European Emissions Trading System (ETS) – Calculations on the regional employment impact of ETS installations

Analytical and methodological report

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1. OBJECTIVES OF THE STUDY AND SOURCES OF DATA

The overall objective of this assignment was to calculate the regional employment impact of EU ETS installations in NUTS 2 and NUTS 3 regions in the EU-27, Iceland, Liechtenstein, Norway, and the UK[1]. The core task of this study was to develop a new database that would include information on EU ETS installations gathered from different data sources (the European Commission, the Orbis company database, and Eurostat).

While the study mainly focuses on the number of people employed by the EU ETS installations in the regions, it also sheds light on other policy-relevant angles, for example, it also analyses the employment of EU ETS installations in the context of economic activities pursued or the amount of greenhouse gas emissions emitted in the regions.

The main information on **17 535 installations** participating in the EU Emissions Trading System was provided by the European Commission. The categories of data provided included identification information of installations, their activity type, and emissions-related data.

To match the information of EU ETS installations to corresponding company economic parameters, we used the **Orbis** database of companies. Using the information on installations allowed us to identify companies that own the installations. Having matched the companies, we extracted and incorporated their identification data and economic data, focusing on the number of employees.

Orbis[2] is a leading database for company data and is owned by Bureau van Dijk (a Moody's Analytics company since 2017). Orbis offers information on more than 400 million companies and entities worldwide, providing various data categories and storing historical data. Orbis's data vary from the company's contact information and company profile to data on its financials, ownership, and management. The database captures and blends data from more than 160 different sources and standardises it to allow companies to be compared.

To assess the regional employment impact of EU ETS installations, we also exploited **Eurostat** data on employment in NUTS 3, NUTS 2, NUTS 1 regions. We extracted such data for EU-27, IS, LI, NO, and the UK for the years 2011-2019. The basic reference year is 2018. All the methodological choices and detailed explanation on how data shortcomings were solved are presented in the methodological report of this study, which is annexed to this report.

2. OVERVIEW OF STUDY METHODOLOGY AND ITS LIMITATIONS

Out of 17 535 installations, we matched 16 365 (93%) to companies in the Orbis database. However, the **calculations for employment at EU ETS installations are based on the data of 12 634 installations (72%)** for the following reasons. First, the analysis excludes aircraft operators (1 575) as the corresponding companies are typically based outside EU ETS[3] countries. Second, stationary installations that could not be matched in Orbis (695) or with no employment or location data available (1 924) were also excluded from the employment analysis. As a result, out of 15 960 stationary EU ETS installations, 12 634 installations (79%) are included in the analysis.

[1] The end of the Brexit transition period on 31 December 2020 brought an end to the UK's participation in the EU Emissions Trading System (the EU ETS). However, under the terms of the Northern Ireland Protocol, Northern Ireland Electricity Generators continue to be participants in the European Union Emissions Trading System (EU ETS). This study presents the UK as part of the EU ETS system because the study, which started in 2020, focuses on the years 2011-2019.

[2] See https://www.bvdinfo.com/en-gb/.

[3] Even though the specific accounts or aircraft company divisions were assigned to a European country in the data provided by the EC, 1 039 aircraft operators matched in Orbis are based in countries not covered by the EU ETS. These are mainly international airlines or companies providing services to airlines, where only the main company's account or its headquarters is available in Orbis. Most of the aircraft operators outside the EU ETS geo-scope are registered in the US (312), British Overseas Territories (e.g. Bermuda) (41), and Switzerland (32). Out of aircraft companies identified as registered in Europe (based on data from the Orbis database), most of them are in the UK (91), Germany (85), and France (34).

Stationary EU ETS installations, which are included in the analysis, are matched to companies in Orbis either[4] at the installation level[5] (2 786) or the account holder level (9 848)[6]. While we can be quite confident about the precision of employment data for the first sub-set, in the second sub-set, installations are matched to their parent companies, many of which are large companies, sometimes even international corporations, often owning multiple EU ETS installations. Hence, their employment data refer not to a specific installation but a bigger company with a much higher number of employees.

To solve this data limitation, for installations that had been matched at the account holder level, we adjusted their employment data with estimates. Namely, in cases when employment data of the installation matched at the account holder level exceeded the maximum number of employees per installation matched at the installation level (active in the same economic activity), the employment data of the installation was replaced by the median value of similar installations from the sub-set of installations matched at the installation level[7]. Nevertheless, due to most installations being matched at the account holder level, an overestimation of the employment impact in the regions can be expected.

Another data limitation was related to incomplete economic data in Orbis available for matched companies. We had to exclude companies from the analysis when no employment data were available. For installations that lacked employment data only for specific years, we used linear interpolation of existing data entries to fill the gaps.

A simplified summary of installations included in the employment analysis of this study, as well as the logic of installations to be assigned to a sub-set for calculating estimations, is explained in Figure 1. All estimates are clearly marked in the database and described in detail in the methodological report available in Annex 1.

The report presents study results for stationary EU ETS installations, focusing on the installations located in the EU-27 (Table 1 provides information on the number of stationary installations in the EU-27 and in the EU-27 plus Iceland, Liechtenstein, Norway, and the UK). The report shows the situation in 2018. As explained above, some employment data include estimates. Annex 1 presents the study's methodology. Annex 2 includes extra maps and tables that show results for all EU ETS countries or other additional data. Country fiches for the EU Member States are provided in Annex 3.

Table 1. Stationary EU ETS installations in the EU-27 and IS, LI, NO, UK

	All installations	Installations for which NUTS region is know	Installations for which employment data are available
EU-27 and IS, LI, NO, UK	15 960 (100%)	15 910 (99,7%)	12 634 (79%)
EU-27	14 289 (100%)	14 239 (99,7%)	11 575 (81%)

Source: PPMI.

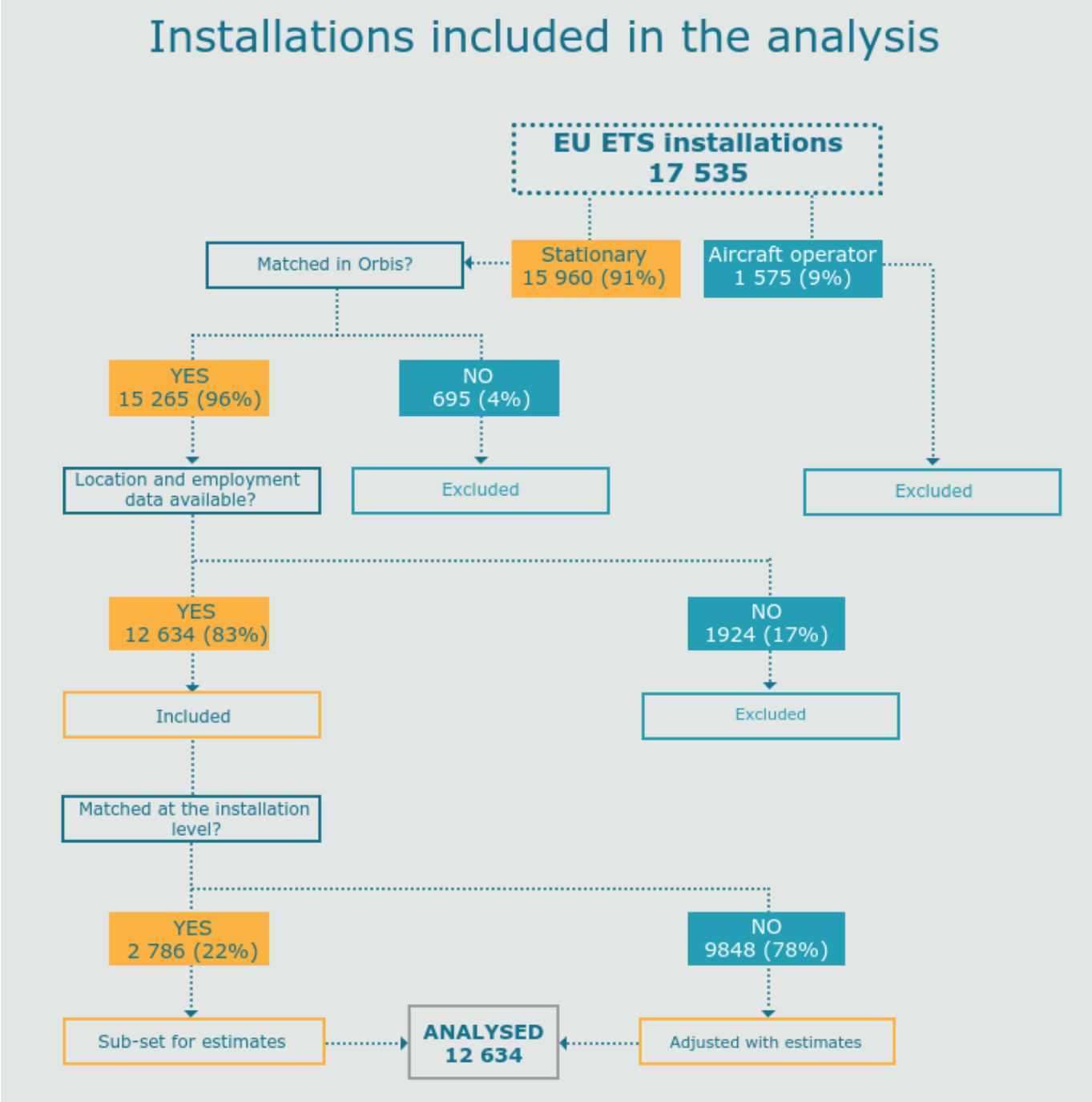
[4] The precision of matching depended on how accurate the installations' names were in the EC list and the varying quality and availability of company data in Orbis.

[5] We consider that the match is at the installation level when the company address in Orbis matches the installation address in the EC dataset (also, the company is active, owns only one installation, and at least some employment data is available).

[6] Account holder is typically a larger company that owns one or more installations, so the employment data of the account holder does not reflect the employment in the specific installations. Information to identify the account holder was available in the data provided by the European Commission.

[7] The sub-set contains 2 786 stationary EU ETS installations that were matched at installation level (addresses are the same in the EC data and Orbis), have no duplicate company IDs in Orbis data (BvD_ID), are active companies, and have at least one employment data entry for years 2011-2019.

Figure 1. The logic of including installations in the employment analysis



Source: PPMI.

3. SUMMARY OF THE CHARACTERISTICS OF EU ETS INSTALLATIONS

The geographical spread of installations across NUTS 2 regions

Out of 15 910[8] stationary installations, the vast majority (14 239) are based in the EU-27 countries. All installations in the EU-27 are spread across 234 NUTS 2 regions, with the median value of 45.5 installations per region and the highest number of 312 installations in the region. Table 2 below provides a summary of the geographical spread of the installations.

Table 2. EU ETS stationary installations in NUTS 2 regions in 2018 (summary)

	EU-27	EU-27 and IS, LI, NO, UK
Number of NUTS 2 regions covered	234	286
Number of installations included	14 239	15 910
Average number of installations per region	61	56
Maximum number of installations per region	312	312
Median number of installations per region	45.5	42

Source: PPMI

Regions with the most EU ETS stationary installations are mainly located in Western and Southern Europe, with a few NUTS 2 regions in Northern and Central Europe on the list. Table 3 identifies the NUTS 2 regions in the EU-27 with the highest number of EU ETS installations in 2018.

Table 3. Top 20 NUTS 2 regions by number of EU ETS stationary installations in the EU-27 in 2018

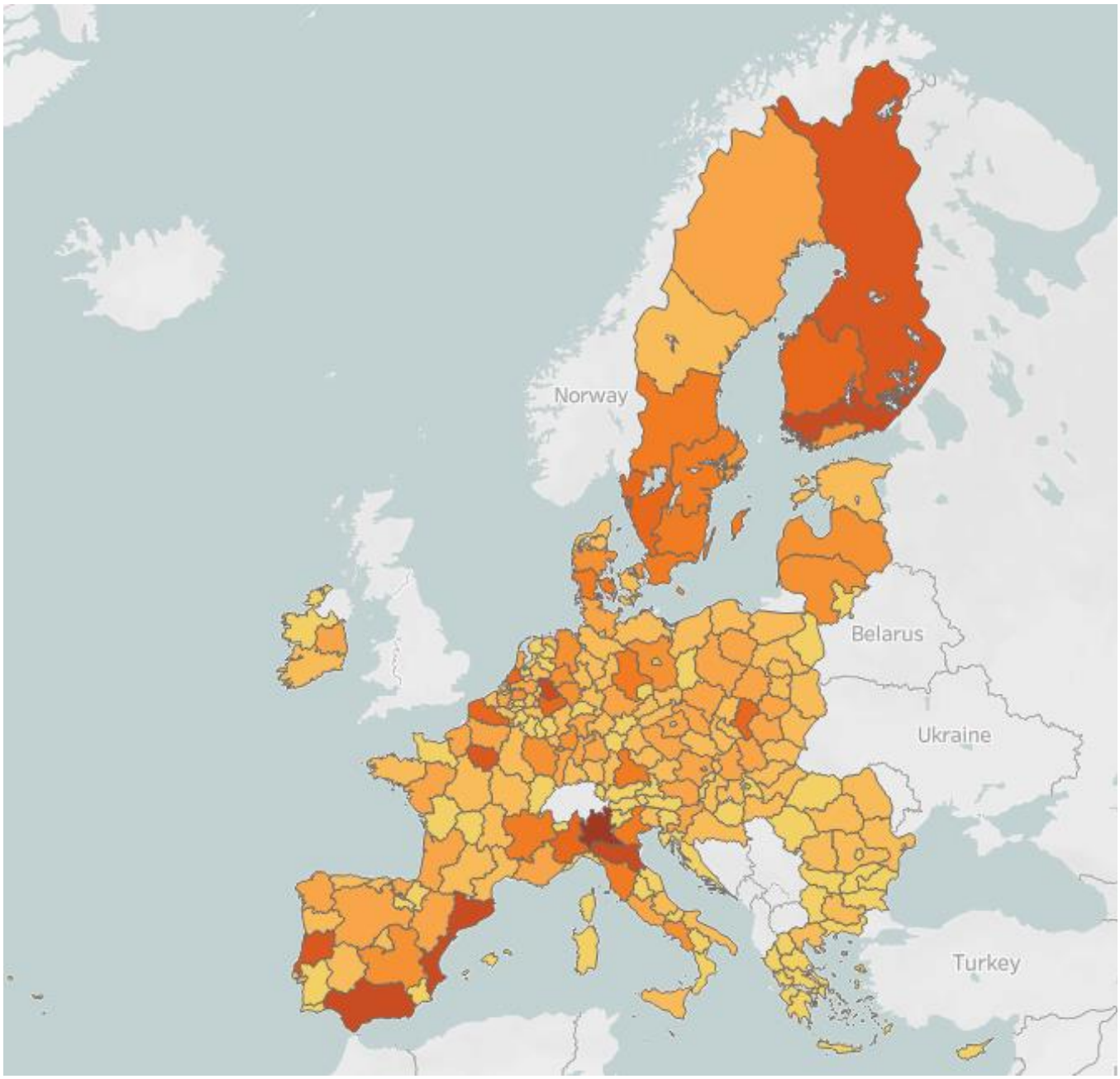
	NUTS 2 code	NUTS 2 region	Number of installations
1.	ITC4	Lombardia	312
2.	ES61	Andalucía	246
3.	ES52	Comunitat Valenciana	245
4.	ITH5	Emilia-Romagna	238
5.	ES51	Cataluña	231
6.	DEA1	Düsseldorf	226
7.	FI1C	Etelä-Suomi	220
8.	FI1D	Pohjois- ja Itä-Suomi	216
9.	FR10	Île de France	211
10.	PT16	Centro (PT)	194
11.	DEA2	Köln	185
12.	NL33	Zuid-Holland	182
13.	PL22	Slaskie	181
14.	ITC1	Piemonte	174
15.	FI19	Länsi-Suomi	170
16.	SE23	Västsverige	159
17.	FRE1	Nord-Pas-de-Calais	158
18.	ITH3	Veneto	153
19.	FRK2	Rhône-Alpes	151
20.	SE12	Östra Mellansverige	150

Source: PPMI.

The overall spread of EU ETS stationary installations per NUTS 2 region in the EU-27 is illustrated in the map below.

[8] Information on NUTS 2 and 3 regions could not be identified for 50 out of 15 960 EU ETS stationary installations.

Map 1. EU ETS stationary installations in NUTS 2 regions in the EU-27 in 2018



Note: Based on the data of 14 239 stationary EU ETS installations.

The geographical spread of installations across NUTS 3 regions

The EU ETS stationary installations are spread across 1 105 NUTS 3 regions located in the EU (overall 1 305 NUTS 3 regions (EU-27+IS, LI, NO, UK)). While typically around eight installations are present in one region, the highest number observed is as high as 171 installations (ES522 Castellón/Castelló). Table 4 below provides a summary of EU ETS installations in NUTS 3 regions.

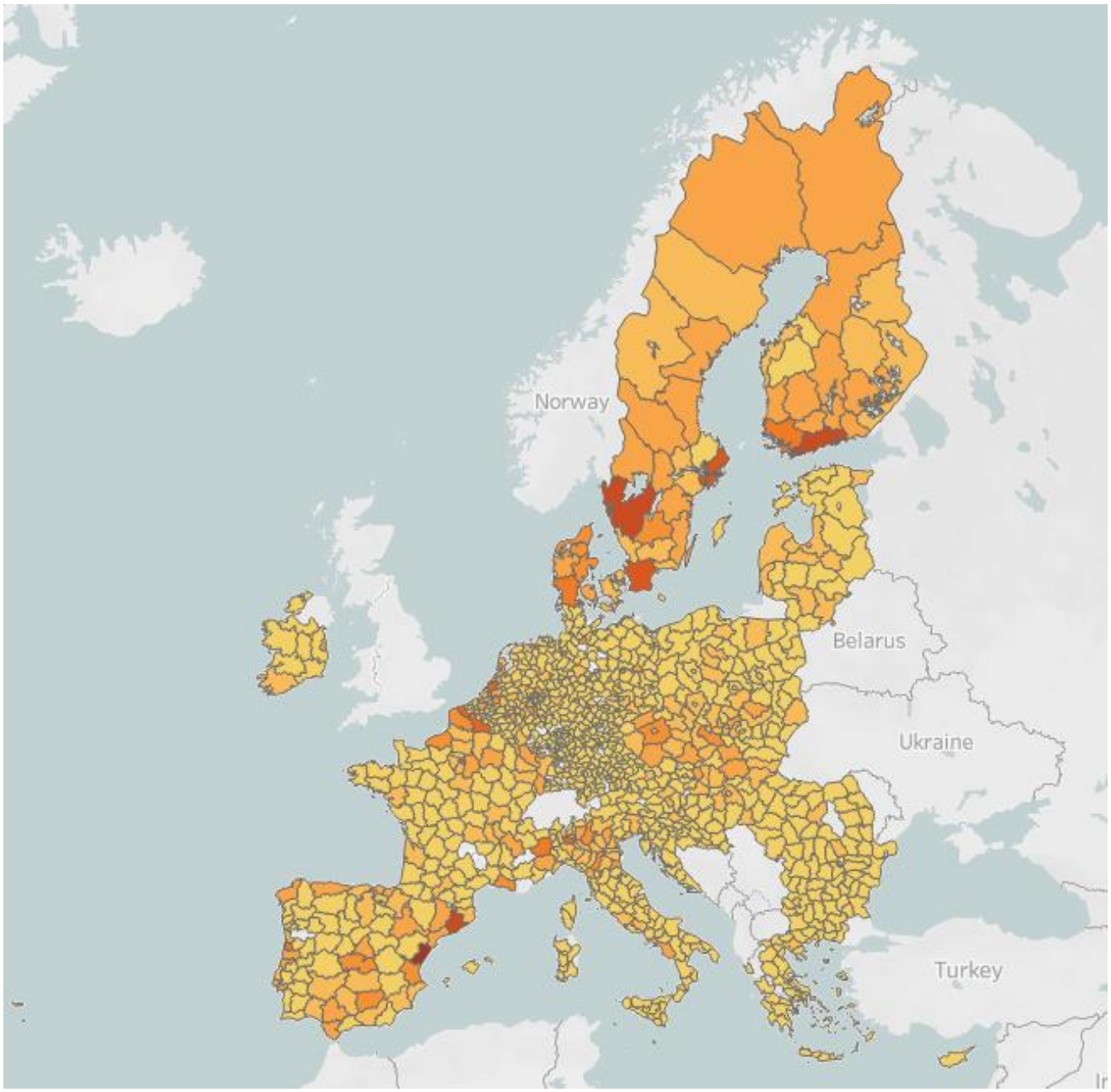
Table 4. EU ETS stationary installations in NUTS 3 regions in 2018 (summary)

	EU-27	EU-27 and IS, LI, NO, UK
Number of NUTS 3 regions covered	1 105	1 301
Number of installations included	14 239	15 910
Average number of installations per region	13	12
Maximum number of installations per region	171	171
Median number of installations per region	8	7

Source: PPMI.

The overall spread of EU ETS stationary installations across NUTS 3 regions in the EU-27 is illustrated in the map below.

Map 2. EU ETS stationary installations in NUTS 3 regions in the EU-27 in 2018



Notes: Based on the data of 14 239 stationary EU ETS installations. The number of EU ETS installations per region may depend on the region's size, for example, NUTS 3 regions in Germany are smaller than in some other EU countries.

The six NUTS 3 regions with the highest number of installations are in Spain, Sweden, and Finland. Table 5 below shows the top 15 regions in the EU-27 by the number of stationary installations.

Table 5. Top 15 NUTS 3 regions by number of EU ETS stationary installations in the EU-27 in 2018

	NUTS 3 code	NUTS 3 region	Number of installations
1.	ES522	Castellón/Castelló	171
2.	SE232	Västra Götalands län	134
3.	ES511	Barcelona	125
4.	FI1B1	Helsinki-Uusimaa	120
5.	SE110	Stockholms län	112

6.	SE224	Skåne län	109
7.	FRE11	Nord	101
8.	NL33C	Groot-Rijnmond	92
9.	ITC4C	Milano	87
10.	DK032	Sydjylland	84
11.	FI1C1	Varsinais-Suomi	77
12.	PT16D	Região de Aveiro	74
13.	ITC11	Torino	73
14.	BE211	Arr. Antwerpen	67
15.	ES616	Jaén	67

Source: PPMI.

The economic activity of stationary installations

To better understand in which economic sectors EU ETS installations operate, we developed a typology based on the information on activity type (provided by the European Commission) with a breakdown by NACE main sections for combustion installations[9]. The typology contains **17 categories** for installation activity (see categories in Table 6), with combustion installations being the prominent activity (61% of all installations).

Among the combustion installations, the categories with the highest number of EU ETS installations are installations in manufacturing (20% of all analysed installations); in electricity, gas, steam and air conditioning supply (14% of all analysed installations); and in electricity production and distribution (14% of all analysed installations). Table 6 below provides the overview of EU ETS installations in the EU-27 per category of economic activity.

Based on our estimates, out of 2.1 million workers at the EU ETS installations in the EU-27, over 800 000 (or 39%) work for combustion installations in manufacturing. The other two types of installation activity that have the highest number of persons employed operate in the manufacturing of steel (almost 168 000) and combustion installations in electricity production and distribution (almost 156 000 persons).

The size of installations operating in the same economic sector varies significantly, which is reflected in the average number of employees exceeding the median number of employees several times in most cases. While, on average, there are 193 persons working in the EU ETS installations, the typical number of employees in the installations manufacturing iron or steel surpasses the average (352 employees). Relatively speaking, the smallest installations are combustion installations in electricity, gas, steam and air conditioning supply (19 employees on average), combustion installations in agriculture, forestry and fishing (24 employees on average), and combustion installations in water supply (36 employees on average).

Table 6. EU ETS stationary installations in the EU-27 per category of economic activity (summary)

Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
In agriculture, forestry and fishing	130	1.1%	24	114	11 440
In mining and quarrying	184	1.6%	146	283	50 626
In manufacturing	2 265	19.6%	163	382	811 971
In electricity production and distribution	1 640	14.2%	37	99	155 695
In electricity, gas, steam and air conditioning supply	1 652	14.3%	19	49	78 760
In gas manufacture and distribution	69	0.6%	77	80	5 463

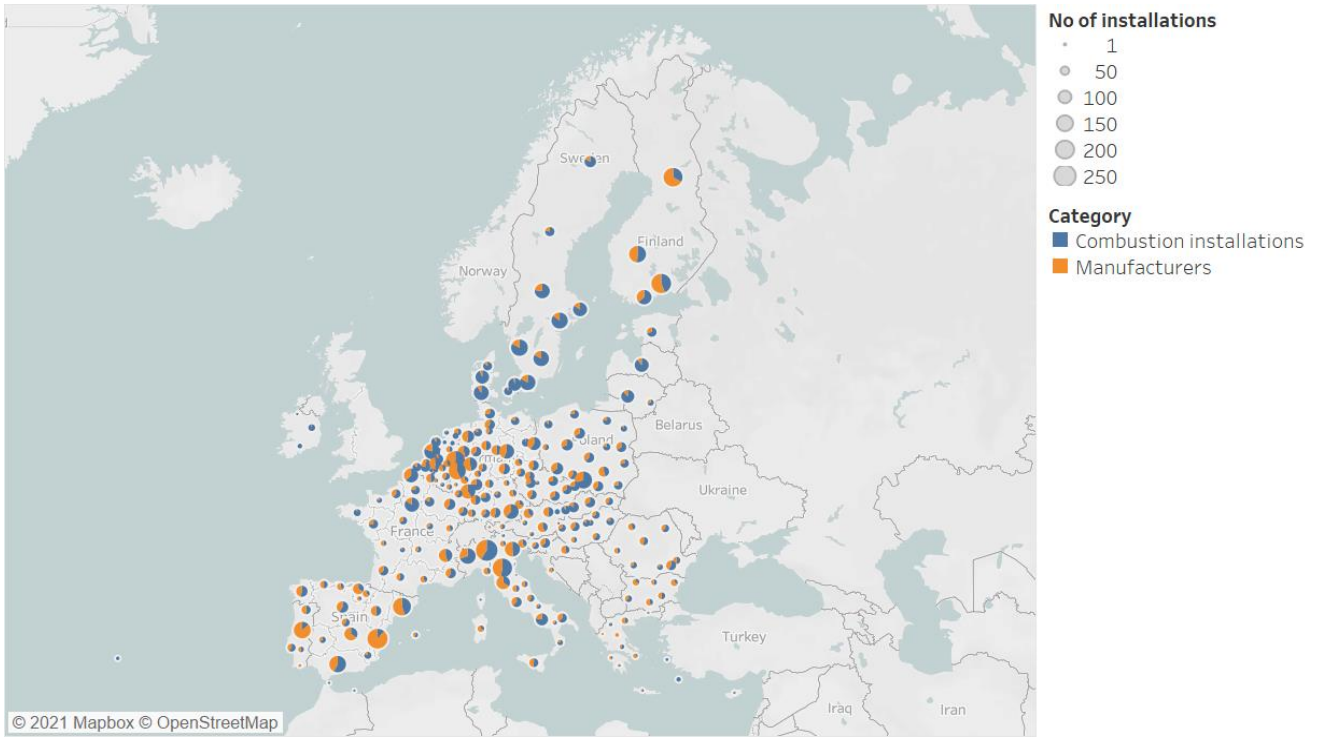
[9] Combustion installations include the following two types of activities: 'Combustion of fuels' and 'Combustion installations with a rated thermal input exceeding 20 MW'.

In water supply; sewerage, waste management and remediation activities	197	1.7%	36	103	19 937
In construction	152	1.3%	112	160	23 051
In other NACE sections	807	7.0%	119	177	130 302
Manufacturers					
Manufacture of cement	274	2.4%	139	225	58 466
Manufacture of ceramics	1 308	11.3%	44	95	112 749
Manufacture of glass	369	3.2%	198	285	98 647
Manufacture of iron or steel	418	3.6%	352	433	167 894
Manufacture of paper and pulp	725	6.3%	146	202	134 501
Production of bulk chemicals	304	2.6%	146	221	66 979
Production of lime, or calcination of dolomite/magnesite	223	1.9%	51	116	25 258
Other categories	858	7.4%	71	188	154 138
Grand Total (EU-27)	**11 575**	**100.0%**	**86**	**193**	**2 105 877**

Source: PPMI.

The map below shows the spread of EU ETS installations per economic activity in NUTS 2 across the EU-27.

Map 3. EU ETS stationary installations in NUTS 2 regions in the EU-27 in 2018 by activity type.



Note: Based on the data of 11 575 stationary EU ETS installations.

4. REGIONAL EMPLOYMENT OF EU ETS INSTALLATIONS

According to our estimations, almost 2.4 million people are employed by the analysed EU ETS stationary installations (12 634 installations or 79% of all stationary installations[10]). Altogether, 2.1 million people work at EU ETS installations located in the EU Member States (EU-27). The following sub-chapters provide more details on employment in the EU ETS installations across the regions. It is important to remember that the figures below also include **estimated values** (as explained in the chapter summarising the methodology of the study).

Employment of stationary installations in NUTS 2 regions

When calculating the number of employees in stationary installations, only those installations with any available employment data in Orbis have been included in the analysis. For EU-27+IS, LI, NO, and the UK, there were 12 634 such installations, out of which 11 575 are located in the EU-27. Consequently, at least some employment data are available for 233 NUTS 2 regions in the EU.

An **average of over 9 000 people** is employed by EU ETS installations in one NUTS 2 region in the EU-27, with the median value somewhat lower and reaching 7 134 employees in the region. Table 7 below summarises the key figures on the number of employees at the EU ETS installations in NUTS 2 regions.

Table 7. Number of employees at EU ETS stationary installations in NUTS 2 regions in 2018 (summary)

	EU-27	EU-27 and IS, LI, NO, UK
Number of NUTS 2 regions covered	233	284
Number of installations included	11 575	12 634
Average estimated number of employees per region	9 077	8 331
Maximum estimated number of employees per region	45 989	45 989
Median estimated number of employees per region	7 133.5	6 458

Source: PPMI.

While the average number of persons employed by EU ETS installations in the NUTS 2 region is just over 9 000, there are several regions where the employment in EU ETS installations far exceeds the average. Twelve (12) NUTS 2 regions have more than 25 000 persons working at installations, and employment in four regions tops 40 000 employees. The 15 regions with the highest number of persons employed at installations are shown in Table 8 below.

Geographically, almost all the regions with the highest number of employees at EU ETS installations are located in Western and Southern Europe. Even though these regions also have more installations than the NUTS 2 average, the sole number of installations in the region does not explain the employment. The number of installations in the 15 regions varies from 84 to 250 installations in the region, with the estimated average number of persons employed per installation ranging from 115 to 370 persons.

Table 8. Top 15 NUTS 2 regions by number of employees at EU ETS stationary installations in the EU-27 in 2018

	NUTS 2 code	NUTS 2 region	Estimated no of employees	No of installations (for which employment data are available)	Estimated no of employees per installation
1.	DEA1	Düsseldorf	45 989	194	237
2.	ITC4	Lombardia	45 728	250	183
3.	ITH5	Emilia-Romagna	45 217	202	224
4.	PL22	Slaskie	40 990	163	251
5.	DEA2	Köln	31 186	156	200
6.	FRE1	Nord-Pas-de-Calais	28 228	111	254
7.	ES51	Cataluña	27 319	174	157
8.	ITC1	Piemonte	27 292	138	198
9.	FR10	Île de France	25 868	115	225

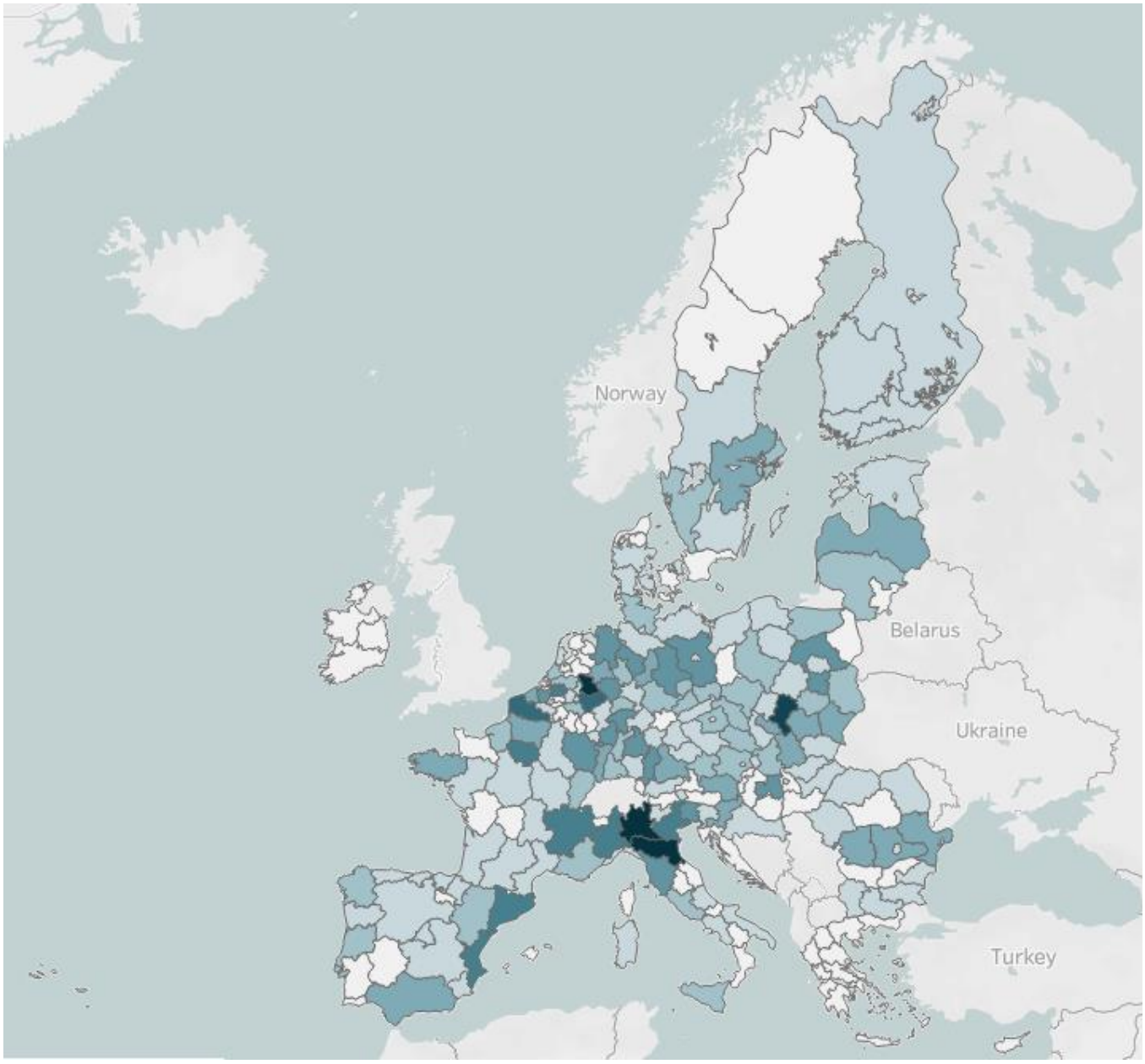
[10] Installations for which at least some employment data were available.

10.	BE21	Prov. Antwerpen	25 499	84	304
11.	FRK2	Rhône-Alpes	25 094	97	259
12.	ES52	Comunitat Valenciana	25 014	218	115
13.	ITH3	Veneto	24 089	123	196
14.	DEA5	Arnsberg	22 035	104	212
15.	DE27	Schwaben	21 833	59	370

Source: PPMI.

The map below illustrates the estimated number of persons employed by EU ETS installations in the EU-27 in 2018.

Map 4. Estimated number of employees at EU ETS stationary installations in NUTS 2 regions in the EU-27 in 2018



Note: Based on the data of 11 575 stationary EU ETS installations.

Source: PPMI.

Employment of stationary installations in NUTS 3 regions

The analysis of employment at stationary installations in NUTS 3 regions covers 1 259 NUTS 3 regions in the EU-27, Iceland, Liechtenstein, Norway, and the UK; of these 1 081 of the regions are located in the EU. **On average, almost 2 000** persons work at EU ETS installations in the NUTS 3 region in

the EU-27. However, the median estimated number is almost half the average and equals 1 098 employees. Table 9 below presents the key figures on the number of employees at EU ETS installations in NUTS 3 regions.

Table 9. Estimated number of employees at EU ETS stationary installations in NUTS 3 regions in 2018 (summary)

	EU-27	EU-27 and IS, LI, NO, UK
Number of NUTS 3 regions covered	1 081	1 259
Number of installations included	11 575	12 634
Average estimated number of employees per region	1 964	1 886
Maximum estimated number of employees per region	19 189	19 378
Median estimated number of employees per region	1 097.5	1 071.5

Source: PPMI.

The top 15 NUTS 3 regions have more than 10 000 employees at stationary installations. The estimated average number of employees per installation, however, varies considerably. Among the 15 regions with the most persons employed, the average number of employees at the installation ranges from 92 to 675 (see Table 10 below).

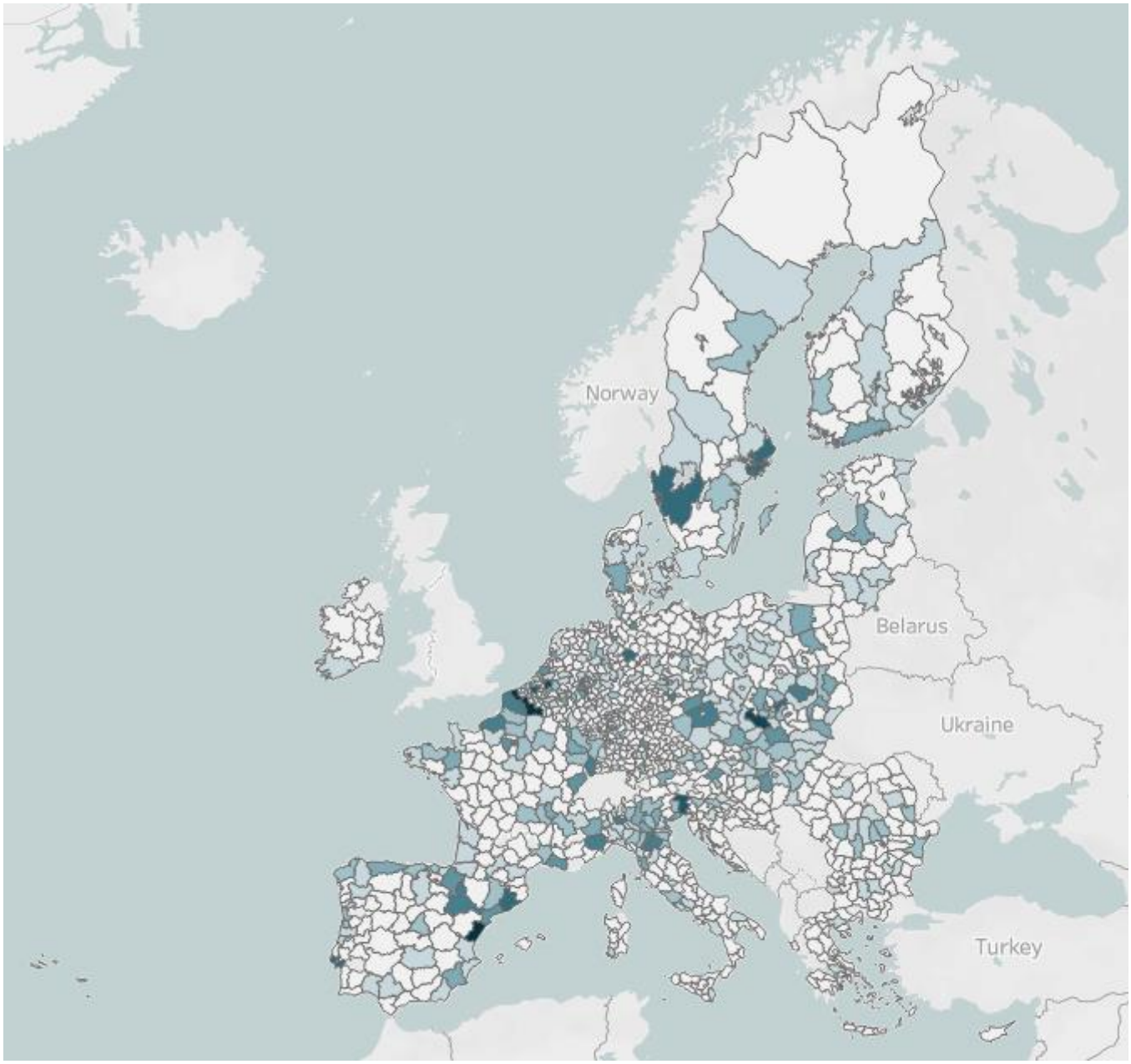
Table 10. Top 15 NUTS 3 regions by the estimated number of employees at EU ETS stationary installations in the EU-27 in 2018

	NUTS 3 code	NUTS 3 region	Estimated no of employees	No of installations (for which employment data are available)	Estimated no of employees per installation
1.	ES522	Castellón/Castelló	19 189	160	120
2.	FRE11	Nord	18 457	68	271
3.	CZ080	Moravskoslezský kraj	17 163	53	324
4.	BE211	Arr. Antwerpen	15 938	51	313
5.	ITH42	Udine	14 547	23	632
6.	BE234	Arr. Gent	13 717	26	528
7.	PL22B	Sosnowiecki	12 542	36	348
8.	ES511	Barcelona	12 469	88	142
9.	SE110	Stockholms län	12 385	107	116
10.	DE929	Region Hannover	12 149	18	675
11.	PT170	Área Metropolitana de Lisboa	11 656	36	324
12.	SE232	Västra Götalands län	11 563	126	92
13.	CZ020	Stredoceský kraj	11 140	55	203
14.	ITH54	Modena	11 038	52	212
15.	ITC16	Cuneo	11 028	32	345

Source: PPMI.

The map below illustrates how the employment in EU ETS stationary installations is spread across NUTS 3 regions in the EU-27 in 2018.

Map 5. Estimated number of employees at EU ETS stationary installations in NUTS 3 regions in the EU-27 in 2018



Note: Based on the data of 11 575 stationary EU ETS installations

Source: PPMI.

5. REGIONAL EMPLOYMENT IMPACT OF EU ETS INSTALLATIONS

EU ETS employment share in the number of total employees in NUTS 2 regions

Our analysis of the employment impact of EU ETS installations in the regions is based on the estimated employment data in 12 634 installations (79% of all stationary installations). It covers 284 NUTS 2 regions (EU-27+IS, LI, NO, UK), out of which 233 regions are located in the EU. Based on our estimations (overestimates are likely), the impact of EU ETS installations on regional employment in the EU-27 is somewhat around 1% (average estimated employment – 1.13%; median estimated employment – 0.94%). The key figures on EU ETS employment share in NUTS 2 regions are presented in Table 11.

Table 11. Estimated EU ETS employment share (%) in the number of total persons employed in NUTS 2 regions in 2018

	EU-27	EU-27 and IS, LI, NO, UK
Number of NUTS 2 regions covered	233	284
Number of installations included	11 575	12 634
Average estimated employment share per region	1.13%	1.09%
Maximum estimated employment share per region	4.12%	5.16%
Median estimated employment share per region	0.94%	0.87%

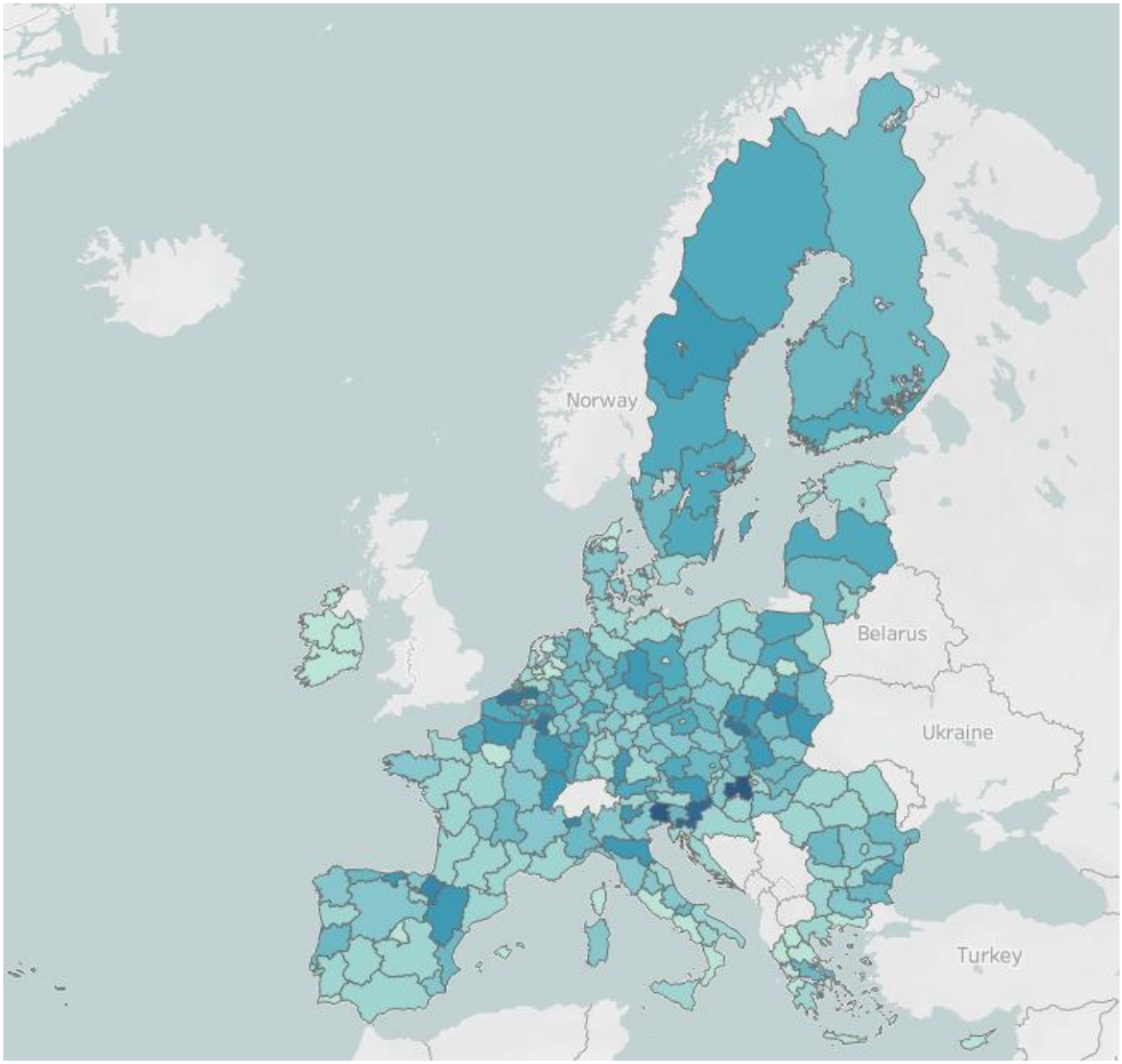
Table 12 below lists the NUTS 2 regions in the EU-27 with the highest estimated employment impact of EU ETS installations in 2018. Persons employed by the EU ETS installations constitute more than 3% of all employment in seven EU-27 regions. Meanwhile, the overall number of persons employed in most impacted regions vary significantly from 61 500 to 836 700. The table below provides more details for each of the top 15 regions.

Table 12. Top 15 NUTS 2 regions by estimated employment impact of EU ETS stationary installations in the EU-27 in 2018

	NUTS 2 code	NUTS 2 region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of persons employed in the region (Eurostat data)
1.	HU21	Közép-Dunántúl	4.12%	19 415	471 250
2.	ITH4	Friuli-Venezia Giulia	3.90%	21 249	545 000
3.	SI03	Vzhodna Slovenija	3.40%	16 377	481 800
4.	BE23	Prov. Oost-Vlaanderen	3.26%	20 346	623 400
5.	BE21	Prov. Antwerpen	3.05%	25 499	836 700
6.	BE34	Prov. Luxembourg (BE)	3.01%	2 964	98 500
7.	CZ08	Moravskoslezsko	3.01%	17 163	571 000
8.	BE25	Prov. West-Vlaanderen	2.99%	16 078	538 500
9.	ES22	Comunidad Foral de Navarra	2.86%	8 723	305 400
10.	PL72	Swietokrzyskie	2.63%	13 316	506 800
11.	ITC2	Valle d'Aosta/Vallée d'Aoste	2.52%	1 552	61 500
12.	SE32	Mellersta Norrland	2.47%	4 396	178 000
13.	SK03	Stredné Slovensko	2.45%	13 937	567 960
14.	BE33	Prov. Liège	2.43%	9 667	398 500
15.	FRF3	Lorraine	2.35%	19 193	815 780

The estimated EU ETS employment share in the number of total employees in NUTS 2 regions across the EU-27 is illustrated in the map below.

Map 6. Estimated EU ETS employment share (%) in the number of total persons employed in NUTS 2 regions in the EU-27 in 2018



Note: Based on the data of 11 575 stationary EU ETS installations.

Source: PPMI.

EU ETS employment share in the number of total persons employed in NUTS 3 regions

The EU ETS installations employment analysis in NUTS 3 regions covers 1 259 NUTS 3 regions located in the EU-27, Iceland, Liechtenstein, Norway, and the UK. 1 081 regions are within the EU. The estimated employment share per NUTS 3 region in the EU-27 typically equals around 1% and is similar to the value for NUTS 2 level, with a somewhat bigger gap between the average and median values (average estimated employment – 1.32%; median estimated employment – 0.88%). Table 13 provides a summary of key figures on EU ETS employment share in NUTS 3 regions.

Table 13. Estimated EU ETS employment share (%) in the number of total persons employed in NUTS 3 regions in 2018

	EU-27	EU-27 and IS, LI, NO, UK
Number of NUTS 3 regions covered	1 081	1 259
Number of installations included	11 575	12 634

Average estimated employment share per region	1.32%	1.26%
Maximum estimated employment share per region	14%	14%
Median estimated employment share per region	0.88%	0.81%

Source: PPMI.

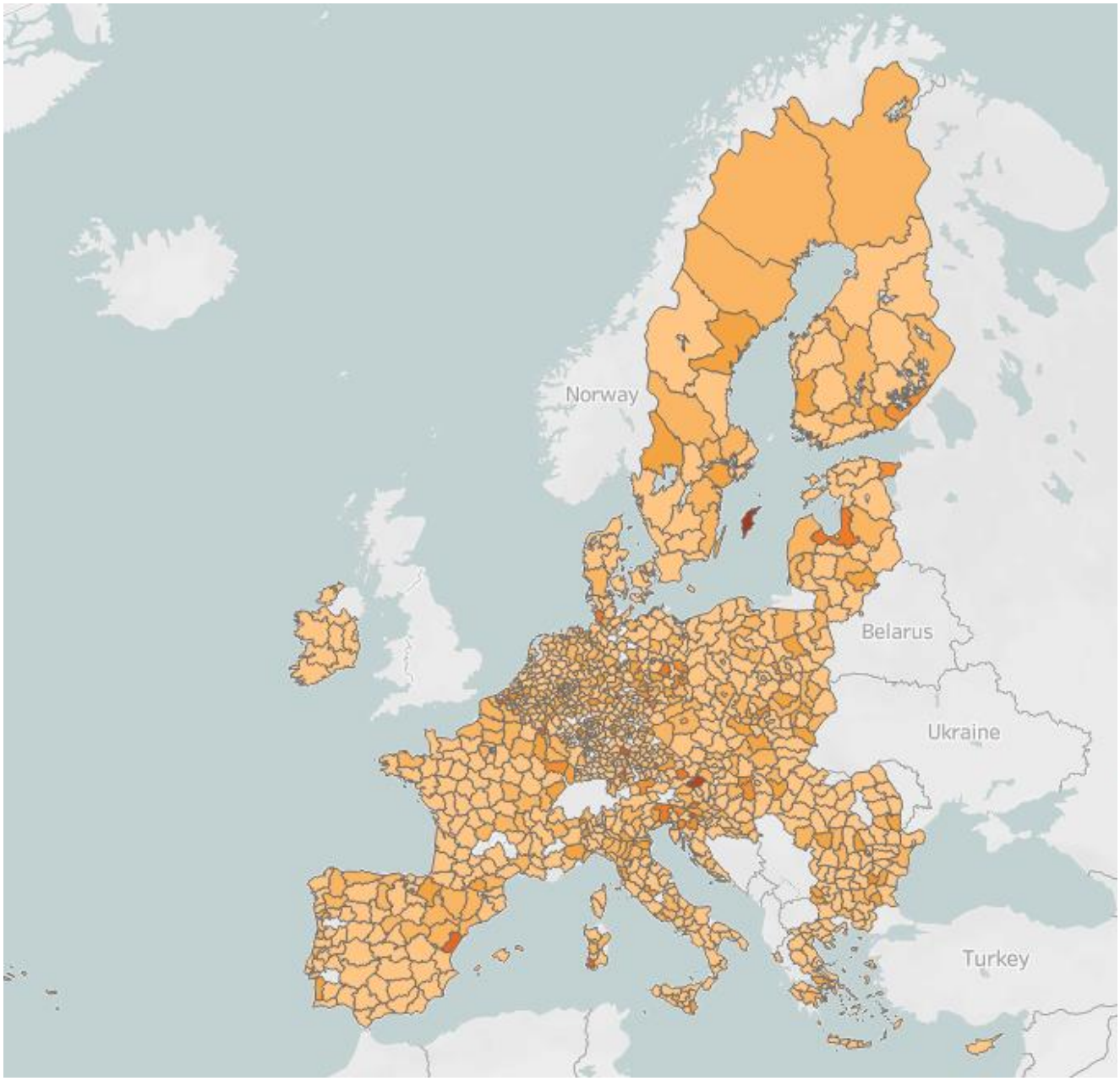
The estimated employment impact of EU ETS installations exceeds 10% of total employment in three NUTS 3 regions in the EU-27. While the number of persons employed in regions most impacted by employment in EU ETS installations ranges from 98 500 to almost 3 million persons employed, five out of the top 10 regions are in Germany. Table 14 presents more information on the most impacted regions.

Table 14. Top 15 NUTS 3 regions by estimated employment impact of EU ETS stationary installations in the EU-27 in 2018

	NUTS 3 code	NUTS 3 region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of persons employed in the region (Eurostat data)
1.	SE214	Gotlands län	14.00%	4 339	430 000
2.	AT223	Östliche Obersteiermark	11.68%	8 445	631 000
3.	DE912	Salzgitter, Kreisfreie Stadt	10.48%	6 054	832 980
4.	SI035	Zasavska	9.75%	1 669	481 800
5.	DE27D	Donau-Ries	9.42%	7 834	1 038 040
6.	DE253	Fürth, Kreisfreie Stadt	8.97%	5 740	1 052 960
7.	DE214	Altötting	7.77%	4 904	2 894 700
8.	ES522	Castellón/Castelló	7.72%	19 189	1 944 300
9.	ITG2C	Carbonia-Iglesias (NUTS 2016)	7.69%	2 721	607 700
10.	DEB34	Ludwigshafen am Rhein, Kreisfreie Stadt	7.62%	9 651	1 016 200
11.	BE257	Arr. Tielt	7.48%	3 208	538 500
12.	BE253	Arr. Ieper	7.34%	3 383	538 500
13.	BE345	Arr. Virton	7.10%	973	98 500
14.	DEB3D	Donnersbergkreis	6.95%	2 182	1 016 200
15.	DE40H	Teltow-Fläming	6.93%	5 549	1 124 610

The map below also illustrates the EU ETS employment share in NUTS 3 regions across the EU-27.

Map 7. Estimated EU ETS employment share (%) in the total number of persons employed in NUTS 3 regions in the EU-27 in 2018



Note: Based on the data of 11 575 stationary EU ETS installations.

Source: PPMI.

6. EMISSIONS OF GREENHOUSE GASES IN EU ETS INSTALLATIONS

Verified GHG emissions of EU ETS stationary installations

In 2018, analysed EU ETS stationary installations located in the EU Member States were allocated 519 210 784 tCO_2 in total, whereas their verified emissions in the same year amounted to 1 189 473 232 tCO_2. The table below presents the top 15 NUTS 2 regions in the EU-27 by verified GHG emissions of the analysed EU ETS stationary installations.

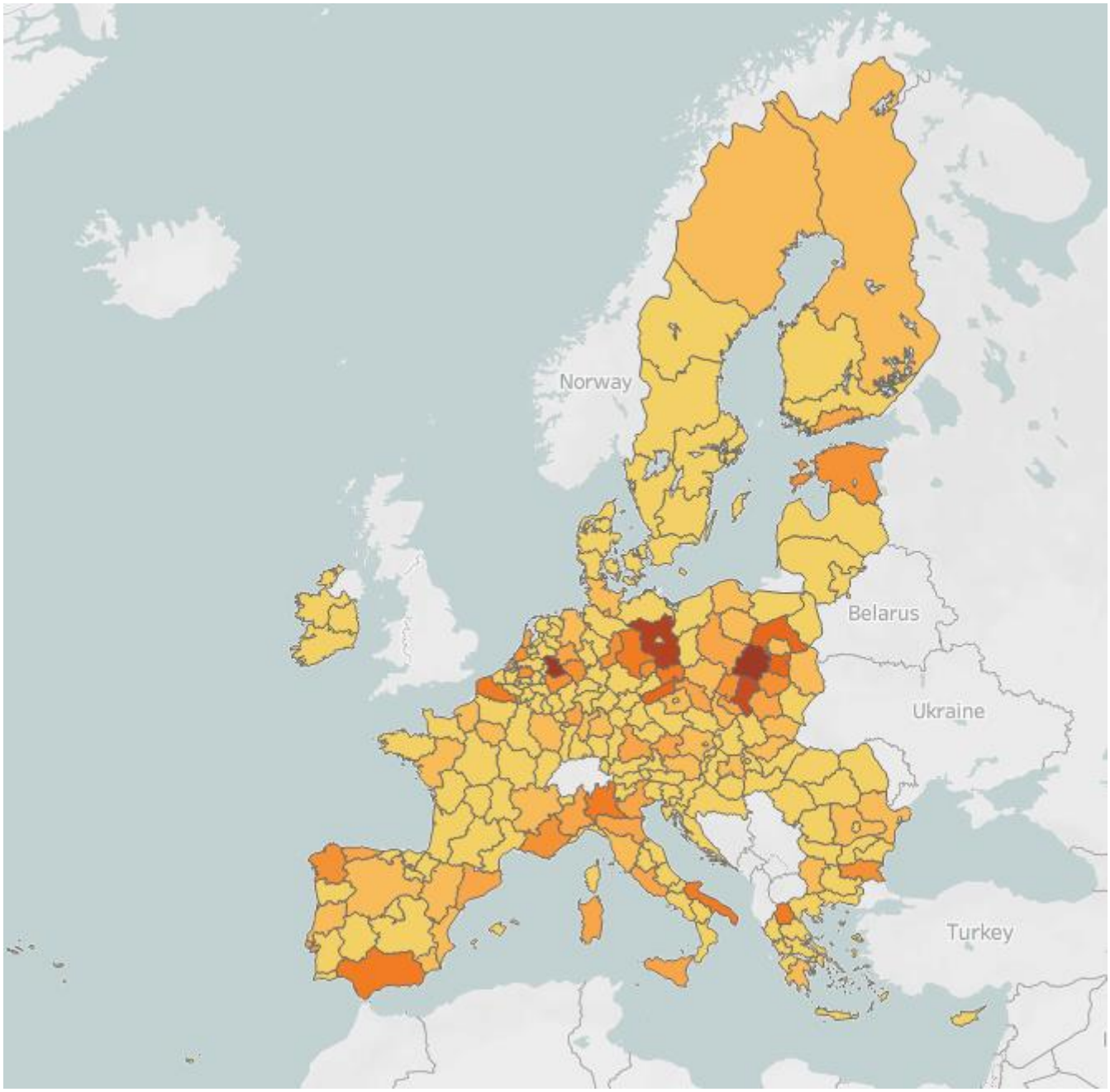
Table 15. Top 15 NUTS 2 regions by verified GHG emissions of the EU ETS stationary installations in the EU-27 in 2018

	NUTS 2 code	NUTS 2 region	Verified emissions	Allocation	No of EU ETS stationary installations
1.	PL71	Lódzkie	42 836 385	1 907 932	58
2.	DEA1	Düsseldorf	38 607 160	30 117 415	194
3.	DE40	Brandenburg	34 409 801	7 747 473	96
4.	PL22	Slaskie	33 179 250	8 242 817	163
5.	PL92	Mazowiecki regionalny	24 784 739	3 596 049	56
6.	CZ04	Severozápad	23 234 160	2 951 059	51
7.	DED2	Dresden	20 588 697	657 468	57
8.	DEE0	Sachsen-Anhalt	20 132 625	9 447 798	120
9.	ITC4	Lombardia	20 113 386	7 152 292	250
10.	FRE1	Nord-Pas-de-Calais	19 867 489	13 126 887	111
11.	EL53	Dytiki Makedonia	19 316 413	28 034	7
12.	ES61	Andalucía	19 276 126	4 620 970	151
13.	ITF4	Puglia	17 378 517	14 746 585	48
14.	FRL0	Provence-Alpes-Côte d'Azur	16 839 343	13 286 580	58
15.	NL33	Zuid-Holland	16 182 144	10 118 448	136

Note: Based on the data of 11 575 stationary EU ETS installations.
Source: PPMI.

The map below also illustrates verified GHG emissions of the analysed EU ETS stationary installations in NUTS 2 regions across the EU-27. Table 16 below provides more details on the top 20 NUTS 2 regions by verified GHG emissions of EU ETS stationary installations per person in the region in the EU-27 in 2018.

Map 8. Verified GHG emissions of the EU ETS stationary installations in NUTS 2 regions in the EU-27 in 2018



Note: Based on the data of 11 575 stationary EU ETS installations.

Table 16. Top 20 NUTS 2 regions by verified GHG emissions of EU ETS stationary installations per person in the region in the EU-27 in 2018

	NUTS code	NUTS 2 region	Verified emissions per person in the region	Verified emissions per employed person in the region	Verified emissions	Population (Eurostat data)	No of employed persons (Eurostat data)	No of stationary EU ETS installations	Verified emissions per EU ETS installation	Verified emissions per EU ETS installation's employee
1.	EL53	Dytiki Makedonia	72	198	19 316 413	269 222	97 530	7	2 759 488	89 427,84
2.	NL34	Zeeland	30	60	11 320 077	382 304	187 800	32	353 752	3 355,09
3.	CZ04	Severozápad	21	46	23 234 160	1 116 766	509 000	51	455 572	2 612,93
4.	PL71	Lódzkie	17	38	42 836 385	2 462 448	1 132 000	58	738 558	5 070,59
5.	BG34	Yugoiztochen	15	34	16 077 472	1 039 549	472 540	27	595 462	2 156,31
6.	PL52	Opolskie	15	37	14 332 272	948 808	390 300	46	311 571	1 681,99
7.	DE50	Bremen	14	22	9 555 422	681 032	436 070	37	258 255	1 479,63
8.	DED5	Leipzig	14	27	14 283 739	1 037 782	538 130	30	476 125	1 389,47
9.	DE40	Brandenburg	14	31	34 409 801	2 504 040	1 124 610	96	358 435	1 637,47
10.	DED2	Dresden	13	25	20 588 697	1 598 573	814 100	57	361 205	1 632,21
11.	ES12	Principado de Asturias	11	30	11 777 261	1 027 624	394 700	32	368 039	1 808,83
12.	PL72	Swietokrzyskie	11	28	14 052 217	1 232 016	506 800	60	234 204	1 055,29
13.	EL65	Peloponnisos	11	27	6 325 546	576 749	238 540	5	1 265 109	4 495,77
14.	PL92	Mazowiecki regionalny	11	23	24 784 739	2 334 793	1 073 500	56	442 585	1 323,05
15.	EE00	Eesti	10	21	13 780 692	1 319 133	649 500	51	270 210	2 916,55
16.	DE91	Braunschweig	9	18	14 640 274	1 595 734	832 980	56	261 433	1 049,63
17.	DEE0	Sachsen-Anhalt	9	20	20 132 625	2 223 081	1 004 550	120	167 772	951,27
18.	SE33	Övre Norrland	9	18	4 548 347	519 760	254 000	72	63 171	1 046,56
19.	BE21	Prov. Antwerpen	8	17	14 032 858	1 849 523	836 700	84	167 058	550,33
20.	CZ08	Moravskoslezsko	8	16	9 090 796	1 205 886	571 000	53	171 524	529,67

Note: Based on the data of 11 575 stationary EU ETS installations.

ANNEXES

ANNEX 1. METHODOLOGICAL REPORT

European Emissions Trading System (ETS) – Calculations on the regional employment impact of ETS installations

Methodological report

Table of Contents

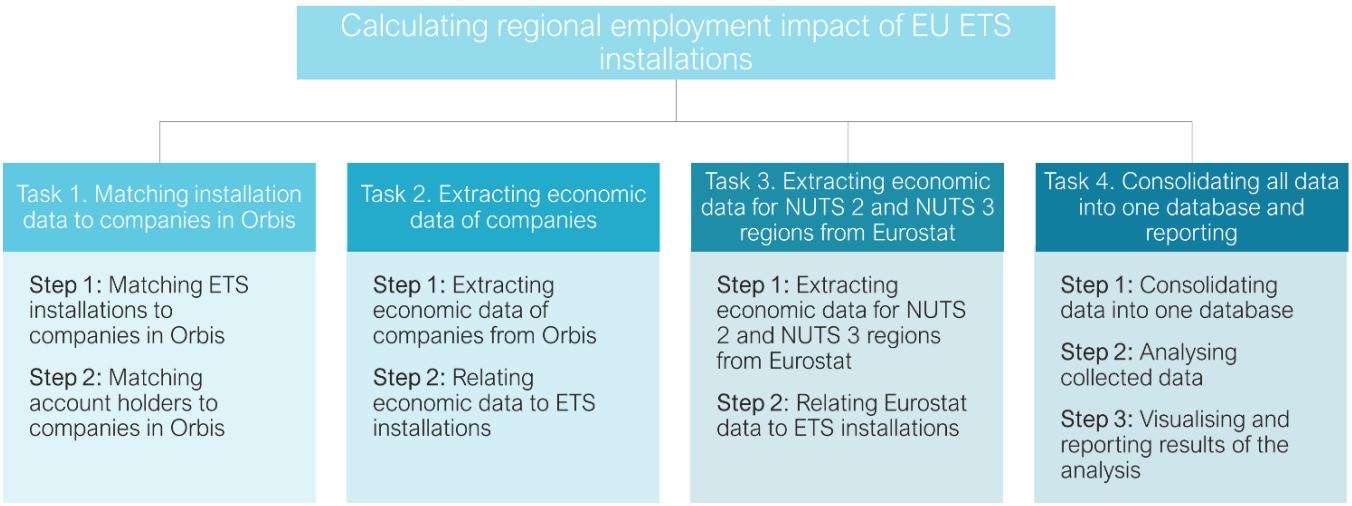
1. OBJECTIVES OF THE STUDY AND ITS OVERALL METHODOLOGICAL APPROACH

The overall objective of this assignment – calculating the regional employment impact of EU ETS installations in NUTS 2 and NUTS 3 regions – is divided into **four main tasks**:

- **Task 1:** Matching EU ETS installation data with economic parameters of companies from the Orbis company database.
- **Task 2:** Extracting economic data of companies from the Orbis database.
- **Task 3:** Extracting economic data for NUTS 2 and NUTS 3 regions from the Eurostat database.
- **Task 4:** Consolidating all data collected into one database and reporting.

Each task has been divided into steps, and these, together with methodological choices, issues faced, and solutions found, are presented in this report. The figure below summarises our methodological approach to this study:

Figure 1. Overall methodological framework



Source: PPMI.

2. MATCHING EU ETS INSTALLATION DATA TO ORBIS COMPANY DATA

The European Commission provided the data on **17 535 installations** participating in the EU Emissions Trading System. The categories of data on EU ETS installations included information at the installation and at the account holder[11] levels – identification information of installations, the economic sector they are active in, as well as their emissions-related data.

Table 1. Categories of data on EU ETS installations provided by the European Commission

Installation identification data		Emissions-related data
At the installation level	At the account holder level	EPER_IDENTIFICATION
REGISTRY_CODE	INSTALLATION_ID	YEAR_OF_FIRST_EMISSIONS
INSTALLATION_IDENTIFIER	ACCOUNT_ID	YEAR_OF_LAST_EMISSIONS
MAIN_ACTIVITY_TYPE_CODE	NAME	PERMIT_REVOCATION_DATE
LATITUDE	ADDRESS1	PERMIT_ENTRY_DATE
LONGITUDE	ADDRESS2	INSTALLATION_STATUS_CODE
POSTAL_CODE	COUNTRY_CODE	CALL_SIGN
NUTS	PERMIT_IDENTIFIER	inVerifiedEmissionsFile
NUTSGuessed	CITY	ALLOCATION (values for 2008-2019)
	PARENT_COMPANY	

[11] Account holder is typically a larger company that owns one or more installations, so the employment data of the account holder does not reflect the employment in the specific installations. Information to identify the account holder was available in the data provided by the European Commission.

	SUBSIDIARY_COMPANY	ALLOCATION_RESERVE (values for 2008-2019) ALLOCATION_TRANSITIONAL (values for 2008-2019) VERIFIED_EMISSIONS (values for 2008-2019) ACCOUNT_CLOSURE

Source: compiled by PPMI.

To match the information of EU ETS installations to corresponding company economic parameters, we used the **Orbis** database of companies. Using the information on installations allowed us to identify companies that own the installations. Having matched the companies, we extracted and incorporated their economic data, namely, the number of employees, turnover, net income, and company identification data.

Orbis[12] is the leading database for company data and is owned by Bureau van Dijk (a Moody's Analytics company since 2017). Orbis offers information on more than 400 million companies and entities worldwide, providing various data categories and storing historical data. Orbis's data vary from the company's contact information and company profile to data on its financials, ownership, and management. The database captures and blends data from more than 160 different sources and standardises it to allow companies to be compared.

Our matching strategy started with the semi-automated matching of installation names using the name, city, and country[13] data from the European Commission's file. Using a *batch search* functionality in Orbis, all installations were automatically matched to the companies that satisfied the name and location requirements (city and country). We noticed that sometimes the installations that Orbis marked as matched were selected incorrectly (because of typos or inaccuracies of information both in the Orbis database and the Excel file from the EC). For this reason, we manually reviewed whether the matches made sense and corrected them to "matched" or "not matched" accordingly.

As expected, the outcomes of this matching differed significantly across countries. The precision of matching depended on how accurate the installations' names were in the EC list[14] and the varying quality and availability of company data in Orbis. **As a result of this matching step, we matched 5 624 (or 32%) EU ETS installations to companies in Orbis.** The results varied from 0-100% across countries.

Given that only a third of all installations were matched using installation-level data, we conducted another round of matching using account holders' data. This step was only carried out *for installations that had not been matched* during the first step. Once again, we used the Orbis *batch search* function, using the account holder name, city, country and company registration number as filters. As the data on account holder names in the Excel file was much more precise and virtually always indicated the company's exact name, **the matching rate of step 2 was significantly higher – 10 484 (or 60%) installations.**

After the two rounds of semi-automated matching, as well as manual identification of 25 installations, we managed to match **92% (16 133) EU ETS installations** with over 10 000 unique companies identified. A total of 1 402 installations could not be matched; most of them are aircraft operators. The matching rate also varied across countries – from 60% (Greece[15]) to 100% (Croatia, Malta, Liechtenstein). The table below summarises matching results per country.

[12] See https://www.bvdinfo.com/en-gb/.

[13] NAME, CITY and REGISTRY_CODE columns (categories of data) as provided by the EC.

[14] Some installations were identified by company names while others by more general names, such as "power plant" or "airlines". Also, some installation names included numbers or city names.

[15] The lower matching rate for Greece resulted from the Greek alphabet used both in the list of installations provided by the European Commission and in the Orbis database. Only a few installations were automatically matched in step 1 (using installation names for search) and a slightly better result was achieved in step 2 (using account holder names for the search).

Table 2. Matching rates per country

Country code	Number of installations	Overall matched, %
AT	296	98
BE	499	93
BG	174	91
CY	29	83
CZ	469	97
DE	2 785	89
DK	465	97
EE	66	97
ES	1 515	97
FI	738	99
FR	1 748	90
GR	217	60
HR	62	100
HU	304	96
IE	234	72
IT	1 643	90
LT	129	98
LU	34	88
LV	120	98
MT	18	100
NL	668	99
PL	1 084	97
PT	371	95
RO	304	88
SE	976	98
SI	106	98
SK	223	95
UK	2 021	99
IS	44	70
LI	2	100
NO	191	93
TOTAL	**17 535**	**92**

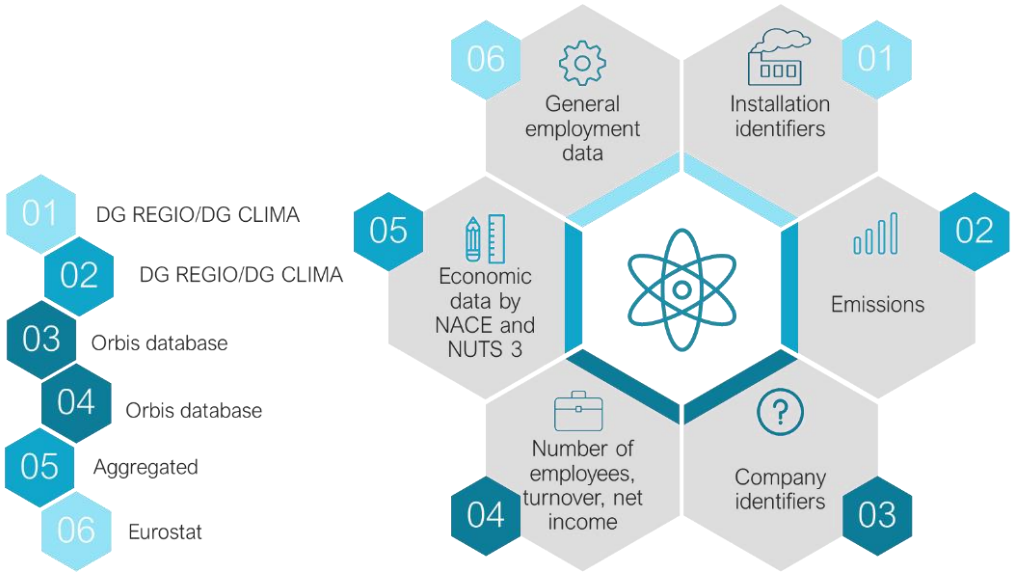
Source: PPMI.

3. CONSOLIDATING THE DATABASE

CONTENT AND STRUCTURE OF THE DATABASE

The data consolidated into the database came from **three main sources: the European Commission, the Orbis database, and Eurostat**. Figure 2 explains the sources of different data categories. To distinguish the data coming from different sources, we used colour labels for the column titles in the database.

Figure 2. Summary of data sources



Source: compiled by PPMI.

EXTRACTING AND CONSOLIDATING COMPANY DATA FROM ORBIS

Step 1. Extracting economic data of NUTS 2 and NUTS 3 regions from Eurostat

After matching company names of EU ETS installations in the Orbis company database, we extracted not only the data on economic parameters of the companies but also company identification data (most importantly, the unique company identification number in Orbis – BvD ID), which could facilitate the future work of the EC, should a similar exercise be repeated. We also extracted data on companies' economic activity (NACE) and NUTS 3 region that served as a cross-check for data provided by the EC. While we focused on gathering data on companies' main economic parameter – the number of employees – we also extracted data on operating revenue (turnover) and net profit. The companies' economic data were extracted for all the available years in Orbis – 2011-2019.

Table 3. Categories of data extracted from Orbis

Company identification data		Company economic data
Company name / Latin alphabet	City / Latin Alphabet	Last avail. year
Company name / Local Alphabet	City / Local Alphabet	Number of employees (last avail. value and values for 2011-2019)
BvD ID number	Postcode / Latin Alphabet	Operating revenue (Turnover) / th EUR (last avail. value and values for 2011-2019)
European VAT number	Address line 1 / Latin Alphabet	P/L for period [=Net income] / th EUR (last avail. value and values for 2011-2019)
BvD sectors	Address line 1 / Local Alphabet	
NACE Rev. 2 main section	Address line 2 / Latin Alphabet	
NACE Rev. 2, core code (4 digits)	Address line 2 / Local Alphabet	
NACE Rev. 2, core code - description	Website address	
Country ISO code	Status	
NUTS1	Standardised legal form	
NUTS2	Type of entity	
NUTS3	Branch indicator	
Standardised city	Date of incorporation	
	Size classification	
	Number of subsidiaries	

Source: compiled by PPMI.

Step 2. Relating economic data to EU ETS installations

Once exported from Orbis, we integrated the company identification data and data on economic parameters of companies into an Excel file with data on EU ETS installations. This action was carried out in an automated way, merging the two Excel files via the matched company name in Orbis.

EXTRACTING AND CONSOLIDATING REGIONAL EMPLOYMENT DATA FROM EUROSTAT

Step 1. Extracting economic data of companies from the Orbis database

We complemented the data on companies' economic parameters from Orbis with the employment data in NUTS 3, NUTS 2 and NUTS 1 regions, both general employment and employment by economic activities. From the **Eurostat** database, we extracted the available data on persons employed by NACE activities in NUTS regions in the EU-27, UK, Norway, Liechtenstein, and Iceland for the years 2011-2019. Unfortunately, publicly available Eurostat data on economic activity was only available at the first level of NACE classification (section level, alphabetical code), both in NUTS 2 and NUTS 3 regions. We also extracted the data on population per country for the years 2011-2019. We believe it could provide interesting angles to our analysis carried out under this assignment. A summary of the categories of data extracted from Eurostat is provided in Table 4 below.

Table 4. Data categories in NUTS 1, NUTS 2 and NUTS 3 regions extracted from Eurostat

Economic data		Population data
Employment per economic activity (NACE)	Employment	
A – Agriculture, forestry and fishing B-E – Industry (except construction) F – Construction G-I – Wholesale and retail trade, transport, accommodation and food service activities J – Information and communication K – Financial and insurance activities L – Real estate activities M-N – Professional, scientific and technical activities; administrative and support service activities O-Q – Public administration, defence, education, human health and social work activities R-U – Arts, entertainment and recreation; other service activities; activities of household and extra-territorial organisations and bodies	Employment (thousand persons) by NUTS regions: Employed persons [nama_10r_3empers] Total employment (all NACE activities) and employment per economic activity	Population on 1 January by NUTS regions [demo_r_pjanaggr3]

Source: compiled by PPMI.

Step 2: Relating Eurostat data to EU ETS installations

We integrated the economic and population data from Eurostat with data on EU ETS installations automatically. The two datasets were merged in the following way:

- Data of installations in NUTS 3, NUTS 2 and NUTS 1 were merged with the data on population and employment in the respective NUTS 3, NUTS 2 and NUTS 1 region.
- Data of installations in NUTS 3, NUTS 2 and NUTS 1 levels active in different economic sectors were merged with the data on employment per different economic activity (NACE) in the respective NUTS 3, NUTS 2 and NUTS 1 region.

IMPROVING DATA QUALITY AND VALIDITY, POPULATING MISSING DATA

Improving data quality and validity

Clarifying NUTS 3 level of installations. The following three data sources (first three columns in Table 5) identify the NUTS 3 region in which a particular installation is operating:

- NUTS – data from the European Commission;
- NUTSGuessed – data from the European Commission;
- NUTS3 – data from Orbis.

Table 5 below explains how we selected the final NUTS 3 value for each installation in the dataset, particularly when data on the NUTS 3 region were inconsistent.

Table 5. Validation of NUTS 3 values

Sources of data on NUTS 3 level					
DG REGIO	**DG REGIO: Guessed**	**Orbis**		**No of installations**	**Selected value**
Value	n.a.	Value	Values are the same	5891	DG REGIO/Orbis value
n.a	Value	Value	Values are the same	2710	DG REGIO Guessed/Orbis value
Value	n.a.	n.a.		1447	DG REGIO value
n.a.	Value	n.a.		675	DG REGIO Guessed value
n.a.	n.a.	Value		595	Orbis value
Value	n.a.	Value	Values differ	3815	DG REGIO value
n.a.	Value	Value	Values differ	1226	DG REGIO Guessed value
n.a.	n.a.	n.a.		1176	n.a.*
				17535	

Note: *1126 (96%) of these installations are aircraft operators. Many of them are registered in non-EU countries.
Source: PPMI.

Unifying the reporting values. Since the data in our database came from different sources, the reporting values were also inconsistent (e.g. employees in thousands or in persons). To solve this problem, we corrected all the employment values provided in thousands by multiplying them by 1 000. In this way, we ensured that all data are reported consistently throughout the database.

Populating missing data with estimations

Orbis data missing values. Unfortunately, Orbis data proved to have significant data gaps. Data on up to 1/3 of installations per economic data category per year were missing. To resolve this, we filled in data gaps for specific years for companies that had at least one value available for the years 2005-2019. The estimates were calculated as follows:

- If only one true value was available (2005-2019), the missing values were populated by entering the available true value for missing years.
- If several true values were available, linear interpolation has been used:
  - If the missing value(s) year-wise are earlier than the available true value, the closest available true value is entered.
  - If the missing value(s) year-wise are later than the available true value, the closest available true value is entered.
  - If the missing value(s) year-wise are in-between the available true values, the value corresponding to the trend is entered.
- While estimating the data, information on the company's incorporation year (column year_of_incorporation) was taken into account to ensure that no estimates were filled in for years prior to the company's incorporation.

This exercise was not performed for installations:

1) with not a single value for that economic parameter available; or
2) with the only value available for a year earlier than 2005; or
3) whose status was inactive, dissolved, in liquidation, bankrupt, or unknown.

Estimating account holders' data to the installation level. As indicated in the description of the installation-company matching process in Section 2 of this report, 60% of installations were matched to Orbis companies using their account holder information. We noticed that a significant number of account holders owned more than one installation in the list provided by the EC. To minimise the overestimation of economic parameters in such installations, we populated the database with estimations at the installation level.

We produced the installation-level estimates by dividing each account holder's economic data **by the number of installations it owns** (in the list provided by the EC). Identification of the number of installations owned was conducted through company identification number duplicates (BvD ID). Unfortunately, during the validation process, we noticed that estimated values in several installations exceeded the overall employment rate in the NUTS 3 region. Giant corporations matched in Orbis as account holders (with hundreds of thousands or even millions of employees) was typically the reason for such overestimates.

To address this issue, for installations that had been matched at the account holder level, we populated the estimates calculated from the sub-set of installations matched at the installation level. The sub-set contains 2 786 installations matched at the installation level (the company address in Orbis matches the corresponding one in the EC dataset, there are no duplicates in the dataset, the company is active, and at least some employment data are available). We can be more confident about the precision of employment data for these installations. The sub-set takes into account different activity types of installations, and minimum, median, and maximum values have been calculated for each category. In cases when employment data of installations matched at the account holder level exceed the maximum value of installations operating in the corresponding economic sector (from the sub-set), the value was replaced by the median value of such installations (from the sub-set).

4. CALCULATING THE REGIONAL EMPLOYMENT IMPACT

Using the database combining the data from different sources, a basic analysis of the regional employment impact of EU ETS installations has been carried out. Out of 17 535 installations, **12 634 (72%)** are included in the calculations of employment at EU ETS installations. The analysis excludes aircraft operators (1 575), as the corresponding companies are typically based outside EU ETS[16]. In addition, stationary installations that could not be matched in Orbis (695) or with no location or employment data available (1 924) were also excluded from the employment analysis. Out of a total 15 960 stationary EU ETS installations, 12 634 installations (79%) are included in the analysis (see Table 6 for the breakdown by country).

Table 6. Number of EU ETS installations included in the analysis by country

Country code	Number of installations	Number of stationary installations	Number of installations included in the analysis (all of them being stationary installations)
AT	296	263	222
BE	499	464	329
BG	174	170	148
CY	29	15	4
CZ	469	454	375
DE	2 785	2604	2292
DK	465	441	395
EE	66	63	51
ES	1 515	1430	1121
FI	738	726	672
FR	1 748	1513	984
GR	217	194	99
HR	62	61	52
HU	304	298	243
IE	234	149	41
IT	1 643	1551	1276
LT	129	123	114
LU	34	27	17
LV	120	117	106

[16] Even though the specific accounts or aircraft company divisions were assigned to a European country in the data provided by the EC, 1 039 aircraft operators matched in Orbis are based in countries not covered by the EU ETS. These are mainly international airlines or companies providing services to airlines, where only the main company's account or its headquarters is available in Orbis. Most of the aircraft operators outside the EU ETS geo-scope are registered in the US (312), British Overseas Territories (e.g., Bermuda) (41), and Switzerland (32). Out of identified aircraft companies registered in Europe (based on the data from the Orbis database), most of them are in the UK (91), Germany (85), and France (34).

MT	18	7	0
NL	668	634	406
PL	1 084	1068	934
PT	371	341	267
RO	304	298	244
SE	976	954	906
SI	106	103	80
SK	223	221	197
UK	2 021	1480	906
IS	44	9	7
LI	2	2	2
NO	191	180	144
TOTAL	**17 535**	**15960**	**12634**

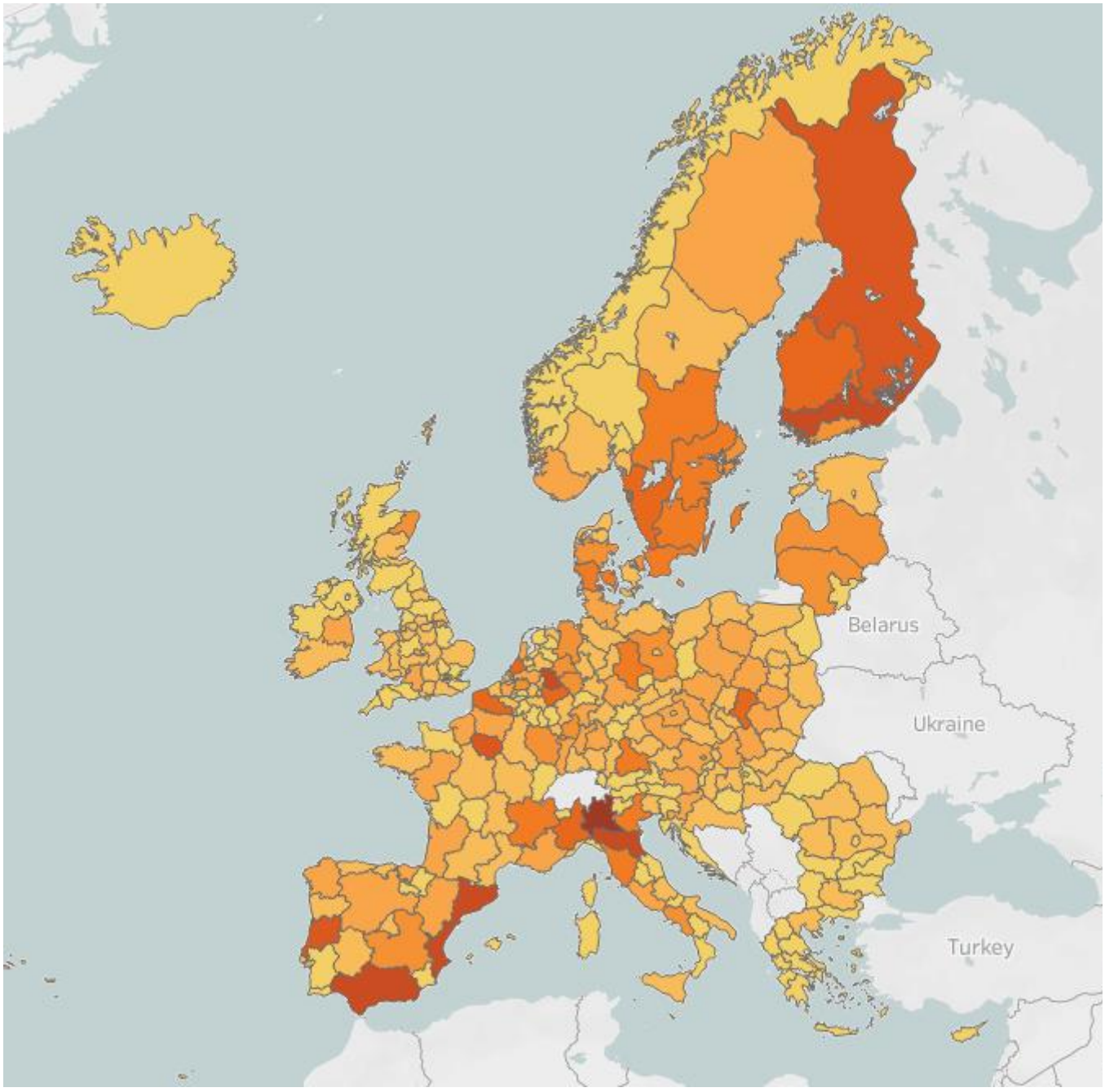
The employment analysis focuses on stationary installations based in the EU-27 in 2018. The results are presented in the **Analytical report** of this study with the following aspects covered:

- Number of EU ETS stationary installations in NUTS 2 and NUTS 3 regions.
- Estimated number of employees at EU ETS stationary installations in NUTS 2 and NUTS 3 regions;
- Top NUTS 2 and NUTS 3 regions by number of employees at EU ETS stationary installations;
- Estimated EU ETS employment share (%) in the number of total employees in NUTS 2 and NUTS 3 regions;
- Top NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations;
- Verified GHG emissions of all EU ETS installations in NUTS 2 and NUTS 3 regions;
- GHG emissions per EU ETS employee and per person (population).

The report also contains country fiches for all EU Member States (EU-27); however, the fiches for Cyprus and Malta are much shorter as data available for the study on the EU ETS stationary installations in those countries were very limited.

ANNEX 2. EXTRA MAPS AND TABLES

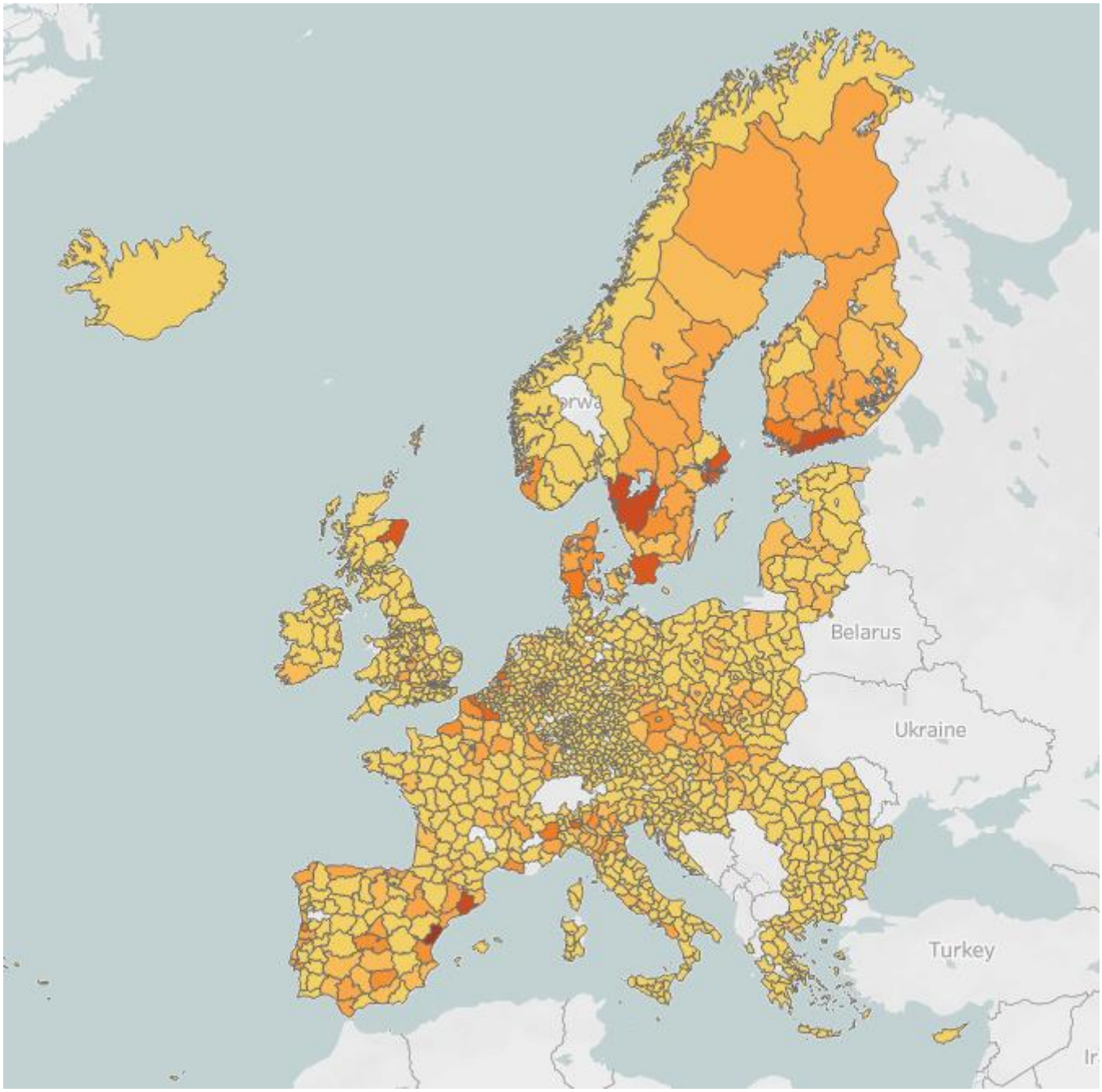
Map 1. EU ETS stationary installations in NUTS 2 regions in 2018 (EU-27+IS, LI, NO, UK)



Note: Based on the data of 15 910 stationary EU ETS installations.

Source: PPMI.

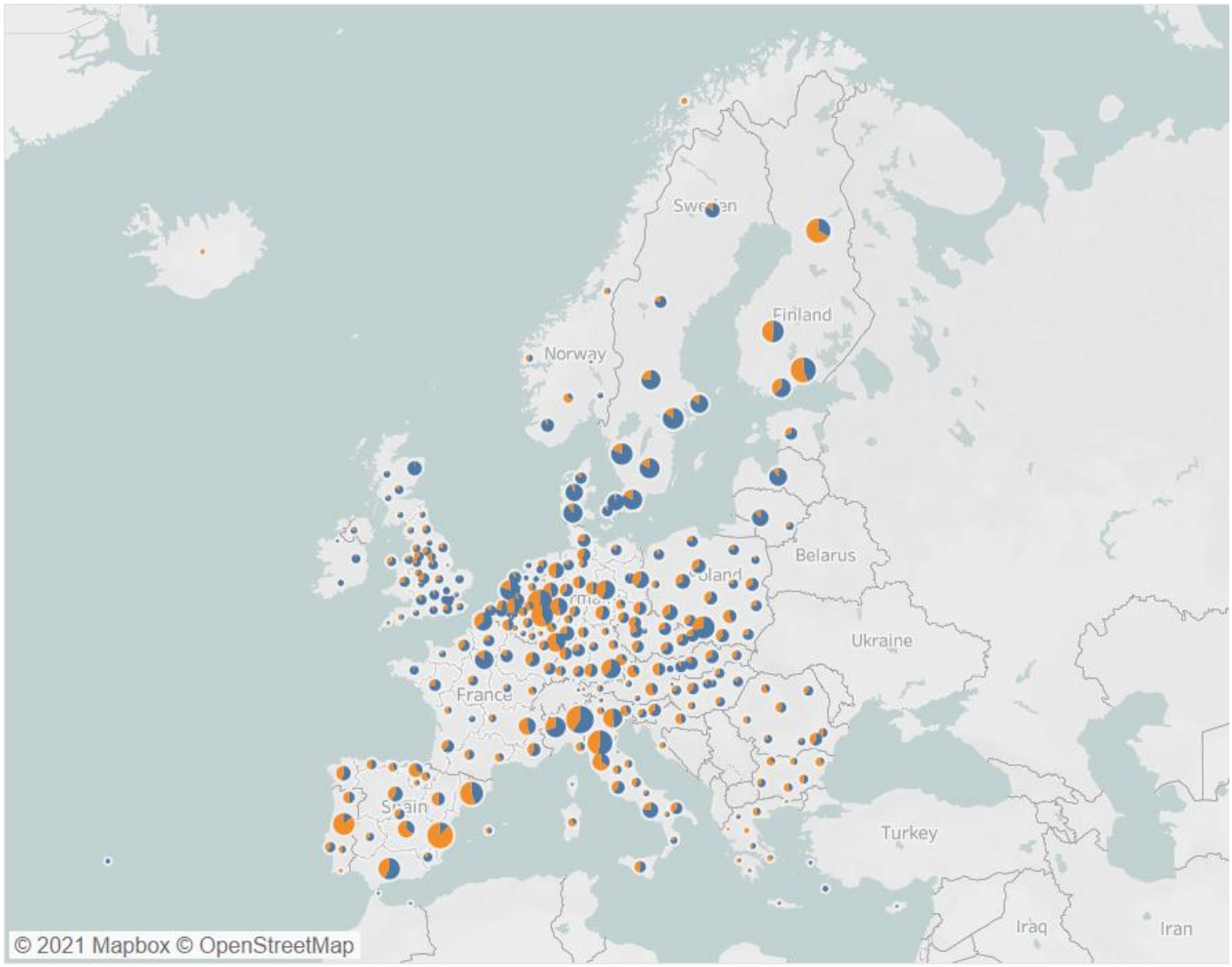
Map 2. EU ETS stationary installations in NUTS 3 regions in 2018 (EU-27+IS, LI, NO, UK)



Note: Based on the data of 15 910 stationary EU ETS installations.

Source: PPMI.

Map 3. EU ETS stationary installations in NUTS 2 regions in 2018 by activity type: combustion installations vs manufacturers (EU-27+IS, LI, NO, UK)



No of installations

1
50
100
150
200
250

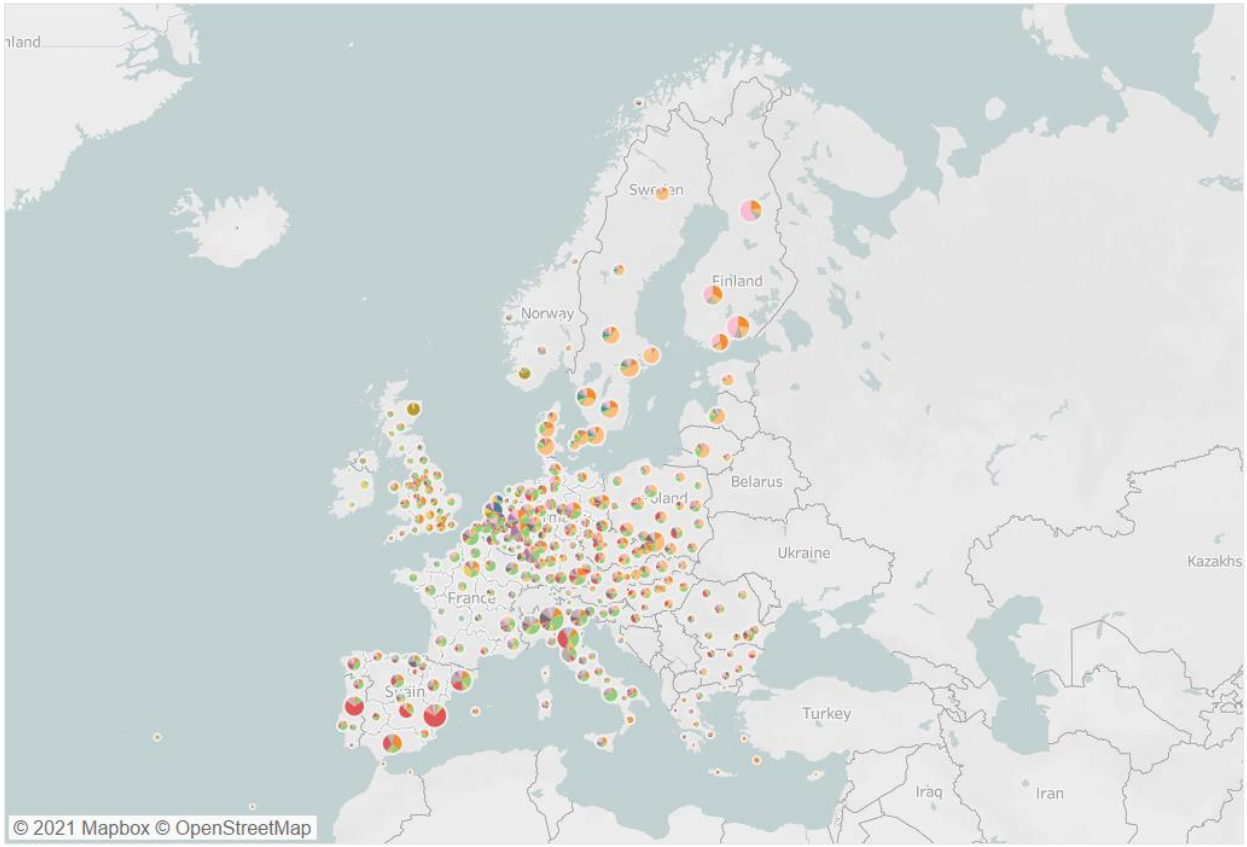
Category

Combustion installations
Manufacturers

Note: Based on the data of 12 634 stationary EU ETS installations.

Source:PPMI.

Map 4. EU ETS stationary installations in NUTS 2 regions in 2018 by activity type (EU-27+IS, LI, NO, UK)

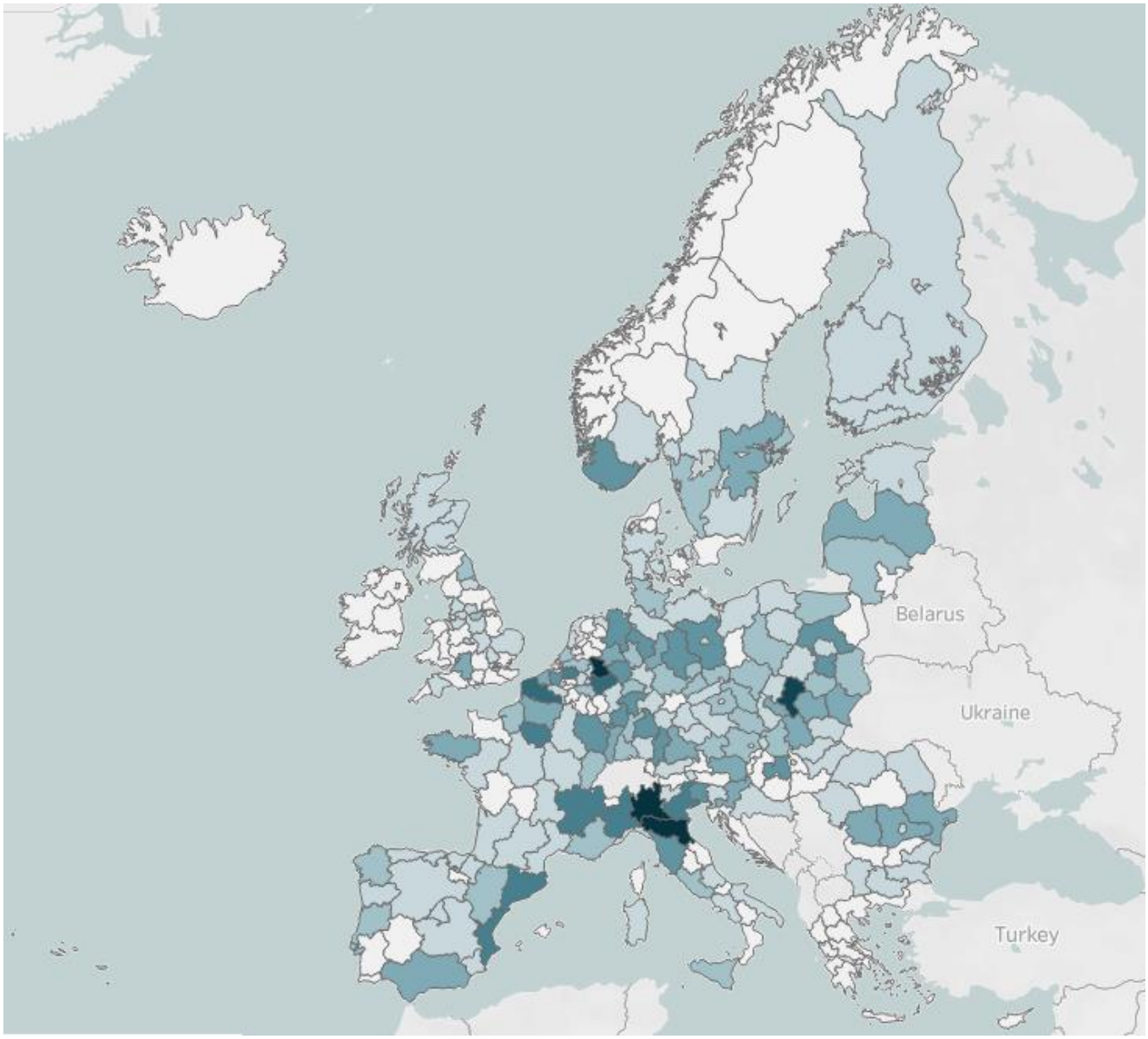


No of installations	Categories
1	Combustion installations in agriculture, forestry and fishing / A sector
50	Combustion installations in construction / F sector
100	Combustion installations in electricity production and distribution / D sector
150	Combustion installations in electricity, gas, steam and air conditioning supply / D sector
200	Combustion installations in gas manufacture and distribution / D sector
250	Combustion installations in manufacturing / C sector
	Combustion installations in mining and quarrying / B sector
	Combustion installations in other NACE sectors
	Combustion installations in water supply; sewerage, waste management and remediation activities / E secto
	Manufacture of cement
	Manufacture of ceramics
	Manufacture of glass
	Manufacture of iron or steel
	Manufacture of paper and pulp
	Production of bulk chemicals
	Production of lime, or calcination of dolomite/magnesite
	Other categories

Note: Based on the data of 12 634 stationary EU ETS installations.

Source:PPMI.

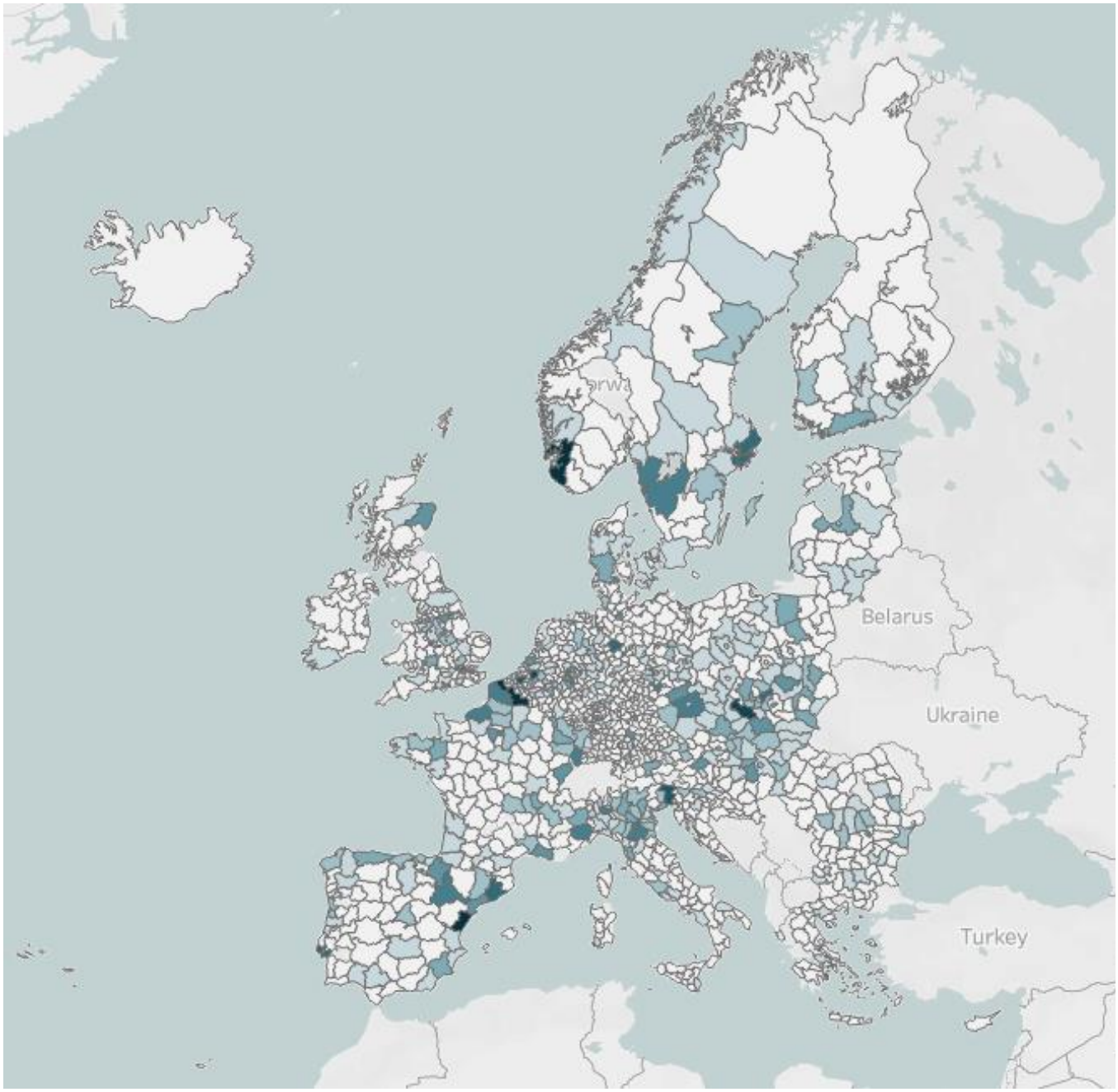
Map 5. Estimated number of employees at EU ETS stationary installations in NUTS 2 regions in 2018 (EU-27+IS, LI, NO, UK)



Note: Based on the data of 12 634 stationary EU ETS installations.

Source: PPMI.

Map 6. Estimated number of employees at EU ETS stationary installations in NUTS 3 regions in 2018 (EU-27+IS, LI, NO, UK)



Note: Based on the data of 12 634 stationary EU ETS installations.

Source: PPMI.

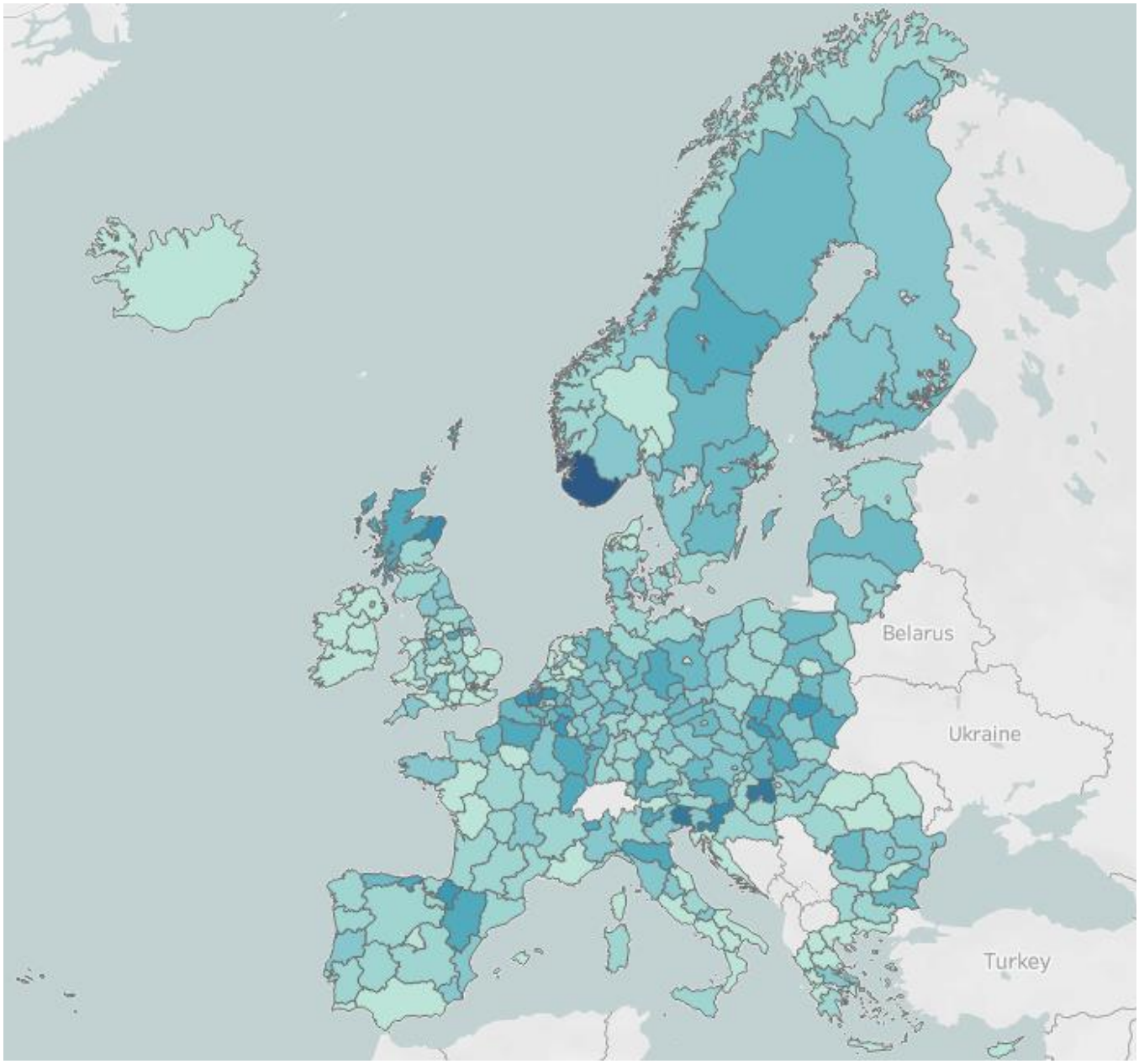
Table 1. Top 15 NUTS 2 regions by estimated employment impact of EU ETS stationary installations in 2018 (EU-27+IS, LI, NO, UK)

	NUTS 2 code	NUTS 2 region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of persons employed in the region (Eurostat data)
1.	NO04	Agder og Rogaland (statistical region 2016)	5.16%	20 758	400 000
2.	HU21	Közép-Dunántúl	4.12%	19 415	471 250
3.	ITH4	Friuli-Venezia Giulia	3.90%	21 249	545 000
4.	SI03	Vzhodna Slovenija	3.40%	16 377	481 800
5.	UKM5	North-Eastern Scotland	3.33%	9 091	273 000
6.	BE23	Prov. Oost-Vlaanderen	3.26%	20 346	623 400
7.	BE21	Prov. Antwerpen	3.05%	25 499	836 700
8.	BE34	Prov. Luxembourg (BE)	3.01%	2 964	98 500
9.	CZ08	Moravskoslezsko	3.01%	17 163	571 000
10.	BE25	Prov. West-Vlaanderen	2.99%	16 078	538 500
11.	ES22	Comunidad Foral de Navarra	2.86%	8 723	305 400
12.	PL72	Swietokrzyskie	2.63%	13 316	506 800
13.	ITC2	Valle d'Aosta/Vallée d'Aoste	2.52%	1 552	61 500
14.	UKM6	Highlands and Islands	2.50%	5 644	226 000
15.	SE32	Mellersta Norrland	2.47%	4 396	178 000

Table 2. Top 15 NUTS 3 regions by estimated employment impact of EU ETS stationary installations in 2018 (EU-27+IS, LI, NO, UK)

	NUTS 3 code	NUTS 3 region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of persons employed in the region (Eurostat data)
1.	SE214	Gotlands län	14.00%	4 339	430 000
2.	AT223	Östliche Obersteiermark	11.68%	8 445	631 000
3.	DE912	Salzgitter, Kreisfreie Stadt	10.48%	6 054	832 980
4.	SI035	Zasavska	9.75%	1 669	481 800
5.	DE27D	Donau-Ries	9.42%	7 834	1 038 040
6.	DE253	Fürth, Kreisfreie Stadt	8.97%	5 740	1 052 960
7.	DE214	Altötting	7.77%	4 904	2 894 700
8.	ES522	Castellón/Castelló	7.72%	19 189	1 944 300
9.	ITG2C	Carbonia-Iglesias (NUTS 2016)	7.69%	2 721	607 700
10.	DEB34	Ludwigshafen am Rhein, Kreisfreie Stadt	7.62%	9 651	1 016 200
11.	NO043	Rogaland (statistical region 2016)	7.49%	19 378	400 000
12.	BE257	Arr. Tielt	7.48%	3 208	538 500
13.	BE253	Arr. Ieper	7.34%	3 383	538 500
14.	UKM64	Eilean Siar (Western Isles)	7.31%	1 023	226 000
15.	BE345	Arr. Virton	7.10%	973	98 500

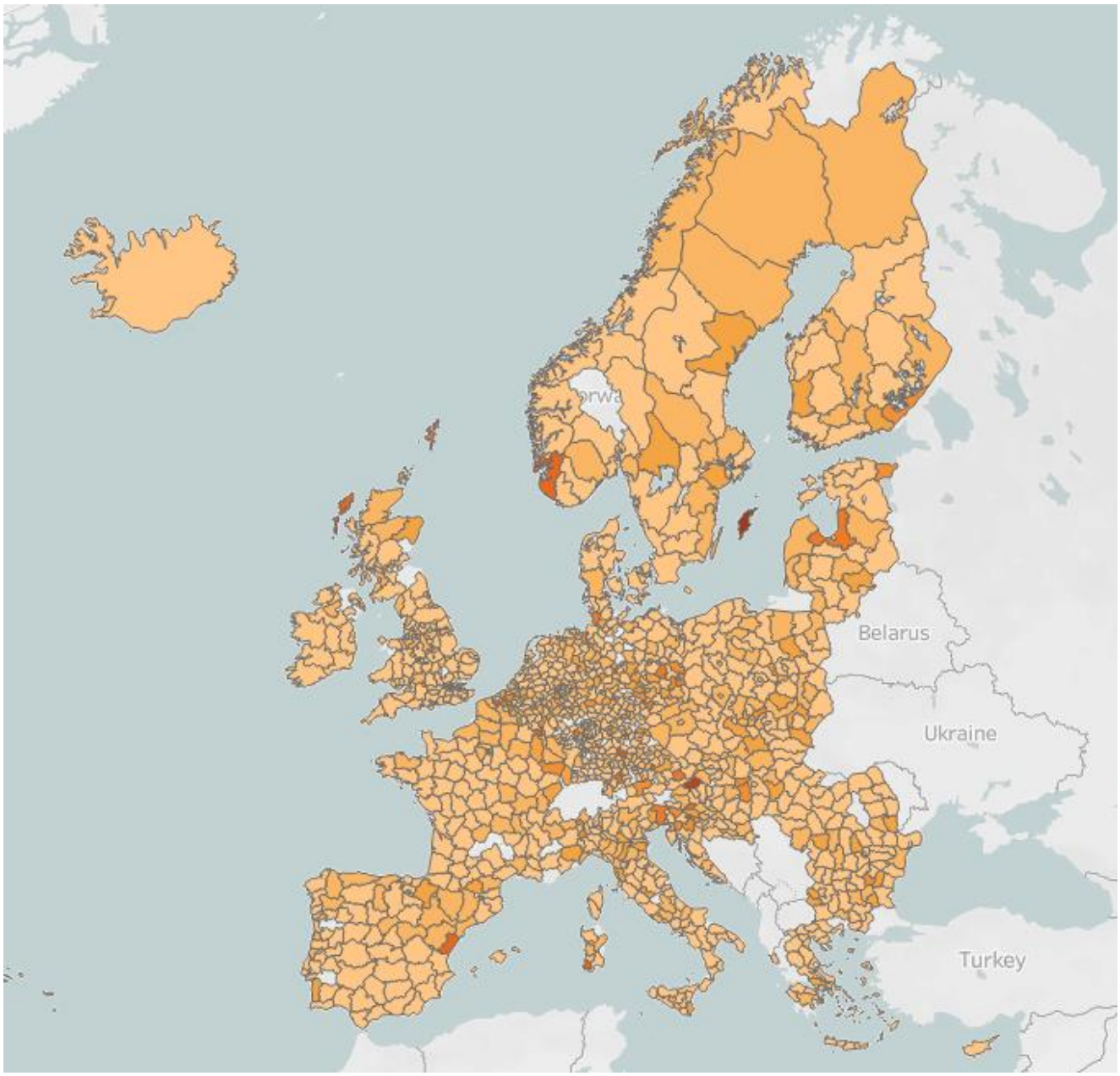
Map 7. Estimated EU ETS employment share (%) in the number of total persons employed in NUTS 2 regions in 2018 (EU-27+IS, LI, NO, UK)



Note: Based on the data of 12 634 stationary EU ETS installations.

Source: PPMI.

Map 8. Estimated EU ETS employment share (%) in the total number of persons employed in NUTS 3 regions in 2018 (EU-27+IS, LI, NO, UK)



Note: Based on the data of 12 634 stationary EU ETS installations.

Source: PPMI.

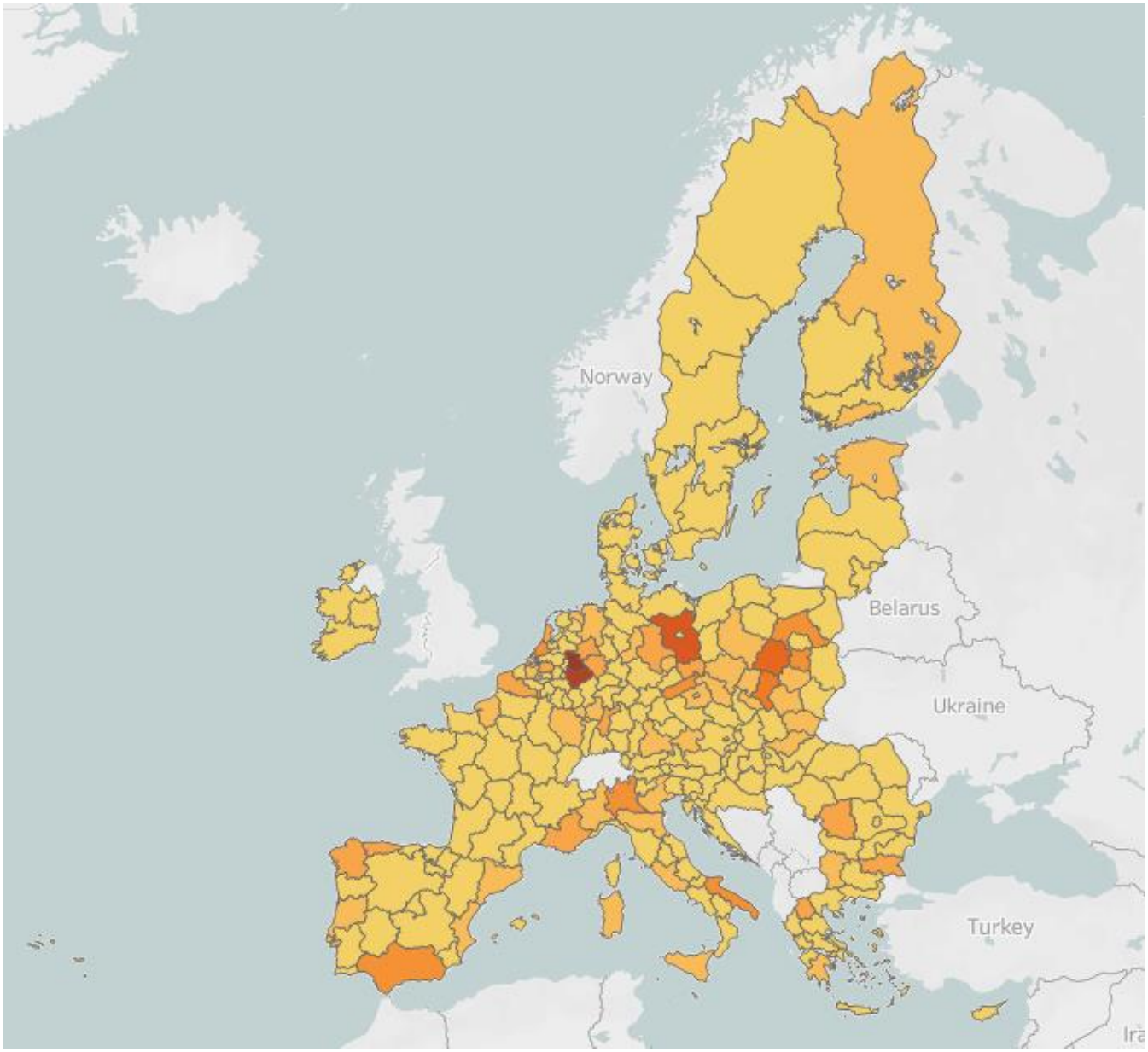
Table 3. Top 15 NUTS 2 regions by verified GHG emissions of the EU ETS stationary installations in the EU-27 in 2018

	NUTS 2 code	NUTS 2 region	Verified emissions	Allocation	No of EU ETS stationary installations
1.	DEA1	Düsseldorf	74 586 428	30 691 509	226
2.	DEA2	Köln	61 743 002	10 298 450	185
3.	DE40	Brandenburg	46 953 707	8 068 222	105
4.	PL71	Lódzkie	42 983 600	1 993 686	70
5.	PL22	Slaskie	34 363 974	9 313 017	181
6.	CZ04	Severozápad	28 168 701	3 874 643	61
7.	NL33	Zuid-Holland	26 976 031	12 412 716	182
8.	PL92	Mazowiecki regionalny	24 844 542	3 621 464	62
9.	ES61	Andalucía	24 834 090	8 942 658	246
10.	ITC4	Lombardia	23 456 474	9 050 401	312
11.	ITF4	Puglia	23 033 379	15 559 652	56
12.	DEE0	Sachsen-Anhalt	21 091 666	9 495 795	126
13.	DED2	Dresden	20 714 398	674 265	61
14.	FRE1	Nord-Pas-de-Calais	20 689 177	13 809 285	158
15.	DEA5	Arnsberg	19 346 792	5 289 548	125

Note: Based on the data of 14 289 stationary EU ETS installations (all such installations in the EU-27 in 2018).

Source: PPMI.

Map 9. Verified GHG emissions of the EU ETS stationary installations in NUTS 2 regions in the EU-27 in 2018



Note: Based on the data of 14 289 stationary EU ETS installations (all such installations in the EU-27 in 2018).

Source: PPMI.

Table 4. Top 20 NUTS 2 regions by verified GHG emissions of EU ETS stationary installations per person in the region in the EU-27 in 2018

	NUTS code	NUTS 2 region	Verified emissions per person in the region	Verified emissions per employed person in the region	Verified emissions	Population (Eurostat data)	No of employed persons (Eurostat data)	No of stationary EU ETS installations
1.	EL53	Dytiki Makedonia	**72**	**198**	19 317 192	269 222	97 530	11
2.	NL34	Zeeland	**30**	**60**	11 339 214	382 304	187 800	38
3.	CZ04	Severozápad	**25**	**55**	28 168 701	1 116 766	509 000	61
4.	NL11	Groningen	**22**	**44**	12 934 875	582 944	296 500	46
5.	DE40	Brandenburg	**19**	**42**	46 953 707	2 504 040	1 124 610	105
6.	PL71	Lódzkie	**17**	**38**	42 983 600	2 462 448	1 132 000	70
7.	ES12	Principado de Asturias	**17**	**45**	17 804 428	1 027 624	394 700	39
8.	BG34	Yugoiztochen	**16**	**35**	16 343 283	1 039 549	472 540	28
9.	PL52	Opolskie	**15**	**37**	14 340 604	948 808	390 300	48
10.	DEA1	Düsseldorf	**14**	**27**	74 586 428	5 198 820	2 805 220	226
11.	DE50	Bremen	**14**	**22**	9 555 422	681 032	436 070	38
12.	DEA2	Köln	**14**	**25**	61 743 002	4 454 228	2 439 570	185
13.	DED5	Leipzig	**14**	**27**	14 284 126	1 037 782	538 130	32
14.	EL65	Peloponnisos	**13**	**32**	7 749 512	576 749	238 540	14
15.	DED2	Dresden	**13**	**25**	20 714 398	1 598 573	814 100	61
16.	PL72	Swietokrzyskie	**12**	**28**	14 381 077	1 232 016	506 800	66
17.	PL92	Mazowiecki regionalny	**11**	**23**	24 844 542	2 334 793	1 073 500	62
18.	EE00	Eesti	**11**	**21**	13 854 174	1 319 133	649 500	63
19.	DEC0	Saarland	**10**	**19**	10 061 832	994 187	534 490	48
20.	DEE0	Sachsen-Anhalt	**9**	**21**	21 091 666	2 223 081	1 004 550	126

Note: Based on the data of 14 289 stationary EU ETS installations (all such installations in the EU-27 in 2018).

Source: PPMI.

ANNEX 3. COUNTRY FICHES

AUSTRIA

Please note that all the data in this country fiche refer to the 222 EU ETS installations included in the analysis. Some employment data are estimates.

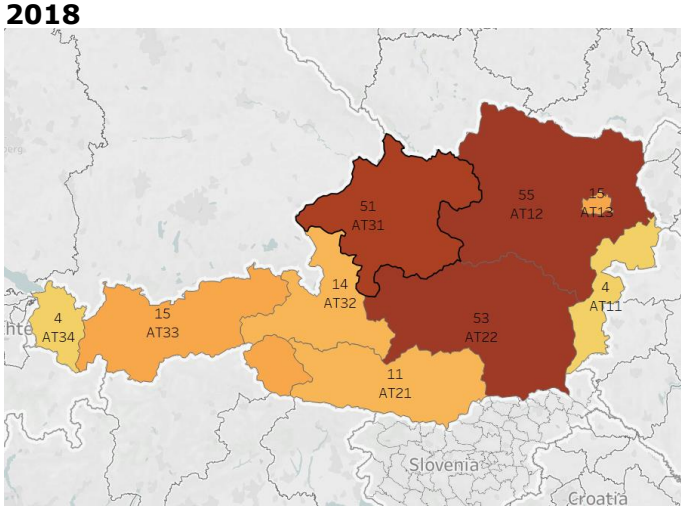
The study estimated the employment of 222 stationary EU ETS installations in Austria (84% of 263 stationary installations in total). The analysed installations employed almost 55 000 people in 2018 (~1.2% of all employed persons in Austria).

Combustion installations accounted for 52% of the stationary EU ETS installations in Austria, most such installations operating in the sectors of electricity production and distribution, manufacturing or electricity, gas, steam and air conditioning supply. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing ceramics, paper and pulp, and cement. For more details, please see the table and maps below.

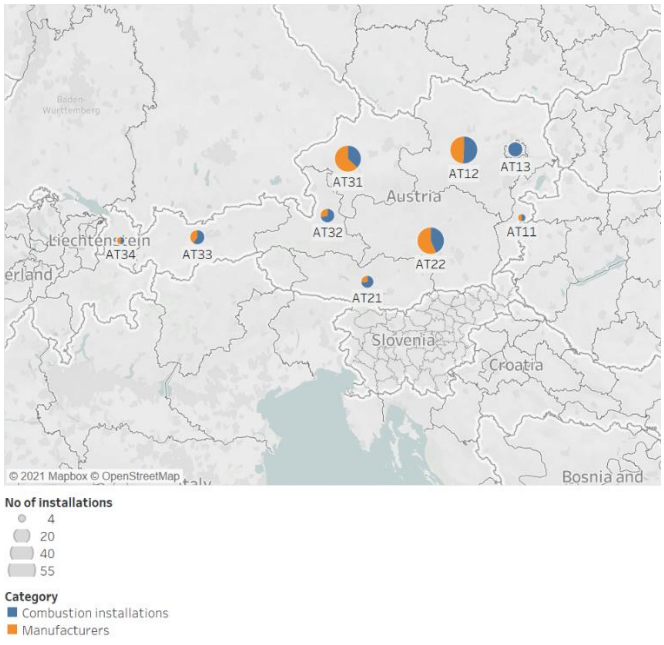
Table 1. Top economic activities by the number of the EU ETS stationary installations in Austria in 2018

Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in electricity production and distribution	45	20.3%	105	133	5 969
Combustion installations in manufacturing	31	14.0%	316	709	21 268
Combustion installations in electricity, gas, steam and air conditioning supply	21	9.5%	20	22	460
Manufacturers					
Manufacture of ceramics	31	14.0%	117	98	2 653
Manufacture of paper and pulp	20	9.0%	242	320	6 406
Manufacture of cement	12	5.4%	185	150	1 655
	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**222**	**100.0%**	**146**	**253**	**54 733**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Austria in 2018



Map 2. EU ETS installations by activity type in NUTS 2 regions in Austria in 2018



Source: PPMI.

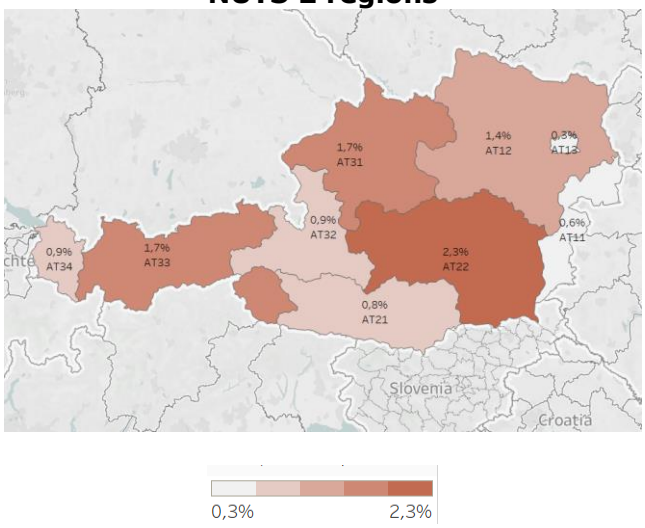
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Austria.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Austria 2018

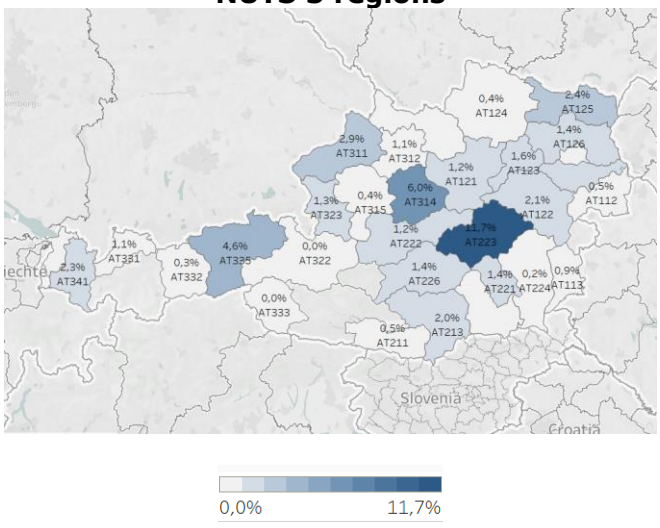
	NUTS 2		NUTS 3	
	Austria	EU-27	**Austria**	EU-27
Number of regions covered	**9**	233	**31**	1 081
Number of installations included	**222**	11 575	**222**	11 575
Average (arithmetic) estimated employment share per region	**1.2%**	1.1%	**1.7%**	1.3%
Maximum estimated employment share per region	**2.3%**	4.1%	**11.7%**	14%
Median estimated employment share per region	**0.9%**	0.9%	**1.2%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Austria in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Austria in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	AT22	Steiermark	2.3%	14 425	631 000	1 240 214
2.	AT33	Tirol	1.7%	7 038	411 100	751 140
3.	AT31	Oberösterreich	1.7%	13 059	768 800	1 473 576
NUTS 3 regions						
1.	AT223	Östliche Obersteiermark	11.7%	8 445	72 300	159 888
2.	AT314	Steyr-Kirchdorf	6.0%	4 579	76 700	155 445
3.	AT335	Tiroler Unterland	4.6%	6 248	135 500	255 529

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Austria in 2018: 1) Voestalpine Stahl Linz (*account holder* – voestalpine Stahl GmbH; *activity* – production of pig iron or steel), 2) Sinteranl., Hochöfen, Stahlwerk Donawitz (voestalpine Stahl Donawitz GmbH; production of pig iron or steel), 3) Raffinerie Schwechat (OMV Downstream GmbH; refining of mineral oil). The study estimated that all three installations fell into the range of 100-500 according to the number of employees.

BELGIUM

Please note that all the data in this country fiche refer to the 329 EU ETS installations included in the analysis. Some employment data are estimates.

The study estimated the employment of 329 stationary EU ETS installations in Belgium (71% of 464 stationary installations in total). The analysed installations employed around 100 000 people in 2018 (~2% of all employed persons in Belgium).

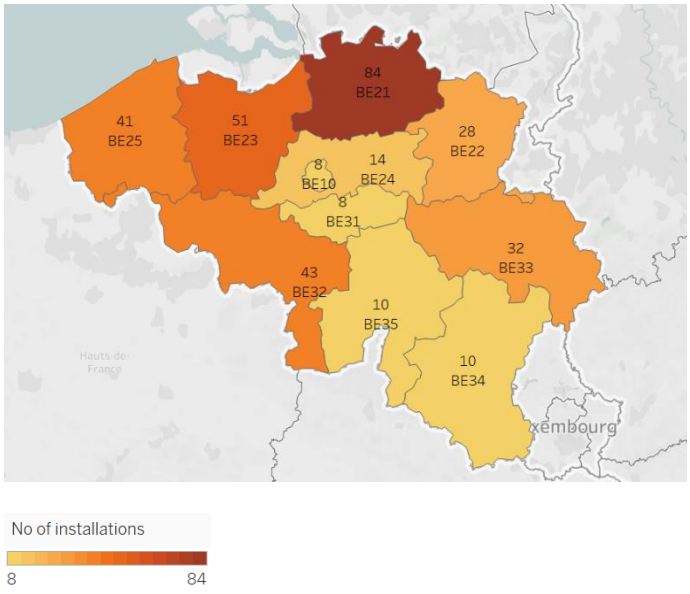
Combustion installations accounted for 64% of the stationary EU ETS installations in Belgium, most such installations operating in the manufacturing sector. Among the rest of the stationary EU ETS installations, the largest share was made up of installations producing bulk chemicals, ceramics and iron or steel. For more details, please see the table and maps below.

Table 1. Top economic activities by the number of the EU ETS stationary installations in Belgium in 2018

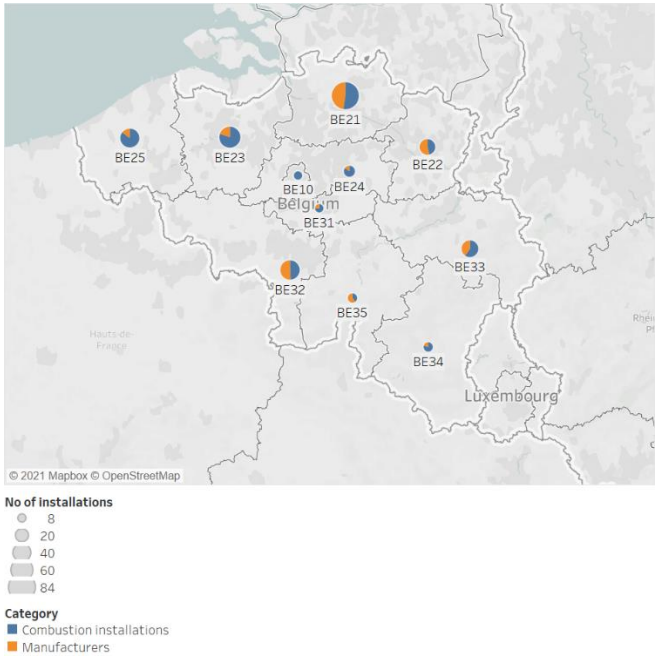
Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in manufacturing	134	40.7%	204	439	56 239
Combustion installations in electricity production and distribution	22	6.7%	36	59	1 117
Combustion installations in construction	13	4.0%	136	179	1 965
Manufacturers					
Production of bulk chemicals	30	9.1%	381	388	11 650
Manufacture of ceramics	24	7.3%	72	100	2 192
Manufacture of iron or steel	17	5.2%	146	312	4 681
	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**329**	**100.0%**	**147**	**329**	**101 776**

Source: PPMI.

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Belgium in 2018



Map 2. EU ETS installations by activity type in NUTS 2 regions in Belgium in 2018



Source: PPMI.

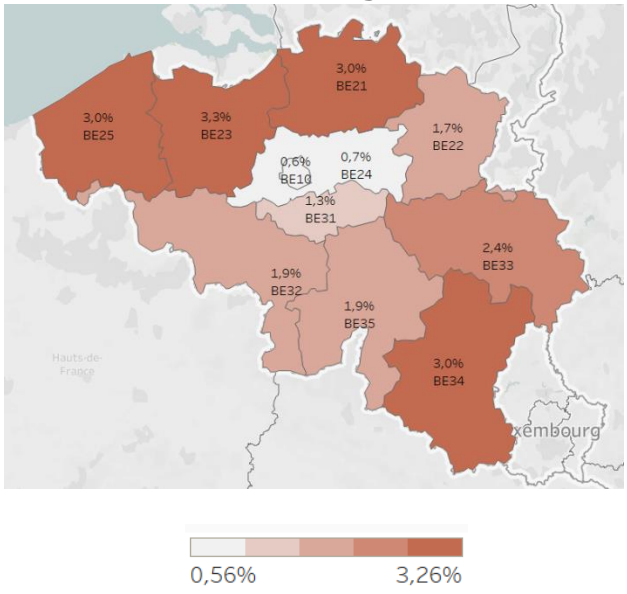
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Belgium.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Belgium 2018

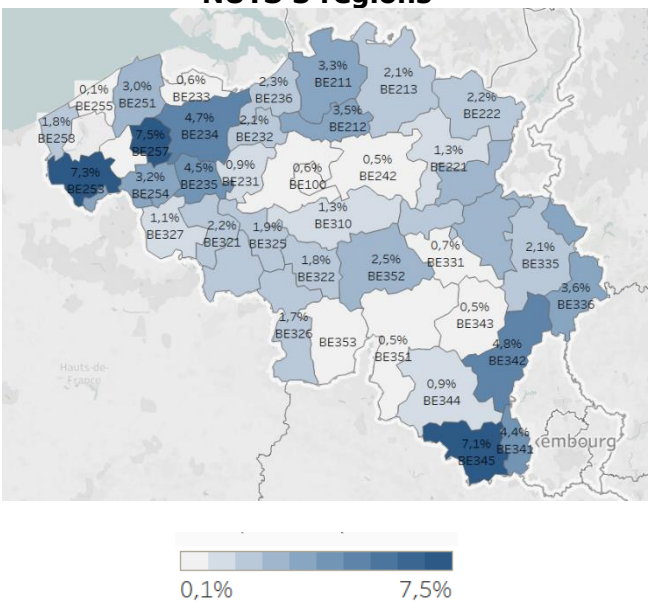
	NUTS 2		NUTS 3	
	Belgium	EU-27	**Belgium**	EU-27
Number of regions covered	**11**	233	**43**	1 081
Number of installations included	**329**	11 575	**329**	11 575
Average (arithmetic) estimated employment share per region	**2.1%**	1.1%	**2.5%**	1.3%
Maximum estimated employment share per region	**3.2%**	4.1%	**7.5%**	14%
Median estimated employment share per region	**1.9%**	0.9%	**2.1%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Belgium in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Belgium in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	BE23	Prov. Oost-Vlaanderen	3.3%	20 346	623 400	1 506 232
2.	BE21	Prov. Antwerpen	3.1%	25 499	836 700	1 849 523
3.	BE34	Prov. Luxembourg (BE)	3.0%	2 964	98 500	285 010
NUTS 3 regions						
1.	BE257	Arr. Tielt	7.5%	3 208	42 900	92 738
2.	BE253	Arr. Ieper	7.3%	3 383	46 100	106 511
3.	BE345	Arr. Virton	7.1%	973	13 700	53 687

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Belgium in 2018: 1) Total Raffinaderij Antwerpen (*account holder* – Total Raffinaderij Antwerpen; *activity* – refining of mineral oil), 2) BASF Antwerpen – 127a (B.A.S.F. Antwerpen; production of bulk chemicals), 3) Esso Raffinaderij (Exxonmobil Petroleum & Chemical; refining of mineral oil). The study estimated that Total Raffinaderij Antwerpen employed over 1 000 people in 2018 while the other two fell into the range of 500-1000 according to the number of employees.

BULGARIA

Please note that all the data in this country fiche refer to the 148 EU ETS installations included in the analysis. Some employment data are estimates.

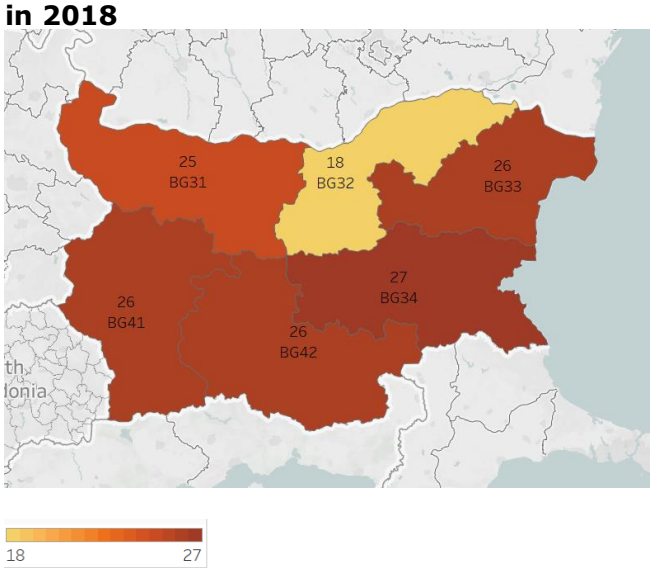
The study estimated the employment of 148 stationary EU ETS installations in Bulgaria (87% of 170 stationary installations in total). The analysed installations employed over 33 000 people in 2018 (~0.9% of all employed persons in Bulgaria).

Combustion installations accounted for 45% of the stationary EU ETS installations in Bulgaria, most such installations operating in the sectors of electricity production and distribution, manufacturing or electricity, gas, steam and air conditioning supply. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing ceramics. For more details, please see the table and maps below.

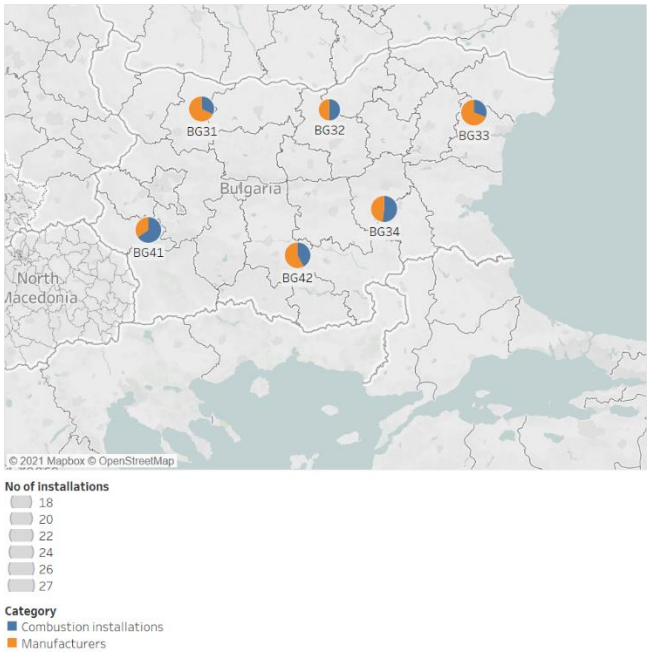
Table 1. Top economic activities by the number of the EU ETS stationary installations in Bulgaria in 2018

Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in electricity production and distribution	18	12.2%	142	175	3 147
Combustion installations in manufacturing	17	11.5%	224	365	5 837
Combustion installations in electricity, gas, steam and air conditioning supply	15	10.1%	259	231	3 002
Manufacturers					
Manufacture of ceramics	27	18.2%	30	114	2 847
Manufacture of cement	6	4.1%	128	137	819
Manufacture of iron or steel	6	4.1%	488	466	2 330
…	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**148**	**100.0%**	**149**	**248**	**33 223**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Bulgaria in 2018



Map 2. EU ETS installations by activity type in NUTS 2 regions in Bulgaria in 2018



Source: PPMI.

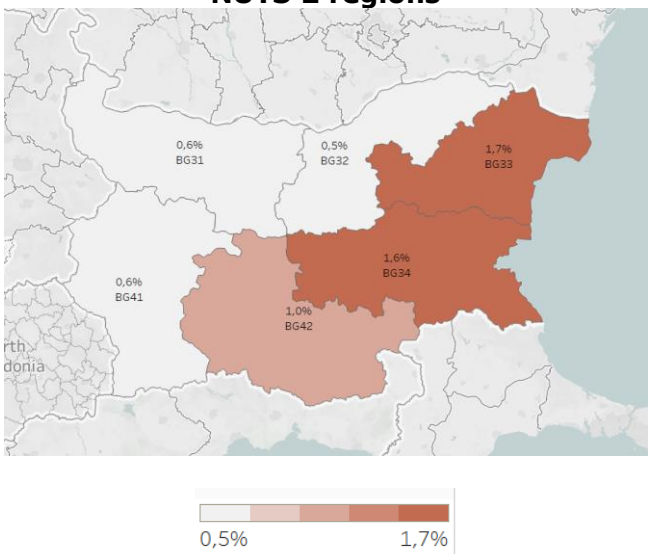
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Bulgaria.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Bulgaria 2018

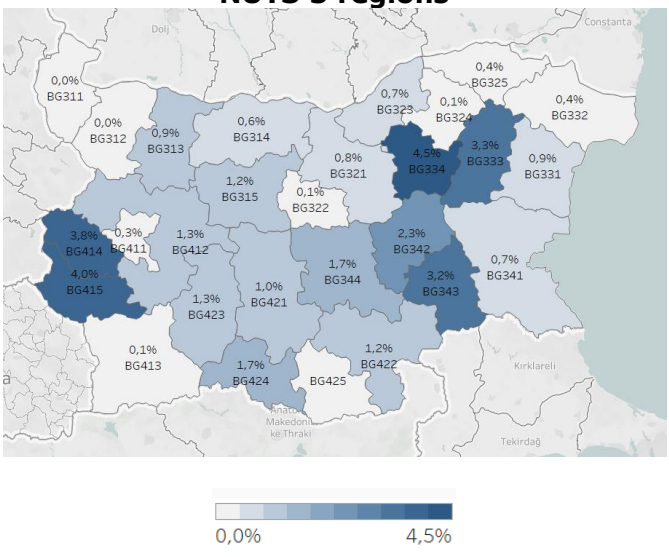
	NUTS 2		NUTS 3	
	Bulgaria	EU-27	**Bulgaria**	EU-27
Number of regions covered	**6**	233	**28**	1 081
Number of installations included	**148**	11 575	**148**	11 575
Average (arithmetic) estimated employment share per region	**1.0%**	1.1%	**2.5%**	1.4%
Maximum estimated employment share per region	**1.7%**	4.1%	**7.5%**	4.5%
Median estimated employment share per region	**0.8%**	0.9%	**2.1%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Bulgaria in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Bulgaria in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	BG33	Severoiztochen	1.7%	7 308	431 300	933 705
2.	BG34	Yugoiztochen	1.6%	7 456	472 540	1 039 549
3.	BG42	Yuzhen tsentralen	1.0%	6 763	663 420	1 417 432
NUTS 3 regions						
1.	BG334	Targovishte	4.5%	2 378	53 260	112 474
2.	BG415	Kyustendil	4.0%	1 982	49 950	121 099
3.	BG414	Pernik	3.8%	1 605	42 580	122 421

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Bulgaria in 2018: 1) TPP MARITSA EAST 2 EAD (*account holder* – TPP MARITSA EAST 2 EAD), 2) TEC ContourGlobal Maritsa East 3 (ContourGlobal Maritsa East 3 AD), 3) TPP AES-3C Maritza East 1 (AES-3C Maritza East 1). All three installations are combusting fuels to produce electricity. The study estimated that the first one employed up to 150 people in 2018 while the other two fell into the range of 1-50 according to the number of employees.

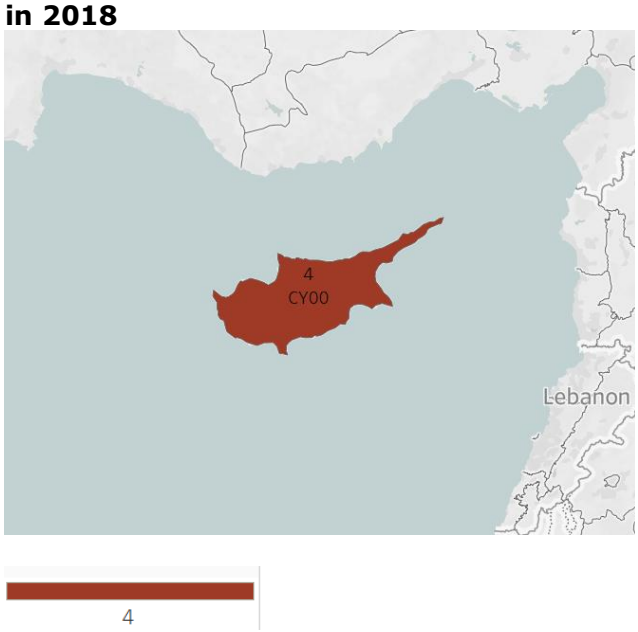
CYPRUS

Please note that all the data in this country fiche refer to the 4 EU ETS installations included in the analysis. Since data on the employment at EU ETS installations in Cyprus are very limited, this country fiche does not include the analysis of employment impact.

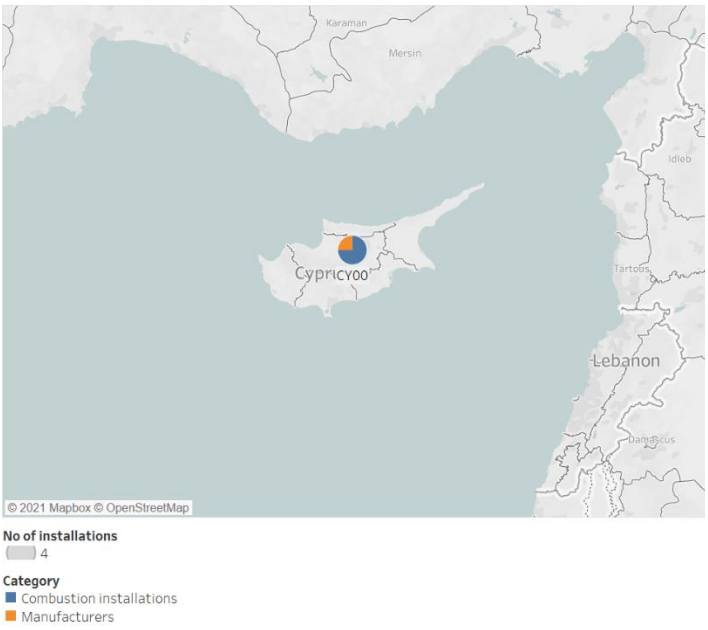
The country fiche presents the results for four stationary EU ETS installations in Cyprus (27% of 15 stationary installations in total).

Combustion installations accounted for 75% (3 out of 4) of the analysed stationary EU ETS installations in Cyprus. One installation (25%) is operating in the manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain. For more details, please see the maps below.

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Cyprus in 2018



Map 2. EU ETS installations by activity type in NUTS 2 regions in Cyprus in 2018



Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Cyprus in 2018: 1) EAC Vasilikos Power Station; 2) EAC Dhekelia Power Station, 3) EAC Moni Power Station. All three of them are combustion installations with a rated thermal input exceeding 20 MW producing electricity and belong to the same account holder – Electricity Authority of Cyprus.

CROATIA

Please note that all the data in this country fiche refer to the 52 EU ETS installations included in the analysis. Some employment data are estimates.

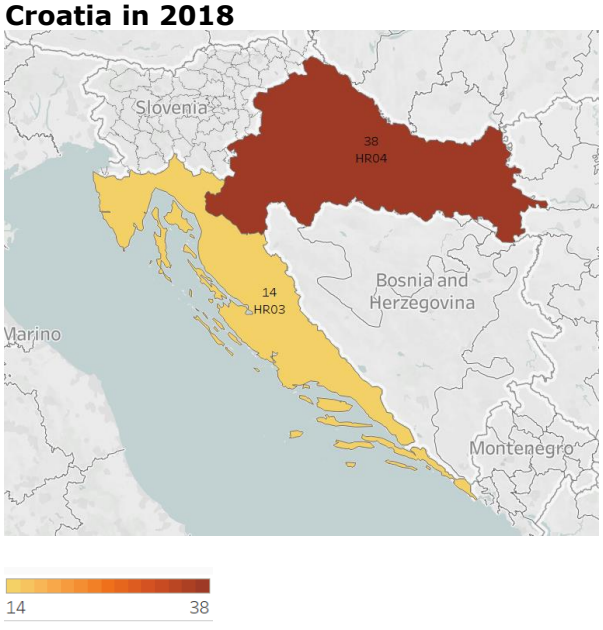
The study estimated the employment of 52 stationary EU ETS installations in Croatia (85% of 61 stationary installations in total). The analysed installations employed almost 10 000 people in 2018 (~0.6% of all employed persons in Croatia).

Combustion installations accounted for 42% of the stationary EU ETS installations in Croatia, most such installations operating in the sectors of manufacturing or of electricity production and distribution. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing ceramics. For more details, please see the table and maps below.

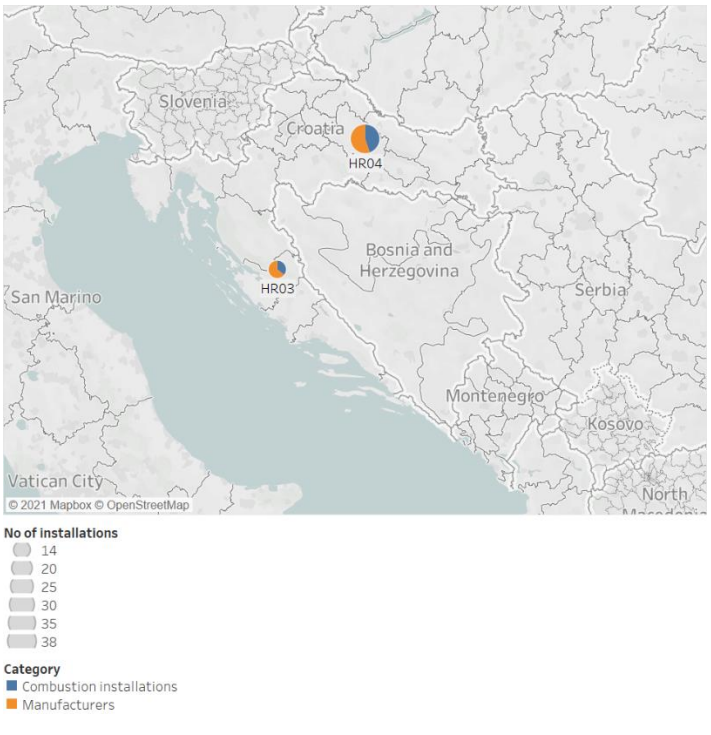
Table 1. Top economic activities by the number of the EU ETS stationary installations in Croatia in 2018

Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in manufacturing	9	17.3%	146	193	1 542
Combustion installations in electricity production and distribution	8	15.4%	244	244	1 952
Combustion installations in electricity, gas, steam and air conditioning supply	3	5.8%	188	188	376
Manufacturers					
Manufacture of ceramics	12	23.1%	87	114	1 250
Manufacture of iron or steel	5	9.6%	302	319	1 274
Manufacture of cement	4	7.7%	352	334	1 334
…	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**52**	**100.0%**	**157**	**208**	**9 996**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Croatia in 2018



Map 2. EU ETS installations by activity type in NUTS 2 regions in Croatia in 2018



Source: PPMI.

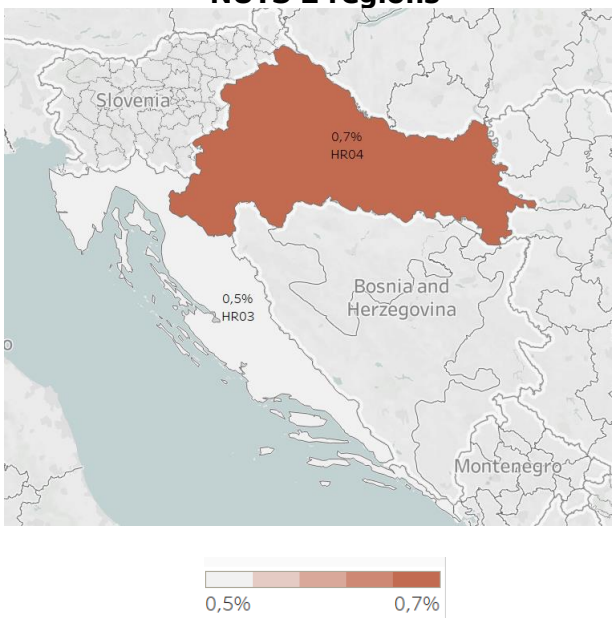
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Croatia.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Croatia 2018

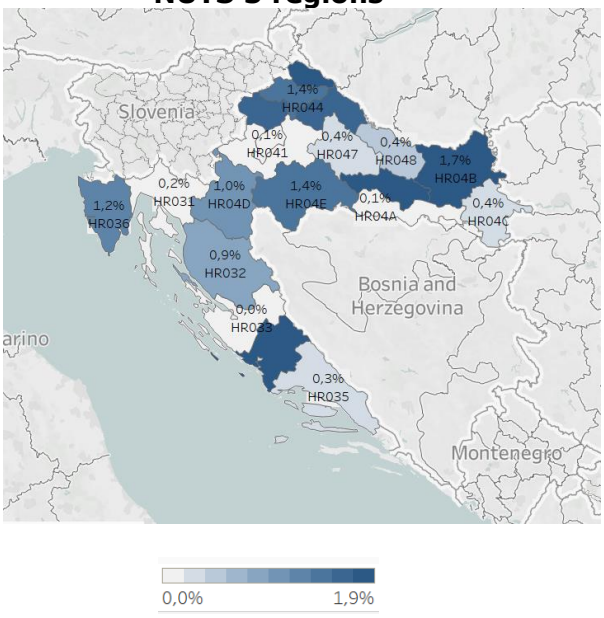
	NUTS 2		NUTS 3	
	Croatia	EU-27	**Croatia**	EU-27
Number of regions covered	**2**	233	**20**	1 081
Number of installations included	**52**	11 575	**52**	11 575
Average (arithmetic) estimated employment share per region	**0.6%**	1.1%	**0.9%**	1.3%
Maximum estimated employment share per region	**0.5%**	4.1%	**1.9%**	14%
Median estimated employment share per region	**0.6%**	0.9%	**1.0%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Croatia in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 2-3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Croatia in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
			NUTS 2 regions			
1.	HR04	Kontinentalna Hrvatska	0.7%	7 405	1 124 670	2 727 154
2.	HR03	Jadranska Hrvatska	0.5%	2 591	520 670	1 378 339
			NUTS 3 regions			
1.	HR049	Pozesko-slavonska zupanija	1.9%	400	21 590	68 708
2.	HR034	Sibensko-kninska zupanija	1.8%	592	32 740	100 695
3.	HR04B	Osjecko-baranjska zupanija	1.7%	1 732	101 870	280 145

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Croatia in 2018: 1) TE Plomin 2 (*account holder* – HEP-Proizvodnja d.o.o.; *activity* – combustion of fuels in production of electricity), 2) Petrokemija d.d. tvornica gnojiva (Petrokemija d.d. tvornica gnojiva; production of ammonia), 3) INA- Industrija nafte d.d. Rafinerija nafte Rijeka (INA d.d.; refining of mineral oil). The study estimated that all three installations fell into the range of 100-500 according to the number of employees in 2018.

CZECHIA

Please note that all the data in this country fiche refer to the 375 EU ETS installations included in the analysis. Some employment data are estimates.

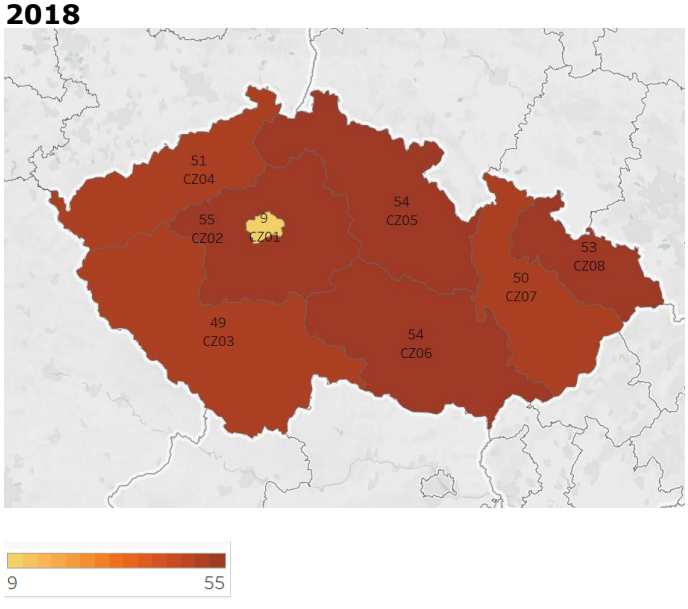
The study estimated the employment of 375 stationary EU ETS installations in Czechia (83% of 454 stationary installations in total). The analysed installations employed over 73 000 people in 2018 (~1.4% of all employed persons in Czechia).

Combustion installations accounted for 67% of the stationary EU ETS installations in Czechia, most such installations operating in the sectors of electricity, gas, steam and air conditioning supply, manufacturing or electricity production and distribution. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing ceramics. For more details, please see the table and maps below.

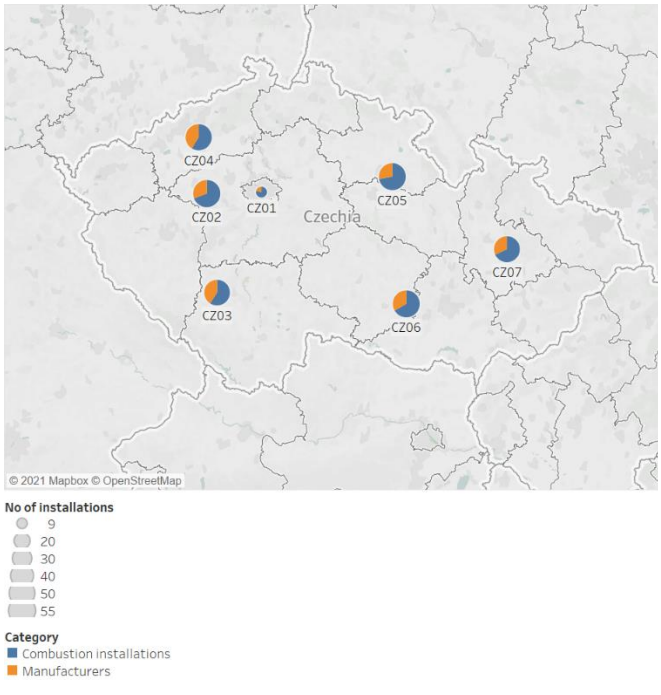
Table 1. Top economic activities by the number of the EU ETS stationary installations in Czechia in 2018

Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in electricity, gas, steam and air conditioning supply	76	20.3%	25	47	3 369
Combustion installations in manufacturing	72	19.2%	321	501	33 558
Combustion installations in electricity production and distribution	63	16.8%	31	70	4 331
Manufacturers					
Manufacture of ceramics	60	16.0%	32	102	5 617
Manufacture of glass	20	5.3%	360	417	7 508
Manufacture of iron or steel	13	3.5%	509	512	5 120
	...	...	...	...	...
GRAND TOTAL (All analysed stationary installations)	**375**	**100.0%**	**96**	**210**	**73 609**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Czechia in 2018



Map 2. EU ETS installations by activity type in NUTS 2 regions in Czechia in 2018



Source: PPMI.

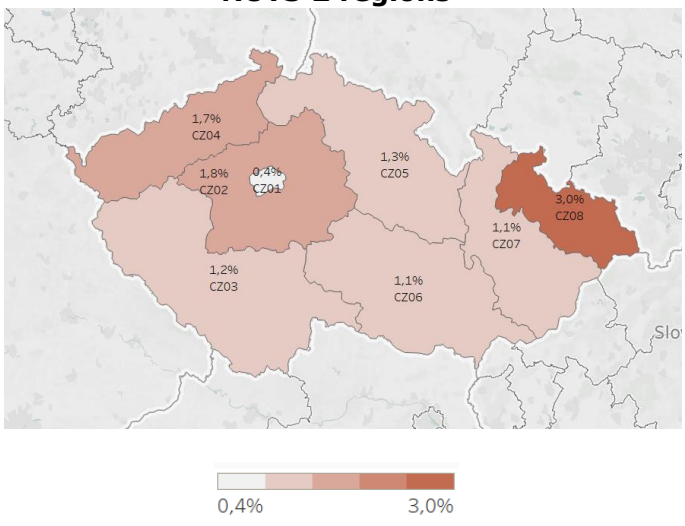
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Czechia.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Czechia 2018

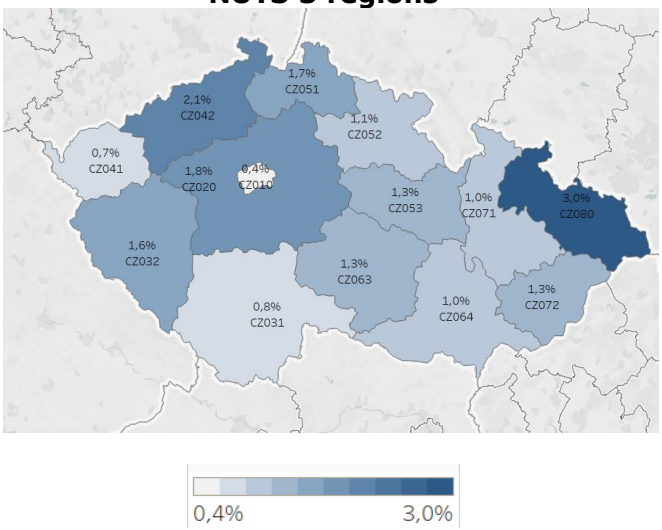
	NUTS 2		NUTS 3	
	Czechia	EU-27	**Czechia**	EU-27
Number of regions covered	**8**	233	**14**	1 081
Number of installations included	**375**	11 575	**375**	11 575
Average (arithmetic) estimated employment share per region	**1.5%**	1.1%	**1.4%**	1.3%
Maximum estimated employment share per region	**0.4%**	4.1%	**3.0%**	14%
Median estimated employment share per region	**1.3%**	0.9%	**1.3%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Czechia in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Czechia in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	CZ08	Moravskoslezsko	3.0%	17 163	571 000	1 205 886
2.	CZ02	Střední Cechy	1.8%	11 140	616 000	1 352 795
3.	CZ04	Severozápad	1.7%	8 892	509 000	1 116 766
NUTS 3 regions						
1.	CZ080	Moravskoslezský kraj	3.0%	17 163	571 000	1 205 886
2.	CZ042	Ústecký kraj	2.1%	7 894	370 000	821 080
3.	CZ020	Stredoceský kraj	1.8%	11 140	616 000	1 352 795

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Czechia in 2018: 1) ČEZ, a. s. - Elektrárna Počerady (*account holder* – Elektrárna Počerady, a.s.; *activity* – combustion of fuels in the production of electricity), 2) ČEZ, a. s. - Elektrárna Tušimice 2 (ČEZ, a. s.; combustion of fuels in the production of electricity), 3) Sev.en EC - Elektrárna Chvaletice (Sev.en EC, a.s.; combustion of fuels in the production of electricity). The study estimated that all three installations fell into the range of 100-500 according to the number of employees in 2018.

DENMARK

Please note that all the data in this country fiche refer to the 395 EU ETS installations included in the analysis. Some employment data are estimates.

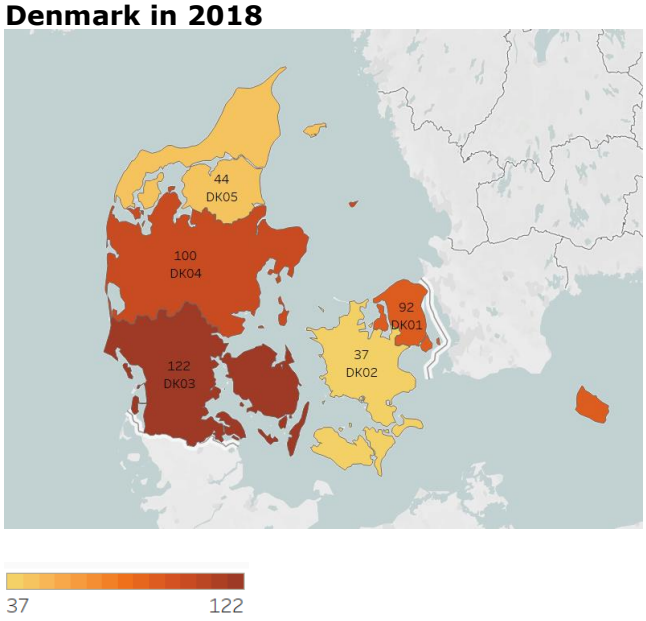
The study estimated the employment of 395 stationary EU ETS installations in Denmark (90% of 441 stationary installations in total). The analysed installations employed around 24 000 people in 2018 (~0.8% of all employed persons in Denmark).

Combustion installations accounted for 93% of the stationary EU ETS installations in Denmark. Half of all stationary EU ETS installations in Denmark are combustion installations operating in the sector of electricity, gas, steam and air conditioning supply. Among the manufacturers, the largest share was made up of installations manufacturing ceramics. For more details, please see the table and maps below.

Table 1. Top economic activities by the number of the EU ETS stationary installations in Denmark in 2018

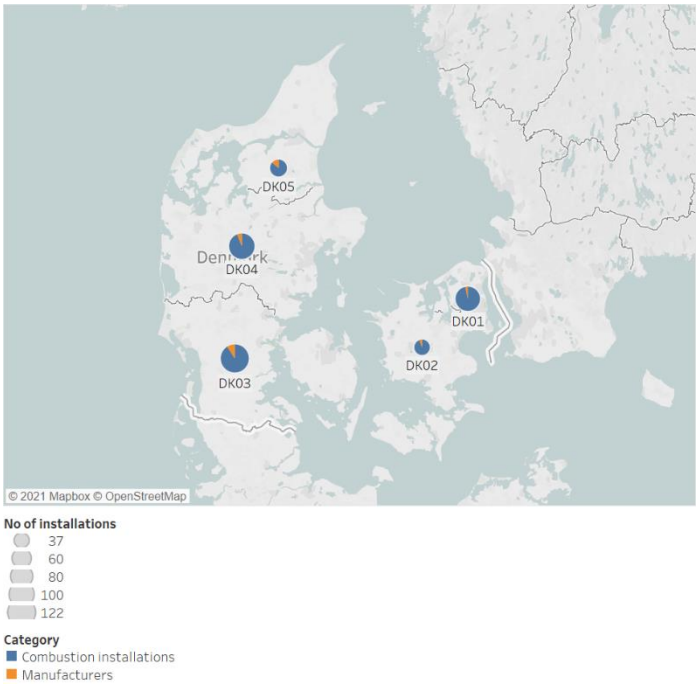
Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in electricity, gas, steam and air conditioning supply	198	50.1%	3	5	945
Combustion installations in manufacturing	61	15.4%	122	221	12 833
Combustion installations in electricity production and distribution	52	13.2%	2	15	793
Manufacturers					
Manufacture of ceramics	21	5.3%	33	45	891
Manufacture of glass	2	0.5%	344	344	344
Manufacture of paper and pulp	2	0.5%	73	73	73
	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**395**	**100.0%**	**7**	**63**	**24 149**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Denmark in 2018



Source: PPMI.

Map 2. EU ETS installations by activity type in NUTS 2 regions in Denmark in 2018



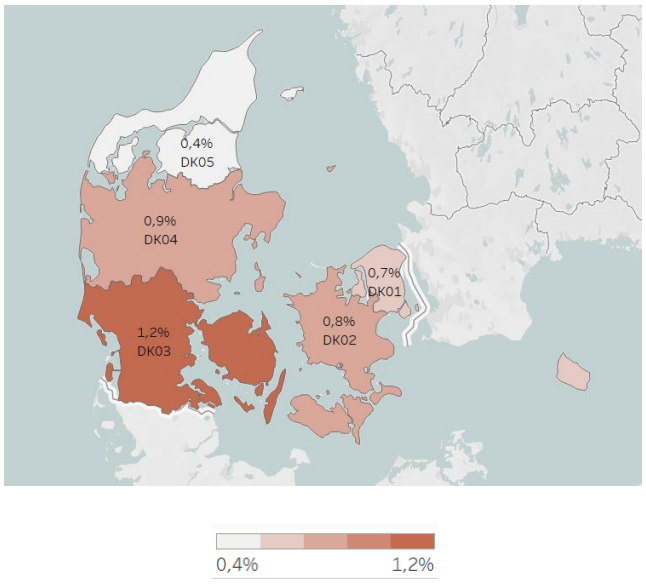
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Denmark.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Denmark 2018

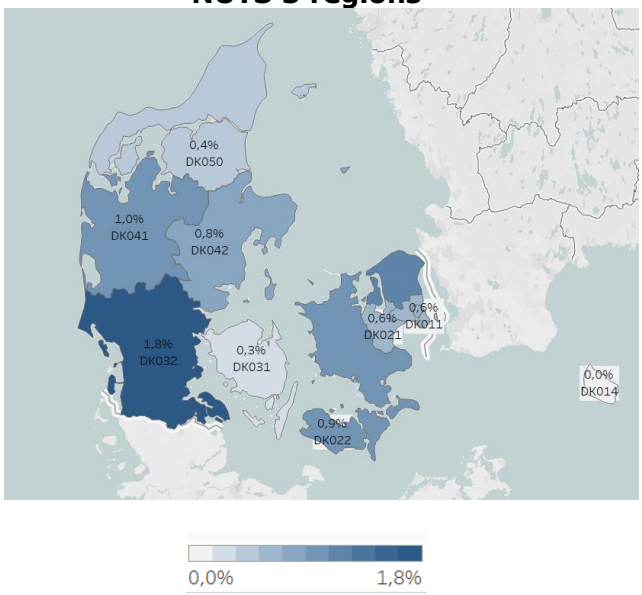
	NUTS 2		NUTS 3	
	Denmark	EU-27	**Denmark**	EU-27
Number of regions covered	**5**	233	**11**	1 081
Number of installations included	**395**	11 575	**395**	11 575
Average (arithmetic) estimated employment share per region	**0.8%**	1.1%	**0.7%**	1.3%
Maximum estimated employment share per region	**1.2%**	4.1%	**1.8%**	14%
Median estimated employment share per region	**0.8%**	0.9%	**0.6%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Denmark in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Denmark in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	DK03	Syddanmark	1.2%	7 263	596 000	1 220 763
2.	DK04	Midtjylland	0.9%	5 853	669 000	1 313 596
3.	DK02	Sjælland	0.8%	2 726	329 000	835 024
NUTS 3 regions						
1.	DK032	Sydjylland	1.8%	6 569	371 000	724 520
2.	DK013	Nordsjælland	1.2%	2 151	187 000	461 852
3.	DK041	Vestjylland	1.0%	2 158	224 000	430 232

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Denmark in 2018: 1) Aalborg Portland A/S (*account holder* – Aalborg Portland A/S; *activity* – production of cement clinker), 2) DONG Energy Generation, Esbjergværket (Ørsted Bioenergy & Thermal Power A/S; combustion of fuels in the production of electricity), 3) Asnæsværket (Ørsted Bioenergy & Thermal Power A/S; combustion of fuels in the production of electricity). The study estimated that all three installations fell into the range of 1-50 according to the number of employees in 2018.

ESTONIA

Please note that all the data in this country fiche refer to the 51 EU ETS installations included in the analysis. Some employment data are estimates.

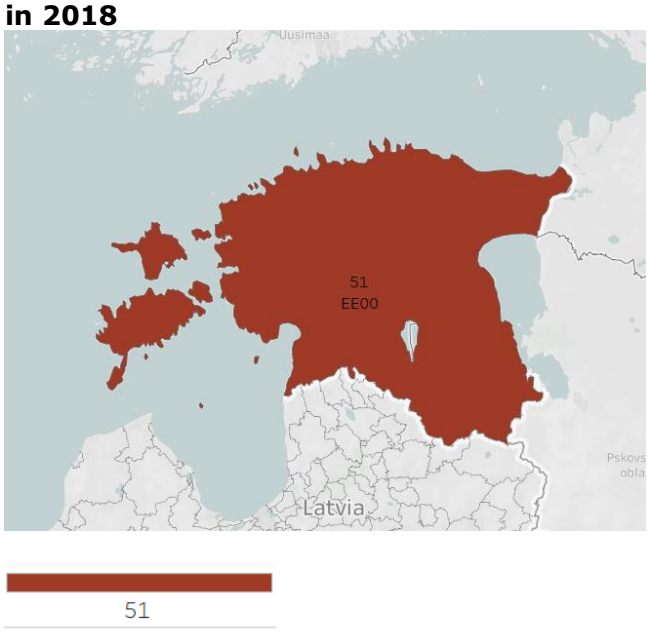
The study estimated the employment of 51 stationary EU ETS installations in Estonia (81% of 63 stationary installations in total). The analysed installations employed over 4 700 people in 2018 (~0.7% of all employed persons in Estonia).

Combustion installations accounted for 73% of the stationary EU ETS installations in Estonia, most such installations operating in the sector of electricity, gas, steam and air conditioning supply. Among manufacturers, the largest share was made up of installations manufacturing ceramics. For more details, please see the table and maps below.

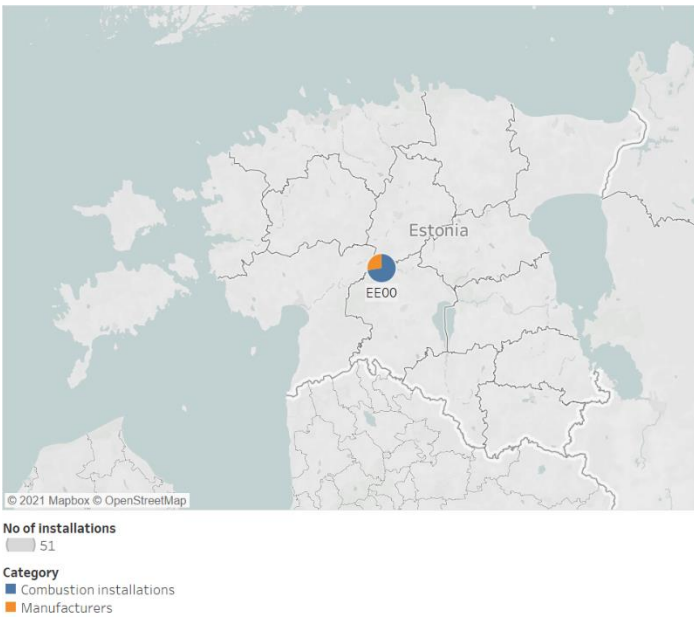
Table 1. Top economic activities by the number of the EU ETS stationary installations in Estonia in 2018

Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in electricity, gas, steam and air conditioning supply	23	45.1%	12	28	641
Combustion installations in electricity production and distribution	6	11.8%	226	158	945
Combustion installations in manufacturing	3	5.9%	101	108	324
Manufacturers					
Manufacture of ceramics	3	5.9%	46	48	144
Manufacture of paper and pulp	2	3.9%	228	228	455
Manufacture of cement	1	2.0%	184	184	184
	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**51**	**100.0%**	**49**	**95**	**4 725**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Estonia in 2018



Map 2. EU ETS installations by activity type in NUTS 2 regions in Estonia in 2018



Source: PPMI.

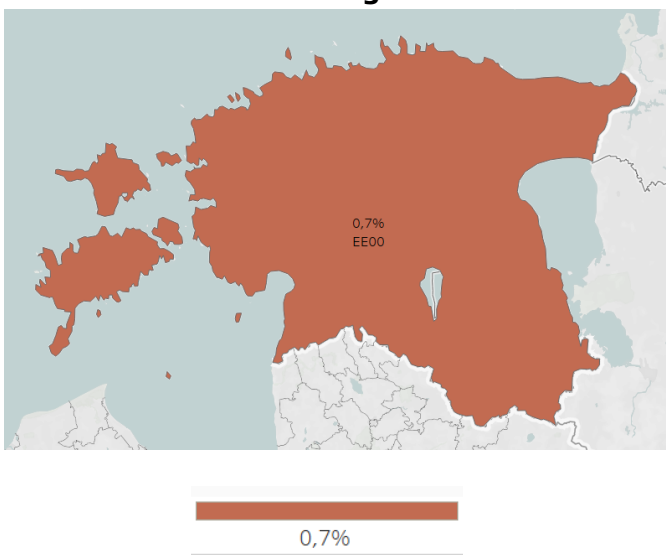
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Estonia.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Estonia 2018

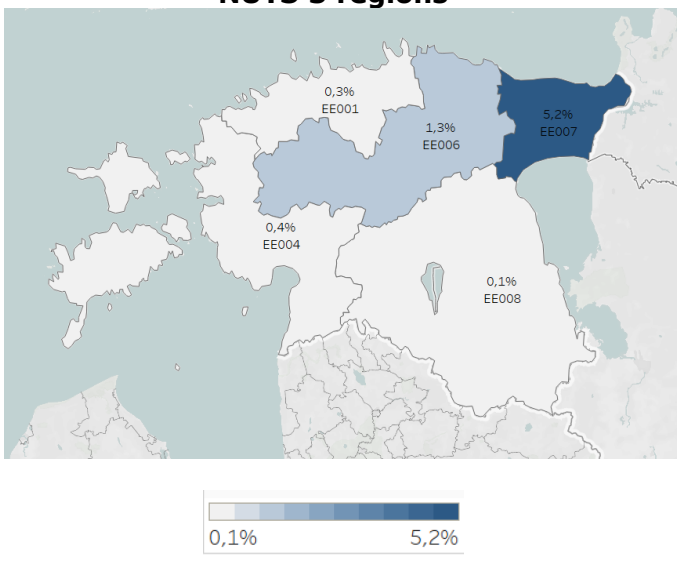
	NUTS 2		NUTS 3	
	Estonia	EU-27	**Estonia**	EU-27
Number of regions covered	**1**	233	**5**	1 081
Number of installations included	**51**	11 575	**51**	11 575
Average (arithmetic) estimated employment share per region	**0.7%**	1.1%	**1.4%**	1.3%
Maximum estimated employment share per region	**0.7%**	4.1%	**5.2%**	14%
Median estimated employment share per region	**0.7%**	0.9%	**0.4%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Estonia in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 1-3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Estonia in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	EE00	Eesti	0.7%	4 725	649 500	1 319 133
NUTS 3 regions						
1.	EE007	Kirde-Eesti (NUTS 2016)	5.2%	2 843	54 600	138 266
2.	EE006	Kesk-Eesti (NUTS 2016)	1.3%	622	49 100	123 751
3.	EE004	Lääne-Eesti	0.4%	280	67 600	149 020

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Estonia in 2018: 1) Eesti Elektrijaam, 2) Auvere Elektrijaam, 3) Balti Elektrijaam. All three of them are combustion installations in electricity production and belong to the same account holder – Enefit Energiatootmine AS. The study estimated that all three installations fell into the range of 100-500 according to the number of employees in 2018.

FINLAND

Please note that all the data in this country fiche refer to the 672 EU ETS installations included in the analysis. Some employment data are estimates.

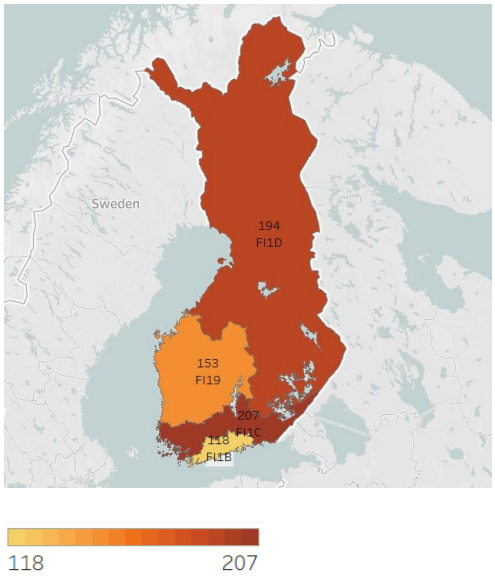
The study estimated the employment of 672 stationary EU ETS installations in Finland (93% of 726 stationary installations in total). The analysed installations employed around 32 000 people in 2018 (~1.2% of all employed persons in Finland).

Combustion installations accounted for 46% of the stationary EU ETS installations in Finland, most such installations operating in the sector of electricity production and distribution. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing paper and pulp. Also, 295 EU ETS installations fall into the category „Other activity opted-in pursuant to Article 24 of Directive 2003/87/EC" in Finland. For more details, please see the table and maps below.

Table 1. Top economic activities by the number of the EU ETS stationary installations in Finland in 2018

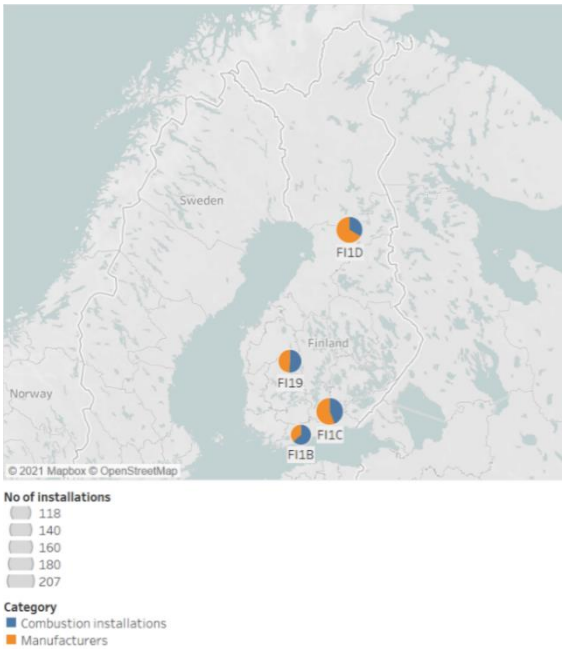
Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in electricity production and distribution	205	30.5%	12	23	4 575
Combustion installations in electricity, gas, steam, and air conditioning supply	64	9.5%	4	5	286
Combustion installations in manufacturing	23	3.4%	148	262	5 771
Manufacturers					
Manufacture of paper and pulp	49	7.3%	178	193	9 262
Manufacture of ceramics	5	0.7%	24	34	172
Manufacture of glass	5	0.7%	188	150	752
…	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**672**	**100.0%**	**8**	**49**	**32 199**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Finland in 2018



Source: PPMI.

Map 2. EU ETS installations by activity type in NUTS 2 regions in Finland in 2018



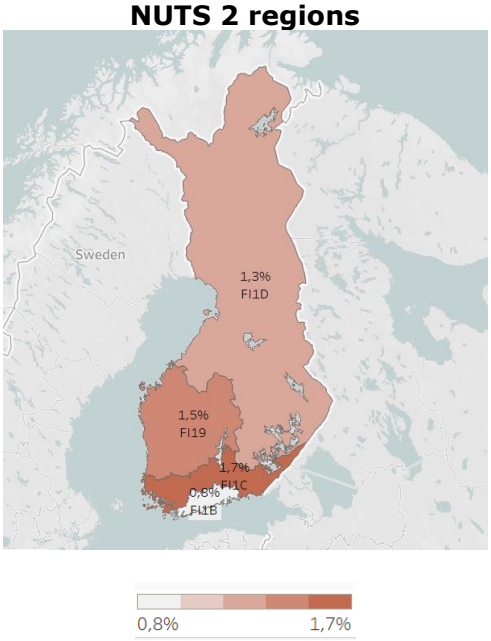
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Finland.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Finland 2018

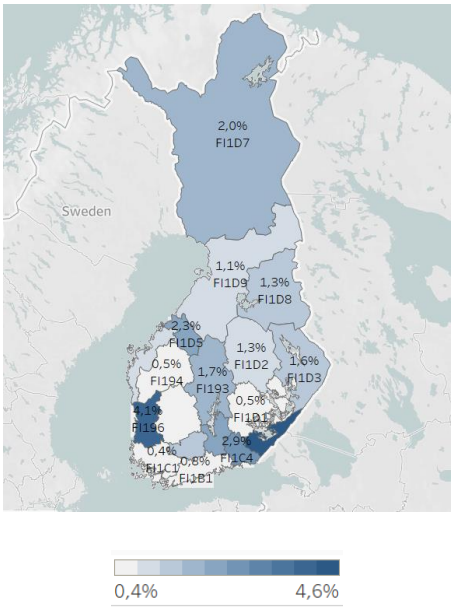
	NUTS 2		NUTS 3	
	Finland	EU-27	**Finland**	EU-27
Number of regions covered	**4**	233	**18**	1 081
Number of installations included	**672**	11 575	**672**	11 575
Average (arithmetic) estimated employment share per region	**1.3%**	1.1%	**1.7%**	1.3%
Maximum estimated employment share per region	**1.7%**	4.1%	**4.6%**	14%
Median estimated employment share per region	**1.4%**	0.9%	**1.5%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Finland in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Finland in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	FI1C	Etelä-Suomi	1.7%	8 808	508 970	1 157 001
2.	FI19	Länsi-Suomi	1.5%	9 116	623 520	1 380 365
3.	FI1D	Pohjois- ja Itä-Suomi	1.3%	7 348	553 220	1 290 651
NUTS 3 regions						
1.	FI1C5	Etelä-Karjala	4.6%	2 444	53 180	129 865
2.	FI196	Satakunta	4.1%	4 123	100 790	220 398
3.	FI1C4	Kymenlaakso	2.9%	2 214	75 560	175 511

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Finland in 2018: 1) Raahen terästehdas (*account holder* – SSAB Europe Oy; *activity* – production of pig iron or steel (primary or secondary fusion) including continuous casting), 2) Porvoon jalostamo (Neste Oyj; refining of mineral oil), 3) Hanasaari B (Helen Oy; combustion of fuels in the production of electricity). The study estimated that all three installations fell into the range of 50-150 according to the number of employees in 2018.

FRANCE

Please note that all the data in this country fiche refer to the 984 EU ETS installations included in the analysis. Some employment data are estimates.

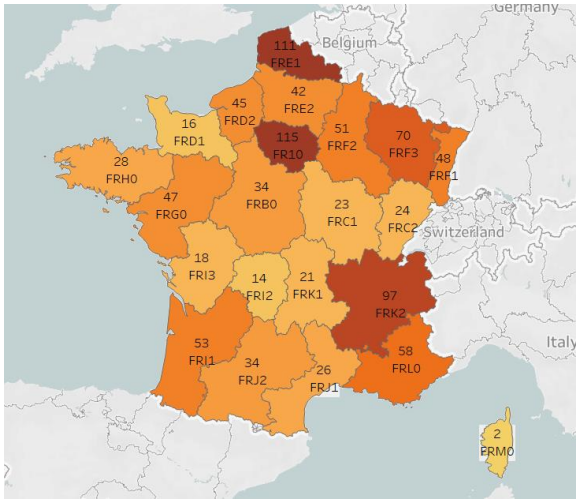
The study estimated the employment of 984 stationary EU ETS installations in France (65% of 1513 stationary installations in total). The analysed installations employed over 241 000 people in 2018 (~0.9% of all employed persons in France).

Combustion installations accounted for 66% of the stationary EU ETS installations in France, most such installations operating in manufacturing. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing paper and pulp, ceramics, and glass. For more details, please see the table and maps below.

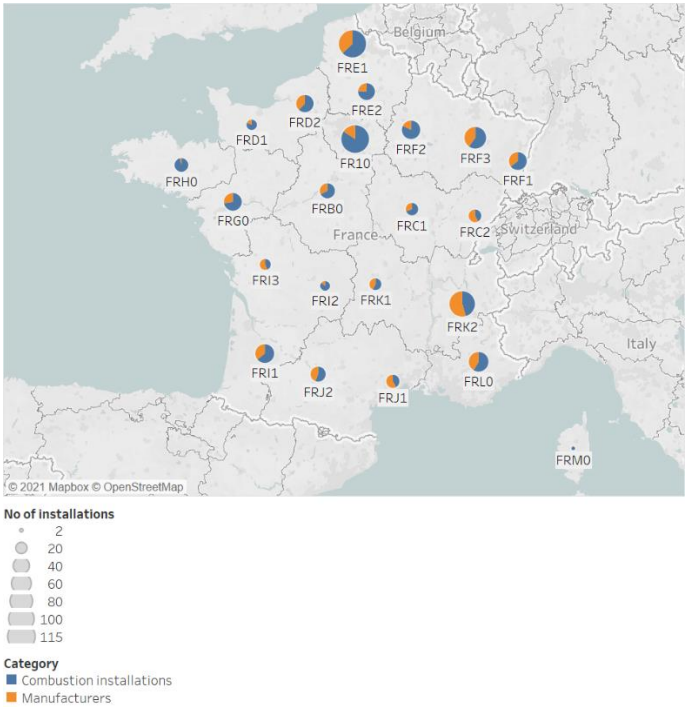
Table 1. Top economic activities by the number of the EU ETS stationary installations in France in 2018

Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in manufacturing	354	36.0%	189	363	119 113
Combustion installations in electricity production and distribution	68	6.9%	146	113	7 602
Combustion installations in electricity, gas, steam and air conditioning supply	51	5.2%	362	209	10 676
Manufacturers					
Manufacture of paper and pulp	76	7.7%	169	262	17 561
Manufacture of ceramics	54	5.5%	79	101	5 333
Manufacture of glass	41	4.2%	299	324	12 963
…	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**984**	**100.0%**	**146**	**260**	**241 720**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in France in 2018



Map 2. EU ETS installations by activity type in NUTS 2 regions in France in 2018



Source: PPMI.

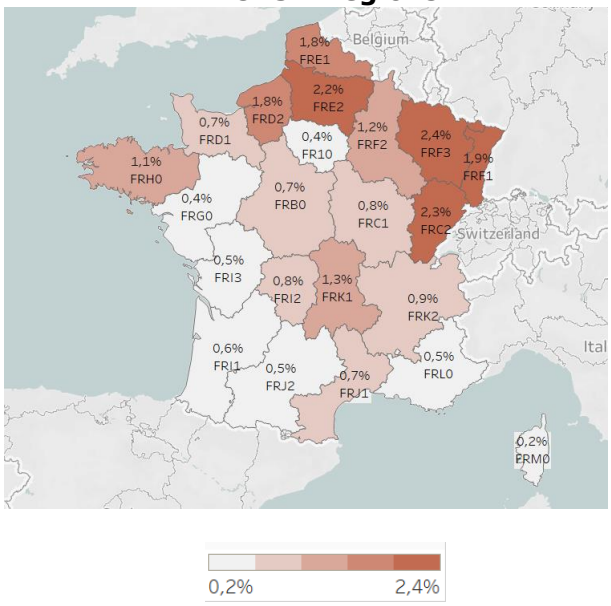
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in France.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in France 2018

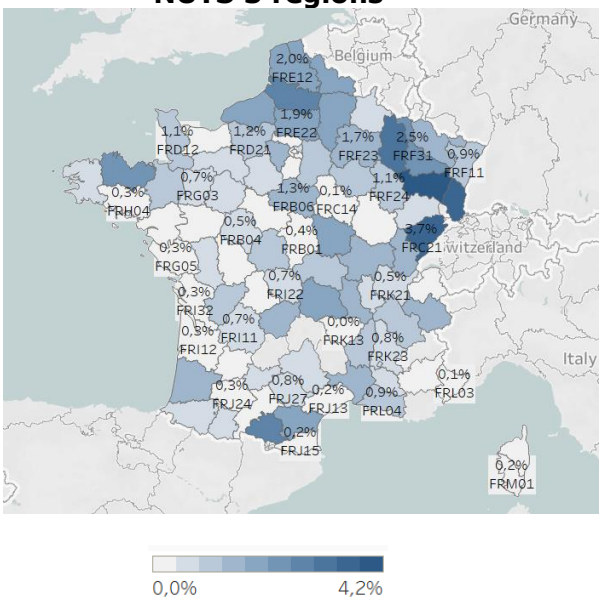
	NUTS 2		NUTS 3	
	France	EU-27	**France**	EU-27
Number of regions covered	**23**	233	**91**	1 081
Number of installations included	**984**	11 575	**984**	11 575
Average (arithmetic) estimated employment share per region	**1.1%**	1.1%	**1.0%**	1.3%
Maximum estimated employment share per region	**2.4%**	4.1%	**4.2%**	14%
Median estimated employment share per region	**0.8%**	0.9%	**0.7%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in France in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in France in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	FRF3	Lorraine	2.4%	19 193	815 780	2 328 460
2.	FRC2	Franche-Comté	2.3%	10 076	437 370	1 179 070
3.	FRE2	Picardie	2.2%	14 224	652 760	1 931 131
NUTS 3 regions						
1.	FRF34	Vosges	4.2%	5 587	131 860	366 112
2.	FRC21	Doubs	3.7%	7 999	213 960	541 454
3.	FRF12	Haut-Rhin	3.6%	10 424	286 260	764 981

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in France in 2018: 1) ARCELORMITTAL MEDITERRANEE (*account holder* – ARCELORMITTAL MEDITERRANEE; *activity* – production of pig iron or steel), 2) ETF - CENTRALE DK6 (ENGIE THERMIQUE FRANCE; combustion of fuels in the production of electricity), 3) EDF Centrale de Cordemais (EDF SA; combustion of fuels in the production of electricity). The study estimated that each of the three installations employed up to 150 persons in 2018.

GERMANY

Please note that all the data in this country fiche refer to the 2292 EU ETS installations included in the analysis. Some employment data are estimates.

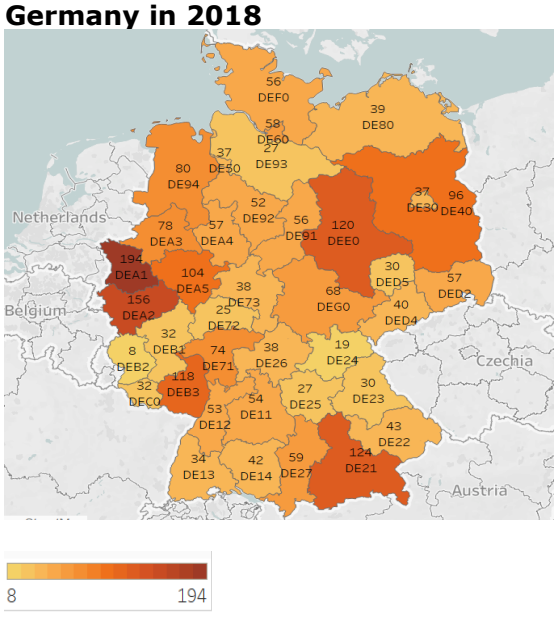
The study estimated the employment of 2292 stationary EU ETS installations in Germany (88% of 2604 stationary installations in total). The analysed installations employed over 500 000 people in 2018 (~1.1% of all employed persons in Germany).

Combustion installations accounted for 56% of the stationary EU ETS installations in Germany, most such installations operating in the sectors of manufacturing and electricity production and distribution. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing ceramics, paper and pulp, and bulk chemicals. For more details, please see the table and maps below.

Table 1. Top economic activities by the number of the EU ETS stationary installations in Germany in 2018

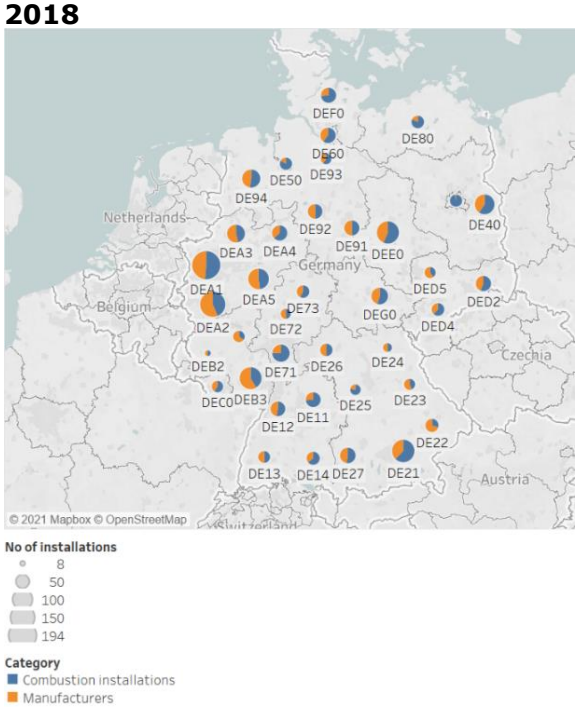
Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in manufacturing	435	19.0%	158	431	182 954
Combustion installations in electricity production and distribution	375	16.4%	88	129	46 030
Combustion installations in electricity, gas, steam and air conditioning supply	188	8.2%	43	66	12 214
Manufacturers					
Manufacture of ceramics	216	9.4%	47	85	17 469
Manufacture of paper and pulp	165	7.2%	130	184	28 023
Production of bulk chemicals	155	6.8%	130	187	28 829
	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**2 292**	**100.0%**	**131**	**231**	**513 038**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Germany in 2018



Source: PPMI.

Map 2. EU ETS installations by activity type in NUTS 2 regions in Germany in 2018



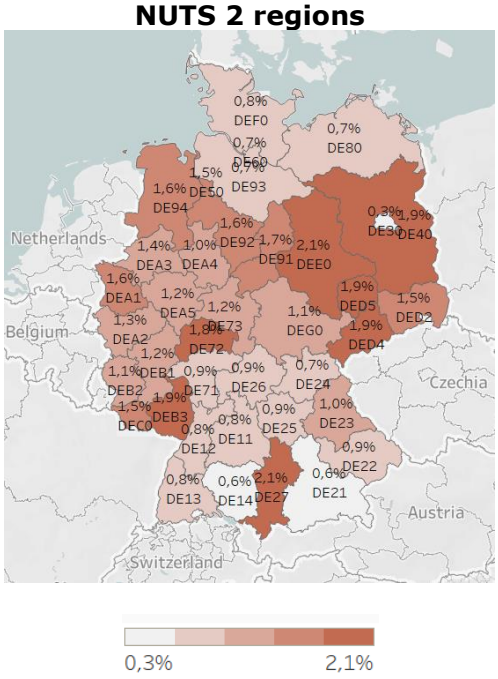
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Germany.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Germany 2018

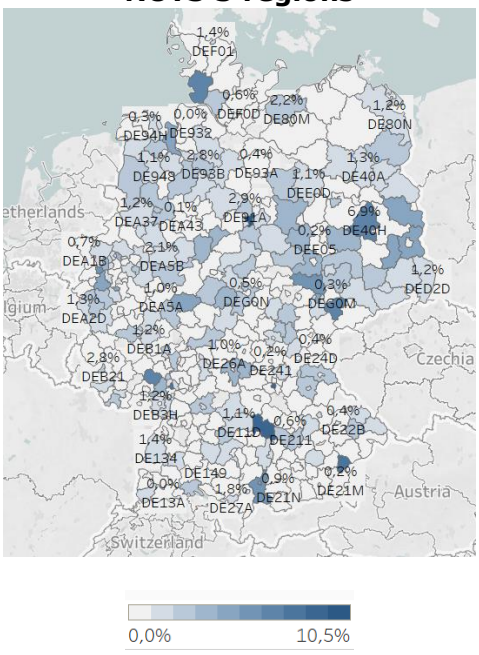
	NUTS 2		NUTS 3	
	Germany	EU-27	**Germany**	EU-27
Number of regions covered	**38**	233	**361**	1 081
Number of installations included	**2292**	11 575	**2292**	11 575
Average (arithmetic) estimated employment share per region	**1.2%**	1.1%	**1.4%**	1.3%
Maximum estimated employment share per region	**2.1%**	4.1%	**10.5%**	14%
Median estimated employment share per region	**1.1%**	0.9%	**0.8%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Germany in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Germany in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	DEE0	Sachsen-Anhalt	2.1%	21 164	1 004 550	2 223 081
2.	DE27	Schwaben	2.1%	21 833	1 038 040	1 873 368
3.	DED5	Leipzig	1.9%	10 280	538 130	1 037 782
NUTS 3 regions						
1.	DE912	Salzgitter, Kreisfreie Stadt	10.5%	6 054	57 740	104 548
2.	DE27D	Donau-Ries	9.4%	7 834	83 150	133 043
3.	DE253	Fürth, Kreisfreie Stadt	9.0%	5 740	64 000	126 526

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Germany in 2018: 1) Kraftwerk Jänschwalde, 2) Kraftwerk Lippendorf, 3) Kraftwerk Boxberg Werk IV. All three are combustion installations in electricity production and belong to the same account holder – Lausitz Energie Kraftwerke AG. The study estimated that all of them fell into the range of 100-500 according to the number of employees in 2018.

GREECE

Please note that all the data in this country fiche refer to the 99 EU ETS installations included in the analysis. Some employment data are estimates.

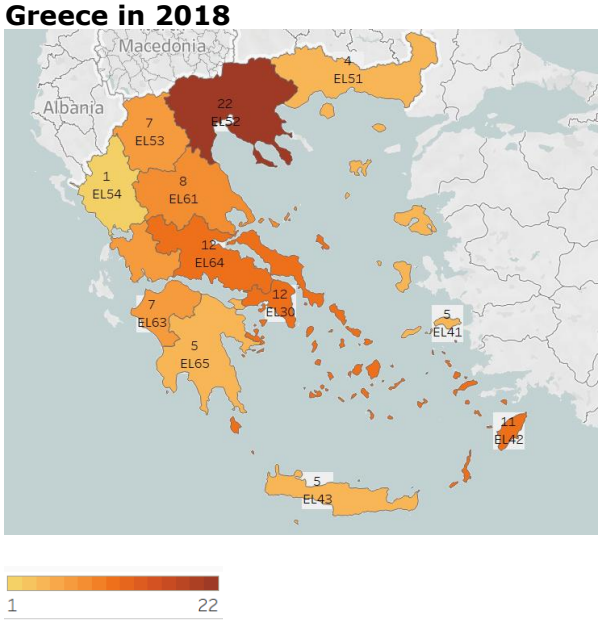
The study estimated the employment of 99 stationary EU ETS installations in Greece (51% of 194 stationary installations in total). The analysed installations employed around 11 000 people in 2018 (~0.2% of all employed persons in Greece).

Combustion installations accounted for 56% of the stationary EU ETS installations in Greece, most such installations operating in the sectors of electricity production and distribution or manufacturing. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing ceramics. For more details, please see the table and maps below.

Table 1. Top economic activities by the number of the EU ETS stationary installations in Greece in 2018

Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in electricity production and distribution	35	35.4%	2	48	1 684
Combustion installations in manufacturing	15	15.2%	159	180	2 521
Manufacturers					
Manufacture of ceramics	16	16.2%	12	18	274
Production of lime, or calcination of dolomite/magnesite	11	11.1%	9	48	482
Manufacture of paper and pulp	8	8.1%	87	99	788
…	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**99**	**100.0%**	**21**	**115**	**11 060**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Greece in 2018



Map 2. EU ETS installations by activity type in NUTS 2 regions in Greece in 2018

Source: PPMI.

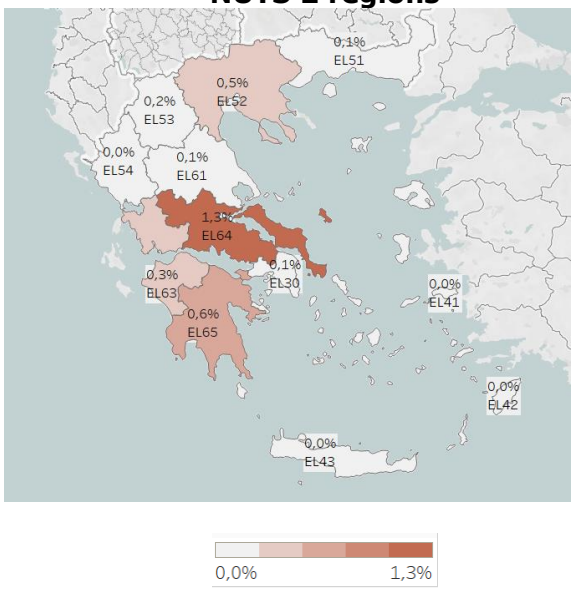
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Greece.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Greece 2018

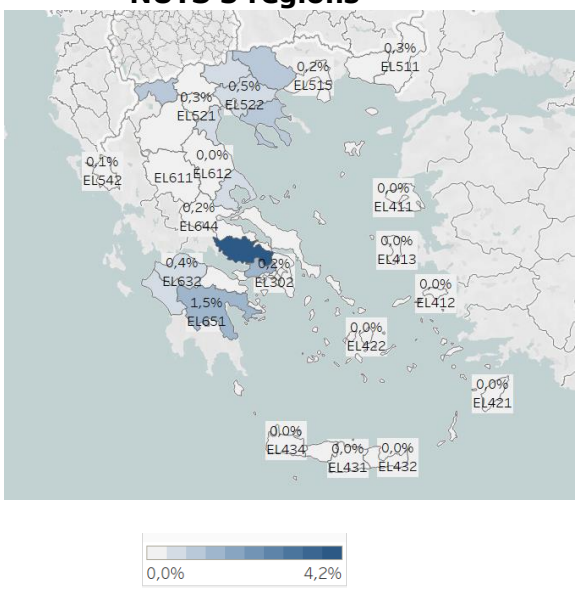
	NUTS 2		NUTS 3	
	Greece	EU-27	**Greece**	EU-27
Number of regions covered	**12**	233	**37**	1 081
Number of installations included	**99**	11 575	**99**	11 575
Average (arithmetic) estimated employment share per region	**0.3%**	1.1%	**0.4%**	1.3%
Maximum estimated employment share per region	**1.3%**	4.1%	**4.2%**	14%
Median estimated employment share per region	**0.1%**	0.9%	**0.2%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Greece in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Greece in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	EL64	Sterea Ellada	1.3%	2 749	218 890	555 623
2.	EL65	Peloponnisos	0.6%	1 407	238 540	576 749
3.	EL52	Kentriki Makedonia	0.5%	3 672	730 680	1 875 996
NUTS 3 regions						
1.	EL641	Voiotia	4.2%	2 441	58 650	121 493
2.	EL651	Argolida, Arkadia	1.5%	1 202	79 700	179 378
3.	EL306	Dytiki Attiki	1.3%	1 116	84 430	179 863

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Greece in 2018: 1) ΑΤΜΟΗΛΕΚΤΡΙΚΟΣ ΣΤΑΘΜΟΣ ΑΗΣ ΑΓΙΟΥ ΔΗΜΗΤΡΙΟΥ (*account holder* – ΔΕΗ Α.Ε), 2) ΑΤΜΟΗΛΕΚΤΡΙΚΟΣ ΣΤΑΘΜΟΣ ΑΗΣ ΚΑΡΔΙΑΣ (ΔΕΗ Α.Ε), 3) ΑΤΜΟΗΛΕΚΤΡΙΚΟΣ ΣΤΑΘΜΟΣ ΜΕΓΑΛΟΠΟΛΗΣ Α ΜΟΝΑΔΑ ΙΙΙ (ΛΙΓΝΙΤΙΚΗ ΜΕΓΑΛΟΠΟΛΗΣ Α.Ε). All three are combustion installations in electricity production. The study estimated that the first two installations fell into the range of 1-50 according to the number of employees in 2018 while the third one employed over 1000 persons.

HUNGARY

Please note that all the data in this country fiche refer to the 243 EU ETS installations included in the analysis. Some employment data are estimates.

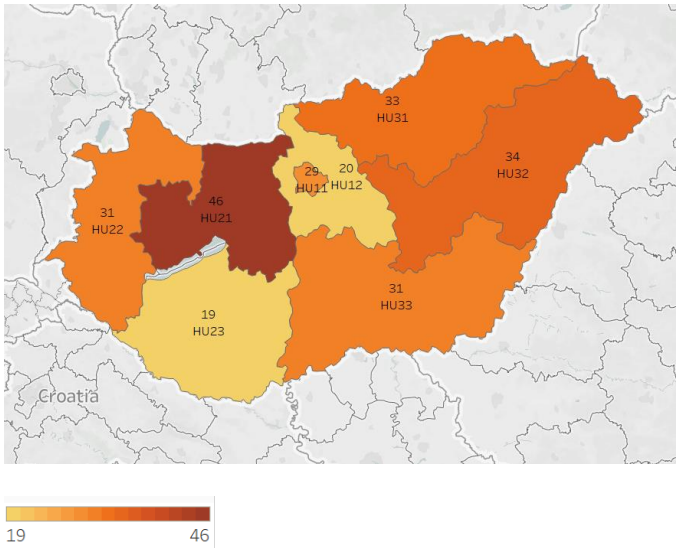
The study estimated the employment of 243 stationary EU ETS installations in Hungary (82% of 298 stationary installations in total). The analysed installations employed almost 50 000 people in 2018 (~1% of all employed persons in Hungary).

Combustion installations accounted for 69% of the stationary EU ETS installations in Hungary, most such installations operating in the sectors of electricity, gas, steam and air conditioning supply or manufacturing. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing ceramics. For more details, please see the table and maps below.

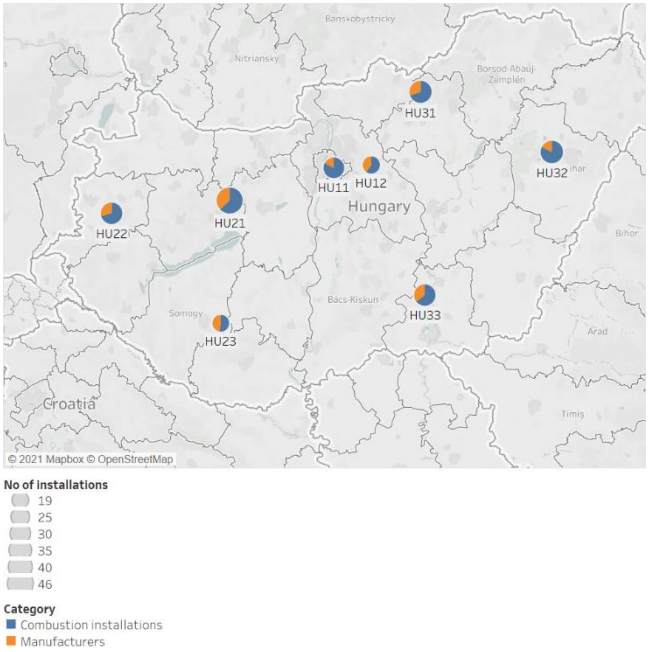
Table 1. Top economic activities by the number of the EU ETS stationary installations in Hungary in 2018

Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in electricity, gas, steam and air conditioning supply	48	19.8%	71	82	3 781
Combustion installations in manufacturing	44	18.1%	196	557	22 845
Combustion installations in electricity production and distribution	38	15.6%	31	106	3 170
Manufacturers					
Manufacture of ceramics	46	18.9%	19	85	3 756
Manufacture of paper and pulp	7	2.9%	149	216	1 295
Manufacture of cement	5	2.1%	257	197	592
…	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**243**	**100.0%**	**79**	**226**	**49 894**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Hungary in 2018



Map 2. EU ETS installations by activity type in NUTS 2 regions in Hungary in 2018



Source: PPMI.

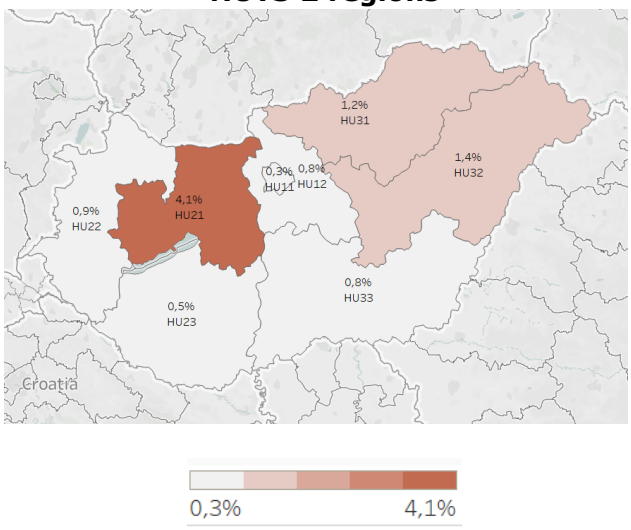
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Hungary.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Hungary 2018

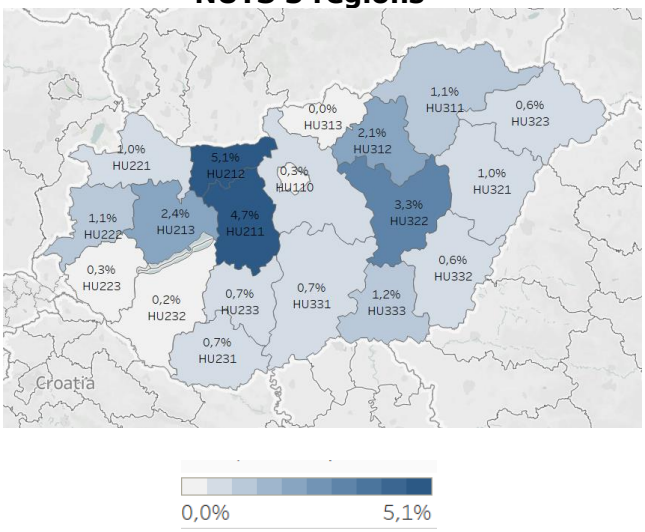
	NUTS 2		NUTS 3	
	Hungary	EU-27	**Hungary**	EU-27
Number of regions covered	**8**	233	**20**	1 081
Number of installations included	**243**	11 575	**243**	11 575
Average (arithmetic) estimated employment share per region	**1.3%**	1.1%	**1.4%**	1.3%
Maximum estimated employment share per region	**4.1%**	4.1%	**5.1%**	14%
Median estimated employment share per region	**0.9%**	0.9%	**0.9%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Hungary in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Hungary in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	HU21	Közép-Dunántúl	4.1%	19 415	471 250	1 055 570
2.	HU32	Észak-Alföld	1.4%	7 236	503 640	1 460 096
3.	HU31	Észak-Magyarország	1.2%	4 856	389 720	1 134 945
NUTS 3 regions						
1.	HU212	Komárom-Esztergom	5.1%	7 105	140 240	297 454
2.	HU211	Fejér	4.7%	8 967	188 930	416 691
3.	HU322	Jász-Nagykun-Szolnok	3.3%	4 185	128 740	371 271

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Hungary in 2018: 1) Mátrai Erőmű ZRt. Visontai Erőmű (*account holder* – Mátrai Erõmû Zrt.; *activity* – combustion of fuels in the production of electricity), 2) ISD POWER Kft. Erőmű (ISD POWER Energiatermelo és Szolgáltató Kft; combustion of fuels in steam and air conditioning supply), 3) MOL Nyrt. Dunai Finomító (MOL Nyrt. Dunai Finomító; combustion of fuels in support activities for petroleum and natural gas extraction). The study estimated that Mátrai Erőmű ZRt. Visontai Erőmű employed over 2 000 people in 2018 while the other two fell into the range of 100-500 according to the number of employees.

IRELAND

Please note that all the data in this country fiche refer to the 41 EU ETS installations included in the analysis. Some employment data are estimates.

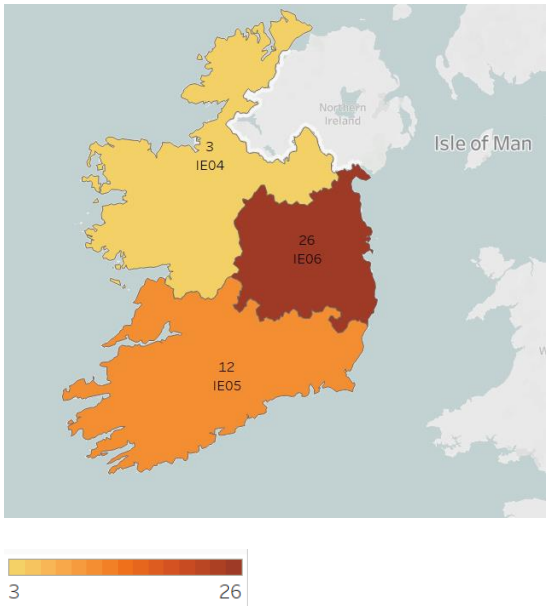
The study estimated the employment of 41 stationary EU ETS installations in Ireland (28% of 149 stationary installations in total). The analysed installations employed over 8 000 people in 2018 (~0.4% of all employed persons in Ireland).

Combustion installations accounted for 98% of the analysed stationary EU ETS installations in Ireland, most such installations operating in manufacturing. For more details, please see the table and maps below.

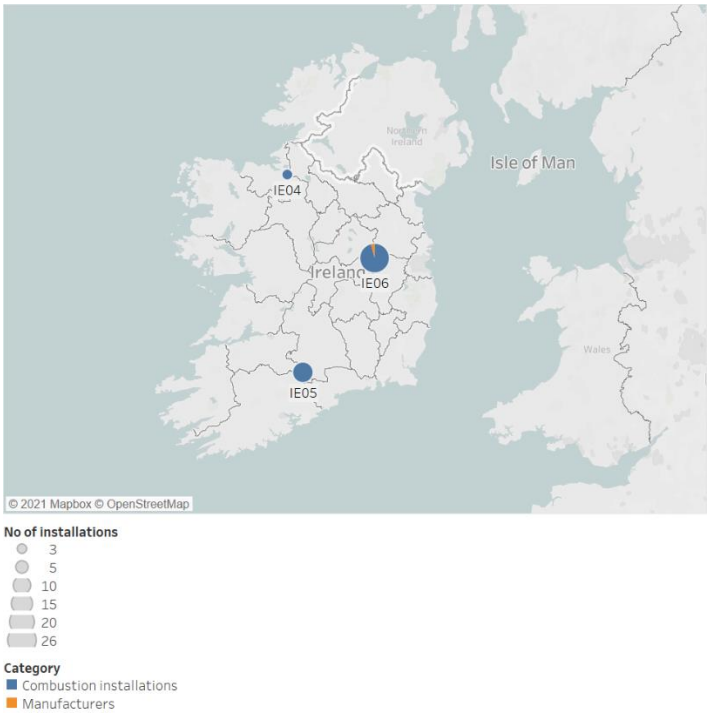
Table 1. Top economic activities by the number of the EU ETS stationary installations in Ireland in 2018

Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations in manufacturing	11	26.8%	362	321	3 526
Combustion installations in construction	1	2.4%			
Production of lime, or calcination of dolomite/magnesite	1	2.4%	146	146	146
…	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**41**	**100.0%**	**154**	**217**	**8 474**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Ireland in 2018



Map 2. EU ETS installations by activity type in NUTS 2 regions in Ireland in 2018



Source: PPMI.

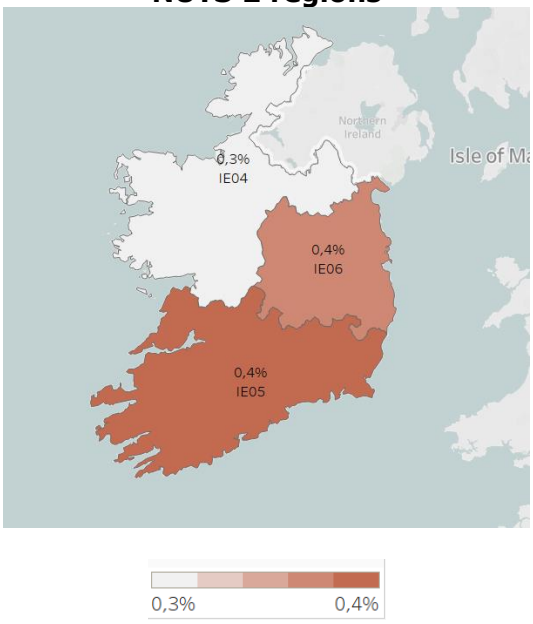
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Ireland.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Ireland 2018

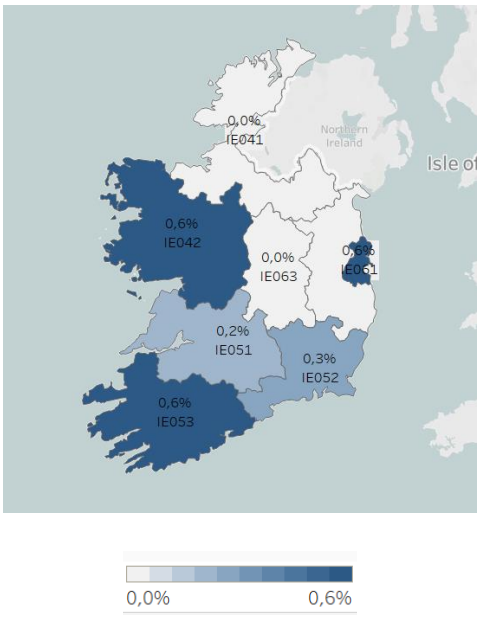
	NUTS 2		NUTS 3	
	Ireland	EU-27	**Ireland**	EU-27
Number of regions covered	**3**	233	**8**	1 081
Number of installations included	**41**	11 575	**41**	11 575
Average (arithmetic) estimated employment share per region	**0.4%**	1.1%	**0.3%**	1.3%
Maximum estimated employment share per region	**0.4%**	4.1%	**0.6%**	14%
Median estimated employment share per region	**0.4%**	0.9%	**0.2%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Ireland in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Ireland in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	IE05	Southern	0.4%	2 896	715 770	1 604 865
2.	IE06	Eastern and Midland	0.4%	4 375	1 132 810	2 369 275
3.	IE04	Northern and Western	0.3%	1 203	363 460	856 252
NUTS 3 regions						
1.	IE053	South-West (IE)	0.6%	1 971	334 950	696 021
2.	IE042	West	0.6%	1 180	201 290	455 384
3.	IE061	Dublin	0.6%	4 199	758 360	1 360 963

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Ireland in 2018: 1) Aughinish Alumina (*account holder* – Limerick Alumina Refining Limited; *activity* – combustion of fuels), 2) Great Island Generating Station (SSE Generation Ireland Limited; combustion of fuels), 3) Whitegate Power Station (Bord Gais Energy Limited; combustion of fuels). The study estimated that Aughinish Alumina and Whitegate Power Station fell into the range of 100-500 according to the number of employees in 2018 while Great Island Generating Station employed less than 50 persons.

ITALY

Please note that all the data in this country fiche refer to the 1276 EU ETS installations included in the analysis. Some employment data are estimates.

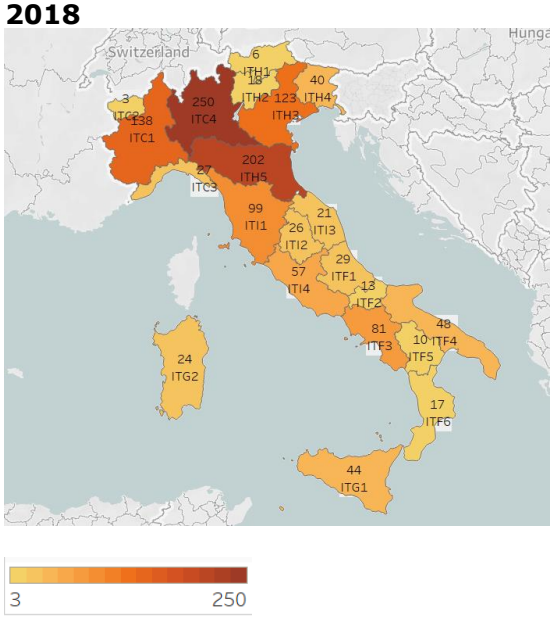
The study estimated the employment of 1276 stationary EU ETS installations in Italy (82% of 1551 stationary installations in total). The analysed installations employed around 250 000 people in 2018 (~0.9% of all employed persons in Italy).

Combustion installations accounted for 56% of the stationary EU ETS installations in Italy, most such installations operating in the sectors of manufacturing, electricity, gas, steam and air conditioning supply or construction. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing paper and pulp, ceramics, and iron or steel. For more details, please see the table and maps below.

Table 1. Top economic activities by the number of the EU ETS stationary installations in Italy in 2018

Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in manufacturing	322	25.2%	146	331	98 747
Combustion installations in electricity production and distribution	170	13.3%	59	131	20 924
Combustion installations in construction	68	5.3%	112	99	6 650
Manufacturers					
Manufacture of paper and pulp	140	11.0%	72	122	15 376
Manufacture of ceramics	139	10.9%	99	138	16 723
Manufacture of iron or steel	84	6.6%	185	337	26 933
	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**1 276**	**100.0%**	**114**	**212**	**251 225**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Italy in 2018



Source: PPMI.

Map 2. EU ETS installations by activity type in NUTS 2 regions in Italy in 2018

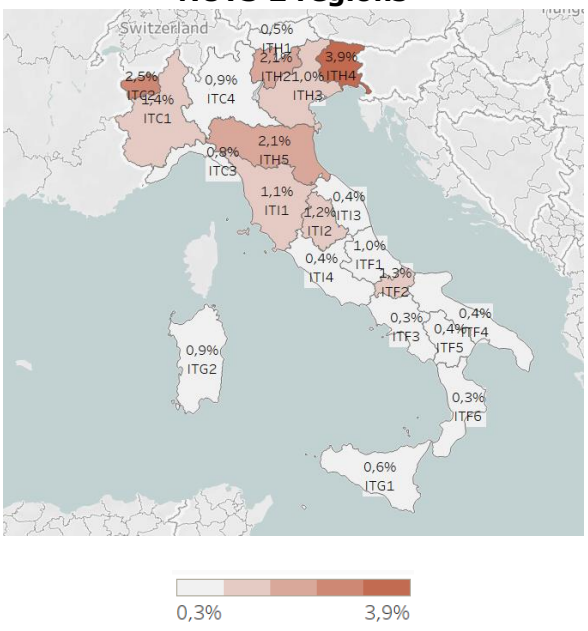
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Italy.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Italy 2018

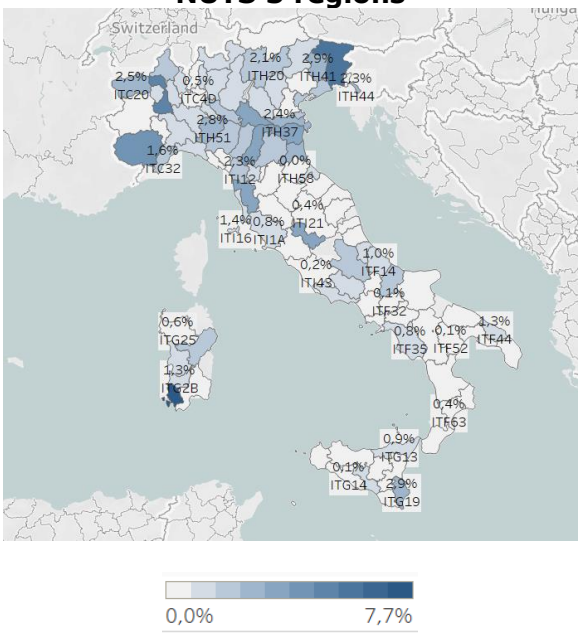
	NUTS 2		NUTS 3	
	Italy	EU-27	**Italy**	EU-27
Number of regions covered	**21**	233	**103**	1 081
Number of installations included	**1276**	11 575	**1276**	11 575
Average (arithmetic) estimated employment share per region	**1.1%**	1.1%	**1.3%**	1.3%
Maximum estimated employment share per region	**3.9%**	4.1%	**7.7%**	14%
Median estimated employment share per region	**0.9%**	0.9%	**0.9%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Italy in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Italy in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
		NUTS 2 regions				
1.	ITH4	Friuli-Venezia Giulia	3.9%	21 249	545 000	1 215 538
2.	ITC2	Valle d'Aosta/Vallée d'Aoste	2.5%	1 552	61 500	126 202
3.	ITH2	Provincia Autonoma di Trento	2.1%	5 699	267 500	539 898
		NUTS 3 regions				
1.	ITG2C	Carbonia-Iglesias (NUTS 2016)	7.7%	2 721	35 400	125 430
2.	ITH42	Udine	6.1%	14 547	238 100	529 381
3.	ITC12	Vercelli	5.0%	3 492	70 400	172 307

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Italy in 2018: 1) CENTRALE TERMOELETTRICA DI TORREVALDALIGA NORD (*account holder* – ENEL PRODUZIONE S.p.A.; *activity* – combustion of fuels in electricity production), 2) Impianti di raffinazione (Sarlux Srl; refining of mineral oil), 3) ArcelorMittal Italia SpA - Stabilimento di Taranto (ArcelorMittal Italia S.p.A.; production of pig iron or steel). The study estimated that Impianti di raffinazione employed over 1 000 people in 2018 while the other two fell into the range of 1-100 according to the number of employees.

LATVIA

Please note that all the data in this country fiche refer to the 106 EU ETS installations included in the analysis. Some employment data are estimates.

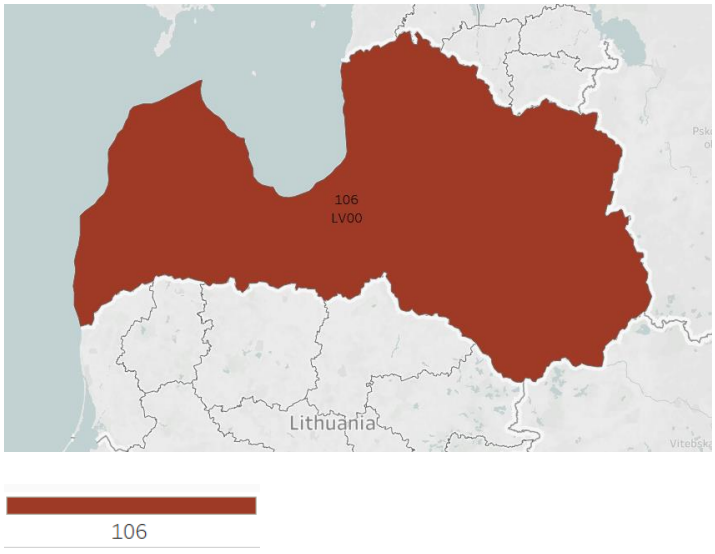
The study estimated the employment of 106 stationary EU ETS installations in Latvia (91% of 117 stationary installations in total). The analysed installations employed over 16 000 people in 2018 (~1.8% of all employed persons in Latvia).

Combustion installations accounted for 90% of the stationary EU ETS installations in Latvia, most such installations operating in the sector of electricity, gas, steam and air conditioning supply. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing cement. For more details, please see the table and maps below.

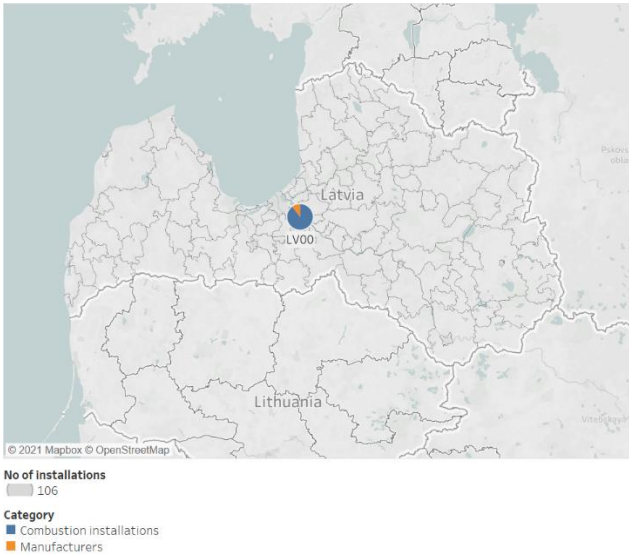
Table 1. Top economic activities by the number of the EU ETS stationary installations in Latvia in 2018

Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in electricity, gas, steam and air conditioning supply	55	51.9%	19	35	1 853
Combustion installations in manufacturing	14	13.2%	271	418	5 437
Combustion installations in electricity production and distribution	5	4.7%	11	275	1 376
Manufacturers					
Manufacture of cement	3	2.8%	62	143	430
Manufacture of glass	1	0.9%	1 702	1 702	1 702
Manufacture of ceramics	1	0.9%	13	13	13
…	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**106**	**100.0%**	**41**	**162**	**16 204**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Latvia in 2018



Map 2. EU ETS installations by activity type in NUTS 2 regions in Latvia in 2018



Source: PPMI.

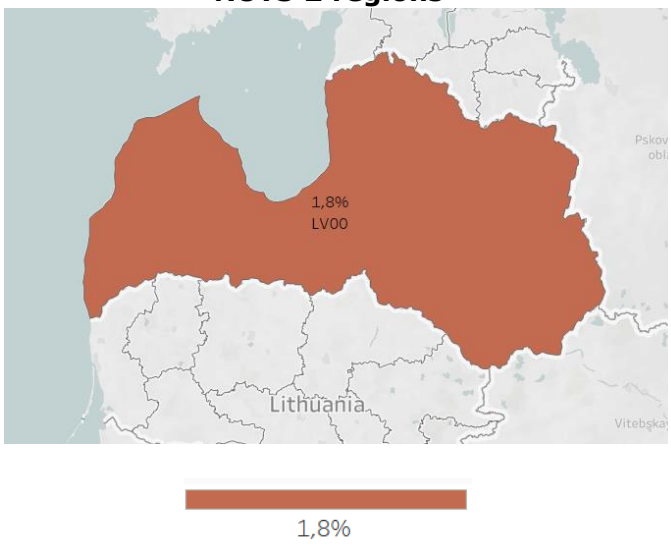
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Latvia.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Latvia 2018

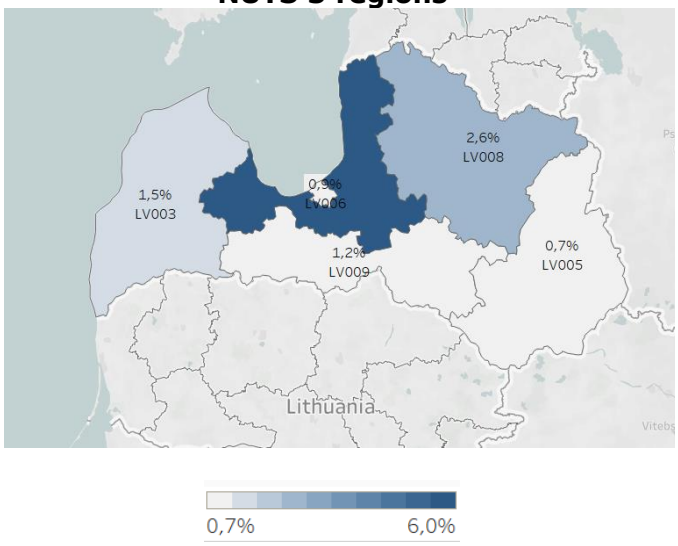
	NUTS 2		NUTS 3	
	Latvia	EU-27	**Latvia**	EU-27
Number of regions covered	**1**	233	**6**	1 081
Number of installations included	**106**	11 575	**106**	11 575
Average (arithmetic) estimated employment share per region	**1.8%**	1.1%	**2.2%**	1.3%
Maximum estimated employment share per region	**1.8%**	4.1%	**6.0%**	14%
Median estimated employment share per region	**1.8%**	0.9%	**1.3%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Latvia in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 1-3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Latvia in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	LV00	Latvija	1.8%	16 204	898 880	1 934 379
NUTS 3 regions						
1.	LV007	Pieriga	6.0%	7 047	117 590	367 266
2.	LV008	Vidzeme	2.6%	2 029	79 100	188 494
3.	LV003	Kurzeme	1.5%	1 469	99 580	243 032

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Latvia in 2018: 1) Installation 7 (*account holder* – AS „Latvenergo" TEC-2; *activity* – combustion installation with a rated thermal input exceeding 20 MW producing electricity), 2) Installation 113 (SCHWENK Latvija, SIA; installation for the production of cement clinker in rotary kilns or lime in rotary kilns or other furnaces), 3) Installation 6 (AS "Latvenergo" TEC-1; combustion installation with a rated thermal input exceeding 20 MW producing electricity). The study estimated that the first and the third of the three installations fell into the range of 500-1000 according to the number of employees in 2018, while the second one employed less than 500 persons.

LITHUANIA

Please note that all the data in this country fiche refer to the 114 EU ETS installations included in the analysis. Some employment data are estimates.

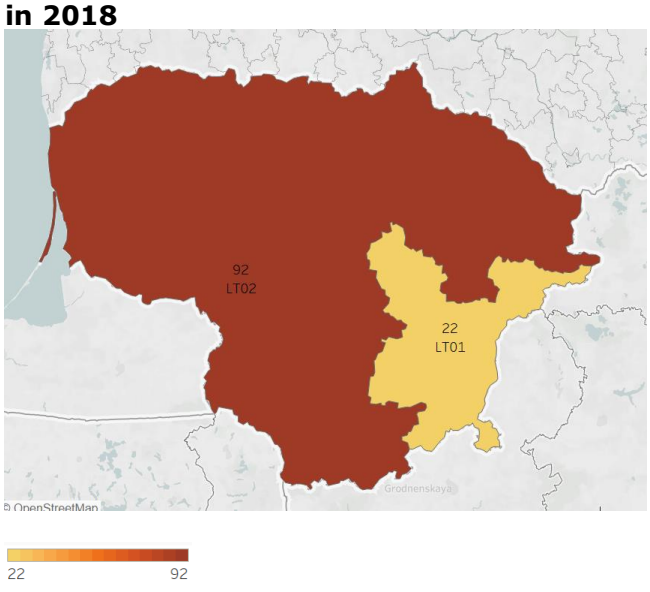
The study estimated the employment of 114 stationary EU ETS installations in Lithuania (93% of 123 stationary installations in total). The analysed installations employed almost 15 000 people in 2018 (~1% of all employed persons in Lithuania).

Combustion installations accounted for 85% of the stationary EU ETS installations in Lithuania, most such installations operating in the sector of electricity, gas, steam and air conditioning supply. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing ceramics, paper and pulp, and glass. For more details, please see the table and maps below.

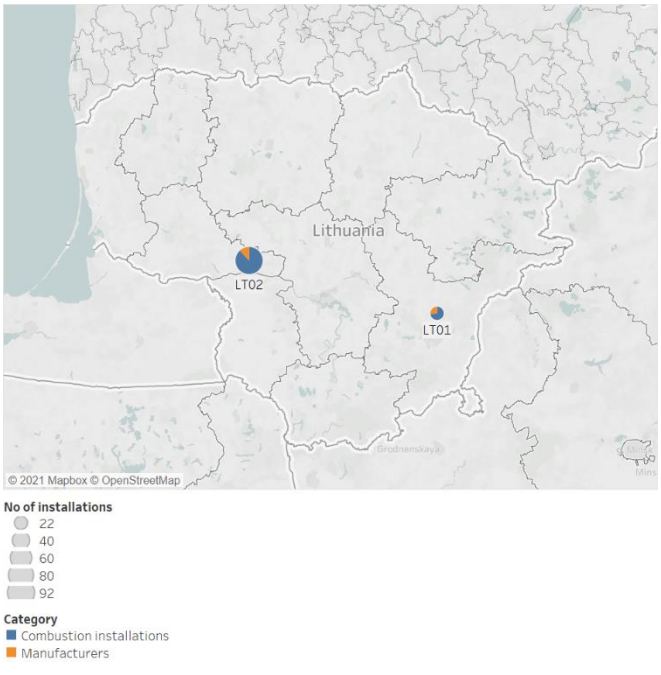
Table 1. Top economic activities by the number of the EU ETS stationary installations in Lithuania in 2018

Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in electricity, gas, steam and air conditioning supply	57	50.0%	65	59	3 294
Combustion installations in manufacturing	20	17.5%	78	183	2 926
Combustion installations in agriculture, forestry and fishing	5	4.4%	92	394	1 575
Manufacturers					
Manufacture of ceramics	8	7.0%	11	31	125
Manufacture of paper and pulp	3	2.6%	422	341	1 022
Manufacture of glass	2	1.8%	242	242	483
	...	...	...	...	...
GRAND TOTAL (All analysed stationary installations)	**114**	**100.0%**	**69**	**144**	**14 874**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Lithuania in 2018



Map 2. EU ETS installations by activity type in NUTS 2 regions in Lithuania in 2018



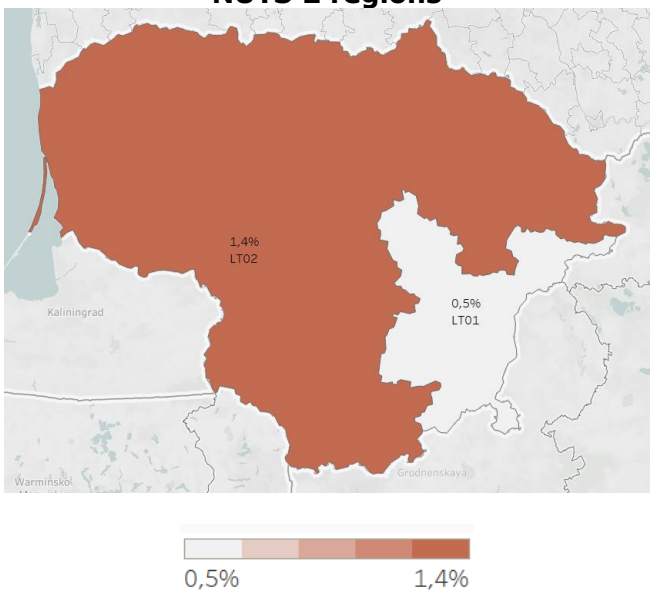
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Lithuania.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Lithuania 2018

	NUTS 2		NUTS 3	
	Lithuania	EU-27	**Lithuania**	EU-27
Number of regions covered	**2**	233	**43**	1 081
Number of installations included	**114**	11 575	**329**	11 575
Average (arithmetic) estimated employment share per region	**1.0%**	1.1%	**2.5%**	1.3%
Maximum estimated employment share per region	**1.4%**	4.1%	**7.5%**	14%
Median estimated employment share per region	**1.0%**	0.9%	**2.1%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Lithuania in 2018

NUTS 2 regions



NUTS 3 regions

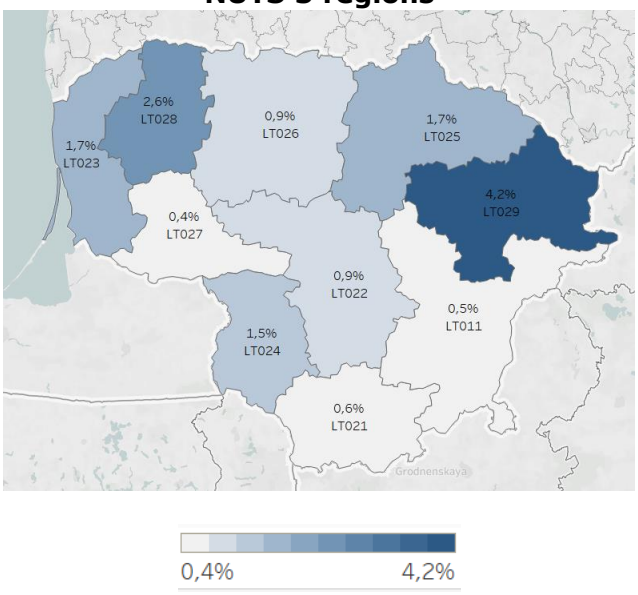


Table 3. Top 2-3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Lithuania in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	LT02	Vidurio ir vakaru Lietuvos regionas	1.4%	11 976	844 000	2 003 534
2.	LT01	Sostines regionas	0.5%	2 898	536 600	805 367
NUTS 3 regions						
1.	LT029	Utenos apskritis	4.2%	2 078	49 600	129 639
2.	LT028	Telsiu apskritis	2.6%	1 550	59 900	134 139
3.	LT025	Panevezio apskritis	1.7%	1 426	82 500	218 726

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Lithuania in 2018: 1) Katiline, amoniako paleidimo katilines Nr.1 ir Nr.2 (*account holder* - AB Achema; *activity* - production of ammonia), 2) Katiline, cemento klinkerio gamybos krosnys (AB Akmenes cementas; production of cement clinker), 3) Termofikacine elektrine Nr. 2 (E-2) (AB Vilniaus silumos tinklai; combustion installation in electricity, gas, steam and air conditioning supply). The study estimated that the first one employed over 1000 people in 2018 (at the account holder level) while the other two fell into the range of 100-500 according to the number of employees.

LUXEMBOURG

Please note that all the data in this country fiche refer to the 17 EU ETS installations included in the analysis. Some employment data are estimates.

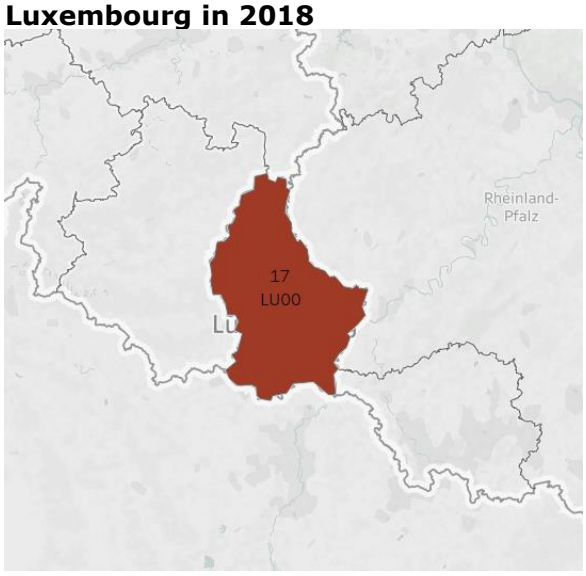
The study estimated the employment of 17 stationary EU ETS installations in Luxembourg (63% of 27 stationary installations in total). The analysed installations employed almost over 3 000 people in 2018 (~0.7% of all employed persons in Luxembourg).

Combustion installations accounted for 59% of the stationary EU ETS installations in Luxembourg, most such installations operating in the sectors of electricity, gas, steam and air conditioning supply or manufacturing. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing glass, iron or steel, and cement. For more details, please see the table and maps below.

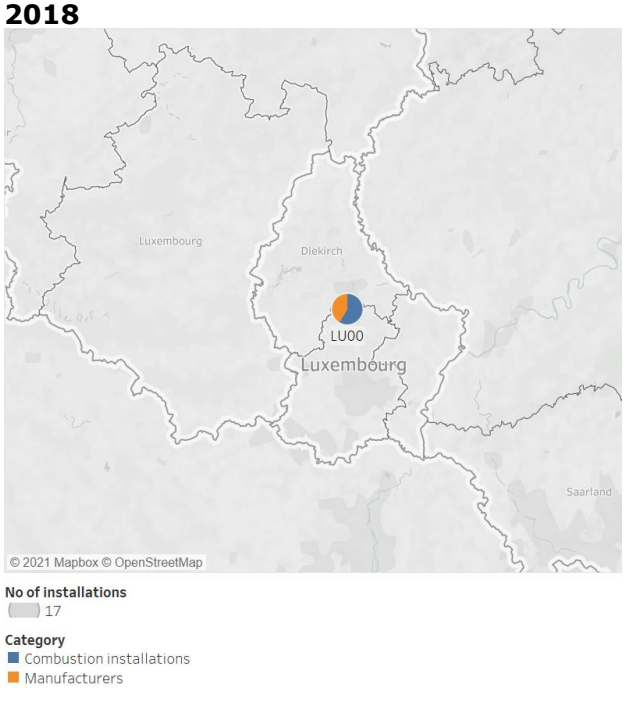
Table 1. Top economic activities by the number of the EU ETS stationary installations in Luxembourg in 2018

Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in electricity, gas, steam and air conditioning supply	4	23.5%	24	20	80
Combustion installations in manufacturing	4	23.5%	81	115	345
Combustion installations in construction	1	5.9%	70	70	70
Manufacturers					
Manufacture of glass	2	11.8%	225	225	225
Manufacture of iron or steel	2	11.8%	1 124	1 124	2 248
Manufacture of cement	1	5.9%	81	81	81
	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**17**	**100.0%**	**76**	**244**	**3 411**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Luxembourg in 2018



Map 2. EU ETS installations by activity type in NUTS 2 regions in Luxembourg in 2018



Source: PPMI.

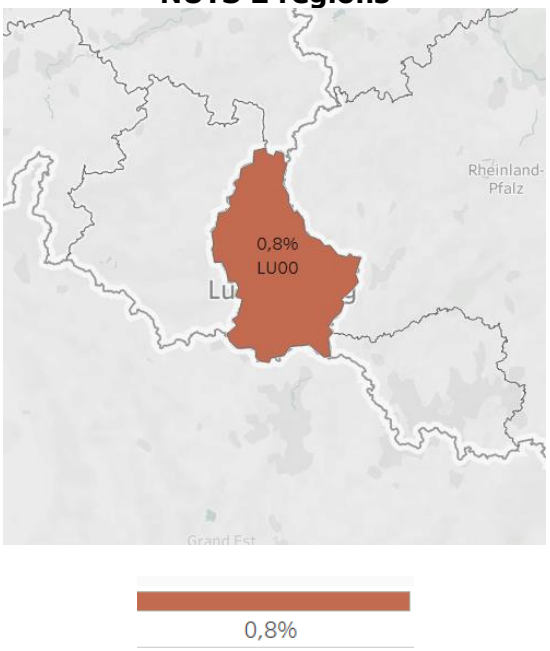
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Luxembourg.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Luxembourg 2018

	NUTS 2		NUTS 3	
	Luxembourg	EU-27	**Luxembourg**	EU-27
Number of regions covered	**1**	233	**1**	1 081
Number of installations included	**17**	11 575	**17**	11 575
Average (arithmetic) estimated employment share per region	**0.8%**	1.1%	**0.8%**	1.3%
Maximum estimated employment share per region	**0.8%**	4.1%	**0.8%**	14%
Median estimated employment share per region	**0.8%**	0.9%	**0.8%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Luxembourg in 2018

NUTS 2 regions



NUTS 3 regions

Source: PPMI.

Table 3. Top NUTS 2 and NUTS 3 region by estimated employment impact of EU ETS stationary installations in Luxembourg in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	LU00	Luxembourg	0.8%	3 411	448 780	602 005
NUTS 3 regions						
1.	LU000	Luxembourg	0.8%	3 411	448 780	602 005

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Luxembourg in 2018: 1) Usine Intermoselle (*account holder* – Cimalux S.A.; *activity* – production of cement clinker), 2) ArcelorMittal Belval et Differdange - Site de Belval (ArcelorMittal Belval et Differdange; production of pig iron or steel), 3) ArcelorMittal Belval et Differdange - site Differd (ArcelorMittal Belval et Differdange; production of pig iron or steel). The study estimated that Usine Intermoselle fell into the range of 50-100 according to the number of employees in 2018, while the other two installations employed over 1000 persons each.

MALTA

There are seven EU ETS stationary installations in Malta. However, data on them and their employees available for this study were very limited; therefore, a complete country fiche for Malta could not be produced. This fiche includes only some information on GHG emissions of the EU ETS stationary installations in Malta, as provided below.

Among the stationary EU ETS installations in Malta, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in 2018: 1) Electrogas Malta (*account holder* – ElectroGas Malta); 2) D3 Power Plant (D3 Power Generation Ltd.), 3) Delimara Power Station (Enemalta plc). All three are combustion installations.

THE NETHERLANDS

Please note that all the data in this country fiche refer to the 406 EU ETS installations included in the analysis. Some employment data are estimates.

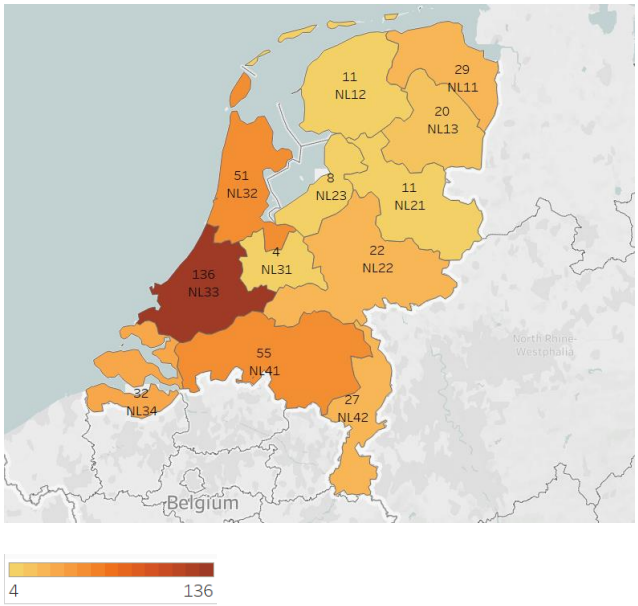
The study estimated the employment of 406 stationary EU ETS installations in the Netherlands (64% of 634 stationary installations in total). The analysed installations employed over 58 500 people in 2018 (~0.6% of all employed persons in the Netherlands).

Combustion installations accounted for 75% of the stationary EU ETS installations in the Netherlands, most such installations operating in the sectors of manufacturing and agriculture, forestry and fishing. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing ceramics and bulk chemicals. For more details, please see the table and maps below.

Table 1. Top economic activities by the number of the EU ETS stationary installations in the Netherlands in 2018

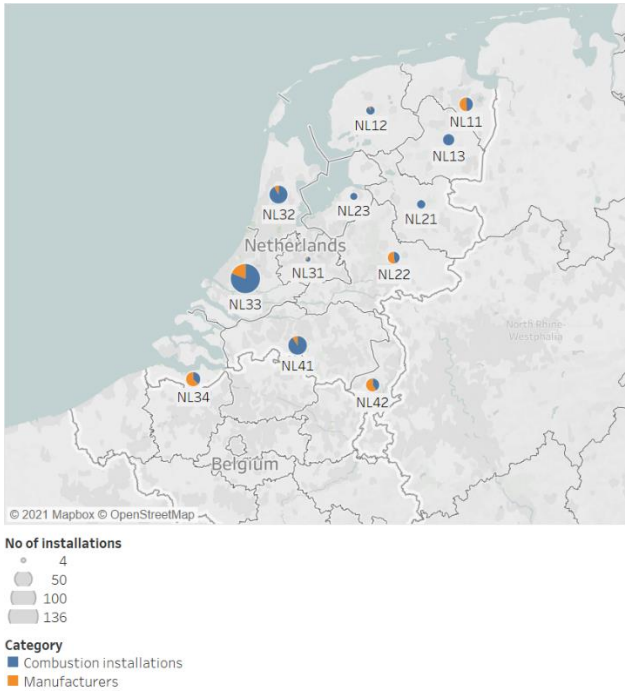
Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in manufacturing	98	24.1%	146	275	25 554
Combustion installations in agriculture, forestry and fishing	78	19.2%	13	21	1 142
Combustion installations in mining and quarrying	40	9.9%	41	56	2 250
Manufacturers					
Manufacture of ceramics	24	5.9%	37	68	1 358
Production of bulk chemicals	22	5.4%	88	95	2 100
Manufacture of paper and pulp	16	3.9%	172	199	3 182
…	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**406**	**100.0%**	**70**	**160**	**58 640**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in the Netherlands in 2018



Source: PPMI.

Map 2. EU ETS installations by activity type in NUTS 2 regions in the Netherlands in 2018



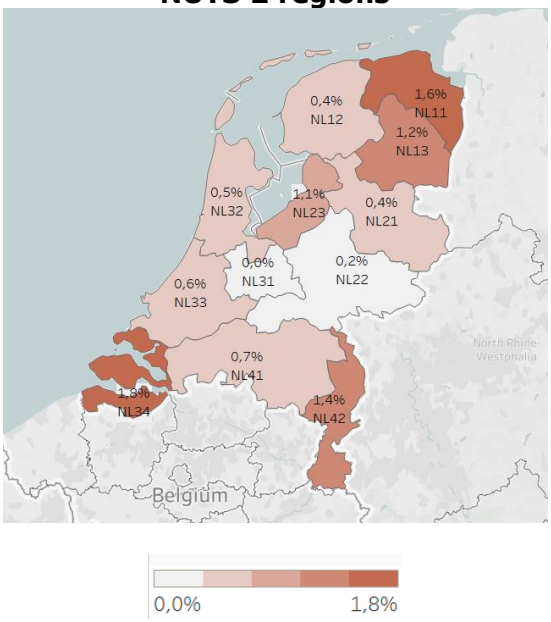
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in the Netherlands.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in the Netherlands 2018

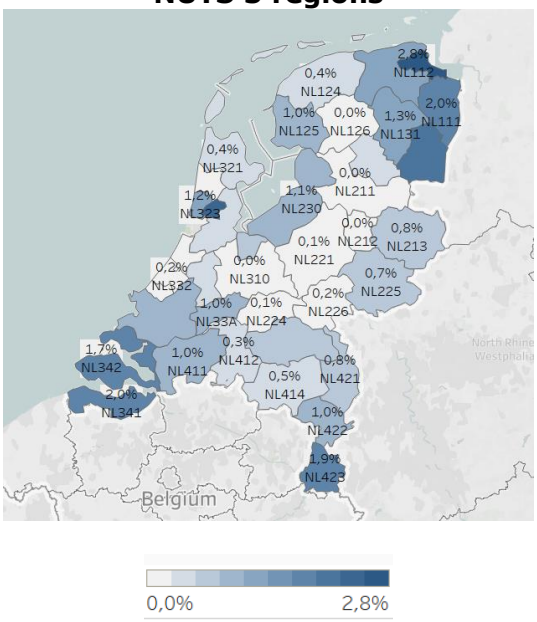
	NUTS 2		NUTS 3	
	The Netherlands	EU-27	**The Netherlands**	EU-27
Number of regions covered	**12**	233	**39**	1 081
Number of installations included	**406**	11 575	**406**	11 575
Average (arithmetic) estimated employment share per region	**0.8%**	1.1%	**0.8%**	1.3%
Maximum estimated employment share per region	**1.8%**	4.1%	**2.8%**	14%
Median estimated employment share per region	**0.6%**	0.9%	**0.7%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in the Netherlands in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in the Netherlands in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	NL34	Zeeland	1.8%	3 374	187 800	382 304
2.	NL11	Groningen	1.6%	4 815	296 500	582 944
3.	NL42	Limburg (NL)	1.4%	8 238	586 500	1 117 198
NUTS 3 regions						
1.	NL112	Delfzijl en omgeving	2.8%	540	19 000	46 396
2.	NL325	Zaanstreek	2.4%	1 688	71 200	170 860
3.	NL132	Zuidoost-Drenthe	2.0%	1 485	74 100	167 842

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in the Netherlands in 2018: 1) Tata Steel IJmuiden bv BKG 1 (*account holder* – Tata Steel IJmuiden B.V.; *activity* – production of pig iron or steel), 2) Uniper Centrale Maasvlakte (Uniper Benelux N.V.; combustion of fuels in electricity production), 3) Shell Nederland Raffinaderij B.V. (SHELL Nederland Raffinaderij B.V.; refining of mineral oil). The study estimated that Shell Nederland Raffinaderij B.V. employed over 1 000 people in 2018 while the other two employed up to 150 persons each.

POLAND

Please note that all the data in this country fiche refer to the 934 EU ETS installations included in the analysis. Some employment data are estimates.

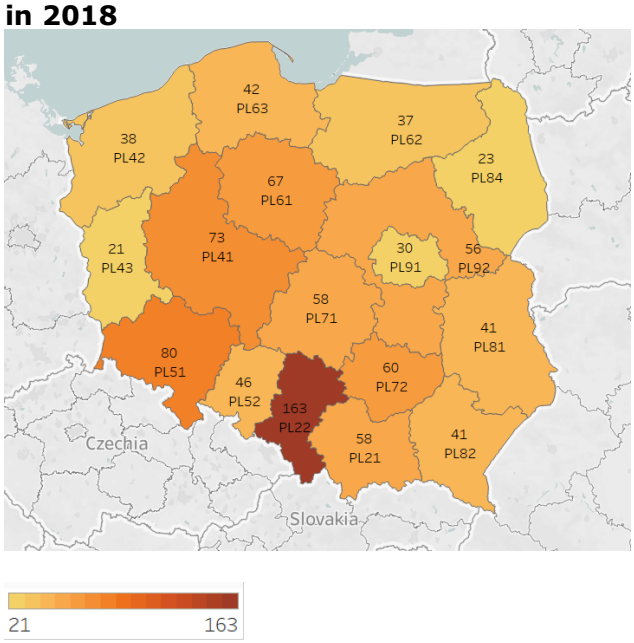
The study estimated the employment of 934 stationary EU ETS installations in Poland (87% of 1068 stationary installations in total). The analysed installations employed over 205 000 people in 2018 (~1.3% of all employed persons in Poland).

Combustion installations accounted for 68% of the stationary EU ETS installations in Poland, most such installations operating in the sectors of electricity, gas, steam and air conditioning supply or manufacturing. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing ceramics, cement, and glass. For more details, please see the table and maps below.

Table 1. Top economic activities by the number of the EU ETS stationary installations in Poland in 2018

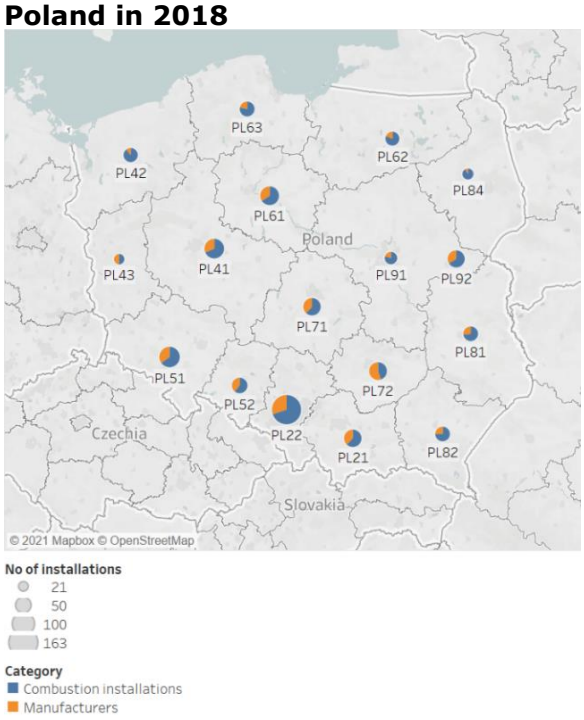
Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in electricity, gas, steam and air conditioning supply	307	32.9%	48	77	23 283
Combustion installations in manufacturing	193	20.7%	146	439	77 322
Combustion installations in electricity production and distribution	64	6.9%	146	193	11 995
Manufacturers					
Manufacture of ceramics	91	9.7%	80	253	19 765
Manufacture of cement	36	3.9%	42	148	5 193
Manufacture of glass	36	3.9%	350	428	14 554
	...	...	...	...	...
GRAND TOTAL (All analysed stationary installations)	**934**	**100.0%**	**96**	**232**	**205 415**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Poland in 2018



Source: PPMI.

Map 2. EU ETS installations by activity type in NUTS 2 regions in Poland in 2018



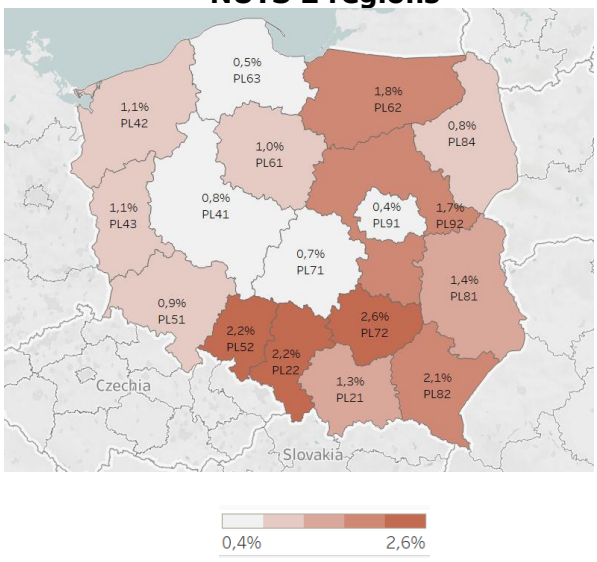
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Poland.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Poland 2018

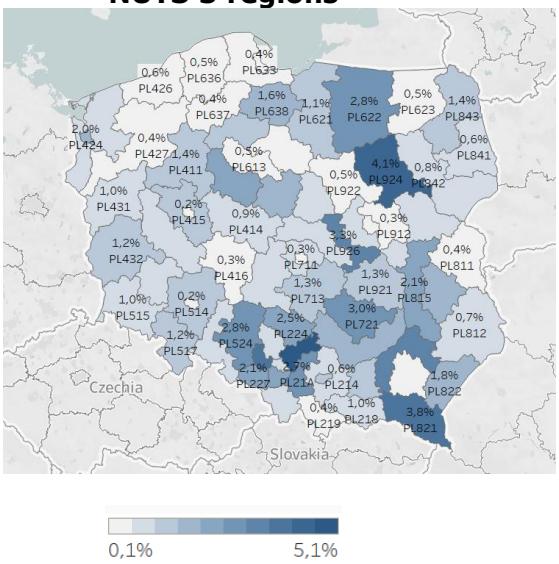
	NUTS 2		NUTS 3	
	Poland	EU-27	**Poland**	EU-27
Number of regions covered	**17**	233	**73**	1 081
Number of installations included	**934**	11 575	**934**	11 575
Average (arithmetic) estimated employment share per region	**1.3%**	1.1%	**1.3%**	1.3%
Maximum estimated employment share per region	**2.6%**	4.1%	**5.1%**	14%
Median estimated employment share per region	**1.1%**	0.9%	**1.0%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Poland in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Poland in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	PL72	Swietokrzyskie	2.6%	13 316	506 800	1 232 016
2.	PL22	Slaskie	2.2%	40 990	1 863 100	4 500 863
3.	PL52	Opolskie	2.2%	8 521	390 300	948 808
NUTS 3 regions						
1.	PL22B	Sosnowiecki	5.1%	12 542	247 000	679 270
2.	PL924	Ostrolecki	4.1%	7 029	171 300	382 337
3.	PL821	Krosnienski	3.8%	6 655	177 000	472 097

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Poland in 2018: 1) PGE GiEK S.A. Oddział Elektrownia Bełchatów (*account holder* – PGE Górnictwo i Energetyka Konwencjonalna S.A.), 2) ELEKTROWNIA KOZIENICE (ENEA WYTWARZANIE SP. Z O.O.), 3) Instalacja do spalania paliw (Enea Elektrownia Połaniec S.A.). All three of them are combustion installations in electricity production. The study estimated that PGE GiEK S.A. Oddział Elektrownia Bełchatów employed up to 150 people in 2018, while the second and third one fell into the ranges of 500-1000 and 100-500, respectively, according to the number of employees.

PORTUGAL

Please note that all the data in this country fiche refer to the 267 EU ETS installations included in the analysis. Some employment data are estimates.

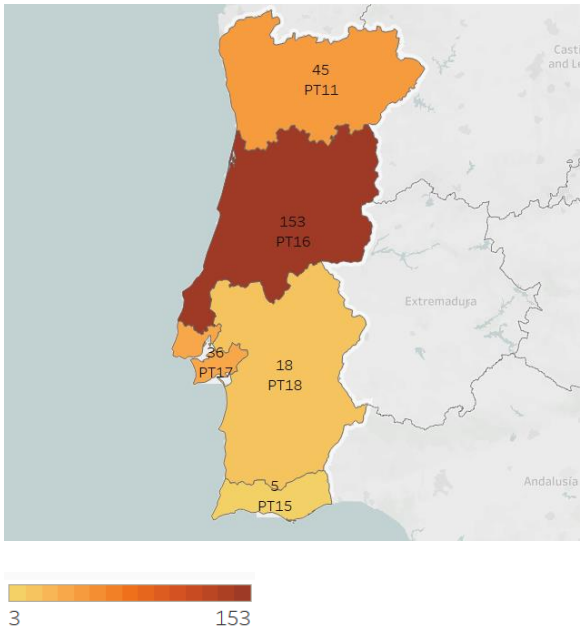
The study estimated the employment of 267 stationary EU ETS installations in Portugal (78% of 341 stationary installations in total). The analysed installations employed over 39 000 people in 2018 (~0.8% of all employed persons in Portugal).

Combustion installations accounted for 33% of the stationary EU ETS installations in Portugal, most such installations operating in the sectors of manufacturing and electricity production and distribution. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing ceramics. For more details, please see the table and maps below.

Table 1. Top economic activities by the number of the EU ETS stationary installations in Portugal in 2018

Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in manufacturing	49	18.4%	166	401	19 651
Combustion installations in electricity production and distribution	32	12.0%	24	87	2 510
Manufacturers					
Manufacture of ceramics	123	46.1%	26	62	7 171
Manufacture of paper and pulp	29	10.9%	117	137	3 981
Manufacture of cement	9	3.4%	93	88	789
	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**267**	**100.0%**	**64**	**154**	**39 206**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Portugal in 2018



Map 2. EU ETS installations by activity type in NUTS 2 regions in Portugal in 2018

Source: PPMI.

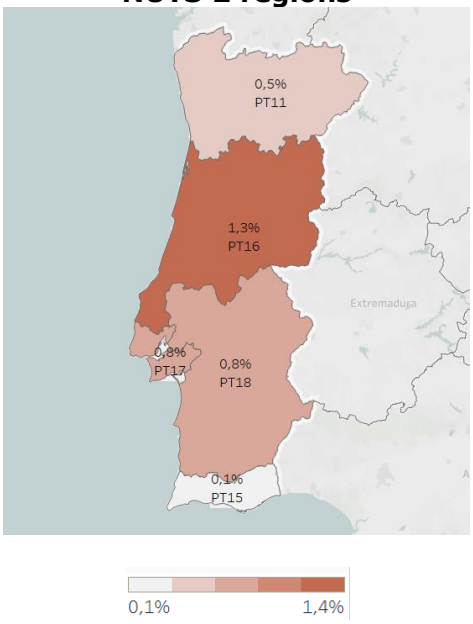
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Portugal.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Portugal 2018

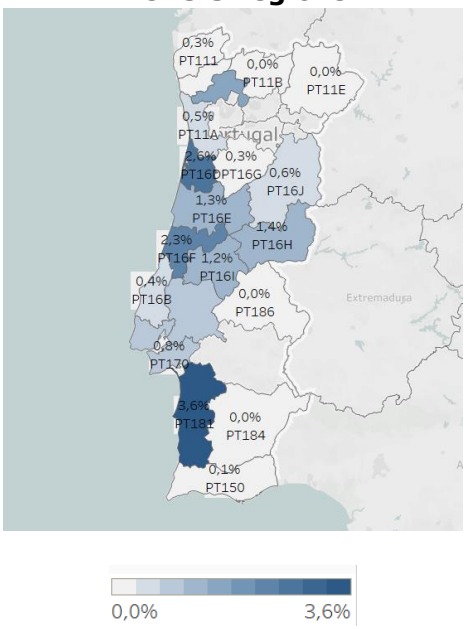
	NUTS 2		NUTS 3	
	Portugal	EU-27	**Portugal**	EU-27
Number of regions covered	**7**	233	**22**	1 081
Number of installations included	**267**	11 575	**267**	11 575
Average (arithmetic) estimated employment share per region	**0.8%**	1.1%	**0.9%**	1.3%
Maximum estimated employment share per region	**1.4%**	4.1%	**3.6%**	14%
Median estimated employment share per region	**0.8%**	0.9%	**0.6%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Portugal in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Portugal in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
		NUTS 2 regions				
1.	PT20	Região Autónoma dos Açores (PT)	1.4%	1 578	114 220	243 862
2.	PT16	Centro (PT)	1.3%	13 442	1 003 310	2 231 346
3.	PT17	Área Metropolitana de Lisboa	0.8%	11 656	1 440 260	2 833 679
		NUTS 3 regions				
1.	PT181	Alentejo Litoral	3.6%	1 649	45 590	93 774
2.	PT16D	Região de Aveiro	2.6%	4 702	180 090	363 095
3.	PT16F	Região de Leiria	2.3%	3 173	136 560	286 309

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Portugal in 2018: 1) Central Termoeléctrica de Sines (*account holder* – EDP - Gestão da Produção de Energia, S.A.; *activity* – combustion of fuels in electricity production), 2) Central Termoeléctrica do Pego (Tejo Energia, S.A; combustion of fuels in electricity production), 3) Refinaria de Sines (Petróleos de Portugal - Petrogal S.A; refining of mineral oil). The study estimated that Central Termoeléctrica de Sines employed up to 150 people in 2018, while the second and third one of the three installations fell into the ranges of 1-50 and 500-1000, respectively, according to the number of employees.

ROMANIA

Please note that all the data in this country fiche refer to the 244 EU ETS installations included in the analysis. Some employment data are estimates.

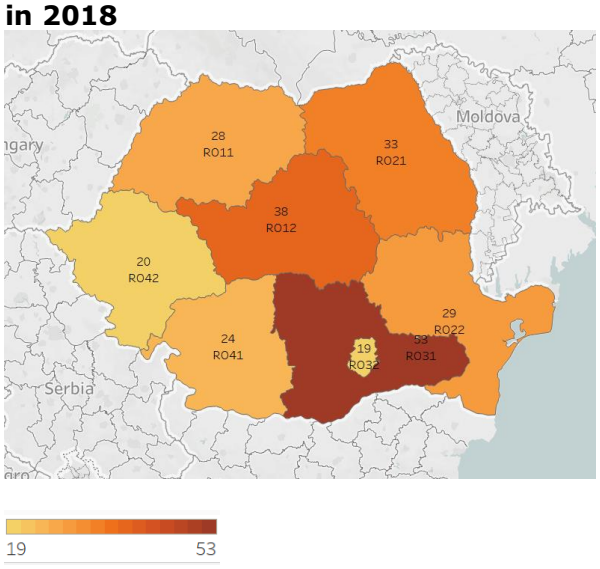
The study estimated the employment of 244 stationary EU ETS installations in Romania (82% of 298 stationary installations in total). The analysed installations employed over 72 000 people in 2018 (~0.8% of all employed persons in Romania).

Combustion installations accounted for 57% of the stationary EU ETS installations in Romania, most such installations operating in the sectors of manufacturing and electricity, gas, steam and air conditioning supply. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing ceramics. For more details, please see the table and maps below.

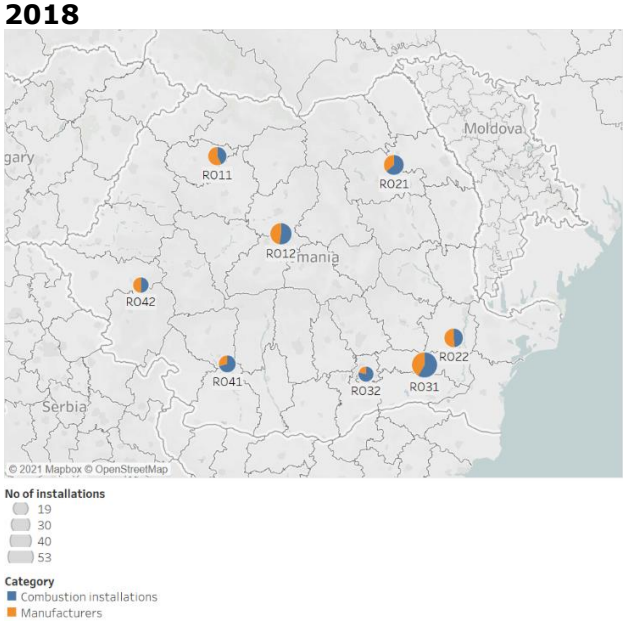
Table 1. Top economic activities by the number of the EU ETS stationary installations in Romania in 2018

Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in manufacturing	46	18.9%	288	516	19 077
Combustion installations in electricity, gas, steam and air conditioning supply	35	14.3%	162	265	5 574
Combustion installations in mining and quarrying	21	8.6%	906	906	19 026
Manufacturers					
Manufacture of ceramics	32	13.1%	74	91	2 362
Manufacture of iron or steel	24	9.8%	400	627	11 277
Manufacture of cement	10	4.1%	363	322	2 902
…	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**244**	**100.0%**	**258**	**410**	**72 488**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Romania in 2018



Map 2. EU ETS installations by activity type in NUTS 2 regions in Romania in 2018



Source: PPMI.

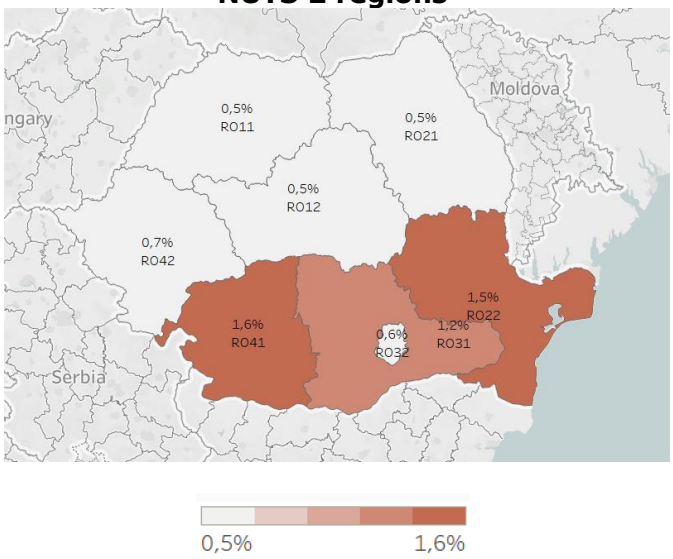
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Romania.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Romania 2018

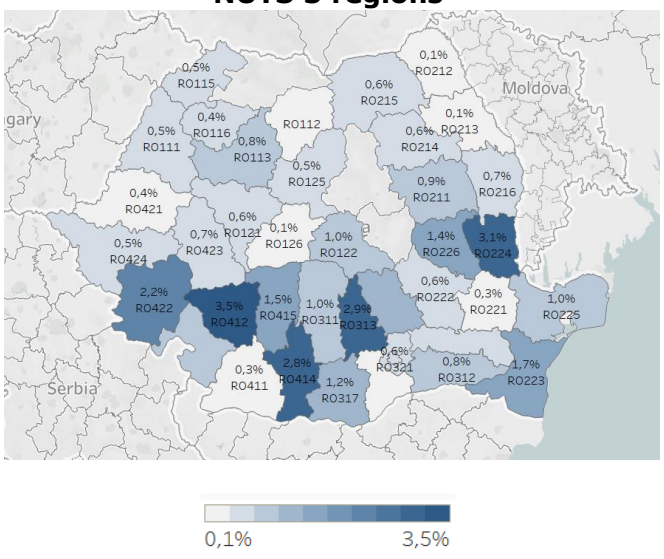
	NUTS 2		NUTS 3	
	Romania	EU-27	**Romania**	EU-27
Number of regions covered	**8**	233	**39**	1 081
Number of installations included	**244**	11 575	**244**	11 575
Average (arithmetic) estimated employment share per region	**0.9%**	1.1%	**1.0%**	1.3%
Maximum estimated employment share per region	**1.6%**	4.1%	**3.5%**	14%
Median estimated employment share per region	**0.6%**	0.9%	**0.7%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Romania in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Romania in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	RO41	Sud-Vest Oltenia	1.6%	14 106	873 100	1 949 813
2.	RO22	Sud-Est	1.5%	14 205	953 100	2 423 059
3.	RO31	Sud - Muntenia	1.2%	14 417	1 224 100	2 965 415
NUTS 3 regions						
1.	RO412	Gorj	3,5%	5 131	148 100	319 903
2.	RO224	Galati	3,1%	5 456	175 400	510 865
3.	RO313	Dâmbovita	2,9%	4 330	149 000	496 213

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Romania in 2018: 1) Liberty Galati SA (*account holder* – SC Liberty Galati SA; *activity* – production of pig iron or steel), 2) Centrala de Cogenerare cu Ciclu Combinat-Brazi (OMV PETROM SA; combustion of fuels in mining and quarrying), 3) SC CET Govora SA (SC CET Govora SA; combustion of fuels in steam and air conditioning supply). The study estimated that Liberty Galati SA employed over 5 000 people in 2018, while Centrala de Cogenerare cu Ciclu Combinat-Brazi fell into the range of 500-1000 and SC CET Govora SA - into the range of 1000-2000 according to the number of employees.

SLOVAKIA

Please note that all the data in this country fiche refer to the 197 EU ETS installations included in the analysis. Some employment data are estimates.

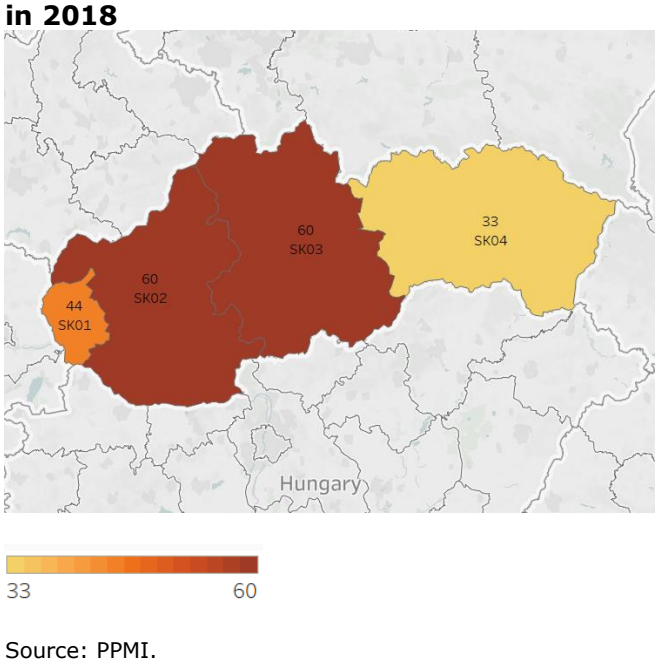
The study estimated the employment of 197 stationary EU ETS installations in Slovakia (89% of 221 stationary installations in total). The analysed installations employed over 38 000 people in 2018 (~1.6% of all employed persons in Slovakia).

Combustion installations accounted for 77% of the stationary EU ETS installations in Slovakia, most such installations operating in the sectors of electricity, gas, steam and air conditioning supply or manufacturing. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing ceramics. For more details, please see the table and maps below.

Table 1. Top economic activities by the number of the EU ETS stationary installations in Slovakia in 2018

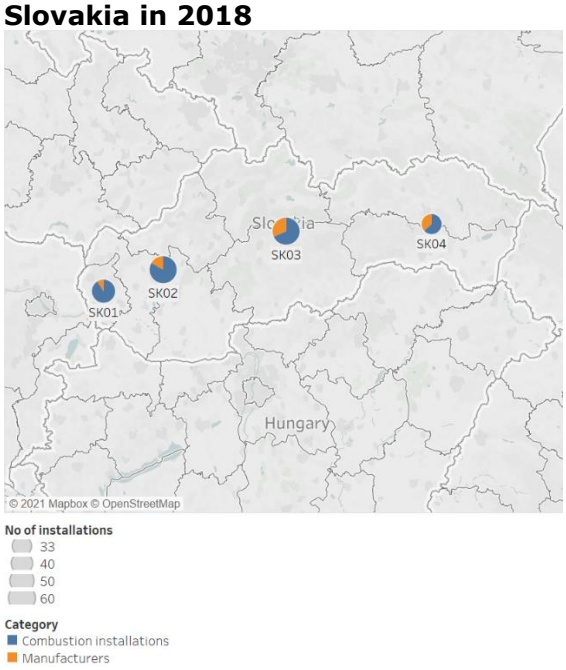
Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in electricity, gas, steam and air conditioning supply	67	34.0%	15	38	2 575
Combustion installations in manufacturing	40	20.3%	250	513	19 508
Combustion installations in electricity production and distribution	13	6.6%	19	44	530
Manufacturers					
Manufacture of ceramics	12	6.1%	42	53	588
Manufacture of glass	6	3.0%	136	217	1 304
Manufacture of paper and pulp	6	3.0%	275	354	2 125
…	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**197**	**100.0%**	**75**	**202**	**38 171**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Slovakia in 2018



Source: PPMI.

Map 2. EU ETS installations by activity type in NUTS 2 regions in Slovakia in 2018



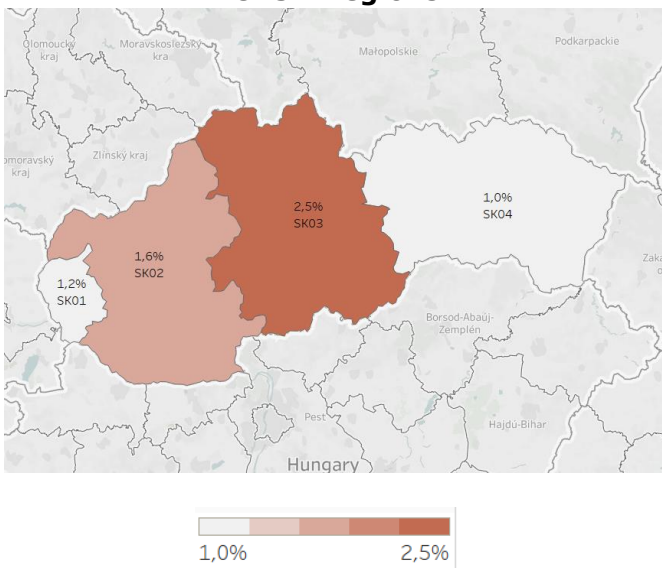
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Slovakia.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Slovakia 2018

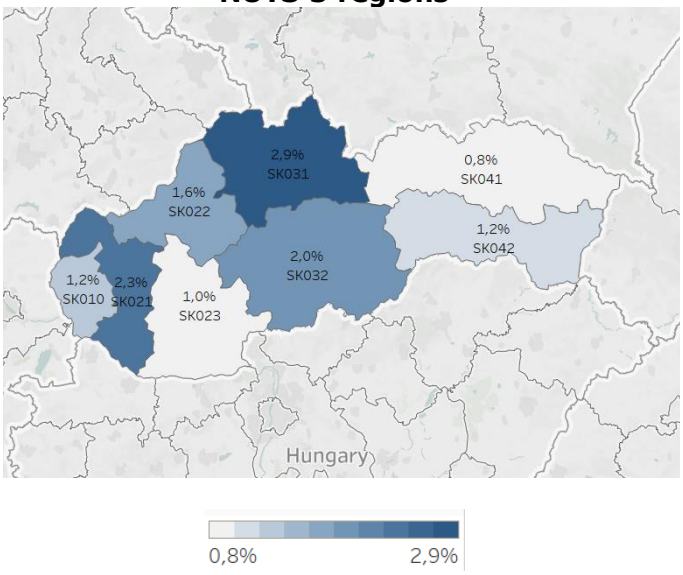
	NUTS 2		NUTS 3	
	Slovakia	EU-27	**Slovakia**	EU-27
Number of regions covered	**4**	233	**8**	1 081
Number of installations included	**197**	11 575	**197**	11 575
Average (arithmetic) estimated employment share per region	**1.6%**	1.1%	**1.6%**	1.3%
Maximum estimated employment share per region	**2.5%**	4.1%	**2.9%**	14%
Median estimated employment share per region	**1.4%**	0.9%	**1.4%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Slovakia in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Slovakia in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	SK03	Stredné Slovensko	2.5%	13 937	567 960	1 340 811
2.	SK02	Západné Slovensko	1.6%	12 905	808 590	1 828 428
3.	SK01	Bratislavský kraj	1.2%	5 647	469 820	650 838
NUTS 3 regions						
1.	SK031	Zilinský kraj	2.9%	8 991	314 700	691 023
2.	SK021	Trnavský kraj	2.3%	5 559	242 350	562 372
3.	SK032	Banskobystrický kraj	2.0%	4 946	253 260	649 788

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Slovakia in 2018: 1) U. S. Steel Košice, s.r.o. (*account holder* – U. S. Steel Košice, s.r.o.; *activity* – combustion of fuels in the manufacture of basic iron and steel and of ferroalloys), 2) Duslo, a.s. Šaľa (Duslo, a.s.; production of ammonia), 3) CRH (Slovensko) a.s., cementáreň Rohožník (CRH (Slovensko) a.s.; production of cement clinker). The study estimated that the first installation employed up to 150 people in 2018 while the other two fell into the ranges of 500-1000 and 100-500, respectively, according to the number of employees.

SLOVENIA

Please note that all the data in this country fiche refer to the 80 EU ETS installations included in the analysis. Some employment data are estimates.

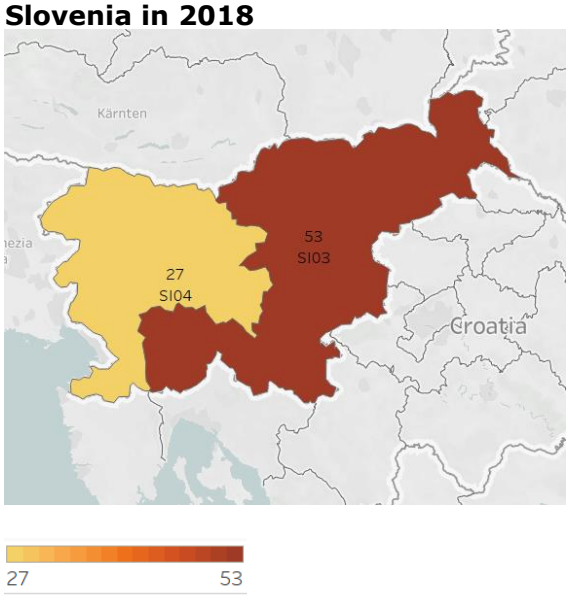
The study estimated the employment of 80 stationary EU ETS installations in Slovenia (80% of 103 stationary installations in total). The analysed installations employed over 23 000 people in 2018 (~2.3% of all employed persons in Slovenia).

Combustion installations accounted for 65% of the stationary EU ETS installations in Slovenia, most such installations operating in the sectors of manufacturing and electricity, gas, steam and air conditioning supply. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing ceramics and paper and pulp. For more details, please see the table and maps below.

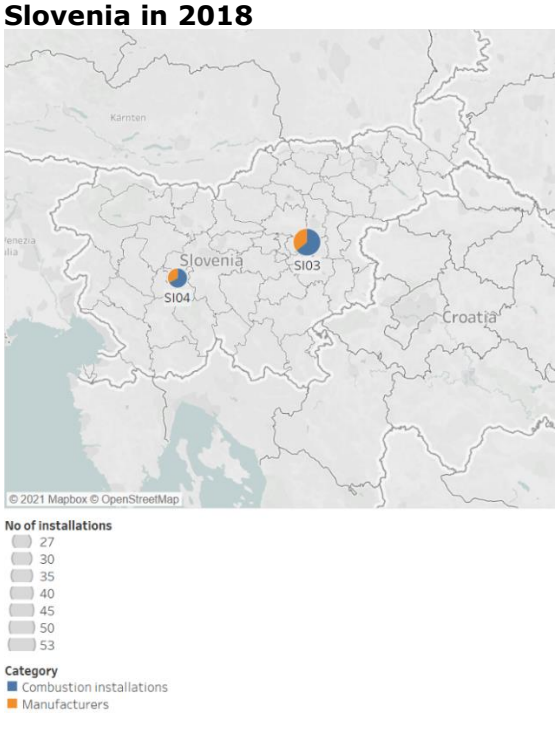
Table 1. Top economic activities by the number of the EU ETS stationary installations in Slovenia in 2018

Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in manufacturing	34	42.5%	146	422	13 089
Combustion installations in electricity, gas, steam and air conditioning supply	7	8.8%	62	136	815
Combustion installations in electricity production and distribution	4	5.0%	13	31	124
Manufacturers					
Manufacture of ceramics	6	7.5%	122	192	961
Manufacture of paper and pulp	5	6.3%	352	331	1 655
Manufacture of cement	3	3.8%	112	112	223
	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**80**	**100.0%**	**146**	**335**	**23 441**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Slovenia in 2018



Map 2. EU ETS installations by activity type in NUTS 2 regions in Slovenia in 2018



Source: PPMI.

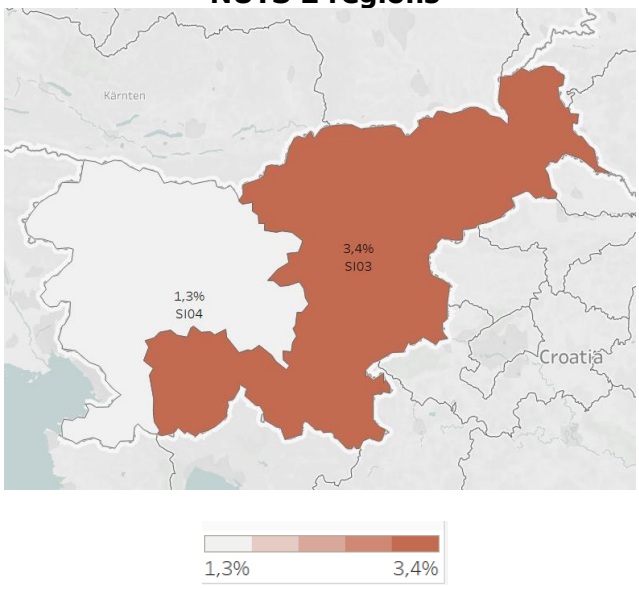
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Slovenia.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Slovenia 2018

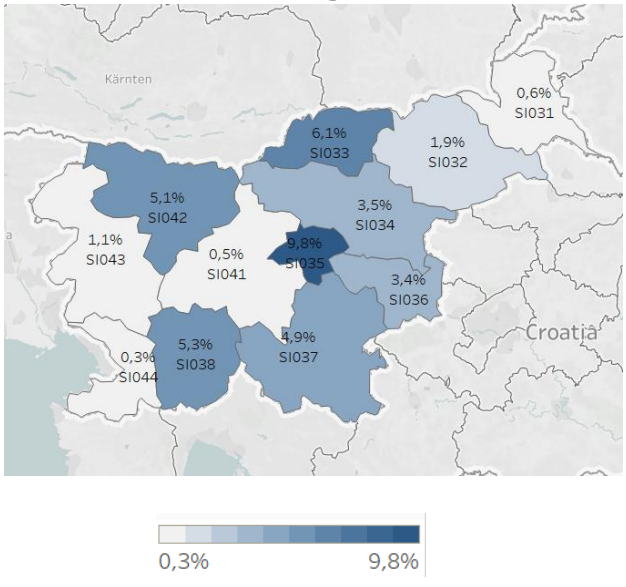
	NUTS 2		NUTS 3	
	Slovenia	EU-27	**Slovenia**	EU-27
Number of regions covered	**2**	233	**12**	1 081
Number of installations included	**80**	11 575	**80**	11 575
Average (arithmetic) estimated employment share per region	**2.4%**	1.1%	**3.5%**	1.3%
Maximum estimated employment share per region	**3.4%**	4.1%	**9.8%**	14%
Median estimated employment share per region	**2.4%**	0.9%	**3.5%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Slovenia in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 2-3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Slovenia in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	SI03	Vzhodna Slovenija	3.4%	16 377	481 800	1 089 717
2.	SI04	Zahodna Slovenija	1.3%	7 064	539 520	977 163
NUTS 3 regions						
1.	SI035	Zasavska	9.8%	1 669	17 110	57 061
2.	SI033	Koroska	6.1%	1 842	30 410	70 550
3.	SI038	Primorsko-notranjska	5.3%	1 112	21 120	52 334

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Slovenia in 2018: 1) Salonit Anhovo, d.d. (*account holder* – Salonit Anhovo, d.d.; *activity* – production of cement clinker), 2) Vipap Videm Krško d.d. (Vipap Videm Krško d.d.; production of paper or cardboard), 3) Acroni, d.o.o. (SIJ Acroni, d.o.o.; production of pig iron or steel). The study estimated that Acroni, d.o.o. employed over 1 000 people in 2018 while the other two installations fell into the range of 100-500 according to the number of employees.

SPAIN

Please note that all the data in this country fiche refer to the 1121 EU ETS installations included in the analysis. Some employment data are estimates.

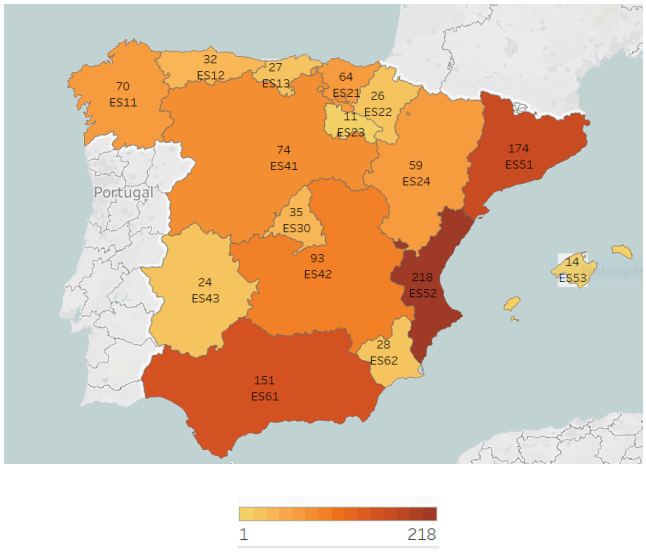
The study estimated the employment of 1121 stationary EU ETS installations in Spain (78% of 1430 stationary installations in total). The analysed installations employed around 155 145 people in 2018 (~0.8% of all employed persons in Spain).

Combustion installations accounted for 43% of the stationary EU ETS installations in Spain, most such installations operating in the sectors of electricity production and distribution or manufacturing. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing ceramics. For more details, please see the table and maps below.

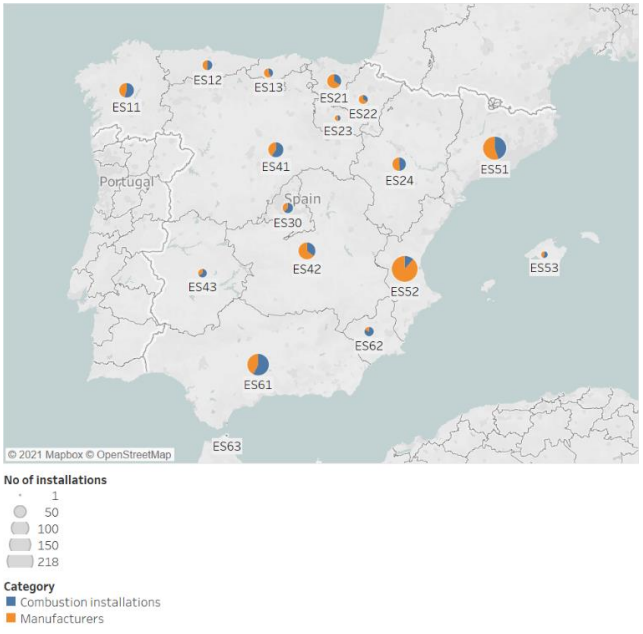
Table 1. Top economic activities by the number of the EU ETS stationary installations in Spain in 2018

Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in electricity production and distribution	199	17.8%	25	32	5 916
Combustion installations in manufacturing	183	16.3%	146	289	49 072
Combustion installations in construction	17	1.5%	144	153	2 137
Manufacturers					
Manufacture of ceramics	352	31.4%	23	66	20 910
Manufacture of paper and pulp	82	7.3%	134	191	13 927
Manufacture of glass	51	4.5%	174	192	8 829
…	…	…	…	…	…
GRAND TOTAL (All analysed stationary installations)	**1 121**	**100.0%**	**62**	**150**	**155 145**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Spain in 2018



Map 2. EU ETS installations by activity type in NUTS 2 regions in Spain in 2018



Source: PPMI.

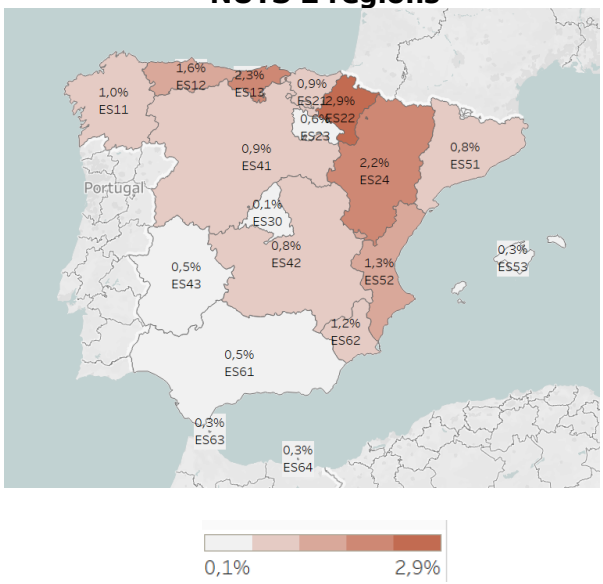
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Spain.

Table 1. Estimated EU ETS employment share (%) in the number of total employed persons in Spain 2018

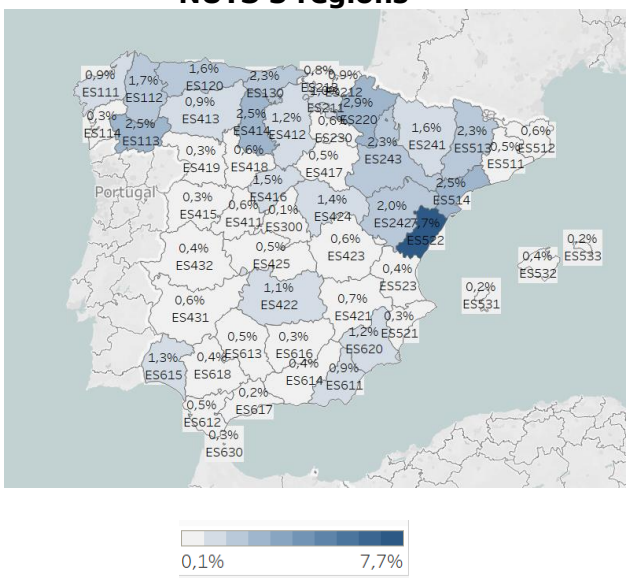
	NUTS 2		NUTS 3	
	Spain	EU-27	**Spain**	EU-27
Number of regions covered	**19**	233	**59**	1 081
Number of installations included	**1121**	11 575	**1121**	11 575
Average (arithmetic) estimated employment share per region	**1.0%**	1.1%	**1.1%**	1.3%
Maximum estimated employment share per region	**2.9%**	4.1%	**7.7%**	14%
Median estimated employment share per region	**0.8%**	0.9%	**0.6%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Spain in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Spain in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	ES22	Comunidad Foral de Navarra	2.9%	8 723	305 400	643 866
2.	ES13	Cantabria	2.3%	5 181	227 500	581 294
3.	ES24	Aragón	2.2%	13 178	604 700	1 313 135
NUTS 3 regions						
1.	ES522	Castellón/Castelló	7.7%	19 189	248 500	569 576
2.	ES220	Navarra	2.9%	8 723	305 400	643 866
3.	ES514	Tarragona	2.5%	8 426	332 900	794 969

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Spain in 2018: 1) Central Térmica As Pontes (*account holder* – Endesa Generación, S.A.), 2) EDP España, S.A. - Aboño 1 (EDP España, S.A.), 3) Endesa Generación, S.A. - Litoral (Endesa Generación, S.A.). All three are combustion installations in electricity production and fell into the range of 50-100 according to the number of employees in 2018.

SWEDEN

Please note that all the data in this country fiche refer to the 906 EU ETS installations included in the analysis. Some employment data are estimates.

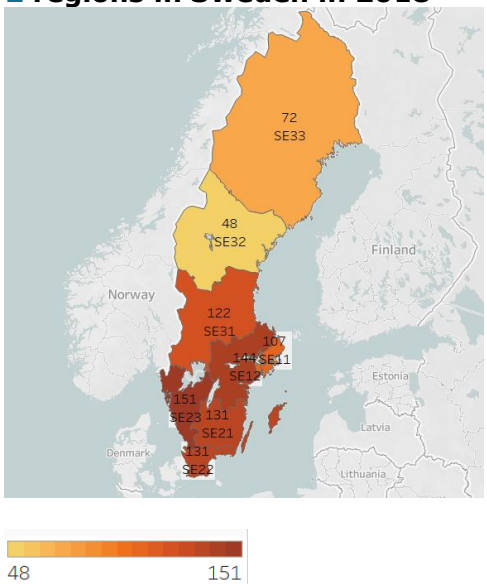
The study estimated the employment of 906 stationary EU ETS installations in Sweden (95% of 954 stationary installations in total). The analysed installations employed around 69 000 people in 2018 (~1.4% of all employed persons in Sweden).

Combustion installations accounted for 83% of the stationary EU ETS installations in Sweden, most such installations operating in the sector of electricity, gas, steam and air conditioning supply. Among the rest of the stationary EU ETS installations, the largest share was made up of installations manufacturing paper and pulp. For more details, please see the table and maps below.

Table 1. Top economic activities by the number of the EU ETS stationary installations in Sweden in 2018

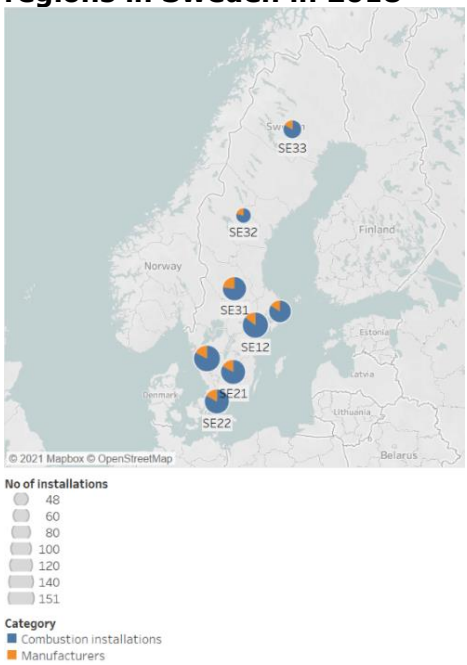
Category	No of installations	% of installations	Median no of employees	Average no of employees	Total no of employees
Combustion installations					
Combustion installations in electricity, gas, steam and air conditioning supply	416	45.9%	10	13	5 332
Combustion installations in electricity production and distribution	158	17.4%	21	145	22 854
Combustion installations in water supply; sewerage, waste management and remediation activities	76	8.4%	23	36	2 768
Manufacturers					
Manufacture of paper and pulp	48	5.3%	187	270	11 343
Manufacture of iron or steel	14	1.5%	146	239	3 344
Production of lime, or calcination of dolomite/magnesite	9	1.0%	21	38	341
	...	...	...	...	...
GRAND TOTAL (All analysed stationary installations)	**906**	**100.0%**	**16**	**78**	**69 061**

Map 1. Number of EU ETS stationary installations in NUTS 2 regions in Sweden in 2018



Source: PPMI.

Map 2. EU ETS installations by activity type in NUTS 2 regions in Sweden in 2018



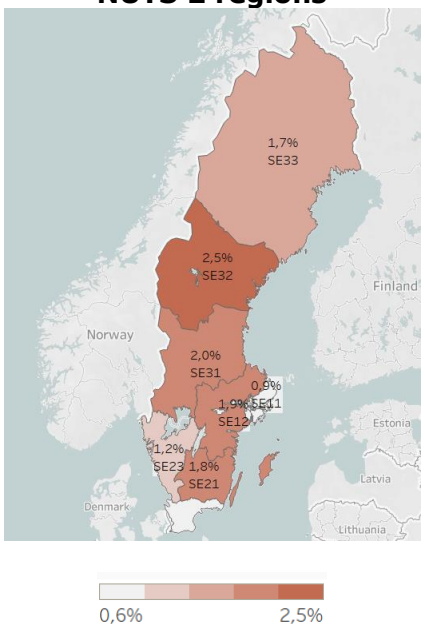
Tables and maps below present key parameters regarding the employment impact of the analysed EU ETS installations per NUTS 2 and NUTS 3 regions in Sweden.

Table 2. Estimated EU ETS employment share (%) in the number of total employed persons in Sweden 2018

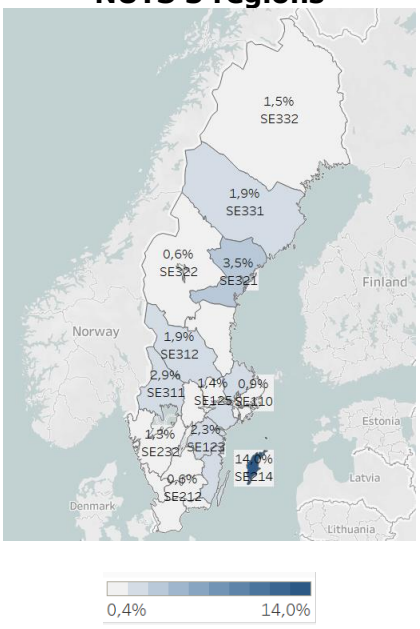
	NUTS 2		NUTS 3	
	Sweden	EU-27	**Sweden**	EU-27
Number of regions covered	**8**	233	**21**	1 081
Number of installations included	**906**	11 575	**906**	11 575
Average (arithmetic) estimated employment share per region	**1.6%**	1.1%	**2.1%**	1.3%
Maximum estimated employment share per region	**2.5%**	4.1%	**14.0%**	14%
Median estimated employment share per region	**1.8%**	0.9%	**1.4%**	0.9%

Maps 3-4. Estimated EU ETS employment share (%) in the total number of employed persons in Sweden in 2018

NUTS 2 regions



NUTS 3 regions



Source: PPMI.

Table 3. Top 3 NUTS 2 and NUTS 3 regions by estimated employment impact of EU ETS stationary installations in Sweden in 2018

	Code	Region	Estimated employment impact of EU ETS installations	Estimated no of employees at EU ETS installations	No of employed people in the region (Eurostat data)	Population in the region (Eurostat data)
NUTS 2 regions						
1.	SE32	Mellersta Norrland	2.5%	4 396	178 000	375 774
2.	SE31	Norra Mellansverige	2.0%	7 795	382 000	852 201
3.	SE12	Östra Mellansverige	1.9%	15 335	794 000	1 687 810
NUTS 3 regions						
1.	SE214	Gotlands län	14.0%	4 339	31 000	58 595
2.	SE321	Västernorrlands län	3.5%	4 027	116 000	245 968
3.	SE122	Södermanlands län	3.1%	3 719	121 000	291 341

Among the analysed stationary installations, which are currently active and for which data on verified emissions are available, the following three emitted the highest amount of GHG in Sweden in 2018: 1) Luleå KVV (*account holder* – Lulekraft AB; *activity* – combustion of fuels in steam and air conditioning supply), 2) Slitefabriken (Cementa AB; production of cement clinker), 3) SSAB Oxelösund (SSAB EMEA AB; production of pig iron or steel). The study estimated that Luleå KVV employed up to 50 people in 2018 while the other two installations fell into the range of 100-500 according to the number of employees.

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