

SMALL INSTALLATIONS WITHIN THE EU EMISSIONS TRADING SCHEME

Report under the project
“Review of EU Emissions Trading Scheme”



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INTRODUCTION

The EU Emissions Trading Scheme (EU ETS) was launched in January 2005. It is the largest cap-and-trade scheme in the world and the core instrument for Kyoto compliance in the EU. This first environmental market established in the EU involves thousands of operators who have obligations for limiting the carbon dioxide emissions from their plants. In an average week more than 10 million allowances are traded, resulting in a market worth several billion Euro already in the first year of operation.

Article 30 of the Directive implementing the EU ETS requires the Commission to review the application of the EU Emissions Trading Scheme and report to the European Parliament and to the Council. The report may be accompanied by proposals for amendments to the scheme.

The European Commission's DG Environment appointed McKinsey & Company and Ecofys to support it in developing the review. Amongst other things, they were asked to develop an understanding of the impact of the scheme on the competitive position of participants and to analyse possibilities for the design of the scheme after the second trading period.

Their work deals with a number of the issues listed in Article 30 as ones that should be addressed in the Commission's report, as well as other relevant issues. Each report discusses approaches taken in the first phase and important lessons learnt. The analyses focus on the post-2012 design. For each design element, future options are investigated. This involves discussion of the advantages and disadvantages of design options, harmonization opportunities, and impact on competitiveness.

The work conducted in the period June 2005–July 2006 consists of a web survey to consult stakeholders on their views on the EU ETS, as well as extensive topical analyses.

This report reflects the views of McKinsey & Company and of Ecofys and does not constitute official views or policy of the European Commission.

Other reports delivered in the scope of this work are available at http://ec.europa.eu/environment/climat/emission/review_EN.htm.

1. Interpretation

1.1 Background

This report focuses on the role of smaller installations in the EU ETS, specifically the number of installations and the share of emissions represented by these installations.

Section 1 classifies installations participating in the EU ETS in terms of total annual emissions. Based on this classification we analyzed the distribution of emission sources and emissions by installation size/class, member state and sector. The work builds upon earlier work conducted for the Ministry of Economic Affairs in the Netherlands. It should be noted that this work was conducted in autumn 2004 and therewith based on data reported in the initially notified NAPs. Later changes or additions made by the Member States have not been included in this analysis. The results are cross-checked with a brief analysis on the first verified emission data for the year 2005.

Section 2 provides an analysis of changes in the definition of installations coverage. The following options are elaborated:

1. Specifying a minimum threshold for actual emissions, or a threshold for maximum emissions.
2. Altering existing thresholds in terms of production capacity
3. Specifying thresholds for inclusion of installations in terms of actual production levels instead of capacity
4. A combination of capacity threshold and emission threshold
5. Changes in the application of the aggregation clause
6. Introducing a specific and conditional opt-out provision for small installations

The analysis builds upon the Member State responses to a survey conducted by the European Commission on the exclusion of smaller installations.

The authors would like to thank Mausami Dasai and Reid Harvey from the US EPA for their information on the experiences in emissions trading in the United States and their critical review of the reporting on these schemes included in this paper.

This report was written in March 2006 and has been updated in 2007.

2 Classification of installations covered by the EU ETS

This section provides a detailed insight in the distribution of emission sources in the EU Emissions Trading System (EU ETS). First it provides a sectoral analysis based on the lists of installations covered in the first trading period of the EU ETS as were available by early December 2005¹. Second the numbers are cross-checked with the verified emission data as reported by the Commission early June 2006. As the latter data were only made available on an aggregated basis the first set of data is used to draw conclusions at sectoral level.

2.1 Sector database from NAPs-I

A database was developed containing all installations covered in each of the 25 EU Member States and the number of allowances assigned to these installations. Next, allowances were classified by installation size/class, Member State and sector (following Annex-1 of the Directive on the EU ETS). The classification of installation size is based on the total annual emissions in tons of CO₂ per year; dividing the installations in 10 size classes. Table 1 summarizes the amount of emission allowances and number of participants (installations) for each of the installation size categories.

Table 1 Allocated emission allowances (annual, NAP-I) and number of participants.

Size Classification (tCO₂/year)	Number of participants (% of total)	Cumulative number of participants (% of total)	Annual emission allocation (% of total)	Cumulative annual emission allocations (% of total)
< 5,000	14%	14%	0.4%	0.4%
5,000 - 10,000	17%	31%	1%	1%
10,000 - 25,000	26%	57%	4%	5%
25,000 - 50,000	15%	72%	4%	9%
50,000 - 100,000	9%	81%	6%	15%
100,000 - 250,000	8%	89%	10%	25%
250,000,- 500,000	4%	93%	14%	38%
500,000 -, 1,000,000	4%	97%	24%	62%
1,000,000 -	3%	100%	36%	98%

¹ For the analysis we used the official versions of the initially notified NAPs as made available on the Commission website http://europa.eu.int/comm/environment/climat/emission_plans.htm

Size Classification (tCO ₂ /year)	Number of participants (% of total)	Cumulative number of participants (% of total)	Annual emission allocation (% of total)	Cumulative annual emission allocations (% of total)
5,000,000				
> 5,000,000	0.0% ¹⁾	100%	2%	100%
Total	100%	100%	100%	100%

1) The corresponding amount of installations registered in this data set equals 57, of which the majority in the energy sector. Note again that the data set was completed with data from draft NAPs so therefore not representing all ETS installations.

Figures 1 and 2 graphically present the cumulative number of allocations per installation size class and the cumulative number of installations per size class. The shape of these figures clearly illustrates that the majority of installations in the EU-ETS is of small/medium size (< 500,000 ton CO₂ per year) while the majority of emissions is in the smaller amount of larger installations (> 500,000 ton CO₂ per year).

Figure 3 compares the share of installations per size class in the total amount of installations with the corresponding CO₂ allowances allocated to these installations. The figure shows that a small number of larger size installations have received the majority of emissions allowances allocated. Approximately 11% of the installations have received 75% of the total emission allowances allocated within the EU ETS. The most remarkable size class is that of the installations with annual emissions between 1 and 5 million ton CO₂ where 3% of the total number of installations covered in the EU ETS represent 36% of the total emissions covered by the EU ETS. On the other hand, a large number of small emission sources exist that constitute a large part of the number of participants. Sources emitting less than 50,000 tons CO₂/year represent over 70% of the participants.

Figure 4 depicts the distribution of the emission allocations over the various sectors distinguished in Annex-1 of the ETS Directive. Individual graphs per sector are included in the Annex. We conclude the following:

- Cross sector: in the smaller size classes a large number of installations are combustion plants (especially small installations in the food industry, paper industry and district heating boilers), ceramics and (especially) glass production facilities. In the larger size class most installations are power plants, refineries, cement and integrated iron and steel plants.

- Combustion installations: a total of nearly 90% of the installations covered by the scheme is responsible for only 13% of the emissions covered. 70% of the emissions covered stem from only 4.5% of the installations covered.
 - Mineral oil refineries: very little installations exist in the smaller size classes and the share of emissions covered by these smaller size classes is even lower. Nearly 24% of the installations covered by the scheme together cover only 1% of the emissions covered.
 - Coke ovens: over 70% of the installations covered together are responsible for only 17% of the emissions covered.
 - Metal ore: over 70% of the installations covered together are responsible for only 16% of the emissions covered.
 - Pig iron and steel: 90% of the installations covered together are responsible for only 15% of the emissions covered.
 - In comparison to the sectors mentioned above, the emission curves for the sectors cement, glass, ceramics, pulp, paper and board are much more evenly spread among size classes. Note for these sectors:
 - Cement: 40% of the installations covered together are responsible for only 4% of the emissions covered. The 10% largest installations are responsible for 40% of the emissions covered
 - Glass, ceramics, pulp, paper and board: The number of smaller installations in this sector is relatively large. Over 50% of the installations covered emit less than 50,000 ton CO₂ per year.
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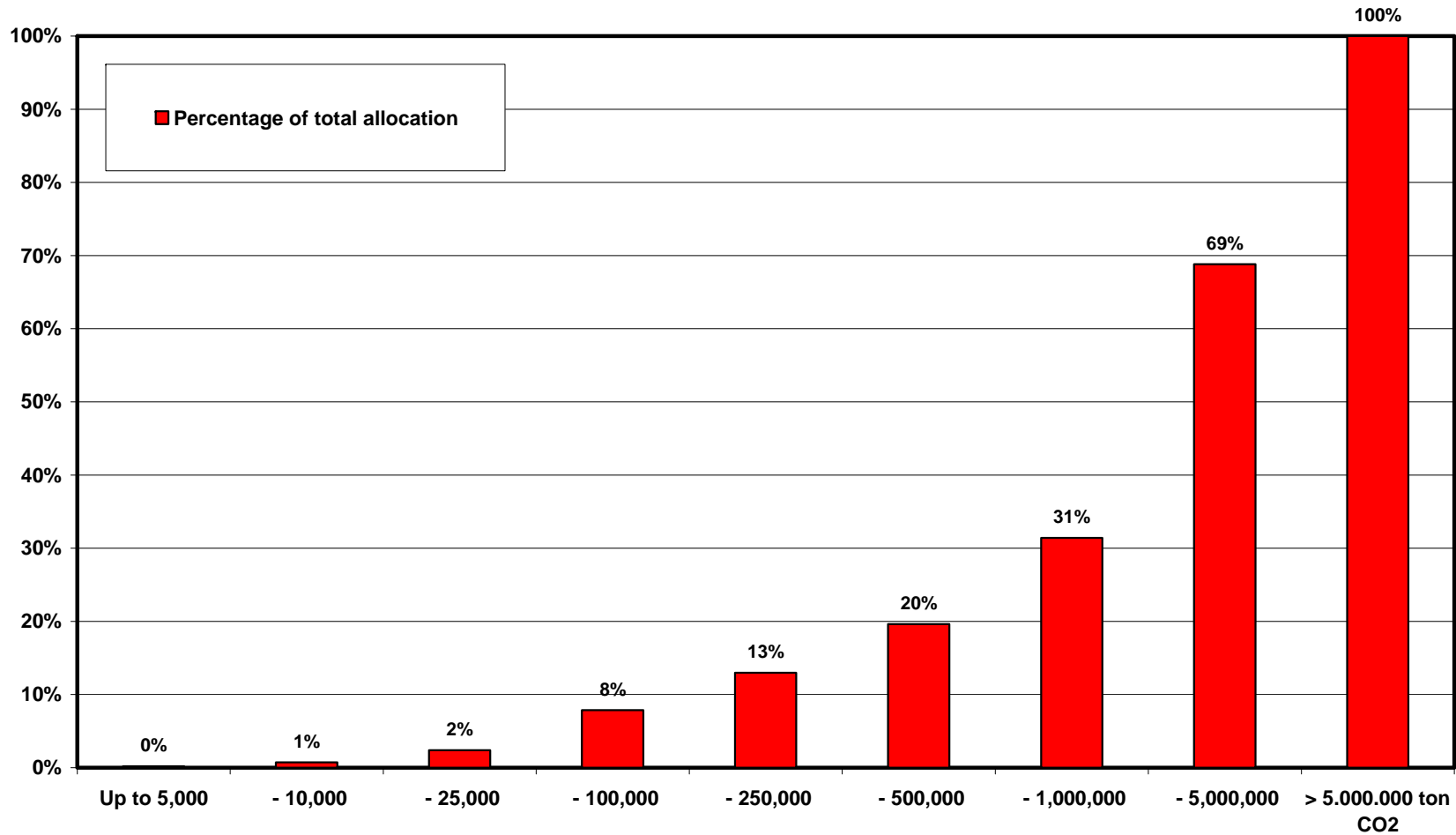


Figure 1 Cumulative amount of allocations per installation size class. Source of data: initially notified NAPsI as made available on the Commission website

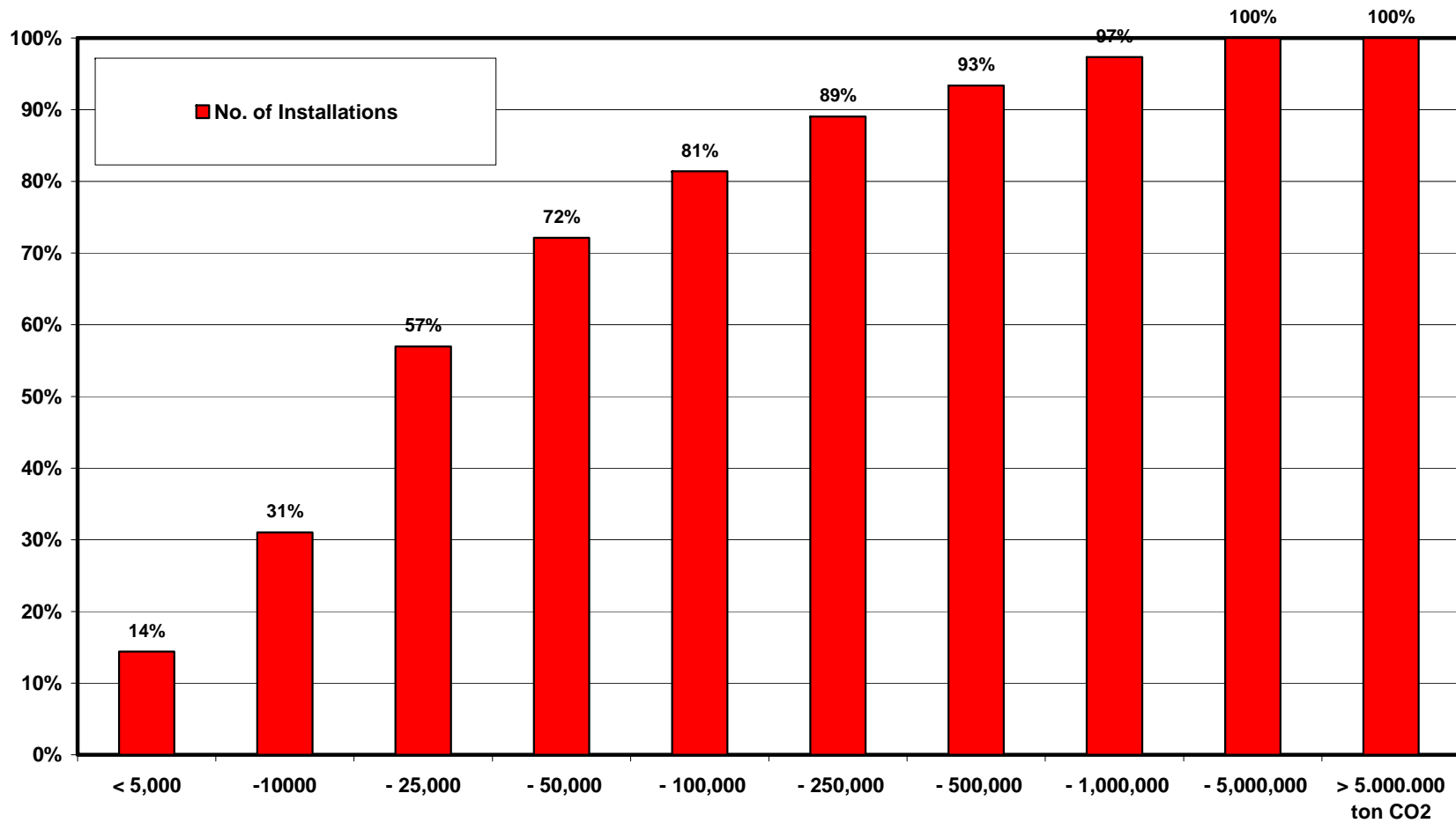


Figure 2 Cumulative amount of installations per installation size class. Source of data: initially notified NAPSI as made available on the Commission website

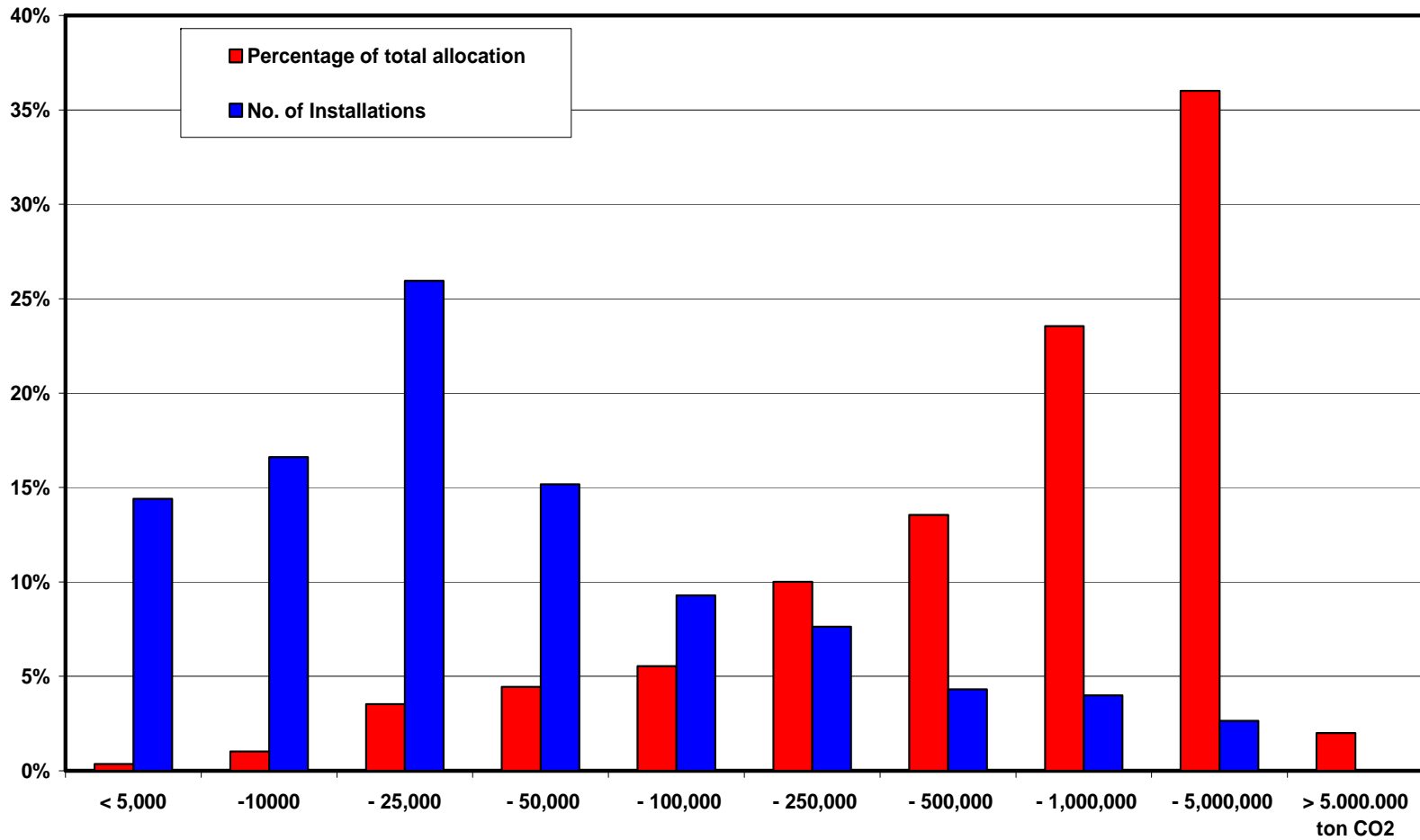


Figure 3 Number of installations and corresponding allocations per installation size class. Source of data: initially notified NAPSI as made available on the Commission website

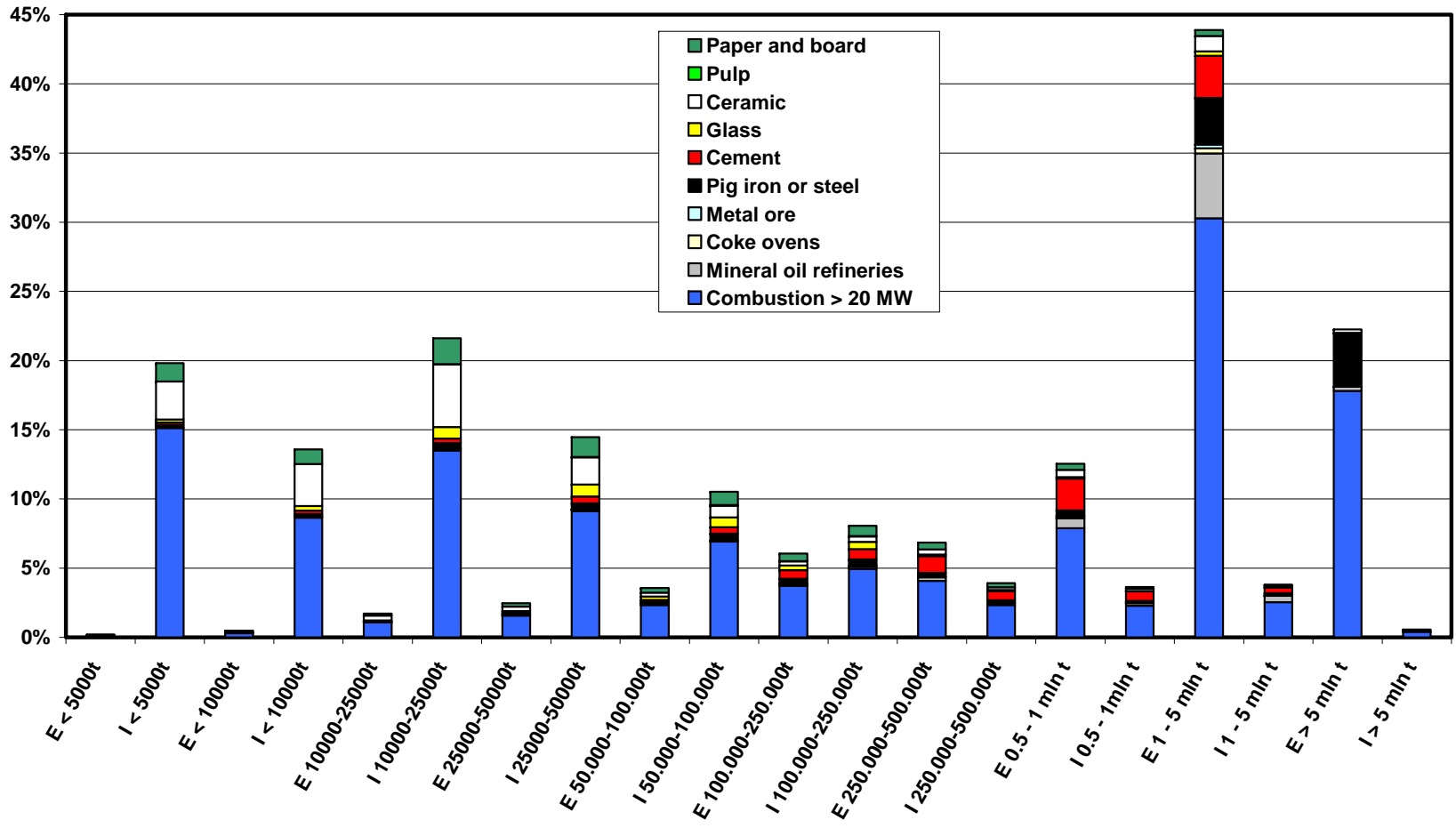


Figure 4 Classification of installations to sectors and size of installations, with E indicating total emissions in tons of CO₂ and I indicating the number of installations in that emission range. Source of data: initially notified NAPSI as made available on the Commission website

2.2 Cross-check with verified emissions

The analysis presented in the previous section was conducted on the basis of the initially notified versions of the NAPs. In May 2006 the first verified emissions data became available that showed the actual amount of emissions from the installations covered by the EU ETS. Using the same classification of installations we cross-check the division among installation size classes with these verified emissions for the year 2005. Note that the data on verified emissions contains emission data from 21 out of 25 Member States.

Figure 5 depicts the number of installations and the corresponding verified emissions for each of the installation size classes. Both are presented as a share of the total amount covered by the EU ETS. Compared to the data used for the analysis in the previous section the following is noted:

- The number of installations included in the first size class is significantly larger compared to the database based on the initially notified NAPs. This can be explained by the fact that some Member States altered the definition of combustion installations covered by the scheme. This for instance resulted in the addition of approximately 700 smaller combustion installations in France.
 - Nearly a quarter of the total amount of installations covered in the scheme together is responsible for only 0.2% of actual emissions covered by the scheme.
 - The number of large emitters – emitting more than 5 million ton CO₂ annually – is significantly higher than the numbers provided in the analysis reported in the previous section. This can be explained by the fact that the latter analysis was based on the initially notified NAPs and the fact that some Member States in a later stage added or altered their list of installations. This for instance excluded a large part of the larger emitters in Germany, which together represent the majority of the group of larger emitters.
 - Based on the verified data less than 1% of the installations covered by the EU ETS have together emitted more than 30% of the total verified emissions.
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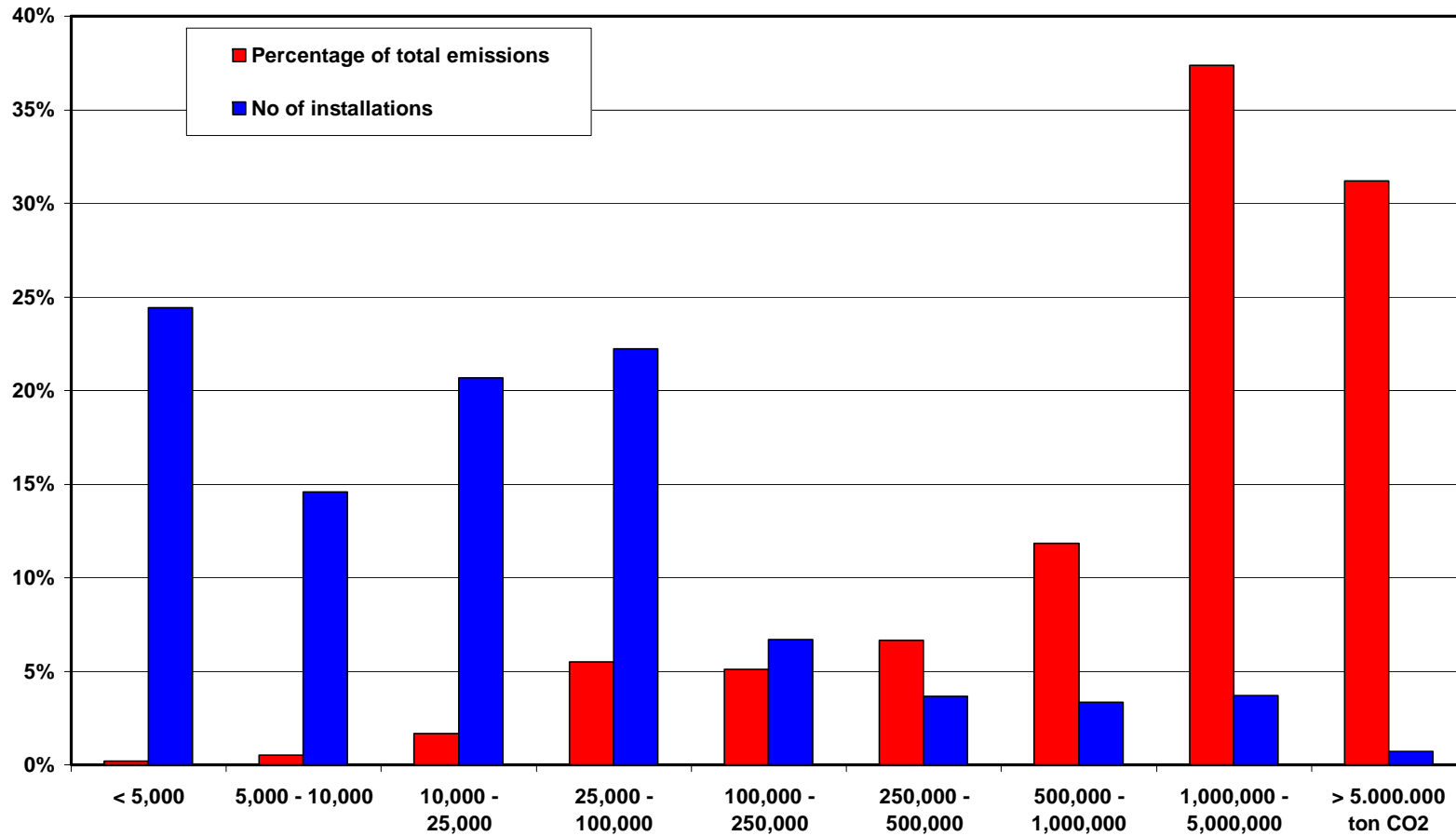


Figure 5 Number of installations and corresponding verified CO2 emissions per installation size class. Overview based on verified emission data for the year 2005.

2.3 Comparison with US trading schemes

The US since many years operates some well-known emission trading programs under its Clean Air Market Programs. The 1990 Clean Air Act set a goal of further reducing Sulfur Dioxide (SO₂) emissions. Under the so-called Acid Rain Program (ARP) a sulfur dioxide allowance trading Program was started in 1995 with the first phase running until 1999 and included an initial group of larger, higher emitting electricity generating units². In Phase II, which began in the year 2000, the group of affected sources was extended to include virtually all units over 25 MW in generating capacity. The NO_x Budget Trading Program (NBP) is a cap and trade program to reduce emissions of nitrogen oxides (NO_x) from power plants and other large combustion sources in the eastern United States. This program started operation in the year 2003. The NBP was preceded by the Ozone Transport Commission NO_x Budget Program that has been in operation from 1999 to 2002.³

In the year 2005 in total 2581 units were monitored under the NBP and 3464 units are monitored under ARP. Note that a considerable amount of units are monitored under both program; the total amount of operating units reporting is equal to 4513 units. Tables 2 and 3 provide an overview of the emission distribution according to size class of the units reporting under both programs. It is noted that 25% of total units cover 95% of total NO_x mass under the NBP. In other words, the smaller units that cover 75% of total units only cover 5% of total NO_x mass covered under the NBP.

Table 2 Emission distribution of units reporting NO_x Mass under the NBP (2005)

NO_x Mass Distribution	NO_x Mass (metric tons)	% NO_x Mass	Units	% of Total Units
Top Units contributing to 95% of Total NO _x Mass	1,623,211	95%	652	25%
Units which make up top 90% of Total NO _x Mass	1,537,522	90%	507	20%
Units which make up top 50% of Total NO _x Mass	855,210	50%	135	5%
Units which make up top 20% of Total NO _x Mass	339,702	20%	33	1%

² Phase I began in 1995 and affected 263 units at 110 mostly coal-burning electric utility plants located in 21 eastern and midwestern states. See <http://www.epa.gov/airmarkets/progsregs/arp/basic.html>.

³ Source: <http://www.epa.gov/airmarkets>

Table 2 Emission distribution of units reporting SO₂ Mass under the ARP (2005)

SO₂ Mass Distribution	SO₂ Mass (metric tons)	% SO₂ Mass	Units	% Units
Units which make up top 86% of Total SO ₂ Mass	8,811,492	86%	789	23%
Units which make up top 82% of Total SO ₂ Mass	8,347,840	82%	643	19%
Units which make up top 45% of Total SO ₂ Mass	4,643,199	45%	173	5%
Units which make up top 20% of Total SO ₂ Mass	2,046,678	20%	40	1%
Units which make up top 9% of Total SO ₂ Mass	911,732	9%	16	0%

Based on these reported data the following is noted:

The remaining 5% of NO_x Mass in the NBP originate from 74% of the units (1929 out of 2581 units). The remaining 14% of SO₂ Mass in the ARP originate from 77% of the units.

3 Options to enable the removal of smaller installations from the scheme

One of the issues discussed in the future design of the EUETS is whether the thresholds for inclusion of installations should be reformulated, specifically to remove smaller installations from the scheme.

3.1 Considerations for removal or continued participation

The main reasoning for this removal is that for smaller installations or for installations operating only on a seasonal basis or a stand-by or back-up capacity, the costs of participation in the EU ETS would outweigh the benefits of being covered by the scheme. A wide range of estimates exist on the costs of EU ETS participation by smaller installations, but very little accurate data is available. A survey by the Commission among Member States revealed that most countries did not have much detailed information on the costs of participation or did not regard it as useful to provide average cost data as the range of these costs among installations would be too large to be able to report meaningful data. From the countries that did report on the estimated costs of EU ETS participation for smaller installations the most notable are reported in Table 1 below.

Table 1 Overview of costs reported for EU ETS participation for smaller installations (source: EC survey among Member States, 2005)

Country	Costs reported
Germany	12.500 to more than 20.000 €/a per installation
Netherlands	Total one-off costs per installation ranging from 1700 to 3800 € and total recurring costs per installation ranging from 8700 to 21500 €/yr, depending on the complexity of the work.
Denmark	Total recurring costs of at least 4300 – 7000 € per installation covering costs of registration with the administration, monitoring, verification etc, depending on complexity of the installation.
Sweden	Total recurring costs of 2100 – 5000 € per installation in phase I and 1400 – 2600 € per installation in phase II.
United Kingdom	Total administrative costs €3675 - €4415 per year.

The issue of undue participation costs for smaller installations was recognized by the Commission in the so-called NAP2 guidance⁴, whereas it was specified that special attention would be paid to realising the potentials for cost savings in the ongoing review of the monitoring and reporting guidelines. In the review exemptions have been specified from monitoring and reporting requirements for small installations with average emissions of less than 25,000 tons of CO₂-equivalents per year during the previous trading period. These exemptions among others concern reducing the frequency for site visits in the verification audit, proof of compliance with the requirements regarding calibration, requirements against accreditation and the right to choose lower tier approaches for source streams.

Having said this, it must also be recognized that participation in the EU ETS also provides specific benefits to smaller companies; benefits that would not be provided by other climate policies that require similar CO₂ reductions. One of the main prospective benefits is that companies can sell their allowances upon issuance in the registry and use the revenues to obtain cheap finance. Obviously the companies still need to cover their actual emissions by the corresponding number of allowances. These allowances are then bought on the allowance market at a time closer to the surrender date. This cheap financing mechanism is clearly a benefit for a small installation being part of the ETS. Obviously there is a price risk attached to this as the price of allowances may rise during the period and companies therewith have to pay a higher price for their allowances than the price for which they earlier sold their allowances. This risk can however be eliminated if allowances are bought back by means of a forward contract.

In the U.S. Acid Rain Program, lower-emitting and/or smaller units were included in the second phase (footnote 1) of the trading program. Any time new sources are added to a program, additional resources are required to provide assistance to the sources as they set up their emissions monitoring and reporting systems. While the learning curve was steep, few penalties resulted from monitoring and reporting errors.

The NO_x Budget Trading Program included some industrial sources in addition to electric utilities; some states are continuing to include these sources under the new Clean Air Interstate Rule trading program (footnote 2), while others are not. Monitoring of industrial sources presents some technical challenges initially, but the resulting emissions data are of high quality and can be used with confidence in a trading program. Most of the sources included in the CAIR program are already

⁴ Communication from the Commission "Further guidance on the allocation plans for the 2008 to 2012 trading period of the EU emission trading scheme", COM (2005) 703 final, 22 December 2005.

participating in the Acid Rain or NOx Budget Trading Programs, so the additional cost for this program is minimal.

In the young and dynamic carbon market various intermediary carbon services have already been set up to assist market parties in their new role as EU ETS participant. This ranges from legal and accountancy services to full carbon compliance services and from aggregation services – combining market bids to larger packages to be able to negotiate better deals – to active portfolio management. For SME's outsourcing carbon management activities at the moment seems an attractive option, in many instances obviously driven by the lack of knowledge on this relatively young market. However, more advanced services are already being offered such as a toolkit oriented approach to chains of SME's. One notable example is the bespoke approach developed by the UK Carbon Trust to the delivery of carbon management services in smaller industries and institutional environments.

3.2 Options for removal of smaller installations

With respect to reformulation of thresholds several options would exist, including:

1. Specifying a minimum threshold for actual emissions, for instance including only installations that emit more than a fixed amount of tons CO₂/year, or a threshold for maximum emissions.
2. Altering existing thresholds in terms of production capacity
3. Specifying thresholds for inclusion of installations in terms of actual production levels instead of capacity
4. A combination of capacity threshold and emission threshold
5. Introducing a specific and conditional opt-out provision for small installations
6. Changes in the application of the aggregation clause

The above is a selection of options to remove specific types of installations. Other options have been discussed. Two options are specifically not elaborated in this paper as they have been taken up by the Commission separately:

- Further elaboration on the definition of combustion installations required to be included in the scheme;
 - Reducing the monitoring, reporting and verification requirements for smaller installations.
-

3.3 Inclusion of a minimum threshold for annual emissions or a threshold for maximum emissions

To address the situation of the smaller installations, it has been suggested that a minimum threshold in terms of annual emissions be defined to decide what installations should be included in the scheme. Alternatively a maximum emission threshold would be defined on the basis of potential emissions from the installation. This can be calculated from the rated thermal input specified in the permit and the maximum plant utilization.

Shifting the emissions threshold to a minimum emission of 10,000 tons CO₂/year would reduce the number of participants in the EU by 33% (or about 3400 participants less) and reduce the emissions included in the ETS by less than 1%. A shift to a threshold level of 25,000 tons CO₂/year will reduce the total number of participants dramatically (-55%), while reducing the included emissions by 2.4%. A shift to 50,000 tCO₂/year would reduce the number of participants by 70% and included emissions by 5% and a shift to 100,000 tCO₂/year would reduce the number of participants by 80% and included emissions by 8.5%.

A few countries have a large share of small installations in the NAP: Denmark, Finland, Latvia, and Sweden. Note that the three latter MS have unilaterally opted in many or most of these smaller installations. The small installations are mainly found in:

< 10,000 tCO ₂ :	Denmark, Finland, Germany, Italy, Sweden, United Kingdom
< 25,000 tCO ₂ :	Cyprus, Czech Republic, Denmark, Finland, Germany, Italy, Poland, Spain, Sweden, United Kingdom

Obviously an advantage of specifying a minimum threshold in terms of emissions is that it would address the issue of seasonal operation of installations. The threshold could be defined as the average emissions in the previous trading period⁵. Note that the decision on the specification of the threshold as well as the choice of reference year (or period) would be needed to be part of the policy design. Moreover the threshold is fairly simple to communicate and calculate. This option is particularly attractive to be used in fairly heterogeneous sectors, where production characteristics vary widely across installations, such as the ceramics industry.

Implementation of this option would most likely require the operator to proof each year that his installation complies with the threshold and therewith may be excluded from the scheme in that specific year. This in itself induces recurring costs for the operator; costs that are not incurred by installations participating in the scheme.

⁵ This rule is obviously not applicable for new entrants. For these installations one could determine the amount of installations based on the average emissions of the top-X% of installations in terms of operating hours.

Likewise it brings additional administrative costs for those bodies responsible for monitoring the scheme. Choosing the amount of actual emissions as the threshold would furthermore bring uncertainty for operators at the margin whether they will or will not be part of the scheme (in that specific year) and create gaming incentives for operators. This uncertainty would not exist when choosing capacity thresholds and is of a lesser extent when opting for production thresholds.

3.4 Altering existing thresholds in terms of production capacity

Several Member States have suggested using a de minimis approach of excluding units below a certain capacity threshold from the EU ETS. Altering existing thresholds specified in Annex I of the Directive is clearly one of the more simple approaches to exempting smaller installations from the scheme and it would surely affect the total number of installations as well as emissions in the EU ETS. One of the main advantages is that it requires no additional efforts to proofing that an installation is or is not covered by the scheme and that the list of ETS participants is known well in advance (as installed production capacities do not change over night).

A drawback of this option is that it would not take away all of the issues that lead to the requests for altering the thresholds, namely that there are a number of installations that operate only on a seasonal basis or as stand-by or back-up capacity.

One specific issue is the treatment of installations that are specifically used as emergency power installations or back-ups. This for instance includes emergency power installations in hospitals and back-up installations in nuclear power plants. In Germany, emergency power generators with less than 50 MWth are exempted; whereas all other stand-by combustion equipment is included in the scheme. In Sweden all stand-by combustion installations over 20 MWth are covered by the scheme. Exclusion of these back-ups could be implemented through a clause in the Directive specifying that installations that are within the permit designated as back-up installations may be excluded from the scheme. Additional thresholds can be specified with respect to the installed capacity or number of actual annual operating hours. These back-up installations would be required to report either their actual emissions or their number of actual operating hours. If these would exceed a pre-specified threshold the operators would be required to surrender the corresponding number of allowances. An evident drawback of this option is that the installations still have to report their emissions and therewith face the costs to monitor and report their operations and have them verified. However, monitoring of operating hours is relatively easier than monitoring of emission reports

3.5 Specifying production thresholds instead of capacity thresholds

Another possibility would be to specify production levels instead of installed capacity. Similar to emission thresholds, the average production levels during the previous trading period would then determine inclusion of installations. Using production levels would better meet concerns with respect to partial or seasonal operation of installations than the use of capacity thresholds. On the other hand, it would increase the uncertainty of companies whose production levels are close to the threshold as to whether they will be covered by the scheme in the next period or not. A system based on production levels would also be more open to manipulation than a system based on capacity thresholds. It would also require companies to reveal more confidential information than in the case of capacity thresholds.

3.6 A combination of capacity threshold and emission threshold

A further possibility is removing smaller installations on the basis of a combination of the present capacity threshold of 20 MWth for combustion plants with an additional threshold of total annual emissions. The additional threshold in this proposal would also apply to the other EU ETS activities, resulting in the exclusion of all installations with annual emissions below x kton CO₂. The main reason for the combination of these two thresholds is that it does result in exclusion of smaller stand-by installations and installations operating at seasonal base while at the same time it does include in the system the relatively large number of installations above 20 MWth that jointly emit large quantities of CO₂. Application of an emissions threshold only would allow these installations to be left out of the scheme the EU-ETS, therewith making the overall scheme less effective.

This option obviously holds similar advantages and disadvantages as addressed above in Section 3.3, but in the combined clause this is relevant for a smaller amount of installations.

3.7 Introducing a specific and conditional opt-out provision for small installations

All the options specified above could be implemented by means of a change in the definitions of Annex I of the Directive. If it was to be decided not to alter this Annex, another option would be to create a specific opt-out provision for smaller installations. Each Member State could then decide whether it wants to exclude its smaller installations from the scheme or not. The clear advantage is that the choice for exclusion and inclusion of installations is both left to the Member States, who can decide upon this option on the basis of specific competitive positions in its market. However, this advantage is also the main drawback of this option as it would regulate certain types of installations in some Member States while in other Member

States similar types of installations are not regulated by the EU ETS (but by other regulation, if this were to be made a condition for the opt-out). This could clearly result in intra-Community competitive distortions.

3.8 Changes in the application of the aggregation clause

Annex I of the Directive contains a so-called aggregation clause which stipulates

Where one operator carries out several activities falling under the same subheading in the same installation or on the same site, the capacities of such activities are added together.

The purpose of this clause is to avoid leakage from the scope of the Directive by means of building individual sources on the same site below the capacity threshold (e.g. 20 MW for combustion units). An example: In the absence of the aggregation clause a heat boiler with 30 MW installed capacity would be covered by the EU ETS, while two separate heat boilers of 15 MW each on a site would fall outside the scope.

Changes to the application of the aggregation clause offer hence also an option to exclude smaller installations.

A range of possibilities exists to change the aggregation clause:

In the Second Guidance document the Commission described the possibilities for not including installations on the basis of this aggregation clause by allowing that a single activity falling simultaneously under several subheadings by Annex I of the Directive, such as "mineral industry", is considered under the more specific sectoral subheading, therewith allowing a significant amount of smaller installations not to be considered under this aggregation clause.

A possibility for changing the aggregation clause is to specify a minimum threshold for the application of the aggregation clause (e.g. 3 MW as in the Commission Guidance). In order to address the concern to build combustion units marginally below 20 MW the clause could be amended to such an extent that only units with more than 10 MW or 12 MW would be counted. Likewise the aggregation clause could also be adapted by specifying production thresholds or emission thresholds instead of or in combination with capacity thresholds. Drawback and advantages of these specifications are similar to the ones described in the sections above.

A further possibility would be to keep the capacity threshold as it stands and to apply the aggregation clause, if aggregated installations sum up to 150 % or 200 % of the capacity threshold. In terms of combustion installations this would imply that any installation above 20 MW is covered by the aggregation clause applies only, if several

units add up to 30 MW or 40 MW. The approach obviously reduces the number of smaller installations included in the scheme. The drawback is that it potentially still requires inclusion of a group of smaller installations that operate only on a seasonal basis.

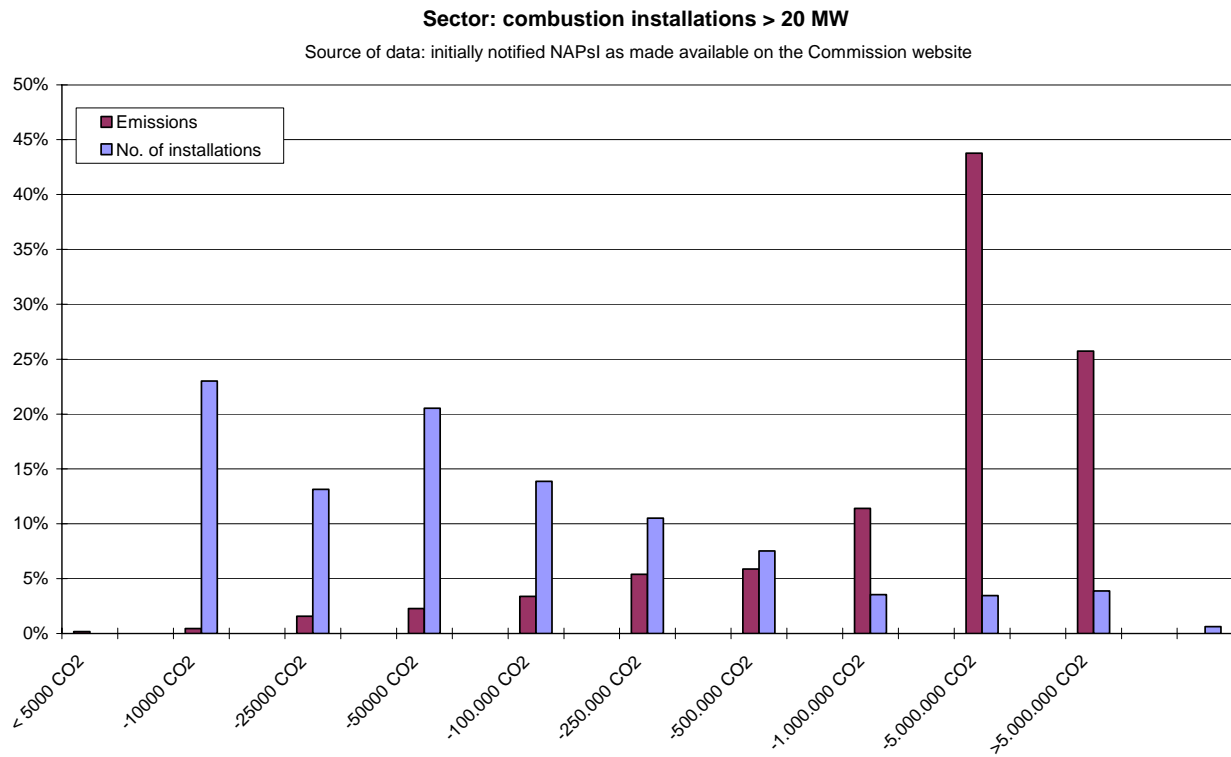
Another option to change the aggregation clause was proposed in the Dutch NAP2 (but disallowed by the Commission for reasons of not being in line with the Directive as it stands) by specifying that an installation is included in the ETS, only if at least one combustion unit has a total capacity of more than 20 MW. If the installation comes under the EU ETS according to this criterion, the other combustion units will also be included in the system.

An obvious drawback of this option is the creation of incentives to built installations with a capacity slightly below the threshold. This for instance occurred in the Dutch promotion schemes for renewable power production where support was limited to a maximum capacity, resulting in a large amount of projects planned just below this capacity limit. The drawback can easily be tackled by combining the clause with a clause on the amount of emissions from these plants as described in Section 3.3. Yet again the drawback of the latter is that additional costs are required to prove that operators have to prove that his installations complies with these emission thresholds, resulting in recurring costs.

A final option would be to delete the aggregation clause.

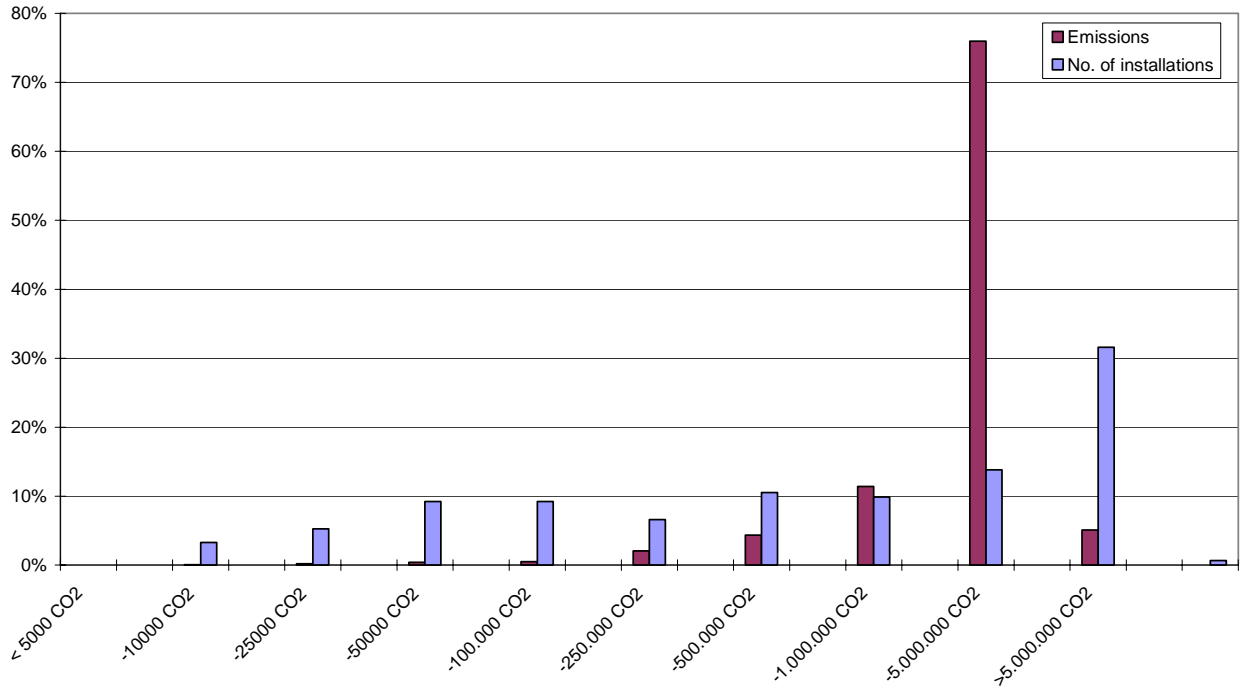
Annex: Sectoral details

This annex provides further sectoral details on the share of installations included in each size class and the corresponding share of emissions covered by that size class. Calculations are based on the official versions of the initially notified NAPSI as made available on the Commission website. Data have been corrected for obvious mistakes but have not been altered based on verified data. For a comparison of information included in this database and the first verified emission data for the year 2005, see section 2.2.



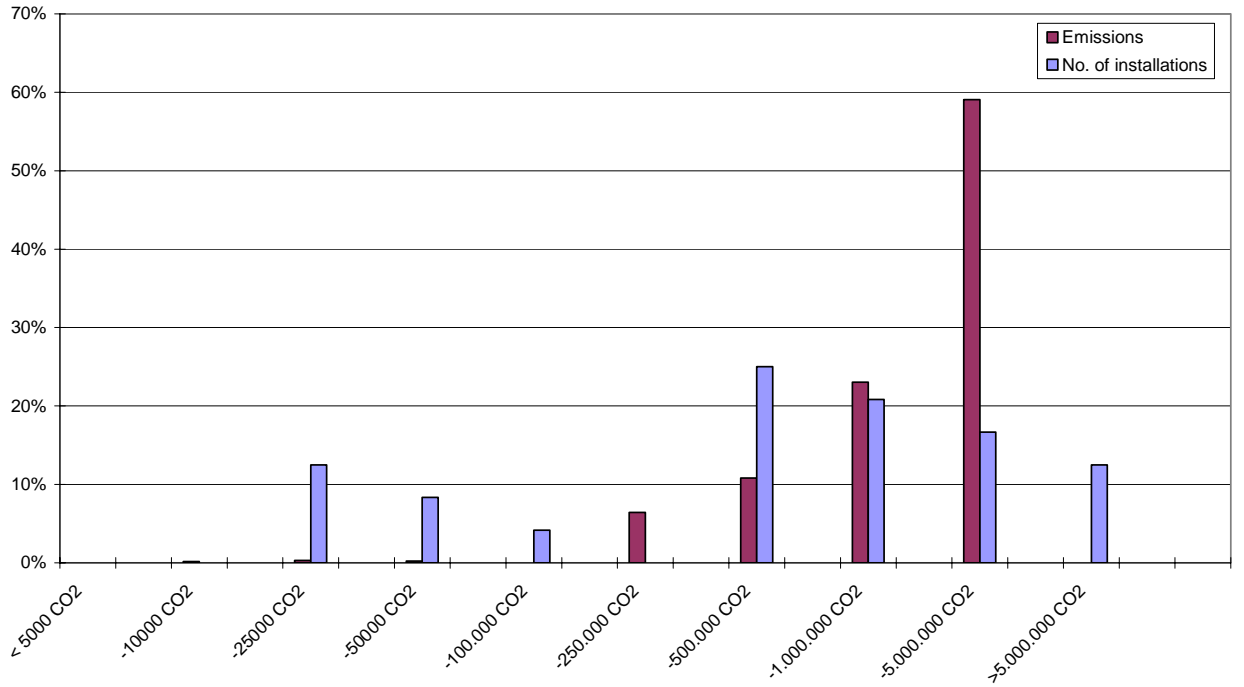
Sector: mineral oil refineries

Source of data: initially notified NAPSI as made available on the Commission website



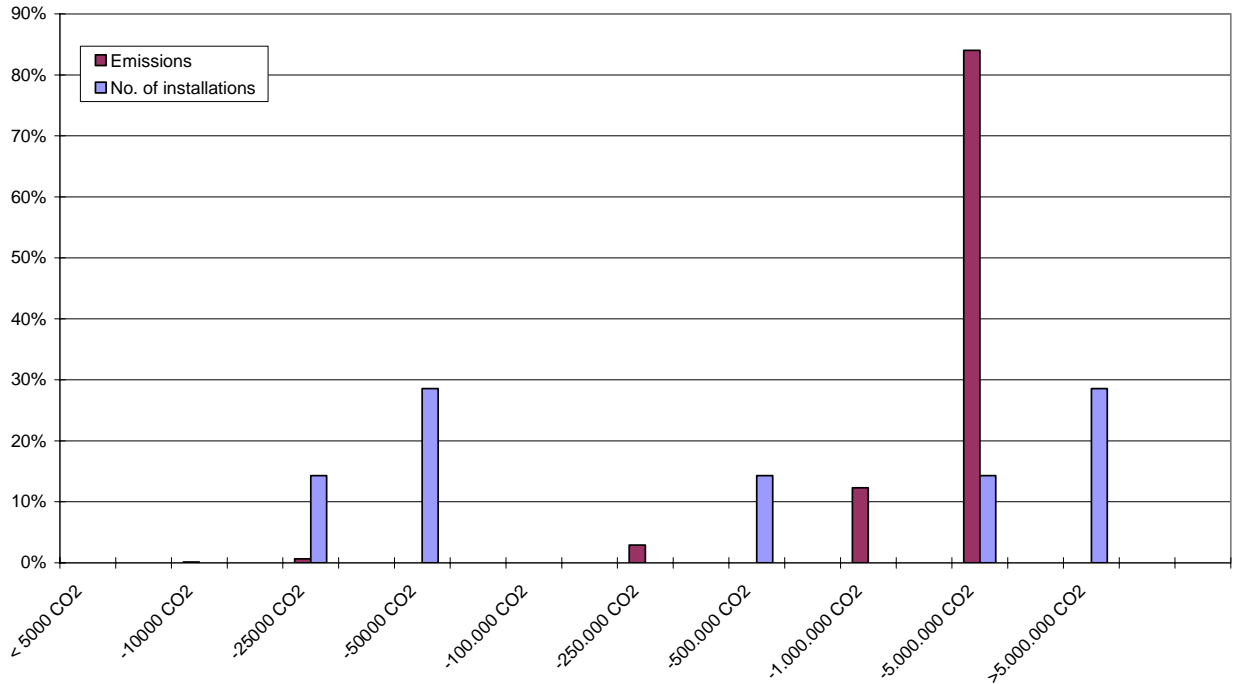
Sector: coke ovens

Source of data: initially notified NAPSI as made available on the Commission website



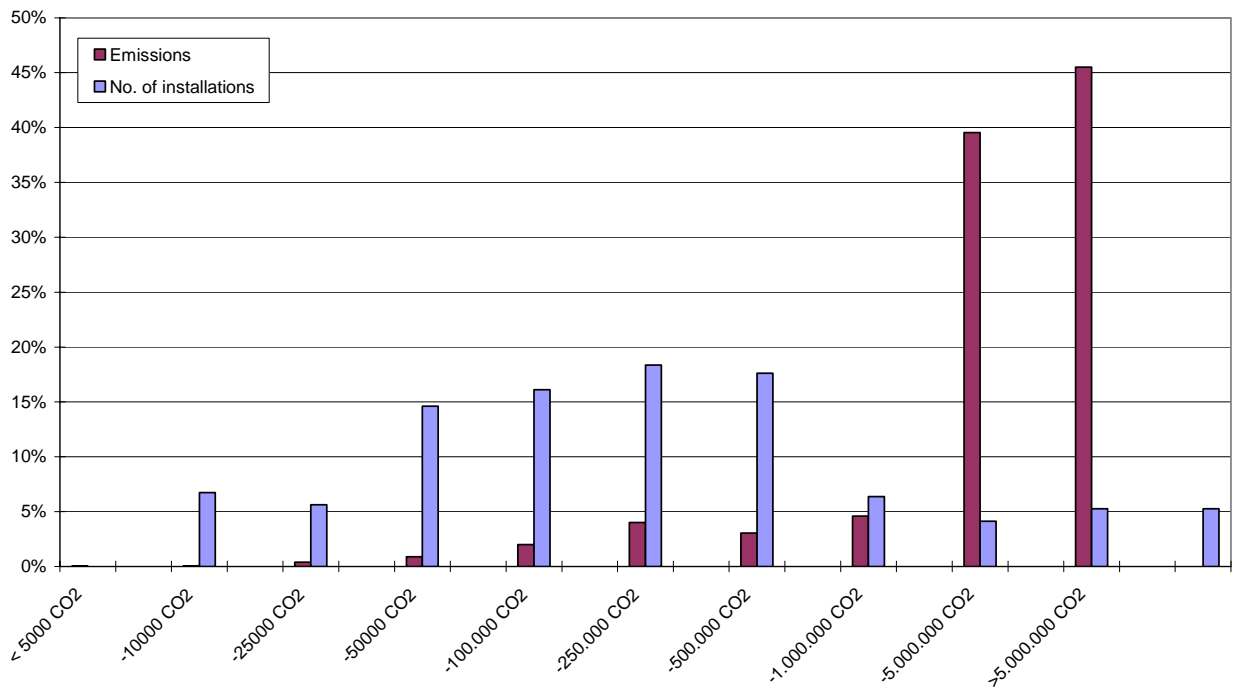
Sector: metal ore

Source of data: initially notified NAPSI as made available on the Commission website



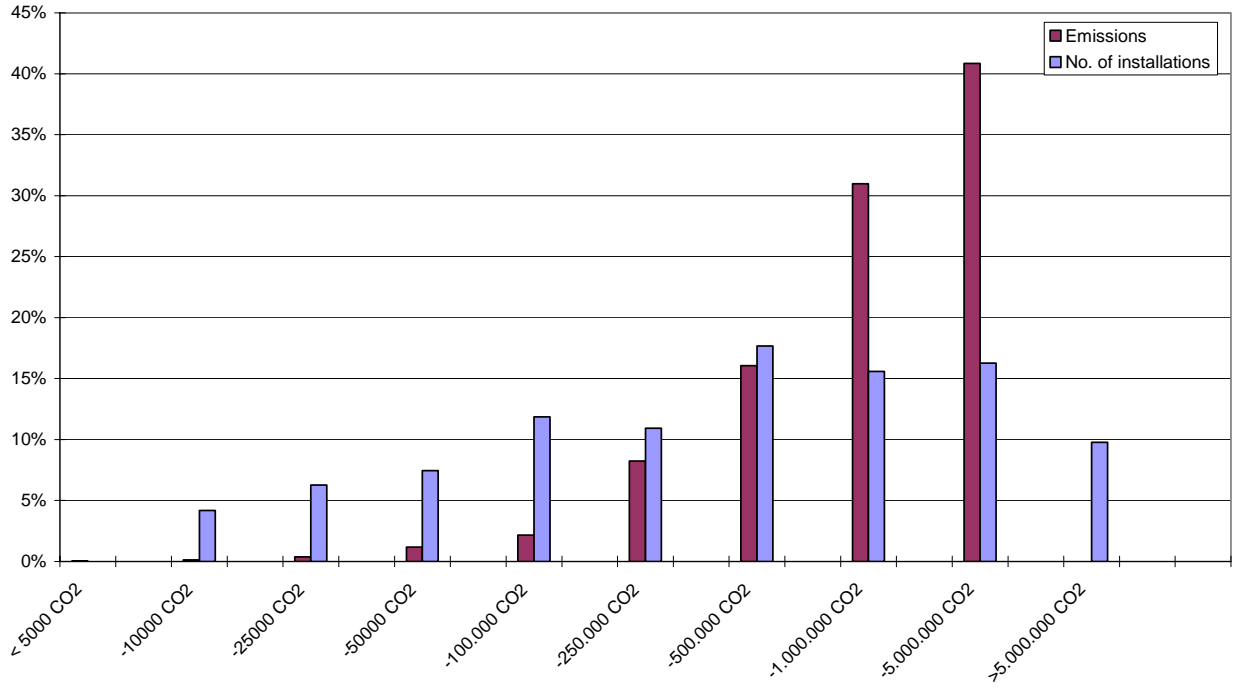
Sector: pig iron and steel

Source of data: initially notified NAPSI as made available on the Commission website



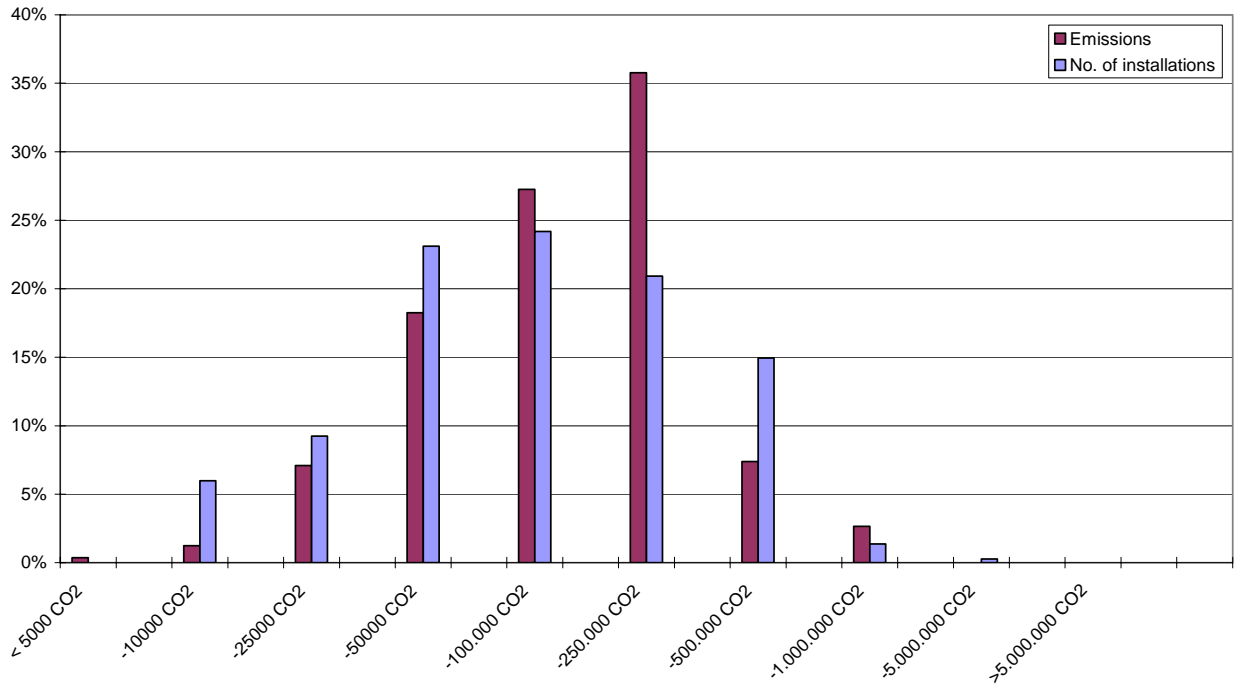
Sector: cement

Source of data: initially notified NAPSI as made available on the Commission website



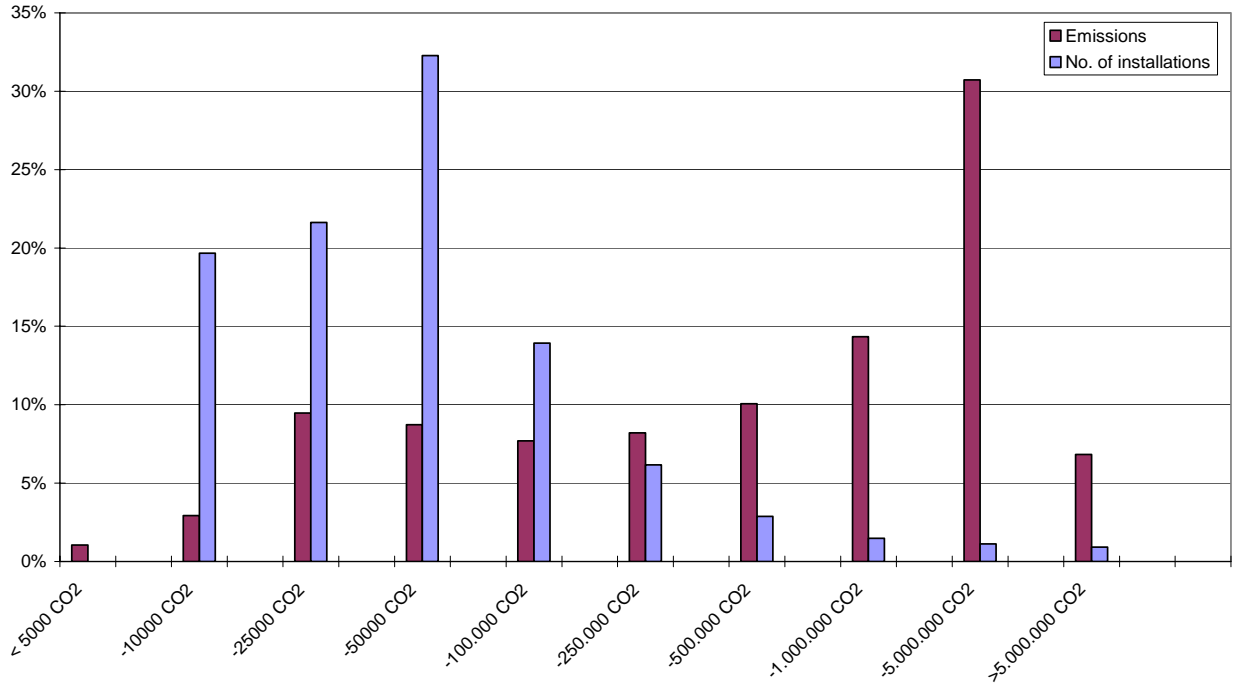
Sector: glass

Source of data: initially notified NAPSI as made available on the Commission website



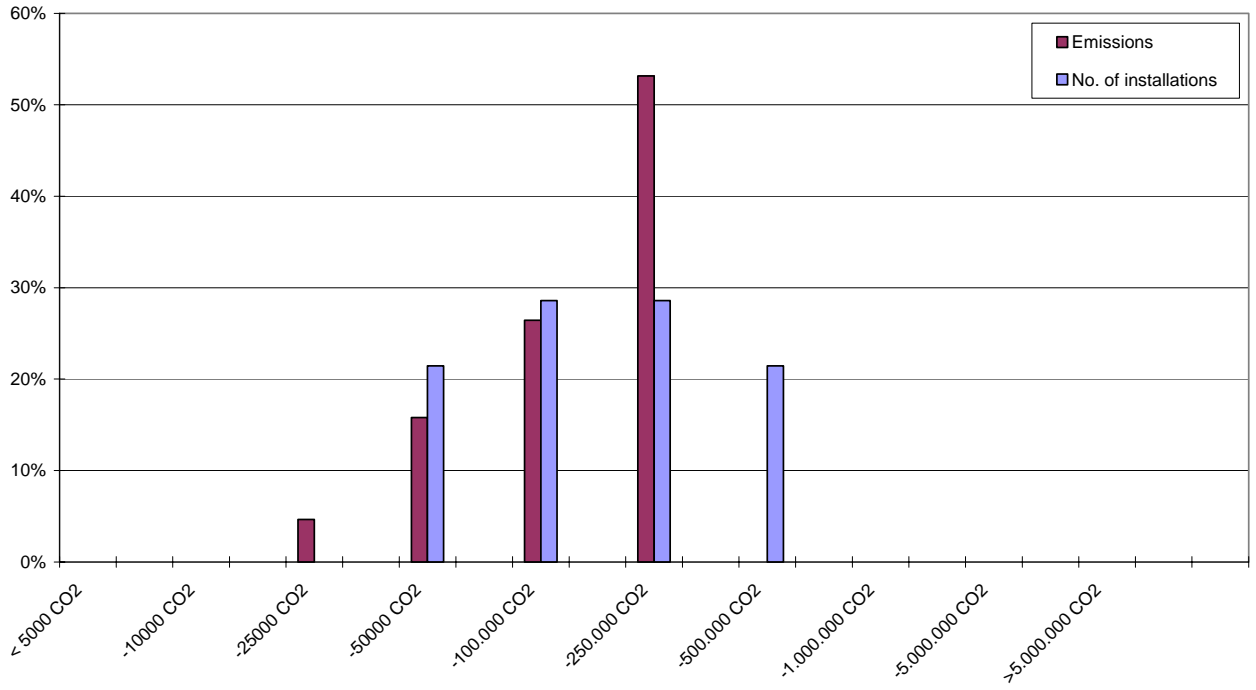
Sector: ceramics

Source of data: initially notified NAPSI as made available on the Commission website



Sector: pulp

Source of data: initially notified NAPSI as made available on the Commission website



Sector: paper and board

Source of data: initially notified NAPSI as made available on the Commission website

