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Results of 5th Compliance Cycle Evaluation of EU ETS MRVA implementation

Technical report

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Abbreviations

A&V	Accreditation & Verification
AER	Annual Emissions Report
AO	Aircraft Operator
AVR	Accreditation and Verification Regulation
CA	Competent Authority
CCC	Climate Change Committee
CCEV	Compliance Cycle Evaluation
CCS	Carbon Capture and Storage
CF	Compliance Forum
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
FAQ	Frequently Asked Questions
EA	European co-operation for Accreditation
EU ETS	EU Emissions Trading System
IR	Improvement Report
ICAP	International Carbon Action Partnership
M&R	Monitoring & Reporting
MMR	Monitoring Mechanism Regulation
MP	Monitoring Plan
MRR	Monitoring and Reporting Regulation
MRV	Monitoring, Reporting and Verification
MRVA	Monitoring, Reporting, Verification and Accreditation
MS	Member States
NAB	National Accreditation Body
SC	Steering Committee
TF	Task Force
TWG	Technical Working Group
VR	Verification Report
WG III	Working Group III

1 » Introduction

This report describes the methodology and the main results of the 5th Compliance Cycle Evaluation (CCEV5). The CCEV5 was conducted as part of the project "Support to the Commission and the Member States (MS) on EU ETS Monitoring, Reporting, Verification and Accreditation", carried out in the period 25 January 2018 – 25 January 2020. Work for this project was conducted by a consortium of SQ Consult B.V. and Umweltbundesamt GmbH Austria, supported by Carbon Constraints Initiative (CCI).

The CCEV5 provides an analysis of Member State's implementation of EU ETS requirements in each step of the compliance cycle, with specific attention on EU ETS monitoring, reporting, verification and accreditation (MRVA). The aim of the work is to help Member States with their EU ETS implementation by recommending improvements for implementation at MS level, and providing recommendations for further enhancement of the EU ETS system.

The CCEV5 was conducted within the framework of a wider set of EU ETS compliance activities that fed into the compliance evaluation: activities in the Compliance Forum, analysis of Article 21 reports etc. In turn the compliance evaluation led to conclusions and recommendations that were taken forward in activities to support MS and the Commission, such as updating of the guidance, compliance forum training events, and ad hoc support to address specific technical questions. Further recommendations for MS and the Commission are included in this report.

2 » Methodology

This chapter provides a description of the methodology used in the CCEV5, including an illustration of the various steps taken in the evaluation process.

2.1 Approach to the evaluation

The CCEV5 consisted of three parallel and related evaluations:

1. The central compliance cycle evaluation;
2. The MS case evaluations;
3. The Sectoral case evaluations that provide in-depth insight into particular categories of EU ETS activity.

The central compliance cycle evaluation is based on a methodology developed by the consultant team in 2015. The methodology centers around a set of appraisal questions that are used to assess the quality of EU ETS implementation in that specific area and to identify potential best practices and possible compliance issues. More information on this part of the evaluation is included in section 2.3.

In the MS case evaluations the project team selected one installation or aircraft operator in each of the MS and assessed the corresponding monitoring plan (MP), annual emissions report (AER), verification report (VR) and, where relevant, the improvement report (IR) from 2018. Criteria that were used to make the selection, included:

- Size of the installation/aircraft operator and share of emissions;
- Issues identified from Article 21 reports, e.g. installations not meeting highest tier, installations using CEMS;
- Information collected from 2015 and 2016: e.g. installations from sectors where MS experienced implementation problems or where sectors specific issues were identified;
- Public information from the EU registry: e.g. a high number of installations in a sector.

When making the selection, the team ensured that it covered the following 12 sectors: combustion activities[1], cement, lime, integrated iron and steel, oil refinery, primary aluminium, secondary metals[2], glass, ceramics, nitric acid and aviation.

In addition, information exchange reports for each MS were analysed: the Article 77 AVR notification report, the NAB work programme, the NAB management report and the Article 73 AVR CA information exchange report. To ensure that all elements of the compliance cycle were covered an MS-specific questionnaire was sent out and interviews held with some MS to collect additional information. More information on the MS case evaluations is provided in section 2.4. Finally, a "Round Robin Test" was carried out in which Competent Authorities (CAs) were requested to review the MP, AER, VR and IR of an imaginary installation to test consistency of approach. More detail on the Round Robin Test is included in section 2.5.

In the sectoral case evaluations a more in-depth assessment was made for selected information from installations from twelve different EU ETS sectors. The following sectors were covered: combustion

Note 1 » [1] Covering both large and small combustion plants
Note 2 » [2] e.g. EAF steel, secondary aluminium

activities[3], cement, lime, integrated iron and steel, oil refinery, primary aluminium, secondary metals[4], glass, ceramics, nitric acid and aviation.

Information collected in these parallel evaluations was brought together in the compliance cycle assessment tool developed by the project team that provides a final "score" for each of the countries and therewith a ranking of countries that identifies the "need to improve" status of each country in relative terms. The results of the evaluation were included in MS-specific action plans in which key omissions or further potential improvements are listed and, where appropriate, follow-up actions are proposed. Where relevant, best practice examples were identified to assist MS in further improvement of their EU ETS compliance.

Figure 1 illustrates the approach and subtasks, including the relationship between the subtasks. It shows that the assessment was conducted in two phases. Results of phase 1 for the three parallel streams were brought together in the compliance assessment tool, after which a plan was developed on the need to collect additional information to cross-check and validate findings, and on the need for further in-depth analysis. These further assessments were conducted in phase 2, after which final results were developed and action plans were formulated and communicated. More information on the three parallel streams is included in the sections 2.2 to 2.5. More information on the methodology for the final ranking and the action plans is included in section 2.6.

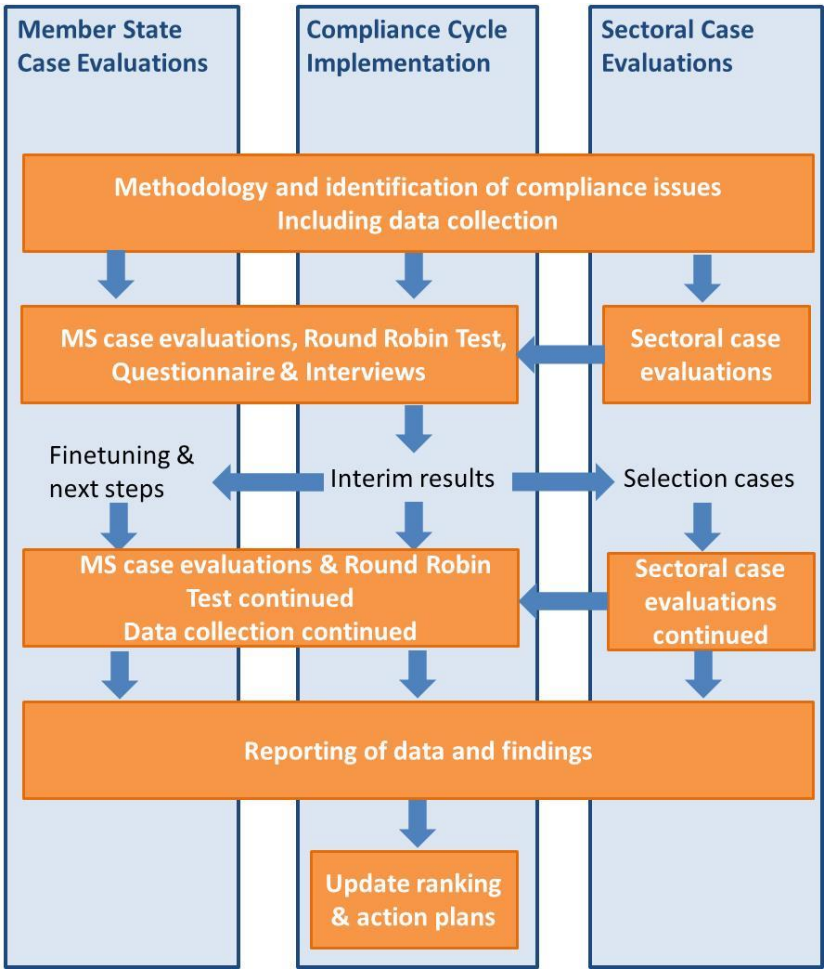


Figure 1 » Project approach, three parallel evaluation streams and subtasks

Note 3 » [3] Covering both large and small combustion plants
Note 4 » [4] e.g. EAF steel, secondary aluminium

2.2 Data sources for the evaluation

As mentioned above, several data sources were used for the evaluation. These data sources include:

- The results of the 4th Compliance Cycle Evaluation carried out in 2014;
- Information collected in the 2015/2016 compliance cycle assessment project: analysis of MS implementation in the compliance monitoring tool, the action plans, notes of the bilateral meeting, MS responses to the bilateral letters and survey;
- The results of the peer reviews carried out in 2016;
- Discussions and conclusions of Compliance Forum training events held in recent years;
- Discussions in the Compliance Forum Task Force meetings
- Information shared in recent Compliance Conferences;
- Information from Article 21 reports submitted in 2017, 2018 and 2019;
- The results from the projects to update the MRR and AVR ("the Regrev projects") where MS suggestions or discussions showed that there were best practices or implementation practices that could be improved;
- MP, AER, VR and IR (if relevant) of selected installations or from aircraft operators (one in each MS)
- Notification reports, NAB work programmes, management reports and information exchange reports;
- MS specific questionnaires and MS-specific interviews to address remaining questions on compliance matters.

2.3 The central compliance cycle evaluation

The central compliance cycle evaluation was conducted through a list of appraisal questions to be answered by MS, covering the whole MRVA compliance cycle. The appraisal questions are a set of detailed questions on implementation of specific MRVA aspects by the individual MS and the extent to which each MS is compliant with the regulatory framework. The questions and the scoring methodology were defined in such a way that quantifiable results were produced. The appraisal questions are a mix of quantitative questions (such as the number of CAs, the number of installations or AOs per verifier and the share of rejected AERs) and qualitative questions (such as the coordination and training of CA staff, the way inspection is carried out and the use and strictness of checks on MPs or AERs). The appraisal questions are aggregated into the main elements of the compliance cycle, also identified as appraisal areas. The list of appraisal questions and their aggregation into appraisal areas is shown in Table 1.

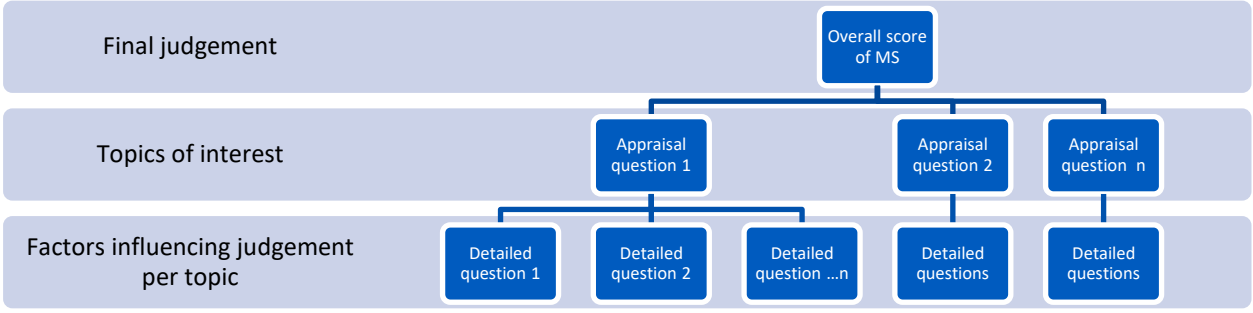
Table 1: Appraisal questions and appraisal areas

Appraisal Area	Appraisal questions aggregated	Area weight factor
A: CA situation overall		**2**
	I. Complexity of the CAs – number of CA/coordination, number of staff and internal organisation	
	III. Staff competence – trainings, workshops, internal guidance	
	IV. Use of IT systems/electronic reporting	
B: M&R Robustness		**5**
	VI. Quality of the permitting process and MP approval by the CA	
	VII. Quality of the MP and monitoring	
	VIII. Quality of AER reporting	
	IX. Quality of checking of AER + VR and follow-up on IR	
C: V&A implementation		**3**
	II. Complexity of accreditation system	
	X. Quality of the verification and verification reports	
	XI. Quality of the accreditation and monitoring of verifiers	
	XII. Quality of information exchange between the CA and NAB	
D: Inspection & Enforcement		**2**
	XIII. Quality of inspections	
	XIV. Quality of enforcement	
E: Round robin test performance		**1**

The results of the MS case evaluations and 'Round Robin Test' were initially considered to be included in the different MRVA compliance elements mentioned in the table above: e.g. the results of the 'Round Robin Test' on the review of the MP was included under VI and the results of the MS case evaluation of the MP was incorporated under element VII. However, after analysis of the results and for giving a more balanced result the Round robin test was then considered a factor on its own.

In the evaluation a score was provided for each question. In a next step the calculation sheet allowed to assign a weight to each appraisal question. However, due to the large number of input factors it was found that such weighting did hardly result in any change of the ranking. Therefore all weighting factors were set to 1. However, each of the appraisal areas was assigned a weight reflecting semi-quantitatively the number of input factors. The factors are shown in Table 1. In the final round the scores for each of these areas were weighted and again aggregated to result in one overall score per MS. The MS were then ranked according to their weighted performance. The approach for developing the appraisal questions and making a final judgement on the overall score is reflected in the figure on the following page.

Figure 2 » Illustration of the compliance assessment methodology used in the project



2.4 The MS case evaluations and the sector-case evaluations

In the MS-specific case evaluation one installation or aircraft operator was selected in each MS. The project team followed that installation or aircraft operator through an entire EU ETS compliance cycle by assessing the corresponding MP, AER, VR and where relevant the IR. Four checklists were developed, one for each document to evaluate them on completeness, consistency and compliance with Annex I and X of the MRR, as well as Article 27 AVR. Further compliance checks were carried out to some extent: e.g. compliance with tier requirements, Article 65 MRR. A compliance check of each and every detail of the documents was not feasible because the project team did not have full access to supporting documentation and the specifics of individual installations or aircraft operators. Where further information was necessary to understand the evaluation, MS were contacted and requested to provide additional details. In some cases, questions were raised in interviews with MS. The scores in the checklists were weighted and aggregated to result in a final score per checklist and per country. These scores were treated like one appraisal question each, mostly in the M&R and A&V areas (areas B and C according to Table 1). Also the results of the 'Round Robin Test' (see next section) were carried over into the Compliance Assessment Tool to address the appraisal questions defined for step 1. Where MS did not participate in the Round Robin test, the MS received the worst possible rating in area E (but with low weight for the overall result).

For each MS notification reports, a NAB work programme and management report as well as a CA information exchange report were analysed. Where a MS only uses foreign verifiers, a work programme or management report from a NAB that accredited foreign verifiers were requested. The information exchange reports were checked for completeness, consistency and compliance with the AVR. The results of the evaluation were inserted into the Compliance Assessment Tool.

In addition, information from different sources was used to carry out sector specific assessments. Questionnaires were sent out to MS to collect information on what type of sector specific issues were encountered in their country and how these were addressed. The analysis of that information was complemented with sector specific issues the project team had identified in the assessment of the MP, AER, VR and IR for each country. This allowed the team to make conclusions on the occurrence of inconsistencies or non-compliance issues across sectors and countries and on issues that were specifically related to an individual sector.

Bringing all the information together led to an interim result based on which the team identified actions needed to complete the evaluation "Step 2" of the evaluation process. Step 2 included more in-depth assessment of specific compliance issues (at MS level or at sector level), collection of best-practice information and identification of options for simplification. The step 2 analysis focused in particular on identification of gaps in the CA activities or expertise, on compliance with Article 21 of the EU ETS Directive, on inconsistency between documents, and on inconsistency of conclusions derived from different information sources. Where needed the project team held interviews with CAs to address further questions to obtain a more complete or a more consistent picture. In step 2 of the sectoral evaluations the team's sector specialists conducted a more in-depth review of all information gathered for each sector, including the reports gathered from relevant installations and other sector-specific information obtained from EU and MS discussions in, for example, TWG meetings and TF meetings as well as from expert reviews conducted by the team in earlier projects.

2.5 Round Robin Test

The 'Round Robin Test' is a Measurement Systems Analysis technique that is often used as an inter-laboratory test. In this project the test was based on an imaginary installation for which the Competent Authorities (CAs) were requested to review the corresponding MP and reports. Since the information provided to all CAs was the same, this test revealed their comparable performance and in that way ensured that the assessment was as fair, balanced and unbiased as possible. However, as further detailed in part 3.2, some CAs used the 'Round Robin Test' to train new team members while others assigned more experienced team members to ensure good results. Because of this, the test was not always fully representative of the competence of the entire team. This has been taken into account in the scoring of the 'Round Robin Test' in the overall evaluation.

The 'Round Robin Test' was carried out as part of the MS case evaluations during May to November 2018. The project team designed an imaginary installation and developed an MP, an AER including the VR and an IR for this installation. CAs were invited to conduct a review for this installation based on their own normal reviewing procedures, just as if this installation were located in their MS. The project team acted as the operator of the installation and sent out the documents in steps to the CA, following a predefined schedule. CA teams could submit to the operator requests for further information or for clarification, which were addressed by the project team. The documentation sent to the CA teams included various mistakes, omissions and incomplete information which the CA teams were requested to identify and send a final result of their reviews to the project team. After each round the intended result – the version of the MP, AER, VR and IR that the team had developed to meet all compliance requirements – was shared with the CA teams prior to the start of the next round. Results of the 'Round Robin Test' are described in section 3.2.

After completion of the 'Round Robin Test' a training event was organised on 14 and 15 November 2018, immediately following the Compliance Conference. The training was organised to share the results of the test and to discuss and explain the answers to the different elements of the test. The wider aim of the test and the corresponding training was to provide technical support to participants in performing their day-to-day tasks when checking (and approving) MPs, AERs, VRs and IRs, and therewith to help the efficiency and effectiveness of their work. This was done by providing "model answers" to the various questions which take into account feedback received from Member States during the 'Round Robin Test', and by providing

an opportunity to discuss with peers. The training material developed for and used at the event was turned into training handbooks to facilitate further cascade of the training.

2.6 Evaluation ranking and formulation of action plans

The results of all assessments were incorporated into the compliance assessment tool to provide a final score for each of the countries and therewith a ranking of countries that identified the "need to improve" for each country in relative terms. Based on the ranking and the significance of improvement needs follow-up activities were organised, consisting of in-person meetings, conference calls or short email communications.

Results of these final activities were taken together with the final evaluations to formulate an "Action Plan" for each country. This action plan described the assessments conducted, identified recommendations for improvement and, where appropriate, outlined best practice examples or recommended follow-up actions. The action plans were sent to the CAs along with the suggestion to implement the specific recommendations.

3 » Results of evaluation

3.1 Overall ranking and summary of results

Table 2 shows the final ranking of MS and illustrates the main areas for improvement in the different compliance steps. Each MS was informed of their position on a quartile basis to give them an indication of the level of compliance and improvement needed. Information on exact ranking is not provided to avoid discussions on ranking positions and to ensure that the main message on where improvement is needed is clearly transmitted. Table 2 presents the ranking table.

Table 2: Ranking of the countries' relative performance as identified in the CCEV5 (anonymised version)

Quartile	Rank	CA situation overall	M&R Robustness	V&A implementation	Inspection & Enforcement	Round Robin Test Result	Total Score
1	**1**	1,1	1,5	1,5	1,6	1,3	1,46
1	**2**	1,9	1,4	1,8	1,6	2,0	1,65
1	**3**	1,3	1,7	1,8	1,8	1,8	1,67
1	**4**	1,5	2,1	2,2	2,4	2,0	2,06
1	**5**	2,1	2,4	1,8	2,5	1,8	2,17
1	**6**	2,5	1,9	2,3	2,2	2,6	2,20
1	**7**	2,0	2,2	1,7	3,7	1,5	2,24
2	**8**	1,8	2,0	2,3	3,6	1,8	2,27
2	**9**	3,0	2,5	1,8	2,0	2,0	2,30
2	**10**	2,6	1,9	2,2	3,8	3,3	2,46
2	**11**	2,6	2,7	2,0	2,8	2,5	2,51
2	**12**	2,9	2,4	1,8	2,6	4,0	2,51
2	**13**	2,1	2,4	1,9	3,0	5,0	2,53
2	**14**	2,5	2,4	2,5	2,9	2,8	2,56
2	**15**	2,4	2,4	2,5	2,8	4,0	2,59
3	**16**	3,1	2,1	2,2	3,5	3,8	2,62
3	**17**	2,1	2,6	2,6	3,1	3,0	2,64
3	**18**	2,6	2,1	2,6	4,0	4,3	2,74
3	**19**	2,8	2,4	2,9	2,8	5,0	2,82
3	**20**	3,0	2,6	2,9	2,8	5,0	2,94
3	**21**	3,1	2,7	2,6	3,4	4,0	2,97
3	**22**	2,5	2,8	3,0	2,8	5,0	2,97
3	**23**	3,3	2,8	2,6	3,0	4,3	2,98
4	**24**	3,3	3,1	2,3	3,8	2,8	3,02
4	**25**	3,1	2,8	2,2	4,2	4,3	3,03
4	**26**	2,9	3,0	2,0	3,8	4,8	3,04
4	**27**	2,9	3,1	2,9	2,8	4,8	3,11
4	**28**	2,9	3,2	2,8	3,0	5,0	3,18
4	**29**	2,3	3,6	2,8	2,9	5,0	3,23
4	**30**	2,1	3,4	3,3	3,5	5,0	3,32
4	**31**	3,3	3,3	2,9	4,4	4,5	3,47

The table shows that the main area for improvement is identified as inspection. Although inspection is not required by the Directive, it is good practice to set-up some type of inspection to monitor the quality of required MRVA implementation. On CA organisation and monitoring and reporting processes there is mostly room for improvement on very specific areas which are indicated in section 4. Verification and accreditation seem to be functioning well. However an analysis of VRs across countries in 2018 showed that the quality of verification reporting can be improved. This explains the slightly lower score on verification and accreditation compared to 2016 in which VRs were not analysed. Further specific issues were identified in verifier's time allocation, application of the principle of materiality and verifier capacity (see section 4.7).

In principle the quality of the MRVA implementation has improved overall. Procedures have been strengthened and areas for improvement that were identified in 2016 were generally taken up. The improvements made by countries varied though: some countries improved their procedures and implemented recommendations of 2016 action plans in more areas than others (e.g. by centralising responsibilities, implementing IT systems and making their procedures more efficient). This explains why some MS moved up the ranking table whereas other MS moved down. The MS action plans indicate where countries can make specific improvements.

3.2 Results Round Robin Test

The 'Round Robin Test' was completed by 26 CAs, who undertook both round 1 on the monitoring plan and round 2 on the AER and further reports. In total 6 CA teams decided not to join the 'Round Robin Test'. Participation in most cases was very active: sending back many questions and showing a high appreciation of the learning values of the test. Some CAs deliberately used the 'Round Robin Test' to train new team members while others assigned more experienced team members to ensure good results. In this way the test was not always fully representative of the competence of the entire team, this has been taken into account in the use of the scoring of the 'Round Robin Test' in the overall evaluation.

A ranking table showing the relative performance of each of the CA teams participating in the 'Round Robin Test' is included in Table 3 below. The table shows that in most cases the teams that scored consistently well performed well in all categories. The table also illustrates the high differences between the CA teams, with quite a number of CA teams that missed a significant number of the mistakes, omissions and information gaps in the MP and reports reviewed. The subsequent training paid special attention to those areas where most weaknesses were identified.

For most countries, an overall higher (lower) score in the 'Round Robin Test' correlates with an overall higher (lower) score on the MS case evaluations. A clear exception to this correlation was identified for three countries. A likely explanation may be the fact that other experts participated in the 'Round Robin Test' than the ones regularly doing the review of reports.

Table 3: Ranking of the countries' relative performances in the Round Robin test (anonymised version)

	MP	AER/VR	IR/MP	Total
1	1.00	0.82	0.88	0.91
2	0.92	0.79	0.65	0.82
3	0.78	0.81	0.67	0.77
4	0.61	0.78	1.00	0.74
5	0.76	0.83	0.49	0.73
6	0.73	0.78	0.56	0.72
7	0.64	0.78	0.74	0.71
8	0.43	1.00	0.70	0.69
9	0.69	0.71	0.58	0.68
10	0.73	0.56	0.67	0.66
11	0.58	0.71	0.33	0.58
12	0.43	0.48	0.88	0.53
13	0.37	0.52	0.86	0.51
14	0.41	0.55		0.46
15	0.47	0.41	0.40	0.44
16	0.30	0.52	0.11	0.35
17	0.37	0.30	0.32	0.33
18	0.30	0.34	0.32	0.32
19	0.31	0.36	0.21	0.31
20	0.30	0.33	0.12	0.28
21	0.17	0.21	0.61	0.26
22	0.26	0.25	0.24	0.25
23	0.19	0.34	0.12	0.23
24	0.15	0.25		0.19
25	0.17	0.26	0.05	0.18
26	0.23	0.08	0.00	0.13

4 » Main conclusions in compliance cycle

As shown in section 3.1, MS have generally improved their MRVA procedures since 2016. MS seem to be increasingly aware of the requirements in the MRR and AVR which has had a positive impact on MS compliance. More MS are using the guidance, templates and tools that have been developed by the European Commission (EC) to facilitate implementation of the requirements. The following sections outline the main conclusions for each step in the compliance chain.

4.1 CA organisation

Both the CA organisation within the MS and the internal organisation within the CA itself was analysed in this project. An assessment was made on the number of CAs responsible for MRVA activities, whether CA organisation is centralised or decentralised and to what extent coordination between different CAs is carried out. How an MS allocated their MRVA responsibilities to their CAs is very much dependent on the legal structures and resources within a country. This is equally true for the internal organisation within a particular CA: the number of staff involved in the assessment of MPs, AERs, VR and IRs, the competence of the staff and the type of coordination between staff.

4.1.1 CA organisation with MS

According to Article 18 of the EU ETS Directive MS shall designate appropriate CA or authorities for the implementation of the Directive, including MRVA activities under the MRR and AVR. The majority of MS have a centralised system for MRVA activities: for 23 MS one CA is responsible for the assessment of MPs, review of AER/VRs, approval of IRs.[5] In Germany, there are local or regional authorities responsible for permitting but one centralised CA for the other MRVA activities, including inspection and enforcement. In Lithuania, Czech Republic and Bulgaria one centralized CA is involved in the main MRVA activities but regional or local authorities or inspectorates are responsible for inspection.

Ten MS have a decentralised system in which several local or regional CAs have been designated to deal with permitting, the assessment of MPs, review of AER/VRs, approval of IRs and inspection and enforcement. The table below shows how many local or regional authorities are involved for those countries.

Table 4: Number of CAs in decentralised CA organisation and MRV responsibilities

Country	Number of local or regional CA	MRV responsibilities
Austria	94 local authorities	Permitting, approval of MPs assessment of notifications of changes to the MP and approval of IR. The review of emission reports is done by the central authority
Belgium	3 regional authorities	Approval of MP, notification of changes to the MP, review of AER/VR and approval of IR are carried out by central authority. In one region the central authority also performs inspection to assess compliance with the MP. Permitting is carried out by several IED authorities.
Finland	1 local authority	Very small authority to address MRV activities in Aland. The rest is carried out by the central authority

Note 5 » [5] For 17 of those MS allocation and policy making or auctioning are allocated to a different authority.

Country	Number of local or regional CA	MRV responsibilities
France	13 regional counties which constitutes of 101 departments	All MRV activities
Latvia	8 regional authorities	All MRV activities
Poland	400 local authorities	Permitting, approval of monitoring plans, assessment of notifications of changes to the monitoring plan and approval of improvement reports. The review of emission reports is done by the central authority
Portugal	2 local authorities	Very small local authorities to address MRV activities in Madeira and Azores. The rest is carried out by the central authority
Slovakia	50 regional authorities	All MRV activities
Spain	19 regional authorities	All MRV activities
UK	5 regional authorities	All MRV activities

In Austria, Spain, Finland, France, Greece, Latvia, Poland, Portugal and the Slovakia the CAs that are responsible for the installation's MRV activities are different to the CAs for aviation. There are often administrative or political reasons behind this. The administration of activities related to air transport is in some cases assigned to a particular Ministry of Transport or air traffic organisation which caused MS to assign the MRV activities to that organisation also.

Where multiple CAs are involved, it is essential to set-up proper information exchange channels and coordination between those authorities. Coordination between authorities is required by Article 10 of the MRR. In one country where permitting is carried out by local authorities but MRVA activities are allocated to a central authority, there has usually been some ad hoc or informal contact between authorities. This was mostly focused on ensuring that the boundaries of the permit are in line with the Directive and the MRR. In another country contact between the central authority and the permitting authorities was more structured: the central authority provided input before the IED[6] authorities issued the permit, ensuring that the boundaries of the permit are in line with the EU ETS Directive. In countries where ETS permits and IED permits are separate and managed by different authorities, the IED authorities can provide comments to the EU ETS authority on the MP before final approval. Furthermore, there are national working groups between the central authority and the authorities involved in permitting.

In 7 countries where the central authority is responsible for MRVA activities and inspection is carried out by regional inspectorates or IED authorities, structured information exchange occurred between both authorities in the form of inspection reports. In a further 6 countries there was no structured information exchange, only communication on an ad hoc basis. In some cases, this was due to the fact that the regional or local inspectorates do not focus on EU ETS compliance in their IED inspections.

Coordination is of particular importance if multiple authorities are involved in the assessment of MPs, review of AER/VR and approval of IRs. This ensures that local authorities treat similar installations in an equal manner and promotes harmonisation across regions. The type of coordination differs between countries. In 6 countries the central authority played an important role providing instructions for local or regional

Note 6 » [6] Industrial Emissions Directive

authorities on how to assess certain aspects in the MPs, AER/VR and IR; though the implementation thereof differed between those countries. In 1 country the central authority evaluates each MP and IR in parallel to the regional authorities and provides instructions to these authorities. This advice is in general followed-up. In the other countries general guidelines and instructions were issued by the central authority. The effect of these instructions or guidelines differs as well since they do not have mandatory effect in all countries. In nearly all countries that have multiple local or regional authorities structural working groups and meetings were organised. This was not the case for 2 countries which held such meetings on an ad hoc basis and relied on other coordination measures. Structured and common training for local or regional authorities were organised by 3 countries, though the type and frequency of training differed between countries.

Table 5 *Examples of good practices on coordination*

Country	Examples of good practices on coordination
Austria	A structured helpdesk organised by the central authority.
France	Templates have been developed to ensure that local authorities provide the necessary information for the information exchange report for NABs or the Article 21 report.
Poland	Central authority assesses each MP and improvement report and sends advice to the local authorities. Local authorities are required by law to send information to the central authority
Spain	Working group where local authorities, NABs and central authority discuss specific MRV issues.
UK	Guidelines, training programmes, IT, coordination group where verifiers, CA and NAB discuss specific MRV issues, structured helpdesk

How the CA is organised has an impact on procedural aspects of MRVA activities and their implementation. Where MS used IED authorities for inspection, IED inspection programmes and approaches were applied when carrying out EU ETS inspection (see section 4.10.1). The involvement of multiple local CAs and the extent to which central authorities are involved in the coordination can influence the tools that are developed to manage MRVA processes: e.g. how to record issues, access to IT systems. It can also affect the procedures for MP approval and review of AER/VR itself: e.g. how central authorities are involved in the different processes, what and how information is shared between local authorities and the central authority. In 4 countries specific provisions have been included in national legislation to ensure that local authorities submit the necessary information to the central authority that uses that information to monitor the local authority's performance or that is responsible for part of the MRVA activities. However, this was not always a guarantee that the central authority received all necessary information. In at least 1 MS problems were encountered in submission of documents in some cases. In other MS not all information was shared because the central authority does not monitor the regional authority's performance and other methods of coordination were used, such as IT systems or coordination working groups.

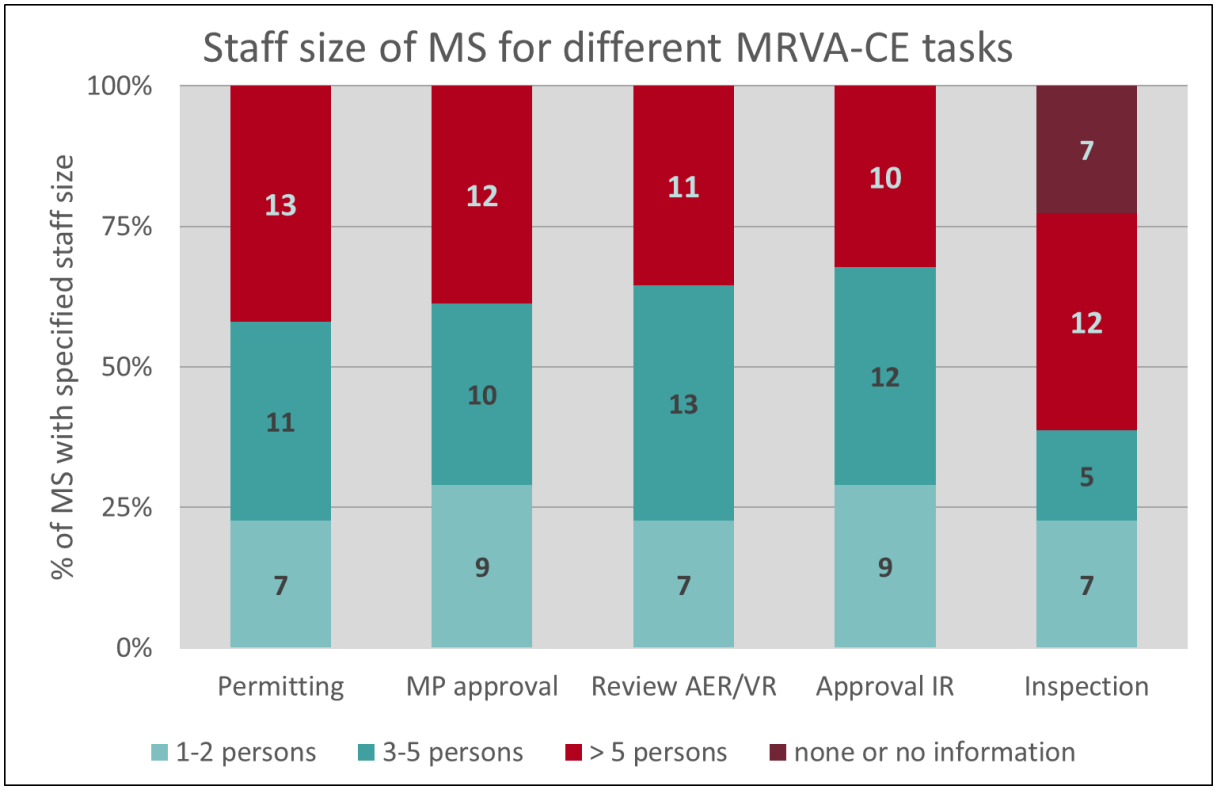
In 2015 a higher number of issues were identified in countries where multiple CAs were involved, in particular concerning submission of documentation to local authorities, information exchange between the different CAs and equal treatment of installations. Since 2015 the quality of coordination has improved, having a positive impact on MS compliance. Less problems were encountered in the submission of information and MS compliance on specific MR issues.

For those MS that have a decentralised CA organisation it is recommended to improve information exchange with the central CA, where possible, by increased use of IT systems or formal information exchange channels and regular working groups.

4.1.2 Internal CA organisation

How MRVA responsibilities are designated to the CA or authorities can have an impact on the internal organisation of the CA: the number of staff involved, the type of staff members involved and how these staff members carry out MRVA activities. Information from a survey that was carried out during this project[7] shows that there are differences in the size of staff responsible for MRVA activities, highly influenced by the resources available in a country. Figure 3 illustrates the variation in staff size among MS for five steps in the compliance cycle. It for example illustrates that 7 out of 31 MS (23%) have 1 to 2 persons for permitting, while 11 MS (35%) have 3-5 persons and 13 MS (42%) have more than 5 persons working on permitting. For inspection data was not available for 7 MS, which can be explained by the fact that inspection is often conducted by other departments than the ones responding to this survey.

Figure 3 » *Staff size in the Member states available for the different MRVA-CE tasks.*



In all but 3 countries the same persons are responsible for the review of AER/VR as for assessment of the MP and notifications about the MP. For permitting and inspection the responsible persons can differ from the persons that carry out MP approval, review of AER/VR and approval of IR. This is also true for aviation. In some countries different staff are involved in the assessment of MPs, review of AER/VR and approval of IR for aviation.

Note 7 » [7] Survey that was sent out to MS in July 2018.

When set against the number of installations and aircraft operators in a country, 11 countries seem to have capacity and contingency problems. These countries are aware of their capacity problems but they have either limited resources to change the situation or have noted to address this in the near future. In 4 countries specific measures have been taken to mitigate these problems. Such measures include the use of IT systems and use of Article 13 MRR for simple installations to facilitate the approval process. In any case for countries with a limited number of staff it is recommended they pay extra attention to contingency, for example by active recording of work processes and active use of templates and tools for both work organisation and recording of results.

In the 9 countries that have multiple local or regional CAs responsible for MP assessment, AER/VR review and approval of IR, installations have been divided over several regions. The number of staff responsible for the activities of those installations can vary per region which can affect the type and extent of coordination activities.

Some MS have a larger team for specific steps in the compliance chain while they have smaller teams in other steps. The differences in size of staff in different steps in the compliance chain can be explained by the fact that in some cases certain activities are allocated to a different authority or authorities whereas in other cases this is caused by the fact that a particular activity is not carried out extensively in the MS (e.g. inspection).

The size of the staff has a direct impact on how coordination between staff members takes place. The higher the number of staff members and the number of installations, the more coordination is likely to be necessary. Typical coordination measures taken by countries include:

- Peer review of MPs, AER/VR and IR by another team member: 11 countries adopted such approaches
- Using checklists: Some MS use the EC checklist for these purposes whereas others have developed their own checklists. Some of these national specific checklist are detailed tools that help CA go through the MP;
- Training CA personnel together in specialised training programmes;
- Spreadsheets or other tools that record technical discussions and decisions on MP and AER. This helps CA staff to make consistent decisions in future;
- Automated checks on MP in IT systems;
- Multiple staff members reviewing MRV issues in the MP and discussing them in meetings;
- Detailed guidance and instructions on how to assess particular issues in the MP.

These measures ensure that installations or aircraft operators are treated in an equal manner.

As with any stakeholder in the EU ETS CA staff needs to be competent to carry out their responsibilities. Different approaches have been taken by MS to ensure continued competence of their staff. The vast majority of MS train new staff on the job. However, 7 MS have specific programmes to train staff members. Information shows that smaller countries with limited resources are not able to develop specific training programmes. Furthermore in 7 countries there have been multiple changes in staff which caused complications with staff's competence at the start when bringing new staff up to speed. Training programmes developed either internally or by the Commission that can be cascaded internally through the CA organisation could provide support (see section 6.2).

How the CA internal organisation has been set-up influences procedures for assessment of MPs. Limited resources can affect how MRV procedures are set-up, forcing MS to adopt risk-based approaches to reviewing AER/VR or for carrying out inspection. In 6 MS inspection is not carried out and in 8 MS it is outsourced to different authorities because the central authority responsible for assessment of MPs, AER and VR does not have sufficient staff to do on-site inspections. In 10 countries limited resources caused the MS to have IED authorities add certain ETS elements to their normal environmental inspections. Furthermore, it was observed that the quality of work processes can be lower if performed with limited resources. Information showed that 5 MS CA with limited staff cannot manage the number of installations effectively and can therefore perform only basic checks on AER/VRs. The problems can be mitigated if the MS have implemented specific measures to facilitate EU ETS implementation (such as dedicated IT systems for MRV processes, tailored and robust risk-based approaches in the review of AER/VRs)

4.1.3 Tools CA use to facilitate implementation

There are different tools that can facilitate the implementation of MRV requirements. One of these tools is the use of guidance documents that explain how requirements in the MRR and the AVR must be interpreted. Since 2016 more MS are using EC guidance and tools and several MS have translated these documents into their own language. Because of the extensiveness of EC guidance material and tools there is less need for countries to adopt specific national guidance. However, 15 countries have developed additional guidance to explain specific issues or procedures applicable nationally. Most of this guidance concerns either national specific instructions for operators or aircraft operator for completing MPs, use of national IT systems or to deal with specific procedures for notification of changes to the MP. However, a number of countries have developed specific guidance on monitoring and reporting issues. **Table 6** contains examples of such guidance material.

Table 6 : *Examples of national specific guidance or tools*

Country	Examples of national specific guidance or tools
Belgium Flanders	Templates to carry out risk assessment for simplified MPs
Czech Republic	Guidance on uncertainty assessment
Denmark	Guidance on biomass and other specific MRV issues
Germany	• Guidelines on preparation of MP and AER for installations • Guidelines for aircraft operators • Frequently Asked Questions • Sector specific guidance on, for example, ceramics, determination of EF for caustic lime or dolomitic lime • Excel tool for calculation of the uncertainty of storage density • Excel tool for determination of analysis schedules and the template for the sampling plan • Inspection protocol for conveyor belt scales • Guidance on emissions data assessment of continuous emission measurement systems Guidelines 1: Information on sampling of solid secondary fuels in the paper industry: template for the calculation of carbon emissions and biomass fraction and emissions factor for the FMS

Country	Examples of national specific guidance or tools
	• Annex 2 to information on sampling of solid secondary fuels in the paper industry: calculation of the representativity of sampling (DIN 19698-2, Annex D) Guidelines 2: Evaluation methods of carbon emissions reporting and statistical evaluation of the representativity of sampling of secondary fuels in the paper industry
Ireland	Guidance on specific issues such as sustainability of bioliquids, emissions from mobile sources and temporary equipment
Netherlands	• Specific guidance for small installations and sector specific cases • Specific guidance on uncertainty assessment
Norway	Specific electronic templates for MP and AER
Romania	Specific guidance on unreasonable costs based on EC guidance
Spain	• Guidance on unreasonable costs for small installations and application of oxidation factor • Guidance for opt-out installations
Sweden	• How to complete MPs and permit and deal with notification of changes to MP • Guidance for installations combusting mixed waste fuels
UK	• General guidance on how to comply with EU ETS for installations and aviation • Specific guidance on use of bioliquids, uncertainty assessment and use of default values

Since 2016 the number of MS using EC templates or IT systems has increased. 17 countries have set-up IT systems, ranging from sophisticated IT systems covering all MRV processes and stakeholders to basic systems that are only used for reporting. More MS are planning to use IT systems or the EC's DECLARE system. The table below shows the type of systems that exist across the EU.

Table 7 : *Type of IT systems*

Type of IT system	Coverage Compliance Cycle	Access	Number of countries
Internal workflow system	All documents	Within the CA	1
Workflow management system	Permitting together with other environmental permits (including MP)	Regional CA	1
System in which EC templates are uploaded and which contains IT functionalities and some automated checks	MP, AER, VR, IR, data collection for allocation	All parties	2
Workflow management system with macro's	AER (webportal) and VR is uploaded	All parties	1
Webportal online system	AER	All parties	3
Hybrid system	Webportal online system for permits, MP, AER; VR are uploaded by operator	All parties but the verifier	1
Webportal online system	Permits, MP, AER, VR	All parties	1
Webportal online system	Permits, MP, AER, VR but not for aviation and installations using CEMS	All parties	1

Type of IT system	Coverage Compliance Cycle	Access	Number of countries
Webportal using xml or similar reporting schemas	Permits, MP, AER, VR, IR, data collection for allocation	All parties	6
IT systems for some regions within a country (different types)	Different coverage per region	Different types of access	1

The case evaluations showed that for these countries the electronic format specifications contain at least the same information as the EC template. In general, these systems meet the requirements in Annex I and X of the MRR. However, for 4 countries compliance with the MRR Annexes can be improved.

Article 75 of the MRR requires MS to implement technological measures assuring the integrity, confidentiality, authenticity and non-repudiation of the data. They have to make sure non-functional requirements such as access control and availability of data are met. Not all MS that have IT systems are in full compliance with Article 75 MRR but these countries are planning to be so in the near future. These countries have been recommended in their action plans to follow-up on these plans.

Countries that do not have an IT system, generally require the operator or aircraft operator to use EC templates. 6 out of all countries do not use EC template but either prescribe a national specific template or allow operators to select which template they use. In 10 countries both EC templates and national specific templates or specifications are applied. The approaches between installations and aviation can differ. In 6 MS national specific templates or IT systems apply to installations whereas for aviation EC templates are required. Most but not all MS that use MS specific templates meet the requirements as included in the EC's template.

4.1.4 Final conclusions on improvement areas

Because of challenges in coordination and harmonisation various countries such as Germany, Lithuania and Sweden have transformed from a decentralised to a more centralised system. These countries mentioned that as result of the transfer MRV activities run more smoothly and harmonisation across regions has been improved.

In general MS have strengthened their procedures and improved coordination internally within the organisation. More measures have been implemented by MS to make MRV processes more effective and there is an increased use of EC templates and guidance.

Despite these improvements there are still some areas that could be reinforced: the use of training programmes, the need to actively record work processes, the use of templates and tools for both work organisation and recording of results. Dedicated IT systems for MRV tasks can in particular enhance effectiveness of MRV processes. The use of IT systems has increased over the last few years, although there is still a large range of sophistication and functionalities among the various IT systems used across Europe. In addition, a number of MS do not have an IT system. The costs of commercial IT systems may be a barrier to their use. These countries are recommended to explore the option of using (part of) the functionalities of DECLARE, i.e. the EC's IT tool that is available to MS free of charge.

4.2 Permitting and MP approval

4.2.1 Permitting

According to Article 4 of the EU ETS Directive MS shall ensure that installations falling under EU ETS have a permit. Permitting procedures differ a lot between MS: the deadlines and timelines for notification of changes to permits, the competent authorities involved, the content of permits, the procedural steps and length of the procedure concerned. In 5 countries the ETS permit is part of the permit under the industrial emissions directive (IED Directive). In 4 of these countries this had an impact on how inspection was organised: IED authorities are involved in the inspection of installations under the EU ETS Directive.

In other countries the ETS permit is separate from the IED permit; though there can be some coordination or involvement of IED authorities. For example, IED authorities are sometimes contacted when questions arise on the boundaries of the installation or they can be responsible for inspection for environmental legislation as a whole, including compliance with EU ETS requirements. As mentioned before, permitting procedures are generally national specific and highly dependent on existing legal frameworks. Some countries have lengthy processes with official opportunities for interested parties to make objections in the permitting procedure whereas other countries have more condensed procedures. These differences affected how MS organize their MP and permitting processes and procedures for the notification of changes to the MP. In a number of countries, a change to the MP does not necessarily lead to an update of the permit. In particular this is the case in countries where it takes more time to update a permit and so it is best to separate the procedures for updating permits and changing the MP as updates of the MP need to be realized more quickly. In these countries a permit usually has to be updated when there is a significant increase or decrease of capacity within an installation.

Although the content of the permit and permit conditions is generally national specific there are some common elements across Europe. In principle, the permit includes permit conditions, information on installation boundaries and capacity. In most cases the MP is an integral part of the permit.

4.2.2 MP approval

According to Article 12 of the MRR each operator or aircraft operator shall submit a MP to the CA for approval. The MP shall consist of a detailed, complete and transparent documentation of the monitoring methodology and shall at least contain the elements in Annex I of the MRR. Since 2014 MP approval procedures within the MS have improved, leading to more complete documentation, increased use of EC guidance and tools and an overall higher compliance rate.

All MS check the MP on completeness, internal consistency and compliance with the MRR. Procedures have been strengthened over time ensuring that the most important elements of the MP are assessed: e.g. compliance with required tiers, compliance with thresholds for source streams, correct category of installation, appropriate use of default factors, and application of correct analysis frequency. However, the 'Round Robin Test' results show that some areas of the MP do not receive the same attention in all MS.

15 out of the 26 MS participating in the Round Robin test missed all issues in the sampling plan. 9 MS failed to check equivalence of non-accredited labs. 18 MS missed non-compliance with Article 29 of the MRR concerning measurement equipment while respectively 10 MS and 12 MS struggled with uncertainty

assessment and procedures. All but 2 MS missed issues in the risk assessment. This shows that some areas remain difficult topics for CAs in the assessment of MPs. Information from other sources[8] also show that not all MS check uncertainty assessments, sampling plans, description of procedures, risk assessment and control activities in sufficient detail. Furthermore, MS reported having difficulties with specific MRV issues such as sustainability of biomass or sector specific issues (see section 5 »).

Internal procedures generally include measures to ensure similar installations are treated equally across sectors, though these measures differ between MS. 12 MS use the checklist developed by the EC whereas 16 MS use their own tailored checklist and 4 MS do not use any checklist. Other measures taken include peer review of all MPs by a team member, adopted by 11 MS, internal meetings to discuss specific MRV issues, excel sheets or IT systems to record internal decisions. The type of tools used by MS are tailored to the CA organisation. The more staff involved the more coordination is needed between staff members. Regardless of the type of CA organisation it is essential in a MP approval process to have a documented trail of all internal technical decisions or discussions made during the MP approval process. This allows CA staff to trace back to how they dealt with particular MRV issues. Not all MS seem to have taken such measures. 7 MS have been recommended to strengthen their procedures to ensure such a technical trail is properly documented.

During the MP approval there can be occasions where it is necessary to communicate with operators or aircraft operators. 9 MS have a more formalised communication process only informing operators or aircraft operators with the final decision on the MP or communicating sparsely through official letters. Other MS have more regular contact with the operator during the MP approval process commenting on various drafts of the MP before a final MP is approved. In only 5 MS can the CA perform on-site checks during the MP approval process. Other MS refrain from carrying out site visits during the MP approval process because they either rely on verifiers to carry out site visits during verification or compliance with the MP is checked during inspection.

Although all countries carry out completeness, internal consistency and compliance checks with the MRR, the level of detail of these checks can differ between MS. In particular this is the case for the following areas:

- Evidence of technical competence of non-accredited labs. In some MS only basic checks are carried out leaving it mostly to the verifier to check these elements;
- Description of procedures: this area is often not looked at in detail;
- Diagrams and description of installation activities;
- Evidence of unreasonable costs: most MS check such evidence using the EC tool for determination of unreasonable costs. However different rules may exist on the type of evidence to be submitted by operators. Good practices can be found in 12 MS, including the use of industry experts or another CA in the evaluation of costs, the application of reference documents with measuring device prices, calibration costs, sampling and analysis costs, the use of market analysis to check the costs.

Together with the MP the operator must submit supporting documentation: i.e. evidence of compliance with uncertainty thresholds and operator's risk assessment. Submission of these documents to the CA has improved over the years. MS reported few problems, though in 4 countries where multiple CA are involved in the assessment of MPs, the central authority did not always receive the supporting documentation.

Note 8 » [8] MS responses to surveys from 2015 and 2018 and MS case evaluations of the monitoring plans

Analysis of the information collected showed that not all MS check supporting documentation in sufficient detail:

- 14 MS conduct only basic checks or do not perform any checks on the appropriateness of the operator's risk assessment. In these cases, the CA leaves it to the verifier to check the inherent and control risks.
- The submission of operator's sampling plans has improved over the years. In general checks are carried out on sampling plans to assess compliance with Article 33 MRR. However not every element of the sampling plans is always checked. CAs tend to focus on completeness of sampling plans but compliance checks with sampling standards and representativeness of sampling is in some cases left to verifiers.
- Implementation of procedures is only checked in a limited number of MS during inspection.
- Although there seems to be an increased use of EC guidance and the training event on uncertainty assessment in 2017 has helped in clarifying issues, there are still differences in how MS check uncertainty assessments. In 5 MS basic checks are carried out and it is left to the verifier to check the details of such an assessment. In other MS detailed checks are performed often involving experts from metrological institutes.

4.2.3 Simplified procedures

The MRR allows more flexible approaches for simple installations or installations with low emissions. For example installations with low emissions are exempted from submitting a risk assessment or an uncertainty assessment to demonstrate compliance with the required tiers. However, this exemption does not exclude these installations from carrying out these assessments. This is still relevant for verification and for demonstrating compliance with the rules. Since 2015 more MS have become aware of these requirements.

A further opportunity for MS to apply simplified procedures is provided in Article 13 of the MRR. This Article allows MS to specify that operators can use simplified monitoring plans for simple or small installations. Article 21 information shows that 8 MS are using simplified MP according to Article 13 MRR. **Table 8** provides more information.

Table 8 : *Use of MRR Article 13*

Country	Use of Article 13	Risk assessment
Netherlands	Where the installation uses natural gas (including an additional de-minimis source stream). Template consists of tick boxes	Risk assessment by the CA
BE (BE-Flanders)	The checklist determines whether the operator can make use of a simplified monitoring plan	Risk assessment by the operator based on checklist[9]
Croatia	Installations with low emissions	Risk assessment by the operator
France	The DREAL (regional CA) determines whether an installation can use a simplified MP	Risk assessment by the operator
Denmark	Installation using natural gas and if applicable one additional de-minimis source stream	Risk assessment by the operator

Note 9 » [9] The checklist is published on the website of the Flemish ministry of environment: https://omgeving.vlaanderen.be/eu-ets-vaste-installaties-monitoring

Country	Use of Article 13	Risk assessment
Hungary	Installations with low emissions	Risk assessment by the CA
Liechtenstein	Applicable to the two installations falling under EU ETS Directive	Risk assessment by the CA
Lithuania	Installations with low emissions	Risk assessment by the CA

The EC guidance developed in 2018 slightly increased the use of simplified MP. There could be more opportunities to implement such procedures in the fourth trading period.

4.3 Notification of changes in the MP

According to Article 15 of the MRR the operator or aircraft operator shall notify the CA of any changes to the MP without undue delay. However, the CA may allow notification of insignificant changes to the MP by 31 December of each year. Significant changes to the MP as listed in Article 15(3) and 15(4) require CA approval. The list of significant changes in the MRR is not exhaustive: some countries have specified in their national legislation or guidance what other changes could also be significant, the majority assess changes on a case by case basis. The term "without undue delay" has been interpreted differently by MS. Most MS maintained the same procedures as established and analysed in 2014.[10] Some MS require the notification of significant changes before these are implemented, in other MS operators or aircraft operators have to notify these changes after they occur within a prescribed timeframe or as soon as possible. Whenever timeframes are prescribed in national legislation, these vary significantly.

Most MS allow operators to notify insignificant changes to the MP by 31 December of each year. Nevertheless as was described in the 2014 Compliance Review report this is not always the case. The 4 MS that indicated different deadlines for these notifications have not changed their procedures. One MS is still not meeting the requirements in Article 15(1) MRR and requires notification of insignificant changes to the CA by 31st of January of the year following the year in which the change occurred. They have maintained these procedures to provide operators more time to update the MPs and to process changes.

Information showed that MS improved the way changes to the MP are recorded in their internal databases. This is partly due to the fact that the number of MS using IT systems has increased. 6 MS strengthened their procedures since 2014, in particular on how notifications and corresponding information are stored within the CA. It is expected that these procedures can be improved further if either more MS have implemented IT systems or use DECLARE. Good practices on how to deal with notification of changes to the MP can be identified in the following areas:

Table 9 : *Examples of good practices on notification of changes to MP*

Country	Examples of good practices on notification of changes to MP
DE, DK, FI, HU, IE, NO, UK, PT, SI, SK	IT systems which give status updates, captures all changes
DE and SI	Regular information on changes to MP on CA website
BE Flanders, IE, NL, NO, UK, DK, PT	Templates or guidance for notifications

Note 10 » [10] Compliance Review Report, page 23

4.4 Quality of monitoring and reporting

The increasing use of guidance and tools developed by EC has helped enhance MS awareness of the requirements and subsequently improve the quality of monitoring and reporting. Improvements not only concern the submission and completeness of information for MPs and emission reports, they also relate to the actual monitoring and reporting process.

4.4.1 Quality of monitoring

The quality of monitoring was assessed using information collected in surveys and Article 21 reports. This information shows that in particular monitoring has improved in the following areas:

- Less category B and C installations are not meeting the highest tier for their major source streams because of unreasonable costs or technical infeasibility. The number of category C installations that did not apply the highest tier methodology decreased from 128 to 97 between 2013 and 2018. The number of category B installations also significantly decreased from 666 in 2013 to 424 in 2018;
- Less problems have been encountered with the submission and application of sampling plans;
- Less MS reported the use of non-accredited labs;
- The use of default factors seems to be appropriate in MS. Literature values agreed with the CA is applied most frequently which seems to be in line with the purpose for which these values are used: i.e. for input materials such as natural gas, fuel oil, diesel and liquefied gas. The high number of category A installations using commercial standard fuels explains the high number of default values.[11]
- In 2015-2016 some MS noted that they did not actively monitor whether installations could meet a higher tier for minor source streams without additional effort. MS compliance on this point seems to have been improved.

In addition, MS case evaluations show that the quality of MP is generally good. For 21 MS however information was missing from the MP, ranging from minor omissions such as lack of clear references to major ones such as no justification for not meeting required tiers. Across MS the main issues identified in the analysis of the MP include:

- Unclear description of activities within the installation
- Unclear description of procedures and lack of references to standards or other relevant information;
- Unclear description in justifications for not meeting required tiers;
- Incomplete information concerning procedures and risk assessment;
- Incomplete information in the section on measurement equipment.

The use of drop-down boxes and structures in templates have improved internal consistency of the MP. Weak areas in particular are found in the management section and procedure sections. The development of exemplars or case studies for training events could improve MS performance.

Note 11 » [11] Technical report on the analysis of Article 21 reports, 2019

4.4.2 Quality of Reporting

The amendments that were made to the EC AER template in 2016 and 2017 have improved the way MS use the reporting codes as required by Article 73 of the MRR. Fewer problems were identified by MS in reporting under CRF and other codes. Information from the Union registry and from Article 21 reports shows that for a number of MS verified AERs were not submitted in time. When this occurred, conservative estimation of emissions was carried out or operators were given the chance to submit verified AERs. How CA carry out conservative estimation of emissions according to Article 70 MRR differs per MS. This is not only dependent on the specific case; some MS have special procedures to carry out conservative estimation of emissions.

MS case evaluations show that the quality of AER is relatively good but for 13 MS inconsistencies between MP and AER were reported. These inconsistencies mainly concerned incorrect MP versions, inconsistencies in the applicability of tiers and the number of source streams. Further improvements can be made in the reporting of data gaps. Information was often not clear or incomplete on data gaps. Inconsistencies were also observed between the AER and VR (see section 4.7).

11 MS use their own template or file format specifications. In most cases the templates contained at least the same data as in the EC templates. 2 MS however did not comply with this requirement.

4.5 Review of emission reports and verification reports

It is good practice for the CA to review verified AERs. This allows the CA to monitor the quality of verified AERs and follow-up on issues identified by the verifier. Since 2014 most CAs have strengthened their procedures for reviewing AERs and VRs. More MS are using the EC guidance and checklist while performing checks. Still differences can be found in the level of checks that are carried out on AERs and VRs.

All MS are performing completeness and internal consistency checks on the reports. Detailed checks and cross checks with the MP and other data are not always carried out on all of the reports in every country. 13 MS perform detailed checks on all reports, though the level of detail differs considerably between countries. Most checks that are carried out include:

- Plausibility checks;
- Checks on correctness of tiers, default values, methodologies applied, trends in emission factors;
- Information on source streams and sources;
- Checks on changes to the MP;
- Consistency with the MP;
- Comments in the VR and verification opinion statements.

These checks are not performed in every MS. In 8 MS basic checks only covering plausibility, completeness and consistency checks were carried out because of limited resources. In some MS cross checks are made with other information sources, including allocation data or data from other reporting mechanisms such as green accounting reporting data, EPRTR data.

12 MS perform detailed checks on a select number of reports. Differences can be identified in the share of reports checked and the approaches that are used to select the reports. 11 of those MS use a risk-based approach whereas 1 MS uses a random selection and 2 MS uses a different approach. When a risk-based approach was used to select emission reports to be reviewed, most of those MS used the EC guidance to

fine-tune that approach. Factors of such a risk-based approach include: comments in the VR, evaluation of MP and IR, information from past years, specifics in the monitoring methodology (e.g. application of fall back, CEMS, biomass). Several good practices can be identified within MS.

Table 10: Examples of good practices in the review of AER and VR

Country	Examples of good practices in the review of AER and VR
Germany/ Ireland/ UK	IT is used to perform automated completeness and consistency checks
Netherlands	Risk based approach in selecting the AERs and VRs to be reviewed. The risk-based approach contains a list of different factors (e.g. size of installations, comments of verifiers)
Ireland	Type of checks carried out on the AER/VR. Various presentations have been held in the TF AV on how the Irish CA performs checks on AER/VRs
Belgium, Germany, Norway	Peer review by team member

Compared to 2016, more MS are using risk-based approaches to perform detailed checks on a selected number of installations rather than applying random selection approaches. EC guidance on the review of AER/VRs has helped MS in strengthening their selection procedures.

Although improvements have been made in the review of AER/VR by MS, some elements can be made more robust. The 'Round Robin Test' revealed that on the following areas deliberate errors included in the test were missed by CA staff carrying out the test. Most omissions include data gaps, exceedance of de-minimis thresholds, missed misstatements, no comments on inconsistencies on duration of site visits, missed non-compliances and non-conformities as well as on a recommendation bordering on consultancy and the independent review by a member of the verification team. For the AER, issues that were rarely missed were incorrect use of default factors, inconsistencies in MP versions, and incorrect verification opinion statement.

4.6 Improvement principle and improvement report

According to Article 69 of the MRR each operator or aircraft operator shall regularly check whether the monitoring methodology applied can be improved. The operator is required to submit an IR to the CA for approval in the following cases:

- Every four years for category A installations, every two years for category B installations and every year for category C installations where the highest tier is not applied or the fall back approach is used;
- If the verifier has reported non-conformities or recommendations of improvement in the VR.

Such IRs have to be submitted by 30 June unless the CA has set an alternative date for submission of the report (but no later than 30 September of the same year).

In general submission of IRs has improved over the years. Article 21 reports indicate that the proportion between submitted and required increased during the last four years from 86 to 95 %. All MS perform detailed checks on the IRs, though the level of detail of checks differs between MS. Most MS seem to focus

mainly on issues that affect the update of the MP. Often recommendations of improvement receive less attention.

Furthermore, CA have become more aware of the requirements. In 2015 and 2016 not all MS realised that installations with low emissions have to submit an IR in response to non-conformities or recommendations for improvement made by verifiers even though they are exempt from submitting one if the highest tier is not applied or if a fall back approach is applied. These MS have adapted their procedures for that.

There are still different approaches on how CA monitor operator's opportunities to improve their monitoring methodology. 14 MS do not actively monitor how operators can improve their methodologies. In some cases, this can be explained by the number of installations in the country that are less likely to be able to improve their methodologies. However, CAs are encouraged to pay closer attention to improvement opportunities: for example, by checking new evidence on unreasonable costs or requesting additional information from operators. Good practices can be identified in some Member States.

Table 11: *Examples of good practices concerning improvement procedures*

Country		Examples of good practices concerning improvement procedures
Germany/ Ireland/ UK, Finland, Slovakia,		IT is used to monitor opportunities for improvement, automatic reminders are sent to operators that they have to submit improvement reports
Czech Republic		Excel file that monitors when improvement reports need to be submitted

Not all MS implemented specific procedures to approve IRs but only take IRs into account in the case of a significant change to the MP. 2 MS have not implemented such approval procedures.

MS case evaluations show that the quality of IRs is generally good. In a few cases inconsistencies with the VR were reported. Furthermore, the description of measures taken to address non-conformities and recommendations of improvement could be clearer. In 24 MS EC templates were used whereas in 8 MS specific templates were adopted. In one country the MS specific template did not contain at least the same information as the EC template.

The 'Round Robin Test' results revealed that a number of CAs did not fully pick up on recommendations of improvement. It shows that in some areas review of the IR may need more attention; a number of MS missed the need to submit an updated MP and relevant documents like the sampling plan along with the IR in case of changes to the monitoring methodology reported in the IR. Further areas for improvement include the submission of a written procedure for estimation methods according to Article 65 of the MRR if data gaps were reported in the AER, the provision of evidence that the requirements of Article 22 are met for approving a fall-back approach and the subsequent submission of additional information supporting the IR if it is not available at the time of IR submission.

It is recognised that recent amendments to the MRR that will come into force in January 2021 will facilitate the implementation of improvement procedures and likely increase MS compliance with the requirements.

4.7 Verification

By the 31st of March of each year the operator or aircraft operator has to submit to the CA an AER verified by an accredited verifier. The verifier follows a specific process: it performs a strategic and risk analysis, drafts a verification plan and carries out certain checks in the process analysis (implementation of activities listed in the verification plan). The verifier assesses the material impact of any misstatements, non-conformities or non-compliance issues identified, and determines whether it has sufficient evidence to state with reasonable assurance that the operator's AER is free from material misstatement. At the end of the verification the verifier drafts a VR which includes an opinion statements, activities performed and outstanding issues identified during the verification. An independent review is carried out by a lead auditor that is not involved in the verification process to ensure the verification is carried out correctly. After a successful review the verifier issues the VR to the operator for onwards submission together with the verified AER to the CA. All activities during the verification, the results and findings are included in the verifier's internal verification documentation. Every verifier has to meet the same requirements in the AVR: e.g. requirements on the verification process, competence requirements and procedural requirements. For this project verifiers and NABs themselves were not interviewed. A full analysis of verifier's compliance with the AVR could therefore not be done. Conclusions could only be made on the issues verifiers reported in the VR that were analysed as part of this project and the issues that were identified in the survey responses and Article 21 reports.

4.7.1 Reporting by verifiers

When analysing survey responses and Article 21 reports it can be concluded that verifier's performance on how to classify outstanding issues in VR has improved. Fewer problems were encountered by MS on the reporting of outstanding issues. More MS are aware what type of misclassifications can occur and were paying closer attention to this. MS recognised that the AV training event had helped to increase awareness of misclassification.

However, MS case evaluations showed that reporting in the VR could still be improved. In the analysis the following issues were found:

- Misclassification of non-conformities, non-compliance issues or recommendations of improvement. Some recommendations were actually non-conformities or non-compliance issues. Some non-conformities could also be considered non-compliance issues and should therefore have been reported;
- Some potential non-conformities or non-compliance issues were identified from the analysis of the MP or AER but these were not noted by the verifier in the VR;
- The description of misstatements, non-conformities, non-compliance issues or recommendations of improvement were in some cases high level and did not provide sufficient detail. In a number of cases the description was not clear and did not comply with Article 27(4) AVR. According to that Article the size and nature of the non-conformity and non-compliance issues need to be indicated, including their material impact and the element of the MP or MRR it affects;

- The duration of a verifier's site visit was sometimes lacking from the VR. Where the duration and time for verifier's site visit was included, it was in some cases inconsistent with the complexity of the installation or very late in the verification process almost allowing insufficient time for operators or aircraft operators to correct issues that were potentially identified by the verifier;
- A number of inconsistencies were found between the AER and VR: e.g. inconsistencies in MP versions, inconsistencies in the emission or monitoring methodology details and the AER, verifiers not identifying and reporting a data gap while the MP or AER implies that there was one;
- Internal inconsistencies within the VR: e.g. verifiers reporting non-conformities or non-compliance issues but indicating in the verification opinion statement that everything is in line with the MP or the MRR; verifiers stating in the VR that Article 18 of the AVR is applied but not reporting in the AER or the VR that a data gap has occurred;
- Verifiers reporting in the VR that there have not been any changes to the MP or capacity changes whereas the AER seems to indicate that there were changes;
- The data gap section in Annex I of the VR was not completed correctly. Some of the boxes were not filled in. The verifier for example did not indicate whether the data gap led to material misstatement;
- Verifiers did not complete the applicable materiality level in Annex II of the verification report template;
- Inconsistency between the materiality level in verification report and the information on category of installation in the approved MP. An incorrect materiality level was applied;
- References were made to old standards or references to guidance documents or standards were missing;
- ISAE 3000 and ISAE 3410 were selected but the verifier was not a financial accountant.

The sheer number of issues found in the majority of MS shows that improvements across Europe need to be made on how verifiers report in the VR.

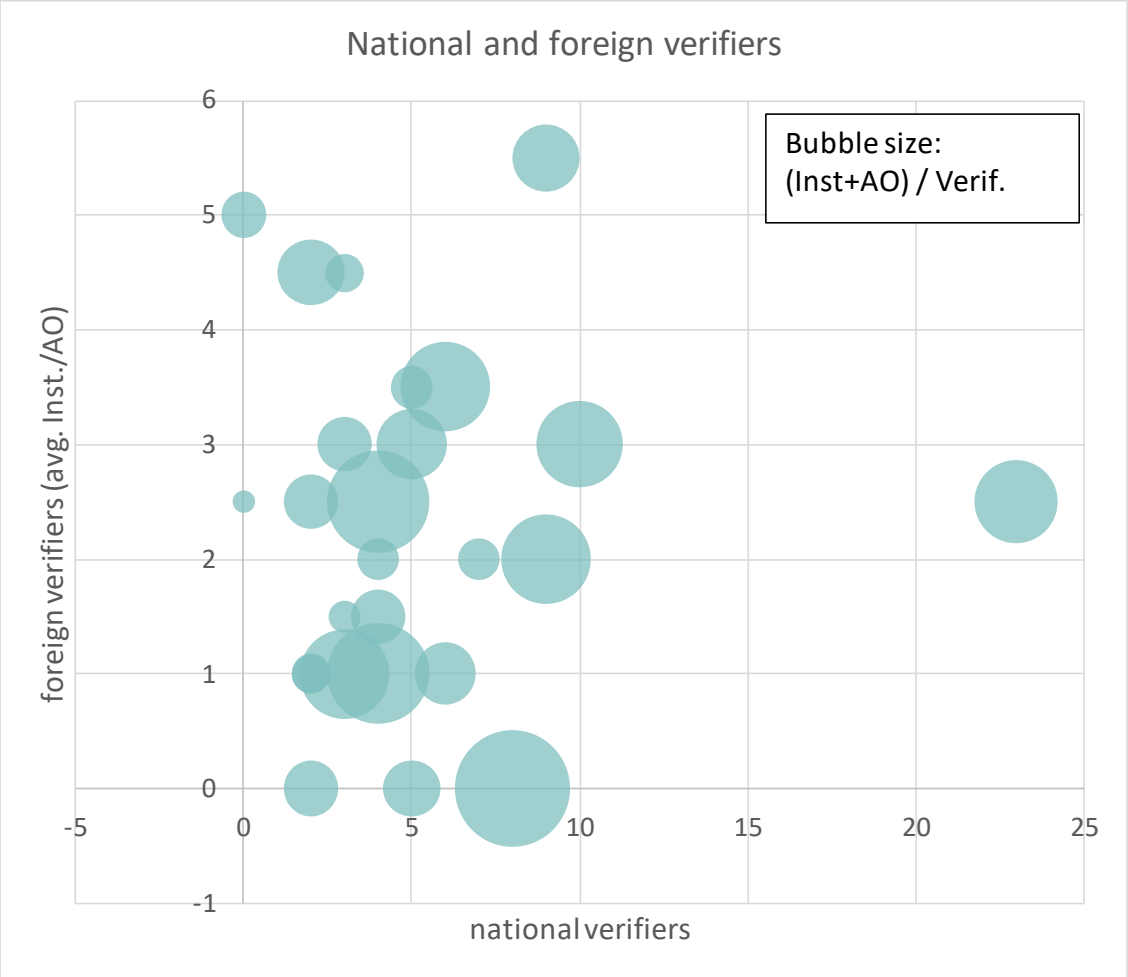
The follow-up of issues identified in the VR has improved. In most cases the NAB is informed on issues that were identified by the verifier. The extent of information provided to the NAB and how this is shared can differ per country. In 11 MS the procedures on follow-up could be improved.

4.7.2 Capacity

Although the number of EU ETS verifiers decreased in most MS since 2013, the overall verifier capacity seems adequate for the number of reports to be verified. However, information from the public website of the different NABs in the EU shows that some MS encounter some capacity problems. 9 MS have only 2 to 4 accredited verifiers for a large number of installations and aircraft operators which makes it difficult to manage the number of verifications, in particular if verification of allocation data is added to the workload. Countries that have a limited number of verifiers accredited by the NAB usually have foreign verifiers accredited by a NAB in another MS. The number of foreign verifiers used in MS differs per country. In some cases, MS indicated that the national language or national procedures may complicate involvement of foreign verifiers. However, MS should be aware that the national language and procedure should not be an obstacle for foreign verifiers operating in a different MS. Mutual acceptance of verifiers is required by the AVR.

Figure 4 illustrates the variation in the number of verifiers per MS. The data indicated on the horizontal axis illustrate the number of national verifiers in the MS while the vertical axis indicates the number of foreign verifiers divided over the amount of airline operators. The number of foreign verifiers provided in this figure are the average between the number of foreign verifiers for installations and for airline operators. The size of the bubble indicates the average amount of installations in the country per verifier.

Figure 4 » Number of verifiers versus the amount of installations



4.7.3 Site visits

Article 21 of the AVR requires site visits to be carried out during the verification to interview operator's staff, check measurement equipment and implementation of procedures. Only in specific cases and under specific conditions can site visits be waived. These conditions are specified in Article 31 and 32 of the AVR. Analysis of the information collected showed that countries with off-shore and very simple installations used waiver more often. Approval of such waiver of site visits is required for installations emitting more than 25 ktonne of CO_2 annually. In the procedure to approve waiver of site visits there are sometimes MS specific areas that can be improved. However, these recommendations for improvement should be tailored to the specific MS and were included in the MS specific action plan. It is clear though that site visits are not waived often. In 2018 verifier's site visits were waived in 20 MS but mostly for installations of low emissions or small emitters in the aviation sector. For a limited number of installations annually emitting more than 25 ktonne a waiver of site visit was approved in 9 countries, in particular under category I[12] and IV[13] as

Note 12 » [12] The verification concerns a category A or B installation that only uses natural gas, or one or more de-minimis source streams which aggregated do not exceed the threshold for de-minimis source streams laid down in Article 19 of Implementing Regulation (EU) 2018/2066. The natural gas is monitored through fiscal metering which is subject to an appropriate legal regime for the control of fiscal meters and meets the required uncertainty levels related to the applicable tier. Furthermore only default values for the calculation factors of natural gas are applied

Note 13 » [13] inaccessible and remote locations as defined in Article 32(5) AVR such as off shore installations.

laid down in AVR Article 32 (1) and (5). In countries where the CA relies heavily on verifiers to check MP elements in the verification, site visits were usually not waived.

4.7.4 Conclusions of the overall quality of verification

Analysis of the information showed that the quality of verification can be improved. This is in particular the case on verification reporting. When analysing the Article 21 reports and information in the survey conclusions can also be made on typical errors that are made by verifiers across MS. These typical errors include:

- Missed source streams and sources;
- Incorrect classification of source streams, including incorrect classification of sustainable biomass (not applying the requirements in a correct manner). These issues are sometimes not picked up by verifiers;
- Missed discrepancies in completeness of flights and discrepancies between Eurocontrol and aircraft operator's information on emissions and city pairs;
- Incorrect default values leading to underreporting which were missed by the verifier;
- Incorrect or missing Waste codes, NACE codes, EPRTR codes;
- Exceedance of de-minimis thresholds missed by the verifier;
- Discrepancies in verifier's time allocation: in some cases, the time allocation seem to be rather low for the complexity of the installation;
- Application of materiality: a number of issues were mentioned by the CA on how the concept of materiality was interpreted. This is a very difficult topic to assess for a CA and can best be evaluated by the NAB as they have all the relevant information to assess whether verifiers were in compliance with the AVR. However, it is good practice for the CA to make comments on application of materiality to the NAB if it has concerns.
- Impartiality of the verifier: verifier making recommendations for improvement that can be perceived as consultancy.

Further information on issues identified in the review of AER/VRs can be found in presentations that were held in the TF AV. These can be found on SharePoint. Training of verifiers, CA and NAB in combined discussion sessions can increase parties' awareness of the MRVA concepts. Training could be organised both at national level to address country-specific challenges as well at international level to facilitate peer-to-peer learning and harmonisation of the quality of verification.

4.8 Accreditation

According to Article 44 of the AVR a verifier issuing a VR to an operator or an aircraft operator shall be accredited for the scope of Annex I activities for which the verifier is carrying out the verification of the AER. Such an accreditation must be carried out by a NAB established pursuant to Accreditation Regulation 765/2008 (Article 54(1) of the AVR). Most MS have appointed one NAB in their country as the NAB according to Article 54 AVR. Cyprus and Liechtenstein do not have a NAB and other countries such as Malta, Iceland, Ireland, Luxembourg and Lithuania have an accreditation body but it does not carry out accreditation of ETS verifiers. These countries use foreign accredited verifiers for the verification of AERs instead.

When accrediting verifiers, the NAB follows an accreditation process consisting of an assessment of the application for accreditation, assessment of the verifier's procedures, competence and compliance in a

document review, office audit and witness audit followed by a decision on accreditation. If the decision is positive an accreditation certificate will be issued to the verifier. Such a certificate is valid for at least five years. The precise validity is dependent on the specific NAB. Once the verifier is accredited, it will have to undergo annual surveillance to assess the verifier's continued competence and compliance with the AVR.

The same requirements on accreditation apply for each NAB and their compliance with the rules is assessed by the European Cooperation for Accreditation (EA) in a regular peer evaluation. EA internal auditors and competent peer evaluators assess in document reviews and on-site procedures whether the NAB and its personnel are complying with the AVR and EN ISO/IEC 17011, are sufficiently competent and are applying the required procedures. If non-compliance issues are identified, the EA can impose sanctions. The accreditation process is functioning effectively. As it is the EA's prerogative to assess the NAB's compliance, this element has not been analysed extensively in this project. Based on the information collected, though, no inconsistencies or non-compliance issues were identified.

4.9 Information exchange between NAB and CA

According to Article 70 of the AVR the MS shall establish an effective exchange of information and cooperation between their NAB and CA. All MS that have appointed a NAB to accredit EU ETS verifiers have implemented such cooperation in the form of regular contacts through meetings, phone calls and e-mail contact. 12 MS have established special working groups to discuss specific MRVA issues in a wider group involving verifiers, NABs and CAs.

In addition to these national cooperation structures Chapter VI of the AVR imposes further requirements on the information exchange between NABs and CAs. According to Article 77 of the AVR verifiers have to inform their NABs on their planned verifications by the 15th of November of each year. Where there are changes in the notified information, they have to agree with the NAB when to send an update of that information. Analysis of the notification reports show that not all verifiers use the latest templates developed by the EC. Furthermore, differences can be identified in how verifiers reported details of planned verifications. Some verifiers were not specific on the dates of site visits, only providing the month in which such a visit would be carried out. This could be because the site visit was not scheduled at the time the notification report needed to be submitted to the NAB. According to Article 77 updates of information in the notification need to be agreed with the NAB and these updates could not be identified from some of the notification reports.

Based on the information reported by verifiers the NAB compiles a work programmes and submits this to the CA of the MS where the verifier accredited by the NAB is carrying out verification. The deadline for submitting these programmes is 31st of December. In 18 MS the national NABs submitted these programmes in time; an improvement compared to 2015. Most problems were encountered in the submission of work programmes across borders. A number of NABs failed to submit such a work programme. The analysis of the work programme shows that there are differences in how the NABs complete the work programmes. Some NABs did not use the most recent template for the work programme that was updated in 2015. Further differences were found in:

- How to report dates of planned verification and planned witness audits. Some NABs only include the month in which such a witness audit is carried out whereas other NABs specify the specific dates for such audits.

- Not all work programmes were complete.

The quality of work programmes is expected to improve with the new requirement in the AVR. As from 2019 the NAB must send an updated work programme to the specific CA by the 31st of January.

By the 1st of June the NAB must report back on the activities they carried out: e.g. accreditation activities, surveillance activities, imposition of sanctions. The national NABs of 16 MS submitted this report in time. At least 20 NABs failed to submit a management report. As with the work programme, this mostly concerned information exchange across borders where the verifier accredited by that NAB was carrying out verification in another MS and the NAB failed to send their reports to the relevant CA. Analysis of the management reports showed that the level of detail in the management report differs per country. Differences can for example be found in:

- How NABs describe outstanding non-conformities;
- How NABs interpret the drop-down boxes and select the appropriate option;
- How NABs provide information on when accreditation activities or surveillance activities are carried out. Similar observations can be made as with the work programme. Some NABs only include the month in which these activities are carried out whereas other MS provide more detailed information specifying the dates of the visit to the verifier's offices and the witness audits;
- Not all complaints and the action taken were clearly described by NABs.

It is clear that since 2015 more MS have become aware of the information exchange requirements and that the CA are more inclined to use the information reported by the NAB. 16 MS are performing specific checks on the work programmes and management reports and use the information for their own purposes: e.g. check whether the verifier is accredited against which scope, find out when a NAB carries out a witness audit and accompany that NAB, find out whether sanctions were imposed on verifiers. The type of checks differs between CAs: some CA check for completeness of the reports, other MS only check the reports from national NABs or perform detailed checks on the work programme and management reports of both the national and the relevant foreign NABs. **Table 12** identifies some good practices.

Table 12 : *Examples of good practices on information exchange between NAB and CA*

Country	Examples of good practices on information exchange between NAB and CA
Ireland, UK	Detailed checks on work programme and management report. Examples of type of checks are included in the TF AV paper published on SharePoint
Netherlands, UK, Ireland, Norway, Germany	Additional information included in the CA information exchange reports, either by adding a sheet to the information exchange report, separate lists or additional column specifying the issue identified.
Several MS	Verifier is informed about issues identified in the review of AER/VR together with the NAB. There are different approaches to how verifiers are informed of such cases. Approaches include: • informing verifier of issues while copying in the NAB and thus giving the verifier the opportunity to respond to issues; • reporting the issues identified in the review to the NAB while copying in the verifier; • treating issues identified in the review as a complaint about the verifier and reporting it as such to the NAB. This requires the NAB to undertake action according to Article 62 AVR.

Country	Examples of good practices on information exchange between NAB and CA
	• Reporting the issues identified in the review of AER to the NAB and discussing the assembled issues with verifiers, NABs and relevant CA in (annual) meetings
Germany	Detailed information in work programmes and management reports, including details on witness audits and information on issues found in the review of AERs. This provides useful information for the NAB and helps them in determining what action should be taken.

The CA in turn has to share its results of the review of AER/VRs, inspection and any relevant complaints to the NAB of the MS that has accredited the verifier. Such information exchange according to Article 73 of the AVR occurs annually: the recommended deadline for submitting such reports is 30th of September. 11 MS aim to send the report by that date. In 2018 the CAs of 11 MS submitted an Article 73 AVR report later than that date: i.e. in November or December once the review of the AER/VRs was completed. In 3 MS the CA sent the information in spring or summer of the following year. Not all CAs submitted reports. In 11 MS the CA did not always send an information exchange report to the NAB. In most cases the failure to submit such reports concerned information exchange across borders. If no issues were found in the review of AER/VR some MS decided not to send any information to the NAB. It would be good practice however to indicate to the NAB that no issues were found. This informs the NAB that the CA has not identified any concerns about an individual verifier.

How MS report issues in the information exchange report to the NAB differs per country. In some countries the CA reports any relevant issues coming from the review of AER/VR or inspection which do not necessarily relate to the competence of the verifiers. In such cases the CA leaves it up to the NAB to draw their own conclusions on the issues identified: whether it can impact the compliance of the verifier with the AVR or its competence. Other MS only report issues that have an impact on the compliance of the verifier. The AVR requires the CA to share any relevant results from the review of AER/VR, inspection to the NAB or review of internal verification documentation, even if it does not concern non-compliance of the verifier.

The level of detail included in the information exchange report differs per country, including the type of evidence that is sent with the information exchange report. In some MS the CA sends a detailed description of the relevant results, outlining the issues concerned, whether it is a missed misstatement, non-conformity, non-compliance with the MRR and what action was taken. In other MS only high-level information was provided or only the drop down box option was selected without providing necessary explanation.

Most issues reported by CA concern issues found in the review of AER/VR. Less issues seem to be reported as a result of inspection or checks on internal verification documentation. This is mostly due to the fact that not all MS carry out inspection or review internal verification documentation of the verifier.

MS reported that it is not always clear what constitutes a complaint regarding a verifier and what must be reported to the NAB. More clarification on this point is necessary. Other areas of improvement concern:

- How NABs report back to the CA on how they followed-up on issues reported by the CA. This is not always done in a timely fashion. MS reported that in some cases it takes more than 3 months to report back or feedback was not provided at all;
- What process to follow when complaints have been shared by the CA or other parties, what information is shared by the NAB and how this is followed-up. Article 62 of the AVR states that the

NAB has to decide on the validity of the complaint, take appropriate action, record the complaint and respond to the complainant. However, information shows that this was not always done in a timely fashion or the information shared was not clear to the CA.

It is expected that this issue will be partially addressed with the new requirements in the AVR. Article 62 of the AVR has been changed to clarify that the NAB should decide on validity, take appropriate action, record and respond to complainant within three months of receiving the complaint. This will encourage a more timely response from the NAB. It will also be addressed by the new requirement in Article 71(3) AVR which specifies that the management report should also include information from the NAB on how they addressed the issues shared by the CA.

The analysis showed that information exchange on a national basis generally works well but information exchange across borders can be improved. Some MS indicated that they did not have to send reports because they do not have a NAB. These MS are not compliant with Chapter VI and have been recommended to change their procedures.

Where multiple CAs are involved in MRVA activities, an MS has to appoint a focal point. This has been done in all of these MS. In such cases it is vital to ensure that results from the review of AER/VR or inspection are communicated by the local CA to the focal point so that they can be reported to the NAB according to Article 73 AVR. In France, templates haven been developed to ensure that such information is shared by the local CA with the Ministry of Environment. In other MS such a Poland, the requirements to share such information is laid down in legislation.

Although information exchange has improved since 2015 and MS awareness has increased, there is still room for improvement. Further clarification in guidance and amendment in the EC templates could promote a more harmonised approach across MS.

4.10 Inspection and Enforcement

4.10.1 Inspection

Inspection is not required by the EU ETS Directive or the MRR. However, it is considered good practice to implement inspection procedures to ensure non-compliance of operators is monitored and followed-up. Although still an area that overall needs improvement, the level of attention for inspection and enforcement has increased strongly in the last few years. Countries have adopted tailor-made inspections approaches, and more inspections dedicated to the EU ETS were observed.

Currently 16 MS have set-up tailored EU ETS inspection by either the CA responsible for MRVA activities or special inspectorates. This is an improvement compared to 2015 when 11 MS had implemented such procedures. 10 MS have implemented IED inspections and can ask IED inspectors to look into EU ETS specific issues and compliance of the operators. This is however not done on a structured basis. 6 MS do not do any on-site inspection because they do not have the resources to do so or they rely mainly on verification. 2 of those MS do however have plans to set-up EU ETS inspection.

Of the MS that check operator's compliance with the approved MP in on-site inspection, 7 MS use authorities that are also responsible for MP approval and AER review. In cases where inspection is conducted by

another CA, e.g. IED authorities or inspectorates, communication of inspection results between the authorities responsible for inspection and the CA responsible for assessment of MPs is key. Yet differences in the level and quality of this communication were observed between those MS. 11 MS use structured inspection reports to inform other authorities whereas other MS use less structured mechanisms. It is recommended to develop standardised communication templates to support these CAs in improving communication and to increase the effectiveness of follow-up of inspection results.

As mentioned before inspection procedures differ between countries, in terms of the share of installations to be inspected, approaches used to select installations to be inspected, frequency of inspection, inspection procedures and checks to be carried out during inspection.

Table 13 : *Examples of good practices in carrying out inspection*

Country	Examples of good practices in carrying out inspection
Netherlands	Risk based approach in selecting installation, EU ETS tailored inspection programme,
Belgium Flanders	How to check procedures in non-conformity audits, Tailored EU ETS inspection approach
UK	Tailored EU ETS inspection approach, training inspectors on EU ETS elements
Ireland	Risk based approach, tools and inspection programmes that are used in inspection, specific training on EU ETS matters

It is recommended to keep actively sharing best practices and lessons learned between countries to help others recognise the value of dedicated EU ETS inspections and build upon approaches and tools used by others.

4.10.2 Enforcement

According to Article 16 of the EU ETS Directive, MS shall lay down rules on penalties applicable to infringements and shall take all measures necessary to ensure that such rules are implemented. The penalties provided for must be effective, proportionate and dissuasive. Such penalties are a key compliance instrument in EU ETS.

According to Article 21 reports[14], all countries have some form of penalties in place for different types of infringements. Most often these are fines with a defined financial minimum and/or maximum. In some cases, fines are defined by a calculation formula, e.g. taking into account the number of days the issue is not resolved, the number of free allowances involved, the market price for EU allowances, the tonnes of CO_2 equivalent emitted or the company's turnover. In other cases, the courts decide the size of fines. The size of fines differs per country ranging from a minimum of 63 Euro (Hungary, per day) to 75,000 Euro (France). Ranges can also be identified in the maximum of fine per infringement: e.g. 102 Euro plus the allowance price (Liechtenstein, per tonne CO_2) to 16,000,000 Euro (Estonia). In some countries the size of fines also differs between the 14 types of infringements reported under Article 21.

6 countries report potential jail sentences for some or all types of infringements, of up to 120 months. A minimum jail sentence has only been indicated in France; a period of 12 months for operating without a permit or failure to comply with the conditions of the permit. In some countries other penalties besides

Note 14 » [14] Taken from the Technical Report on Article 21, 2019

fines and jail sentences can be imposed: for instance, in Greece a shutdown of the installation of 5 to 20 days can be applied.

In most MS a distinction is made between different types of infringements. Generally, the highest penalties are reserved for not having an ETS permit or not complying with the conditions of a permit or the approved MP. Other infringements include failure to submit supporting documentation, failure to notify changes to the MP, failure to submit verified AERs in due time, failure to update MPs, failure to submit IRs, having a verified AER that is not line with the MRR. Similar infringements exist for aviation. The number of penalties imposed on operators or aircraft operator is low. Generally preventive measures are taken to ensure proper enforcement of non-compliance issues before penalties are imposed.

Procedures for enforcing non-compliance issues and imposing penalties are very specific to the MS concerned. CAs are recommended to actively share their approach and strive, where appropriate, for harmonization to support a level playing field for EU ETS operators.

5 » Main conclusions on sector specific issues

The sectoral evaluation is based on all information gathered and evaluated for the relevant sector in the course of this project. These information sources include the documents received for the Member State case evaluations, especially the MP and AER, as well as sector specific issues identified from the survey responses (see section **Error! Reference source not found.**) and discussions in TWG MRVA and TF meetings. It has to be borne in mind that for each MS only one installation was analysed. Therefore, for the sectoral evaluation only a very limited set of documents was available for each sector (1-4 MS per sector). Additionally, the documents for a specific sector may be of different quality between the MS, e.g. due to work experience of staff involved (see chapter 3), which would be one of the key factors in assessing whether a finding can be attributed to be an issue for a specific sector.

However, the following issues may be considered as being of particular relevance for the respective sector.

Large scale power plant:

Belt weighers seem challenging to maintain to some operators, especially if high levels of accuracy are required by the MRR, which is usually the case for large scale power plants. Therefore, some operators of solid fuel power stations monitor their consumption of solid fuels using heat accounting to back calculate activity data using the net calorific value and other parameters of the input materials and the energy generated taking into account stock level changes. However, it is considered rather unlikely that this method can achieve a higher accuracy. Moreover, this methodology of performing back-calculation is not a valid option in the MRR. Therefore, this approach would constitute a non-compliance to the MRR, unless it would fall under Article 22, in which case unreasonable costs would need to be demonstrated to apply such fall-back approach.

For combustion installations with large coal stocks for the determination of stock changes, the storage density of coal and the determination of its uncertainty are relevant. Especially if the stock size varies considerably over time, more frequent density surveys may be required as the storage density changes because coal is removed from stock. This may impact the uncertainty assessment.

An issue for large scale power plants using solid biomass is the appropriate determination of the moisture content especially for fuels like wood chips where the moisture content may change considerably over time. However, as solid biomass fuels in large scale power plants usually consist exclusively of biomass or are mixed fuels with a very low fossil fraction, they normally qualify as de minimis source streams. Estimation methods may then be applicable.

Small combustion plant:

For small combustion plants (as well as for other small plants) a common issue is the lack of attention that operators pay to the procedures required by the MRR, e.g. risk assessment and uncertainty assessment. For example some operators do not fully understand the relevance of control risk in the accounting process, e. g. operators tend to assume that there is no control risk for a certain parameter analysed by an external laboratory and forget about control risks associated with sample taking. It seems necessary to raise the awareness of these operators for the importance of the risk assessment and the uncertainty assessment (e.g. in the form of training).

Oil refinery:

A sector wide issue is the compliance with uncertainty requirements for the catalytic cracker regeneration.

A general issue in this sector is the complexity and inter-connectedness of units which can give rise to problems of accounting for individual source streams. For the NIMS this is also relevant for the associated heat. This issue is specific to sectors where various fluid or gaseous input and output source streams are relevant (e. g. organic chemicals, refineries).

Another issue that is particularly relevant for the refineries is that incorrect settings may be hard coded into the distributed control systems (DCS) or flow computers. This relates to certain parameters like the compensation for gas volumes, default densities etc. This issue is also relevant for other sectors with significant numbers of instruments (e. g. bulk organic chemicals, nitric acid).

In complex installations where there are multiple levels of staff responsible for operational data that are not directly involved in ETS activities, staff turnover with inadequate handovers may have the effect that people collecting primary data (e.g. process technicians) are not aware of the need to feedback to ETS co-ordinators issues with data quality/operational gaps and/or updates to previously validated data. This issue also applies to other sectors like bulk organic chemicals or iron and steel.

Validation of online analysers is felt to be burdensome by some operators which may lead to operators applying different approaches for emission determination or validation. Some operators also misinterpret the term "validation" and thus apply some alternate approach that is non-compliant to the MRR. This issue can occur in several sectors, but it is of particular relevance for refineries and other complex sectors. CAs are encouraged to take these issues into account in their assessment of MPs and review of AER and VR.

Integrated iron and steel:

A common issue in the iron and steel sector seems to be that the net calorific value of fuels serving as process input is not reported by operators in the installation´s AER as well as in the MP. Though the NCV only serves as a memo-item, it is mandatory to be reported and may be useful for consistency checks by the verifier and analyses of aggregated data on sector or MS level by the CA.

For one installation where blast furnace and coke gases were transferred to another ETS installation, no information was given on measuring instruments used for those source streams and on the analyses of their composition.

According to information obtained from the survey, analyses of the carbon content of scrap materials are considered burdensome by some operators as they are complicated and expensive due to the heterogeneity of the material. Additionally, the default value for the carbon content of iron scrap in the MRR is seen as very conservative, well above commonly observed contents. Therefore, some MS allow the application of constant values that differ from the values in Annex VI (e.g. EUROFER data). However, Annex II, section 3.1 of the MRR allows such deviation only if Annex VI does not contain a default value which renders the approach taken a non-compliance with the MRR.

Ferrous metals:

One installation did not apply the standard values for tier 1 but a considerably lower value for the emissions factor of petroleum coke in a mass balance. This constitutes a non-compliance with the MRR for the same reason as above (iron and steel).

Furthermore, one installation did not provide the reference to the laboratory engaged in the MP for one source stream (while for other source streams a reference was provided). Although this finding could be considered to constitute a non-compliance with Article 34, it is not a sector-specific issue as it occurs across sectors. CA should pay close attention to whether operators have included the appropriate references to standards, laboratories or procedures. Similar omissions have been observed throughout the MS case evaluations.

Primary aluminium:

In the primary aluminium sector information on tiers for the determination of PFC emissions in the MP was inconsistent with the information in the AER for a few installations. While the MP indicated that the highest tier is used, in the AER only a default value (lower tier) was applied for one or more parameters (slope emission factor, weight fraction of C_2F_6) without providing sufficient explanation.

For one installation the information on the carbon content of baked anodes was unclear. While it was indicated that the material was analysed, a value of exactly 1 was given which does not seem to be a plausible result of analyses. CA are encouraged to look for such inconsistencies in the review of the AER and VR.

Secondary aluminium (metals):

Scrap aluminium is usually contaminated with certain amounts of carbon containing impurities. Therefore, scrap material should constitute a source stream in the MP which was not the case for one installation examined. It is recognized that the determination of the emission factor may be burdensome for some installations as there is no default value contained in Annex VI. Nonetheless, omission of that source stream in the MP can be regarded as a non-compliance with the MRR. However, we did not carry out further checks on whether there are valid reasons for the absence of such corresponding source stream as that information was not available in the MP. This point was alerted to the CA in the action plan though.

A lower tier for the carbon content of some minor source streams was applied while the operator indicated that this was done because of unreasonable costs. However, no evidence was provided to prove that costs were indeed unreasonable according to Article 18 of the MRR.

One installation applying a mass balance misclassified several source streams as carbonates (instead of mass balance materials) in the AER. Therefore, the NCV was not reported as a memo-item for these source streams. These issues were reported to the respective MS in the action plans. Further analysis of information collected from MS imply that not all MS assess evidence of unreasonable costs to the same level of detail. The Commission training on unreasonable costs could support MS in how unreasonable costs can best be assessed and what appropriate evidence may be useful. Experiences on this were shared in the TF MR meetings as well.

Cement:

In the case studies some operators applied for lower tier requirements for the analysis of EF and NCV, for a number of source streams claiming that analyses in general or a higher frequency of analyses would incur unreasonable costs. However, sufficient evidence has to be provided in the MP to prove that costs are indeed unreasonable according to Article 18 of the MRR. While this issue is also relevant for other sectors like lime or glass industry it is typical for the cement sector as in this sector generally a lot of different fuels and materials are used as input materials which requires many source streams to be analysed. Most installations in this sector are category B or C installations which require the application of the highest tier and therefore the analyses of EF and NCV.

Several installations in the case studies used analyses by laboratories not accredited in accordance with ISO17025 for several source streams like raw materials. However, these installations did not provide satisfactory evidence required according to Article 34 of the MRR to demonstrate equivalency of the non-accredited laboratory, e.g. for one installation the ISO9001 certificate was no longer valid. This is an issue specific for sectors like cement, lime, iron and steel where installations have in-house laboratories for routine analyses. These in-house laboratories are often not accredited to ISO 17025 and must therefore demonstrate sufficiently that they meet requirements equivalent to EN ISO/IEC 17025.

An issue identified from the survey responses by MS for the cement sector is that some operators did not include the urea source stream from denitrification of flue gas scrubbing in the MPs for their installations. This issue may also be relevant for other sectors (e. g. coal power plants) and CA should be aware of that when assessing MPs.

Lime:

For several source streams of an installation the highest tier is not achieved for the emission factor. Instead the installation uses a standard factor that is based on analyses carried out a few years before. This is deemed to be a common issue in this sector for the determination of the emission factor of raw materials. Operators tend to think that for these materials with little variation in composition over time analyses are not required or are too burdensome. However, the MRR only allows operators to apply lower tiers when they have demonstrated satisfactorily that analyses indeed incur unreasonable costs.

One installation gave extremely low values for the uncertainty (e.g. below 0.01%) of several source streams in the MP that are not plausible and also not consistent to the information given for the uncertainty of the measuring instruments. However, this is not considered to be a sector specific issue.

An issue specifically relevant to the lime sector is the deductibility of transferred CO_2 for PCC installations. However, due to recent changes to the MRR following the Schäfer Kalk ruling MPs may have been updated for most concerned installations. The lime sector usually covers a high number of installations of low emissions that do not always have robust procedures or control activities. CAs and verifiers should be aware of this in their evaluation of the MP and risk assessment.

Glass:

In the case studies several installations applied lower tiers for a number of source streams than required by the MRR for the determination of calculation factors. For one installation it was not fully clear which tiers were actually applied as tiers given in the MP and in the AER were not consistent for some source streams.

As described above for the cement sector operators have to provide sufficient evidence that they may deviate from tier requirements because of unreasonable costs or technical infeasibility.

In the 'Round Robin Test' – where a glass producer was the test installation – most CAs participating in the test omitted to list all suppliers´ laboratories in the MP. These laboratories have to be listed if results from these laboratories are used for emissions calculation. Furthermore, sampling plans have to be provided by the suppliers: a number of CAs did not provide such plans. Although these issues were identified for quite a number of MS in the 'Round Robin Test', this is not a sector-specific issue. It does show however that requirements on sampling plan and the use of laboratories may need explanation in future training events.

Especially for small installations operators sometimes use results of analyses from in-house laboratories while these are not performed in accordance with Articles 32 to 35 of the MRR. This should be regarded as a no tier approach. In these cases, default values according to Annex VI would constitute a higher tier and more accurate value and therefore have to be used if a tier 1 approach is eligible. For minor and major source streams of category B and C installations external analyses in accordance with Articles 32 to 35 of the MRR may be necessary (Article 26 of the MRR) unless unreasonable costs are demonstrated.

Ceramics:

It is observed that in the ceramics industry installations often do not pay enough attention to the implementation of an effective control system and the description in the MP may not be sufficiently clear or complete. This is attributed to the fact that in the ceramics sector installations are often smaller than in other branches of the mineral industry and that they therefore do not have an assigned person responsible got EU ETS. However, as the sector is relatively complex (often various input materials are used, some of which are rather heterogeneous), this complexity should be reflected in the description of procedures in the MP.

In the case studies one installation gave little data on the analyses of lime in the MP. This refers especially to sampling including the sampling frequency on which no information was given. Furthermore, no written procedure for analyses was provided and the equivalence of the non-accredited laboratory used was not demonstrated. This is a non-compliance with the MRR that is typical for this sector and may be attributed to the fact that input materials are often not analysed on a regular basis for production control.

For input materials that are not analysed (tier 1), typically a default value based on analyses results carried out in the past is used but the representativeness for future batches is not demonstrated. Furthermore, operators have to review from time to time whether the default value is still representative for the input material and this should be reflected in their procedures.

While the aforementioned issues are particularly common for the ceramic sector they are also observed in other sectors (e.g. in the glass industry) especially for small installations without specialised personnel.
Another sector specific issue is that operators often assume that they do not have to take into account the organic carbon in input materials in the calculation of emissions. While it may actually be non-fossil it is for the operator to demonstrate that the organic carbon is at least to a certain degree of biogenic (non-fossil) origin. If an operator chooses not to analyse whether the organic carbon is fossil or biogenic, the total carbon content has to be taken into account in calculating the installation's process emissions.

One installation in the case studies reported de minimis source streams with combined emissions above the threshold according to Article 19. However, this is not considered a sector specific issue as it has been observed for many installations with a number of de minimis source streams in various sectors. CA are encouraged to monitor this carefully in the review of AERs and VRs.

Nitric Acid:

The MRR requires operators to follow the provisions in EN 14181 when applying CEMS for N_2O emissions. Under this standard, an ongoing quality assurance is required (QAL 3) which involves the use of e.g. CUSUM cards. VRs have shown that quality assurance was only partially followed up if those cards indicated drift outside the tolerated range.

Bulk organic chemicals:

In the bulk organic chemicals sector issues may arise because the requirements for CEMS used for the ETS differ from the requirements for the use of CEMS for other purposes like control of NO_x emissions. Therefore, terms and calculations are sometimes not clear to operators using CEMS for both purposes. CAs should be aware of this when analysing the MP.

Ammonia:

There were no sector specific issues identified for the installations that were assessed in this sector. However, it should be noted that in many installations in that sector, ammonia is further processed into urea onsite. In this case the CO_2 is not emitted but fixed in and exported with the urea.

Natural gas is used as the raw material for ammonia production. In such cases often a single incoming meter is used which serves both fuel and material streams, so calculation needs to ensure that deduction of natural gas used for ammonia production is correct and an appropriate uncertainty has been accounted for in the uncertainty assessment for natural gas.

Aviation:

A common issue in the aviation sector is that aircraft operators use aircraft types in the reporting period additional to those given in the MP.

A number of MS in the survey and TF Aviation meetings stressed difficulties in contacting foreign aircraft operators that are attributed to the MS when trying to impose excess penalties or other penalties. This seems to relate only to aircraft operators from non-EU countries. This is a common issue across MS.
A further issue in the aviation sector is the correct attribution of flights to an operator, e. g. if leasing arrangements are relevant.

While it may be relevant for all sectors it is typical for the aviation sectors that operators exceed the threshold of Annex I of the EU ETS Directive for inclusion of activities in the ETS but are not aware of the consequences it entails. Therefore, these operators often do not submit the AER in time for the year of exceedance.

Other sectors:

Only a limited number of MS has offshore installations but an issue that is common in the offshore sector across MS is the treatment of thermal post combustion of CO_2 containing gases. This concerns in particular how to carry out analyses, what frequency to apply and how to apply continuous measurement.

An issue relevant especially for board plant manufacturers and similar installations is that emissions reported have to include the fossil component of wood biomass (e. g. internal production residues). This may also be relevant for other installations using wood waste containing a small fossil part as a fuel.

A similar issue is that carbonates present in residues from paper production have to be accounted for. This is particularly relevant for the ceramics sectors as these materials are frequently used in this sector. CAs should pay specific attention to this issue when assessing MPs of installation using these source streams.

6 » Recommendations

The objective of the evaluation is to further assist MS in implementation of the various elements of the EU ETS compliance cycle. As mentioned in earlier sections the action plans contain MS specific recommendations on where MS could improve their implementation. However, recommendations can also be made on a wider level, relevant for all MS. These recommendations can enhance harmonisation across MS. Both the Commission and the Compliance Forum can play a major role in achieving these improvements.

6.1 Recommendations for update of regulations and guidance

6.1.1 Update of MRR and AVR

In 2018 amendments were made in both the MRR and AVR that can address some of the areas where opportunities for improvement or simplification were identified in 2016. The so-called "RegRev I" project aimed at improving the Regulations for better readability, for reducing administrative burden and for making the requirements better aligned and better understandable for the users of the Regulations. However, it seems too early to judge if these goals have been reached. Firstly, most amendments of the MRR will apply only from 2021 onwards. Secondly, the updated AVR was applied for the first time in early 2019 covering the verification of 2019 AERs, i.e. after the input for this report was collected. Finally, the updated Regulations have not yet been supplemented by updated guidance documents. Thus, the full potential of the improved Regulations has most likely not yet been unleashed by CAs.

Consequently, it should be considered a rather theoretical possibility to claim that the Regulations can be further improved. At the current point in time it is recommended to first see how the updated Regulations work in practice, and to evaluate them for further update only after a few years of experience have been gained.

6.1.2 Amendments in the guidance

In some cases, MS indicated that they were not always aware where guidance on a specific topic could be found. Quick guides have been developed by the EC to support all types of stakeholders in guiding them through the documents. MS are encouraged to use these guides. It is noted though that the quick guides might not allow parties to search for very specific MRVA issues that are addressed in parts of the guidance or in FAQs. Improvements could therefore be envisaged in:

- Transforming quick guides in an electronic roadmap on the EC website;
- Creating a roadmap to specific MRVA issues.

Analysis of information showed that some MRVA issues remain difficult topics for MS and clarification in guidance could improve the harmonisation across MS. Additional guidance could be beneficial on:

- Uncertainty assessment: further guidance was created in a recent EC project, i.e. the development of the uncertainty assessment tool and the MRR training on uncertainty assessment (see section 6.2);
- Guidance on information exchange between NAB and CA: as explained in section 4.9 the level of detail of information included in the information exchange reports varies across MS. Furthermore,

some details on information exchange are not clear: e.g. what constitutes a complaint, what and how information is shared by the NAB and how new requirements in the AVR should be interpreted. Further clarification could be provided by updating the templates for information exchange and KGN II.10.

- Sustainability of biomass: Currently MRR guidance document 3 includes guidance on biomass. This guidance needs to be updated as a result of revisions in the RED Directive and the possible impact on the MRR. Revisions to the guidance document will also influence the role of the verifier with respect to checking sustainability of biomass. KGN II.3 on process analysis describes this role and therefore needs to be updated as well.
- Some sector specific issues could need further clarification in guidance (see section 5). It should be assessed whether some of these issues could be picked up in FAQs.
- Requirements on how small installations have to deal with MRR requirements are explained in current guidance. However, the analysis of information showed that although MS awareness has increased on this topic, there are still some areas that may not be clear for MS: e.g. application of conditions for waiver of site visits for simple and small installations, application of Article 13 of the MRR regarding the simplified MP. Exemplars or specific FAQ on this topic could facilitate further improvements. Furthermore, KGN II.5 on site visits requires adjustment.
- Room for improvement has been identified on verification reporting. It should be assessed whether further explanation is needed in KGN II.6 on the VR.
- The concept of materiality in verification and its impact on verifier's sampling causes confusion for CAs. For CAs it is not always clear what the scope of verification is for a verifier and how a verifier carries out sampling. In particular the role of reasonable level of assurance and materiality is difficult to understand for the CA. The CA's perception of this topic is not always the same as how the NAB assesses the verifier's performance and how it should be interpreted in the AVR. At the same time the verifier's competence can be strengthened as some remarks in the information exchange reports and the analysis of VRs seem to imply that the verifier was not always in compliance with the AVR. It should be assessed how KGN II.4 on verifier's sampling could be strengthened. Furthermore, training on these topics could be useful (see section 6.2).
- Some MS indicated that they would like to have more guidance on CORSIA implementation: either in the form of FAQs or in the form of future training webinars.
- Some MS noted that the EU ETS training handbook published on the EC website should be updated. Such a handbook is useful to inform new CA staff members of EU ETS requirements.

Other areas of improvement (e.g. CA's role in risk assessment and procedures, checking evidence of non-accredited labs) are topics that are more suited for small or larger training events (see section 6.2).

6.2 Recommendations for training

Training events are an effective instrument for informing CA and other relevant stakeholders on how to deal with specific issues. In the past several training events have been organised by the EC that aimed to train CA staff, verifiers and NABs on specific MRVA issues. The following training events have been organised:

- MRR training event on uncertainty assessment (May 2016);
- MRR Training event on operator's sampling plan (June 2017);

- MRR training event on unreasonable costs, the use of uncertainty assessment tool and data gaps (November 2019);
- AVR training event on how to classify and report outstanding issues in the VR (September 2015);
- AVR training event on various issues in verification (September 2016):
  - Verifier's sampling and scope of verification;
  - Materiality and reasonable assurance judgements;
  - Resolutions in connection with Article 23 MRR (notification of temporary changes to the MP) and Article 65 MRR (data gaps);
  - Changes to the capacity, activity levels and operation of an installation (Article 17(4) and 27(3) (o) AVR).
- AVR training event on various issues in verification (September 2017):
  - The scope, detail and types of checks performed during verification (for both data validity and rules compliance);
  - Minimum expectations in relation to verifier site visits;
  - The type of checks to perform on specific M&R issues (e.g. distinctions between the role of the verifier and that of the CA in relation to, for example the operator's risk assessment, control procedures, unreasonable cost claims, CEMs, biomass and evidence for acceptance of non-accredited laboratories;
  - Potential for limitation(s) of verification scope and consequences for conclusions expressed in the verification opinion statement.
- AVR training event on information exchange between NAB and CA (webinar) (September 2018)

Section 4 shows that the following topics could be addressed in future training events to promote CA's and verifier's awareness of these topics.

- The role of the CA and verifier on risk assessment and procedures;
- How to approve certain elements in the MPs and how to review AER/VR, in particular on how to deal with sector specific issues in both processes;
- How to address sector specific issues in an installation;
- Smaller topics: Biomass, dealing with non-accredited labs, CORSIA implementation, the scope of installation boundaries, transfer of CO_2;
- Tailored training for verifiers, CA and NAB on several verification topics with specific case studies. Topics include auditing and sampling, application of materiality, time allocation, how to report in the VR;
- Some MS indicated that they would like training on particular issues associated with allocation: how to deal with changes that impact the allocation, how to interpret certain elements in the FAR and the Implementing Regulation on annual activity level data. Future training on these topics could be of support to MS. However, there is no TF under the Compliance Forum for allocation topics. Therefore, no recommendation is made here for how such training could be organised.

Although some topics have already been addressed in earlier training events, these can still be relevant as topics for a future training event, addressing the topics from a different perspective or repeating lessons learnt. This is particularly true for areas where repeated errors or problems were identified: e.g. checking operator's sampling plans, uncertainty assessment, classification of outstanding issues in the VR.

The 'Round Robin Test' followed by a training event discussing the results of the test proved to be a success, allowing CA staff to focus on new sectors or train their new staff. The test was carried out in such a way that this could be cascaded internally within the organisation.

Some MS expressed the need to have general EU ETS training for new staff that they can cascade internally in their organisation. This type of training would in particular be useful for MS that have limited resources.

6.3 Recommendations for Compliance Forum activities

The Compliance Forum plays a pivotal role in the discussion between CAs of specific MRVA issues. Some specific issues have already been picked up in the work plans for the Task Forces. This includes the following topics:

- Some MS indicated that they would like more guidance on how to deal with CORSIA implementation. This is currently being discussed in the TF Aviation
- Sharing experiences on information exchange between NAB and CA is a reoccurring topic in the TF AV
- The TF MR addresses some of the sector specific implementation issues such as emission factors on scrap aluminium, how to deal with waste incineration plants and biomass.
- Both the TF MR and TF AV are discussing or are planning to discuss the impact of the RED Directive on the MRR and AVR.

It is important to have a logbook of issues that have been discussed in the TF meetings and indicate whether discussions have led to common interpretations. This logbook could provide input to EC's guidance. Such lists exist for the TF MR and the TF AV but updates and revisions of these list could be needed. One MS indicated that for the TF Aviation such a list should also be developed.

MS and the Compliance Forum are encouraged to continue to share experiences on how to complete MP, AER, VR and IR templates as well as information exchange report templates. This can increase harmonisation across MS and provide input on potential necessary updates of these templates.

MS and the Compliance Forum Task Forces are also encouraged to continue their discussions on specific MRVA issues. New topics coming from this Compliance Review exercise will be communicated with the various Task Forces. This includes for example sharing experiences in verifier's time allocation and verification planning. Further issues that could be considered include:

- Approaches for the determination of the emission factor for iron scrap (carbon content of scarp materials)
- Determination of stock changes and storage density (e.g. for coals stocks).
- Use of suppliers´ laboratories and associated requirements
- Implementation of an appropriate control system and its description in the MP for small scale installations
- Treatment of organic carbon in the ceramics industry (though this has been raised in TF MR)
- Application of Art. 31 (1) e (e.g. demonstration of representativeness for future batches). It has been on the TF MR workplan but more discussion on this could be useful.

Sharing experiences on these topics could give CA and NABs a good overview on how time is allocated to verification across Europe and help in identifying on whether further guidance or training would be beneficial.

6.4 Summary of main conclusions

Since 2015 the quality and effectiveness of the approval of MPs, review of AER/VRs and inspection have improved because of increased use of the Commission's templates and IT systems as well as strengthened CA procedures. More MS have taken measures to ensure a proper technical trail of CA decisions and ensure equal treatment between installations and AOs. Whereas the effectiveness of CA procedures has enhanced, some MRV areas continue to cause interpretation problems and would benefit from dedicated training or tailored guidance. Section 6.1 and 6.2 indicate on which areas additional training and guidance is needed.

In principle the regulations, guidance material and templates seem to have increased harmonisation across MS and installations/AOs. Differences in MS implementation can mostly be found in the review of AER/VR, follow-up of issues identified in the verification, inspection procedures and enforcement. In general these differences do not seem to have a detrimental effect on the robustness of the MRV scheme and are largely due to MS specific legal and institutional framework. On some areas, though, improvements can be made on EU level: e.g. on information exchange across borders, follow-up of recommendations for improvement, inspection procedures. MS recommendations for improvement have been made in tailored action plans.

Evaluation of MPs, AERs and VRs show that not all documents were complete and the level of detail varied, in particular where description of procedures or methodologies are required. Overall the quality of verification reporting and consistency between MP, AER and VR on specific areas could be improved. Sections 4.4 and 4.7 provide more information on what issues were identified. Assessment of the information exchange reports reveals that there is some room for improvement in the template itself: i.e. clarity of the drop down boxes and guidance how to complete open fields (see section 4.9).

It is clear that the Commission's regulations, guidance material, templates, tools and sharing experiences in Compliance Forum Task Forces have contributed to the effective implementation of MRVA processes. Once the revisions in the regulations enter into force, some of the areas of improvement identified in the analysis can likely be resolved. The revised provisions in the regulations can help MS structure or harmonise some of their procedures better. Tailored updates in guidance material, templates and implementation of recommendations listed in MS specific action plans can ameliorate MS implementation even more. Specific recommendations to this effect have been made in chapter 6 and in the MS action plans.

Annex I

This Annex contains information on where changes occurred within the CA organisation of MS compared to information that was published in the 2014 Fourth Compliance Review MRAV report. Nearly all MS improved their MP approval, review of AER/VR and IR approval procedures. The majority of MS also strengthened inspection and enforcement procedures. Information on these improvements and recommendations on further improvement are included in MS specific action plans that are sent separately to the MS. Good practices from MS are included in the main report and listed below for each of the MS.

Austria

Since 2014 there have not been any changes in the CA organisation. There are 94 local authorities involved in the assessment of MPs and approval of IRs. The Environment Agency Austria, the technical advisor of the Ministry of Environment is reviewing AER/VRs.

Best practice identified:

- Helpdesk that is used to answer any questions from local authorities;
- Approaches used to review improvement reports and following-up on verifier's comments;
- CA expertise provided in the NAB's witness audits.

Belgium

Since 2014 there have not been any changes in the CA organisation. Three regions, each having its own CA, are involved in MRVA activities: the Ministry of Environment in the Flemish region, the Walloon Air and Climate Agency in the Walloon region and the Ministry of Environment in Brussels region. Regional permitting authorities are involved in permitting for all of these regions.

Best practices identified in the Flemish region:

- Detailed checklist and instructions for the approval of MPs
- Procedure for notification of changes to the MP using templates (changes logbook).
- Monitoring the implementation of improvement reports
- How to check the implementation, establishment, maintenance and documentation of procedures subsequent to MP approval in conformity audits
- EU ETS conformity audit inspection by VBBV (checking compliance of the MP and MRR, checklist and procedures, checks performed)

Best practices identified in the Walloon region:

- IT system carrying out systematic checks
- Peer review for MRVA activities (MP approval, review of AERs and approval of IR)
- Enforcement of the requirement to meet higher tiers if uncertainty assessment shows that higher tier could be achieved
- Close monitoring of installations just below the threshold to assess whether they have exceeded the threshold (contact with those operators)
- Improvement process is embedded in IT system (monitoring when IR need to be submitted)

Bulgaria

Since 2014 there have not been any changes in the CA organisation. The Executive Environment Agency is responsible for permitting, MP approval, addressing notifications of changes to the MP, review AER/VR and approval of IR. Regional inspectorates are carrying out inspection.

Best practice identified:

- Inspectors are trained by the CA responsible for MRVA activities. That CA sometimes accompanies inspectors during inspection;
- Frequency of inspection: each installation is visited every year;
- Structured communication and reporting from regional inspectorates to the Executive Environment Agency and Ministry of Environment;
- Site visits during the MP approval process.

Croatia

The Environmental Agency and the Ministry of Environment and Nature Protection has merged into a single authority responsible for assessment of MP, review of AER/VR, approval of IRs and inspection.

Best practice identified:

- Technical Committee where representatives from CA, the NAB, technical institutes and ministries are represented and that provides technical advice;
- Inspection covering EU ETS aspects and checking compliance with permits and MPs. The inspection is making use of IED approaches and IED tools.

Cyprus

Since 2014 no changes were made in the CA organisation. The Ministry of Agriculture, National Resources and Environment (MANRE) is responsible for all MRVA activities. A technical committee existing of representatives from different ministries and organisations provides technical advice to the Ministry of Environment on all MRVA activities.

Best practice identified:

- Technical Committee providing advice on technical MRVA issues;
- Sector specific checklists for inspection;
- Frequent inspection that result in a concrete list of issues that needs to be addressed before the next inspection.

Czech Republic

Since 2014 there have not been any changes in the CA organisation but internal procedures have strengthened. The Ministry of Environment (MZP) is responsible for permitting, approval of MPs, addressing notification of changes to the MP, review of AER/VR and approval of IR. Regional inspectorates are carrying out inspection.

Best practice identified:

- Technical advice from hydrological and metrological institute and experts on specific MRVA issues;
- Cooperation and communication between the NAB and CA;

- Technical Committee that helps the NAB on technical aspects;
- Monitoring of IR submission deadlines and implementation of improvements in excel tools;
- Including findings in the review of AER/VR in excel tools which are further analysed and for which follow-up actions are identified;
- Involvement of Czech hydro metrological Institute in the review of AER/VR with view to collecting data for UNFCCC reporting;
- Compilation of detailed list of issues that are identified during the review of AER/VR and that are used for communication with the NAB.

Denmark

Since 2014 there have not been any changes in the CA organisation. The Danish Energy Agency is responsible for all MRVA activities.

Best practice identified:

- Strong coordination and cooperation activities between verifiers, NAB and CA in the form of annual meetings, frequent discussion and communication between CA and NAB);
- Electronic system used for MPs, AER and VRs;
- Checklists and tools used during MP approval;
- Article 13 MRR MP templates.

Estonia

Since 2014 there have not been any changes in the CA organisation. The Ministry of Environment is responsible for all MRVA activities. The Environmental Inspectorate under close supervision of the Ministry of Environment is responsible for inspection.

Best practice identified:

- There is an online reporting e-mail system with digital signature;
- Using technical experts in NAB assessments in annual surveillance.

Finland

Since 2014 there have not been any changes in the CA organisation. The Energy Authority is responsible for MRVA activities for installations and the Finish Transport Safety Agency is responsible for MVRA activities for aviation. The government of Åland authorities manages the EU ETS separately, using partially the same instruments

Best practice identified:

- Public access to information on website (permits, MPs, AERs and VRs are published on the website);
- Using templates to record internal MRVA discussions and technical trail of MP and AER/VR assessments;
- Specific guidance and procedures to facilitate the demonstration of compliance with sustainability criteria for biofuels and bioliquids;
- Approach for assessing unreasonable costs (researching examples of costs, requesting information on sources for costs, requiring operators to attach calculations to MP submission;

- IT system based on xml;
- Involving external experts in the approval of MPs for installations using CEMS;
- Checklist the CA uses to check a selection of internal verification documentation;
- System for demonstrating equivalence of a non-accredited lab with ISO 17025. Non accredited labs have to get an expert opinion from the NAB, FINAS. FINAS checks lab documentation, lab procedures, technical competence and any applicable certifications and assesses whether it is equivalent. If equivalence is demonstrated, a certificate is provided to the lab.

France

Since 2014 the number of regions have decreased: 13 regions instead of 26 regions in 2014. The regions are divided into 101 departments. For each region the local authority Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREALs) is responsible for MRVA activities. The IT system is being extended and updated.

Best practice identified:

- Platform on which DREALs and Ministry can communicate with each other;
- Bi-annual meetings between DREALs and Ministry;
- Template used to collect information from DREALs for Article 21 reporting and information exchange to NABs.
- National guidance/ instructions on CA internal web page that can be accessed by all DREALs.

Germany

Since 2014 there have not been many changes in the CA organisation. DEHSt is responsible for all MRVA activities except permitting. Since 2014 DEHSt has been more involved in inspection activities.

Best practice identified:

- IT system, including IT automated checks;
- Guidance, exemplars and FAQ are published on the DEHSt website;
- Helpdesk for operators and verifiers;
- Specific checklists, tools and internal procedures to ensure technical trail and equal treatment between operators;
- Inspectors assigned to specific operators for assessment of MP, AER and IR as well as inspections;
- Training and internal instructions on how to deal with specific MRVA issues (specific training programmes);
- Detailed information included in the work programmes and management reports and CA information exchange reports which make the information shared between NAB and CA easier to understand;
- Inspection of EU ETS aspects and compliance with MP; inspection procedures and approaches (e.g. how to select installations to be inspected).

Greece

Since 2014 there have not been any changes in the CA organisation. The Hellenic Ministry of Environment, Energy and Climate change is responsible for all MRVA activities for operators whereas the Hellenic Civil Aviation Authority is responsible for these activities for aircraft operators.

Best practice identified:

- Using external experts for specific MRV issues;
- Requiring operators to submit a new MP by June each year to ensure the most recent MP is in place before the verification starts.

Hungary

Since 2014 there have not been any changes in the CA organisation. The National Inspectorate for Environment and Nature is responsible for MRVA activities.

Best practice identified:

- Using external resources in checking claims on technical infeasibility and specific MRVA issues;
- Internal coordination meetings, tools and procedures to ensure technical trail and equal treatment between installations;
- Use of IT system for MP, AER and VR;
- Inspection of EU ETS aspects and compliance with MP.

Iceland

Since 2014 there have not been any changes in the CA organisation. The Environment Agency is responsible for all MRVA activities.

Best practice identified:

- Approach for assessing unreasonable costs and technical infeasibility (operator providing information which is confirmed by independent companies or other CAs);
- Detailed checks on AER/VR, including cross checks with external data sources such as green accounting.

Ireland

Since 2014 there have not been any changes in the CA organisation. The Environmental Protection Agency is responsible for all MRVA activities.

Best practice identified:

- Comprehensive AER/VR checklist in IT system, robust AER/VR procedures;
- Use of IT system with automated checks;
- Guidance and EU ETS specific tools and protocols for inspection;
- Training programmes and webinars that are included on the CA website;
- Maintaining a spreadsheet of findings for each operator and aircraft operator in MP approval and AER review process ensuring technical trail and equal treatment;
- Checks carried out by the CA on NAB's work programmes and management reports;
- Compiling and maintaining a detailed list of issues from review AER/VR and inspection for information exchange to NABs;
- Monitoring implementation measures for improvement through IT system;

- The CA utilises external resources in the checking of complex claims regarding the technical infeasibility of implementing a specific monitoring methodology required by the MRR.

Italy

The CA organisation has changed. The National Committee is responsible for taking decisions on MPs, notification of changes to the MP and approval of IRs. The National Committee is supported by the Technical Secretariat consisting of representatives from several ministries and the Technical Support Group. An IT system has been implemented to cover MP, AER, VR, IR and allocation data. This will be operational in fourth trading period.

Best practice identified:

- IT system that covers MP, AER, VR, IR and allocation data and provides access to all parties (operational in 4th trading period);
- Approach for assessing unreasonable costs and technical infeasibility.

Latvia

Since 2014 there have not been changes in the CA organization. An IT system has been implemented to cover all permitting activities, including the EU ETS permit and MP.

Best practice identified:

- Risk based selection with respect to inspection based on installation size, complexity and compliance;
- Internal information system that facilitates recording of technical decisions in the MP approval and AER/VR review processes and helps coordination between CAs;
- On site visits can be organised if significant changes to the MP have been notified.

Liechtenstein

Since 2014 there have not been any changes in the CA organisation. The Office of Environment is the Competent Authority is responsible for all MRVA activities. Only two installations with low emissions are covered by the EU ETS.

Lithuania

MRVA responsibilities for installations have been transferred from regional environmental protection departments to the Environmental Protection Agency. The agency is responsible for approval of MPs, review of AER/VRs, addressing notification of changes to the MP, the review of AER/VR and approval of IR. Regional inspectorates are carrying out inspection.

Best practice identified:

- Involving inspectors in MP approval and permitting process;
- Frequency of inspection and implementation of EU ETS aspects in the inspection: e.g. assessing compliance with the MP;
- Using technical experts in NAB assessments in annual surveillance.

Luxembourg

Since 2014 there have not been any changes in the CA organisation. The Environmental Administration (AEV) is responsible for all MRVA activities.

Best practice identified:

- Frequent contacts between operators, verifiers and CA;
- Experts used in assessment of specific MRV issues such as unreasonable costs and technical infeasibility.

Malta

Since 2014 there have not been any changes in the CA organisation. Malta Resources Authority is responsible for all MRVA activities.

Best practice identified:

- MP is supported by a standard operating procedure which forms part of the installation's environmental management system and includes details of the uncertainty assessment, risk assessment and procedures.
- When a foreign verifier comes to Malta to do a site visit, the CA arranges a pre-meeting with the verifier to ensure a common understanding prior to the site visit.
- Good communication and cooperation with operators during approval process and review process.

The Netherlands

On MRVA there have not been any changes in the CA organisation. The Dutch Emissions Authority is responsible for all MRVA activities.

Best practice identified:

- Excel checklist for MP and AER review. MP checklist is linked with COM template and is used to capture internal decisions and to communicate with operators;
- Internal coordination procedures to ensure technical trail and equal treatment between installations;
- Involving external resources for checking technical infeasibility and other complex MRV issues
- Annual meetings with the NAB, CA and verifiers;
- Procedures in checking uncertainty assessment and compliance with CEMS requirements;
- EU ETS specific inspection procedures and tools used during inspection. Detailed checks are carried out by personnel that are experienced in EU ETS elements. These inspectors also review the AER/VR;
- Risk based approaches in selecting the AER/VR to be assessed in detail and to select the installations to be inspected;
- Compilation of detailed list of issues from review AER/VR and inspection to be shared in CA information exchange report to the NAB;
- Specific guidance and sector specific examples published on the website.

Norway

Since 2014 there have not been any changes to the CA organisation. The Norwegian Environment Agency is responsible for all MRVA activities. An IT system has been implemented.

Best practice identified:

- A number of case workers work on the MP approval and AER/VR review. Peer reviewers are assigned for every case worker. If there is a lack of knowledge training is organised.
- IT system for MP, AER and VR processes;
- Approach in assessing unreasonable costs and technical infeasibility;
- Regular meetings between NABs and CAs.

Poland

Local Environmental authorities are responsible for permitting, the approval of MPs, addressing notification of changes to the MP and approval of IR. Since 2015 the central authority, KOBIZE, is required by law to provide a technical opinion on each MP, notification of changes and IR. Local authorities follow-up these technical opinions when approving MP and IRs. KOBIZE reviews AER/VRs. Local authorities are required to provide the central authority with the necessary information.

Best practice identified:

- The Central Authority provides technical advice on each MP and notification of changes to the MP;
- Measures taken to ensure information from regional authorities is provided to the central authority providing technical advice on MPs;
- Regular meetings/communication between NABs and CAs.

Portugal

Since 2014 there have not been any changes to the MP. The Agência Portuguesa do Ambiente (APA) is responsible for permitting, approval of MPs, addressing notification of changes to the MP, review of AER/VR and approval of IR. Inspection is carried out by a separate organisation, the General Inspectorate of Agriculture, Sea, Environment and Spatial Planning (IGAMAOT). An IT system has been implemented covering permits, MP, AER, VR, IR, data collection for allocation.

Best practice identified:

- Checking and monitoring of time allocation of verifiers;
- IT system covering the MRV workflow;
- Regular meetings/communication between the NAB and CA.

Romania

Since 2014 there have not been any changes in the CA organisation. The Ministry of Environment and Climate Change (MECC) is responsible for all main compliance tasks. CAs at local level (LEPAs) which are coordinated by MECC, inform MECC by the end of each year on new ETS installations and provide data which is used for crosschecking by MECC.

Best practice identified:

- Cooperation and communication between the NAB and CA (e.g. in the form of regular meetings and frequent communication);
- Local environmental protection authorities have to inform the CA of any developments/changes concerning installations falling under EU ETS (regarding the scope of EU ETS)
- Detailed reports on inspection findings that are submitted to the EU ETS CA.

Slovakia

Since 2014 there have not been any changes to the CA organisation. Environmental District Offices are responsible for MRVA activities. General inspections are carried out by the Slovak Environmental Inspection Authorities on operators of installations. In 2018 an IT system has been implemented covering MP, AER, VR, IR as well as data collection for allocation

Best practice identified:

- Strong communication between District Offices and Ministry;
- IT system covering MP, AER, VR, IR and allocation data processes;
- Using technical experts in NAB assessments during annual surveillance.

Slovenia

Since 2014 there have not been any changes in the CA organisation. The Slovenian Environment Agency is responsible for permitting, MP approval, addressing notification of changes to the MP, review of AER/VR and approval of IR whereas the inspectorate is carrying out inspection.

Best practice identified:

- IT system;
- Checks with external data sources in the review of AER/VR, including information from other reporting mechanisms and information from the CO_2 tax system;
- Cooperation and communication between NAB and CA.

Spain

Since 2014 there have not been any changes in the CA organisation. There are 19 regional authorities responsible for MRVA activities within their region.

Best practice identified:

- Coordination between different regional authorities, e.g. using a working group and coordination commission where regional CA, Ministry and NAB regularly convene to discuss MRV issues;
- Strong feedback loops between regional authorities, Ministry, NAB and verifiers;
- CA is invited to join witness audits of NABs;
- Using technical experts in some of the specific MRV issues such as CEMS.

Sweden

Responsibilities have been transferred from the Regional County Administrative Boards to the Swedish Environmental Protection Agency. That Agency is now responsible for the approval of MPs, AER/VR review, addressing notification of changes to the MPs, approval of IRs and inspection and enforcement.

Best practice identified:

- Guidance on how to demonstrate that the sustainability criteria have been met for biofuels and bioliquids;
- Specific checklist, coordination procedures and tools to ensure technical trail and equal treatment between installations;
- Specific training programmes and opportunities for CA staff;
- Risk based approaches to review AER/VR;
- Cooperation and communication with the NAB.

United Kingdom

Since 2014 there have not been any changes in the CA organisation. There are five regional authorities responsible for all MRVA activities within their region.

Best practice identified:

- IT system with automated checks covering all work flow processes;
- Elaborate training programmes for CA staff (training database and training modules);
- Helpdesk for operators and aircraft operators;
- Specific checklist, coordination procedures and tools to ensure technical trail and equal treatment between installations;
- Compliance manual focusing on compliance chain MRV processes;
- UK emissions trading group which brings together representatives of DECC, the CAs, UKAS, verifiers and industry.
- How to monitor implementation of improvement measures using the IT system;
- Risk based approaches in the review of AER/VR processes and inspection;
- Checks carried out by the CA on NAB work programmes and management reports;
- Compilation of list of detailed issues from review AER/VR and inspection for communication to NAB in CA information exchange report.