

	<p>Clean Sky Joint Undertaking</p> <p>Ex-post Audit</p>	
<p>Ex-post audit Report 2019 – final version</p>		
<p>Written by: Yolanda Garcia Castillo Ex-post Audit Officer</p> <p>Reviewed by : Bettina Dittmann Internal Audit and Quality Management Officer</p>		<p>Date: 13/05/2020</p> <p>Ref. : EPA 02 (2020)</p>

I. Introduction

The purpose of this Ex-post Audit Report is to provide input to the assurance on the legality and regularity of the CS2 JU operational expenditure of the year 2019 for the Executive Director.

In this context, the report describes the results of the ex-post audits performed until today, which potentially provide support or put in doubt the confirmations given in the annual assurance declaration 2019 by the Director, i.e.:

- The information provided in the Annual Activity Report (AAR) 2019 gives a true and fair view
- Resources have been used in the year 2019 for the intended purpose
- Resources have been spent in accordance with the principle of sound financial management
- The underlying transactions are legal and regular
- No information, which could hamper the interest of the JU, is missing in the AAR 2019

The results of the EPA process represent a significant element of the Internal Control System of the JU and need to be described in the AAR. Therefore, this report summarises key information regarding the EPA process, which should be summarised in the AAR 2019 in the section related to Internal Controls.

The main objectives of the ex-post audits are:

- 1) Assess the legality and regularity of the validation of cost claims performed by the JU's management through the achievement of a number of quantitative targets,
- 2) Provide an adequate indication on the effectiveness of the related ex-ante controls
- 3) Provide the basis for corrective and recovery activities, if necessary

The scope of the audits performed during the year 2019 comprised only H2020 grant agreements and their expenditure.

The audit activities for H2020 grants are fully centralised in the Common Audit Service (CAS) of DG R&I. This contributes to a consistent harmonised audit approach for the totality of H2020 projects and aims at reducing the audit burden for beneficiaries who participate in projects with several granting authorities of the H2020 Research family¹. The implementation of the audit results remains under the responsibility of Clean Sky 2 JU.

¹ Group of Commission services, Agencies and Joint Undertakings implementing the H2020 programme

On the basis of the H2020 Audit Strategy and in line with the related implementing procedure², the JU is establishing its specific audit results for the H2020 programme on the basis of its individual samples drawn from the CSJU population of grants. These samples may include representative and risk based selections. So far, for the EPA exercises carried out from the beginning of the H2020 programme until 2019, only representative samples have been established.

In addition, cost claims pertaining to Clean Sky 2 projects also form part of the Common Representative Sample (CRS) of the Common Audit Service of DG R&I (CAS), which is the basis for calculating the results of the ex-post audits for the entire H2020 Research family.

Furthermore, cost claims of Clean Sky 2 projects will be included in various samples of corrective (risk based) audits established by the CAS.

Taking into account the above mentioned audit layers the following samples are considered relevant for the assurance of the Executive Director of Clean Sky 2 JU for the year 2019:

- (A) *Specific sample of Clean Sky 2 JU for H2020 projects (including only representative audits)*
- (B) *Sample of corrective (risk based) audits of the Common Audit Service of DG R&I (CAS) covering Clean Sky 2 H2020 projects*
- (C) *Common Representative Sample (CRS) of the CAS covering H2020 projects for all H2020 stakeholders, including Clean Sky 2 JU*

The Common Representative Sample of the CAS (CRS) provides an estimate, via a representative sample of cost claims, of the **overall level of error** in the Research Framework programmes, across all services involved in its management.

Whilst the CRS is therefore a basic indicator of legality and regularity for the Framework Programme as a whole, Clean Sky 2 JU aims to assess its particular population to provide specific assurance on the legality and regularity regarding the JU's individual operational expenditure.

Due to the specific samples taken for the Clean Sky 2 JU population of grants, as described in the following sections, explicit evidence has been made available to draw conclusions on the error rate prevailing in the specific population of grants of the Clean Sky 2 JU.

II. Scope of the audit exercise 2019 and coverage

For the calculation of the audit coverage, the accumulated H2020 projects audited value covered by the EPA exercises 2016 to 2019 is compared to the accumulated total amount

² Procedure for implementing the H2020 Ex-post Audit Strategy from 01.12.2016

of validated cost claims for H2020 projects at the date of the closing of the Final Annual Accounts 2019.

(A) Specific CS2 JU sample

The audit sample for 2019 was established in line with the H2020 Audit Strategy and the Clean Sky 2 JU Procedure for implementing the H2020 Ex-post Audit Strategy. It comprises the following elements:

- Representative sample
 - Most significant cost claims selected at random (the population was stratified to achieve a certain coverage of the most significant cost claims).
 - Remaining cost claims selected at random.

The sample consisted of cost claims pertaining only to Members. The scope of the audits comprised H2020 projects from the year 2017.

In the first four annual audit exercises (from 2016 to 2019) no Grant Agreements for Partners (GAPs) have been selected as part of the representative JU sample, since auditable cost claims were still limited in numbers at the time of selecting the sample for 2019.

70 new audits for H2020 projects, covering 76 cost claims, were launched until March 2019, out of which, 61 final reports have been issued until the date of this report. The reports for two additional audits are still in a pre-final stage. However, all results of the 63 audits are considered as final.

Additionally, the results of nine audits stemming from the 2018 representative sample (eight final audit reports and one pre-final audit report) are considered final and included in the 2019 reporting.

The total audited value of the JU specific sample reported in 2019 was € 46,038,348.19 (reported validated project costs).

Table 1:

Audits included in EPA exercise 2019 - H2020 program		
	Total value of audited project costs	Number of audits
(A.1) audits launched for the 2018 representative sample	3,141,705.11	9
(A.2) audits launched for the 2019 representative sample	42,896,643	63
(A) total audits included in EPA exercise 2019	46,038,348.19	72

Based on the results of the final audit reports, extrapolation of systematic errors has been performed and recoveries of finally validated errors have been achieved to a high percentage. Final representative and residual error rates have been calculated and contribute to the Declaration of Assurance for 2019 of the Executive Director.

The scope of the audits covers H2020 projects from the years 2016 to 2017 from Members:

Table 2a: scope of audit exercise 2019

Audit exercise 2019	Totals	GAMs 2016	GAMs 2017
(A.1)	9 remaining audits from representative sample 2018		
audited value	3,141,705	3,141,705	0
number of cost claims	10	10	0
number of audits	9	9	0
(A.2)	63 out of 70 audits from representative sample 2019		
audited value	42,896,643	0	42,896,643
number of cost claims	67	0	67
number of audits	63	0	63
total			
audited value	46,038,348	3,141,705	42,896,643
number of cost claims	77	10	67
number of audits	72	9	63

The accumulated coverage achieved for the H2020 projects at the end of the year 2019 is 13.00% as shown in the following table:

Table 2b: audit coverage based on audits fully finalised

Accumulated audit coverage based on audits fully finalised until end of 2019	
	Euro
Total audited value from EPA exercises 2016 to 2019 (a)	107,351,124.57
Total amount of validated cost claims(b)	825,728,181.00
Coverage (a) / (b)	13.00%

(B) Sample of corrective (risk based) audits of the Common Audit Service of DG R&I (CAS) covering Clean Sky 2 H2020 projects

In addition to the Clean Sky 2 JU representative samples, cost claims pertaining to Clean Sky 2 JU projects have also been audited as part of the corrective (risk based) samples selected by the CAS. The JU does not consider them as representative for the specific Clean Sky 2 error rate calculation.

In 2019, 54 audits included participations selected by the CAS on Clean Sky 2 projects, covering 71 validated cost claims stemming from Clean Sky 2 GAMs 2014, 2015 and 2016. Out of these, 47 audits were finalised until the closure of the final Annual Accounts 2019. The report for one additional audit is still in a pre-final stage but its results are considered as final. Additionally, 4 audits stemming from the 2018 corrective sample of the CAS are included in the 2019 reporting.

The total value of audits stemming from the corrective CAS samples reported in 2019 was € 40,776,504.14 (reported validated project costs).

Through these samples, an additional coverage for the Clean Sky 2 H2020 operational payments of 5% could be achieved.

III. Audits launched, on-going, closed

Table 3:

Status of current H2020 audits launched in 2019 and before	number	share of total launched
audits launched for the representative sample 2018	9	
Total number launched	9	100%
Pre-final reports received	9	100%
Final reports received	8	89%
Audits included in the final audit results 2019	9	100%
audits launched for the representative sample 2019	70	
Total number launched	70	100%
Pre-final reports received	63	90%
Final reports received	61	87%
Audits included in the final audit results 2019	63	90%

IV. Adjustments and error rates of the CS2 specific sample

Table 4:

Audit exercises - individual and accumulated until 2019	Total Audited value (100% costs) of reports received	Adjustment	Adjustment in favour of CSJU	Adjustment in favour of the beneficiary	Detected error rate in favour of the beneficiary	Detected error rate in favour of CS JU	Systematic error in favour of JU	Systematic error rate in favor of JU	Total unaudited cost claims of audited beneficiaries (E)
Results audit exercise 2016 (all representative)	13,067,875.10	-129,320.98	-148,803.72	19,482.74	0.15%	-1.14%	-50,543.52	-0.39%	2,032,186.36
Results audit exercise 2017 (all representative)	27,132,195.87	-373,888.03	-527,965.16	154,155.92	0.57%	-1.95%	-143,185.38	-0.53%	59,275,139.67
Results audit exercise 2018 (all representative)	21,112,705.41	-103,512.27	-207,015.67	103,503.40	0.49%	-0.98%	-148,295.93	-0.70%	75,806,533.02
Results audit exercise 2019 (all representative)	46,038,348.19	262,520.66	-512,589.45	775,110.12	1.68%	-1.11%	-409,565.89	-0.89%	117,681,332.31
Accumulated results all audit exercises (all representative)	107,351,124.57	-344,200.62	-1,396,374.00	1,052,252.18	0.98%	-1.30%	-751,590.71	-0.70%	254,795,191.36

Error rates:

The representative error rate is an indicator of the quality of the ex-ante controls as it gives an estimate of errors that remain undetected after the ex-ante controls have been performed.

Based on the final results of the audits, detected errors are corrected and extension of systematic errors is calculated and implemented following the related rules of the Clean Sky 2 grant agreements. Under this assumption, the residual error rate is calculated and contributes to the assurance on the legality and regularity of the Clean Sky 2 JU's operations.

The audit reports received provide final results for 72 representative audit engagements launched in 2018 and 2019.

The **final accumulated representative error rate** in favour of Clean Sky 2 JU for the H2020 programme expenditure, identified in the audited cost claims of the audit exercises of the years 2016 to 2019, amounts to **1.30%**.

The corresponding rate for the individual audit exercise of the year 2019 is at **1.11%**.

The residual error rate indicates the 'net-errors' that remain in the total population after implementing corrective actions resulting from the ex-post controls including extension of systematic errors to non-audited cost claims. The following formula is applied:

$$\text{ResER}\% = \frac{(\text{RepER}\% * (P-A) - (\text{RepERsys}\% * E))}{P}$$

P =	Total population
A =	Audited population
E =	total non-audited cost claims of audited beneficiaries
RepER% =	Representative error rate
RepERsys% =	Systematic error rate
ResER% =	Residual error rate

Taking into account the systematic errors identified by the auditors in their audits, the following residual error rates are calculated:

Table 5a:

Calculation of H2020 accumulated residual error rate (ResER%) 2016-2019	
Total population (P) =	825,728,181
Audited population (A)=	107,351,124.57
total non-audited cost claims of audited beneficiaries (E) =	254,795,191
Representative error rate (RepER%) =	-1.30%
Systematic error rate (RepERsys%) =	-0.70%
ResER% =	-0.92%

Table 5b:

Calculation of annual residual error rate (ResER%) 2019	
Total population (P) =	324,216,051
Audited population (A)=	46,038,348.19
total non-audited cost claims of audited beneficiaries (E) =	117,681,332
Representative error rate (RepER%) =	-1.11%
Systematic error rate (RepERsys%) =	-0.89%
ResER% =	-0.63%

The error rates reported for the year 2019 – accumulated and annual – indicate a similar level of error as identified in the previous year for the H2020 projects of Clean Sky. On the level of the programme and of the actual year 2019, the error stays below the targeted threshold of 2%.

V. Extension of audit findings

The extension of audit findings stemming from H2020 audits is done according to common criteria for the entire H2020 Research Family. This means that systematic errors identified in individual cost claims of H2020 projects will be corrected in all projects of the concerned

beneficiaries including those funded by other granting authorities. For efficiency reasons, the minimum threshold for the audit extension is an average systematic error of 2% identified in the audited projects of an individual audit.

The initiation of the audit extension has to be agreed by all affected granting authorities in dedicated meetings on each case. Only after a positive decision, the audit extensions are launched by the CAS. The implementation is then performed by the individual granting authorities.

In the 122 audits concerning beneficiaries of Clean Sky 2 JU finalised until end of 2019, extension of systematic audit findings has been launched in 28 cases. Nearly 50% of these cases have been successfully closed until the end of 2019.

Table 6: H2020 extension of audit findings until EPA 2019

	Finalised Audits	Value of audited cost claims	Extension of audit findings launched (numbers of cases)	Value of corrected unaudited cost claims after extension	Extension of audit findings Implemented³ (% of numbers of cases)
EPA 2016	6	13,067,875	0	-	-
EPA 2017	16	27,132,196	4	3,720,391	100%
EPA 2018	28	21,112,705	6	5,455,076	100%
EPA 2019	72	46,038,348	18	18,354,067	16%
Total	122	107,351,124	28	27,529,534	46%

In addition to the above cases of audit extension, CS2 JU implemented the correction of systematic errors also in 5 further cases, following audits of Clean Sky 2 beneficiaries, which had been audited by the CAS only for other than Clean Sky projects.

VI. Materiality applied for specific audit exercises

The control objective is to ensure for the CS H2020 programme that the residual error rate, which represents the level of errors which remains undetected and uncorrected, does not

³ The implementation of the correction is done by CS2 JU, in the case of the on-going projects, through withholding the overpaid amounts from the next payment to the coordinator and, in the case of closed projects, through recovery orders directly sent to the beneficiary.

exceed 2% of the total expense recognised until the end of the programme. 2% is therefore the materiality level set for the JU. A detailed description of the materiality criteria applied for the assessment of the audit results with a view to the assurance declaration of the Executive Director of the JU is provided in a dedicated Annex of the AAR 2019.

VII. Implementation of H2020 audit results

Overpayments identified in the EPA exercise 2018 for H2020 projects had been implemented until the closure of the JU's Final Accounts 2019 at a rate of 85%. The implementation rate⁴ has meanwhile improved further to 93%.

Table 7a:

ACCUMULATED Total corrective action for H2020 EPA exercise 2016- 2018 - implementation achieved in 2019				
Audited value (of audited and unaudited cost claims)	Adjustments (detected error and extension of findings) in favour of CSJU	related overpayment	recovered overpayment (€) (i.e. adjustments booked in the system for next payment or RO issued)	recovery rate (%)
183,326,574	-893,453	-751,408	-696,553	92.70%

For overpayments detected in H2020 audits of the ex-post audit exercise 2019, the implementation rate is at 53% in May 2020 and is expected to arrive at 100% until the end of 2020, when the extension of audit finding cases will have been assessed and closed by the dedicated unit in the Common Audit Service.

⁴ Following Article 21.5 of the H2020 GA, the CSJU implements audit adjustments in on-going projects through deducting the rejected costs from the payment to the project coordinator for the next reporting period.

Table 7b:

Total corrective action for H2020 EPA exercise 2019 - implementation achieved				
Audited value (of audited and unaudited cost claims)	Adjustments (detected error and extension of findings) in favour of CSJU	related overpayment	recovered overpayment (€) (i.e. adjustments booked in the system for next payment or RO issued)	recovery rate (%)
163,719,680	-1,377,155	-964,151	-514,779	53.39%

At the time of this report, the accumulated corrections implemented for the H2020 programme until the date of this report represent 71% of the total impact of detected errors and extension of audit findings.

ACCUMULATED Total corrective action for H2020 EPA exercise 2016- 2019 - implementation achieved				
Audited value (of audited and unaudited cost claims)	Adjustments (detected error and extension of findings) in favour of CSJU	related overpayment	recovered overpayment (€) (i.e. adjustments booked in the system for next payment or RO issued)	recovery rate (%)
347,046,255	-2,270,608	-1,715,559	-1,211,331	70.61%

VIII. Results of non-representative ex-post audits pertaining to the sample of corrective (risk based) audits of the CAS covering Clean Sky 2 H2020 projects

In the year 2019, a detected error rate resulting from the sample of corrective (risk based) audits selected by the CAS covering Clean Sky 2 H2020 projects has been established and represents 1.95% of the audited expenditure of 2019. The accumulated detected error for the years 2016 to 2019 of this type of sample amounts to 2.02%

The representativeness of this error rate is limited as the selection of the samples has not been based on a consistent methodology for random sampling and the coverage achieved is only at 4.94% (see section II above). The difference to the detected error rate of the specific representative sample of Clean Sky 2 JU is caused by the results of one audit in the non-representative sample, which provided for an unusually high individual (non-systemic) detected error.

IX. Results of the Common Representative Sample (CRS) of the CAS covering H2020 projects for all H2020 stakeholders, including Clean Sky 2 JU

The Horizon 2020 audit campaign started in 2016. At this stage, 3 Common Representative Samples (CRS) with a total of 467 expected results have been selected. By the end of 2019, cost claims amounting to EUR 16.2 billion have been submitted by the beneficiaries to the services. The error rates at 31 December 2019 are:

Representative detected error rate: 2.78%⁵

The rate is based on 298 representative results out of the 467 expected in the 3 CRS. Taking into account the results of draft audit reports, the rate rises to 3.30%.

- Cumulative residual error rate for the Research and Innovation Family: 2.15 %
The rate is expected to rise to around 2.31 % when taking into account the results of the draft audit reports.
The rates for DG R&I alone amount to 2.24 % respectively 2.40 % .

As in 2018, the above-presented error rates needs to be treated with caution. Since not all the results of the 3 CRS are yet available, the error rate is not fully representative of the expenditure under control. Moreover, the nature of expenditure in the first years of the programme may not be totally representative of the expenditure across the whole period. As H2020 is a multi-annual programme, the error rates, and especially the residual error rate, should be considered in a time perspective. Specifically, the cleaning effect of audits will tend to increase the difference between the representative detected error rate and the cumulative residual error rate, with the latter finishing at a lower value.

Due to its multi-annual nature, the effectiveness of the control strategy of the Research and Innovation Directorates-General can only be fully measured and assessed in the final stages of the FP, once the ex-post control strategy has been fully implemented and systematic errors have been detected and corrected.

⁵ Following a comment of the Court of Auditors in its annual audit 2018, stating that the Commission methodology for the calculation of the error rate lead to an understatement of the error rate the extent of which could not be quantified, the Commission currently adapts its methodology for the calculation of Horizon 2020 error rate in line with the Court's observations starting with the 2020 ex-post audit campaign.

For a sample of audits from the years 2018 and 2019, the Commission applied the revised methodology and arrived at an understatement of 0.34% in that sample. In the reporting of the results 2019, the Commission increased its actual error rates established on the basis of the old methodology, by a general mark-up of 0.34% to mitigate the risk of a potential understatement of the error rate pertaining to the 3 CRS.

As last year, there is evidence that the simplifications introduced in Horizon 2020, along with the ever-increasing experience acquired by the major beneficiaries, affect positively the number and level of errors for all H2020 stakeholders.

X. Assessment of the ex-post audit results and conclusion for the Assurance declaration of the Executive Director in the AAR 2019

The results of the ex-post audit exercises 2016 to 2019 relate to validated cost claims for GAMs of the H2020 programme only. The entire operational expense incurred by the JU in 2019 pertains to the H2020 programme. Therefore the FP7 audit exercise had been closed by the end of 2018 and all results had been reflected in the reporting of the year 2018.

As described in the materiality criteria in the dedicated Annex of the 2019 AAR, the control objective of the JU is to ensure for the H2020 Clean Sky programme, that the residual error rate, which represents the remaining level of errors in payments made after corrective measures, does not exceed 2% of the total expense incurred until the end of the programme.

The audit approach for H2020 grants is based on the H2020 Audit Strategy and the related implementing procedure of CS2 JU⁶.

The results of the CS2 JU EPA process 2019 provide information on the legality and regularity of the validation process for GAM execution 2014 to 2017 for the H2020 programme. The EPA results of the year 2019 do not directly relate to the entire H2020 expenditure incurred by the JU until the end of 2019. However, the JU's EPA strategies are implemented through an on-going process, which produces accumulated results applicable to the entire expense incurred for the CS programme up to a certain point of time.

The error rate can be considered representative, as the major part of the selected sample of the year 2019 is final and available for the error rate calculation.

The accumulated direct audit coverage of the validated financial statements pertaining to GAMs of the years 2014 to 2017 is 13%.

The additional coverage achieved through corrective audits launched by the CAS on Clean Sky 2 grants is 5%.

The accumulated results established in the H2020 samples of the years 2016 to 2019 reflect a representative error in favour of Clean Sky 2 JU in the validated operational expense of 1.30%, compared to 1.44% for the accumulated audit exercises until 2018.

The H2020 **accumulated residual error rate** stemming from the first 4 audit exercises amounts to **0.92%**, compared to **1.11%** for the first three exercises, until year 2018.

The accumulated audit coverage of the validated H2020 financial statements pertaining to GAMs for the years 2014 to 2017 is **13%**. In view of the moderate errors detected, the level

⁶ Clean Sky 2 JU Procedure for implementing the H2020 Ex-post Audit Strategy, dated 01.12.2016

of assurance provided through these audit results is considered adequate for the reporting of the year 2019.

The results from audits pertaining to the specific samples carried out on the Clean Sky 2 expenditure as well as the samples of the CAS (CRS and other corrective audits), indicate, that over the multiannual period, and especially considering the envisaged level of the overall audit coverage of Horizon 2020 expenditure of Clean Sky2, the residual error rate will stay below 2% for the Clean Sky 2 H2020 programme.

Conclusion

The error rates for the audited population of H2020 stay below the materiality level of 2%, a reservation in the Assurance Declaration of the Executive Director for the Final AAR 2019 is not considered necessary.