deployment Programme are derived from the version 08 of the Eurocontrol "Standard Inputs for Cost and Benefits Analyses" published in January 2018. An update of the monetization factors is performed whenever deemed necessary, following the release of a new version of the Eurocontrol "Standard Inputs for Cost and Benefits Analyses" with significant changes.

Full life-cycle mode and final check

The objective is to provide a monitoring of the CP1 benefits in a full life-cycle mode: starting from high-level benefits estimates as foreseen in the initial CP1 CBA, through more accurate expectations of benefits as monitored during the implementation phase of the projects, to a final benefit determination after the projects have been implemented.

The benefits can include quantitative benefits, such as cost savings or operational efficiency improvements, as well as qualitative benefits, such as noise reduction or social economic impacts.

To illustrate the continuous process, the project performance assessment life-cycle could be represented as in the following figure:

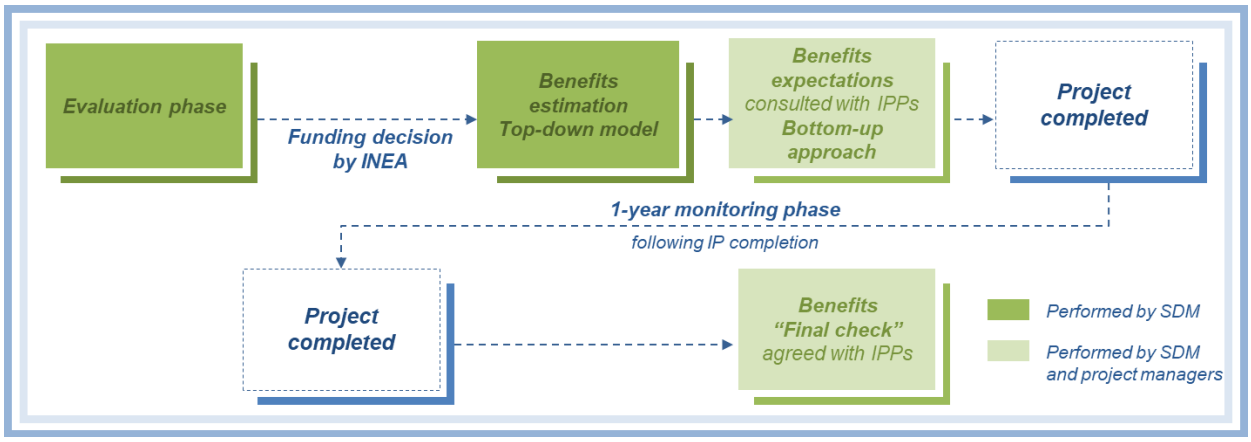

Figure 3 - Project performance assessment life-cycle

While the CP1 CBA and the underlying methodology constitute the general reference for performance expectations at ATM Functionality (AF) level, the projects' contribution to performance and their CBAs are identified and quantified at a greater level of detail. As time passes and more actual information is available, the methodology allows to fine tune from the initial overall top-down approach to a continuous bottom-up approach conducted with the implementing partners and finally to turn from expectations to actual results both on cost and benefits sides. As the global CBA of the deployment programme is built by summing the parts being deployed and the ones already completed, the picture progressively turns from an estimated CBA to a CBA with actual results.

It should be noted that the performance of completed projects can be monitored after a period of a minimum of one year of operations, in order to have a more accurate measurement.

Models used in the performance assessment

Grouping of projects into threads

In many cases, projects are combined into "threads" to facilitate the calculation of the performance gains and associated benefits: a thread is a group of projects whose benefits are inter-related.

Indeed, in many cases individual Implementation Projects (IPs) cannot be assessed alone: study projects aiming to find an appropriate implementation method, interdependent projects, cross-border initiatives, infrastructure enabler projects etc. In such cases, a grouping of projects is needed to have a more realistic assessment which also includes synergies. In practice, threads are usually composed of one to three-four interrelated IPs.

Of course, after the performance and benefits calculation is performed, consolidation occurs both on benefits and on costs to build a global CBA for the specific thread.

Top-down model for AF1 and AF2

To define the benefit expectations during the execution phase, a top-down model is used at the first stage of the evaluation.

For AF1 and AF2, SDM is using a model with defined improvement percentages for each Family and each relevant performance indicator, based on different sources: S3JU Deliverables, Flights Demo Reports and expert judgement.

The performance gains are then calculated on a yearly basis based on the KPI improvement percentage of the Family in the model, multiplied by a yearly ramp-up factor, multiplied by the reference KPI value for the selected location (for instance the level of taxi delays in minutes at the selected airport), multiplied by the gap coverage of the project (or thread) within the Family, finally multiplied by the volume of traffic for the given location. Some correction factors for specific locations or projects may also be used in the calculation.

Simulations for AF3 and AF4

For AF3 and AF4 the simulations are run by the Network Manager and take into consideration a harmonised network approach that ensures the consistency between the Network Operations Plan (NOP), the European Route Network Improvement Plan Part 2 (ERNIP) and the relevant projects proposed in the context of AF3 and AF4. This consistency must be maintained for all the subsequent updates of the Deployment Programme and the gaps identification.

Capacity Assessment with respect to the AF3 and AF4 projects:

- The capacity assessment is based on the Capacity Assessment and Planning Guidance document that has been approved by the Network Manager Board in June 2013, as part of the Network Operations Plan Approval. The reference to this document is given in all the successive editions of the Network Operations Plan.
- In the capacity assessment, the percentages of improvement brought by the project or thread are taken into account together with the flight profiles derived from STATFOR data assuming routing via the shortest routes available on the future ATS route network, with generally unconstrained vertical profiles.
- The Network Manager has ensured a full consistency between the last available version of the Network Operations Plan and the evaluation of the operational performance potential of the AF3 and AF4 projects.
- A do-nothing scenario was developed to compare to the potential of the various AF3 and AF4 related projects listed in the last available version of the Network Operations Plan. The assessments take into consideration a harmonised network approach.

Flight Efficiency Assessment with respect to the AF3 and AF4 projects:

- The flight efficiency assessment is based on the overall flight efficiency evaluations made in the context of the last version of the European Route Network Improvement Plan, Part 2 – ARN Version.
- The Network Manager has ensured a full consistency between the European Route Network Improvement Plan, Part 2 last ARN version and the evaluation of the operational performance potential of the AF3 and AF4 projects with respect to flight efficiency.
- The evaluations made in the previous editions of the European Route Network Improvement Plan, Part 2 demonstrated that the operational performance improvements achieved were in line year on year with the estimations made.

No benefits monetisation for AF5 and AF6

AF5 and AF6 are support to other AFs, with transversal benefits that are difficult to quantify separately. They are also enablers for future ATM technologies, outside the scope of the CP1 but included in the Airspace Architecture Study and the ATM Master Plan. Therefore, in the CP1 CBA no benefits were directly quantified in AF5 and AF6.

Although no monetised benefits have been assigned to AF5 and AF6, they remain key SESAR functionalities. A qualitative description of their benefits would include:

- For AF5, reduction in charges (Cost Efficiency) from the rationalisation of the existing infrastructures; increase of ANS Productivity (Cost Efficiency) from more resilient and seamless information data access, higher levels of automation in the management of information, reduction in misalignments between different stakeholders, increased trust in the exchanged data; increase of Safety from a better situational awareness and collaborative decision-making; Capacity, Operational efficiency and Environment savings, from enhancements in future functionalities that are critical to enhance airport management, en-route/approach ATC processes, network management, functionalities related to the flight object etc.

- For AF6, improved predictability from the sharing and use of on-board 4D trajectory data by the ground ATC system and NM system, facilitating more efficient business trajectories; ANS productivity gains (Cost Effectiveness), from less tactical interventions, automated assistance to controller for seamless coordination and adaptation to actual traffic situation; Capacity gains in both en-route and TMA airspace, from improved network planning and better airspace management; Flight Efficiency improvements in Time & Fuel/CO2, from improved de-confliction and the reduction of tactical interventions, allowing the aircraft to fly as much as possible on direct routes across sectors/centres/FABs, and better descent profiles.

Matching between SDM performance assessment and PRB targets

Capacity

As defined by the performance and charging scheme, the PRB proposes targets in terms of Union-wide En-Route ATFM delays.

SDM uses an envelope of En-Route ATFM delays saved due to CP1 implementation. This envelope is an absolute figure compared to a do-nothing scenario. Therefore, the KPIs are not directly comparable: PRB value is a target of En-Route ATFM delay per flight and SDM value is the total saving compared to a do-nothing scenario.

Considering the CP1 scope, the table below shows how to translate savings into a saving per flight (example for the year 2027):

En Route ATFM minutes saved due to CP1 implementation in 2027 (Source: Network Manager simulation, updated with traffic from STATFOR April 2023)	26,615,468
Flight movements in 2027 (Source: STATFOR April 2023)	11,490,000
CP1 capacity impact in 2027 (against the do-nothing scenario)	**2.3 minutes/flight**

Table 3 – Conversion of En-Route ATFM delay savings to impact per flight

This impact represents the CP1 contribution based on NOP and ERNIP data used for the simulation. It must be stressed, that this saving is measured against the do-nothing scenario on the same year (here

2027) and should be taken into account as such, not applying this impact to any historical reference (like year N-1 for instance).

The simulated evolution of CP1 contribution over the period 2025 2035, extracted from the Airspace Architecture Study[8] from 2019, is shown on the figure below.

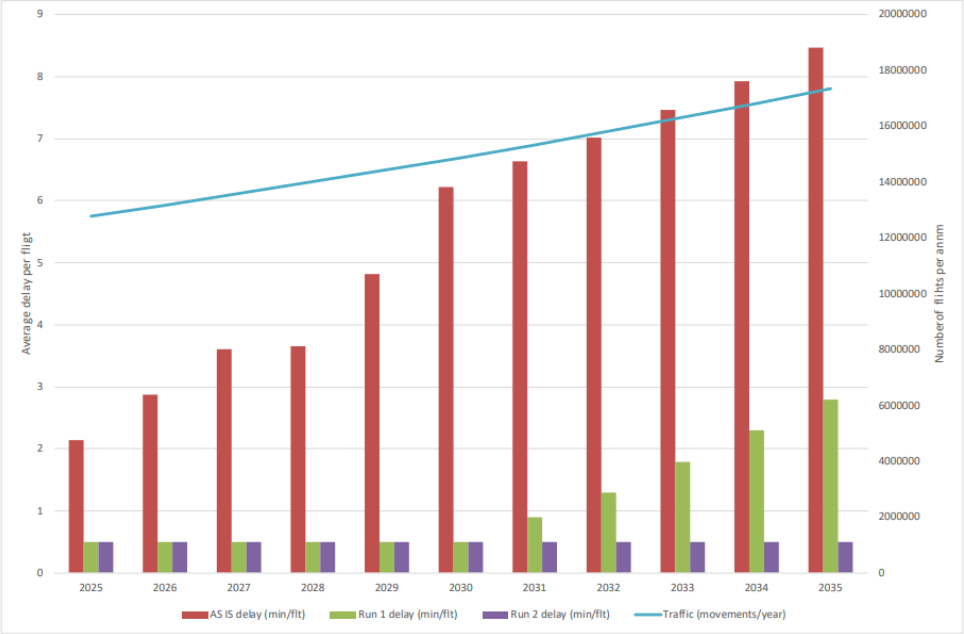

Figure 4 – Predicted En-Route ATFM delays (Airspace Architecture Study)

This graph shows the En-Route ATFM delays evolution as predicted by the Network Manager in 2019, based on the traffic forecast from 2019:

- Red bars - simulation without any implementation (do-nothing scenario)
- Green bars - simulation with PCP/CP1 implementation
- Blue bars - with additional future SESAR solutions.

It demonstrates the importance of PCP/CP1 implementation, even when tangible delay savings could not be traced. It highlights as well, that without further investment but with rising traffic the overall delay per flight would start raising from 2031 onwards up to >2min/flight.

Environment

PRB proposes the Union-wide targets in terms of horizontal efficiency by using the Key performance Environment indicator based on Actual trajectory representing the percentages of additional distance between the great circle distance and the actual trajectory (KEA).

SDM uses the envelope of Nautical Miles saved due to CP1 implementation. This envelope is an absolute figure compared to a do-nothing scenario. Therefore, the KPIs are not directly comparable.

[8] A Proposal for the future architecture of the European airspace, by SESAR Joint Undertaking and Eurocontrol

Considering the CP1 scope, the table below shows how to translate savings into an average percentage per flight (example for the year 2027):

Nautical Miles saved due to CP1 implementation in 2027 (Source: Network Manager simulation, updated with traffic from STATFOR April 2023)	45,138,340
Flight movements in 2027 (Source: STATFOR April 2023)	11,490,000
Average distance flown per flight *(Source: Eurocontrol Standard Inputs for Economic Analyses Edition 2020)*	*659*
Nautical Miles flown in 2027 (Average distance flown x movements)	7,571,910,000
Average CP1 savings per flight in 2027 (against the do-nothing scenario)	**0.6 %**

Table 4 – Conversion of Nautical Miles savings average percentage per flight

This impact represents the CP1 contribution, based on NOP and ERNIP data used for the simulation. Again, it must be stressed that this saving is measured against the do-nothing scenario on the same year (here 2027) and should be taken into account as such, not applying this impact to any historical reference (like year N-1 for instance).

3. Capacity

SDM calculates the savings on capacity and especially the En-Route ATFM delays savings based on a simulation done by Network Manager. The initial simulation, dated from 2015, has been continuously updated by SDM and the impact of COVID has significantly reduced the initial savings (see the years 2020 and 2021 in Figure 5 below). The savings are estimated against a do-nothing scenario which foresees a strong increase of these delays in case no CP1 investment is made (see Figure 4 above from the Airspace Architecture Study).

In the CP1 CBA, En-Route ATFM delays savings are stemming from AF3 (60%) and AF4 (40%). Figure 5 below shows the CP1 initial envelope (before COVID), the CP1 updated envelope (based on the latest STATFOR traffic forecast from April 2023), and the En-Route ATFM delays savings generated by all AF3/AF4 projects coordinated by SDM (the estimated data values per Member State was exchanged with PRB).

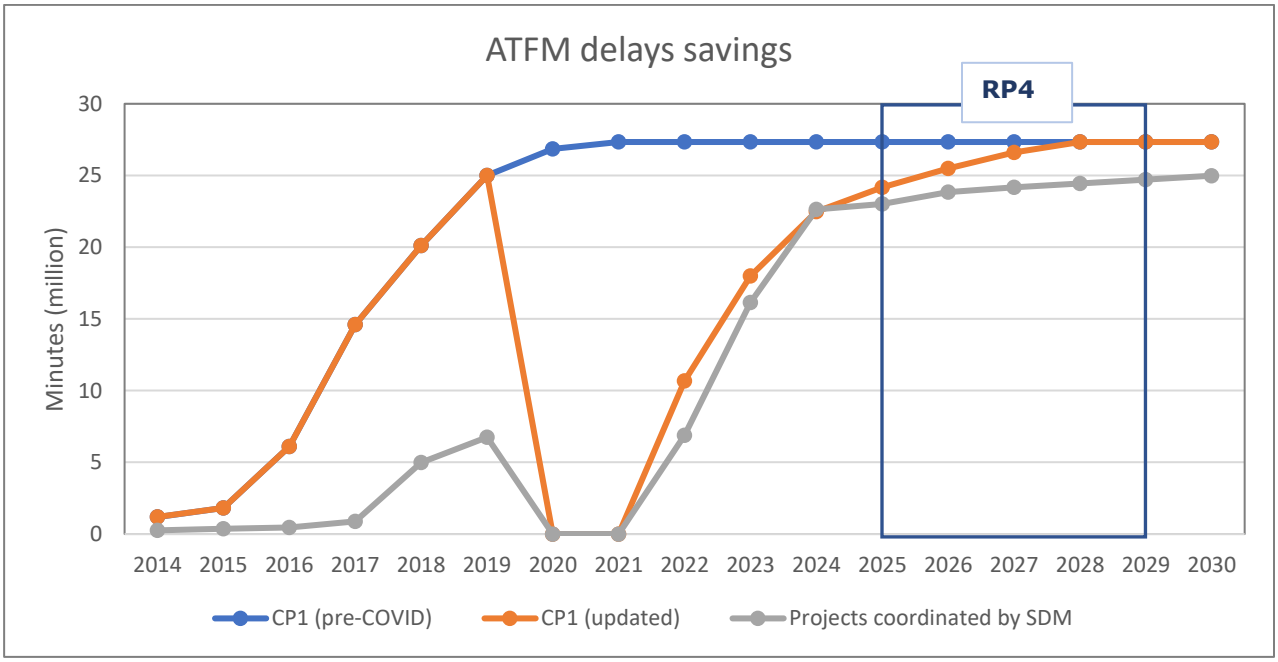

Figure 5 – CP1 En-Route ATFM delays savings

The figure shows that the yearly savings from CP1 should continue to rise during RP4, from 22.5 million minutes in 2024 (last year of RP3) to 24.2 million minutes in 2025 (first year of RP4) and 27.3 million minutes in 2029 (last year of RP4). A large part of these savings (more than 90%) is generated by the projects coordinated by SDM. The values are shown in Table 5 below.

		RP4				
En-Route ATFM delays savings (million)	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
CP1 (updated)	22.5	24.2	25.5	26.6	27.3	27.3
Projects coordinated by SDM	22.5	23.0	23.8	24.2	24.4	24.7

Table 5 – Values of CP1 En-Route ATFM delays savings

Evidence of savings on capacity

SDM monitors the performance impact of the awarded projects, both the ongoing ones (estimated performance) and the completed ones (final check). The En-Route ATFM delays results are depicted on the grey line in Figure 5 above. It shows that the updated estimations on the ongoing projects and the final checks performed on the first completed projects are confirming the updated CP1 envelope. The difference between the two lines (overall CP1 in orange and awarded projects in grey) is explained by the fact that not all AF3/AF4 investments projects are coordinated by SDM.

Examples of projects already completed that passed the final check with significant positive impact on capacity:

- NAV PORTUGAL / Interface to Network Manager Systems (AF4)
- EUROCONTROL-NM: Trajectory Prediction (AF4)
- BULATSA / tCAT in Sofia ACC (AF4)
- EUROCONTROL-NM: ASM FUA (AF3)
- EUROCONTROL-NM / Implementation of target times (ATFCM) (AF4)
- Czech Republic / Traffic Complexity Tool (AF4)
- EUROCONTROL-NM / Flight Evolution and upgrade of interfaces (AF4)
- COOPANS / Harmonisation of technical ATM platform (AF3)

Examples of projects without final check yet, but with expected significant positive impact on capacity:

- DSNA / 4-Flight (AF3)
- DFS / ICAS (AF3)
- Many other examples (Borealis, PANSA, BULATSA, ENAIRE…)

4. Environment

In the CP1, this KPA is mainly driven by optimized flight paths during the En-Route phase, where AF3 functionalities will improve the En-Route horizontal flight efficiency and reduce the CO2 footprint of European aviation sector. CO2 savings during the En-Route phase due to AF3 represent more than 80% of the total CO2 savings from the CP1.

The additional savings in CO2 (20%) are generated during the approach and taxi-in & out phases by AF1 and AF2 but, as noted above, not all locations are mandated to implement AF1/AF2 in the CP1 Regulation. Moreover, some of these functionalities may be outside of the responsibility of ANSPs.

Therefore, this section will focus on CO2 savings from AF3, namely Airspace Management (ASM) and Flexible Use of Airspace (FUA), initial Free Route and full cross border Free Route airspace (the later by the end of 2025).

The master KPI used to calculate CO2 savings in the En-Route phase is the number of Nautical Miles saved, which can easily translate into minutes of flight, tons of fuel and tons of CO2 by using the following conversion factors:

- 1 Nautical Mile = 1/7.3 minute
- 1 minute = 60 kg fuel
- 1 kg fuel = 3.15 kg CO2

The figure below shows the CP1 initial envelope of Nautical Miles savings (before COVID), the CP1 updated envelope (based on the latest STATFOR traffic forecast from April 2023), and the Nautical Miles savings generated by all AF3 projects coordinated by SDM.

For the CP1, it can be noted there is an intermediate level after 2022 (initial Free Route by the Member States) and a final level after 2025 (Cross Border functionality), corresponding to the due dates in the CP1 Regulation (the estimated data values per Member State was exchanged with PRB).

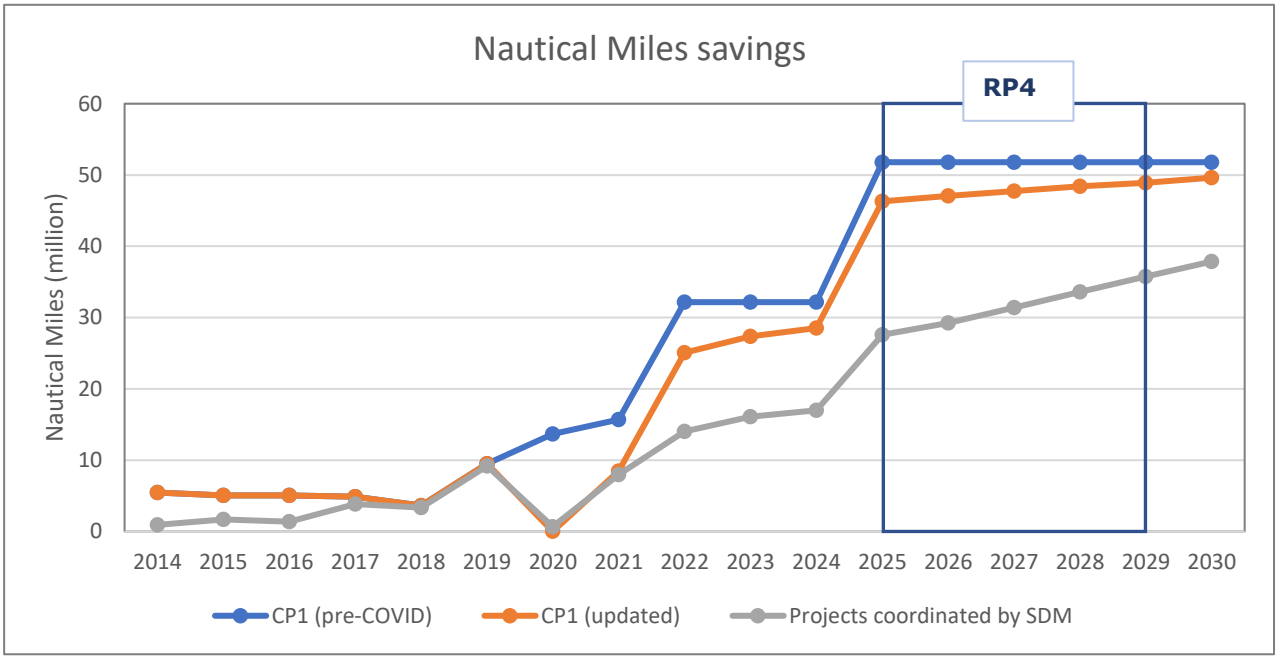

Figure 6 - CP1 En-Route Nautical Miles savings

The figure shows that the yearly savings from CP1 should continue to rise during RP4, from 28.5 million Nautical Miles in 2024 (last year of RP3) to 46.3 million NM in 2025 (first year of RP4) and 48.9 million NM in 2029 (last year of RP4). A large part of these savings (more than 65%) is generated by the projects coordinated by SDM. The values are shown in Table 6 below.

				RP4		
En-Route Nautical Miles savings (million)	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
CP1 (updated)	28.5	46.3	47.1	47.7	48.4	48.9
Projects coordinated by SDM	17.0	27.6	29.3	31.4	33.6	35.7

Table 6 – Values of CP1 En-Route Nautical Miles savings

Evidence of savings on flight efficiency:

SDM monitors the performance impact of the awarded projects, both the ongoing ones (estimated performance) and the completed ones (final check). The Nautical Miles results are depicted on the grey line in Figure 6 above. It shows that the updated estimations on the ongoing projects and the final checks performed on the first completed projects are confirming the updated CP1 envelope. The difference between the two lines (overall CP1 in orange and awarded projects in grey) is explained by the fact that not all AF3 investments projects are coordinated by SDM.

Examples of AF3 projects already completed that passed the final check with significant impact on environment:

- BOREALIS / NEFRA Free Route Implementation (AF3)
- ENAV / Free Route Italy (AF3)
- HUNGARO CONTROL / Free Route & ATM System Upgrade (AF3)
- EUROCONTROL-NM: DCT FRA Support (AF3)
- EUROCONTROL-NM: ASM FUA (AF3)
- EUROCONTROL-NM: Interactive Rolling NOP & Network Collaborative Management (AF4)
- CROATIA CONTROL / SEAFRA Simulation & Implementation (AF3)
- NAV PORTUGAL / ASM (AF3)

In general, SDM expects a reduction of fuel per flight in the range of (35-58kg), depending on the size and structure of the airspace.

5. Safety

Safety benefits are, although clearly being an important performance area, not monetised in the CP1 CBA. This mainly results from the lack of a universal methodology to comprehensively assess safety benefits. If such a methodology could be used, monetised benefits would likely be significant as **safety appears in all the ATM Functionalities under the CP1:**

AF1: Safety benefits are expected from AMAN/DMAN integration and extended AMAN due to the increased predictability that enables a lower complexity and reduces traffic congestion. Additionally, the assurance that military aircraft operate same procedures as civil aircraft reduces mixed traffic operations that always raise safety concerns. It must be noted however that such procedures themselves may require the optimisation or upgrades of existing safety nets e.g., Area Proximity Warning and Mid Term Conflict Detection as foreseen under AF3 below.

AF2: AF2 is likely to be the most safety-related ATM Functionality in the CP1. Safety is expected from all the functionalities associated to Airport safety nets and from Electronic Clearance Input supporting Airport safety nets.

AF3: Safety is expected from the upgrade of ATM systems to support Free Route RA. Dynamic Area Proximity Warning (APW) and Mid Term Conflict Detection (MTCD) developed under this family would be of use for AF1.

AF4: One of the key purposes of AF4 is to reduce tactical interventions by air traffic controllers and improve de-confliction of aircraft. As such it aims at reducing the workload of ATCOs, with safe and expeditious movements of air traffic as a consequence.

AF5: Safety benefits expected would be of direct or indirect nature, as integration of different information systems with SWIM will lower the complexity with a reduced risk of system outages during operations and make information more easily available thus providing air traffic controllers with more accurate information, leading to better situational awareness.

AF6: Air-Ground Trajectory Information Sharing can contribute to improving safety.

Consequently, the following top key risk areas as identified by the EASA Annual Safety Reviews are addressed explicitly by the functionalities in the CP1:

Runway collisions: runway excursions, ground collisions and deviation of taxiing procedures have a high number of ATM/ANS related incidents and accidents, with direct ATM/ANS contribution. AF2 makes an impactful contribution to this.

Airborne collisions: AF3 and AF1 are addressing separation minima infringements and unauthorised penetration of segregated airspace in the Free Route Airspace (FRA) or in the Terminal Maneuvering Area (TMA); AF1 is also addressing deviations from operational procedures and missed approaches.

The need to handle future traffic after Covid recovery without impacting safety and security calls for continuous investments in safety related projects. In particular, even without precise quantified justifications, the upmost **importance of safety investments in the CP1 justifies that the target levels of safety should at least be maintained during RP4** like they were between 2014 and 2019 despite a double-digit increase of traffic, which will demonstrate a global increase of safety from a relative perspective.

Conclusion

- The CP1 implementation has been supported by CINEA through the Connecting Europe Facility funding. This helped significantly to accelerate a synchronized deployment conducted by SDM.

- Because CP1 implementation due dates are well within the timeframe (2025-2029) of RP4, CP1 contribution to performance should be taken into account in the target setting of RP4.

- SDM uses an envelope to estimate the benefits stemming from CP1 implementation. This envelope is an absolute figure compared to a do-nothing scenario. Therefore, the KPIs and their estimated values are not directly comparable with the targets proposed by the PRB.

- Despite this, within the KPAs addressed in the Performance and Charging regulation, there are strong evidences of significant savings from CP1 across the RP4 timeframe in Capacity and Environment, driven by ATM Functionalities AF3 and AF4.

- There is a harmonised network approach that ensures the consistency between the Network Operations Plan (NOP), the European Route Network Improvement Plan Part 2 (ERNIP) and the relevant projects proposed in the context of CP1 (e.g. AF3 and AF4).

- The measured savings from CEF awarded projects by SDM are currently indicating that the initial simulations and envelopes were correctly estimated. SDM will continue providing an utmost realistic view on the expected improvements through continuously maintained data.

- Equally important to stress are the qualitative improvements enabled by the CP1 in the Safety area.