

Framework for qualitative assessments

1 Introduction

Context

The revised EU ETS Directive¹ for the period 2021-2030 aims to ensure that the EU is on track to meet its emission reduction targets for 2030, to maintain the competitiveness of the EU industry and that sectors at risk of carbon leakage will face no undue costs. The revised EU ETS Directive sets out in a detailed manner how the free allocation rules and the carbon leakage list are to be established. According to Article 10(b), paragraphs 1 to 4 of the revised Directive, a sector can be deemed to be exposed to a significant risk of carbon leakage if it fulfils the quantitative criteria (QT):

- (Art 10b (1)) (sub)sector carbon leakage indicator, defined as the product of the sector intensity of trade with third countries by the sector's emission intensity, exceeds 0.2 – "first level assessment"

In cases where the "first level assessment" leads to the establishment of borderline cases a qualitative assessment can be carried out according to the criteria outlined in Article 10b paragraph 2 of the revised Directive (abatement potential, market characteristics and profit margins). Additionally, under the criteria defined in Article 10b paragraph 2 and 3 of the revised Directive some sectors may be eligible to submit applications for a quantitative assessment at a disaggregated level. The eligibility criteria for these "second level assessments" are set in the revised Directive under Article 10b paragraph 2 and 3:

Table 1. Overview of second level assessment eligibility criteria for qualitative assessment (as set in the EU ETS revised Directive).

Criteria		Article	Assessment process	Sector application route	Application deadline
A	carbon leakage indicator between 0.15 and 0.2	Art 10b (2)	Qualitative assessment	to Commission	3 months after publication of preliminary CLL
B	emission intensity exceeds 1,5	Art 10b (3)	Qualitative assessment OR Quantitative at Disaggregated level	to Commission	3 months after publication of preliminary CLL
C	free allocation is calculated on the basis of the refineries benchmarks	Art 10b (3)	Qualitative assessment OR Quantitative at Disaggregated level	to Commission	3 months after publication of preliminary CLL

¹ Directive (EU) 2018/410 of the European Parliament and of the Council of 14 March 2018 amending Directive 2003/87/EC to enhance cost-effective emission reductions and low-carbon investments, and Decision (EU) 2015/1814).

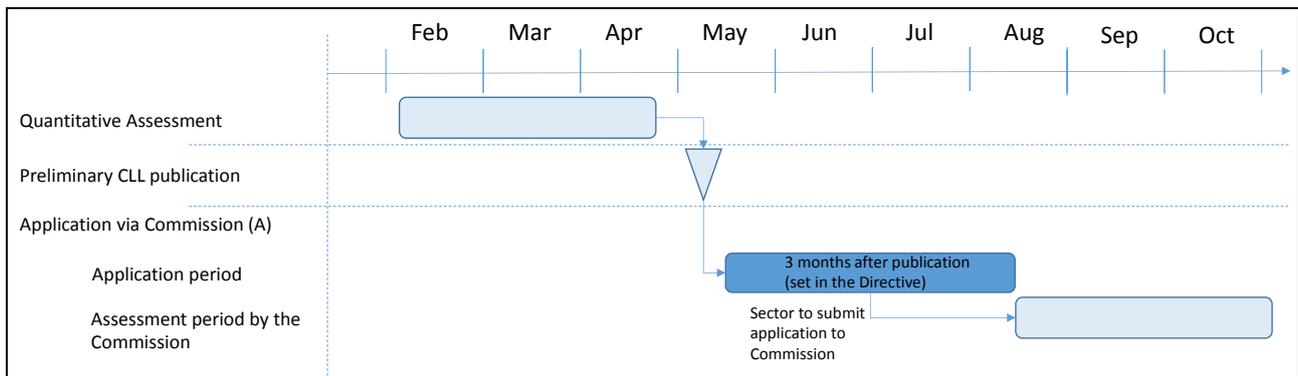
Aim of this paper

The present paper provides an overview of the focus and framework for the Qualitative Assessment. It provides additional guidelines and instructions on what sectors need to do when applying for a Qualitative Assessment and on the evidence they need to provide to support their application.

2 Process

After publication of the preliminary Carbon Leakage List, sectors eligible for a qualitative assessment can apply to the Commission for integration on the Carbon Leakage List within three months after the publication of the preliminary Carbon Leakage List.

Timeline of qualitative carbon leakage assessment:



Applications

The sectors have to submit an application, following the proposed framework.

The entity who submits an application on behalf of the industry sector should ensure the completeness and representativeness of the application in terms of geographical distribution and number of installations (refer to criteria in section 5). The applicant entity may take the form of one industry sector association, a joint application by multiple industry sector associations, a joint application by multiple companies, or a combination of the above, in all cases a single point of contact must be clearly identified. For reasons of efficiency and effectiveness, together with increased application quality, only one application by eligible sector is advised.

Where a sector applies for a qualitative assessment it must:

- confirm its NACE 4-digit code and the activities it covers
- provide a list of all the installations in the sector that are covered by the EU ETS

Having done this, the sector must:

- put forward its argument for why it thinks the sector should be on the Carbon Leakage List, based on the three criteria:
 - o the extent to which it is possible for individual installations in the sector concerned to reduce emissions and/or electricity consumption;
 - o the extent to which there is scope to pass cost increases onto customers, and the influence of market characteristics on the ability to pass cost increases on;
 - o the extent to which profit margins associated with serving the EU market are negative or too low to make further long-term investment economically viable (and provide a strong incentive to relocate production).

Given the interlinkages between criteria, it is expected the argument will be based on the combination of all three criteria.

In making its argument, the sector needs to set out its own reasoning and evidence on the special circumstances that prevail and why the sector should be placed on the Carbon Leakage List. In support of its application, the sector shall submit duly substantiated, complete and independently verified data to enable the Commission to carry out the assessment. Furthermore, complete documentation on data sets, data sources, calculations, estimates and methodologies applied need to be provided. The time period to be covered in the qualitative assessments is 2014, 2015, 2016.

A publishable summary has to be part of the application file.

Verification

The applications' data have to be assessed by a competent and independent verifier. The independent third party should review and assess the information or evidence (supplied by the sector/firm) and, using its own expert knowledge, judgement and standard analytical techniques, verify if that information/evidence is true or correct. The verification covers data used, assumptions applied, calculations of indicators and the link between indicators and conclusions on the criteria for the qualitative assessment as specified in section 3 of this paper. The information to be assessed can extend beyond financial information. It may relate to non-financial technical information, e.g. engineering, scientific, production process. The review itself is likely to be carried out by technical testing firms or specialist consultancy (e.g. engineering, environmental) firms, which have the appropriate qualification or accreditation to perform the verification.

A verification report containing the verification conclusions and the main findings is to be provided, together with evidence on the competence and independence of the verifier.

The independence of the verifier should be confirmed by demonstrating that, outside the work to verify the application, the verifier is not connected to, governed by or reliant on the applicant, i.e. that it is not owned, in part or full, by the applicant; that the applicant is not involved in the decision-making or in the management of the verifier; that there is no existing or intended contractual relationship that might constitute a conflict of interest.

The competence and independence of the verifier can be demonstrated by:

- Accreditation by National Accreditation Body
- Certified accreditation with representative industry organisations
- Certified quality standards (e.g. ISO) accreditation
- The track record of the verifier in providing similar services for other clients, including
 - past project/contract experience
 - letters of satisfactory completion

Only submissions including a positive opinion from the verifier can be considered by the Commission.

Assessment by the Commission

Application will be assessed by the Commission, using inter alia the quality criteria explained in section 5. On that basis, the Commission will decide on the sector's inclusion on the CL List.

3 Analytical framework for the qualitative assessments

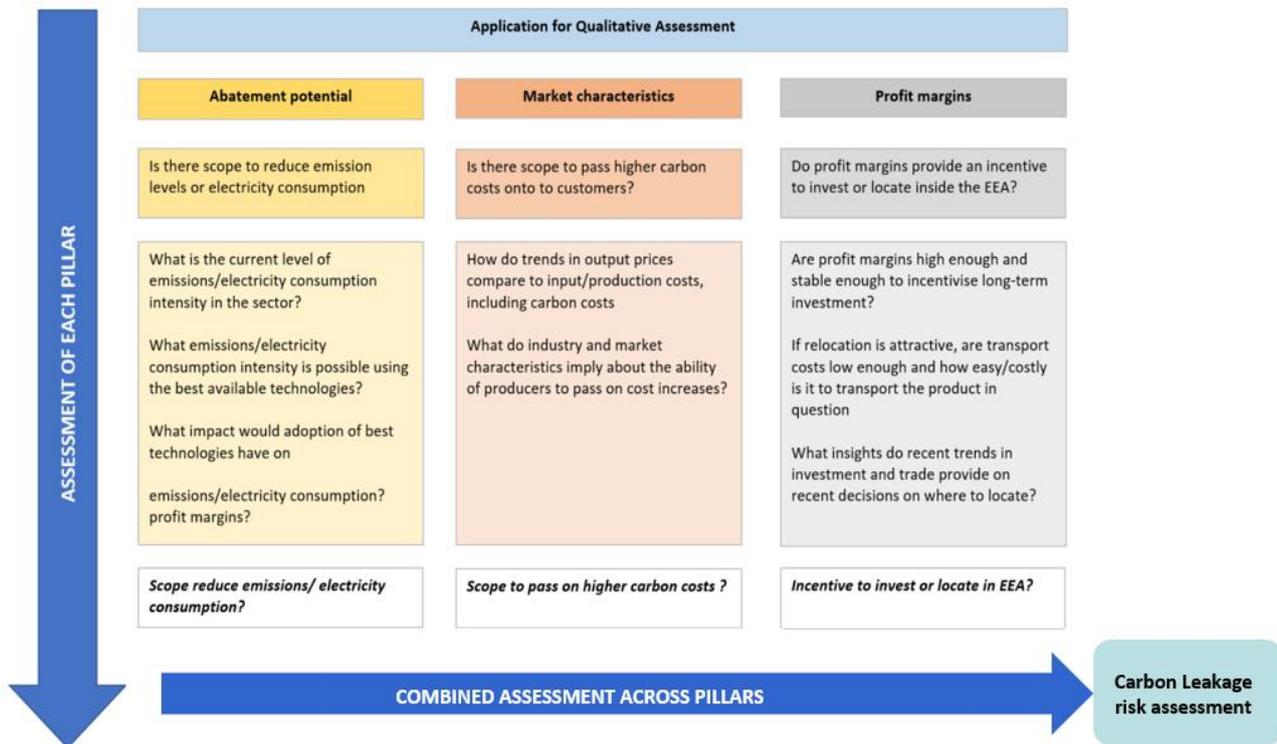
Overview

The analytical framework for the qualitative assessments is structured around the three criteria specified by the revised ETS Directive:

1. Abatement potential

- the extent to which it is possible for individual installations in the sector or sub-sectors concerned to reduce emission levels or electricity consumption;
- 2. Market characteristics
 - current and projected market characteristics, including any common reference price where relevant (i.e. commodity prices);
- 3. Profit margins
 - profit margins as a potential indicator of long-run investment or relocation decisions, taking into account changes in costs of production relating to emission reductions.

Figure 1 Overarching analytical framework for Qualitative Assessments



The first criterion, abatement potential, relates to the mitigation of risk (of carbon leakage) that occurs when carbon costs can be reduced by incorporating new technologies and/or alternative fuels/ raw materials into the production process. For sectors where there is little or no scope for further reductions in the carbon cost of production through new technologies and/or fuels/ raw materials, this might be because firms in the sector have already adopted the best available technologies and cannot improve further by existing technology.

The focus of the second criterion, market characteristics, is on assessing the ability of the sector to pass higher carbon costs on to customers. If firms in the affected sector have a relatively strong degree of bargaining power, such that demand is not too sensitive to changes in prices, they are more likely to be able to pass on cost increases. In such cases, the risk of carbon leakage is lower.

The third criterion focuses on profit margins as a potential driver of long-run investment or relocation decisions. If profit margins are positive, high and sustained in the domestic market, that increases the incentive to invest in the domestic market and reduces the incentive to relocate. In contrast, if profit margins are continually low or negative, the cost of complying with the ETS is a sizeable share of profit margins, and/or profit margins are higher in third countries outside of the ETS, the incentive to invest in the

domestic market is low and the incentive to relocate, to serve the overseas market and/or export back to the EU, is high.

Detailed analytical framework for each criterion

A set of questions is provided to operationalise the three criteria and therefore to facilitate and harmonise the applications:

- **Abatement potential: ascertaining the extent to which it is possible for individual installations in the sector to reduce emissions or electricity consumption**
 - What is the current level of emissions and electricity consumption intensity in the sector?
 - What emissions and electricity consumption intensity is possible using the best available technologies?
 - What is/are the production process(es) used?
 - How is your current level of emissions and electricity consumption comparable to the most efficient techniques levels?
 - What further savings are possible?
 - Will be any breakthrough technology possible and by when?

Abatement potential will be determined by assessing the implications of the following on the scope to reduce emissions and/or electricity consumption:

- Direct emissions intensity
- Electricity consumption intensity
- Indirect emissions intensity
- Current fuel mix
- Penetration of best available technologies
- Impact of full adoption of best available technologies on emissions
- Impact of investment on profit margins
- Opportunity cost of foregone investment in existing technologies
- Penetration of alternative fuels
- Impact of full adoption of alternative fuels on emissions
- Impact of investment in alternative fuels on profit margins
- Opportunity cost of foregone investment in fossil fuel technologies

See Table 2 in Annex 1, with details of the assessment criteria for abatement potential pillar and information on the default indicators and data sources to be used.

- **Market characteristics: assessing the extent to which producers can pass cost increases on to customers**
 - How do trends in output prices compare to input/production costs, including carbon costs, and is there any pattern/correlation?
 - What do industry and market characteristics imply about the ability of producers to pass on cost increases? How do trends look like?

The influence of market characteristics will be determined by assessing the implications of the following on the scope to pass cost increases on to customers:

- Output prices (and the extent to which they follow production costs)
- Common reference price set globally
- Bargaining position - Industrial structure
- Bargaining position - Pricing power

- Bargaining position - Availability of/competition from substitute products
- Bargaining position - Dependence of sector on downstream customers; dependence of downstream customers on sector
- Domestic demand - levels and trends
- Import penetration - levels and trends
- Import prices - levels and trends

See Table 3 in Annex 1, with details of the assessment criteria for market characteristics and cost pass through and information on the default indicators and data sources to be used.

- ***Profit margins (as indicators of investment or relocation decisions): ascertaining the size of profit margins associated with EU production/market to assess the relative attractiveness of the ETS area as a place for long-term investment***
 - Are current and expected future profit margins high enough and stable enough to incentivise long-term investment?
 - If relocation is attractive, are transport costs low enough and how easy/costly is it to transport the product in question (e.g. value to weight ratio)?
 - Do current trade patterns imply it would be feasible?
 - Do recent investment trends provide any insight on recent decisions on where to locate?
 - Do recent trends in business demography (start-ups and closures) provide any insight on the attractiveness of the EU as a location to invest?

The influence of profit margins will be determined by assessing the implications of the following on the incentive to relocate or invest abroad:

- Profit margins
- Are profit margins consistent with the stage of the business cycle
- Projections for future demand in the EU ETS area
- Projections for future costs/prices/profit margins
- Substitute products with carbon leakage exposure
- Value to weight ratio
- Current trade patterns
- Investment in the sector in the EU ETS area
- Net trade balance
- Import penetration
- Business demography

See Table 4 in Annex 1, with details of the assessment criteria for profit margin pillar and information on the default indicators and data sources to be used.

The assessment will then combine the individual criterion assessments to make an overall assessment and conclusion on the risk of carbon leakage.

4 Data sources

To ensure the assessments are robust, the data and methods used need to be of a high quality.

With regard to data, **official sources** (e.g. Eurostat) score highly in terms of the standard of data quality (in terms of coverage of sectors, consistency over time and coherence with national accounts aggregates and credibility among stakeholders) and should be used where possible.

Alternative sources include industry associations, commercial databases or firms but care must be taken to ensure the robustness and completeness of data from these sources.

The quality and coverage of data in commercial databases is difficult to assure: data can sometimes be inconsistent with the most relevant indicator from national accounts. The key challenge with firm level data is that no single firm is representative of the whole (sub)sector and considerable time and effort is required, through the collection, processing and summing of data from all firms in the sector, to generate an estimate for the whole (sub)sector. Where industry associations use data from their own collation activities, the data need to meet the quality criteria described below as best as possible.

To the extent possible, applications should use official statistics, i.e. Eurostat or EUTL data. Where necessary, reliable secondary sources and the information provided by industry can be used and should be supported with clear reasoning.

Tables 2-4 in Annex 1 provide details of the assessment criteria/questions for each pillar and information on the indicators and data sources that can be used to answer the questions. Table 5 in Annex 2 expands on this and provides a more detailed list of default indicators and data sources that shall be used to provide estimates for the assessment criteria under each pillar.

5 Quality criteria

The overarching objective is that the data used should have as complete and comprehensive coverage of the sector as possible and provide an accurate representation of the sector.

Quality criteria for application

To that end, the quality criteria for the application include:

- Representativeness of data
 - The data used should cover the whole of the 4-digit NACE sector being assessed, and only that sector.
 - If coverage of the whole sector is not possible, the part of the sector that is included should, as a minimum, account for 85% of turnover in the EU ETS area.
 - The geographic scope of the data and calculations should be the European Economic Area (EU28 plus Iceland, Liechtenstein, Norway), which covers the same 31 countries participating in the EU ETS
 - If coverage of the whole EEA is not possible, those countries that are included should, as a minimum, account for 85% of sector turnover in the EU ETS area and trade (exports+imports) with non-EU ETS countries.
 - All installations that are covered by the EU ETS, and their direct emissions, should be included.
 - If coverage of all installations is not possible, those installations that are included should, as a minimum, account for 85% of direct emissions from the sector.

If the minimum thresholds described above cannot be met, the representativeness of the data risks to be undermined and so too the robustness of conclusions from the Qualitative Assessment. In case the thresholds are not met, the application needs to demonstrate the representativeness of data.

To note that, where the assessments are based on data covering a sample of the sector (rather than the whole sector), this introduces a sampling error: where the assessment for the sample is different from the assessment for the whole sector (which is unknown). The larger the sampling error the greater the risk that

those left out are (more) different to those covered. In turn, this increases the chance that the assessment for the sample covered does not apply to those not covered, and the whole population. This reduces the strength of any conclusion or decision made about whether a sector qualifies for the carbon leakage list.

To minimise the sampling error and the risk of an incorrect assessment, where the sector cannot be covered in full a high coverage (85%) is requested so that the assessment for the sample of the sector is valid and representative for the whole sector.

- Robustness of data
 - Data should come from reliable and trustworthy sources, preferably official sources. Where this is not the case, the source and/or derivation of the data should be clear, transparent and easy to follow. Alternative data and methods should be verified and audited.
- Consistency of the data
 - The data should measure the concept/indicator they purport to measure, be consistent with both standard economic definitions and methods, and the other supporting data.
 - Where multiple sources are combined, their geographic, sector, and installation coverage should be consistent.
- Time period
 - Data provided in support of an application should be for the years 2014, 2015 and 2016 (where relevant the data period may be complemented by more recent data) which is the time period to be covered in the Qualitative Assessments.
- Traceability of calculations
 - Where alternative methods have been used to calculate the data values for an indicator, a clear description of the method must be provided. The method must be transparent, easy to follow and replicate, and the data used must be readily accessible.

Annex 1 Research questions, assessment measures and data sources for each assessment pillar

Table 2: Assessment Criteria and data sources for abatement potential pillar

Abatement potential: ascertaining the extent to which it is possible for individual installations in the sector to reduce emissions or electricity consumption				
Question	Assessed by:	Measure/ Formula	Data sources	Comment
What is the current level of emissions/ electricity consumption intensity in the sector?	Direct Emissions per unit of production	kg CO ₂ / t of product	Emissions: - EUTL (installation) - Quantitative assessment (4-digit sector) Production: - Eurostat Europroms database	
	Electricity consumption per unit of production	Kwh / t of product	Electricity consumption: - Producers (installation) - EC & Member States (4-digit sector) Production: - Eurostat Europroms database	
	Indirect emissions per unit of production	kg CO ₂ / euro	Electricity consumption: - Producers (installation) - EC & Member States (4-digit sector) Emissions factor - EC (DG CLIMATE) Production: - Eurostat Europroms database	
What is the current fuel mix?	Proportion of fossil fuels in fuel inputs (e.g. oil, gas, coal) Proportion of alternative fuels in fuel inputs Total amount of energy generated on-site Proportion of energy generated on-site	% of fuel inputs (purchases) that are fossil fuels % of fuel inputs (purchases) that are alternative fuels % of energy from fossil/ alternative fuels	Fuel purchases broken down by fuel type: - Producers - Sector organisations Volume of fossil fuels burned and associated CO ₂ emissions: - Producers	

Abatement potential: ascertaining the extent to which it is possible for individual installations in the sector to reduce emissions or electricity consumption				
Question	Assessed by:	Measure/ Formula	Data sources	Comment
	from fossil/alternative fuels.		- Sector organisations Volume of alternative fuels burned and associated CO ₂ emissions: - Producers - Sector organisations	
What is the lowest, emissions/ electricity consumption intensity possible using the best available technologies?	Emissions per unit of production	kg CO ₂ / euro	Identify installation with lowest current emissions intensity EU IPPC BAT Reference documents	
	Electricity consumption per unit of production	Kwh / t of product	Identify installation with lowest current electricity intensity EU IPPC BAT Reference documents	
	Indirect emissions per unit of production	kg CO ₂ / euro	Identify installation with lowest current emissions intensity Emissions factor - EC (DG CLIMA) Production: - Eurostat Europroms database	
What is the penetration of these technologies in the sector?	Penetration/ prevalence of most efficient techniques	Share of installations using most efficient techniques Share of production from most efficient techniques	List of installations: - EUTL Those using most efficient techniques: - Producers - Sector organisation Production from installations/that part of the sector using most efficient techniques: - Producers - Sector organisation	To note that the IED requires MS to report best available technologies and Information is available in the European pollution release and transfer register (http://prtr.ec.europa.eu).
Average emissions/ electricity	Direct Emissions per unit of production	kg CO ₂ / euro	Emissions: - EUTL (installation)	

Abatement potential: ascertaining the extent to which it is possible for individual installations in the sector to reduce emissions or electricity consumption				
Question	Assessed by:	Measure/ Formula	Data sources	Comment
consumption intensity for: - installations/ part of the sector not using most efficient techniques - production from installations/that part of the sector not using most efficient techniques			- Quantitative assessment (4-digit sector) Level of compliance with best available technologies. Production not based on most efficient techniques: - Residual from total production <i>minus</i> production using best available technologies	
	Electricity consumption per unit of production	Kwh / t of product	Electricity consumption: - Producers (installation) - EC & Member States (4-digit sector) Production not based on best available technologies: - Residual from total production <i>minus</i> production using best available technologies	
	Indirect emissions per unit of production	kg CO ₂ / euro	Electricity consumption: - Producers (installation) - EC & Member States (4-digit sector) Emissions factor - EC (DG CLIMATE) Production not based on best available technologies: - Residual from total production <i>minus</i> production using best available technologies	
What impact would adoption of best technologies have on emissions/ electricity consumption?	Total emissions/ electricity consumption if all production from best available technologies	kg CO ₂ kwh and % reduction	Emissions/ electricity consumption intensity for best available techniques: - from above calculations Production not based on best available technologies: - from above calculations	Use measures calculated above to apply emissions/ electricity consumption intensity for best available techniques to that part of production not based on best available techniques

Abatement potential: ascertaining the extent to which it is possible for individual installations in the sector to reduce emissions or electricity consumption				
Question	Assessed by:	Measure/ Formula	Data sources	Comment
<i>What impact would adoption of best available technologies have on profit margins?</i>				
Total cost of investment required to move all production to best available technologies	Identify average cost of investment in best available technologies for a given level of production. Scale this up to the level of production not based on best available technologies.	millions of euros	Average cost of investment in best available technologies for a given level of production: - EU IPPC BAT Reference documents - Producers - Sector organisation Production not based on best available technologies: - from calculations above	
Impact on profit margins	Identify average lifespan of best available technologies and derive annual cost of investment. Subtract annual cost of investment from average profit over 2014-16 (as guide to future profits), to estimate impact on profit margins	%	Lifespan of best available technologies: - EU IPPC BAT Reference documents - Producers - Sector organisation Profit margins: - See calculation below under 'Profit margins' pillar	
Opportunity cost of closing installations early (investment foregone)	Identify cost of current installation, average lifespan and years in operation. Estimate opportunity cost as total investment costs scaled by proportion of lifespan installation will not be in operation	euros	Investment cost, expected lifespan, years in operation: - Producers - Sector organisation - EU IPPC BAT Reference documents	
What impact would the use of alternative fuels or raw materials have on emissions?	Estimate amount of energy produced using fossil fuels, and associated CO ₂ emissions. Estimate amount of alternative fuels required to generate same amount of	kg CO ₂	Energy produced using fossil fuels: - Producers - Sector organisations Volume of alternative fuels required to produce same amount of energy and associated CO ₂	

Abatement potential: ascertaining the extent to which it is possible for individual installations in the sector to reduce emissions or electricity consumption				
Question	Assessed by:	Measure/ Formula	Data sources	Comment
	energy, and CO2 emissions associated with using these fuels. Estimate impact on emissions by subtracting latter from former.		emissions: - Producers - Sector organisations - Sector studies - EU IPPC BAT Reference documents	
What impact would the use of alternative fuels or raw materials have on profit margins?				
Total cost of investment required to move to all alternative fuels	Identify average cost of investment to convert to alternative fuels for a given level of production/energy generation. Scale this up to the level of production/energy generation not based on alternative fuels.	millions of euros	Average cost of investment to switch to alternative fuels for a given level of production/energy generation: - EU IPPC BAT Reference documents - Producers - Sector organisation Production/energy generation not based on alternative fuels: - from calculations above	
Impact of investment in alternative fuel technologies on profit margins	Identify average lifespan of alternative fuel technologies and derive annual cost of investment. Subtract annual cost of investment from average profit over 2014-16 (as guide to future profits), to estimate impact on profit margins	%	Lifespan of alternative fuel technologies: - EU IPPC BAT Reference documents - Producers - Sector organisation Profit margins: - See calculation below under 'Profit margins' pillar	
Opportunity cost of closing fossil fuel technologies early (investment foregone)	Identify cost of current installation, average lifespan and years in operation. Estimate opportunity cost as total investment costs scaled by proportion of lifespan	euros	Investment cost, expected lifespan, years in operation: - Producers - Sector organisation - EU IPPC BAT Reference documents	

Abatement potential: ascertaining the extent to which it is possible for individual installations in the sector to reduce emissions or electricity consumption				
Question	Assessed by:	Measure/ Formula	Data sources	Comment
	installation will not be in operation			

Table 3: Assessment Criteria and data sources for market characteristics and cost pass-through pillar

Market characteristics: assessing the extent to which producers can pass cost increases on to customers				
Question	Assessed by:	Measure/ Formula	Data sources	Comment
<u>Costs and prices</u>				
How do trends in output prices compare to input/production costs, including carbon costs?	Comparing: - sector output prices with - sector production costs - sector carbon costs	Output prices: - Output price index - Value of sold production / volume of sold production Production costs: - Total purchases of goods and services - Labour costs - Turnover (to obtain unit production cost (per unit of turnover))	Output price index: - Eurostat Short-term Business Statistics Production values/volumes: - Eurostat Europroms database Production costs and Turnover: - Eurostat Structural Business Statistics	
How do trends in EU output prices compare to trends in output prices in other countries outside the EU?	Comparing: - sector output prices in the EU With - sector output prices in other countries (less relevant for commoditised goods/ industries)	EU sector output prices: - see above Sector output prices in other countries: - Price index (where relevant)	EU sector output prices: - see above Sector output prices in other countries: - National Statistics Offices - Sector organisations	
Is there a common reference price that is	Confirm if price is set globally.	EU sector output prices:	EU sector output prices: - see above	

Market characteristics: assessing the extent to which producers can pass cost increases on to customers

Question	Assessed by:	Measure/ Formula	Data sources	Comment
set globally (which limits scope for cost pass through)?	If so, identify reference series and compare to production costs.	- see above EU sector production costs: - see above Reference series for global price: - price per unit or weight	EU sector production costs: - see above Reference series for global price: - owner/publisher of price series	

What do industry and market characteristics imply about the ability of producers to pass on cost increases?

What is the structure of the sub-sector by firm size:	Profile share of the sector accounted for by small, medium and large firms			
What share of the sector (by output) does each firm size-band account for?	Profile value added by firm size band	- Value added in the sector by firm (employment) size band	Value added: - Eurostat Structural Business Statistics (SME database)	Limited to 3-digit NACE detail
How concentrated is the sector?	Number of large producers and share of value added (or turnover) accounted for large firms	- Number of enterprises in the sector by firm (employment) size band - Value added in the sector by firm (employment) size band	Number of enterprises and value added: - Eurostat Structural Business Statistics (SME database)	Limited to 3-digit NACE detail
How does the structure/ concentration of the sector compare to the structure/ concentration of downstream customers?				
How dependent are downstream customers on the sector and its output?	Identify key downstream customer sectors and identify their dependence on the	- Downstream customer sector purchases from sector as a	Inter-dependence between sector and downstream customer sectors: - Eurostat Input-Output	Limited because available only to 2-digit NACE detail.

Market characteristics: assessing the extent to which producers can pass cost increases on to customers

Question	Assessed by:	Measure/ Formula	Data sources	Comment
Does the sector have some bargaining/monopoly power over downstream customers?	sector (as share of inputs accounted for by the sector). Identify sector's dependence on downstream sectors (as share of output that goes to each downstream sector) Does the sector's output have a high value-added content (high power) or a low value-added content (low power)? Compare structure of sector with structure of downstream sectors (concentration, value added by firm size)	share of: - the sector's output - the downstream sector's total purchases of inputs - Value added as a % of turnover - Value added in the sector by firm (employment) size band	tables Value added and turnover: - Eurostat Structural Business Statistics Value added by firm size: - Eurostat Structural Business Statistics (SME database)	
What is the profile of ownership of EU installations?	Proportion of the sector that is foreign controlled	Value of: - enterprises - value added - turnover that is foreign controlled compare to total EU - enterprises - value added - turnover to obtain share of EU sector that is foreign controlled.	Sector value added, turnover, enterprises that are foreign controlled: - Eurostat Structural Business Statistics (Foreign controlled EU enterprises database) Total EU sector value added, turnover, enterprises: - Eurostat Structural Business Statistics	Limited because data only available at 2-digit level.
How large is the market currently? What is the historical trend – has it been growing or shrinking? And what are the expectations for the future? What role/share do imports have in	Look at levels/trends in EU domestic demand, import penetration and import prices	Domestic demand = Production + Imports - Exports Import penetration = Imports / Domestic demand	Domestic demand (calculated as Production <i>plus</i> Imports <i>minus</i> Exports): - Eurostat Europroms database Imports (by value, by volume): - Eurostat Europroms database	

Market characteristics: assessing the extent to which producers can pass cost increases on to customers				
Question	Assessed by:	Measure/ Formula	Data sources	Comment
meeting demand and setting prices Has the role/share of imports been increasing/ decreasing		Import prices: - Import price index - Value of imports / volume of imports	Import price index: - Eurostat Short-term business statistics	

Table 4: Assessment Criteria and data sources for profit margin pillar

Profit margins (as indicators of investment or relocation decisions): ascertaining the size of profit margins associated with EU production/market to assess the relative attractiveness of the ETS area as a place for further long-term investment				
Question	Assessed by:	Measure/ Formula	Data sources	Comment
<u>Are profit margins high enough and stable enough to incentivise long-term investment?</u>				
What is the size of recent profit margins?	Gross operating rate	(Gross value added – Labour costs) / Turnover	Gross value added, turnover and labour costs: - Eurostat Structural Business Statistics for countries in EU ETS - National Statistics Offices for other countries outside EU ETS	
What stage of the business cycle is the sector at in the time period being analysed	Comparison of annual GVA growth over 2014-16 and longer historical period to long-term average	Annual growth in real sector GVA (Gross value added)	Nominal GVA (Gross value added): - Eurostat Structural Business Statistics Price index (to deflate nominal GVA): - Eurostat Short-term business statistics	
	Comparison of annual export & import growth over 2014-16 and longer historical period to long-term average	Annual growth in sector exports Annual growth in sector imports	Exports & imports: - Eurostat Europroms database Price index (to deflate nominal trade values): - Eurostat Short-term business statistics	
<u>What are the expectations for future profit margins?</u>				
Is demand expected to remain strong/grow fast enough to make	Is demand in the EU / EU ETS area expected to grow		Outlook for demand: - Sector reports by - independent	

Profit margins (as indicators of investment or relocation decisions): ascertaining the size of profit margins associated with EU production/market to assess the relative attractiveness of the ETS area as a place for further long-term investment

Question	Assessed by:	Measure/ Formula	Data sources	Comment
<i>further investment worthwhile?</i>	<i>slower/faster or at much the same rate?</i> <i>How does this compare with the growth of demand in other markets?</i>		<i>forecaster</i> <i>- sector associations</i> <i>- Company reports</i>	
<i>What do the projections for future costs and prices look like? Do they suggest profit margins will increase/be maintained/decrease?</i>	<i>Are input costs expected to grow slower/faster or at much the same rate?</i>		<i>Outlook for profits:</i> <i>- Sector reports by independent forecaster</i> <i>- sector associations</i> <i>- Company reports</i>	
Are there possible substitute products treated differently in terms of carbon leakage and their inclusion (or not) on the carbon leakage list?	Identify substitute products and their treatment under the EU ETS.		Substitute products: - Producers - Literature/reports on the sector - Market reports by competition authorities	
Is relocation feasible?	Value to weight ratio	euro per kg	Production (by value, by volume): - Eurostat Europroms database Imports (by value, by volume): - Eurostat Europroms database	
	Current trade patterns	Annual growth in sector exports and imports	Exports & imports: - Eurostat Europroms database Price index (to deflate nominal trade values): - Eurostat Short-term business statistics	
Do recent investment trends provide any insight on recent decisions on where to locate?	Sector investment in the EU or EEA	Gross investment in tangible goods Net investment in tangible goods	Investment in tangible goods: - Eurostat Structural Business Statistics	

Profit margins (as indicators of investment or relocation decisions): ascertaining the size of profit margins associated with EU production/market to assess the relative attractiveness of the ETS area as a place for further long-term investment

Question	Assessed by:	Measure/ Formula	Data sources	Comment
	Sector investment in countries outside the EU or EEA	Various, but most likely: - Gross fixed capital formation	Investment measure: - National Statistics Office	
	Trade balance	Exports - Imports	Exports & imports: - Eurostat Europroms database	
	Import penetration	Imports / Domestic demand	Imports: - Eurostat Europroms database Domestic demand (calculated as Production <i>plus</i> Imports <i>minus</i> Exports): - Eurostat Europroms database	
Do recent trends in business demography provide any insight on the attractiveness of the EU as a location to invest?	Business birth rate	Birth rate (number of enterprise births in the reference period (t) divided by the number of enterprises active in t)	Birth rate: - Eurostat Structural Business Statistics (Business Demography database)	Limited because data only available at 2- or 3-digit level.
	Business death rate	Death rate (number of enterprise deaths in the reference period (t) divided by the number of enterprises active in t)	Death rate: - Eurostat Structural Business Statistics (Business Demography database)	Limited because data only available at 2- or 3-digit level.
	Business churn	Birth rate + death rate	Churn rate: - Eurostat Structural Business Statistics (Business Demography database)	Limited because data only available at 2- or 3-digit level.
	Survival rate	Survival rate x: number of enterprises in the reference	Survival rate: - Eurostat Structural Business Statistics (Business Demography	Limited because data only available at 2- or 3-digit level.

Profit margins (as indicators of investment or relocation decisions): ascertaining the size of profit margins associated with EU production/market to assess the relative attractiveness of the ETS area as a place for further long-term investment

Question	Assessed by:	Measure/ Formula	Data sources	Comment
		period (x) newly born in t-x having survived to t divided by the number of enterprise births in t-x	database	

Annex 2 Data sources

Table 5 Indicators and data sources for qualitative assessments

Indicator	Units	Official source	Measure	Sector detail	Time period	Comment
<i>Abatement potential</i>						
Installations involved in production of the 4-digit NACE sector	number	EUTL (EU ETS registry)	Records each installation covered by EU ETS	NACE 4-digit (Rev.2)	2013-16 (Phase III (part)) 2008-12 (Phase II) 2005-07 (Phase I)	Provides details on those installations covered by the EU ETS
Direct emissions from each installation	kg CO ₂	EUTL (EU ETS registry)	CO ₂ emissions per installation	NACE 4-digit (Rev.2)	2013-16 (Phase III (part)) 2008-12 (Phase II) 2005-07 (Phase I)	Provides details on verified emissions for each installation covered by the EU ETS
Electricity consumption	Kwh	Member States (e.g. NSO, environment/energy ministry, or other competent authority), sectors.	NET electricity consumption (including auto-production)	Should be NACE 4-digit (Rev.2)		
Emissions factor	tCO ₂ /MWh	EC and contractor				Once calculated, this will not change.
Fuel mix (average emission factor)						
Best available technologies		BREFs (where available)				

Indicator	Units	Official source	Measure	Sector detail	Time period	Comment
<u>Market characteristics</u>						
Output prices	index	Eurostat Short-term business statistics	Producer prices - domestic market - non-domestic market Import prices	NACE 4-digit (Rev. 2)	2000-17 Pre-2000 data are patchy	
Input prices	Index	Eurostat Short-term business statistics	Producer prices - domestic market - non-domestic market Import prices Total purchases of goods and services	NACE 4-digit (Rev. 2)	2000-17 Pre-2000 data are patchy	
	euros	Eurostat structural business statistics (SBS) Supply and Use tables	Purchases of inputs	NACE 4-digit (Rev. 2)	2008 – most recent year (2016 ?)	
	euros			NACE 2-digit	Data pre-2008 on NACE Annual	Potentially use to weight Eurostat Short-term business statistics to derive input price index
Turnover	euros	Eurostat Europroms database	Sold production	8-digit Prodcom	1995-2016	First four digits of Prodcom code provide the corresponding NACE sector
		Eurostat Structural Business Statistics (SBS)	Turnover	NACE 4-digit (Rev.2)	2008 – most recent year (2016 ?) Data pre-2008 on	Eurostat SBS used to help fill gaps.

Indicator	Units	Official source	Measure	Sector detail	Time period	Comment
GVA	euros	Eurostat Structural Business Statistics (SBS)	Value added at factor cost	NACE 4-digit (Rev.2)	NACE Rev. 1.1 2008 – most recent year (2016 ?)	
Imports & Exports	euros	Eurostat Europroms database	Imports by value or volume	- Combined Nomenclature 8-digit - CPA (2008) 4-digit (corresponds to NACE Rev.2)	1988-2016	Data pre-2008 on NACE Rev. 1.1
Turnover/GVA by firm size	euros	Eurostat Structural Business Statistics - SMEs	Turnover, by firm size band Value added at factor cost, by firm size band	NACE 2-digit and 3-digit (Rev.2)	2006-15	
Employment by firm size	number	Eurostat Structural Business Statistics - SMEs	Persons employed, by firm size band	NACE 2-digit and 3-digit (Rev.2)	2006-15	
Supply chain	euros	Eurostat Symmetric Input-Output tables	Purchases of intermediate inputs from other sectors; Sales of output to other sectors	NACE 2-digit	Annual, 2008-16	
Domestic demand	euros	Eurostat Europroms database	Apparent domestic demand	Presented at NACE 4-digit	1995-2016	Calculated as: Production + Imports - Exports, using data from Eurostat Europroms database
Foreign ownership	euros, number	Eurostat Structural Business Statistics - Foreign controlled EU enterprises (EU FATS)	- # enterprises - Turnover - Value added - Persons employed	NACE 2-digit (Reve. 2)	2008-15	

Indicator	Units	Official source	Measure	Sector detail	Time period	Comment
		database	- Various others			
<i>Profit margins</i>						
Profit margin	%	Eurostat Structural Business Statistics (SBS)	Gross operating rate	NACE 4-digit (Rev.2)	2008 – most recent year (2016?) Data pre-2008 on NACE Rev. 1.1	Derived from data on turnover, GVA and labour costs.
Turnover	euros	Eurostat Europroms database	Sold production	8-digit Prodcom	1995-2016	First four digits of Prodcom code provide the corresponding NACE sector
		Eurostat Structural Business Statistics (SBS)	Turnover	NACE 4-digit (Rev.2)	2008 – most recent year (2016?) Data pre-2008 on NACE Rev. 1.1	Eurostat SBS used to help fill gaps.
GVA	euros	Eurostat Structural Business Statistics (SBS)	Value added at factor cost	NACE 4-digit (Rev.2)	2008 – most recent year (2016?) Data pre-2008 on NACE Rev. 1.1	
Labour costs	euros	Eurostat Structural Business Statistics (SBS)	Personnel costs	NACE 4-digit (Rev.2)	2008 – most recent year (2016?) Data pre-2008 on NACE Rev. 1.1	
Investment	euros	Eurostat Structural Business Statistics (SBS)	Gross investment in tangible goods Net investment in tangible goods	NACE 4-digit (Rev.2)	2008 – most recent year (2016?) Data pre-2008 on NACE Rev. 1.1	Gross investment is also available for the sub-categories that make up 'tangible goods', these are: land; existing buildings/structures; construction and alteration of buildings; machinery and

Indicator	Units	Official source	Measure	Sector detail	Time period	Comment
Value to weight ratio	euro per kg/unit	Eurostat Europroms database	Sold production - by value - by weight/ volume	Prodcom 8-digit	1995-2016	equipment Where data permit, use value and weight measures to derive value to weight ratio.
			Exports/ imports - by value - by weight/ volume	- Combined Nomenclature 8-digit - CPA (2008) 4-digit (corresponds to NACE Rev.2)	1988-2016	
Domestic demand	euros	Eurostat Europroms database	Apparent domestic demand	Presented at NACE 4-digit	1995-2016	Calculated as: Production + Imports -Exports, using data from Eurostat Prodcom and Comext database

Links to key sources

- Eurostat Europroms: <http://epp.eurostat.ec.europa.eu/newxtweb/>
- Eurostat Structural Business Statistics: <http://ec.europa.eu/eurostat/web/structural-business-statistics/overview>
- Eurostat Short-term Business Statistics: <http://ec.europa.eu/eurostat/web/short-term-business-statistics/overview>
- Eurostat Input-Output tables and Supply and Use tables: <http://ec.europa.eu/eurostat/web/esa-supply-use-input-tables/overview>
- EUTL (ETS): <http://ec.europa.eu/environment/ets/welcome.do>

Annex 3 Guidelines for assessment by the Commission

Task 1: The initial assessment of applications will include checks of eligibility, completeness of the files, verification requirements and data sources used.

The Commission will check:

- if the Carbon Leakage indicator for the 4-digit NACE sector lies between 0.15 and 0.2;
- if the Emissions Intensity indicator for the 4-digit NACE sector is >1.5; or,
- if the 4-digit NACE sector uses refinery-related product benchmarks.

If any of these conditions holds, then the sector is eligible to apply for a Qualitative Assessment.

The Commission will carry out the initial assessment within two weeks of receiving the application. In case an application is deemed incomplete, the applying sector will be informed accordingly and invited to provide the missing information within two weeks.

Task 2: Assuming the sector is entitled to apply for a Qualitative Assessment, the next task for the Commission, once the application and detailed supporting evidence has been received, is to assess the validity and completeness of the application.

This involves:

- Assessing the validity of the application and completeness of the data/evidence put forward
 - The Commission reviews the data provided and checks that the data are complete, i.e. that the sector has:
 - Provided data for 2014, 2015 and 2016
 - Data have been provided for all the variables required to assess each pillar and its impact on the risk of carbon leakage; and that these are in the correct units
 - Used the default data and methods and, if not, has provided detailed description and justification for the alternative data and methods used
 - Assess if the supporting data meets the quality criteria described in Section 5 with respect to representativeness, robustness and consistency of the data, and the traceability of all calculations.
 - The Commission will review the data provided and check that the data and methods have been independently audited and verified as required.
 - This may require asking the sector to provide documentary evidence (e.g. in the form of a letter or report from the auditor/verifier) that the data it is presenting have been reviewed and approved/verified by an independent third party.
- Checking the accuracy of the data provided to support the application.
 - Using the data sources and methods outlined, the Commission:
 - checks that the input data are correct (correct source, dataset, sector code, indicator, unit, year etc) and are valid if they come from a non-default source
 - checks that any manipulations/calculations have been applied correctly
 - assuming the data and calculations are correct and consistent, verify that the data values provided in the data template are correct and accurate
 - If additional methods or data sources have been used to complement the default method and data, the Commission will review the data and workings (which should have been provided with the original application). The Commission will check if the data and methods have been used correctly and the calculated values are consistent with these. Any additional data and methods used by the sector should be independently verified. The sector must confirm this in the form of a letter or report from the verifier.

- If there are errors or inconsistencies, the Commission will work with the sector to understand these and come to a resolution based on the default method and data sources.

The Commission will then proceed to assess the risk of carbon leakage for the sector using the analytical framework and the data provided by the sector for the indicators under each pillar. The Commission assesses each pillar individually and then comes to a conclusion (on the risk of carbon leakage) by making a combined assessment across the pillars.

Each pillar will be assessed against the criteria in the tables below, using the evidence provided by the sector for the key questions/indicators of interest under each pillar (see Tables 6-8).

*The Commission will produce an **assessment report** based on Tasks 1 and 2. This will detail the Commission's findings and assessment of the application. It will confirm or not, if the sector is eligible to apply for a Qualitative Assessment. It will also confirm if all inputs have been received and are complete and correct; use the default data sources/methods; data meet the quality criteria; and any alternative data/methods have been audited/verified and described in detail.*

If the Commission is satisfied that:

- *the application is valid and complete; and,*
- *the correct (default) data and methods have been used correctly and any additional methods have been verified/audited, the application will be assessed on the risk of carbon leakage using the evidence provided by the sector for the key questions/indicators of interest under each pillar and by making a combined assessment across the pillars.*

Table 6 Criteria for assessing abatement potential

Scope to reduce emissions and electricity consumption			
		<i>Scope to reduce emissions and/or electricity consumption further</i>	<i>No scope to reduce emissions and/or electricity consumption further</i>
1	Direct emissions intensity	High/above average for manufacturing Not falling High compared to best available technologies	Low/below average for manufacturing Falling for some time Low compared to (or in line with) best available technologies
2	Electricity consumption intensity	High/above average for manufacturing Not falling High compared to best available technologies	Low/below average for manufacturing Falling for some time Low compared to (or in line with) best available technologies
3	Indirect emissions intensity	High/above average for manufacturing Not falling High compared to best available technologies	Low/below average for manufacturing Falling for some time Low compared to (or in line with) best available technologies
4	Current fuel mix	High % of fossil fuels	Low % of fossil fuels
5	Penetration of best available technologies	Low	Already high
6	Impact of full adoption of most efficient techniques on emissions	Marked fall in emissions	Small fall in emissions
7	Impact of investment on profit margins	Weak/ little change	Strong/ large reduction
8	Opportunity cost of foregone investment in existing technologies	Low	High
9	Penetration of alternative fuels	Low	Already high
10	Impact of full adoption of alternative fuels on emissions	Marked fall in emissions	Small fall in emissions
11	Impact of investment in alternative fuels on profit margins	Weak/ little change	Strong/ large reduction
12	Opportunity cost of foregone investment in fossil fuel technologies	Low	High

Table 7 Criteria for assessing scope for passing on costs

Scope for cost pass through			
		<i>Costs can be passed on easily</i>	<i>Difficult to pass costs on</i>
1	Output prices	Follow production costs	Do not move with production costs
2	Common reference price set globally	No	Yes
3	Bargaining position - Industrial structure	More concentrated than or large firms account for larger share, compared to downstream sectors	Less concentrated than or small firms account for larger share, compared to downstream sectors
4	Bargaining position – pricing power	Sector output has high value-added content	Sector output has a low value-added content
5	Bargaining position - Availability of/competition from substitute products	Low	High
6	Bargaining position - dependence	Downstream sector heavily reliant on sector (high % of inputs come from the sector) and/or Sales to downstream sector are a small % of total sales	Downstream sector not reliant on sector (low % of inputs come from the sector) and/or Sales to the downstream sector are a high % of total sales
7	Domestic demand	Strong/growing fast	Weak/slow or negative growth
8	Import penetration	Low/falling	High/growing
9	Import prices	Higher/rising	Lower/falling

Table 8 Criteria for assessing profit margin pillar

Profit margins			
		<i>No incentive to relocate/invest abroad</i>	<i>Incentive to relocate/invest abroad</i>
1	Profit margins	High	Low
2	Business cycle: are profit margins consistent with the stage of the business cycle	High profit margins when sector/market growing (fast); low profit margins when sector/market growing slowly or contracting	Low profit margins when market growing (fast); negative margins at any stage
3	Projections for future demand in the EU ETS area	Strong/accelerating growth In line with or faster than in other countries outside the EU ETS	Slowing/contracting Not as fast as in other countries outside EU ETS

4	Projections for future costs/prices/profit margins	Margins to hold or widen Margins in line with or wider than in other countries outside the EU ETS	Margins to narrow Margins smaller than in other countries outside the EU ETS
5	Substitute products with preferential CCL treatment	No	Yes
6	Value to weight ratio	Low	High
7	Current trade patterns	No or little trade in good (routes and infrastructure not already set up; indicator that trading from new location may be difficult)	Good already heavily traded (routes and infrastructure already set up; indicator that relocation is feasible)
8	Investment in the sector in the EU ETS area	High/growing In line with or faster than in other countries outside EU ETS	Low/falling Slower than in other countries outside EU ETS
9	Net trade balance	High/widening	Low or negative/narrowing (indicative of relocation in action)
10	Import penetration	Low/flat or falling	High/growing
11	Business demography	Sector characterised by high birth rate, low death rate, high survival rate	Sector characterised by low birth rate, high death rate, low survival rate

From this, the Commission will have a clear assessment for each pillar. On a basis of a combined assessment, the Commission will make a conclusion on the risk of carbon leakage, based on the extent to which the argument (no abatement potential; no/little scope for passing on costs; low/negative profit margins) is supported:

- Weak evidence to support the argument;
- Strong evidence to support the argument.

The conclusion is straightforward where the findings for each pillar suggest a strong risk of carbon leakage, or where the findings for each pillar suggest no risk of carbon leakage.

In cases where strong evidence is provided for all three criteria, the Commission will assess the arguments in view of the likely magnitude of carbon leakage exposure risk. When this assessment concludes that the sector is to be considered less exposed to carbon leakage risks, the sector should not be included on the Carbon Leakage List.

The challenge will lie in making a conclusion where the evidence across the pillars is mixed, e.g. where the evidence to support the argument is strong for one pillar, while for the other two pillars it is weak or there is none.

In these cases, the Commission will:

- Review the role of the sector in the wider supply chain/economy and its contribution to GVA, employment, trade, emissions and electricity consumption.
- Assess the findings for each pillar against the findings for the others to deepen the analysis and check the assessment, e.g. does the assessment for profit margins make sense given the market/industry characteristics?
- Assess if pillars should be given different weightings in the assessment, for example because there is one pillar weak the sector cannot do anything about.
- If required, identify additional indicators for a pillar and reassess the conclusion for the pillar.
- Where available, review projections for future industry/market performance and implications for EU industry and emissions, e.g. is there a possibility to modernise in the sector, are projections in line with resource efficiency/ circular economy?

Having reviewed the above, the Commission will make the overall assessment and conclusion on the risk of carbon leakage.