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**COMMISSION STAFF WORKING DOCUMENT**

*Accompanying the document*

**Report from the Commission to the European Parliament and the Council  
on the Functioning of the European carbon market in 2021 pursuant to Articles 10(5)  
and 21(2) of Directive 2003/87/EC (as amended by Directive 2009/29/EC and Directive  
(EU) 2018/410)**

{COM(2022) 516 final}

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## Appendix 1 – ETS scope

Figure 1.1. Number of installations per emissions category in 2021.

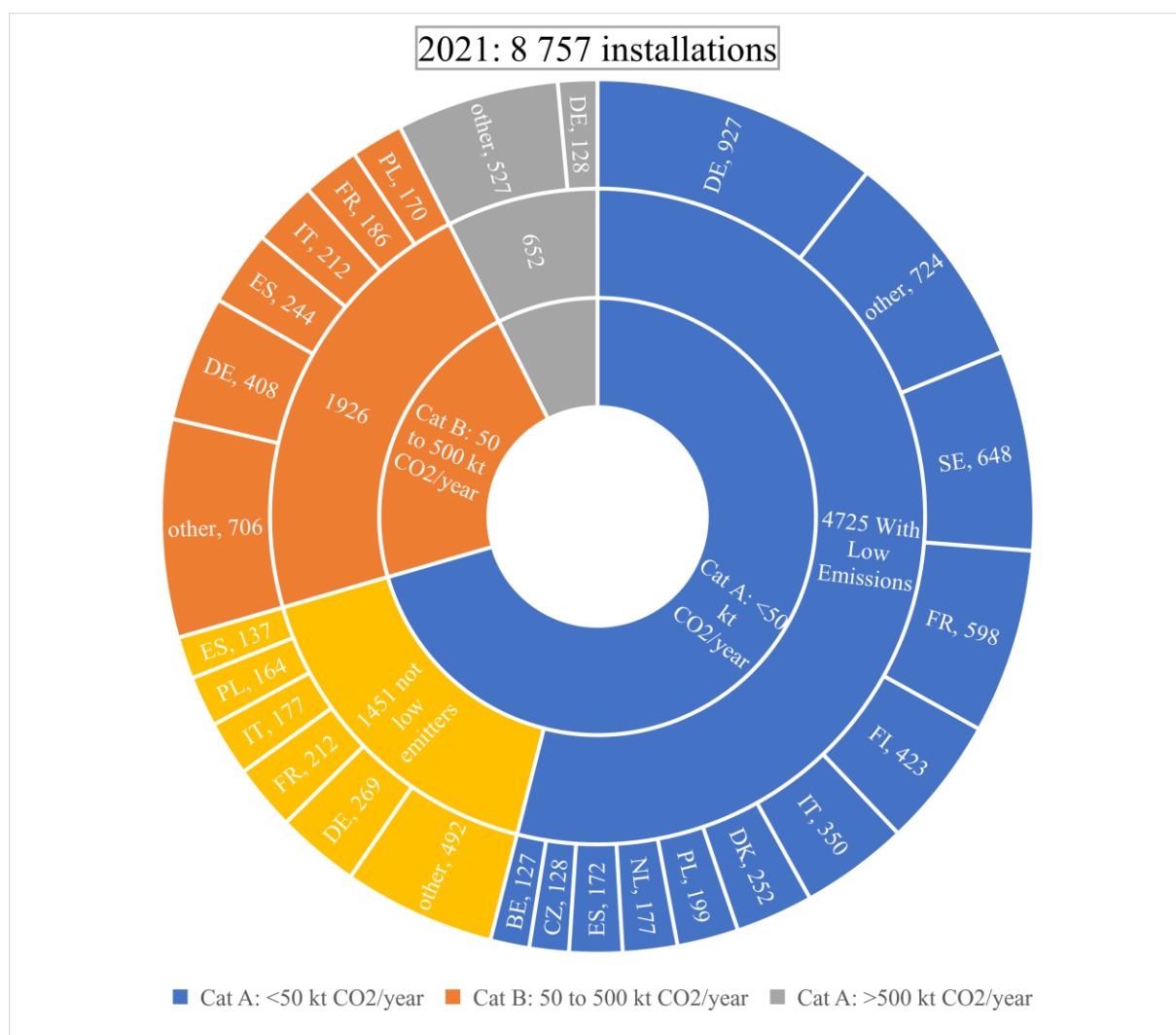


Table 1.1. Countries reporting non-CO<sub>2</sub> emissions from EU ETS activities in 2021.

Gas	Activity	Number of countries	EU ETS country
PFCs	Primary aluminium	12	DE, ES, FR, GR, IS, IT, NL, NO, RO, SE, SI, SK
N <sub>2</sub> O	Nitric acid	19	AT, BE, BG, CZ, DE, ES, FI, FR, GR, HR, HU, IT, LT, NL, NO, PL, PT, RO, SK
	Adipic acid	3	DE, FR, IT
	Glyoxal and glyoxylic acid	3	DE, FR, IT

## Appendix 2 – Auction revenues

Table 2.1. Revenues from the auctioning of general and aviation allowances in 2021 (EU27).

EU ETS country	Revenues in 2021 [million EUR]	
	General allowances	Aviation allowances
AT	306.6	4.4
BE	527.3	5.9
BG	830.9	2.0
CY	77.0	1.4
CZ	601.9	2.1
DE	5 270.9	35.3
DK	287.6	5.3
EE	248.1	0.6
EL	1 003.9	10.7
ES	2 452.4	30.5
FI	404.6	4.4
FR	1 446.0	23.1
HR	110.7	1.6
HU	286.2	2.0
IE	145.3	4.0
IT	2 495.8	25.2
LT	85.3	0.9
LU	7.3	0.7
LV	61.3	1.1
MT	29.5	1.2
NL	885.2	8.8
PL	5 588.6	5.0
PT	505.9	8.0
RO	480.1	3.8
SE	214.5	7.6
SI	129.8	0.3
SK	275.8	0.3
<b>Total</b>	<b>24 758.6</b>	<b>196.1</b>

Table 2.2. Revenues from the auctioning of general and aviation allowances in 2021 (EFTA countries).

EU ETS participating country	Revenues in 2021 [million EUR]	
	General allowances	Aviation allowances
Iceland	3.9	1.9
Liechtenstein	0.2	-
Norway	174.5	8.6
<b>Total</b>	178.6	10.5

Table 2.3. Revenues from the auctioning of allowances for the Innovation and Modernisation Funds.

Fund	Revenues [million EUR]	
	2020	2021
Innovation Fund	1 333.8	2 163.2
Modernisation Fund	-	3 751.7
<b>Total</b>	1 333.8	5 915.0

Table 2.4. Projects supported under the InnovFin EDP and CEF DI (through NER 300 funds), June 2020 - June 2022.

Project title	Description
Provence Grand Large Floating Offshore Wind Project (InnovFin EDP)	The project concerns the design, installation, operation and maintenance of a floating offshore wind farm about off the coast of Marseille, France in 100m Water Depth. The project will consist of three 8MW turbines which will be mounted in an innovative floating. The NER 300 contribution in form of loans) amounts to EUR 50 million.
CH New Charging and Energy Storage Solutions (InnovFin EDP)	The proposed technology platform allows the integration of electric vehicles (“EVs”) into the power grid by aggregating and leveraging the energy storage potential of end-user EVs batteries as stationary storage devices in order to provide power system services. The project’s demonstration is located in Germany, France and the Netherlands and the NER 300 contribution amounts to EUR 2.1 million.
DK Everfuel Green Hydrogen Project	The project comprises the deployment of a hydrogen distribution infrastructure and a hydrogen production plant, to supply green hydrogen to a large-scale fleet of fuel cell electric buses in Denmark. The financing of EUR 20.7 million is supported under the Future Mobility product, backed by the Connecting Europe Facility and the NER300 Programme.

ES Evervest	The project consists of the roll out of an electric vehicle charging network involving the deployment of 476 charging points in 200 sites over a 3-year implementation period. Charging points will only sell electricity sourced from renewable sources backed by relevant certificates. This project requested the EIB loan of EUR 50 million, fully covered from NER300 unspent funds.
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Table 2.5. Total number of allowances in the Modernisation Fund per beneficiary Member State for phase 4 (2021-30).

Member State	Share as per Annex IIb of the EU ETS Directive	Allowances as per Article 10(1) of the EU ETS Directive	Transfers from Article 10(2)(b) of the EU ETS Directive (solidarity)	Transfers from Article 10c of the EU ETS Directive	Total transfers from Article 10(2)(b) (solidarity) and Article 10c	Total
BG	5.84%	16 095 825	0	0	0	16 095 825
CZ	15.59%	42 968 135	38 722 276	111 462 281	150 184 557	193 152 692
EE	2.78%	7 662 054	0	0	0	7 662 054
HR	3.14%	8 654 262	0	5 978 852	5 978 852	14 633 114
LV	1.44%	3 968 834	0	0	0	3 968 834
LT	2.57%	7 083 265	0	8 696 818	8 696 818	15 780 083
HU	7.12%	19 623 677	0	0	0	19 623 677
PL	43.41%	119 643 793	0	0	0	119 643 793
RO	11.98%	33 018 490	81 673 875	86 073 704	167 747 579	200 766 069
SK	6.13%	16 895 104	1 783 231	33 228 414	35 011 645	51 906 749
<b>Total</b>	100.00%	275 613 439	122 179 383	245 440 068	367 619 451	643 232 890

## Appendix 3 – Balancing supply and demand

Figure 3.1. TNAC methodology

A key notion for the functioning of the Market Stability Reserve (MSR) is the total number of allowances in circulation (TNAC). Allowances are added to the reserve if the TNAC is above a predefined upper threshold (833 million allowances), and are released from the reserve if the TNAC is below a predefined lower threshold (below 400 million allowances)\*. The MSR absorbs or releases allowances when the circulating volume is outside of a predefined range. Backloaded and so-called unallocated\*\* allowances were also put in the reserve. From 2023 onwards, allowances held in the MSR exceeding the previous year's auction volume will no longer be valid.

The TNAC relevant for determining the MSR feeds and releases is calculated on the basis of the following formula:

$$\text{TNAC} = \text{Supply} - (\text{Demand} + \text{allowances in the MSR})$$

The components of supply and demand used in the formula are described in the Communication from the European Commission on the TNAC, published annually in May.\*\*\*

\* Or where measures are adopted under Article 29a of the EU ETS Directive.

\*\*Unallocated allowances are allowances not allocated pursuant to Article 10a(7) of the EU ETS Directive, i.e. allowances remaining in the new entrants' reserve, and resulting from the application of Article 10a(19) and (20), i.e. allowances foreseen for free allocation to installations but remaining unallocated because of (partial) cessation of operations or significant capacity reductions. De facto "unallocated" allowances stemming from the application of the relevant carbon leakage factor to sectors not included in the carbon leakage list during the current period, as well as any allowances that are not allocated under Article 10c of the ETS Directive, are not foreseen to be placed in the MSR under Article 1(3) of [Decision \(EU\) 2015/1814](#). Such allowances are therefore not covered (please refer to p. 225 of the Impact Assessment (SWD(2015)135 final) accompanying the 2015 proposal for revision of the EU ETS Directive).

\*\*\*See the latest TNAC Communication, published in May 2022: [C/2022/4874](#).

Table 3.1. Annual contributions to the Market Stability Reserve by EU ETS country.

<b>EU ETS country</b>	<b>2021</b>	<b>2022</b>
AT	5 563 187	6 345 090
BE	9 228 856	10 525 966
BG	6 531 499	7 449 497
CY	874 285	997 166
CZ	14 108 876	16 091 870
DE	80 029 579	91 277 689
DK	5 005 490	5 709 009
EE	2 225 742	2 538 569
EL	11 888 232	13 559 116
ES	30 610 010	34 912 228
FI	6 682 443	7 621 657
FR	21 881 211	24 956 603
HR	1 513 604	1 726 341
HU	4 381 023	4 996 772
IE	3 740 851	4 266 625
IS	156 001	177 927
IT	37 775 362	43 084 666
LI	3 492	3 982
LT	1 100 842	1 255 564
LU	438 053	499 621
LV	480 330	547 840
MT	332 525	379 262
NL	13 394 277	15 276 835
NO	3 106 500	3 543 117
PL	34 583 085	39 443 717
PT	6 072 075	6 925 501
RO	11 604 041	13 234 982
SE	3 246 409	3 702 690
SI	1 478 674	1 686 501
SK	4 206 047	4 797 204
NI (Northern Ireland)	883 013	1 007 119



## Appendix 4 – Monitoring, reporting and verification

Table 4.1. Accreditation and verification in the EU ETS in 2021<sup>1</sup>.

Aspect	Countries	Number	Differences per country compared to 2020
Number of verifiers accredited by the National Accreditation Body of a Member States – for installations	23	106	AT(2), BE(2), BG(3), CZ(5), DE(16), DK(3), EE(1), EL(5), ES(6), FI(4), FR(6), HR(2), HU(5), IT(10), LV(3), NL(3), NO(3), PL(8), PT(3), RO(6), SE(4), SI(2), SK(4)
Number of verifiers accredited by the National Accreditation Body of a Member State- for aviation	12	23	AT(1), CZ(1), DE(4), EL(3), ES(2), FR(2), IT(3), LV(1), PT(2), RO(2), SI(1), SK(1)
Number of verifiers accredited by another Member State - for installations	24	57	AT(1), BE(4), BG(4), CY(2), CZ(1), DK(1), EE(3), ES(3), FR(1), HR(1), HU(3), IE(6), IS(2), LT(3), LU(4), MT(1), NL(2), NO(2), PL(3), PT(1), RO(2), SE(4), SK(1), XI(2)
Number of verifiers accredited by a national accreditation body in another Member State - for aviation	23	39	AT(2), BE(3), BG(1), CY(1), DK(1), EE(1), ES(1), FI(1), HR(1), HU(1), IE(2), IS(1), IT(3), LT(2), LU(2), MT(3), NL(2), NO(3), PL(3), PT(1), RO(1), SE(2), SK(1)
Number of complaints made about verifiers	6	28	DE(4), ES(16), FR(4), LV(1), RO(2), SE(1)
Number of resolved complaints	5	26	DE(4), ES(16), FR(3), RO(2), SE(1)
Number of complaints from prior reports, not reported as resolved earlier and meanwhile resolved	1	11	DE(11)
Number of non-conformities for verifiers reported in the information exchange	8	64	AT(10), BG(10), FI(18), FR(3), HR(10), HU(5), IE(3), NO(5)
Number of non-conformities above resolved	8	46	AT(10), BG(5), FI(9), FR(3), HR(10), HU(5), IE(3), NO(1)
Number of non-conformities from prior reports, not reported as resolved earlier and meanwhile resolved	3	24	BG(4), DE(11), FI(9)
Verifiers suspended	1	2	NO(2)
Withdrawal of accreditation certificate	1	1	FR(1)
Scope of accreditation reduced	6	7	DE(2), DK(1), FI(1), FR(1), NO(1), SE(1)

<sup>1</sup> The maximum number of countries is 30 because Liechtenstein did not have any active operators in 2021.

Table 4.2. EU ETS coordination between competent authorities in 2021<sup>2</sup>.

Aspect	Number of countries and list of relevant countries	
Does a central competent authority review monitoring plans, annual emission reports and improvement reports in addition to local and regional authorities on a regular basis?	11	AT, BG, ES, HR, HU, LT, NL, PL, SE, SI, XI
Does a central competent authority steer local and/or regional competent authorities by giving binding instructions and guidance?	5	BG, FR, NL, SK, XI
Does a central competent authority steer local and/or regional competent authorities by giving non-binding instructions and guidance?	5	AT, FI, LT, PL, PT
Are regular meetings organised with the competent authorities?	9	BE, BG, EL, ES, FR, NL, PT, SE, XI
Is common training organised for all competent authorities to ensure harmonised implementation of requirements?	8	AT, BG, FR, NL, PT, SE, SK, XI
Is a structured working or coordination group established, where competent authority staff, discusses monitoring and reporting issues and develops common approaches?	10	BG, EL, ES, FR, HR, HU, NL, PT, SE, XI

<sup>2</sup> The maximum number of countries is 30 because Liechtenstein did not have any active operators in 2021.

Table 4.3. Administrative charges in the EU ETS in 2021<sup>3</sup>.

Aspect		Number of countries and list of relevant countries (values in EUR)	
Installations	Are fees charged to operators?	16	AT, BG, CZ, DK, ES, FI, HR, HU, IS, IT, NO, PL, PT, RO, SI, XI
	Permit issuance/monitoring plan approval	14	BG(250), CZ(400), ES(985.35), FI(500), HR(5), HU(257), IS(3500), IT(250), NO(3356), PL(17.52), PT(207.96), RO(360), SI(22.6), XI(7729.2)
	Permit update	13	BG(100), ES(393.33), FI(400), HR(5), HU(143), IS(780), IT(62), NO(1007), PL(2.13), PT(103.97), RO(360), SI(22.6), XI(546.92)
	Permit transfer	8	FI(500), HR(5), HU(143), IS(780), IT(62), PL(2.13), SI(22.6), XI(546.92)
	Permit surrender	3	IT(62), PL(2.13), XI(870.1)
	New entrant reserve application	8	BG(500), HR(5), HU(652.5), IS(2600), IT(62), PT(1455.69), SI(22.6), XI(1447.53)
	Annual subsistence charge amount	3	DK(4854), IT(250), XI(5277)
Aircraft operators	Are fees charged to aircraft operators?	13	AT, BG, DK, FI, HR, HU, IS, IT, NO, PL, PT, RO, SI
	Approval of monitoring plan for emissions	11	BG(500), FI(700), HR(5), HU(540), IS(3100), IT(250), NO(3000), PL(2.13), PT(279.14), RO(2000), SI(22.6)
	Approval of change to monitoring plan for emissions	11	BG(50), FI(250), HR(5), HU(540), IS(1080), IT(62), NO(800), PL(2.13), PT(139.57), RO(500), SI(22.6)
	Approval of monitoring plan for tonne-kilometre data	8	BG(500), HU(540), IS(3100), IT(62), PL(2.13), PT(279.14), RO(2500), SI(22.6)
	Approval of change to monitoring plan for tonne-kilometre data	8	BG(50), HU(540), IS(1080), IT(62), PL(2.13), PT(139.57), RO(500), SI(22.6)
	Transfer of monitoring plan	5	HR(5), HU(540), IS(1080), IT(62), SI(22.6)
	Surrender of monitoring plan	1	IT(62)

<sup>3</sup> The maximum number of countries is 30 because Liechtenstein did not have any active operators in 2021.

Table 4.4. Compliance checks in the EU ETS in 2021<sup>4</sup>.

Type of check		Number of EU ETS countries (% or number per relevant country)	
Installations	Share of the emissions reports checked for completeness and internal consistency (%)	30	AT(100%), BE(100%), BG(100%), CY(100%), CZ(100%), DE(100%), DK(100%), EE(100%), EL(100%), ES(100%), FI(100%), FR(100%), HR(100%), HU(100%), IE(90%), IS(100%), IT(100%), LT(100%), LU(100%), LV(100%), MT(100%), NL(100%), NO(100%), PL(100%), PT(100%), RO(100%), SE(100%), SI(100%), SK(100%), XI(100%)
	Share of the emissions reports checked for consistency with the monitoring plan (%)	29	AT(20%), BE(70%), BG(100%), CY(100%), CZ(30%), DE(100%), DK(100%), EE(100%), EL(100%), ES(90%), FI(100%), FR(70%), HR(100%), HU(100%), IE(90%), IS(100%), LT(80%), LU(100%), LV(100%), MT(100%), NL(100%), NO(100%), PL(100%), PT(100%), RO(100%), SE(3%), SI(100%), SK(100%), XI(100%)
	Share of the emissions reports that were cross-checked with allocation data (%)	23	AT(20%), BE(100%), BG(100%), CY(100%), CZ(10%), DK(100%), EE(100%), EL(100%), ES(43%), FI(100%), FR(100%), HU(100%), IE(1%), IS(100%), LT(80%), LU(100%), LV(100%), PL(100%), PT(100%), RO(100%), SI(100%), SK(100%), XI(100%)
	Share of the emissions reports that were cross-checked with other data (%).	21	AT(20%), BE(100%), BG(100%), CY(100%), CZ(30%), DK(79%), EE(100%), EL(100%), ES(34%), FR(100%), HR(100%), LT(80%), LU(100%), NL(100%), NO(100%), PT(100%), RO(100%), SE(100%), SI(100%), SK(100%), XI(100%)
	Share of the emissions reports that were analysed in detail (%).	25	AT(20%), BE(11%), BG(8%), CY(100%), CZ(30%), DK(54%), EE(100%), EL(50%), ES(23%), FI(100%), FR(30%), HR(100%), IE(90%), IS(100%), LT(100%), LU(100%), MT(100%), NL(25%), NO(100%), PL(100%), PT(100%), RO(100%), SE(3%), SK(100%), XI(100%)
	Number of verified emissions reports that were rejected because of non-compliance	2	FR(1), RO(1)
	Number of verified emissions reports that were rejected because of other reasons.	5	ES(5), FR(4), LT(16), NO(3), PT(26)
Aircraft operators	Share of the emissions reports checked for completeness and internal consistency (%)	26	AT(100%), BE(50%), BG(100%), CY(100%), CZ(100%), DE(100%), DK(100%), EE(100%), EL(100%), ES(100%), FI(100%), FR(100%), HR(100%), IE(100%), IS(100%), IT(100%), LT(100%), LU(100%), MT(100%), NL(100%), NO(100%), PL(100%), PT(100%), RO(100%), SE(100%), SK(100%)
	Share of the emissions reports checked for consistency with the monitoring plan (%)	24	AT(100%), BE(50%), BG(100%), CY(100%), CZ(50%), DE(100%), DK(100%), EE(100%), EL(100%), ES(100%), FI(100%), HR(100%), IS(100%), IT(60%), LT(100%), LU(100%), MT(100%), NL(14%), NO(100%), PL(100%), PT(100%), RO(100%), SE(100%), SK(100%)
	Share of the emissions reports that were cross-	23	AT(100%), BE(100%), BG(100%), CY(100%), DE(100%), DK(100%), EE(100%), EL(100%), ES(100%), FI(100%),

<sup>4</sup> The maximum number of countries is 30 because Liechtenstein did not have any active operators in 2021.

checked with other data (%)		FR(100%), HR(100%), IS(67%), IT(100%), LT(100%), LU(100%), MT(100%), NL(100%), NO(100%), PT(100%), RO(100%), SE(100%), SK(100%)
Share of the emissions reports that were analysed in detail (%).	23	AT(100%), BG(100%), CY(100%), DE(100%), DK(30%), EE(100%), EL(100%), ES(100%), FI(100%), FR(80%), HR(100%), IS(100%), IT(50%), LT(100%), LU(100%), MT(100%), NL(14%), NO(50%), PL(100%), PT(100%), RO(100%), SE(45%), SK(100%)
Number of verified emissions reports that were rejected because of non-compliance	0	-
Number of verified emissions reports that were rejected because of other reasons.	1	PT(3)

Table 4.5. EU ETS compliance measures in 2021<sup>5</sup>.

Compliance measures		Countries	
Installations	Onsite inspections	17	AT, BE, BG, CY, EL, ES, FR, HR, HU, IS, LT, NL, NO, PL, RO, SE, SI
	Have preventive measures been taken to ensure operator's compliance?	17	AT, BG, CZ, DE, DK, EE, ES, FI, FR, HR, HU, LU, NL, NO, PL, SE, SI
	Ensuring that selling of emission allowances is prohibited in the case of irregularities	7	AT, BG, CZ, DE, FR, SI, SK
	Imprisonment possible?	8	BE, CY, DK, EE, IE, LU, NO, SE
Aircraft operators	Onsite inspections	0	-
	Have preventive measures been taken to ensure aircraft operator's compliance?	4	AT, CZ, DE, RO
	Ensuring that selling of emission allowances is prohibited in the case of irregularities	12	AT, CY, CZ, DE, EE, FI, HR, IS, LU, NO, RO, SE
	Imprisonment possible?	6	CY, DK, IE, LU, NO, SE

Table 4.6. Excess emissions penalties in the EU ETS in 2021<sup>6</sup>.

Penalty	Countries	Number of operators and country	
Imposition of excess emission penalties to installation	8	29	CZ(2), DE(1), DK(1), ES(4), HR(1), HU(9), PL(1), RO(10)
Imposition of excess emission penalties to aircraft operators	4	9	BE(1), DE(3), ES(4), IE(1)

<sup>5</sup> The maximum number of countries is 30 because Liechtenstein did not have any active operators in 2021.

<sup>6</sup> The maximum number of countries is 30 because Liechtenstein did not have any active operators in 2021.