Methodology for the free allocation of emission allowances in the EU ETS post 2012

Sector report for the mineral wool industry

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Disclaimer and acknowledgements

Disclaimer

The views expressed in this study represent only the views of the authors and not those of the European Commission. The focus of this study is on preparing a first blueprint of an allocation methodology for free allocation of emission allowances under the EU Emission Trading Scheme for the period 2013 – 2020 for installations in the mineral wool industry. The report should be read in conjunction with the report on the project approach and general issues. This sector report has been written by Ecofys.

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The authors would like to thank representatives from the mineral wool industry for the in-depth discussions on possible benchmarking options for the mineral wool industry during the execution of the project.

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1 Introduction

The mineral wool sector covers the production of glass wool and stone wool insulating materials, which are essential randomly interlaced masses of fibre with varying lengths and bound by a binder. The main products of the mineral wool sector are low density insulation rolls, medium and high density slabs, loose wool for blowing, and pipe insulation (BREF Glass, 2008).

In order to acquire information and data on the mineral wool sector, Ecofys has been in contact with the European Insulation Manufacturers Association (Eurima). The members of this association together are estimated to account for about 91% of EU27 sector emissions (Eurima, 2009a).

Table 1 provides an overview of the classification of the mineral wool industry in relevant activity classifications. The original Annex I to the Greenhouse Gas Emission Allowance Trading Directive[1] listing activities included in the EU ETS, does not specify mineral wool production: installations producing glass wool are categorized as installations for the manufacture of glass[2] and as combustion installations[3] although the inclusion of stone wool production has not been done uniformly over all Member States. This situation will be changed in the third trading period since the Annex I to the amended Directive[4] lists mineral wool production as a separate category of activities (see Table 1). Due to this change of Annex I, the EU ETS will from 2013 onwards include about 10 stone wool producing installations that were not included before.

In the NACE Rev. 1.1 classification of economic activities, the sector is associated with two four-digit codes.

Table 1 Classification of the mineral wool industry in the categories of activities of the Annex I of the amended Directive and in the NACE Rev. 1.1 classification of economic activities

Annex I category of activities	NACE Rev. 1.1 code	Description (NACE Rev. 1.1)
Manufacture of mineral wool insulation materials using glass, rock or slag with a melting capacity exceeding 20 tonnes per day	26.14	Manufacture of glass fibres
	26.82	Manufacture of other non-metallic mineral products, not elsewhere classified

67 plants account for approximately 88% of production and 91% of emissions in EU27 (Eurima, 2009c). A list of these installations is attached to this report (see appendix A). The

[1] Directive 2003/87/EC
[2] Installations for the manufacture of glass including glass fiber with a melting capacity exceeding 20 t per day
[3] Combustion installations with a rated thermal input exceeding 20 MW (except hazardous or municipal waste)
[4] Directive 2009/29/EC amending Directive 2003/87/EC

installations include at least 87 plants/lines[5]. The distribution of these plants over the Member States is shown in Table 2. The top five MS in terms of production account for half of the plants/lines and over half of production (Eurima, 2009c).

Table 2 Number of mineral wool installations per MS (Eurima, 2009c).

Country	No. of installations	Country	No. of installations
Austria	1	Italy	2
Belgium	1	Lithuania	3
Czech Republic	3	Netherlands	2
Denmark	3	Poland	8
Finland	8	Romania	2
France	6	Slovakia	1
Germany	11	Slovenia	2
Greece	1	Spain	4
Hungary	3	Sweden	5
Ireland	1	United Kingdom	5

The mineral wool sector in the EU mainly consists of five main producers which together account for about 95% of total production (EURIMA, 2009b): Saint-Gobain, Rockwool International, Paroc Group, URSA and Knauf Insulation. There are also several independent manufacturers. The limited number of producers in the sector makes commercial data particularly sensitive.

By weight 70% of production is stone wool with the balance glass wool, although the lower density of the latter means that the finished products account for a similar share of the insulation market (Eurima, 2009c). The largest plant produces 60 times the output of the smallest, and around half of the plants produce below 50 kt / year and half over 50 kt / year (see Table 3)(Eurima, 2009c).

Table 3 Number of plants/lines per bin of production volume. Data is based on 73 plants/lines accounting for approximately 88% of EU production and 91% of emissions (Eurima, 2009c).

Production (kt / year)	No. of plants/lines	Percentage of total
<=25	17	23%
25 - 50	25	34%
50 - 75	11	15%
75 - 100	13	18%
>=100	7	10%
Total	**73**	**100%**

Some plants were not part of phases I and II of the EU ETS and therefore data is not available on the total emissions of the mineral wool sector, but estimates indicate that the total amount of emissions related to this sector are between 2.5 and 3 Mt CO_2. Based on 50 installations, on

[5] Where significant differences were encountered in the product mix or plant configuration, Eurima (2009c) indentified individual production lines.

average in 2008, plants received an allocation 1.18 times their emissions, with a standard deviation of 0.35 (Eurima, 2009c). Eurima indicated that in terms of total production and emissions 2008 is not a representative year because of a downfall in production due to the economic crisis.

2 Production process and GHG emissions

The chemical composition of mineral wool can vary widely. The basic materials for glass wool manufacture include sand, soda ash, dolomite, limestone, sodium sulphate, sodium nitrate, and minerals containing boron and alumina. Traditional stone wool production is made by melting a combination of alumino-silicate rock (usually basalt), blast furnace slag, and limestone or dolomite. In addition, for both glass and stone wool the batch may contain recycled process or product waste. For glass wool, other forms of waste glass (cullet) are also used as feedstock.

Glass wool and stone wool production make use of different proprietary technologies, but both include melting, fiberising and curing according to the following general plant configurations:

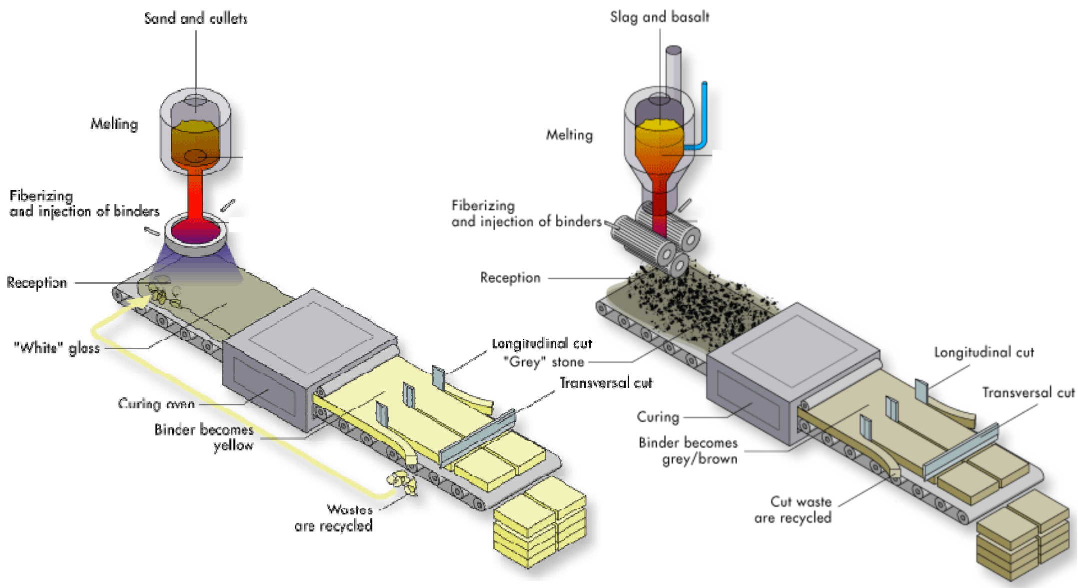

Figure 1 General plant configurations for glass wool production (left) and stone wool production (right)

Mineral wool plants use a mix of technologies and fuels: a total of 11 proprietary fiberising technologies is employed (Eurima, 2009c). Melting technologies and fuels used for melting and curing are considered in Table 4. The table shows that glass wool furnaces are predominately gas fired, but also that a substantial number of furnaces are electrically heated. The melting stage in stone wool production is predominately performed by means of coke/gas melt cupolas.

Table 4 Melting technologies and fuels used for melting and curing for mineral wool production by plants/lines in EU27. Analysed plants/lines account for approximately 88% of production and 91% of emissions (Eurima, 2009c).

Product	Melting Technology	Fuel for melting	Fuel for curing	Nr. Of identified plants/ lines	Nr. of plants/ lines analysed
Glass Wool	Air-gas	Electricity + gas	Gas	1	0
		Gas	Electricity + Gas	1	1
			Gas	6	6
	Air-gas + Boost	Electricity + gas	Gas	1	1
	Electric	Electricity	Electricity + Gas	1	1
			Gas	13	11
	Oxy-gas	Gas	Gas	1	1
	Oxy-gas + Boost	Electricity + gas	Gas	9	8
Stone Wool	Air-gas	Gas	Gas	2	2
	Cupola	Coke + Gas	Electricity + Gas	16	15
			Gas	22	20
		Coke + Oil	Oil	5	4
	Electric	Electricity	Electricity + Gas	1	1
			Gas	1	1
		Electricity + gas	Gas	4	1
Unknown	Unknown	Unknown	Unknown	3	0
Total				**87**	**73**

Mineral wool production is a high temperature energy intensive process. Table 5 shows a breakdown of the total energy consumption in mineral wool production into the main process areas. It should be noted that the characterisation of energy use between melting and fiberising is not always clear. Nevertheless, the energy use during the melting phase of stone wool production in general accounts for a higher percentage of total energy use than in case of glass wool production. When interpreting the figures in Table 5, the reader should keep in mind that due to the use of electricity resulting in indirect emissions, and due to process emissions, there is not necessarily a correlation between energy use and direct CO_2 emissions.

Table 5 Energy use in mineral wool production (BREF Glass-draft, 2008). The figures for fiberising, curing, and other consumption are estimates made by (BREF Glass, 2008-draft), based on discussion with industry and figures from (ETSU, 1992).

	Glass Wool	Stone and Slag Wool
Total energy consumption (GJ/tonne finished product)	9 – 20	7 – 14
Melting (% of total energy	20 – 45	60 – 80[1]
Fiberising (% of total energy)	25 – 35	2 – 10
Curing and drying (% of total energy)	25 – 35	15 – 30
Others (% of total energy)	6 – 10	5 – 10

[1] Energy use in melting phase also includes part of energy needed for fiberising.

The major part of carbon dioxide (CO_2) emissions occurs during melting, both due to fossil fuel combustion and due to decomposition of carbonates in the batch materials (e.g. soda ash, limestone and dolomite) resulting in process emissions. Results of a data collection exercise showed that the average direct emission factors for stone wool and glass wool are 0.74 tCO_2/t-stone wool and 0.57 tCO_2/t-glass wool, respectively (Eurima, 2009c).

The tables below show the full range of CO_2 emissions per tonne of melt from mineral wool plants in the EU and the full range of emissions from downstream operations of mineral wool plants in the EU. The ranges in the tables are taken from reference document on best available technologies (BREF Glass, 2001) and are considered not to be refined enough to come to a proper benchmark.

Table 6 Full range of direct CO_2 emissions from mineral wool melting activities for EU 15 (BREF Glass, 2001)

	Glass Wool			Stone Wool		
	Electric melting	**Flame fired furnaces**	**Combined fossil fuel/electric melting**	**Cupola Furnaces**	**Immersed electric arc furnaces**	**Flame fired furnaces**
CO_2 (kg/tonne melt)	100 - 300	400 - 500	400 - 500	400 - 800	20 - 200	400 - 500

Table 7. Full range of mineral wool line CO_2 emissions (BREF Glass, 2001)

	Combined fiberising forming and curing	Product curing
CO_2 (kg/tonne melt)	40-230	40-230

As is apparent from Table 4, in 16 cases, or 18% of the plants/lines accounting for 13% of output, solely electricity is used for melting, whereas a significant number use some electricity for melting through electric boost (35% of plants/lines) or curing (21% of plants lines). According to the reference document on best available technologies (BREF Glass-draft, 2008), the direct energy consumption for electric melting is in the range 3.0 to 5.5 GJ/t finished product. Overall estimated indirect emissions account for 34% of CO_2 emissions but this rises to 75% in the case of the top 7 plants/lines exhibiting the lowest emission factors which all use electricity for melting as illustrated by Table 8 (Eurima, 2009c).

Table 8 Percentage of indirect emissions with respect to total emissions (direct + indirect) for different fuels used in melting stage. Data is based on 73 plants/lines accounting for approximately 88% of EU production and 91% of emissions (Eurima, 2009c).

Fuel for melting	Percentage of indirect Emissions
Electricity	72%
Electricity + gas	47%
Gas	34%
Coke + Gas	17%
Coke + Oil	15%
Total	34%

3 Benchmark methodology

3.1 Background

Table 9 shows the mineral wool products in the PRODCOM 2007 classification.

Table 9 Mineral wool sector in PRODCOM 2007 classification

Glass Wool	
26.14.12	Voiles, webs, mats, mattresses, boards and other articles of glass fibres, except woven fabrics
23.14.12.10	Glass fibre mats (including of glass wool)
23.14.12.30	Glass fibre voiles (including of glass wool)
…	…
Stone and slag wool	
26.82.16	Non-metallic mineral products n.e.c.
26.82.16.10	Slag wool, rock wool and similar mineral wools and mixtures thereof, in bulk, sheets or rolls
…	…

The most important issue when benchmarking mineral wool products is the difference in electricity intensity due to the use of different types of furnaces. A benchmark based on direct emissions would be set by electricity-based furnaces. Electric melt is employed by the three plants that would set the benchmark for glass wool production, and by three out of four plants that would set the benchmark for stone wool production. Note that in case of stone wool, there are only 3 electric melt plants in EU27 (Eurima, 2009c).

The most efficient production process as defined in terms of total emissions (direct and indirect) is however different. As a consequence, having a benchmark set by electric melt does not result in a fair representation of the overall GHG efficiency of the sector.

3.2 Proposal on how to account for difference in electricity intensity

In order to have the benchmark reflect the most GHG efficient production process, we propose to take the indirect emissions from electricity use[6] into account in the benchmark curve using a uniform emission factor for electricity production and base the benchmark on the total emissions (direct and indirect emissions). This benchmark should not be applied directly, since doing so would result in free allocation for electricity use (and therefore indirectly to energy production) which is inconsistent with our interpretation of Art. 10a (1) of

[6] No verified data on electricity use is available within the framework of the EU ETS.

the amended Directive: "…no free allocation shall be made in respect of any electricity production..." (See section 3.2 of the report on the project approach and general issues).

In order to avoid free allocation for electricity production, we propose to multiply the benchmark based on total emissions with the plant-specific share of direct emissions in the total emissions, when calculating the allocation to an installation. For a further explanation, we refer to Section 6.3 of the report on the project approach and general issues.

The benchmark curve based on total emissions could also form the basis in developing rules for financial compensation for electricity consumers in pursuit of Art. 10a (6) of the amended Directive.

In view with the reasoning to construct benchmark curves based on total emissions, only the electricity use in the melting furnace should be taken into account. However, based on discussion with industry experts, it is believed to be infeasible to determine the share of electricity consumption in the furnace in the total electricity use of a plant (Eurima, 2009d): the electricity use in the furnace may not separately be monitored and verified.

It has been checked that if the specific electricity consumption in other processes than melting would be equal for each plant, the allocation to each plant would be the same in the following cases:

- The total electricity consumption is considered when determining the share of direct emissions needed to calculate the allocation; Benchmark is determined using total electricity consumption of a plant.
- Electricity consumption due to melting is considered when determining the share of direct emissions needed to calculate the allocation; Benchmark is determined using electricity consumption due to melting.

Differences in allocation using both approaches only occur because of differences in the specific electricity consumption of process steps other than melting: plants that would use more electricity per tonne production in these process steps than the specific electricity consumption of these process steps as implicated by the benchmark value would receive less allocation. Assuming that differences in specific indirect emissions due to electricity consumption of process steps other than melting are small compared to the specific total emissions of a plant (direct + indirect), the differences in allocations resulting from both approaches are considered to be small.

Considering the above, we propose to consider total on-site electricity use when constructing the benchmark curve.

3.3 Proposal for products to be distinguished

Glass wool and stone wool are interchangeable in many applications (BREF Glass-draft, 2008). We therefore propose not to distinguish them as separate products and to define the product to be considered for benchmarking as mineral wool incorporating both glass wool and stone wool.

However, due to differences in material characteristics stone wool is better suited for high temperature or fire protection applications, and glass wool is better suited for applications where lightweight is critical (BREF Glass-draft, 2008). Based on this difference glass wool and stone wool could be distinguished as separate products to be considered for benchmarking, should it be found that the effect of different suitability for particular applications is substantial in terms of technical requirements and in terms of market shares of those applications.

Figure 2 and Figure 3 show linearizations of benchmark curves based on direct emissions only for glass wool and stone wool, respectively. For background of these curves the reader is referred to section 4.1. The figures show that benchmark emission intensities based on direct emissions are similar for both products: 0.27 tCO_2/t-stone wool and 0.29 tCO_2/t-glass wool (Eurima, 2009c). As mentioned in section 3.1, these emission factors are dominated by electricity intensive plants. The difference in benchmark emission values based on total emissions (direct + indirect) is more substantial: 0.63 tCO_2/t-stone wool compared to 0.77 tCO_2/t-glass wool (Eurima, 2009e).

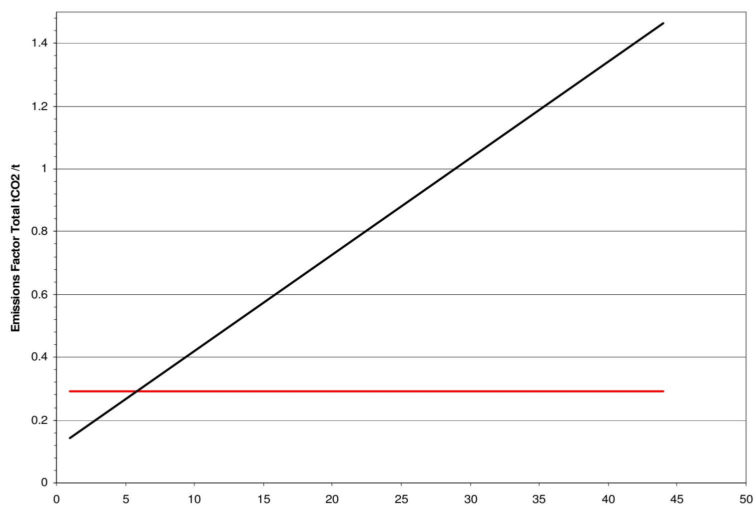

Figure 2 Linearization of benchmark curve for glass wool plants only based on direct emission factors (black line) and average performance of top 10% installations (red line) (Eurima, 2009c)

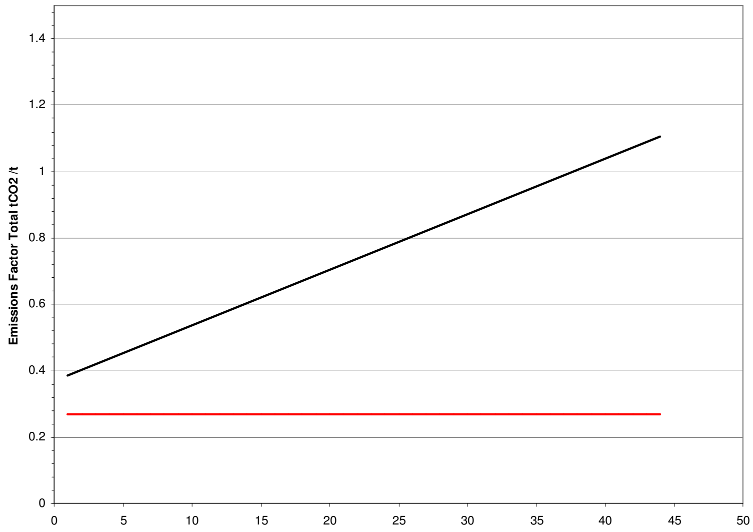

Figure 3 Linearization of benchmark curve for stone wool plants only based on direct emission factors (black line) and average performance of top 10% installations (red line) (Eurima, 2009c)

4 Benchmark values

4.1 Background and source of data

Eurima has requested data from all mineral wool plant operators that are members covering a total of 67 plants. The data requested included confidential details of plant configuration, technology, fuel use, emissions, production and production capacity for the years 2005 to 2008. Where significant differences exist in products or plant configuration the data has been segregated by individual production line. In total 73 plants and lines have been separately identified within the EU27, which in total account for an estimated 88% of EU production and 91% of sector emissions.

Emissions have been compared with production to derive an emission factor in tonnes of CO_2 per tonne of production. This has been carried out using direct emissions as covered by the EU ETS, and also total emissions using estimated indirect emissions derived from reported electricity use per tonne of production and the EU average carbon intensity of 0.465 tCO_2 / MWh. The electricity use per tonne production includes all electricity use on-site.

For reasons of commercial sensitivity the resulting benchmark curves are presented as the linear regression line and tables of results, with the individual benchmark graphs presented as only provided to Ecofys. Additionally, although the underlying dataset and analysis is not included, this is available for independent verification under e.g. confidentiality agreements.

A comparison of the average emission factor for the years 2005 to 2008 has been made and it was found that the difference between the lowest and highest year is less than 5%. The year for which the fullest and most accurate dataset is available is 2008 and as this yields an average emission factor close to the average of the 4 years for which partial data is available this is the year considered in this analysis. Eurima indicated that in terms of total production and emissions 2008 is not a representative year because of a downfall in production due to the economic crisis. In order to further show the impact of the choice of reference year, Figure 4 shows linearization of the benchmark curves based on direct emissions for the years 2005 to 2008 based on a sub-set of 66 plants/lines for which data is available for all years.

In the time available it has not been possible to consider the impact of excluding data outliers, which include impacts from plants commissioning, plants running down, furnace rebuilds, capacity extensions etc.

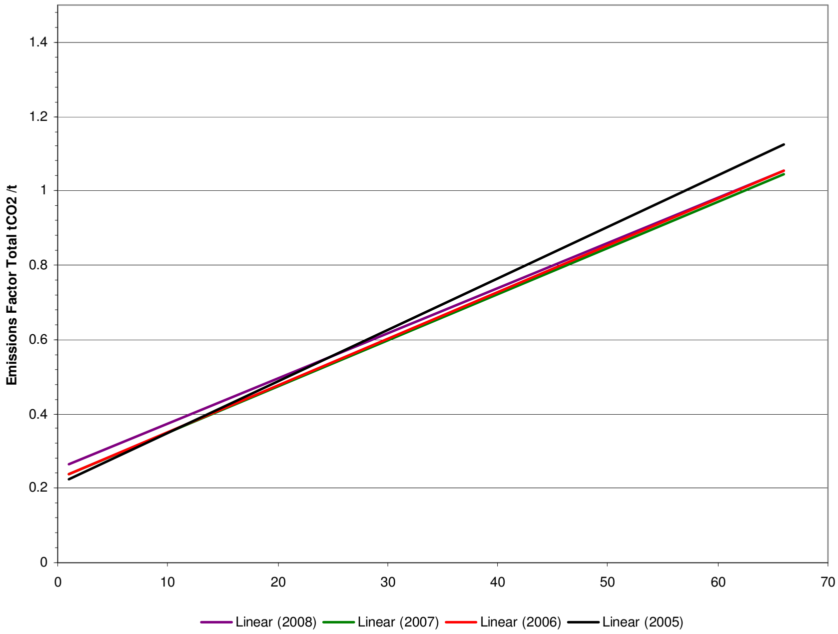

Figure 4 Linearizations of benchmarks curve for mineral wool plants based on direct emission factors for the years 2005 to 2008 (Eurima, 2009c)

4.2 Final proposed benchmark values

A linearization of the benchmark curve based on total emissions using the EU average carbon intensity of 0.465 tCO_2/MWh to account for indirect emissions is shown in Figure 5.

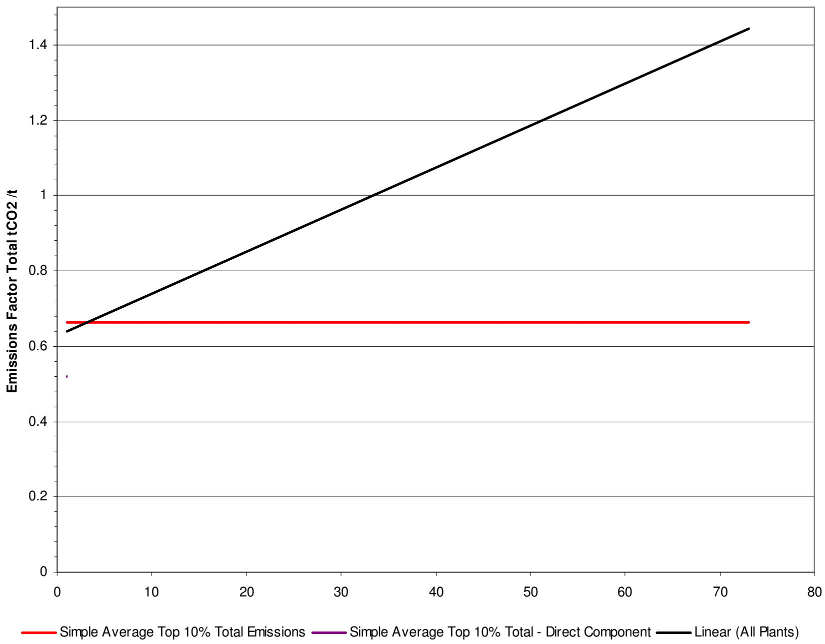

Figure 5 Linearization of benchmark curve for mineral wool plants based on total emission factors (black line) and average performance of top 10% installations (red line) (Eurima, 2009c)

We propose to use the emission factor based on the average performance of the 10% most efficient installations (7 installations) as a benchmark value for mineral wool production (0.664 tCO_2/t-mineral wool). However, as explained in Section 3.2, in order to avoid free allocation for electricity production (Art. 10a (1) of the amended Directive), this benchmark value needs to be multiplied with the plant-specific share of direct emissions to the total primary emissions.

The specific emission factor of a plant is a result of a large number of variables such as: applied technologies, capacity utilization, plant age and size. Eurima (2009c) specifically investigated the impact of economies of scale and found that there is a statistical significant relationship between annual production and total emission factor for all plants.

The proposed benchmark value is on the high side of the ranges as given in the reference document on best available techniques (BREF Glass, 2001) (see Table 6 and Table 7). It is also higher than the emission factor used to determine the allocation for the UK new entrants (0.5053 tCO_2/t-mineral wool) (Enviros Consulting Limited, 2006). This can at least partly be attributed to the fact that the proposed benchmark includes indirect emissions whereas the specific emissions in reference document on best available techniques and the UK new entrants benchmarks do not. In case of the UK new entrants benchmarks, the benchmark excludes the energy used in the furnace if output from it is zero). Including this energy use would raise the UK new entrant emission factor, bringing it more in line with the proposed benchmark.

The product definition on which the proposed benchmark is based is covered by the PRODCOM codes listed in section 3.1. Following the descriptions of the PRODCOM products, those codes also cover glass fibre mats and voiles not made of glass fibre.

4.3 Possibility of other approaches

Eurima has investigated alternative approaches to come to an allocation (Eurima, 2009c). In one of these approaches the benchmark curve based on total emissions is taken as a starting point. The average total emission factor for the top 10% of sites is determined, which subsequently is corrected by subtracting for each installation the site specific contributions from indirect emissions. The benchmark is then calculated using the remaining share of direct emission factors. Because the top 10% sites ranked according to total emissions differs from those ranked according to direct emissions the implied direct emission factor for those sites differs. This approach results in a benchmark value of 0.52 tCO_2/t-mineral wool.

As another alternative approach, the impact of excluding from the curve based on direct emissions, those plants/lines that use electric melt, or that use electric melt or electric boost has also been considered. The results of this approach are shown in the figures below. Average performances of top 10% most efficient plants is 0.43 tCO_2/t-mineral wool and 0.52 t CO_2/t-mineral wool, respectively. Note that the latter value is identical to the one resulting for the first described alternative approach.

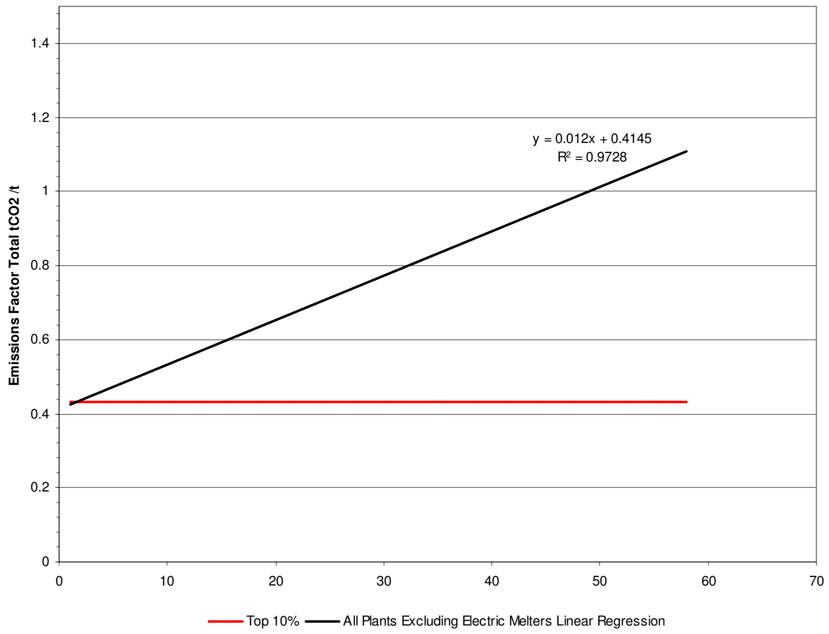

Figure 6 Linearization of benchmark curve based on direct emission factors for mineral wool plants/lines excluding electric melters (black line) and average performance of top 10% installations (red line). Plants/lines account for 86% of production of all considered plants/lines (Eurima, 2009c).

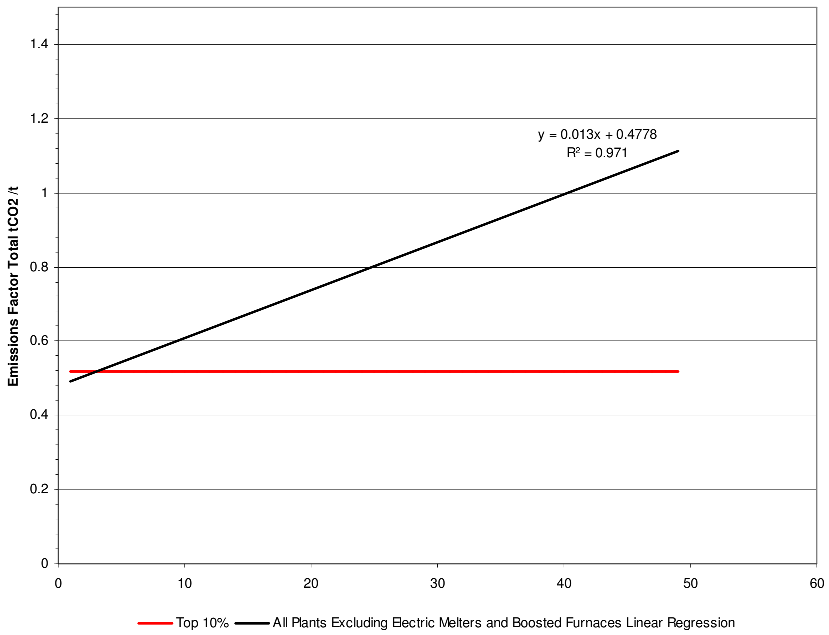

Figure 7 Linearization of benchmark curve based on direct emission factors for mineral wool plants excluding electric melters and boosted furnaces (black line) and average performance of top 10% installations (red line). Plants/lines account for 75% of production of all considered plants/lines (Eurima, 2009c).

The alternative approaches described above both address the variation in electricity intensity between different plants. Both approaches result in benchmark values that are not dominated by electric melt. However, they both do not avoid free allocation in respect of electricity generation if they would be applied to all furnaces and are therefore regarded to be inconsistent with Art. 10a (1) of the amended Directive.

In case of the second alternative approach described above, an option could be to only apply benchmarking for installations that employ furnaces that do not consume electricity and to use a fall-back approach (see section 5.3 of the report on the project approach and general issues) for installations employing electric melters and boosted furnaces. Such an approach would avoid free allocation in respect of electricity generation. It would however not be in line with our working principle not to use technology specific benchmarks for technologies producing the same product (see section 4.4 of the report on the project approach and general issues).

5 Additional steps required

- Benchmarks should be based on 2007-2008 performance (Art. 10a (2) of the amended Directive). The present benchmark curves do not include 2007 data, so this data would still need to be considered. No accurate verified data is however available for years prior to 2008 (Eurima, 2009d).

- Benchmarks should be based on the 10% most efficient installations in a sector or subsector performance (Art. 10a (2) of the amended Directive). The present benchmark curves only include Eurima members, so data from non-Eurima members would still need to be considered.

- If separate benchmarks for glass wool and stone wool were to be found desirable (see Section 3.3), then the benchmark curves based on total emissions for glass wool and stone wool need to be constructed.

6 Stakeholder comments

1. Overall demand for Mineral Wool insulation is expected to grow strongly in Europe as a result of energy & GHG efficiency programmes, but the construction industry is currently in recession. As a result, basing allocation on historic production or limiting allocations to the level of historic direct emissions may lead to severe under-allocation.

2. Whilst it is mathematically possible to derive a benchmark for the Mineral Wool sector, it is essential to address the issue of electric melters and technological constraints. Even then it is far less clear that this would result in an allocation that was more equitable than other approaches such as grandfathering or a modified benchmark capped and floored by historical emissions - both in terms of intra and inter sector distortions.

3. Excluding electric and electrically boosted plants yields a benchmark based on an emission factor closer to the average of the sector (Ecofys: see section 4.3 for a description of this approach).

4. Strict application of a "top 10%" criteria does not reflect the constraints which may be faced by individual plants due to the prevalence of proprietary technology which means that the most efficient plant configurations are not necessarily commercially available to all operators and a significant proportion of plants would inevitably be under-allocated.

5. Recognizing the variations in scale, an alternative approach based on linear regression analysis of emission factor versus annual production yields a similar average emission factor, and may represent a more equitable approach to allocating intra sector, compared with those mentioned in the report.

6. The year for which the fullest and most accurate dataset is available is 2008 and as this yields an average emission factor close to the average of the 4 years for which partial data is available this is the year considered in this analysis.

7. Defining "most efficient" as meaning those plants with the lowest direct emission factor means that all of the plants contained within the top 10% and setting the benchmark use electric melting and are therefore not a fair reflection of the wider sector.

8. If indirect emissions are taken into account then there could be additional work required to refine the methodology, for example the standard emission factor used.

7 References

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Appendix A: List of mineral wool installations

The following list contains all plants operated by Eurima members in 2008 in EU27 accounting for 88% of production and 91% of sector emissions. It excludes installations that are operated by non-Eurima members

Operator	Country	Location
DBW Advanced Fiber Technologies	Germany	Bovenden
Deutsche Rockwool Mineralwoll GmbH Germany (DE)	Germany	Gladbeck
Deutsche Rockwool Mineralwoll GmbH Germany (DE)	Germany	Neuburg
Deutsche Rockwool Mineralwoll GmbH Germany (DE)	Germany	Flechtingen
Fibran S.A. (GR)	Greece	Terpni
Knauf Insulation d.d., (SI)	Slovenia	Trata
Knauf Insulation GmbH - AT	Austria	Ferndorf
Knauf Insulation GmbH & Co. KG (DE)	Germany	Bad Berka
Knauf Insulation GmbH & Co. KG (DE)	Germany	St. Egidien
Knauf Insulation Ltd. (UK)	UK	St. Helens
Knauf Insulation Ltd. (UK)	UK	Cwmbran
Knauf Insulation Ltd. (UK)	UK	Queensferry
Knauf Insulation S.A Belgium (BE)	Belgium	Visé
Knauf Insulation spol. s.r.o Czech Republic (CZ)	Czech Republic	Krupka
Knauf Insulation, a.s. (SK)	Slovakia	Nova Bana
Moy Isover	Ireland	Ardfinnan
Odenwald Faserplattenwerk GmbH	Germany	Amorbach
Paroc Ab Sweden (SE)	Sweden	Hällekis
Paroc Ab Sweden (SE)	Sweden	Hässleholm
Paroc Lithuania (LT)	Lithuania	Vilnius
Paroc Oy Ab Finland (FI)	Finland	Lappeenranta
Paroc Oy Ab Finland (FI)	Finland	Parainen
Paroc Oy Ab Finland (FI)	Finland	Oulu
Paroc Poland (PL)	Poland	Trzemeszno
Rockwool A/S Denmark (DK)	Denmark	Vamdrup
Rockwool A/S Denmark (DK)	Denmark	Doense
Rockwool Benelux B.V (NL)	Netherlands	Roermond
Rockwool Czech Republic	Czech Republic	Bohumin
Rockwool France SAS (FR)	France	St Eloy les Mines
Rockwool Hungary (HR)	Hungary	Tapolca
Rockwool Hungary (HR)	Hungary	Goganfa
Rockwool Italia (IT)	Italy	Iglesias
Rockwool Lapinus (NL)	Netherlands	Roermond
Rockwool Ltd Great Britain (UK)	UK	Pencoed
Rockwool Peninsular S.A.U. Spain (ES)	Spain	Caparroso
Rockwool Polska	Poland	Cigacice
Rockwool Polska	Poland	Malkinia
Saint-Gobain A/S Denmark (DK)	Denmark	Vamdrup
Saint-Gobain AB Sweden (SE)	Sweden	Billesholm
Saint-Gobain Austria (AT)	Austria	Stockerau
Saint-Gobain Benelux (NL)	Netherlands	Etten Leur
Saint-Gobain Construction Products Sp. Z o.o. (PL)	Poland	Gliwice
Saint-Gobain Cristaleria Spain (ES)	Spain	Azuqueca

Continuation

Operator	Country	Location
Saint-Gobain Eurocoustic (FR)	France	Genouillac
Saint-Gobain France (FR)	France	Orange
Saint-Gobain France (FR)	France	Chalon sur Saône
Saint-Gobain France (FR)	France	Chemille
Saint-Gobain France (FR)	France	Rantigny
Saint-Gobain G+H (DE)	Germany	Bergisch Gladbach
Saint-Gobain G+H (DE)	Germany	Ladenburg
Saint-Gobain G+H (DE)	Germany	Lübz
Saint-Gobain G+H (DE)	Germany	Speyer
Saint-Gobain Isover UK (UK)	UK	Runcorn
Saint-Gobain Italia (IT)	Italy	Vidalengo
Saint-Gobain Orsil (Cz)	Czech Republic	Castolovice
Saint-Gobain Rakennustuotteet Oy Finland (FI)	Finland	Hyvinkää
Saint-Gobain Rakennustuotteet Oy Finland (FI)	Finland	Forssa
Saint-Gobain Romania (RO)	Romania	Ploiesti
SCHWENK DÄMMTECHNIK GMBH & CO. KG	Germany	
URSA Benelux BVBA	Belgium	Desselgem
URSA Deutschland GmbH	Germany	Delitzsch
URSA Deutschland GmbH	Germany	Wesel
URSA France SAS	France	St. Avold
URSA Ibérica Aislantes	Spain	El Pla de Sta. Maria
URSA Polska Sp. Z.o.o.	Poland	Dabrowa Gornicza
URSA Salgótarján Glass Wool Co., Ltd.	Hungary	Salgótarján
URSA Slovenija, d.o.o.	Slovenia	Novo Mesto

Source: Eurima (2009b)