Response to Mandate M/431

"GHG emissions in energy-intensive industries"

Summary of major conclusions

Based on the two-track approach both Working Groups have identified specific needs for future standardization.

The gap analysis of WG 33 has shown that there is both a need for a generic standard to cover the process related GHG emissions and a need for six sector-specific standards corresponding to the characteristics of the participating industries. Of particular importance, WG 33 considered the validation of the foreseen generic standard (applicable to all energy-intensive industries). The validation becomes of increasing importance due to the MRV (measure, report, verify) principle. The discussions have shown that there is a urgent need in energy intensive industries for standards regarding the assessment of greenhouse-gas emissions. Therefore the development of standards, as recommended in this report, should not be further delayed.

BT WG 210 recommends to initiate the development of a standard on GHG emissions related to basic and intermediary products of energy intensive industries. Besides the recommendation to initiate a standards development, BT/WG 210 saw great need to harmonize any future standardization work on CEN and ISO level and coordinate it with other initiatives.

Aspects of particular importance, but not exclusively, to the energy intensive industries include:

- Calculating electricity from renewable resources;
- Allocation in particular with regard to recycling and the use of secondary fuels;
- Energy mix including low carbon sources;
- Impact of extractive and mining activities;
- Handling of variable supply chains, including calculating rules;
- Carbon capture and storage;
- Climate change impact of transport;
- Quantifying energy efficiency and raw material efficiency;
- Approach to other environmental impact categories.

Apart from those particular issues some general aspects have been identified that would benefit from a standardization process.

The future standards should have an international impact as the mandate is also supporting international action on climate change.

The development of standards for processes and products should as far as possible be coordinated.

Table of Contents

Introduction

The following introduction has been jointly drafted by the leadership of CEN/TC 264/WG 33 and CEN/BT WG 210, the groups that have been tasked with the execution of mandate M/431.

1.1 Background

The programming mandate M/431 is embedded in the new approach of the EU industrial policy. The Commission has the opinion that with a view to international developments and subject to already existing legislation (such as the EU ETS MRG), the work for developing a methodology for assessing direct and indirect emissions from energy-intensive industries would be best achieved by European Standards.

The programming mandate was first sent to CEN on October 15, 2008. On December 2, 2008 CEN launched the ballot among its members about whether the mandate should be accepted, together with a proposal how to allocate the work within CEN. After having received some comments by CEN members, the proposal was slightly changed and finally agreed by CEN/BT Resolution 1/2009 on February 19, 2009.

1.2 Allocation of work

It was decided by CEN/BT that the mandate should be executed in two parts:

One part of the work was allocated to WG 33 of CEN/TC 264 Air Quality.

This part should address the following topics:

- Process related GHG (indirect and direct) emissions assessment
- GHG quantification/calculation
- Uncertainty assessment
- Preparation of a deliverable including an inventory, a gap analysis and recommendations for any future standardization work, if relevant.

The secretariat of CEN/TC 264/WG 33 was allocated to the German standards body DIN Deutsches Institut für Normung e.V. The convenor of this group was Ferdinand Hencks, representing the Luxembourg Ministry of Economy and Foreign Trade.

For the other part of the work a new BT/WG 210 “GHG emissions in energy-intensive industries” was set up.

This part should address the following topics:

- Emission metrics (labelling, LCA, etc.)
- GHG emission performance (indicators) for the different sectors
- Environmental management systems and corporate responsibility
- Preparation of a deliverable including an inventory, a gap analysis and recommendations for any future standardization work, if relevant.

The secretariat of BT/WG 210 too was allocated to the German standards body DIN Deutsches Institut für Normung e.V. The convenor of this group was Christian Hochfeld, Member of the Executive Board of the Öko-Institut in Berlin, Germany (in March 2010 succeeded by Stefan Seum, also from Öko-Institut).

The close cooperation between the two groups tasked with the execution of the mandate, as stressed by CEN BT, was considered as absolutely necessary to fulfil the requirements laid down in the mandate.

CEN BT asked both CEN/TC 264/WG 33 and the new BT/WG 210, when preparing recommendations for any further standardization work, to consider whether such activities should be European or international.

Within the mandate the term “energy intensive industries” is specified according to the Communication of the European Commission COM (2005) 474. These include:

- Aluminium
- Cement
- Ceramics
- Chemicals
- Glass
- Lime
- Non-ferrous Metals
- Pulp and Paper
- Rubber
- Steel and Steel Alloys

1.3 Participation

Although all industries have been invited to participate in the work, not all of them did actually contribute.

Industry experts have either been participating as NSB delegates, liaison officers from other CEN/TCs or as representatives of external liaison partners. This ensured that the relevant industry federations have been represented. Furthermore, the European Trade Union Institute (ETUI) did participate in the work.

A large number of CEN members have been active in the work, either by delegating experts to the Working Groups and/or by mirroring the activities on a national level.

Representatives of the European Commission have regularly been attending meetings of both working groups.

1.4 Timeframe

As described above the mandate requires that “CEN shall present its recommendations for a standardisation programme to the Commission within 12 months from acceptance of the mandate”.

The timeframe was not respected because of the need for coordinating the product (BT/WG 210) and process (CEN/TC 264/WG 33) related work in the most effective way.

An extension of the deadline for providing the final report has been requested from the European Commission.

1.5 Definition of scope

BT/WG 210 has been focussing on basic and fundamental intermediary products of energy intensive industries (e.g. aluminium) and not final consumer products (e.g. aluminium can). Therefore, BT/WG 210 focused its work on the cradle to gate approach rather than considering the full life cycle of a product (cradle to grave).

CEN/TC 264/WG 33, in contrary, focused on the green house gas performance of industrial production processes, with the aim of improving them continuously.

The European Commission indicated expectations that BT/WG 210 would work on technical standards and methodology standards, rather than on management related standards. Therefore, environmental management system standards have been excluded from the original scope of BT/WG 210, in agreement with representatives of the European Commission.

1.6 Structure of report

Following this introduction are the inventories, gap analyses and conclusions from each of the working groups tasked with the execution of the mandate.

2 Report of WG 33

Part A: Common generic aspects to the industry sectors

2.1 Gap analyses/standardization programme

The goal of the standardisation programme is the development of a harmonised tool for assessing GHG emissions from individual plants i.e. a coherent set of standards (including a generic standard and, if necessary, relevant daughter standards) on the quantification of GHG emissions.

To execute the mandate prerequisites have to be fulfilled: perform a gap analysis and formulate the corresponding terms of reference (TOR). The objective of the gap analysis is to avoid duplication of work. Therefore an inventory of the existing documents (standards, guidelines, voluntary protocols etc.) is set up to detect gaps.

On the basis of the gap analysis WG 33 formulates the TOR to develop the standardization programme.

2.2 Terms of Reference (TOR)

The following TOR (general principles, derived requirements and a reference frame with common performance assessment rules) constitute the general basis for the development of the standardization programme.

2.2.1 General principles for GHG monitoring and reporting (generic) standards put forward in ISO 14064

1. Relevance: Ensure that the GHG performance assessment appropriately reflects the GHG emissions of the company and serves the decision-making needs of users – both internal and external to the company.

2. Completeness: Account for and report on all GHG emission sources and activities within the chosen boundary for performance assessment. Disclose and justify any specific exclusion.

3. Consistency: Use consistent methodologies to allow for meaningful comparison of emissions over time. Transparently document any changes to the data, performance boundary, methods, or any other relevant factors in the time series.

4. Transparency: Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.

5. Accuracy: Ensure that the quantification of GHG emissions is systematically neither over nor under actual emissions, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable assurance as to the integrity of the reported information.

2.2.2 Requirements that a generic standard has to comply with legislative aspects and with public and industrial requirements

R 1 Comprehensive and flexible; allow monitoring and reporting for different purposes	R 7 Provide rules for verification depending on purpose
R 2 Generic guidance and rules on boundaries for different purposes	R 8 Provide inventory at relevant system with rules for aggregation.
R 3 Provide the basis for concrete methods for calculations	R 9 Provide rules for back-calculation and neutrality after corporate restructuring
R 4 Include concept of materiality	R 10 Define performance indicators
R 5 Provide concrete levels for uncertainty, assurance and materiality	R 11 Result from a stakeholder driven process
R 6 Provide verification criteria	

2.2.3 Reference frame with Common Performance Assessment Rules

The reference frame setting common rules to the EII's sectors may be the main basis for the development of a generic standard. The reference frame should in particular enable the EII's sectors to establish methodologies for CO_2 process performance assessment.

<u>The process performance assessment approach</u>

To consider the process performance in an objective way the indirect emissions should be considered by taking in account the set boundaries. To define a basis for comparability of the CO_2 performance of specific processes or production systems in a defined boundary a performance indicator of the process has to be established. It is expressed by kg CO_2 equivalent / t product resulting from the production process (reference product).

In so far the performance of a production process is related to the resulting (intermediate) product (e.g. klinker).

The performance approach shall:

- allow fair comparison of systems by providing an indication on the quality of operation of a site rather than on its structure;
- identify the performance of individual operators in charge of the considered process.
- In case of production systems in a defined boundary assess how much the different processes weigh;
- identify the potential for improvement as compared to a performance indicator; and
- document progress.

The sector-specific calculation methodologies may be validated against the set rules.

Rules

- Definition of the assessment boundary (limitation of comparisons). The system may include all or part of the processes depending on the purpose. The boundary is associated to a reference product for a single process or different reference products in case of multiple steps process (processing route).
- Identify all inputs (e.g. those carrying indirect emissions) and outputs of the production process, which have an impact on GHG performance (materials, energies, products and by-products). Even if a materiality threshold with a very minor impact on the performance is applied to exclude non-significant flows, it must be clearly identified and justified.
- Collect flow and analysis data on inputs and outputs identifying their source and ensuring the highest possible accuracy. Depending on the assessment boundary, data can be collected globally for a site or at the level of each process included in the boundary.
- Prepare a complete material flow ensuring a correct balance between inputs and outputs at each process stage.
- Fix and link indirect emissions to the boundary.
- Rules for aggregation of multi-process activities for different purposes.
- Lists with definitions of the different parameters used for assessment in order to avoid wrong referencing of data (reference product, by-product, energies etc.).
- Rules of accounting of limited resources such as raw materials, by-products, use of complementary information, check of mass balance.
  - Standardized measurement techniques: rules for sampling and analysing products;
  - mass and volumetric measurements or determination of calorific values.
- Standardized rules ensuring quality of data and similar treatment by means of crosschecks, use of complementary information, check of mass balance…
- Appropriate rules for calculation of CO_2 emissions for the assessment boundary completed by specific methods.
- Specific Rules for calculating direct combustion emissions.
- Guidance on uncertainty assessment.
- Calculation rules:
  - Calculate the CO_2 emissions related to a considered production process i.e. the sum of direct and indirect emissions (kg $CO_{2\ equiv.}$) and report them to 1 t of the reference product. These unit based emissions in defined boundary and time scale represent the performance of the product of a process / system (kg $CO_{2\ equiv.}$ / t $_{ref.\ product}$).
  - The weighted average of realized unit based emissions for the same reference product represents the performance for that product.
  - The reference performance enables comparability between processes with the same reference product.
  - Consider actually realized performances by different operators for the same process to compare their performances against the reference performance.

- A gap to the reference performance or a ratio between achieved performance and reference performance draws the performance indicator of the process.

  The evolution of the indicator will give realistic assessment of the evolution of process performance.

2.2.4 Constraints/risk, success factors and sustainability

Constraints

It is obvious that in the application of the future standards the EU legal requirements have to be respected.

Risk factors

The risk of not developing the foreseen standards (see gap analysis, Part B) entails no harmonised process related methodologies within the industrial sectors leading to the situation that the data used and the results are neither comparable nor verifiable.

Success factors

The extra value of the foreseen standards is

- harmonisation on the basis of already existing process related and sector-specific methodologies,
- an overall description of the GHG effects of a production process,
- potential to support the intensifying efforts of developing and strengthening Climate Change Policies on the international level,
- the conformity to the MRV (measure, report, verify) principle claimed at the Copenhagen conference.

Sustainability

The benefits from the drawn programme especially for the concerned EC policies and CEN shall be likely to be continued.

Part B: Specific aspects to the industry sectors

2.3 Result of the gap analyses performed by the participating industries

The participating industries have provided reports to WG 33 to formulate terms of reference (see Part A) and to perform the gap analysis. The result of the gap analysis is the following:

2.3.1 Cement[1]

The ultimate goal of this gap analysis is to investigate whether and to which extent there is a need for the development of supplementary EN standards, to (i) determine GHG performance levels, (ii) assess potential for improvement, and (iii) support international actions on climate change related to EU Climate Change policies. The analysis follows four steps:

Step 1: Determine the requirements that a standard for the cement industry has to comply with.

Step 2: Identify the standards and guidelines, existing or under development, relevant for the standardisation of GHG emissions monitoring and reporting in energy intensive industries.

Step 3: Characterize of standards across their main features.

Step 4: Analyse the gaps, identifying features that do not comply with the requirements.

The following eleven key requirements for a standard are identified:

Table S-1: Requirements for a standard for GHG emissions monitoring and reporting in the cement industry

Requirements	
R1	The standard should be comprehensive but also flexible, to allow for monitoring and reporting for different purposes.
R2	The standard should give generic guidance on boundaries (i.e. coverage of emission sources) and levels of detail required for different reporting purposes, to ensure meaningful and fair comparisons. More specific guidance will be expected to be provided by the scheme or programme under which emissions are monitored and reported.
R3	Provide concrete methods for measurement and calculation.
R4	Include the concept of materiality and allow default values for non-material emission sources.
R5	Provide concrete levels of assurance, as well as rules concerning materiality and allowed uncertainty.
R6	Provide verification requirements.
R7	Provide rules for accreditation and verification depending on the reporting purpose.
R8	Provide for inventory compilation at plant level with aggregation rules for corporate reporting.
R9	Provide rules for back-calculating baseline emissions at corporate level.
R10	Define performance indicators against which the emissions are compared.
R11	Result from a balanced process supported by all stakeholders (science, regulators, users, standardization bodies).

[1] This is an extract of the executive summary of the First Climate report entitled "Gap analysis of GHG emission standards for the cement industry", 09.02.2010

These requirements are considered as having a common value for the participating industries (c.f. 1242).

A key finding of this gap analysis is that the envisaged standard(s) should be geared towards the monitoring and reporting of emissions from specific industrial production processes, rather than to comprehensive analysis of different products. We find that existing standards dealing with the analysis of product-related emissions, in the sense of life-cycle analyses, are not of direct relevance for the envisaged standards. Rather, the envisaged new standards should provide for harmonized determination of emissions from selected production processes which can be used as an *input* for more comprehensive, life-cycle type analyses under other standards, such as ISO 14040 ff.

With this background, four existing guidelines and protocols (collectively "existing standards") are assessed to be relevant. (i) ISO 14064-1 / 14064-3 / 14065 ; (ii) Monitoring Guidelines for the EU ETS; (iii) US EPA Rule for Mandatory GHG Reporting ; (iv) WBCSD CSI Cement CO2 Protocol.

Their gaps identified are summarized in Table S-2:

Table S-2: Key gaps in GHG accounting standards compared to the standard to be developed (■= gap; □= partial gap)

Criteria / Gaps	Related Requirements	ISO 14064/ 65	EU ETS Mon. GL	US EPA Rule	CSI Protocol
Comprehensive accounting for all direct emissions	R1		■	■	
Account for all relevant indirect emissions required for comparative assertions	R1, R2		■	■	
Specification of different inventory boundaries	R1, R2		■	■	
Sector specific suitable measurement techniques	R3	■	□	□	■ [1]
Sector specific calculation rules for emission determination	R4, R5	■	□	□	
Concrete verification requirements	R6	■	□	□	■ [1]
Coherent verification procedures and rules for accreditation	R7		□	□[2]	□
Suitable key performance indicators for comparative assertions	R10	■	■	■	
Guideline is the result of a standardisation process	R11		■	■	■

[1] This gap will be largely covered in version 3 of the CSI protocol.

[2] Verification by EPA may entail gaps, depending on the level of detail and assurance expected from the verification.

ISO 14064 provides a sound generic framework for GHG accounting. However, it completely lacks the concrete specifications required for harmonised calculation, measurement and verification throughout the cement industry, or other industries.

NOTE A generic standard shall provide these specifications.

The US and EU monitoring rules, in contrast, do provide industry-specific guidance. However, they limit the boundaries of the GHG inventory to a rigid and narrow scope of the main direct emissions. With respect to measurement techniques for, e.g., mass and volumetric measurements or determination of calorific values, the EU and US monitoring rules provide some guidance, while ISO 14064 / 65 and the CSI Protocol are currently silent.

The CSI Protocol is today the only rule specifically geared towards assessing and comparing plants and companies in the cement sector. Consequently, the Protocol is found to have the least gaps. Among the gaps identified, the lack of guidance on measurements techniques is expected to be amended by the current revision of the protocol. The main gap of the CSI Protocol is the fact that is not the result of an official standardization initiative. This could be overcome by subjecting it to a standardization process, followed by publication as an official standard.

In this manner, a sectoral standard building on the CSI Protocol could complement in an ideal manner the generic framework of ISO 14064-1 / 14064-3 / 14065.

2.3.2 Lime

In order to comply with the requirements of ISO 14064-1 a certain number of standards – either existing or to be developed have to be included in the reporting of GHG emissions of EU lime plants. A generic standard on process performance assessment is necessary.

Concerning the sector-specific aspects there is a need for harmonizing the calculation of direct decarbonation emissions and the accounting rules between countries for direct combustion emissions. These specific aspects may be included in the standardization work by the following points:

- rules for accounting the emission factors of lime and LKD decarbonation CO_2 emissions;
- rules for sampling and analyzing products and input materials;
- definition of acceptable levels of accuracy, not dependent on the amount of CO_2 emitted by the installation;
- material flow for inputs / outputs;
- generic standard for the assessment of direct combustion emissions.

Concerning indirect emissions the use of a harmonized way for uniform upstream values [sector-specific] for input and for output is required.

Performance assessment may be realized by calculating the CO_2 intensity for the determined reference product of the boundary or each of the processes included in the boundary.

2.3.3 Steel

A long list of available documents has been investigated:

Standards: ISO 14064 – 14065 – 14066 – 14069 – activities of ISO/TC 17

Guidelines: EU ETS Monitoring Guidelines – IPCC

Initiatives: GHG Protocol, World steel sectoral methodology, Reges, DEFRA.

Many of these documents are dealing with management, verification and are quantification oriented towards inventories (absolute emissions).

Particularly the steel related activities of ISO/TC 17 do not allow comparison between similar production processes of different sites as requested by the scope of the mandate. For this purpose there is a need to develop a generic process performance assessment standard. To be noticed that process efficiency i.e. process performance (claimed by the mandate) is different from energy efficiency claimed by ISO/TC 17 as support for standardization of measurement methodologies.

Being still under development, ISO 14067 Standards will be designed to characterize finished products by means of Life Cycle Inventory or Life Cycle Assessment. The results can be used for comparing materials when determined, for a large enough boundary not the operating performance of producers since they are strongly influenced by the production structures and the weight of indirect emissions impacted by events out of control of the operator.

A clear separation has to be made between the characterization of finished products by means of LCI / LCA and the process related work assigned to WG 33. For the first category there exist already standards whereas for the second category there is a need for a coherent set of process related standards.

Until now there are no methods which allow fully comparable and process related GHG performance assessment.

2.3.4 Aluminium industry

The gap analysis shows that there is no need to consider standardization work for products.

There are a number of LCA standards in place for this purpose, like the ISO 14040, 14044, 14064 standards and the ongoing work on ISO 14067 will specifically address GHG emissions from products.

For direct process and plant based emissions we see an advantage in developing standards for GHG monitoring and reporting the direct emissions from alumine refineries, primary smelters, anode baking plants and recycling plants. For quantification of process and plant related emissions there are few standards, but a number of industry and guideline documents which can be used as a basis for a standard.

Examples of these are:

- WBSCB/WRI Aluminium sector GHG protocol developed by the International Aluminium Institutes (IAI) and also used as basis for the IPCC Technical Guidance Document.
- Protocol for PFC (CF_4 and C_2F_6) measurement developed by US EPA and IAI.
- EU monitoring guideline documents for ETS.

These documents can be transformed into the aluminium specific part of a future standard, which needs to have sufficient detail and specificity for individual operations to be able to report comparable data for the purpose of accurate reporting of emissions.

2.3.5 Ferroalloys

A common denominator has to be found (→ future standards) between existing general standards (ISO 14040, ISO 14064 etc.) sector-specific guidelines and different national reporting standards, also within the EU.

A generic standard could fulfill this purpose. Particularly there is a need to define rules how to handle bio-carbon, scarce resources and how to calculate indirect emissions. These specific aspects may be treated by generic rules.

2.3.6 Chlorine industry

The chlor-alkali industry is characterised by the practical absence of direct GHG emissions. It follows that only indirect emissions from steam and electricity (mainly CO_2) have to be considered.

The real emissions are partly influenced by the structure of the production units, but strongly by local factors (source of energy used by electricity or steam producers).

There is no common way of measurement of these emissions and of defining boundary accepted today by the chlor-alkali industry. Therefore there is a need for harmonisation.

The accounting for indirect emissions related to electricity production (and perhaps also steam production) may preferably be treated by generic rules.

2.3.7 Synthesis of the gap analyses

- None of the ISO Standards/guidelines which were included in the gap analysis allow the assessment of process related GHG emission performance. Therefore industries agreed on the need to develop such standards.
  The general principles for monitoring GHG emissions according to ISO 14064 are applicable with respect to the foreseen generic standard.
- Particularly the cement, the lime and the aluminium industries consider the relevant WBCSD protocols as basis for sector-specific standardization.
  Concerning the steel industry the ISO/TC 17 proposal provide a CO_2 and energy indicator at site level but does not address process efficiency. The ISO initiative is suited to establish a simple, robust and comparable monitoring of GHG emissions of a production site considering that no information is provided on the GHG performances of the process operated on the site. Therefore the steel industry supports the development of a standard establishing a set of generic rules against which specific calculation methodologies shall be validated.
- As conclusion it has to be noticed that the exercise of the gap analysis showed the need for further standardisation work in this sector.

2.4 Characteristics of the industry sectors: Emission sources and process description

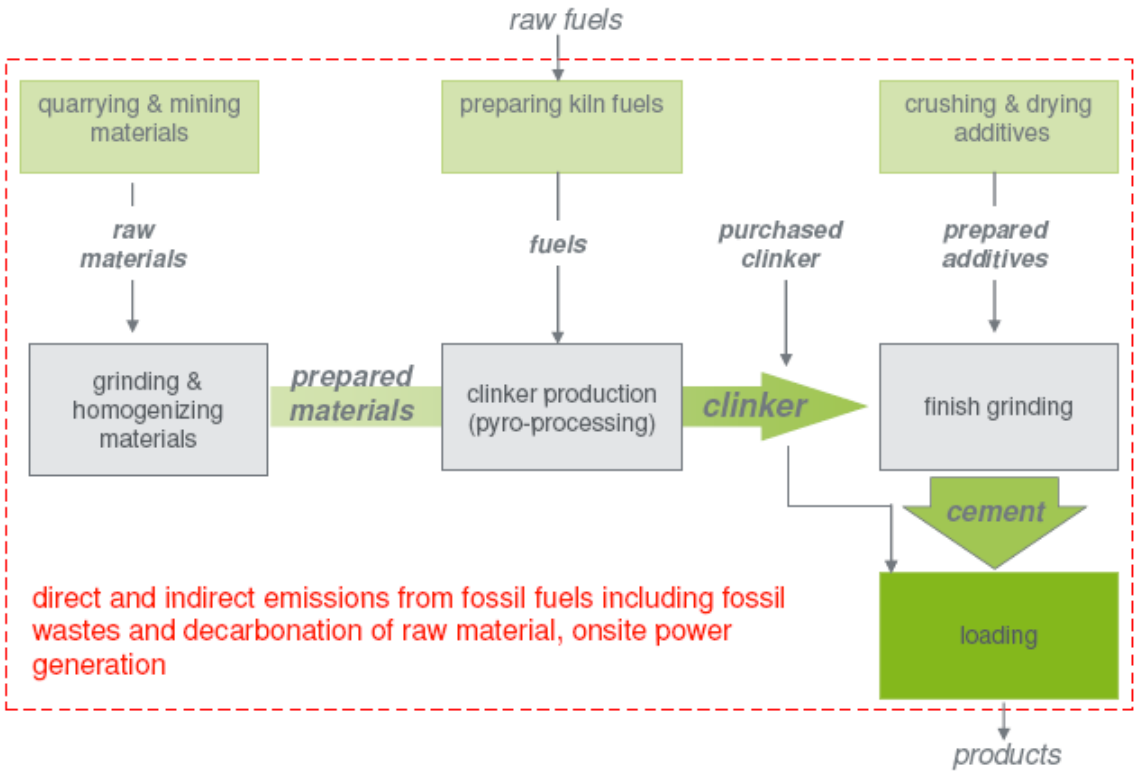
2.4.1 Cement sector

Emission sources

- Two main sources of direct CO_2 emissions in the production process: combustion and kiln fuels, calcination of raw materials in the pyroprocessing stage.
- Another source of direct emissions is due to non-kiln fuels (e.g. dryers, room heating, ore-site transports.
- Indirect emissions are due to external power production and transports.
- Non-CO_2 GHGs are not relevant.

Process steps and system boundaries for emissions reporting according CSi protocol

They are shown by the following scheme.



2.4.2 Lime sector

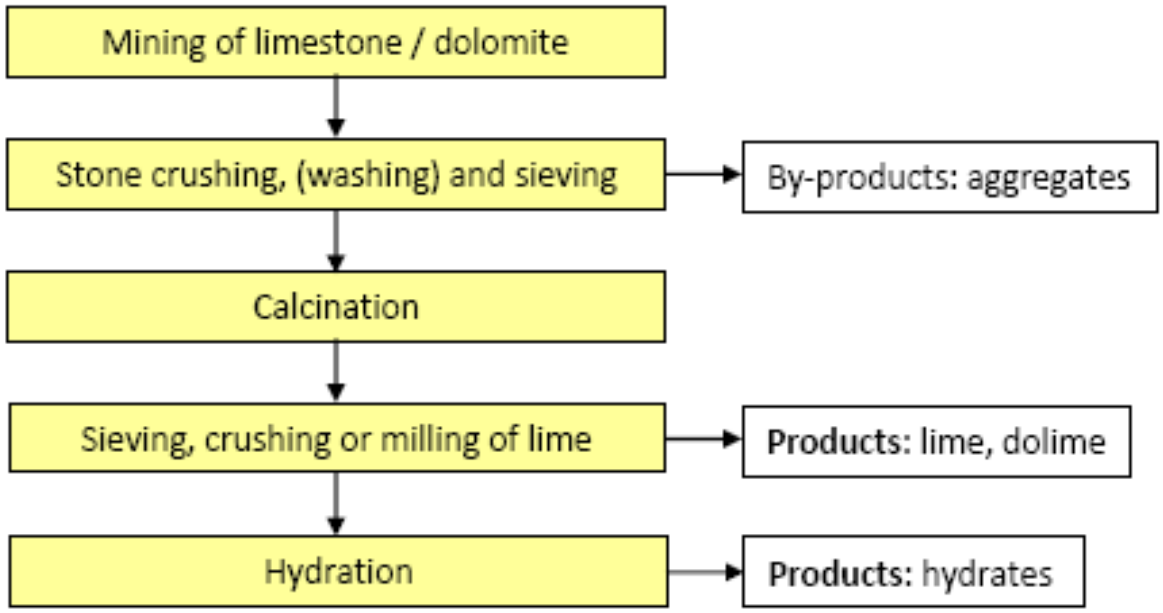
Emission sources

- **"Decarbonation CO_2"** is generated by the decarbonation of the limestone when it is transformed into lime. These CO_2 emissions are defined by the stoechiometry of the chemical reaction and cannot be reduced without deterioration of the final product quality. They represent 70 % of the total CO_2 emissions.
- **"Combustion CO_2"** is generated by the combustion of fuel, which is used to produce the heat needed to drive the $c_h$emical reaction and depends on the type of fuel mix used. On average 30 % of the total CO_2 emissions originate here.

- Another source of direct emissions is that from mobile sources.
- Specific are the direct GHG removals (CO_2 sequestration from on site PCC production).
- Indirect emissions are due to electricity purchase, imported raw material (e.g. lime from external sources or burned products) and transportation.
- Non-CO_2 – GHG such as CH_4 and N_2O may be considered.

Process steps

They are shown by the following scheme:



2.4.3 Iron and steel sector

Emission sources

The main emission sources in the iron and steel sector are solid fuels and carbonated fluxes (limestone). The level of emission is primarily affected by the choice of the production route (primary metal production or scrap recycling) and for each type of site by the capacity. However, the possibility to exchange a number of intermediate products in significant quantities affects the level of inventory and the CO_2 intensity whatever product is chosen as reference.

Process steps

The production of steel is a complex process due to a number of factors:

- It results from a multiple step production route incorporating a variety of process technologies with different plant layouts. These processes interact with each other and a change at one level can cascade to other upstream or downstream processes.
- The raw materials used are of different origin and vary strongly from one site to another one. Since these raw materials cannot be always used in their primary form, specific preparation has to be done using adapted processes.
- The ability of steel to be recycled indefinitely creates further difference depending on access to this recovered material.

- Intermediate products like coke or pig iron can be extensively exchanged between sites to optimise the production chain and capacity utilization.

2.4.4 Aluminum industry

Emission sources

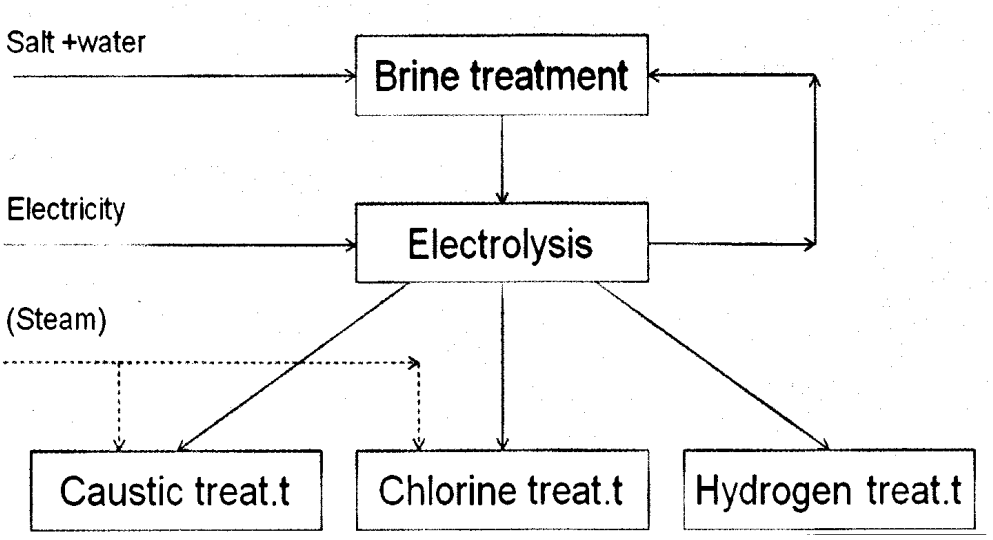
- Process emissions from the anode plants consisting of CO_2 from fuel use and CO_2 from the combustion of coal tar pitch volatiles from the baking process.
- Process emissions from the electrolysis process, consisting of CO_2 from the reaction between oxygen from the aluminium oxide and the carbon from the anodes, which are consumed in this process.
- Non-CO_2 GHG emissions: PFC emissions occurring during anode effects in the electrolysis cells.
- Fuel based emissions from refineries and recycling plants.

2.4.5 Chlorine sector (inorganic basic chemicals)

Emission sources

- Basically no direct CO_2-GHG emissions coming from the process. (Electrolysis)
- Important indirect CO_2 emissions related to the energy consumed:
  - electricity, usually bought from the grid is considered as a raw material,
  - steam usually produced at the site level (but not included in the boundary of the chlorine production) or even bought from external Company.
- Main other raw material is salt, supplied in different form (solution, solid not purified or solid purified) leading to different energy consumption (indirect GHG emissions) in the main process.
- Main technologies in use, leading to different ratios electricity/steam;

Boundary of electrolysis processes for chlorine



- Upstream
  - brine or salt production/purification/transport (to include as indirect emissions?)
  - water purification item)
  - energy production usually not included in the boundary.
- Downstream
  - treatment of products (purification of chlorine, compression of hydrogen, concentration of caustic soda ...), according to customers' requirements.

2.4.6 Ferroalloys sector

Sources of emissions and the related process

- Ferroalloys are principally produced either by the carbothermic or metallothermic reduction of oxidic ores or concentrates in Submerged **E**lectric **A**rc **F**urnaces (EAF) where a measured mixture of ore/oxydes, carbonaceous reducing agents, and slag forming materials are smelted and reduced.
- The major source of GHG emissions is the process-related emissions from the EAF operations, which result from the reduction of the metallic oxides and the consumption of the carbon electrodes during the process.
- Carbon cannot be substituted in the carbothermic process.
  - There is an incompressible level of emissions.

Reasons for differences in GHG emissions

- Although the different products (FeSi, FeMn, Si, FeCr, FeSiMn) are manufactured by the same technology (electric arc furnace using C as reductant) there are great variations between the different ferroalloy products:
  - direct CO_2 emissions: from 1,3 to 7,7 $t/t_{product}$,
  - energy intensity: from 3 to 12,5 MWh/t.
- Process efficiency
- Choice of raw materials
  - huge variations in composition
  - coal, coke, charcoal, wood chips
  - purity, density, moisture
- Sources of electricity
- Energy recovery

2.5 Specific standardization needs and corresponding available documents

Combining the results of the gap analyses and the requirements by the characteristics of the industry sectors the following specific standardization needs are set out.

2.5.1 Cement sector

A sectoral standard related to the CSi Protocol could ideally complement generic standards such as of ISO 14064 – 1/3 and 14065.

2.5.2 Lime sector

- Direct CO_2 emissions from the discharged **L**ime **K**iln **d**ust LKD.
  Standards have to be developed e.g. on the basis of the NLA protocol (version 2008) or the US EPA protocol.
- Direct CO_2 emissions from stationary and mobile sources.
  Existing standards for the assessment of these emissions can be used or adapted (e.g. GHG protocol, EU monitoring and reporting guidelines).
- Indirect CO_2 emissions from the purchased electricity.
  Existing standards for assessing these emissions can be used (e.g. GHG protocol. CSI cement protocol).
- Non CO_2 GHG for combustion emissions (direct or indirect)
  These emissions will not modify substantially the GHG emissions of a lime plant. Therefore provided that standard emission factors can be used for the assessment of CH_4 and N_2O emissions (as proposed in the Australian and US reporting systems), these gases should also be included in the reporting system.
- Sampling and analysing carbonates, calcined products and LKD.
  Standards have to be developed.
- Combustion CO_2 emissions
  The harmonization of accounting rules is desirable, either by using standardized sampling and analysis methodology for the determination of their NCV, C-content, oxidation factor or by using similar **n**et **c**alorific **v**alue NCV and CO_2 emission factors (e.g. the default values mentioned in the IPCC guidelines).

Definition of the assessment boundary

- Nowadays 5 different boundaries exist depending on the degree of integration of the installations.
  There is a need for a standard defining some boundaries.
  Guidelines should be developed for the allocation of exported by-products and the reporting of imported raw material or lime.
- The link between boundary and reference products is not problematic for plants producing only one type of burnt product. However the link must be studied in detail for complex plants.

Material flow

A complete material flow of each plant ensuring a correct balance between inputs and outputs at each process stage is recommended.

2.5.3 Iron and steel sector

It is very difficult to assess the global performance of a steel production process without going to a sufficient level of detail and it would be useful to have besides generic standards specific tools for measuring performance by referring to a list of the existing steel production processes.

2.5.4 Aluminum industry

- A standard that gives detailed guidance and rules for monitoring and reporting process emissions of GHG from primary aluminium anode plants and electrolysis and possibly alumina refineries and recycling plants.
- Use available industry documents and guidelines:
  - WBCSD/WRI (developed by the International Aluminium Institute - IAI) The aluminium sector GHG protocol (= Industry sector specification)
  - IAI/EPA Protocol for measurement of Tetrafluoromethane (CF_4) (= Industry sector specification) and Hexafluoroethane (C_2F_6) - these are emissions from Primary Aluminium Production.
  - EU Monitoring and Reporting Guidelines (fuel based emissions only).
- Use this documentation and transform them into a specific standard, which can be used by industry for monitoring and reporting GHG process emissions. The standard must have sufficient detail and specificity for individual operations to be able to report comparable data for the purpose of accurate reporting of emissions.

2.5.5 Ferroalloys sector

There are no common standards available for assessing the performance of GHG emissions of ferroalloys. In regard to the above figuring questions adequate sector-specific standards should be developed:

- How to handle bio-carbon?
- How to handle scarce resources?
- How to calculate indirect emissions?
- How to handle energy recovery? Particularly, when they lower total emissions and increase the emissions from this particular installation.

2.5.6 Chlorine sector (inorganic basic chemicals)

There is no common way of measurement of the emissions and of defining boundaries. Therefore, the elaboration of a sector-specific standard is recommended. There are documents, which could be used for standardization purpose (indirect emissions).

2.6 Summary of the detected standardization needs i.e. the standardization programme

1. As a result of the gap analyses of the six participating industries the need to develop standards for process related GHG emissions performance assessment in energy-intensive industries has been demonstrated.

2. The gap analyses have shown that there exist both common / generic and sector-specific needs to elaborate these standards. The gap analyses have also demonstrated a distinction between procedures (rules) and methods to obtain necessary data i.e. measurement methods.

   It has also appeared that a number of sector-specific aspects may be treated by generic rules.

   Some industries such as cement and Al consider already applicated GHG protocols as a basis for sector-specific standardization.

3. Gap analyses shows that generic standardization may cover common needs of the energy-intensive industries.

   This result fulfills the recommendation of the mandate to put emphasis on sector-independent approaches wherever possible.

   The sector-specific needs detected by the gap analyses that cannot be integrated in a generic standard. They have to be considered separately.

4. It is proposed to establish the following programme of standards:

   – one generic standard applicable to all EII's sectors,

   – six sector-specific standards (one for each industry sector).

   These standards are deemed to represent a coherent set of standards assessing the GHG emissions in energy-intensive industries.

2.7 Conclusion

The analysis of the results of this gap analyses established by six industry sectors demonstrate that there is a clear need for further GHG emissions standardization. These planned standards should complete already existing GHG emission standards for monitoring and reporting. Particularly with respect to the programming mandate there is a need to develop process related GHG emission performance assessment standards.

The following conclusions entailing recommendations for future standards have to be considered:

- Generic standardization may cover common needs of the energy-intensive industries i.e. the development of a process related GHG performance assessment standard.

  This result fulfills the recommendation of the mandate to put emphasis on sector-independent approaches wherever possible.

- The gap analyses have also detected sector-specific needs. Those, which cannot be integrated in a generic standard, have to be considered separately.

In consequence the following programme of standards is proposed to be established with focus on CO_2 equivalent performance.

  – one generic standard,

  – six sector-specific standards (one per each sector).

These standards are deemed to represent a coherent set of standards assessing the GHG emissions in energy-intensive industries.

Some industries such as lime and AL have found it relevant to include non-CO_2 GHG emissions.

This standardization program is completed by the following recommendations:

- Validation of the foreseen generic standard. The validation becomes of increasing importance due to the MRV (measure, report, verify) principle claimed at the December 2009 Copenhagen conference.
- The future standards should have an international impact as the mandate is also supporting international action on climate change.

  The possible positive input on the international level stems from the observation that on a global scale climate change policies are more often focused on energy than on CO_2. This is in contrast with EU policies, which focus on GHG emissions. The discussed standards may be helpful to align these policies and thus support any international negotiations. For these reasons the future standards shall be proposed to ISO in the frame of the Vienna Agreement.

3 Report of BT WG 210

3.1 Inventory

3.1.1 Standards for the assessment of product related GHG emissions

3.1.1.1 ISO Standard on carbon footprints of products (ISO 14067) and links to ISO 14020 series and ISO 14040 series

The ISO Technical Committee (TC) 207 on Environmental Management, together with its Subcommittee 7 on Greenhouse Gas Management and Related Activities last year took up the task of preparing a standard for "carbon footprints of products" (currently at committee stage - ISO CD 14067). The standard will consist of two parts – one standard for assessment and quantification and one for communication, both parts being open to comments until 9 June 2010.

ISO 14067 aims to expand the environmental management standards family. The ISO 14040 series on life cycle assessment provides an important basis for the quantification part. The communication part will be based on ISO 14020 series on product environmental labels and declarations. The first working drafts of ISO 14067 were discussed at the ISO/TC 207 annual meeting in Cairo in June 2009. The aim is to finalize the standard by 2011.

3.1.1.2 Additional international and national initiatives

3.1.1.2.1 WBCSD/WRI Greenhouse gas product protocol

The Greenhouse Gas Protocol (GHG Protocol) by the Washington-based World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), which was launched in 1998 as a development of the BP (British Petroleum) greenhouse gas reporting protocol, sets out procedures for corporate greenhouse gas accounting. The protocol includes guidelines on defining the boundaries of the organization for which the inventory is to be drawn up and on managing data quality.

The existing GHG Protocol covers direct GHG emissions incurred by the company (Scope 1) and purchased electricity (Scope 2) but does not include purchased goods and services (Scope 3).

In August 2008 WRI and WBCSD launched the GHG Protocol Supply Chain Initiative to address scope 3 (products and services) and product-bound greenhouse gas accounting currently not included in the GHG Protocol. The need for this had previously been evaluated in a comprehensive stakeholder survey.

A product guideline and a supply chain guideline (within the GHG Protocol: Scope 3) are being developed with the aim to finalize them by the end of 2010. The initiative officially commenced work in September 2008 with the first sessions of the steering committee in Washington and of the technical working groups in London[2].

It is intended that the GHG Protocol Supply Chain Initiative will by the end of 2010 develop further reporting guidelines that will enable businesses to measure greenhouse gas emissions throughout their entire value chain.

Scope 3 operates in parallel with the product Life Cycle Assessment (LCA) standards that are likewise in the process of development. The aim is to develop methods that enable the

[2] http://www.ghgprotocol.org/wri-and-wbcsd-convening-global-stakeholder-process-to-develop-new-productsupply-chain-guidelines

greenhouse gas emissions associated with the purchase of products and services to be identified with sufficient accuracy.

Within this process major challenges need to be overcome. Disaggregating specific greenhouse gas data to individual products and services presents a particular problem. Other difficult areas are special issues such as the method of accounting for "green" electricity and waste processes. The distances involved in globalized production networks also pose major challenges for data quality.

These gaps can only be filled by using carefully calculated standard values; however, obtaining these also presents a considerable challenge.

3.1.1.2.2 UK Publicly Available Specification (PAS) 2050: 2008

One of the first steps towards standardization of a product carbon footprint (PCF) methodology was taken at national level in Great Britain, initiated by BSI British Standards Solutions in cooperation with the Carbon Trust and the Department for Environment, Food and Rural Affairs (defra). On 29 October 2008 these organizations launched a Publicly Available Specification – *Specification for the assessment of the life cycle greenhouse gas emissions of goods and services*, a guideline under a British standard (PAS 2050)[3].

PAS 2050 thus represents the first attempt – at least at national level in the UK – to create a standardized basis for the assessment of greenhouse gas emissions arising throughout the life cycle of goods and services (product carbon footprint). The development process included two international consultation rounds, in which many non-UK bodies and experts took part. The final version of the specification makes not always clear how the comments on particular methodological challenges were integrated. Presumably not all the methodological recommendations contained in the PAS 2050 are suitable for inclusion in an international guideline or standard (see also Section 3). For this reason international initiatives and standardization bodies have started to address these issues without explicitly adopting the PAS 2050 as a basis of their work (see below).

Apart from the initiatives described above there are several additional initiatives which mainly focus on the labelling the GHG emissions related to products over the whole life cycle (from cradle to gate) (non-exhaustive):

- France (BP X 30-323)
- Japan (TS-Q-0010)
- Korea
- Sweden (KRAV Label)

Many of those country initiatives also work on specific methodologies for the quantification of GHG over the life cycle, but with some deviations from the ISO 14040 /14044/14025 principles. Most of them work on Product Category Rules (PCR) mainly for fast moving consumer goods or food products.

None of the presented initiatives focussed on the basic products of the energy intensive industries (cradle to gate) despite that many carbon footprints of products are dominated by the carbon footprint of those intermediary products (e.g. synthetic textiles on plastics). That is why BT/WG 210 sees the need to internationally harmonize and standardize the assessment of GHG emissions of **basic** products from the energy intensive industries (cradle to gate).

[3] http://www.bsigroup.com/en/Standards-and-Publications/Industry-Sectors/Energy/PAS-2050/

3.1.1.3 Current limits to the product carbon footprint methodology

The goals of product carbon footprints cannot at present be pursued with the necessary level of precision. The reasons for this are the state of development of the methodology, insufficient international agreement and harmonization and – most importantly – the inadequate availability of and access to necessary data. Thus, without a harmonized approach, the range of uncertainties in PCFs will vary widely and can hardly be assessed. Furthermore, the lack of standards for defining the functional units any PCF assessment has limitations. This affects in particular two goals:

- product comparisons of multiple products carried out on behalf of different clients and by different practitioners,
- public comparison with competing products in ways that are acceptable under competition law (e.g. through reporting of CO_2eq values or use of CO_2eq labels)

For methodological reasons it is therefore at present not possible to use CO_2eq labels for the purpose of comparing similar products and services. Once the international standardization procedures are in place this will theoretically be possible, but in many case it will continue to found on the lack of sufficient data or the excessive costs involved.

A separate question would be whether and in what form CO_2eq labels could play a major part in the attainment of product-related climate change mitigation goals and the provision of information to consumers. This will be discussed in the following section.

3.1.2 Initiatives for the communication of GHG emissions of products

3.1.2.1 ISO Environmental Labelling Standards

The environmental labelling of products is subject of international standards within the ISO 14000 series. The basic principles of environmental labels (eco-labels) identify the overall environmental performance of a product or service based on life-cycle considerations. Among other principles, the participation in eco-labels is voluntary and results should be based on sound, verifiable scientific evidence. According to ISO 14020, eco-labels should be derived through an open and consensual process.

Eco-labels are classified in three categories:

- Type I (ISO 14024:1999) eco-labels are independent and reliable labels that consider the life-cycle impact of products and services based on ambitious and multiple criteria of environmental quality. Awarded products should guarantee the highest environmental standard in the market segment.
- Type II (ISO 14021:1999) self-declared environmental claims under ISO 14021 are developed internally by companies and are not reviewed by an independent authority and process.
- Type III (ISO 14025:2006) environmental impact labels are qualified product information based on life-cycle impacts. The parameters to be assessed are fixed by qualified third parties and data is independently verified. The label provides information that allows a comparison of environmental performance, leaving the final assessment or weighing to the consumers. References for developing environmental impact labels are found in “environmental product declarations” (EPD).

Beyond the three types of labels so-called single issue labels and mandatory environmental aspects labels exist. The Energy Star is one example of a mandatory single issue label. Product carbon footprints would fall into the Type III label because it would be a label on a particular environmental impact area. Thus, the development of PCF labels would need to take in particular the provisions of ISO 14025 into account and the establishment of EPDs would be warranted.

3.1.2.2 Environmental Product Declarations

Environmental product declarations are defined quantified environmental data for a product for pre-set impact categories. By basing the EPDs on standardized procedure they should allow for a fair comparison of the environmental performance of products. Important criteria of EPDs, based on ISO 14020 and 14025, include:

- Voluntariness
- Transparency
- Accuracy and scientific basis
- Fitness for purpose – taking the functionality of the product into account.

The requirements for setting up EPD programs are identified in ISO 14025. They include the involvement of stakeholders in an open process. Corresponding approaches and methodologies are defined in Product Category Rules (PCRs) to ensure the credibility and reliability of EPD information. The EPD programs are established by nation states or multilaterally, for example under the European Union.

There is an increasing number of EPDs under development, many of which include the impact category global warming and which may provide useful guidance in developing PCFs (e.g. EPDs for Building Products developed in CEN/TC 350 under Mandate M/350 of the European Commission to CEN)

3.1.2.3 Diversity of labels and marks

CO_2eq marking and labelling initiatives are in their early stages paid scant regard to other existing labels and experiences with them. There are now around 400 different labels and marks and may add to an already over-saturated information supply to the consumers. There are a few well-known and highly regarded labels and correspondingly labelled products. These include the German Blue Angel (Umweltzeichen Blauer Engel), the European eco-label (and other national eco-labels in other countries), the European Bio-label (organic food label), energy efficiency label, the Energy Star and the Fair Trade Label.

The vast majority of schemes in connection with the product labels operate on a voluntary basis. In some cases, however – for example in France – mandatory forms of labelling are being considered. The *Grenelle de l'environnement*, as the government initiative is called includes plans that would require consumers to be informed – via a label or other suitable forms – of the greenhouse gas emissions and other environmental impacts of a product and of the resources consumed over the product's life cycle. It is aimed to implement the scheme in January 2011. However, the scheme has not yet been adopted by the French parliament. Methodological approaches remain open.

In addition to the product labels initiated through multi-stakeholder processes, there are schemes operated by individual companies to draw attention to particularly climate-friendly products in their portfolio. It is likely that additional schemes will be launched in forthcoming years with a risk of diluting helpful information to the consumers.

The following sections highlight samples of CO_2 labelling and marking initiatives already implemented or underway.

3.1.2.4 Examples of CO_2 labels and climate-related product labelling

3.1.2.4.1 CO_2eq labels and carbon reduction labels

The most common types of GHG label in current use – but also the most controversial – are CO_2eq labels (also called carbon labels) and carbon reduction labels. The best known of these is probably the Carbon Trust's carbon reduction label. The label displays the exact value of the product carbon footprint, but does not necessarily have to cover all the stages of

the product's life cycle[4]. The label is only awarded to companies who have pledged to reduce the PCF over two years. The label also includes explanatory comments, such as product comparisons or information for the customer on how the PCF of the use phase may be reduced. The label is displayed on the product packaging (as for example at Tesco, UK), in shops (at the point of sale) or on the Internet.

The carbon reduction label provides the model for a range of comparable international schemes – for example in South Korea and Japan, where similar labels have been introduced.

3.1.2.4.2 CO_2eq seals

There are also schemes that use the product carbon footprint as a basis for awarding a label or seal to the best products in a product group (e.g. detergents). One such label is the Swiss "approved by climatop" CO_2eq seal (e.g. used by Migros, CH). The seal is awarded to those products in a product group that show at least twenty percent lower GHG footprint in a comparative PCF. The assessment takes the product's entire life cycle, including use and disposal phase, into account. Since it is a comparative assessment it avoids some of the methodological challenges.

3.1.2.4.3 Climate neutral labels

There is an ever-increasing number of schemes that label products as climate neutral, for example the "*Stop Climate Change*" label. Such schemes involve calculating the PCF and offsetting their emissions through investment in climate change mitigation projects. Approaches vary widely and have to be viewed critically. There are important differences with regard to the questions:

- Which greenhouse gases are taken into account?
- Are all phases of the product's life cycle covered or only certain parts of it?
- Are there requirements and due diligence for the reduction of the PCF before offsetting adhered to?
- What (quality) requirements are attached to the offsetting projects?

3.1.2.4.4 Environmental labels with a climate focus

There are environmental labels that cover more environmental aspects than just global warming, for example the German eco-label "blue angel" (Umweltzeichen Blauer Engel). The updated "Blauer Engel" specifies the emphasis of the sound environmental performance ("best off") by adding a focus area, such as "because it protects the climate". A PCF is not necessarily the criterion used for awarding products. For example, in the case of energy-using products energy consumption may be used. Other environmental categories are also taken into account before the eco-label is awarded.

3.1.2.4.5 Product related climate change mitigation schemes

In addition to the eco-label there are other ongoing product-related climate change mitigation schemes, such as the EuP process and the planned revision of the EU energy efficiency labelling scheme.

[4] For example, the product carbon footprint quoted on the carbon reduction labels of T-shirts produced by Continental Clothing cover only the acquisition of the raw materials, production and transport to the United Kingdom. The use phase and final disposal of the product are not included.

3.2 Gap Analysis

The objective of the gap analysis was to identify voids in existing standards and initiatives or those under development for assessing the greenhouse gas (GHG) emissions of **basic products** from energy intensive industries as defined above.

One main challenge of this gap analysis is that the most relevant standards ISO 14067-1 and ISO 14067-2 on product carbon footprint are still under development, leaving it unclear whether major issues identified below will be covered in the documents.

The following methodological issues with significant importance particularly for the energy intensive industries are still open and controversially discussed. They should be the main focus for harmonisation of methodologies in European or International Standards:

- Calculating electricity from renewable resources, e.g. avoiding double-counting and sustainability issues related to bioenergy
- Allocation in particular with regard to recycling and the use of secondary fuels
- Energy mix including low carbon sources
- Impact of extractive and mining activities
- Handling of variable supply chains, including calculating rules
- Carbon capture and storage
- Climate change impact of transport
- Quantifying energy efficiency and raw material efficiency
- Approach to other environmental impact categories
- Carbon storage in basic and intermediary products (relevant e.g. for pulp and paper and rubber industry)
- Identifying the appropriate time reference

Furthermore, there are two horizontal issues that would have to be addressed:

- Data transparency, -quality and -sources
- Need for quality, transparency and harmonization of Product Category Rules

It is expected that all other relevant generic issues (issues that are relevant for all products) are well covered by existing and upcoming ISO standards as well as in Environmental Product Declarations and Product Category Rules. Thus the potential demand for additional standardization or harmonisation of standards remains on the level of basic products from energy intensive industries. The relevance of most of the open questions mentioned is significant for those basic products.

Further insights might be provided by the handbook of the European Commission's "International Reference Life Cycle Data System (IRLCD) Handbook" published March 2010[5] and the standard ISO 14031 "Environmental management - Environmental performance evaluation - Guidelines", which is currently considered for revision.

Some aspects of the gaps identified might be partly covered by existing standards (published or under development), including the following

[5] http://lct.jrc.ec.europa.eu/

- EN ISO 14020:2001 *Environmental labels and declarations - General principles (ISO 14020:2000)*
- EN ISO 14021:2001 *Environmental labels and declarations - Self-declared environmental claims (Type II environmental labelling) (ISO 14021:1999)*
- EN ISO 14024:2000 *Environmental labels and declarations - Type I environmental labelling - Principles and procedures (ISO 14024:1999)*
- EN ISO 14025:2010 *Environmental labels and declarations - Type III environmental declarations - Principles and procedures (ISO 14025:2006)*
- ISO AWI TS 14033 *Environmental management -- Quantitative environmental information -- Guidelines and examples*
- EN ISO 14040:2006 *Environmental management - Life cycle assessment - Principles and framework (ISO 14040:2006)*
- EN ISO 14044:2006 *Environmental management - Life cycle assessment - Requirements and guidelines (ISO 14044:2006)*
- ISO 14064-1:2006 *Greenhouse gases - Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals*
- ISO 14064-2:2006 *Greenhouse gases - Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements*
- ISO 14064-3:2006 *Greenhouse gases - Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions*
- ISO/CD 14067-1 *Carbon footprint of products - Part 1: Quantification*
- ISO/CD 14067-2 *Carbon footprint of products - Part 2: Communication*
- ISO/WD 14069 *GHG - Quantification and reporting of GHG emissions for organizations (Carbon footprint of organization) - Guidance for the application of ISO 14064-1*
- CEN WI 00320025 *Methodology for calculation, declaration and reporting on energy consumption and GHG emissions in transport services (goods and passengers transport)*

It was observed that some of the issues identified above (e.g. the classification and consideration of indirect emissions) are treated differently in existing standards. Therefore, apart from the recommendation to develop a new standard for basic and intermediate products, a harmonization of approaches regarding the major contentious issues should be one focus of the future work.

3.3 Conclusions and Recommendations

The following conclusions focus on basic and intermediary products of energy intensive industries in a cradle-to-gate perspective:

- BT/WG 210 has identified a set of gaps in existing standards and initiatives. These are described in clause 3.
- To fill these gaps, it is recommended to initiate the development of a standard on GHG emissions related to basic and intermediary products of energy intensive industries
- It is further recommended to encourage the coordination of product and process related standardization activities under one umbrella, with sub-structures solving the gaps identified. The committee in charge should liaise with relevant product related Technical Committees and stakeholders.
- The proposed standard should be developed on a European level, coordinating activities with ISO, especially regarding generic environmental (management) standardization
- The development of any future standard for energy intensive industries (including process or product related standards for assessing GHG emissions) should be harmonized with the further development of generic environmental (management) standards.
- The standard to be developed should particularly address the following aspects:
    - Calculating electricity from renewable resources, e.g. avoiding double-counting and sustainability issues related to bioenergy
    - Allocation in particular with regard to recycling and the use of secondary fuels
    - Energy mix including low carbon sources
    - Impact of extractive and mining activities
    - Handling of variable supply chains, including calculating rules
    - Carbon capture and storage
    - Climate change impact of transport
    - Quantifying energy efficiency and raw material efficiency
    - Approach to other environmental impact categories
    - Carbon storage in basic and intermediary products (relevant e.g. for pulp and paper and rubber industry)
    - Data transparency, -quality and -sources
    - Need for quality, transparency and harmonization of Product Category Rules
    - Identifying the appropriate time reference
- Apart from the issue particularly relevant for energy intensive industries, a standard would also have to cover generic issues, like definition of system boundaries, inventory analysis and reporting.