



EUROPEAN
COURT
OF AUDITORS

2019 Audit of EU Joint Undertakings in brief

**Introducing the European Court of Auditors'
2019 annual report on EU JUs**

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Acronyms

The list of acronyms includes the EU agencies and other Union bodies covered by this report.

Acronym	Full name
ARTEMIS	The ARTEMIS Joint Undertaking to implement the Joint Technology Initiative in Embedded Computing Systems
BBI	The Bio-based Industries Joint Undertaking
CAS	Common Audit Service of the Commission's DG RTD
CEF	Connecting Europe Facility
CFS	Certificate on Financial Statement
COSO	The Committee of Sponsoring Organizations of the Treadway Commission
CS	The Clean Sky Joint Undertaking
DG RTD	Directorate General for Research and Innovation
EA	Executive Agency
EASA	The European Union Aviation Safety Agency
ECSEL	The Electronic Components and Systems Joint Undertaking
ENIAC	The European Nano-electronic Initiative Advisory Council
EIT	The European Institute of Innovation and Technology
EU	European Union
EUAN	European Union Agencies' Network
EURATOM	European Atomic Energy Community
EUROHPC	The European High-Performance Computing Joint Undertaking
EVM	Earned value management
FP7	Seventh Framework Programme for Research and Technological Development (2007-2013)
F4E	The Fusion for Energy Joint Undertaking
FCH	The Fuel Cells and Hydrogen Joint Undertaking
GERD	Gross Domestic Expenditure on Research and Development

H2020	Horizon 2020 Framework Programme for Research and Innovation (2014-2020)
ICF	Commission's Internal Control Framework 2017
IFAC	International Federation of Accountants
IKAA	In-kind contributions for Additional Activities
IKOP	In-kind contributions for Operational Activities
IMI	The Innovative Medicines Initiative Joint Undertaking
INTOSAI	International Organization of Supreme Audit Institutions
ISAs	The International Standards on Auditing of IFAC
ISSAIs	The International Standards of Supreme Audit Institutions of INTOSAI
ITER	International Thermonuclear Experimental Reactor
JU	Joint Undertaking
MFF	Multiannual financial framework
MUS	Monetary Unit Sampling
NFA	National funding authority
PMO	Office for Administration and Payment of individual entitlements
S2R	The Shift2Rail (European Rail Initiative) Joint Undertaking
SESAR	The Single European Sky Air Traffic Management Research Joint Undertaking
SNE	Seconded National Expert
TEN-T	Trans European Transport Network programme
TFEU	Treaty on the Functioning of the European Union

Executive summary

I For the financial year ended 31 December 2019, we issued an unqualified (“clean”) audit opinion on the reliability of the accounts of all Joint Undertakings (JUs). However, as in previous years, our audit opinion on the 2019 annual accounts of the ‘Fusion for Energy’ (F4E) JU is accompanied by an emphasis of matter, mainly to draw attention to the risk of further cost increases and delays in the ITER project implementation.

II We also issued an unqualified (“clean”) audit opinion on the legality and regularity of the payments and revenue underlying the 2019 annual accounts for all JUs.

III Overall, our audit of the annual accounts of the JUs and their underlying transactions confirmed the positive results reported in previous years. However, we observed various matters needing improvement in the areas of budgetary and financial management, in-kind contributions, the internal control and monitoring framework for grant payments, procurement procedures, human resources and sound financial management.

IV For the Seventh Framework Programme for Research and Technological Development (FP7) and Trans-European Transport Network programme (TEN-T) activities, the members’ contributions amounted to approximately 90 % of the targets set by the JUs’ founding regulations at the end of 2019 and the closing phase of the programme.

V For the Horizon 2020 Framework Programme for Research and Innovation (H2020) activities however, programme progress and related contribution fell short of targets for some JUs. At the end of 2019, which was beyond the midpoint of the programme period, the JUs had implemented on average 51 % of their H2020 and related additional activities. If the additional activities are excluded, the implementation rate drops to 44 %. In particular, the JUs achieved on average 36 % of their contribution targets for operational activities, as compared to the 85 % for their additional activities. On the other hand, the JUs completed most of the call procedures and had already awarded and/or signed on average, 78 % of their planned H2020 activities at the end of 2019.

VI The internal controls of the JUs were generally effective and – based on the *ex post* audit results - the JUs reported residual error rates for 2019 below the materiality level of 2 % for grant payments. Our audit of a sample of 2019 grant payments at beneficiaries confirmed the *ex post* audit results. Most of the JUs had

implemented the new principle-based internal control framework (ICF), which, however, should be regarded as an ongoing process, whose quality depends on the continuous improvement of the JUs' key control indicators and annual self-assessments.

VII For the Fusion for Energy JU, the weaknesses we found in its procurement procedures, the management of its human resources and the ITER project monitoring, might place the JU's staff performance and operational effectiveness at risk.

VIII All JUs took corrective actions to follow up on our previous years' observations. Therefore, of the 26 observations not addressed at the end of 2018, 20 observations (77 %) were subsequently completed in 2019, while six observations (23 %) remained ongoing at the end of 2019.

What we are auditing

Legal structure and establishment

01 Joint Undertakings (JUs) are a form of public-private partnership endowed with legal personality that aims to foster cooperation with the private sector and Member States in strategic areas of EU research and innovation, to achieve results that one country or company is less likely to achieve alone and to bring research and innovation results closer to the market.

02 The JUs operating under the FP7 and H2020 programmes are established under Article 187 of the Treaty on the Functioning of the European Union (TFEU). Fusion for Energy (F4E) was created under Articles 45 to 51 of the Treaty establishing the European Atomic Energy Community (Euratom).

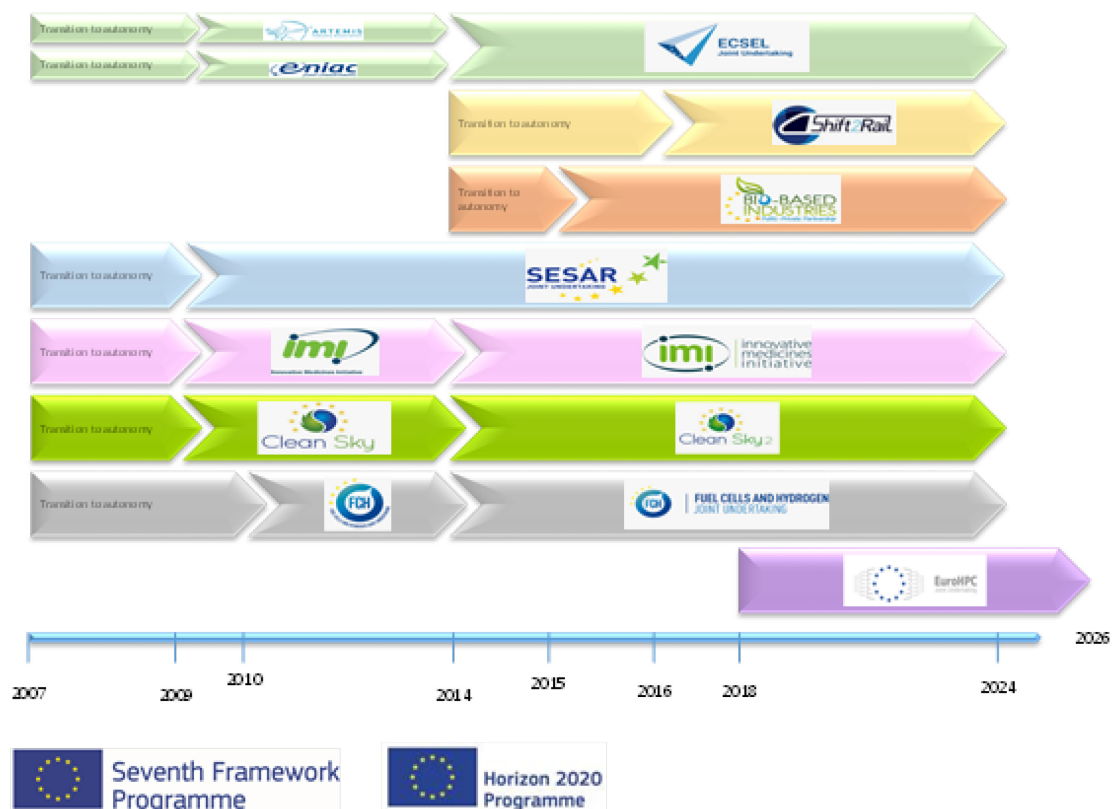
03 They consist of public members, typically the European Union (represented by the Commission), private members, which are from industry and research, and in some cases participating Member States and international organisations. JUs, with the exception of F4E, adopt their own research agendas and work plans and award funding mainly through open calls for proposals.

JUs operating under H2020

04 Currently, eight JUs are implementing H2020 projects and are planned to be operational until 2024, with the exception of the European High-Performance Computing joint Undertaking (EuroHPC), which will remain operational until the end of 2026.

05 *Figure 1* presents an overview of the evolution of the JUs under the H2020 programme.

Figure 1 – Evolution of European Joint Undertakings



Source: EC based on the Council Regulations establishing the JUs, modified by ECA.

06 Seven JUs implement specific actions of FP7 and H2020 activities

- Clean Sky (CS);
- Single European Sky Air Traffic Management Research (SESAR);
- Fuel Cells and Hydrogen (FCH);
- Innovative Medicines Initiative (IMI);
- Electronic Components and Systems for European Leadership (ECSEL), which was established in 2014 by a merger of two JUs: Nanoelectronics (ENIAC) and Embedded Systems (ARTEMIS);
- Bio-Based Industries (BBI), and
- Shift2Rail (S2R).

07 These actions are in the areas of transport (CS, S2R, and SESAR), transport/energy (FCH), health (IMI), bio-based industries (BBI) and electronic components and systems (ECSEL).

08 In addition, in November 2018, the Council established an eighth JU in the digital research area, EuroHPC, through a joint initiative between the EU and other European countries, the purpose of which is to develop a world-class supercomputing ecosystem in Europe. We will audit the accounts of this JU for the first time, in 2020.

F4E is operating under Euratom to establish ITER

09 In 2007, under the Euratom Treaty, the EU established the ‘Fusion for Energy’ (F4E) JU for a period of 35 years. It is responsible for providing Europe’s contribution to the International Thermonuclear Experimental Reactor (ITER), a global scientific partnership that aims to demonstrate that nuclear fusion can provide a viable and sustainable source of energy¹. The founding members of F4E are Euratom, represented by the Commission, the Euratom Member States, and Switzerland.

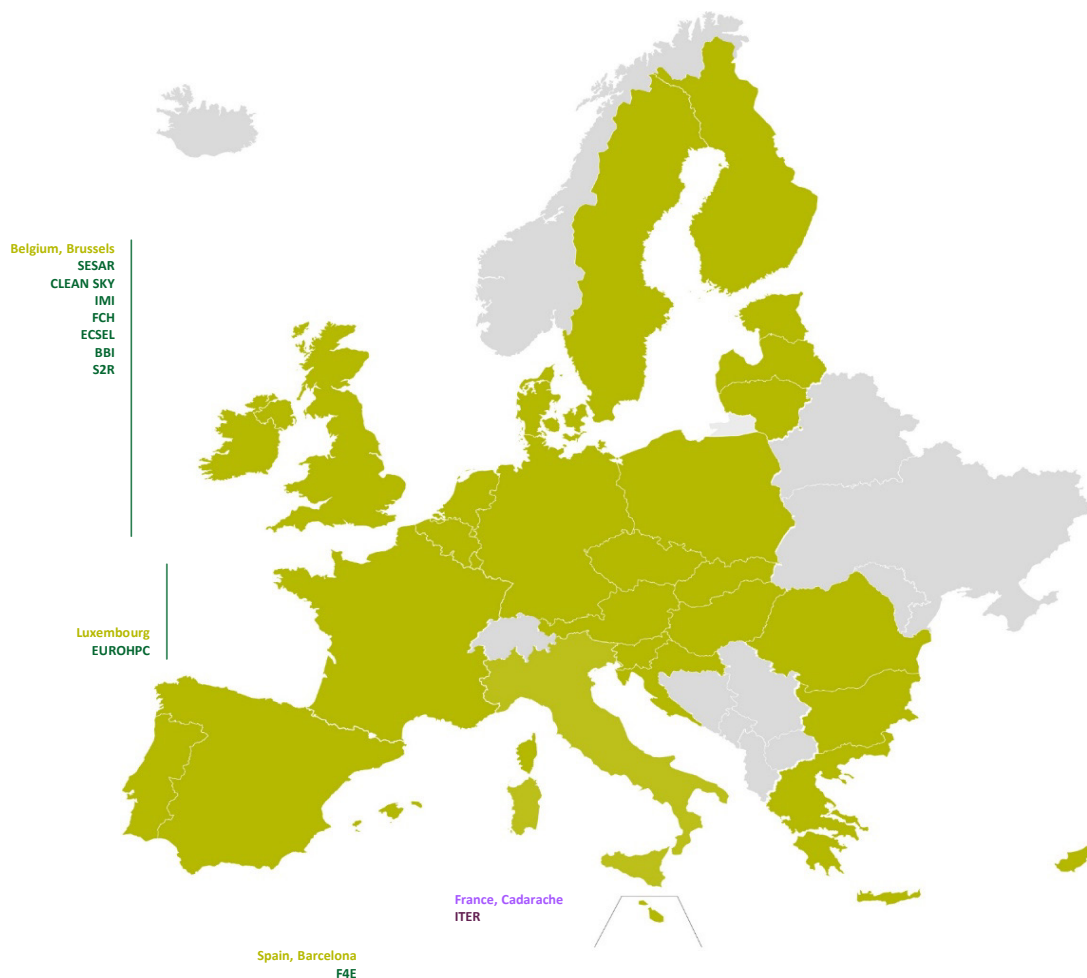
10 Europe has taken the lead for the ITER project, with a 45 % share of the construction costs, of which 80 % is funded from the EU budget and 20 % by France as the ITER host country. The other ITER members’ share is around 9 % each. F4E is mainly funded by Euratom and its Member States. The total Euratom funds dedicated to F4E are limited to 6,6 billion euros until the end of 2020.

JUs are located in the European Union

11 All H2020 JUs are based in Brussels (Belgium), with the exception of EuroHPC, which is located in Luxembourg. F4E is located in Barcelona (Spain), whereas the main fusion facilities are being built in Cadarache, France (see [Figure 2](#))

¹ The ITER project to build and operate an experimental facility to demonstrate the scientific viability of fusion as a future sustainable energy source was formally agreed at the end of 2006. It involves seven global partners (the EU represented by the European Atomic Energy Community (Euratom), the United States, Russia, Japan, China, South Korea and India).

Figure 2 – Joint Undertakings in the European Union in 2019



Source: ECA.

JUs' governance models

12 Most JUs follow a bipartite model, with the Commission and industry (and in some cases research) participating in the governing board and contributing to the JU's activities (CS, IMI, FCH, BBI, S2R). Some follow a tripartite model, in which the Member States or intergovernmental organisations, the Commission, and industry participate in the governing board and contribute to the JU's activities (ECSEL, SESAR, and EuroHPC).

JUs' FP7 and H2020 research activities are financed by both the EU and the industry and research partners

13 For the JUs implementing FP7 and H2020 projects, both the EU and industry and research partners contribute to funding the JUs' research and innovation activities:

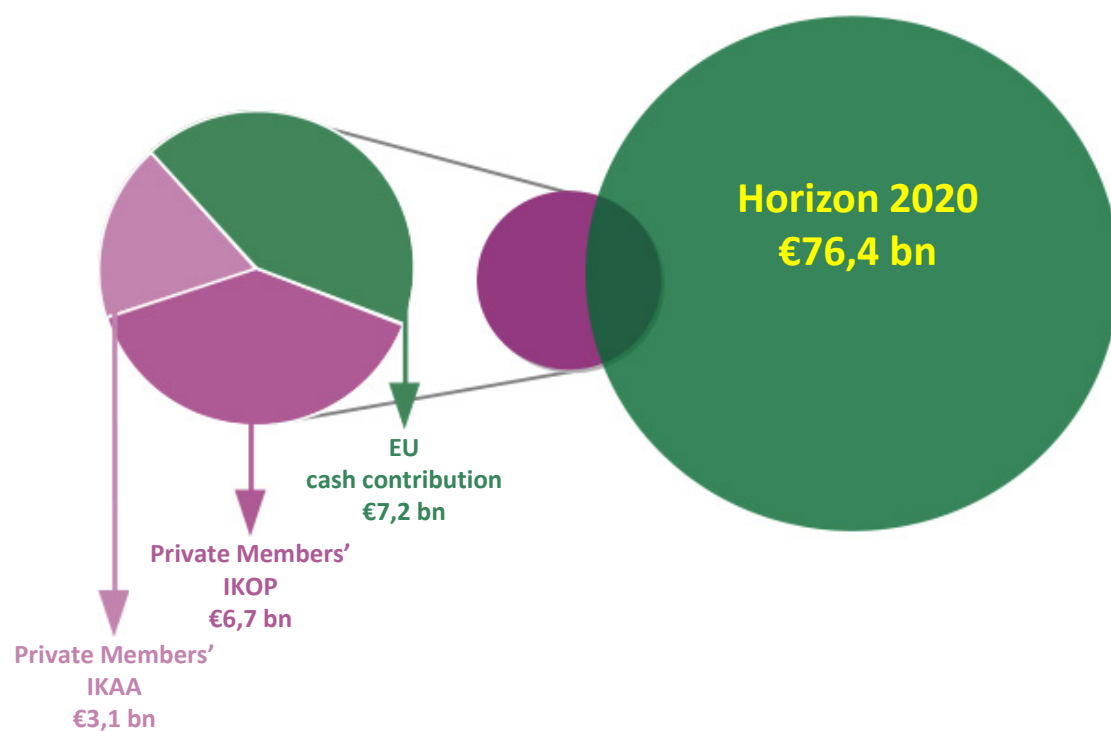
- The EU (represented by the Commission) provides cash funds from the FP7 and the H2020 programmes to co-fund the JUs' research and innovation projects².
- The private partners from industry and research provide in-kind contributions by delivering the research and innovation activities in which they invested their own financial resources, human resources, assets and technologies.
- Both the EU and private partners equally finance the JUs' administrative costs.

14 As to the previous MFF 2007-2013, JUs implement around 3,6 billion euros or about 7 % of the global FP7 budget. As the amount of private partners' in-kind contributions has at least to equal the amount of EU co-financing, the EU funding of 3,6 billion euros leverages about 8,7 billion euros of FP7 research and innovation projects.

15 For the current MFF 2014-2020, JUs manage around 7,2 billion euros or 10 % of the global H2020 budget. As illustrated in [Figure 3](#), this EU funding, however, leverages about 17 billion euros of research and innovation projects in the H2020 areas assigned to JUs.

² SESAR also received funding from the Trans-European Transport Network (TEN-T) programme under the previous multiannual financial framework (MFF 2007-2013) and from the Connecting Europe Facility (CEF) under the current MFF 2014-2020.

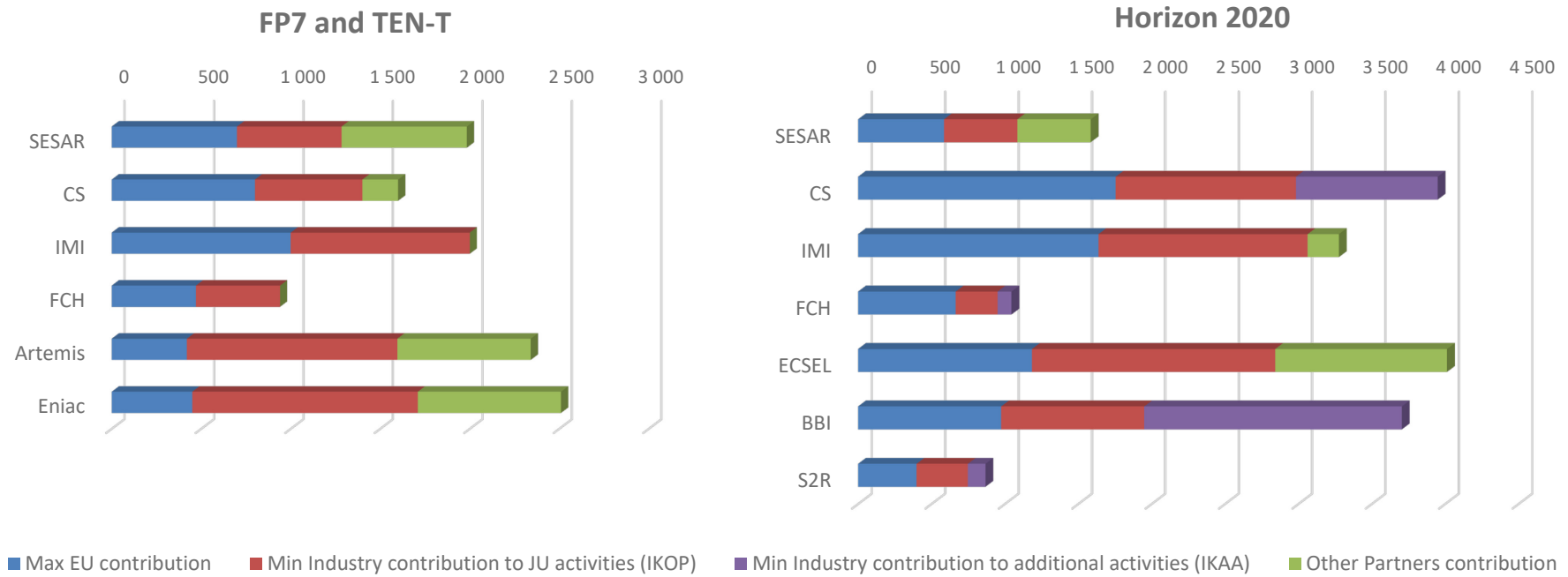
Figure 3 – JU co-funding and leverage of private members' in-kind contributions under H2020



Source: ECA.

16 For H2020 activities, the respective JU founding regulations define the amount of both EU cash contributions and private partners' in-kind contributions for H2020 research and innovation projects, as shown in [Figure 4](#).

Figure 4 – Members’ contributions over JU lifetime (in million euros)



Source: ECA.

17 Under H2020, there are two types of private members' contributions. For all JUs, the private members have to contribute a minimum amount to the total costs of the JU research and innovation projects. This contribution is defined as the difference between the total project costs and the EU co-funding. In the case of four JUs (CS, FCH, BBI and S2R), the private members have to also provide a minimum amount of in-kind contributions to fund activities performed outside the JUs' work plans but falling within the scope of the JUs' objectives.

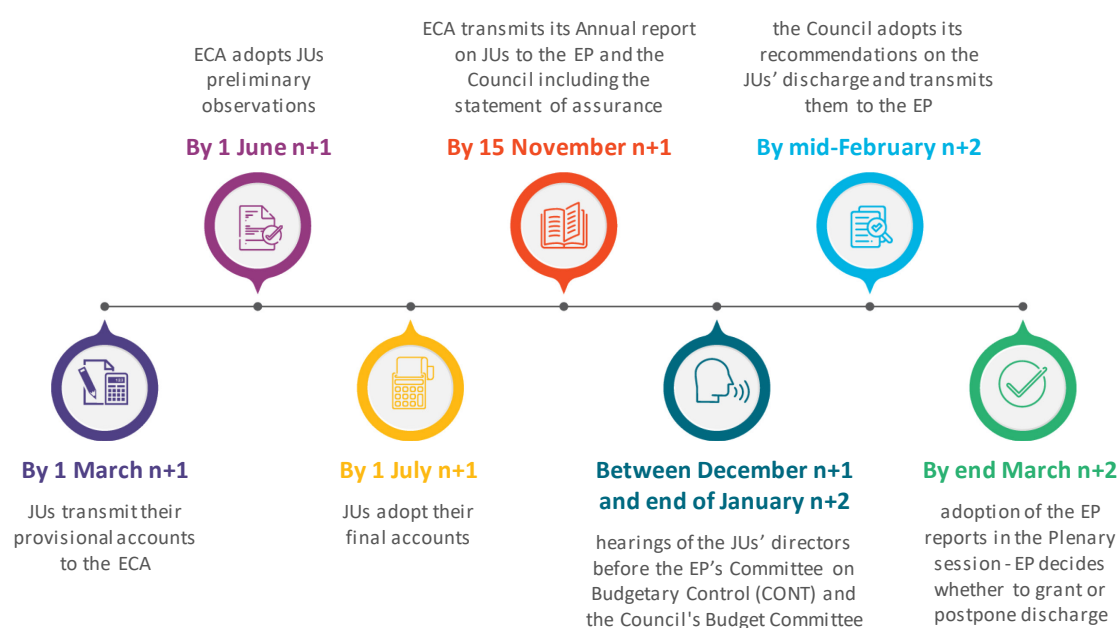
18 In 2019, the total payments budget for all JUs amounted to some 1,9 billion euros (2018: 2 billion euros). The 2019 payments budget for the seven JUs implementing research programme activities was 1,2 billion euros (2018: 1,2 billion euros), and 0,7 billion euros for F4E (2018: 0,8 billion euros).

19 At the end of 2019, JUs operating under H2020 employed 229 staff (temporary and contract agents) and eight seconded national experts, SNEs (2018: 225 staff and seven SNEs). F4E employed 437 staff (officials, temporary and contract agents) and two SNEs (2018: 442 staff).

Discharge procedure

20 The timeline of the annual discharge procedure is shown in *Figure 5*.

Figure 5 – Annual discharge procedure



Source: ECA.

Our audit

21 As required by Article 287 of the TFEU, we audited the accounts of eight JUs (SESAR, CS, IMI, FCH, ECSEL, BBI, S2R and F4E) for the financial year ended 31 December 2019 and the legality and regularity (compliance) of the transactions underlying those accounts.

Using the work of others

22 For the audit of the reliability of the JU accounts, we based our opinion on the final audit reports of the independent external auditor contracted by the JU. For each JU, we examined the quality of the external auditors' work for the most risk prone areas.

23 For the audit of the compliance of the underlying payments, we took account of the work performed by other auditors. Therefore, we assessed and tested the JUs' internal control systems and considered the results of the ECA's reviews of the *ex post* audits performed by the Commission's Internal Audit Service (IAS) for H2020 grant payments.

Our risk assessment

24 The 2019 annual audit of the JUs' accounts and underlying transactions took into consideration our risk assessment of the JUs, which is briefly presented below:

- Overall, we consider the risk to the reliability of the annual accounts to be low. However, due to an important change in accounting policy in 2018, the risk for F4E was reassessed as medium. The JUs' accounts are established by applying the accounting rules adopted by the Commission's accounting officer. These are based on internationally accepted accounting standards for the public sector. The number of material errors found in the past was small.
- The risk related to the legality and regularity of payments was considered as low for staff and administrative payments. Salaries are administered by the Commission's Office for Administration and Payment of individual entitlements (PMO), which we audit within the framework of its specific assessments of administrative expenditure. We have found no material errors in relation to staff expenditure in recent years.

- The risk to the legality and regularity of recruitment procedures was low in general, but medium for the F4E JU, where serious weaknesses in recruiting procedures were found in the past. Special attention was also given to the JUs' use of interim staff during 2019.
- For interim and final grant payments, the risk was assessed to be medium in general, as they are based on beneficiaries' cost declarations that are generally complex. Moreover, for H2020 grant payments, certificates on financial statements (CFS) are only required from the beneficiary for final payments (trust principle).
- For contract payments and public procurement procedures, the risk was assessed as low for those JUs implementing FP7 and H2020 activities, given the limited number of such procedures run by them. The risk was assessed as medium for the F4E JU, which mainly operates complex procurement procedures for high-value contracts, and for EuroHPC, which only established its procurement process in 2019.
- For the budget management, the risk was assessed as low to medium because of the multiannual nature and complexity of the H2020 grant actions and the ITER project. For the sound financial management, it was also assessed as low to medium and the main risk area identified was the grant design and the F4E's human resources and project management.

Overall results from the JUs' annual audits for the financial year 2019

Unqualified ("clean") opinions for all JUs...

... on the annual accounts, but emphasis of matter for F4E related to the EU contribution to ITER

25 We issued unqualified audit opinions on the annual accounts of all JUs. In our opinion, these accounts present fairly, in all material respects, the JUs' financial positions as of 31 December 2019 and the results of their operations and their cash flows for the year then ended, in accordance with the provisions of the applicable financial regulations and the accounting rules adopted by the Commission's Accounting Officer.

26 As in previous years, our audit opinion on the 2019 annual accounts of F4E is accompanied by an emphasis of matter³ to draw attention to the following:

- o In November 2016, the ITER Council approved a new ITER project baseline. The new ITER baseline estimates the deadlines for the achievement of First Plasma⁴, the start of the operational phase in 2025 and the completion of the construction phase in 2035. The new baseline is considered the earliest possible technically achievable date. The previous 2010 baseline had estimated that the construction phase would be completed in 2020.
- o The F4E JU recalculated its contribution to the project construction phase at 12 billion euros (in 2008 values), up from the 6,6 billion euros (in 2008 values) approved by the EU Council in 2010. These recent estimates do not include contingencies, even though the Commission suggested that a contingency of up

³ An emphasis of matter draws attention to a matter, which is not materially misstated in the accounts, but which is of such importance that it is fundamental to the users' understanding of the accounts.

⁴ First Plasma represents the stage in the construction of the fusion machine that will allow testing the essential components of the machine; it is also the point where the operation phase starts.

to 24 months in terms of schedule and 10-20 % in terms of budget would be appropriate.

- o In April 2018⁵, the Council of the EU mandated the Commission to approve the new ITER baseline on behalf of Euratom and reaffirmed the commitment to make resources available within the limits of the next MFF, but without prejudice to any subsequent MFF negotiations to determine the details of the future funding.
- o On 31 January 2020, the United Kingdom withdrew from the EU and Euratom. The transition period for negotiating a new partnership agreement with Euratom ends on 31 December 2020. The negotiation outcome may have a significant effect on the post-2020 activities of the F4E JU and the ITER project.
- o While positive steps have been taken to improve the management and control of the JU's contribution to the project construction phase, there remains a risk of further cost increases and delays in project implementation compared to the current approved baseline.

... on the revenue underlying the JUs' accounts

27 For all JUs, we issued *unqualified ("clean") audit opinions* on the legality and regularity of the revenue underlying the annual accounts for the year ended 31 December 2019. In our opinion, transactions were legal and regular in all material respects.

... on the payments underlying the JUs' accounts

28 For all JUs, we issued *unqualified ("clean") audit opinions* on the legality and regularity of the payments underlying the annual accounts for the year ended 31 December 2019. In our opinion, transactions were legal and regular in all material respects.

29 *Figure 6* gives an overview of the ECA's opinions on the JUs' annual accounts and on the legality and regularity of the underlying transactions (revenue and payments) from 2017 to 2019.

⁵ The amount of 6,6 billion euros (in 2008 values) adopted by the Council of the EU in 2010 currently serves as a ceiling for the Joint Undertaking's spending up to 2020.

Figure 6 – Evolution of ECA’s opinions on JUs from 2017 to 2019



Source: ECA.

Our observations address areas for improvement

30 Without calling our opinions into question, we also observed various matters needing improvement in the areas of budgetary and financial management, in-kind contributions, the internal control and monitoring framework for grant payments, procurement procedures, human resources and sound financial management.

Shortcomings remain in the annual planning of payments

31 The JUs’ need to plan for important multiannual research grant projects continued to be the main difficulty in the planning and monitoring of payment appropriations. Given the needs of the JUs, unused payment appropriations may be included in the budget in the subsequent three financial years. Regarding BBI the significant increase in unused payment appropriations for H2020 projects at the end of 2019 was mainly caused by unexpected project delays in 2019. Regarding ECSEL’s payment budget for FP7 projects, the low implementation rate of less than 50 % was mainly due to the delay by national funding authorities (NFAs) in providing end-of-project certificates for ongoing FP7 activities.

JUs achieved an implementation rate of 90 % for their FP7 and TEN-T activities

32 The JUs implementing activities under the FP7 and TEN-T programmes (2007-2013 MFF) are SESAR, CS, IMI, FCH, and ECSEL. In 2019, only three JUs (IMI, FCH and ECSEL) were still in the closing phase for the implementation of their respective FP7 actions. At the end of 2019, members' contributions for such activities represented on average, 90 % of the contribution targets set by the JUs' founding regulations (see [Table 1](#)).

Table 1 – FP7 and TEN-T – Members' contributions (in million euros)

Members' contributions (as per Founding Regulation)			JUs under FP7	Members' contributions (as at 31.12.2019)			
EU	Other members	Total		EU	Other members	Total	Implementation rate
700,0	1 284,3	1 984,3	SESAR 1	634,1	1 100,5	1 734,6	87 %
800,0	600,0	1 400,0	CS 1	800,0	607,9	1 407,9	101 %
1 000,0	1 000,0	2 000,0	IMI 1	924,8	780,2	1 705,0	85 %
470,0	470,0	940,0	FCH 1	421,5	450,4	871,9	93 %
655,5	1 784,4	2 439,9	ECSEL (for Artemis/Eniac)	655,5	1 551,9	2 207,4	90 %
3 625,5	5 138,7	8 764,2	Total	3 435,9	4 491,0	7 926,9	90 %

Source: Data provided by the JUs.

33 For SESAR, the excess in members' cash contribution at the end of 2019 amounted to 30,7 million euros. Of this, 23,8 million euros represent unused cash contributions from FP7 funds. In the absence of a pragmatic solution for an early reimbursement, these funds remain with the JU, without being used for research projects.

Some JUs lost momentum for the implementation of their H2020 activities

34 The seven JUs implementing H2020 activities are SESAR, CS, IMI, FCH, ECSEL, BBI, and S2R, with a life span of 10 years (2014-2024). At the end of 2019, beyond the middle of implementation of their H2020 activities, these JUs had implemented on average, 51 % of their H2020 and related additional activities and 44 %, if the additional activities are excluded. Some JUs, however, did not achieve the expected programme progress and were therefore falling behind the contribution targets set by their respective founding regulations (see [Table 2](#)).

35 In the case of four JUs (CS, FCH, BBI, S2R), the respective founding regulation provides for in-kind contributions by private members in the form of additional activities performed outside the JUs' work plans but within the scope of the JU's objectives (IKAA), and sets a minimum level to be contributed by the end of the H2020 programme. As shown in [Table 2](#), by the end of 2019, the private members' contributions mainly consisted of the declaration of own costs for these activities. Since there is no obligation to disclose the corresponding IKAA in the annual accounts, they are outside our audit scope.

36 At the end of 2019, the private partners' contributions amounted to 5,1 billion euros (or 52 % of the agreed total contribution of 9,8 billion euros). This amount comprised 2,4 billion euros of in-kind contributions to the JUs' H2020 own operational activities (IKOP)⁶ and 2,7 billion euros of IKAA. Thus, the private members' implementation rate for IKOP was on average 36 % of the targets defined in the JU founding regulations, while that for IKAA was close to 85 % (see [Table 2](#)).

⁶ Of this amount only approximately 0,9 billion euros (38 %) was certified at the end of 2019.

Table 2 – Horizon 2020 – Members' contributions (in million euros)

Members' contributions (as per Founding Regulation)				JUs under Horizon 2020	Members' contributions (as at 31.12.2019)						
EU	Other members' IKOP (1)	Other members' IKAA (2)	Total		EU	IKOP validated	IKOP reported not validated	IKAA	Total	Implementation rate with IKAA	Implementation rate without IKAA
585,0	1 000,0	N/A	1 585,0	SESAR 2020	331,0	186,5	179,3	N/A	696,8	44 %	44 %
1 755,0	1 228,5	965,3	3 948,8	CS2	1 139,7	292,7	320,1	899,9	2 652,4	67 %	59 %
1 638,0	1 425,0	N/A	3 063,0	IMI2	423,7	232,1	144,2	N/A	800,0	26 %	26 %
665,0	95,0	285,0	1 045,0	FCH2	420,0	5,4	32,7	667,0	1 125,1	108 %	60 %
1 185,0	1 657,5	N/A	2 842,5	ECSEL	681,5	117,4	705,4	N/A	1 504,3	53 %	53 %
975,0	975,0	1 755,0	3 705,0	BBI	414,6	29,9	52,0	916,1	1 412,6	38 %	25 %
398,0	350,0	120,0	868,0	S2R	221,7	76,8	74,6	182,5	555,7	64 %	50 %
7 201,0	6 731,0	3 125,3	17 057,3	Total	3 632,2	940,8	1 508,3	2 665,5	8 746,9	51 %	44 %

(1) In-kind contributions to the JU's operational activities

(2) In-kind contributions to additional activities outside of the JU's work plan

Source: Data provided by the JUs.

37 With regard to the BBI, although its founding regulation was expressly amended in 2018 to enable industry members to account for their cash contributions at project level, there is still a high risk that the industry members will not achieve the minimum required amount of operational cash contributions of 182,5 million euros by the end of the BBI programme. As a result, the Commission (DG RTD) decided at the end of 2018 to reduce the JU's 2020 budget of 205 million euros by 140 million euros.

38 At the end of 2019, the JUs had already completed most of the call procedures for the implementation of the H2020 activities assigned to them (see [Table 3](#)).

Table 3 – Horizon 2020 – Committed JU co-funding (in million euros)

EU contributions (as per Founding Regulations)				Grant agreements awarded/signed (as at 31.12.2019)	
EU total	JU administration	max JU co-funding	JUs under Horizon 2020	committed JU co-funding	Programme implementation rate
585,0	29,3	555,8	SESAR 2020	498,5	90 %
1 755,0	39,0	1 716,0	CS2	1 523,7	89 %
1 638,0	42,6	1 595,4	IMI2	1 190,6	75 %
665,0	19,0	646,0	FCH2	536,7	83 %
1 185,0	15,3	1 169,7	ECSEL	832,8	71 %
975,0	29,3	945,8	BBI	594,3	63 %
398,0	13,5	384,5	S2R	300,2	78 %
7 201,0	187,9	7 013,1	Total	5 476,8	78 %

Source: Data provided by the JUs.

Internal controls in respect of grant payments were generally effective

39 The JUs have set up reliable ex-ante control procedures based on financial and operational desk reviews. The JUs are obliged to implement the Commission's new internal control framework (ICF), which is based on 17 internal control principles. At the end of 2019, the JUs (with the exception of ECSEL), had implemented the new ICF and developed key control indicators for all control principles, to assess the effectiveness of their control activities and detect control weaknesses. The established ICF, however, should be regarded as an ongoing process, whose quality depends on the continuous improvement of the JUs' key control indicators and annual self-assessments.

40 For FP7 grant payments, the JUs (with the exception of ECSEL) reported residual error rates below the materiality level of 2 %, based on the *ex post* audit results at the end of 2019. Where ECSEL is concerned, the significant variation in the methodologies

and procedures used by the participating states' NFAs does not allow the calculation of a single residual error rate for FP7 payments. However, the residual error rate established by DG RTD for the whole FP7 programme was 3,52 % at the end of 2019. Given the low percentage of FP7 payments in 2019 (around 11 %), the residual error rate for ECSEL's total operational payments made in 2019, is considered to be below the materiality threshold.

41 For H2020 grant payments, all JUs implementing H2020 projects reported a residual error rate below the materiality threshold of 2 %, based on ex-post audit results of the Common Audit Service (CAS) of the Commission at the end of 2019.

Our audit of a sample of 2019 grant payments at the beneficiaries confirmed the *ex post* audit results for declared personnel cost

42 In 2018 and 2019, the ECA reviewed on a sample basis, the *ex post* audits carried out by CAS and its contracted external auditors. These reviews revealed methodological differences and audit quality weaknesses, as reported in the respective chapter of the ECA annual reports for 2018 and 2019⁷, understating the error rate for H2020 payments. Moreover, the residual error rate reported by the seven H2020 JUs in their respective annual activity reports is not directly comparable with the error rate published in the 2019 ECA annual report for the Commission's research expenditure⁸.

43 Therefore, we adjusted our JU audit approach for 2019 and supplemented the assurance sought from *ex post* audits with a detailed audit at the beneficiaries (substantive testing) for a sample of JU payment transactions. These transactions were randomly selected (MUS-based sample) from a population of all interim and final grant payments made in 2019 by the seven JUs implementing FP7 and H2020 projects. Our

⁷ See ECA annual report 2018, Chapter 5 (paragraphs 5.31 – 5.34) and ECA annual report 2019, Chapter 4 (paragraphs 4.28 and 4.29), which reported that in contrast to the ECA calculation method, the CAS representative error percentage for each audited H2020 transaction is calculated based on the total amount of the cost declaration, rather than on the amount of the cost items sampled for detailed audits and reperformances.

⁸ In contrast to the error rate calculated by the ECA, the residual error rate calculated by the JUs (based on the *ex post* audit results and in line with the CAS' H2020 *ex post* audit strategy formula), includes the correction of all errors detected in audited payments, as well as the correction of systemic errors in the non-audited payments of audited beneficiaries (so-called "extension").

detailed audits confirmed systemic errors in relation to the declared personnel costs, which had also been detected and reported by the *ex post* auditors.

F4E's weaknesses in procurement, human resource and project management place its operational effectiveness at risk

44 Our compliance audit of F4E procurement procedures for high-value contracts revealed shortcomings in the procurement planning and evaluation process that may have deterred potential contractors from submitting a tender.

45 In the framework of the eighth annual assessment of F4E, the expert panel identified several problems and risks at senior management and corporate culture level. In addition, it observed that F4E increasingly uses contracted or insourced resources to overcome restrictions of its establishment plan for statutory staff, including for positions considered as core competencies. In 2019, the level of these resources was around 289 persons (or 62 %) of the statutory staff, fixed in the establishment plan.

46 In 2019, an ad-hoc group appointed by the F4E Governing Board reviewed the current F4E reporting system and proposed the introduction of an earned value management (EVM) system⁹, which was endorsed by the F4E Governing Board. The proposed EVM system, however, does not take into account all the independent experts' recommendations and does not provide clear information on what technical progress was achieved against costs incurred to-date, regarding the total of the F4E JU's delivery obligations for the ITER project.

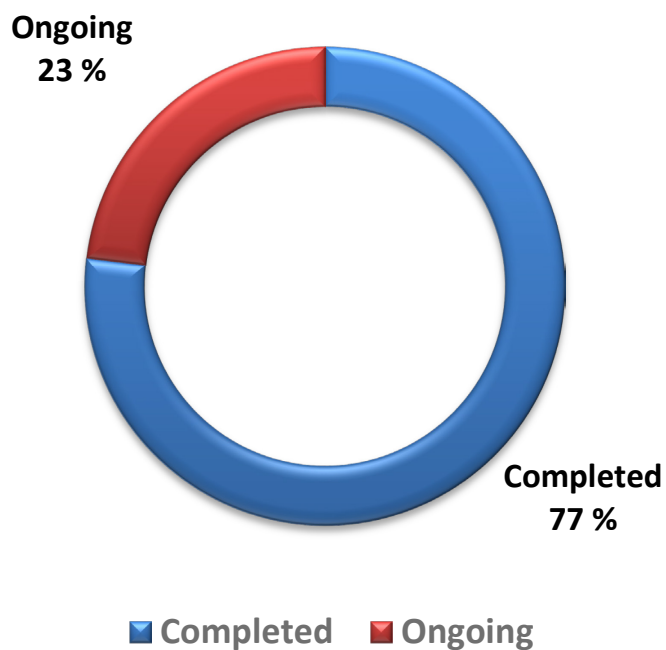
Follow up on previous years' audit findings

47 In most cases, the JUs have taken corrective action to follow up the observations and comments in our specific annual reports from previous years. **Figure 7** shows for the 26 observations not addressed at the end of 2018, corrective action was taken in 2019, so that 20 observations (77 %) could be completed while six observations (23 %)

⁹ EVM helps project managers to measure project performance. It is a systematic project monitoring process used to find deviations in project progress based on the comparison of work performed and work planned. It is used on the cost and time schedule control and to provide quantitative data for project decision-making. The project baseline is an essential component of EVM and serves as a reference point for all EVM-related activities.

remained ongoing at the end of 2019¹⁰. Further details can be found in the annexes to Chapter 3 of the full report.

Figure 7 – JUs' efforts to follow-up previous years' observations



Source: ECA.

¹⁰ Note: For CS, IMI, FCH and F4E, all previous years' observations were completed because of the JUs' corrective actions taken during the 2019 audit.

Other JU-related audits and reviews

48 Apart from the annual audit report related to the JUs' annual accounts, in the course of 2019 we also issued a number of special reports and reviews, which referred to JUs (see [Figure 8](#)).

Figure 8 – Audit results from other JU-related products recently issued by ECA



Briefing paper 2019:
EU support for energy storage: challenges to be addressed

This briefing paper describes and analyses what the EU does in the field of energy storage technologies which provide a flexible response to the imbalances caused by an increased share of variable renewable energy sources, such as solar and wind, in the power grid. We focused on the investments funded from the EU budget and We identified seven main challenges to the EU support to the development and deployment of energy storage technologies.

The Commission recognises the importance of effective research and innovation in accelerating the transformation of the EU's energy system and bringing promising new low-carbon technologies to the market. Between 2014 and October 2018, Horizon 2020, the principal research programme of the Commission, had granted €1.34 billion to projects for grid energy storage or for low carbon mobility. We found that the Commission has taken steps to simplify Horizon 2020, but there remains scope to reduce further the complexity of EU research funding and increase participation by innovative companies. There is also a risk that the EU has not sufficiently supported the market deployment of innovative energy storage solutions.

The details on the audit conclusions, related recommendations and the auditee's reply can be consulted on the ECA website eca.europa.eu.



ECA special report 11/2019:
The EU's regulation for the modernisation of air traffic management has added value – but the funding was largely unnecessary - SESAR - deployment

In 2005, the EU launched a programme known as SESAR to harmonise and modernise air traffic management (ATM) systems and procedures across Europe. These systems have traditionally been developed at a national level. Overall, the EU has committed €3.8 billion to SESAR between 2005 and 2020, of which 2.5 billion euro was earmarked to support the deployment of such systems and procedures.

In this audit, we reviewed the EU's intervention in the deployment phase of SESAR, the technological pillar of the EU's Single European Sky (SES) initiative. We concluded that the EU's regulatory intervention in the form of common projects has added value. However, we also found that EU funding in support of ATM modernisation was largely unnecessary, and that the management of the funding is affected by some shortcomings. We also made a number of recommendations to the European Commission to help improve its support for ATM modernisation.

The details on the audit conclusions, related recommendations and the auditee's reply can be consulted on the ECA website eca.europa.eu.



ECA special report 2/2020:
The SME Instrument in action: an effective and innovative programme facing challenges

The SME Instrument was set up under the Horizon 2020 research framework programme to support innovation in small and medium-sized enterprises (SMEs). Its objective is to develop and capitalise on the potential of SMEs by filling the gap in funding for early stage high-risk projects and increasing private-sector commercialisation of research results. It is targeted towards innovative SMEs in the EU and 16 associated countries. With an overall budget of €3 billion for the period 2014-2020, the instrument provides grants to high-potential companies.

We examined if it has targeted the right type of SMEs, achieved wide geographic coverage, the selection process was effective, and if the Commission adequately monitored the instrument.

We found that it provides effective support to SMEs in developing their innovation project but we identified a risk that the instrument funds some SMEs that could have been financed by the market, that participation in the Instrument varies markedly between participating countries, and resubmission of unsuccessful proposals is an increasing drain on management and evaluation resources without providing added value.

The details on the audit conclusions, related recommendations and the auditee's reply can be consulted on the ECA website eca.europa.eu.

Source: ECA.

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