

Briefing document

# The Potential of Product Standards to Address Industrial Emissions

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The Climate Change Committee is assessing potential policy options in order to support the UK in identifying and implementing the most ambitious and effective routes to industrial decarbonisation, as part of its recommendations to the UK government on the Sixth Carbon Budget and the route to Net Zero by 2050.

Emerging from the analysis is the potential of product standards to support the acceleration to Net Zero. The Climate Change Committee therefore has developed a potential classification or 'taxonomy' of carbon product standards and associated considerations in order to:

- Provide the groundwork for further analysis and policy assessment;
- Identify the powers that need to be sought for implementation in the future;
- Outline the context for assessing the impact product standards will have on carbon leakage.

As part of this work, Leeds University in coordination with CCC is providing an overview evaluation of the various policy options available to the UK government and the Energy Systems Catapult is providing an assessment of policy approaches and their potential to mitigate carbon leakage.

# 1. Taxonomy of GHG Emissions Reducing Product Standards

There are numerous types of product standards implemented across the UK currently, ranging from regulated product standards in areas of health and safety to voluntary 'best practice' standards in manufacturing. In considering future product standards to enable Net Zero emissions, it is essential to examine the potential types of standards, the stage of product they could be applied to, the party on which obligations are placed, the policy levers, potential sectors and overall considerations in design and implementation.

## Types of Product Standards: Carbon Disclosure, Carbon Cap, and Non-Carbon Specifications

CCC categorises potential product standards for reducing emissions by three key types:

- **Carbon Disclosure:** These are standards which most commonly set a methodology for Life Cycle Assessment (LCA), often governed by standards bodies such as ISO/EN/BS. LCA involves the assessment of emissions from the entire life cycle of a product, across the entire supply chain, typically consisting of stages from extraction of raw materials, through design and formulation, processing, manufacturing, packaging, distribution, use, re-use, recycling and, ultimately, waste disposal<sup>1</sup>. Compliance with these standards can be voluntary, such as a company choosing to follow a particular LCA methodology to disclose product emissions, or mandatory, such as a government requiring carbon disclosure on certain products following a particular methodology. Compliance with these standards can be communicated in different ways, particularly depending on the different product stages and whether the products are B2C (business to consumer) or B2B (business to business) – for B2C, product labels can display lifecycle data for consumers, or for B2B, separate information can be provided such as Environmental Product Declarations (EPDs) in the building and construction sectors.
- **Carbon Cap (a Minimum Standard on Carbon):** Following an agreed methodology (such as Life Cycle Assessment), a carbon cap or limit can be set for a product. For this to be mandated there would likely need to be a high level of understanding, skill and experience with the particular methodology first. These types of carbon cap standards could be voluntary, such as a company adhering to a recommended carbon cap benchmark for a particular product, or mandatory, such as a government's requiring procurement of products which meet certain minimum standards of carbon.
- **Non-carbon measures:** These could include a range of standards which do not explicitly govern carbon levels, but if implemented do have an impact on carbon emissions. For example, the existing Ecodesign standards focussed on energy efficiency; the future Ecodesign standards focus on Circular Economy and potentially including percentage of recycled material; low carbon fuel or CCS obligations found in manufacturing; standards banning sale of ICE vehicles, and more. Like the carbon focussed standards, these could be voluntary or mandatory.

## Stage of Product: Primary product, Intermediary product, Secondary or tertiary product

The stage of product to which a standard is applied could have significant implications on cost transfer, carbon leakage and competitiveness, innovation and circularity.

- **Primary product:** This would be an unmanufactured product, consisting of a raw material.
- **Intermediary product:** A product that is manufactured or produced from a primary product intended for use in a secondary product. It can include steel or concrete, milk, or a car engine.
- **Secondary or tertiary product:** The final product for end use or consumption. In agriculture and food, this would include ice cream; in fashion a dress; in building and construction a building and in automotive manufacturing a vehicle\*.

## Obligations: The Producer or Purchaser

Standards can place obligations on different actors within a product supply chain. They could be placed on either the producer of primary, intermediary and secondary products or the purchaser or seller.

- **Producer:** Obligations would be placed on manufacturers and raw material producers. The onus would be on the producer to demonstrate compliance, and any costs borne in meeting such compliance would be the responsibility of the producer who could, in turn, pass on these costs to the purchaser if feasible or desirable.
- **Purchaser or seller:** Obligations could also be placed on the purchaser or seller, which could include a broader range of actors including distributors (retailers or wholesalers) selling onwards to businesses or consumers or businesses purchasing for their own use. These obligations would likely operate differently depending on whether they applied to Business to Business products (B2B) or Business to Consumer products (B2C). In the case of B2B products, the obligation could be placed on either the distributor/retailer or the final consumer – the business – to demonstrate compliance with the standard. Within the context of the B2C market, the purchaser with the obligation would likely be a distributor or retailer rather than the end consumer.

\* Note that some industries use different categorisations and terminologies which should be considered. For example, in building and construction, cement can be considered an intermediate product, concrete is the primary construction product with the building element as secondary product and building the tertiary product.

## Policy Levers: Regulation, Self-Regulation, Flexible Regulation

There are many levers that can be utilised to enable compliance with standards, either by mandating or requiring compliance (regulation), by encouraging self-regulation, or carbon pricing (flexi-regulation).

**Regulation:** There are numerous forms of regulation which could enforce product standards on either the producer or purchaser:

- **Production or manufacturing regulation:** This could include a new regulation placing compliance obligations on producers and manufacturers, similar to existing health and safety regulations such as, General Product Safety Regulations 2005 (GPSR).<sup>2</sup> Alternatively or additionally, this approach could adjust existing regulation such as the EU Best Available Techniques reference documents (BREFs), which identify best practices for a range of industrial processes in order to set permit conditions for certain industrial installations.<sup>3</sup>
- **Building regulations and/or planning permissions:** This could be considered a more specific type of production regulation. For building projects, compliance for building level disclosure or carbon cap standards could be governed by building regulations or planning permissions or both. At the national level, they could operate similar to 'Part L' of building regulations which governs conservation of fuel and power in buildings<sup>4</sup>. They could also be built into planning policy, either governed centrally or by individual local authorities such as the GLA's intention to mandate whole-life carbon disclosure for significant building projects as part of the London Plan.<sup>5</sup>
- **Distributors and sellers (wholesalers and retailers) regulation:** Similar to the General Product Safety Regulations 2005, obligations could be placed on retailers and distributors to ensure that the products they sell comply with regulations. This kind of regulation will likely require some type of regulation on producers and manufacturers as well, to ensure that the distributors and sellers have the information and documentation they need to comply.
- **Government Procurement:** Specific regulations or policies could be placed on government procurement to meet certain carbon cap or disclosure standards. These regulations would need to specify which government entities must meet the obligations (e.g., Local Authorities and/or central government departments) and would set out the compliance criteria such as the products or processes and the cost threshold. It could operate similar to the current Energy Efficient Directive Article 6 which requires central government departments in EU member states to purchase highly energy efficient, products, services and buildings<sup>6</sup>. Specific Regulations could also apply to government procured infrastructure projects within the National Infrastructure and Construction Procurement Pipeline.<sup>7</sup>

**Self-Regulation:** An approach in which industry typically works in coordination with government to develop and govern the compliance of standards within a certain industry. Self-regulation could be entirely governed by an industry body separate from government which is funded by the industry itself, or conducted in coordination with government sometimes with the government stepping into regulate entities that do not agree to comply with the industry self-regulation body or approach. A current example includes the agricultural *Red Tractor Scheme* which operates as an independent not-for-profit set up by the UK food industry to administer a standard governing animal welfare, environmental protection, food safety, and traceability<sup>8</sup>.

**Flexible Regulation (Carbon Pricing)** Flexible compliance offers an opportunity to encourage compliance with standards through structures that provide incentives or penalties. This could be implemented in a number of different ways – for example, as part of an emissions trading or carbon pricing scheme which would involve penalties for exceeding a 'carbon cap' or an incentive similar to the Renewable Heat Incentive which would provide financial incentives for meeting certain carbon standards\*. \* This approach can be considered a product standards approach or a benchmarking approach - for example, the carbon caps identified with a Carbon Pricing scheme could be considered as a 'standard' or a 'benchmark'.

## Sectors: Manufactured products, Construction, Fuels, Agricultural products

There are a wide number of products which could be governed by product standards for net zero.

- **Manufactured products:** the key sectors categorised by Make UK include food and drink; chemicals and pharmaceuticals; rubber, plastic and non-metallic minerals; metals; electronics; electrical equipment; machinery; transport; and other.
- **Construction:** This sector incorporates the processes and use of Non-Road Mobile Machinery utilised in the construction of buildings and infrastructure.
- **Fuels:** Standards placed on fuels, such as fossil fuels, hydrogen, and biogas.
- **Agricultural products:** product standards for primary or intermediary agricultural products – such as milk, meat, vegetables – could be applied as well as or either product standards for secondary or tertiary products such as ice cream, processed meat, or vegetable products.

**Box 1:****Taxonomy of Product Standards to Reduce Industrial Emissions**

It is essential to examine the potential types of standards, the stage of product they could be applied to, the party on which obligations are placed, the policy levers, potential sectors and overall considerations in design and implementation.

<b>Table B1</b> Dimensions of the Taxonomy	
<b>Types of standards</b>	Carbon disclosure Carbon Cap
<b>Compliance</b>	Voluntary Mandatory
<b>Stage of Product</b>	Primary Intermediary Secondary/Tertiary
<b>Obligated party</b>	Producer Purchaser
<b>Policy Levers</b>	Regulation Self-regulation Flexible regulation
<b>Types of Regulation</b>	Production or manufacturing regulation Building regulations and/or planning permissions Distributors and sellers (wholesalers and retailers) regulation Government Procurement
<b>Sector Products</b>	Manufactured Products Construction Fuel Agricultural Products



## 2. Industry and Policy Developments

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Understanding current and future drivers for carbon disclosure and carbon caps on products, such as growing corporate interest in carbon reduction and disclosure, regional developments within the European Union and further abroad in some specific sectors, can help to inform a UK appropriate approach to product standards.

### Net Zero Commitments and Scope 3 reporting

An increasing number of companies within the UK and globally have set targets to reach Net Zero emissions and as part of this, have committed to measuring and disclosing Scope 3 emissions (arising as a consequence of the activities of a company but occurring from sources not owned or controlled by the company). According to one study, 75% of FTSE100 companies are reporting on at least some Scope 3 emissions. For some companies, Scope 3 emissions comprise the majority of their emissions and therefore disclosure and labelling become a focal point of their Net Zero strategies as it is one of the means of influencing the behaviour of consumers of their products. For example, for companies in consumer products and food, 95% or more of their total emissions are Scope 3. In other cases, companies following voluntary standard methodologies for their Net Zero commitments are required to address Scope 3 to achieve the standard – the Science Based Targets Initiative, for example, requires that companies must address Scope 3 Emissions if they represent over 40% of their total emissions. Increasing interest and pressure to measure and disclose is driving more support for the use of voluntary standards on measurement and disclosure, such as those recently to be implemented by Unilever. In addition to meeting requirements for these standards, there is increased interest from consumers and citizens – 92% of the recent UK Citizens Assembly on Climate Change supported implementing labelling and providing information about the carbon emissions caused by different products and services.

### The Unilever Commitment: Food and FMCG Labelling

Unilever has set an ambitious plan to reach zero emissions for from its own emissions and those of its suppliers by 2039. Each of their companies' 70,000 products ranging from ice cream to shampoo to coffee will be labelled with the level of emissions from the process of manufacturing and shipping for that product. Currently there are no standards or verification available, and Unilever hopes that this level of transparency will accelerate net zero and that there may be an independent standard for carbon labelling supported by competitors in the sector. The first stage will be focussed on data collection and standardisation, and the aim is to develop partnerships with other businesses and organisations to standardise data collection, sharing and communication including moving from product by product Life-cycle Assessment (LCA) Studies to carbon data embedded in B2B systems.

## Sector Led Labelling and Disclosure

In addition to individual companies addressing Scope 3 emissions, some sectors are collaborating extensively to address embodied emissions. This includes the retail sector, for example, which in the UK under the British Retail Consortium is working together a sectoral plan to Net Zero, including the potential for eventual carbon labelling. Globally, one of the sectors which has gone the farthest on disclosing, labelling, and even mandating reduction of embodied carbon is the Building and Construction Sector.

### Case Study: Embodied Carbon Reduction in the Building and Construction Sector

Globally, the operation and construction of building is responsible for 39% of global *energy-related* Greenhouse Gas Emissions,\* with 28% from the operation and 11% from the manufacturing and construction of buildings (considered 'embodied carbon'). In the UK the proportion of national GHG emissions from construction† embodied carbon could be approximately 7%. At a building level, current emissions for office buildings are estimated to be 66% operational emissions with 34% from embodied carbon. As increasingly the operational emissions from buildings are reduced with the switch to renewables, the emphasis globally is growing on the increasing proportion of embodied emissions.

The sector globally has reached general consensus on a definition and associated methodology standard of embodied carbon in building and construction, included within a wider definition of whole-life carbon including operational emissions. Particularly in Europe, but increasingly abroad, they have also generally agreed on methodologies to govern B2B product and process LCA labelling, known as 'Environmental Product Declarations (EPDs).' Major property companies and construction companies in the UK and around the world are beginning to disclose and target reduction of embodied carbon, and manufacturers of building products such as cement and concrete, steel, glass, insulation and numerous others are publishing EPDs to guide decision making about product level embodied carbon.

Recognising the growing importance of the sector in reducing emissions, as well as the increasing consensus, coordination, and commitment to disclosure and reduction within the private sector, governments around the world are beginning to mandate disclosure and carbon caps in this sector using levers such as procurement, building regulations, and planning policy:

- **Disclosure:** In the UK, the GLA is introducing whole-life carbon disclosure as a pre-condition for planning approval for major projects within the updated 'London Plan'. The Netherlands requires embodied carbon disclosure in government procurement for buildings and construction. New Zealand will soon be mandating embodied carbon disclosure within their building regulations.
- **Carbon Cap:** Netherlands introduced a buildings regulation which sets a carbon cap on embodied emissions in buildings in 2018, after a number of years of mandatory disclosure. It is set as a carbon price, which converts 11 categories of LCA emissions to a shadow price on carbon and is capped at 1 EUR or .02 tonnes of CO<sub>2</sub>e per sq m/per year.

\* Includes indirect emissions from power consumption.

† Including construction of infrastructure.

Finland will soon be introducing a carbon cap on embodied emissions in buildings through their building regulations, following years of voluntary disclosure within the sector. In 2021, California through their 'Buy Clean' initiative is introducing a purchaser carbon cap on building and construction products procured by the state government, including steel and other materials. In California, the implementation of the initiative has been delayed to give companies a chance to improve reporting and disclosure before agreeing the carbon cap.

## Regional Developments in Carbon Reduction Product Standards

There is an opportunity to establish product standards at a regional level, particularly where there are trading arrangements which already govern product standards. The European Union has established strong environmental and climate change related product standards and continues to advance plans for more ambitious standards.

### Case Study: Regional Carbon Reduction Product Standards in the EU

The EU Single Market provides the EU with strong levers to mandate product standards, as it can stipulate that all goods sold on the Single Market must adhere to a particular standard. By its nature, the standard then applies to both domestic and foreign products sold on the Single Market and can have an impact on emissions beyond its borders as well as a direct impact on territorial emissions within the EU. There are a number of product standards at the EU level either currently in place or in development which have the potential to impact upon emissions within the EU and even outside. These include:

- **Product Environment Footprint (PEF):** PEF standards are carbon disclosure methodologies for labelling a range of products including pet food, solar PV panels, clothing which are currently being piloted and considered for widespread adoption.
- **Current Ecodesign Directive:** Standards governing the energy performance of a range of electrical products ranging from computers, dishwashers, to hot-water boilers.
- **Future Ecodesign Directive:** Under the Circular Economy Action Plan (CEAP), the scope and coverage of the Ecodesign Directive may be extended to include recycled content requirements for certain products including intermediary products such as steel, cement and chemicals.
- **The EU Taxonomy for Sustainable Finance:** specifies carbon intensity of hundreds of products/materials, to inform criteria for 'sustainable' financing.
- **The EU Level(s) approach:** a voluntary 'standard' for buildings, covering operational performance but also embodied performance, which could be made mandatory;
- **Environmental Product Declarations:** LCA labelling for construction products required for building or infrastructure level carbon disclosure or carbon cap, including compliance with Level(s).

### 3. Design and Implementation Principles

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In determining whether product standards would be appropriate for UK Net Zero policy, a number of key design and implementation principles should be considered.

- A period of disclosure is likely required before mandatory carbon caps: For product standards to be effective, it is likely that the industries impacted need to have sufficient experience with and agreement of the methodologies required. It may be that in some or all industries a period of mandatory disclosure is required before a carbon cap can be introduced to allow for this, as seen in other jurisdictions in the building and construction sector. It also would provide time to assess the impacts of following a particular methodology, e.g. if an LCA methodology were followed future non-carbon standards on circularity may not be required if the methodology adequately addresses end of life re-use. Voluntary disclosure could therefore be encouraged or incentivised before mandatory disclosure.
- Ratcheting carbon caps gradually may yield highest carbon impact long term: It may be also be that low carbon caps could be placed on certain sectors in initial phases, and these carbon caps could be gradually ratcheted up to higher levels of reduction over time. They also could be designed to address both territorial emissions as well as consumption emissions, which could maximise the overall carbon reduction potential.
- Lowest cost and affordability to bear the costs must be carefully planned and accounted for: In designing product standards, consideration should be given to who will initially bear the costs of meeting these standards, who the initial cost-bearer could pass these additional costs onto, and whether complementary policy mechanisms are needed to manage the bearing of additional costs – for example subsidies for decarbonisation. Protecting consumers will be important, to ensure that standards are not regressive and that certain standards do not overly impact upon disadvantaged groups. Self-regulation can also be considered to minimise costs for both industry and the government.
- Whether and how obligations are placed on intermediate or secondary/tertiary products could have significant implications on supply chain: If regulations de jure are placed on secondary or tertiary product, the input processes and materials de facto must also adhere to standards. This may work well for some sectors, such as building and construction or automotive where engineering innovation in constructing the final 'product' could lead to resource efficiencies as well as product innovation. If regulations are set at the intermediate product level, ensuring that all competing products for the secondary or tertiary product are considered fairly will be essential. Another important consideration is if standards are set on some secondary or tertiary products but not on others, there may be limited incentive for certain primary or intermediary sectors to switch all of its production sites to lower carbon. For example, if regulation was set on building and construction but not vehicles, it may not be cost-effective for steel manufacturers to switch its limited number of production sites to lower carbon steel.

This may be mitigated if a producer has more numerous production sites, as it could choose to convert one site but not all – but it should be an overall consideration if part of the aim is to decarbonise primary or intermediary products by placing obligations on secondary or tertiary products. Assessment by sector across the entire supply chain will be essential to understand where best to place the standards and how to mitigate any competitiveness or cost impacts.

- Carbon leakage and competitiveness must be considered: As assessed in the Energy Systems Catapult report on Carbon Leakage, careful design of product standards and potentially accompanying policies like a Border Carbon Adjustment will be essential to ensure that product standards do not impact competitiveness and lead to carbon leakage. For example, it may be that minimising leakage could be accomplished by placing standards on the purchaser/seller rather than the producer; selecting product standards for sectors which have a degree of international collaboration and consistency on carbon disclosure methodologies and mandatory caps; or placing product standards on sectors which have very low levels of international trade.
- Different sectors may need different approaches and different timelines: Consideration should be given as to which sectors are more ready for carbon disclosure or carbon cap product standards, and which sectors would bring about the highest emissions reductions if standards were introduced. Additionally, the trade intensity of different sectors and potential impacts on competitiveness and carbon leakage may differ significantly from sector to sector, and different complementary policies – like BCAs – or different types of design considerations may be needed to mitigate carbon leakage for certain sectors, such as whether the obligation is on the producer or purchaser/seller or on the intermediary or secondary product. Additionally, some sectors may be more ready for self-regulation, which can present an option to reach maximum compliance with minimal government involvement and cost.

## 4. Conclusions for UK Policy

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Product standards should be carefully considered as a potential policy mechanism to achieve industrial decarbonisation. They have the potential to create markets and competitiveness for low-carbon products; to align with and support the increased ambition seen within the private sector to achieve Net Zero including Scope 3 emissions; and to drive reductions in Industrial Emissions within the UK but also internationally through consumption based emissions. However, if taken forward, they should be designed carefully so as to minimise carbon leakage, ensure that the industry is as prepared as possible with any required methodologies, additional costs are absorbed with minimal impact to any particular group, and carbon reductions are maximised over time.

# Endnotes

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- <sup>1</sup> Life Cycle Assessment, European Environment Agency  
[www.eea.europa.eu/publications/FGH-07-97-595-EN-C%2Fissue-report-No-6.pdf&usg=AOvVaw0eUoxsTUP\\_2dBvV\\_qxEbM](http://www.eea.europa.eu/publications/FGH-07-97-595-EN-C%2Fissue-report-No-6.pdf&usg=AOvVaw0eUoxsTUP_2dBvV_qxEbM); page 5
- <sup>2</sup> <https://www.gov.uk/guidance/machinery-manufacturers-and-their-responsibilities>
- <sup>3</sup> <https://www.eea.europa.eu/themes/air/links/guidance-and-tools/eu-best-available-technology-reference>
- <sup>4</sup> <https://www.gov.uk/government/publications/conservation-of-fuel-and-power-approved-document-1>
- <sup>5</sup> <https://www.london.gov.uk/what-we-do/planning/implementing-london-plan/planning-guidance/whole-life-cycle-carbon-assessments-guidance-pre-consultation-draft>
- <sup>6</sup> <https://www.gov.uk/government/publications/procurement-policy-note-0714-implementing-energy-efficiency-directive-article-6>
- <sup>7</sup> <https://www.gov.uk/government/publications/national-infrastructure-and-construction-procurement-pipeline-202021>
- <sup>8</sup> <https://redtractor.org.uk>



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