

Operationalising a Carbon Regulator

Report 3

International Considerations for a Carbon Regulator

September 2024



Report produced by Baringa at the direction of Energy Systems Catapult

Please note this is a shortened version of Report 3 containing the Executive Summary and Recommendations. The full report can be downloaded from the project page:
<https://es.catapult.org.uk/project/operationaleising-a-carbon-regulator/>

Part of the Carbon Accounting programme, funded by Innovate UK:

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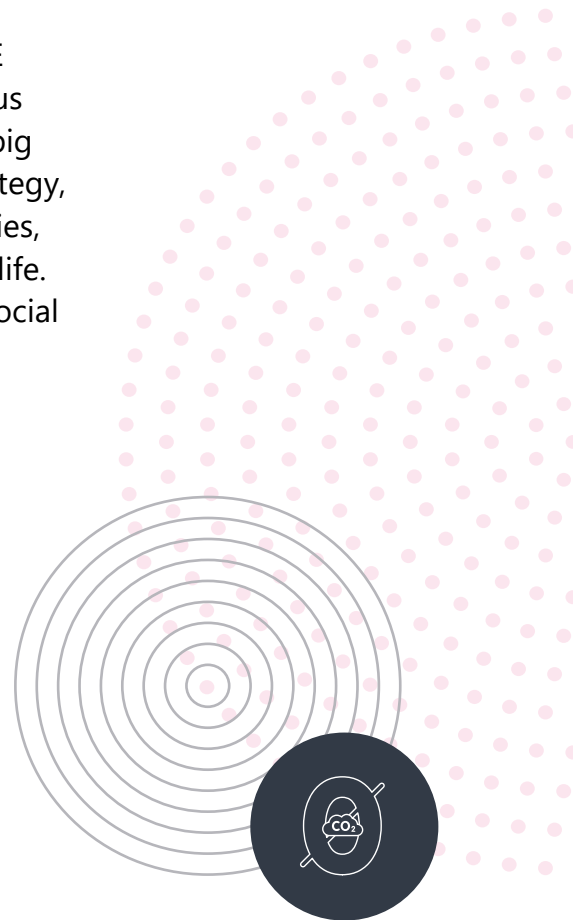
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Energy Systems Catapult was set up to accelerate the transformation of the UK's energy system and ensure UK businesses and consumers capture the opportunities of clean growth. The Catapult is an independent, not-for-profit centre of excellence that bridges the gap between industry, government, academia, and research. We take a whole systems view of the energy sector, helping us to identify and address innovation priorities and market barriers in order to decarbonise the energy system at the lowest cost.

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Acronyms

ACCU – Australian Carbon Credit Units

A-PACT – Automotive Partnership for Carbon Transparency

ASI – Aluminium Stewardship Initiative

AVR – Accreditation and Verification Regulation

CAA – Carbon Accounting Alliance

CBAM – Carbon Border Adjustment Mechanism

CCC – Climate Change Committee

CMA – Competition Markets Authority

CSRD – Corporate Sustainability Reporting Directive

EEIO – Environmentally Extended Input-Output

EERS – Emissions and Energy Reporting System

EFRAG – European Financial Reporting Advisory Group

EPA – Environmental Protection Agency

ESEF – European Single Electronic Format

ESRS – European Sustainability Reporting Standards

ETS – Emissions Trading Scheme

FCA – Financial Conduct Authority

FMC – First Movers Coalition

FRC – Financial Reporting Council

GCCA – Global Cement and Concrete Association

GGIRCA – Greenhouse Gas Industrial Reporting and Control Act

GHG – Greenhouse Gas

GRI – Global Reporting Initiative

ICCA – International Council of Chemical Associations

IDDI – Industrial Deep Decarbonisation Initiative

IEA – International Energy Agency

ISSB – International Sustainability Standards Board
LCA – Life Cycle Assessment
LME – London Metals Exchange
MEE – Ministry of Ecology and Environment, China
MPP – Mission Possible Partnership
MRV – Monitoring, Reporting and Verification (of emissions)
NRG – National Greenhouse and Energy Reporting
PSSI – Pharmaceutical Supply Chain Initiative
SMEs – Small Medium Enterprises
SECR – Streamlined Energy and Carbon Reporting
PCR – Product Category Rules
RMI – Rocky Mountain Institute
TCFD – Taskforce on Climate-Related Financial Disclosures
TfS – Together for Sustainability
TPT – Transition Plan Taskforce
UNIDO – United Nations Industrial Development Organisation
WBSCD – World Business Council for Sustainable Development
WPID – Working Party on Industrial Decarbonisation
WRI – World Resources Institute



Executive Summary

Reliable and trustworthy emissions data is essential to the functioning of a Net Zero economy. National carbon accounting policies can drive the adoption of consistent standards, which in turn encourage disclosure of accurate and interoperable emissions data. The existing regulatory landscape is increasingly setting more stringent requirements relating to carbon accounting. Without effective international coordination, there is a risk of further complicating the landscape with diverging standards.

In this report, we identify international considerations for a Carbon Regulator and implications for UK exports based on a review of national policies. Firstly, this report considers the national policies of a select group of countries chosen based on their trade proximity to the UK¹. Secondly, the report outlines key considerations for a Carbon Regulator based on a review of international coordination initiatives across industrial sub-sectors². Finally, the report identifies opportunities for a Carbon Regulator to play a leading role in promoting international alignment in carbon accounting to support UK industry.

Review of national policies

Approaches to carbon accounting in national policies, such as methodology and boundary requirements, are predominantly set on a case-by-case basis. Due to limited coordination across regulators and governments, this leads to inconsistent practices in the carbon accounting landscape and limits a 'whole systems' view of emissions both at national and international levels. Additionally, there is no clear best practice to inform approaches to set up an effective carbon accounting regulatory framework.

Existing national policies, both in the UK and internationally, present several challenges to consistent and accurate emissions reporting that a Carbon Regulator should have knowledge of, including:

- There is a lack of harmonisation of methodologies in carbon accounting policies. This increases the administrative burden for reporting entities, creates inconsistency in corporate emissions disclosures, and limits the comparability of low-carbon products.

¹ The countries assessed were Australia, Canada, China, the European Union, France, Germany, Japan, Netherlands, Switzerland, and the United States of America. The report focuses on disclosure policies such as EU CBAM, in addition to claims, procurement, carbon markets and transition plan policies.

² The sectors assessed were Aluminium, Automotive Manufacturing, Cement, Chemicals, Glass, Iron & Steel, Pharmaceuticals, and Refined Oil.

- There is an absence of digital tools based on standardised data management frameworks to support exchange of interoperable emissions data.
- There exist multiple governance structure(s) to manage and verify accuracy of emissions disclosures and ensure compliance.

Governments are increasingly implementing more prescriptive carbon accounting regulation as the importance of emissions data in investment decisions grows.

However, limited coordination results in inconsistency and incomparable reported emissions data. A Carbon Regulator could facilitate international coordination by supporting the UK government and regulators to develop effective carbon accounting policies aligned to international trends, informing best practices, and identifying existing gaps. This will promote the harmonisation of a complex international landscape and reduce potential risks for UK companies with disparate reporting requirements.

Another key challenge for a Carbon Regulator to consider is the lack of interoperable digital tools across the carbon accounting landscape. This hinders access to comparable emissions data within industrial supply chains. While digital reporting platforms are increasingly being established, there is no globally accepted standard for collecting, storing, and sharing GHG emissions data³. A Carbon Regulator could promote standardisation across reporting tools, working with international forums to align best practices and facilitate effective data sharing among stakeholders, including UK exporters, suppliers, customers and regulators.

Varied governance structures to deliver carbon accounting regulation provide potential learnings for operationalising a Carbon Regulator and highlight key international actors with whom government could coordinate. A Carbon Regulator may also observe where divergence in governance introduces complexity into the landscape, for instance, in carbon accounting verification processes. The Catapult has previously proposed that the accreditation of third-party verifiers could be a function of a Carbon Regulator⁴. Due to the variation in reporting requirements, current international verification requirements tend to be policy specific, driving further inconsistencies across the landscape. A Carbon Regulator could play a role in standardising verification processes in the UK and enhance credibility in the assurance of verified UK industry emissions data to other regulators.

³ The EU presents an example of best practice with the European Single Electronic Format (ESEF), which standardises the electronic reporting of financial information, including sustainability-related information, by companies within the EU.

⁴ Energy Systems Catapult. Operationalising a Carbon Regulator – Report 2: Review of Existing Regulatory Landscape.

Limited coordination across regulators and governments leads to inconsistent practices within the international carbon accounting landscape.



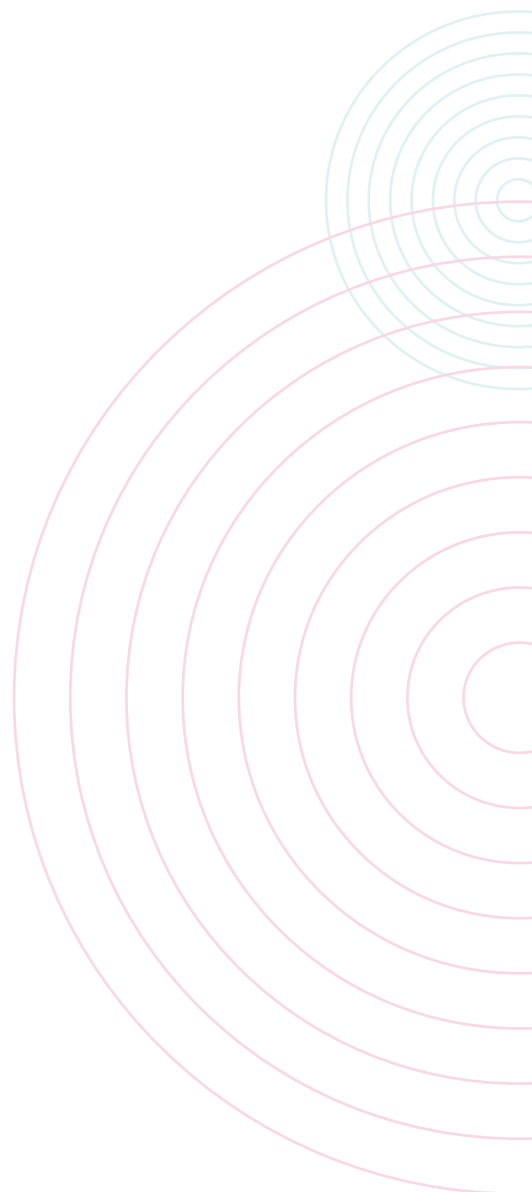
Review of international coordination initiatives

The international coordination landscape is complex, involving various actors and mechanisms to improve emissions data interoperability for the transition to Net Zero. This paper proposes that a Carbon Regulator should stay informed about these initiatives to align the UK's carbon accounting regulatory framework with best practices, and support industry through international engagement. Coordination initiatives primarily aim to promote standardised methodologies, facilitate data sharing, and foster collaboration to ensure consistency and accuracy in carbon accounting practices globally. They predominantly provide cross-sectoral guidance to accommodate diverse business needs. They also promote the uptake of digitalisation, primarily via reporting platforms to enhance transparency and traceability across supply chains. In recent years, there are increasing efforts to:

- Establish detailed and consistent sector-specific emissions measurement and reporting guidance, prioritising Scope 3 and product-level reporting⁵.
- Improve harmonisation of existing low-carbon product standards to reduce confusion for buyers, especially in the data required to establish emissions thresholds for low-carbon products.
- Leverage the purchasing power of industry and governments to accelerate a market for low-carbon products.
- Develop tailored, technology and process specific pathways that companies can use to establish their own transition plans in alignment to the goals of the Paris Agreement.

These efforts primarily address specific high-emitting industrial sectors with large global trade volumes, political decarbonisation interest, and relatively standardised production pathways, i.e., Iron & Steel, Cement and Aluminium. Gaps in current initiatives include limited sectoral coverage, lack of interoperability in technology ecosystem, and lack of action on governance, specifically verification processes. These gaps exacerbate the key challenges UK industry faces when navigating the carbon accounting policy landscape.

⁵ The GHG Protocol defines Scope 3 emissions as all indirect emissions (excluding indirect emissions from the generation of purchased energy) that occur in the value chain of the reporting company, including both upstream and downstream emissions.



The UK is one of the global leaders in international coordination efforts in the carbon accounting landscape, influencing the objectives and outcomes of many initiatives. A Carbon Regulator, with the support of other UK government agencies, could facilitate international engagement. The objective of the engagement would be to maximise the effectiveness of these initiatives, to enhance national capabilities, to address the system-wide challenges of carbon accounting, and support UK industry to navigate a less complex landscape.

Implications for UK exports

Based on our review of the international landscape, the following key risks for UK industry were identified:

- **Administrative burden** – Reporting entities face increasing costs of compliance due to varied reporting requirements, with a higher burden on SMEs who have more limited resources to navigate requirements.
- **Inaccurate emissions reporting** – Credibility of UK industry reported data could be impacted due to use of multiple reporting approaches, insufficient guidance on how to apply emissions measurement methodologies to sector-specific processes, and inconsistent verification processes.
- **Reduced customer demand** – Increasing demand for exporters to satisfy disparate information requests from buyers, often without support of interoperable digital solutions to facilitate exchange of emissions data.
- **Limited credibility of UK low-carbon exports** – Lack of alignment on criteria in existing low-carbon product standards impacts the credibility of this market and creates confusion for procurement decision makers where claims on materials with same purpose differ.
- **Limited access to finance** – Growing need for industrial firms to demonstrate sustainability performance to financial institutions, transparently and consistently, to avoid losing investment. Limited interoperable digital tools in place to assist obliged entities.

Recommendations for international engagement

There are opportunities for the UK to strengthen its international engagement to ensure a Carbon Regulator can provide assurance for the credibility of UK Industry-reported data while mitigating the risks for reporting entities and ensure ongoing competitiveness of UK exports globally. We have set out these recommendations for engagement below.

- 1. The design and development of national policies requires international engagement to promote harmonisation of standards and avoid additional hurdles for reporting entities.**
- 2. Enhanced coverage of sector-specific carbon accounting resources across international landscape is required to address diverse emissions reporting needs, promote accurate data collection, and enable effective sustainability measures for industry.**
- 3. Improved exchange of interoperable emissions data across global industrial value chains requires multi-stakeholder promotion of open source digital platforms and/or digital infrastructure based on standardised data model for storing and sharing GHG emissions data.**
- 4. Improved coordination to promote standardisation of accreditation requirements for verification bodies to the international community and provide assurance of credibility of UK verified industry emissions data.**
- 5. UK green claims policies, such as the Green Claims Code, should ensure the on-going competitiveness of UK exports by considering the criteria outlined in international low-carbon product standards and claims**

To effectively implement the proposed recommendations, a Carbon Regulator would require a mandate that allows for ongoing international engagement, which is currently lacking across existing carbon accounting regulatory frameworks. Allocating resources for international engagement within the scope of a national regulator would present challenges that require further investigation. Other areas of Government, such as the Department for Business and Trade need to support a Carbon Regulator in engaging in the international landscape, to align with Government priorities on international trade and low carbon economic activities.



1. Operationalising a Carbon Regulator – Project Context

The Innovate UK funded Carbon Accounting programme is led by High Value Manufacturing Catapult in collaboration with Connected Places Catapult, Digital Catapult, Satellite Applications Catapult, and Energy Systems Catapult.

The programme makes the case for a policy and regulatory environment that:

- Supports creating a comprehensive UK framework for greenhouse gas (GHG) emissions, with agreed standards and tools for accounting, tracking, and reporting GHG emissions through supply chains to accelerate industrial decarbonisation.
- Unlocks investment and creates an environment where UK industry excels on the global stage as a destination for low carbon manufacturing.

As part of this programme, Energy Systems Catapult is reviewing the policy and regulatory environment needed to support a data driven Net Zero economy. Credible, science-based emissions data will be essential to inform investment and innovation decisions for industry and the wider economy. Regulation is an important part of the policy toolkit to help standardise reporting practices and increase the credibility of emissions data.

Our Spring 2023 report⁶ summarised the role that standardisation of carbon accounting can have in facilitating a policy environment that helps industry make investment decisions for long-dated assets, innovate to reduce emissions, and compete on a level playing field both domestically and internationally.

This built on our earlier work with the South Wales Industrial Cluster (SWIC) Carbon Accounting in Industry project⁷, which reviewed the carbon accounting mechanisms and methodologies relevant to UK industry⁸ and made proposals to move towards a more consistent and coherent approach to disclosing emissions.

⁶ Energy Systems Catapult (2023). Carbon Accounting and Standards in Industry: A Framework for Innovation and Growth. <https://es.catapult.org.uk/report/carbon-accounting-and-standards-in-industry-a-framework-for-innovation-and-growth/>

⁷ Energy Systems Catapult (2022). Carbon Accounting in Industry: Learning from the South Wales Industrial Cluster to Develop a Consistent and Coherent National Framework. <https://es.catapult.org.uk/report/carbon-accounting-in-industry/>

⁸ In this report, we use the term 'industry' to refer to both foundation industries (e.g. metals, ceramics, glass, chemicals, paper, and cement) and manufacturing industries (e.g. automotive, aerospace, pharmaceuticals, etc.).

Net Zero Carbon Policy

This project sits within Energy Systems Catapult's wider Net Zero Carbon Policy thought leadership programme⁹, building on a foundation of high impact industrial decarbonisation reports. Throughout our work we promote an economy-wide, whole systems approach to carbon policy design, highlighting opportunities for innovation and low carbon growth, while recognising the specific needs of different sectors and energy consumers.

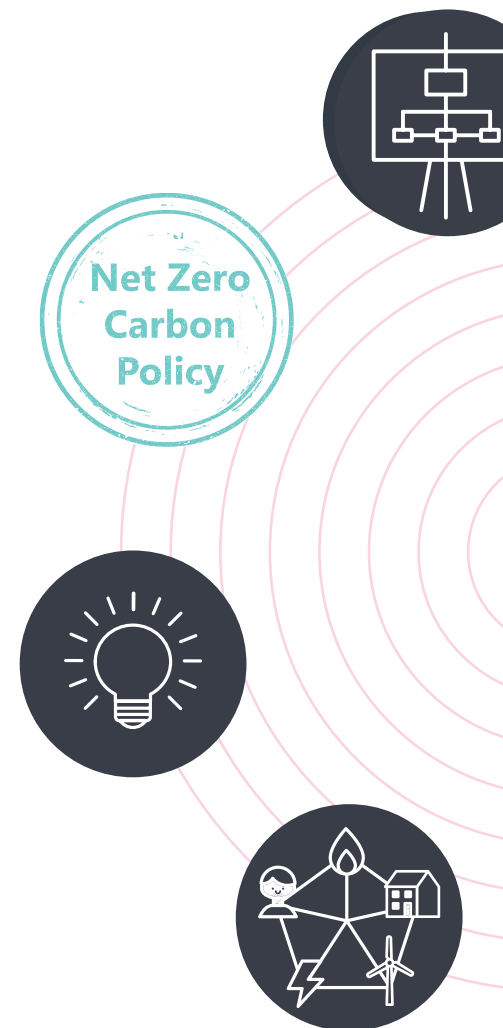
We adopt the following principles to guide our approach to research, analysis, and the development of policy recommendations:

- **Encourage innovation** with policies that enable open and competitive markets that reveal the value of clean energy resources and technologies.
- **Understand business needs** with an emphasis on reducing the administrative burden of carbon policies where possible to ensure industry, particularly small and medium-sized enterprises (SMEs), can thrive in a Net Zero economy.
- **Adopt a whole systems approach** to policy design using industry expertise to support economy-wide decarbonisation, facilitate regional partnerships, promote international best practice, and encourage reshoring of industry (while preventing further offshoring).

Within an economy-wide framework, we recognise that carbon policy should be tailored to the unique opportunities and challenges that individual sectors face¹⁰.

⁹ Energy Systems Catapult's back catalogue of Net Zero Carbon Policy work can be found here: <https://es.catapult.org.uk/project/net-zero-carbon-policy/>

¹⁰ Energy Systems Catapult, Net Zero Carbon Policy <https://es.catapult.org.uk/project/net-zero-carbon-policy/>



1.1 Our Proposal for a Carbon Regulator

Crucial to the standardisation of carbon accounting practices is the development of a regulatory framework that sets requirements on the gathering and reporting of emissions data as it travels through supply chains. We have previously proposed the introduction of a body charged with responsibility for economy-wide oversight of carbon accounting practices and MRV¹¹. We refer to this proposed body as a 'Carbon Regulator'.

A Carbon Regulator would be an independent body, either set up as a new institution, or by extending the mandate of an existing organisation, or it could be a group of bodies working together in a more coherent way.

Reliable and trustworthy emissions data will be essential to the functioning of a Net Zero economy. Economy-wide regulatory oversight can provide clarity, and innovation-friendly regulation can ensure a level playing field for innovators, cut investment risks, and build investor, business and consumer confidence. It can also support:

- **Streamlined reporting** – Reducing the administrative burden of reporting emissions and promoting a single source of emissions disclosure. Doing so also establishes a consistent source to be propagated for different carbon accounting use cases (e.g. Life Cycle Assessments and Corporate Reporting). This can only be enabled by the regulation of data best practice and the effective coordination of digitalised reporting and accounting software.
- **Credible emissions data** – Regulation can help maintain the integrity of a system, while driving demand for credible, scientifically-backed methods for measuring emissions. This has advantages, including:
 - Providing investors with confidence that the decarbonisation projects they support have a material effect on emissions reduction.
 - Supporting the third-party verification of emissions disclosures.
 - Standardising reporting methodologies where appropriate.
 - Assuring that all carbon accounting adheres to an agreed set of principles.

¹¹ In our previous reports, we make a clear distinction between MRV (the monitoring, reporting and verification of emissions at their source) and how emissions are then accounted for in different use cases – both functions require regulatory oversight.

- **A transition to improved emissions data** – Over time, regulation can improve access for SMEs and other consumers of emissions data to more comparable and complete data sets. During the transition, regulation can also safeguard organisations from unjust penalisation for gaps in their emissions data by phasing in requirements for different businesses sizes, while encouraging a shift towards improved emissions inventories.
- **A level playing field for competition** – Independent regulation can mitigate conflicting carbon intensity claims between competing products and services (e.g. construction materials). This can empower climate-conscious consumers and purchasing behaviour, promote fairer competition and help businesses and sectors identify where best to target innovation for Net Zero.

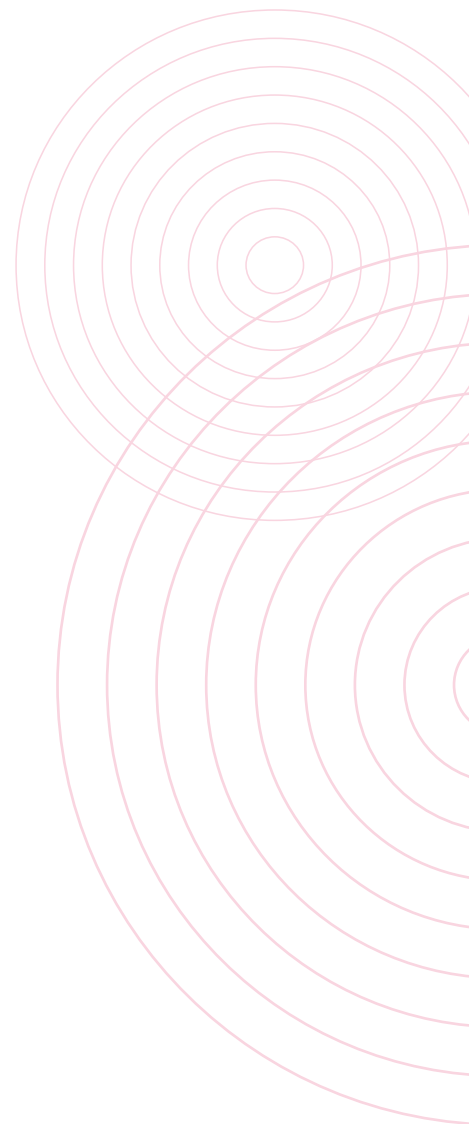
There are already carbon accounting regulations and regulators (e.g. the Environment Agency is responsible for the UK Emissions Trading Scheme (UK ETS)), but they are disparate and specific to individual policy mechanisms. As a result, there is no consistent, economy-wide oversight for carbon accounting and MRV of emissions.

The complexity of carbon accounting related regulation may increase with the implementation of a Carbon Border Adjustment Mechanism (CBAM), which the UK Government have confirmed will be in place by 2027. The government is also exploring whether there is a role for voluntary product standards, that could pave the way for future mandatory product standards. In doing so, it pointed to developing a new emissions reporting framework that would aim to maximise the use of existing data and minimise additional industry reporting burdens.¹² In Government consultation responses, there was also strong support for an independent regulator to verify product embodied emissions.

1.2 Research Approach to Operationalising a Carbon Regulator

In the Spring of 2023, we commenced a two-year project to understand the practicalities of operationalising a well-regulated carbon accounting framework, including considerations for the implementation of a Carbon Regulator. Throughout this project we intend to publish our learnings through a series of reports, with the aim of establishing a network of informed actors who can contribute to our future work in this area.

¹² DESNZ and HMT (2023). Addressing carbon leakage risk to support decarbonisation: Summary of consultation responses and government response. https://assets.publishing.service.gov.uk/media/657c7fbd95bf6500d7190cb/2023_Government_Response_-_Addressing_Carbon_Leakage_Risk.pdf



In this first year, we are publishing two reports to provide context on the regulatory foundations we propose are needed to support a Net Zero economy. We have focused on the following areas:

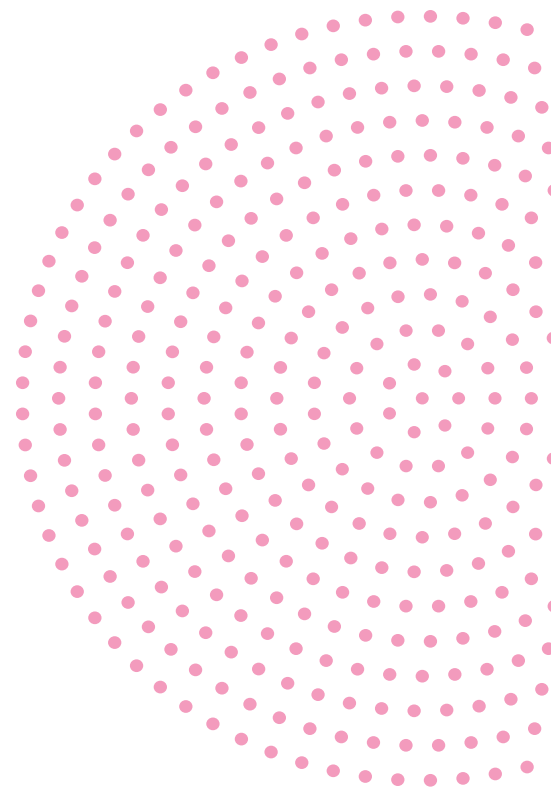
- Identifying approaches to regulatory design and delivery, drawing on insights from existing regulated sectors and interview with regulatory experts. Which is the focus of the first report in this series: *Operationalising a Carbon Regulator – Learning from Other Sectors*¹³
- Understanding the existing landscape of carbon accounting regulation in the UK, which is the focus of the second report in this series: *Operationalising a Carbon Regulator – Review of the Existing Regulatory Landscape*.
- Reviewing international considerations for a Carbon Regulator, including opportunities for a Carbon Regulator to play a leading role in promoting international alignment and export requirements on UK industry. This is the focus of this report.
- The fourth and final report in this series will look to dive deeper into specific gaps in regulation and what practical steps could be taken to fill these gaps. We aim to publish this report in early 2025.

At the heart of our research, we aim to capture a wide range of stakeholder views. For this report we have conducted a series of interviews with regulatory experts, industry stakeholders, and representatives from NGOs, research institutes and academia.

The rest of this report is structured as follows:

- Section 2 reviews existing and proposed national policies to establish key considerations for a UK Carbon Regulator in driving consistent and accurate emissions reporting in the UK.
- Section 3 reviews international coordination initiatives to understand their impact on harmonising carbon accounting and potential friction with national reporting requirements.
- Section 4 outlines key considerations for UK exports based on an assessment of the international carbon accounting landscape.
- Section 5 presents a set of recommendations for a UK Carbon Regulator on international engagement to support UK industry to navigate the international carbon accounting landscape.

¹³ The project website, where we will publish links to relevant publications as they arise can be found here: <https://es.catapult.org.uk/project/operationalising-a-carbon-regulator/>



2. National Carbon Accounting Policies

National carbon accounting policies can drive the adoption of consistent emissions reporting standards, which in turn encourage accurate and interoperable emissions data.

In this section, we review carbon accounting policy approaches in other countries and highlight considerations for the UK and proposed Carbon Regulator. The aim of the national policy review is to establish lessons learned for a UK Carbon Regulator in driving consistent and accurate emissions reporting in the UK.

2.1 Overview of National Policies Covered

National carbon accounting policies from ten countries are reviewed in this assessment. To narrow the scope of the assessment, five policy types are selected. The five policy types include: carbon markets, claims, disclosures, procurement, and transition plans. Disclosure policies have the highest coverage across the existing landscape. Meanwhile, transition plans had the lowest coverage, existing only in France under Article 29 of the Energy and Climate Law, which is only applicable to financial services firms.

¹⁴ Only includes carbon markets operating at a national level.

¹⁵ China is proposing to include high-emitting industry in covered entities under its national ETS – currently limited to the power sector.

¹⁶ The German national ETS covers heat generation and transport sectors while industry is covered under EU ETS.

Country	Status of regulation (in place, proposed, none)					Key	
	Carbon markets ¹⁴	Claim	Disclosure	Procurement	Transition plan	✓	Active policy
Australia	✓	✓	✓	✗	✗	—	Proposed
Canada	✗	✗	✓	✓	✗	✗	None
China ¹⁵	—	✗	✓	✗	✗		
European Union	✓	✓	✓	✗	—		
France	✗	✗	✓	✗	✓		
Germany ¹⁶	✗	✗	✓	✓	✗		
Japan	—	✗	✓	✓	✗		
Netherlands	✗	✗	✗	✗	✗		
Switzerland	✓	✗	✓	✗	✗		
United States of America	✗	✗	✓	✓	✗		

Table 1 Status of National Policies by Country

The selected carbon accounting policy type addresses one or more use cases, including target setting, internal abatement planning, climate-related risk assessment, carbon pricing, and informing consumer decision-making or impact investor decision-making. Awareness of the intended use case is critical as this determines which type of GHG accounting method is needed, e.g., attributional or consequential, and the granularity/comparability of data required¹⁷.

2.2 Key Considerations for a UK Carbon Regulator

Following a review of the national policies landscape, three key challenges were identified that a UK Carbon Regulator could consider when fulfilling its role to facilitate economy-wide consistent and accurate carbon accounting.

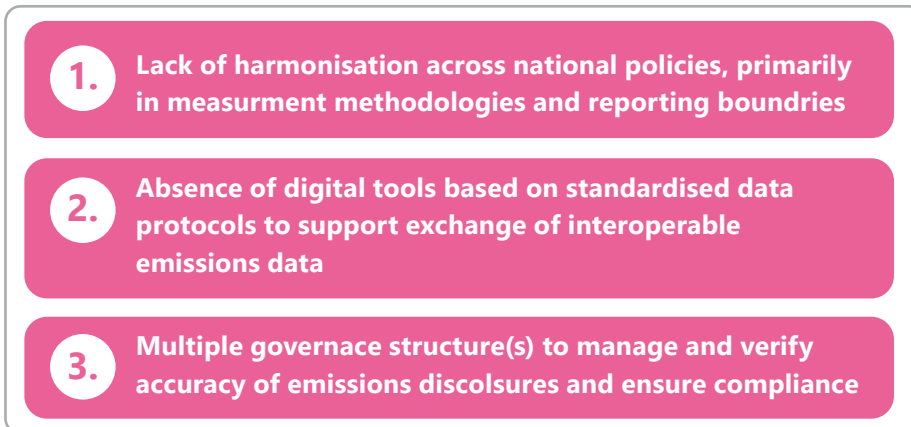


Figure 1 Summary of key challenges to effective emissions reporting based on national policies

Harmonisation of methodologies in carbon accounting

GHG emissions reporting requirements vary across the global carbon accounting policy landscape, notably in specified emissions measurement methodologies and reporting boundaries. Such variation leads to a lack of comparability, including both comparability of corporate emissions disclosures and comparability of low-carbon products. National policies provide reporting entities with different degrees of flexibility in how to apply reporting methodologies. While flexibility may increase compliance with a stated policy, allowing reporting entities to apply the methodology most applicable to its existing business model

¹⁴ Only includes carbon markets operating at a national level.

¹⁵ China is proposing to include high-emitting industry in covered entities under its national ETS – currently limited to the power sector.

¹⁶ The German national ETS covers heat generation and transport sectors while industry is covered under EU ETS.

¹⁷ Matthew Brander (2021). The most important GHG accounting concept you may not have heard of: the attributional-consequential distinction.



and data availability, it also has an unintended consequence of creating a lack of comparability across corporate disclosures.

National carbon accounting policies either derive their own guidelines based on existing international standards, prescribe the usage of a specific international standard, or allow the entity to choose an international standard, provided the methodology is disclosed. When national governments develop their own methodologies, guidelines, or standards, it promotes consistency within their jurisdiction. However, it also leads to the multiplication of standards, resulting in inconsistency and incomparability with data reported by entities in other jurisdictions. This approach fosters a “fake marketplace for competing standards” further increasing the variety of methods for measuring emissions¹⁸. For example, the French government developed the Bilan d'émissions de GES in France, which states that it is strongly based on the GHG Protocol and ISO 14046-1 methodologies. Meanwhile, Australia prescribes its NGER Measurement Determination, which provides its own methods and criteria for calculating greenhouse gas emissions and energy data under the NGER Act.

Alternatively, some national policies assert that the calculation methodology to be used is left to the discretion of the reporting entity with a recommendation to align to international standards such as the GHG Protocol and ISO 14064, the two most prescribed standards. While there are many similarities between the standards, they contain differences such as the specified calculation method (e.g., mass-balance or emission factor approach¹⁹), energy content, emission factors, and conditions for use of carbon offsets. This contributes to the lack of harmonisation in the carbon accounting landscape and incomparability of emissions reporting.

This challenge is made more difficult when policy makers largely fail to distinguish between the major types of GHG accounting methodologies, i.e., attributional or consequential, when designing carbon accounting regulations²⁰. In contrast to the attributional method where responsibility for emissions can be allocated to a specific entity, the consequential method is able to provide information on the emissions impact that occur

¹⁸ Insight from stakeholder interview with academic research institute.

¹⁹ The mass balance approach quantifies the input and output of materials and products, along with associated emissions, to calculate the overall carbon footprint. The emission factor approach applies using standardised emissions factors (amount of GHGs released per unit of activity) to calculate GHG emissions based on activity data.

²⁰ Matthew Brander (2021). [The most important GHG accounting concept you may not have heard of: the attributional-consequential distinction.](#)

outside the entity's defined inventory boundary²¹. As such, interchangeable application of these GHG accounting methodologies to achieve the same intended objective may lead to unintended consequences, like failure to drive economy-wide emissions reductions.

Lastly, national carbon accounting policies addressing industrial sub-sector emissions primarily focus on the measurement and reporting of Scope 1 and 2 emissions. This creates a gap for Scope 3 emissions reporting and Scope 3 emissions can be large for industrial sub-sectors. When inclusion of the fifteen Scope 3 emissions categories, in full or in part, is required, the reporting boundary is typically dependent on a materiality assessment completed by the reporting entity. While this may reduce a firm's reporting requirement and subsequent administrative burden, firm-specific materiality assessments may also obscure supply chain emissions as firms determine disparate materiality thresholds²². Alternatively, national policies may have disparate materiality thresholds. It is worth noting that the GHG Protocol itself does not provide a "one size fits all" materiality threshold but instead requires third party verifiers to opine on the determined threshold.

Harmonisation is required to facilitate the sharing of credible and accurate emissions data. Governments should adopt a whole systems view of emissions data, considering various use cases to drive innovation and decarbonisation across industry. However, governments, both in the UK and internationally, are creating divergent policy requirements that hinder overall understanding of emissions data and reporting. A Carbon Regulator could support government to improve harmonisation across policies with similar use cases, ensuring the most appropriate methods are being applied. Also, establishing an international coordinating function for a Carbon Regulator could offer a broader perspective and assist in aligning specific policy requirements and use cases where feasible.

Exchange of interoperable emissions data

Industry is often subjected to additional requirements beyond corporate-level disclosures, including facility and product-level reporting. Facility-level reporting is commonly mandated in economy-wide policies where firms are obliged

²¹ Energy Systems Catapult (2022). [Carbon Accounting in Industry: Learning From the South Wales Industrial Cluster to Develop a Consistent and Coherent National Framework.](#)

²² A material assessment refers to the process used to evaluate and determine the significance or importance of ESG issues or impacts for an organisation. GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard states that a quantitative materiality is typically calculated as a percentage of emissions inventory, in total or on an individual line-item bases (<https://ghgprotocol.org/corporate-value-chain-scope-3-standard#supporting-documents>)



to meet emissions reductions targets, such as EU ETS. Meanwhile, product-level reporting is mostly required under claims and procurement policies, such as the EU Green Claims Directive, where entities are required to account for the lifecycle of a product or service.

Granular emissions reporting should enable companies to identify emissions hot spots more easily along its supply chain to better inform mitigative actions. However, granular emissions reporting policies largely fail to account for the extensive data input needed to fulfil these reporting obligations. Public access to company-level or asset-level emissions data is either limited to protect sensitive data or shared at an aggregated level, consequently increasing the administrative burden for reporting entities. This issue is exacerbated by the lack of interoperability in the existing technology ecosystem to facilitate exchange of emissions data across suppliers, customers, and other stakeholders.

Although emissions reporting platforms, such as CDP, do exist, there is a lack of a globally accepted standards for the collection, storage, and sharing of GHG emissions data. Many jurisdictions require companies to submit GHG reports directly to the relevant government administrative agency while others have established reporting platforms for companies to submit their data. Examples include the EU CBAM registry and the Emissions and Energy Reporting System (EERS) for disclosures under the Australian NGER Act. Other jurisdictions provide more flexibility allowing companies to disclose data in their annual financial reports (e.g., EU CSRD). However, only a few have developed data standards for emissions reporting, such as the European Single Electronic Format (ESEF) which companies reporting under EU CSRD must apply.

Absence of digital tools based on standardised data management frameworks limits accessibility to comparable emissions data across industry supply chains, which is critical to reducing the UK's consumption emissions. It is important for a Carbon Regulator to be aware of the gaps across the existing technology ecosystem to identify effective ways to leverage digitalisation to facilitate exchange of emissions data across multi-stakeholders, including suppliers and customers of UK exports, and regulators analysing reported UK data. Improved interoperability will result in greater

transparency of how UK is progressing towards emissions reductions targets at both a company and national level. Additionally, by promoting presumed open data principles, a Carbon Regulator can support government to provide assurance for companies around the use of company data within the carbon accounting regulatory framework.

²³ European Securities and Markets Authority. [Electronic Reporting \(europa.eu\)](https://www.esma.europa.eu/press-news/esma-news/2014-10-23-2014-10-23-2014-10-23-2014-10-23-2014-10-23)

²⁴ Directive 2014/109/EC. [CL2004L0109EN0040010.0001 cp 1..1 \(europa.eu\)](https://eur-lex.europa.eu/eli/dir/2014/109/oj/1)

Data standards for emissions reporting

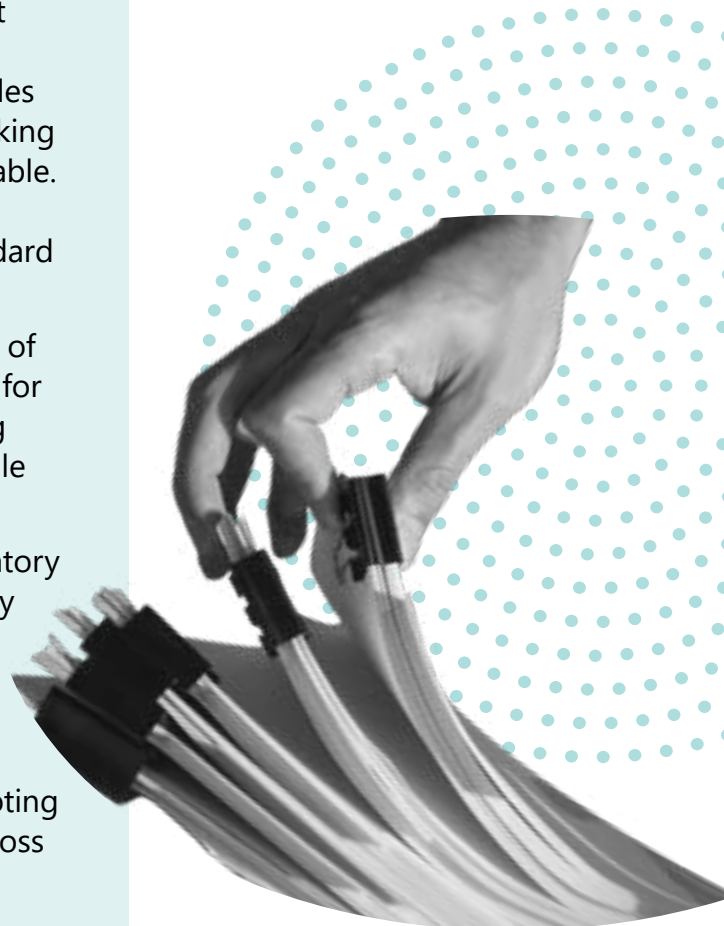
The European Single Electronic Format (ESEF) is a regulatory framework established by the European Securities and Markets Authority (ESMA) to standardise the electronic reporting of financial information by companies within the European Union (EU)^{23,24}.

This framework was integrated into the Transparency Directive (Directive 2004/109/EC), which mandates that issuers whose securities are traded on EU regulated markets prepare their annual financial reports in a single electronic format (ESEF). ESMA was assigned the responsibility to develop regulatory technical standards for this electronic reporting format, with the aim to enhance the accessibility, analysis, and comparability of annual financial reports.

ESEF requires issuers to apply the Inline XBRL format when disclosing sustainability-related information in their annual financial reports. This data format enables financial statements to be electronically tagged, making disclosed information structured and machine-readable. ESEF also requires all annual financial reports to be prepared in XHTML which can be opened with standard web browsers.

ESEF aims to enhance transparency and accessibility of sustainability information, including emissions data, for investors and other stakeholders, thereby facilitating informed decision-making and promoting sustainable investment practices.

ESMA undertakes annual amendments to the regulatory technical standards on ESEF to incorporate necessary changes to the ESEF taxonomy and account for developments in the market. This approach ensures that the framework maintains alignment to the evolving reporting requirements and technological advancements, enhancing its effectiveness in promoting consistency and comparability of emissions data across EU issuers.



Streamlined governance of carbon accounting regulation

Both the public and private sector play a key role in the design, implementation, and governance of national carbon accounting policies. Government organisations, in a legislative and administrative capacity, are responsible for drafting and implementing the policy and governance framework. This includes establishing rules for reporting and verification; collection and analysis of the reported data; providing technical resources and training to support reporting entities; facilitating consultations with relevant stakeholders; and ensuring compliance. Meanwhile verification bodies, often public-sector firms, are responsible for conducting audits of reported data in accordance with verification guidelines; and accreditation agencies to provide independent assessment of verification bodies.

Jurisdictions adopt different institutional arrangements to effectively coordinate across different delivering bodies. Across the UK's major trading partners, arrangements include:

- **Establishment of a new government agency** – Australia established the Clean Energy Regulator (CER), a new agency set up to administer Australia's mandatory reporting program under the NGER Act. The CER is the primary institution to implement legislation to reduce carbon emissions, including carbon accounting policies. CER leads coordination with other agencies such as the Australian Securities and Investments Commission (ASIC) as required. Further investigation into the effectiveness of the CER can inform benefits of setting up a Carbon Regulator as a new institution.
- **Coordination across multiple existing government agencies** – In Germany, the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) is responsible for developing and implementing environmental policies while the Federal Environment Agency (UBA) is the central environmental authority whose work in carbon accounting centres around data collation and analysis to inform policy. Additionally, the German Council for Sustainable Development (RNE) was established as an independent entity to advise the

Federal Government on issues of sustainability policy. Such an arrangement can be further investigated to identify practicalities of delivering carbon accounting regulation through coordinated regulatory bodies.

- **Collaboration across a multi-tiered governance structure** – This is largely adopted in jurisdictions where carbon accounting policy is implemented at a supranational, federal, and state/province level, such as the EU, US, and Canada. For example, the US Environmental Protection Agency (EPA) administers its mandatory GHG reporting program and plays a central role in coordinating with: (1) other federal agencies to address emissions from energy production, transportation, and land use; and (2) state environmental agencies to support the implementation of state level emissions reduction programs. This approach is not directly applicable to the UK but can offer lessons should any regulatory functions be distributed to local governments once the carbon accounting sector matures.
- **Mandate policy through an existing agency** – In Switzerland, the Federal Office for the Environment (FOEN) is the federal agency tasked to ensure the sustainable use of natural resources, including leading the development and implementation of carbon accounting policies in Switzerland. Understanding this institutional arrangement can provide insight into pros and cons of extending mandate of existing government agencies to deliver carbon accounting regulation.

Not only is it potentially important for a UK Carbon Regulator to maintain awareness of key actors across the political landscape, but the different governance structures provide potential examples for operationalising a UK Carbon Regulator.

Approach to enforcement

Government organisations typically adopt a targeted approach to enforcement, likely due to impracticalities of blanket enforcement. This allows for additional scrutiny on highest emitters where reductions are most impactful. Various mechanisms are used to enforce compliance with mandatory carbon accounting policy:

Government organisations typically adopt a targeted approach to enforcement, likely due to impracticalities of blanket enforcement.



- Financial incentives for meeting emissions reduction targets such as bankable credits, and penalties for non-compliance such as fines.
- Operational penalties for non-compliance such as permit suspension.
- Required independent verification and auditing of reported emissions.
- Infringement notices, including public disclosure of non-compliant entities.

²⁵ Insight from stakeholder interview with intergovernmental organisation.

²⁶ Insight from stakeholder interview with intergovernmental organisation

Despite implementation of such enforcement mechanisms, there is a lack of evidence of economy-wide compliance to mandatory policies. Regulators are aware of administrative burden for reporting entities given the evolving landscape, thus enforcement is relatively “flexible” as so not to dissuade participation. Non-compliance may have a penalty, but existing penalties imposed lack significant impact (e.g., relatively low-cost fines for non-compliance)²⁵. Regulators also lack sufficient financial and labour resources to ensure economy-wide compliance with mandatory policy requirements²⁶.

To facilitate enforcement, governments typically phase in mandatory requirements to gradually increase the coverage of sectors and firms targeted by the policy. For example, the scope of the EU ETS was expanded to cover maritime transport and EU CSRD plans to extend reporting requirements to SMEs by 2027. A Carbon Regulator could monitor how enforcement mechanisms evolve to identify how best to support UK industry with requirements from foreign jurisdictions and support UK Government by sharing different approaches across the landscape.

Verification requirements

Verification requirements for submitted emissions data are inconsistent ranging from self-certification to mandated independent third-party review of reported data. There is limited existing policy that specifies verification and accreditation requirements or that provides entities with financial support to cover the associated costs. Notable exceptions to this include:

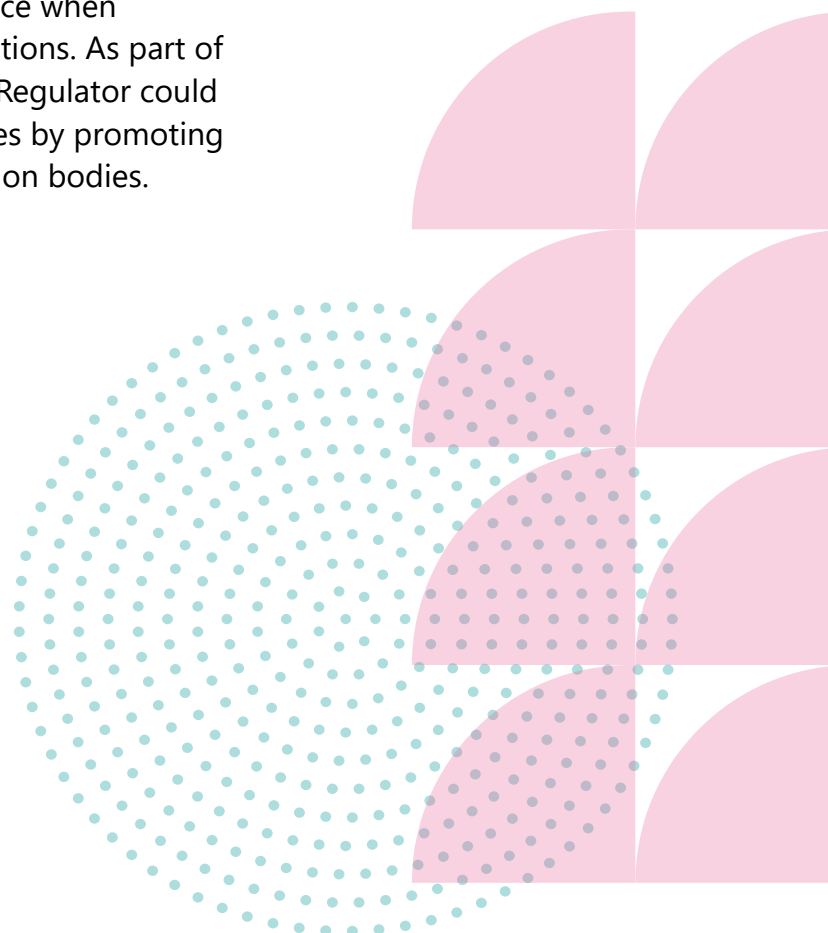
- The EU Accreditation and Verification Regulation (AVR) – defines rules for verification of emission reports submitted under the EU ETS and requirements for accreditation.

- Australia’s NGER (Audit) Determination 2009 – defines the requirements for preparing, conducting, and reporting on GHG emissions and energy audits.
- Australia’s NGER (Auditor Registration) Instrument 2019 – outlines the qualifications an auditor must have to be registered under the NGER Act.
- China’s National Emissions Trading Scheme – external review of reported data is conducted by program administrators approved by the Ministry of Ecology and Environment (MEE). Verification costs are paid by MEE²⁷, showing how governments can ease administrative burdens for companies under national carbon accounting policies. This approach, demonstrated by the Chinese national ETS, offers a model for potential government support mechanisms.

²⁷ HFW. [China’s National Emissions Trading Scheme: The world’s largest carbon market has finally arrived - HFW](#)

²⁸ <https://es.catapult.org.uk/report/the-case-for-an-economy-wide-carbon-regulator/>

The Catapult has previously proposed that the accreditation of third-party verifiers could be a function of a Carbon Regulator²⁸. This could either be done directly or through the recognition of appropriate verification bodies. However, due to the variation in reporting requirements, current international verification requirements tend to be policy specific. With gaps in standardisation of accreditations for verification bodies, this increases complexity for both companies and regulators to meet compliance when working across different policies and jurisdictions. As part of its proposed verification function, a Carbon Regulator could encourage alignment in verification processes by promoting standardisation of qualifications for verification bodies.



3. International Coordination Initiatives

²⁹ See Appendix for the coverage of key mechanisms applies in each sector.

International coordination initiatives play a crucial role in advancing the transition to a Net Zero economy, influencing global and regional priorities for harmonising carbon accounting for industrial sub-sectors.

The objectives of this section are to understand the existing priorities and mechanisms used by initiatives to promote harmonisation across supply chains. Also, this section aims to identify potential consequences of international initiatives for designing and implementing a UK Carbon Regulator and associated carbon accounting requirements.

3.1. Overview of International Coordination Initiatives Covered

This report assessed the sectoral international coordination initiatives that are aiming to support the interoperability of emissions data for eight industrial sub-sectors: Aluminium, Automotive Manufacturing, Cement, Chemicals, Glass, Iron & Steel, Pharmaceuticals, and Refined Oil.

Both state and non-state actors such as intergovernmental organisations, international trade associations, and multi-national industrial companies are leading the implementation and administration of international coordination initiatives. The existing landscape deploys several mechanisms to facilitate the development of credible, interoperable emissions data across the supply chain. The key mechanisms applied by international coordination initiatives include²⁹:

- Carbon accounting standards that establish a framework to measure and report GHG emissions. Examples of initiatives include the GHG Protocol, ISO 14064, and sector-specific emissions reporting standards such as the Cement CO₂ and Energy Protocol.
- Certification to establish a benchmark to define the level of carbon emissions associated with a product or production process of a product. Examples of initiatives include the ResponsibleSteel International Production Standard and the Aluminium Stewardship Initiative (ASI).

- Collaborative networks that establish a platform to: (1) share knowledge, best practices, and resources for emissions management; (2) create market demand for low-carbon materials to accelerate the transition to a net-zero economy. Examples of initiatives include the Clean Energy Ministerial Industrial Deep Decarbonisation Initiative (IDDI) and the First Movers Coalition (FMC).
- Sustainability reporting platforms that facilitate storage and exchange of sustainability related information, including but not limited to GHG emissions data. Examples of initiatives include the CDP (formerly Carbon Disclosure Project) and the London Metals Exchange (LME) Passport.
- Sustainability reporting standards that establish a framework to disclose sustainability-related information including environmental, social and governance metrics. Examples of initiatives include the ISSB IFRS Sustainability Standards.
- Supply chain management frameworks to define principles to promote responsible supply chain management across an industry sector, including principles related to environmental practices such as carbon accounting. Examples of initiatives include the Responsible Care Global Charter and the Pharmaceutical Supply Chain Initiative (PSCI).
- Transition planning initiatives that provide a framework, tools, guidance, and/or standards specifically focused on supporting organisations navigate and implement effective transition plans. Examples of initiatives include the Science Based Targets initiative (SBTi) and the UK-led Transition Plan Taskforce.

As shown in Table 2, the application of these mechanisms to provide guidance and set standards and targets to support interoperable emissions is more advanced in certain high-emitting industrial sectors.

Sector	Status			
	Emissions measurement and reporting guidelines	Low-carbon product standard	Green procurement targets	Transition plan guidance
Aluminium	✓	✓	✓	✓
Automotive manufacturing	—	✗	✗	✗
Cement	✓	—	✓	✓
Chemicals	✓	✗	✗	✓
Glass	✗	✗	✗	✗
Iron & Steel	✓	✓	✓	✓
Pharmaceuticals	✗	✗	✗	✗
Refined Oil	✓	✗	✗	✓

Key	
✓	Active policy
—	Proposed
✗	None

Table 2 Summary of objectives of international coordination initiatives by sector

3.2. Key Considerations for a UK Carbon Regulator

This section reviews how existing international coordination initiatives help to address the key challenges to effective emissions reporting introduced by the complex regulatory landscape.

While international coordinating initiatives have myriad objectives, the initiatives covered in this assessment primarily aim to address the key challenges of harmonising carbon accounting across the objectives illustrated in Figure 2. It is important for a Carbon Regulator to consider that existing international initiatives have unintended consequences, which are explored further in this section. Existing international coordinating initiatives are currently insufficiently addressing all the key challenges facing the national carbon accounting policy landscape. Therefore, it is important for a Carbon Regulator to identify the best practices to inform UK Government policy design and support UK industry navigate the landscape.

Objective of international coordination initiatives	How are international coordinating initiatives addressing these challenges		
	Lack of harmonisation in national policies	Absence of interoperable digital tools	Lack of streamlined governance structures for verification and compliance
Emission measurement and reporting guidelines	●	●	○
Low-carbon product standard	●	●	○
Green procurement	●	●	○
Transition plan guidance	●	●	○

Key	Gaps in the current landscape to address key challenges	Consideration for a UK carbon Regulator
●	No significant gaps to address key challenges identifications across existing initiatives	No international engagement facilitated through a Carbon Regulator is needed to support UK industry
●	Partial gaps to address key challenges identified across existing initiatives	International engagement facilitated through Carbon Regulator is needed to support UK industry
○	Major gaps to address key challenges identified across existing initiatives, or no initiatives in place	International engagement facilitated through a Carbon Regulator is needed to support UK industry

Figure 2; Gaps in current international coordination initiatives to address key challenges to effective emissions reporting

Emissions measurement and reporting guidelines

There are several efforts across key international coordination initiatives to develop sector-specific emissions measurement and reporting guidelines, building on international standards like the GHG Protocol, to encourage firms within a sector to transparently disclose comparable emissions data.

Sector-specific guidance has been developed to support firms particularly with data-intensive reporting, such as Scope 3 emissions reporting and product-level emissions reporting. Scope 3 emissions account for a significant proportion of industrial companies' emissions, making access to transparent and comparable Scope 3 emissions data critical for decarbonisation. Meanwhile, product-level emissions reporting, unlike corporate-level reporting, provides a detailed breakdown of emissions associated with individual products enabling targeted emissions reduction



strategies and informed decision-making. International coordination of product-level reporting is essential in global marketplaces to promote fair competition internationally.

Recognising the need for more detailed guidance, coordinating initiatives like the IDDI, Working Party on Industrial Decarbonisation (WPID), Together for Sustainability (TfS), and Automotive Partnership for Carbon Transparency (A-PACT) aim to improve harmonisation in measurement and reporting methodologies, with specific objectives to establish sector-specific guidance for Scope 3 and product-level reporting. These initiatives facilitate multi-stakeholder engagement to develop these frameworks. They aim to obtain sector expertise to fill knowledge gaps in existing standards, which mostly provide broad guidance³⁰. However, lack of coordination across regulators limits the adoption of these guidelines into policies. This creates an unintended consequence of ambiguity around which frameworks are to be applied by companies as best practice.

Development of emissions measurement and reporting guidelines is more advanced in some industrial sub-sectors like Iron & Steel and Cement, which represent 7-8%³¹ and 5-8% of global emissions respectively, with similar progress noted in the Aluminium sector³². For example, the Cement CO₂ and Energy Protocol (2011), developed by the World Business Council for Sustainable Development (WBCSD) in collaboration with the IEA and the Cement Sustainability Initiative (CSI), is aligned with the GHG Protocol and outlines a methodology for calculating and reporting CO₂ emissions addressing all direct and the main indirect sources related to the cement manufacturing process.

Such frameworks aim to improve accuracy and consistency in emissions measurement across their respective sectors by:

- Aligning to existing globally accepted international standards like the GHG Protocol.
- Prescribing sector-specific methodologies and thresholds to simplify application by industry (e.g. a detailed method for the reporting of calcination CO₂ emissions based on kiln input in the Cement CO₂ and Energy Protocol)³³.

³⁰ Insight from stakeholder interview with intergovernmental organisation.

³¹ IEA, Breakthrough Agenda. The Breakthrough Agenda Report 2023. [The Breakthrough Agenda Report 2023 \(iea.blob.core.windows.net\)](https://www.iea.blob.core.windows.net)

³² Chatham House. Making Concrete Change: Innovation in Low-Carbon Cement and Concrete. [Making Concrete Change: Innovation in Low-carbon Cement and Concrete | Chatham House – International Affairs Think Tank](https://www.chathamhouse.org/2023/04/making-concrete-change-innovation-in-low-carbon-cement-and-concrete)

³³ World Business Council for Sustainable Development & The Cement Sustainability Initiative. The Cement CO₂ and Energy Protocol. [CSI-CO₂-Protocol.pdf \(wbcsd.org\)](https://www.wbcsd.org/~/media/2011/01/CSI-CO2-Protocol.pdf).



Significant gaps were identified in existing emissions measurement frameworks addressing other sectors. Due to highly complex production pathways, establishing sector-wide emissions measurement guidelines for the Chemicals sector is challenging. Existing guidelines in the Refined Oil sector focus primarily on measuring and monitoring methane emissions. There are no existing or proposed sector-specific emissions measurement and reporting guidelines in Glass and Pharmaceuticals. These gaps are likely to increase the administrative burden on companies, who due to a lack of industry-led standards and best practice guidelines, need to apply broader guidance which may not be fit for purpose. This limits the accuracy of their reported emissions data by UK companies operating in these sectors.

It is also important to note that like national policies, access to company-level reported data is often restricted and where open-access digital platforms exist, there are limited efforts across the landscape to develop consistent data standards to enable the exchange of interoperable emissions data across industrial value chains.

A Carbon Regulator needs to be aware of the sectoral and technology gaps to identify barriers to application of emissions measurement guidelines within existing UK industrial reporting and to identify areas of further support for UK industry. A Carbon Regulator could address this in collaboration with UK government, industry bodies and sector specific UK regulators to support the UK to meet its industrial climate targets.

Low-carbon product standards

Low-carbon product standards are a critical mechanism for enhancing the credibility and transparency of “green” products, reducing greenwashing, and developing a market for low-carbon products. Current initiatives focus on improving harmonisation of existing standards to reduce confusion for buyers. When adhering to low-carbon product standards, producers can obtain certifications that verify their low carbon footprint. These certifications can be recorded on digital platforms, providing transparency and traceability for buyers and stakeholders. Not only will certification enable transparency of emissions data, but certification also enable efficient compliance monitoring,

reducing administrative burdens for regulators and investors.

Low-carbon product definitions are expected to continuously develop at industry, national, and international levels³⁴, driven by a range of factors including:

- Supply chain pressures to minimise embodied carbon emissions of supplied goods and services.
- Need for a consistent benchmark for firms to comply with claims and procurement policies.
- Advancing a standard aligned to production capabilities of a specific industry or region.
- Creating a competitive edge from product differentiation.

While these drivers are important for promoting interoperable emissions data, the evolving landscape creates unintended challenges for firms to evolve their own reporting processes and systems at-pace with the standards. Therefore, a Carbon Regulator should maintain awareness of the evolving landscape, to be aware of the challenges facing UK firms. A Carbon Regulator could then share these lessons learned with UK Government to facilitate the ongoing competitiveness of UK exports by ensuring that UK products are considered more carbon intensive by international markets and standards.

Two challenges facing industrial sub-sectors are the existence of multiple low-carbon product standards for some high-emitting products, namely steel, and gaps in standards for other industrial sub-sectors. The development of sector-specific low-carbon product and production standards is concentrated in high-emitting sectors with fewer production pathways, high global trade volumes and/or political interest³⁵. Meanwhile, there are no existing internationally recognised low-carbon standards, at either a product or process level, in the Automotive Manufacturing, Refined Oil, Glass, Chemicals and Pharmaceuticals sectors.

Also, multiple low-carbon product and production standards for steel creates ambiguity for steel producers and firms along the value chain and hinders the development of a low-carbon product market. This also hinders development of firm-level decarbonisation strategies when firms are uncertain to which standard to align their business processes.

³⁴ Insights from stakeholder interview with an academic research institution

³⁵ Insights from stakeholder interview with an academic research institution.

It is potentially important for a Carbon Regulator to be aware of the different standards to identify additional burden on UK firms and ensure UK products remain competitive in low-carbon product markets, as low-carbon product standards are the first step in developing low-carbon product markets. A regulator could issue guidance, independently or collaboratively with UK Government, on what makes an international product standard credible to encourage adoption of certain principles, such as transparent reporting methodologies. This guidance could also be used by companies and the public sector in setting their own procurement requirements on products.

Additionally, a Carbon Regulator could facilitate coordination across relevant stakeholders working to increase comparability and harmonisation of low-carbon product definitions globally by supporting UK government to align criteria in future claims and procurement regulations to global best practice. This would enhance the credibility and competitiveness of low-carbon UK exports globally.

Green procurement targets

Green procurement targets incentivise the purchase of goods and services with a reduced emissions footprint. The targets, set and monitored through international coordination initiatives such as the First Movers Coalition (FMC), are designed to harness purchasing power of industry and governments to accelerate a market for low-carbon products. Interoperable digital platforms can leverage this demand signal to connect buyers with suppliers who meet these targets, thereby facilitating market access for environmentally responsible products. However, there is a lack of open-access platforms to provide real-time information on credible low-carbon suppliers. Additionally, there is a significant gap in engagement from emerging markets across these initiatives, which may unintentionally enhance unfair competition practices and inconsistencies as low-carbon markets develops³⁶.

Procurement targets include criteria such as an emissions footprint threshold, use of recycled materials, and adherence to environment certifications. The use of common metrics across a supply chain enhances the interoperability of emissions data, allowing for consistent measurement and comparison across suppliers. Green procurement targets can

³⁶ Insight from stakeholder interview with academic research institute.



also encourage adherence to common low-carbon product standards, setting a benchmark for sectoral best practice. For example, the Climate Group's Steel Zero initiative requires members to commit to buy and use low emission steel for 50% of their steel requirements by 2030. The initiative stipulates that this can be achieved by purchasing ResponsibleSteel™ Certified Steel, or steel meeting an equivalent international standard³⁷.

It is important for a Carbon Regulator to maintain an awareness of these requirements to ensure the ongoing competitiveness and compliance of UK steel products, and other industrial exports, with current standards.

Transition plan guidance

Sectoral transition plans enable industrial decarbonisation and promote the exchange of interoperable emissions data by providing a roadmap. Transition plans are tools for innovation and investments in low-carbon technologies, supporting policy development, and promoting transparency. Across the international coordination initiatives landscape, transition plans have largely been developed with a sectoral lens to provide tailored, technology and process specific pathways that companies can use to develop their own transition plans in alignment to the goals of the Paris Agreement. Existing roadmaps to inform decision makers from the public and private sectors about the actions necessary to deliver Net Zero are largely structured as paper-based frameworks.

Mission Possible Partnership

Mission Possible Partnership (MPP) developed sector-specific guidance for Aluminium, Cement, Chemicals, Iron & Steel, Shipping, Aviation, and Trucking by following a four-step approach to developing Net Zero transition strategies:

- Convene value chain across industrial sector (suppliers, policy, consumers, finance).
- Define sector transition strategy.
- Jointly commit to actions in 2020s across industry, demand, finance, and policy.
- Help implement and reduce emissions.

³⁷ Climate Group. About SteelZero. [About SteelZero | Climate Group \(theclimategroup.org\)](https://www.theclimategroup.org/about-steelzero)

The MPP initiative also provides a suite of tools (including a report, an online explorer, and an open-source model) aiming to inform decision makers from the public and private sectors about the nature, timing, cost, and scale of actions necessary to deliver Net Zero within the sector by 2050 in compliance with a 1.5°C target. MPP facilitates collaboration between stakeholders to develop sector-specific transition pathways, including acceleration of low-carbon technologies. It has developed a Global Project Tracker which maps announcements, investment decisions, and operations of net-zero-aligned industrial projects across critical industrial sectors globally.

The MPP is only one example of the many coordination initiatives developing sector-specific transition pathways and transition planning guidance for industrial sub-sectors. SBTi, Transition Plan Taskforce, Climate Action Pathway (CAP) for Industry, and Assessing Low Carbon Transition Initiative (ACT) are all developing sector-specific transition plans and guidance, with most sector-specific transition plan guidance leveraging the work of the IEA. To deliver harmonisation in disclosures on transition plans, ISSB recently announced plans to assume responsibility for the disclosure-specific materials developed by the Transition Plan Taskforce³⁸. Similar efforts are required to improve coordination across existing initiatives to ensure development of diverse transition plans without duplication of efforts. By maintaining awareness of the direction of climate action promoted through these initiatives, a Carbon Regulator could support the UK government implement policy that establishes UK industry as a leading low-carbon market, developing products and technologies to support diverse transition strategies.

Overall, the international coordination landscape is complex, involving various actors and mechanisms to enhance emissions data interoperability for the transition to Net Zero. It is crucial for a Carbon Regulator to remain informed about these initiatives to fulfill its potential remit to align UK carbon accounting regulatory frameworks with international best practices and identify opportunities to better support industry through international engagement. G7 member countries, including the UK, wield significant influence over international coordination efforts, often shaping the objectives and outcomes of these initiatives. With support

³⁸ IFRS. [IFRS - ISSB delivers further harmonisation of the sustainability disclosure landscape as it embarks on new work plan](#)



G7 member countries, including the UK, wield significant influence over international coordination efforts, often shaping the objectives and outcomes of these initiatives.

from UK government departments, a Carbon Regulator could facilitate international engagement to maximise the effectiveness of these initiatives, thereby enhancing national capabilities to address the system-wide challenges of carbon accounting and assisting UK industry to remain competitive in a less complex landscape.



4. Implications for UK Exports

This section explores key implications for UK exports based on learnings from the previous section, highlighting why a Carbon Regulator or other UK governing bodies could engage internationally to support UK industry navigate carbon accounting disclosures and remain competitive.

The current lack of harmonisation, absence of interoperable digital systems, and lack of streamlined governance for verification and compliance across the global landscape introduce financial, operational, and reputational risks for UK industry as illustrated in Figure 3.

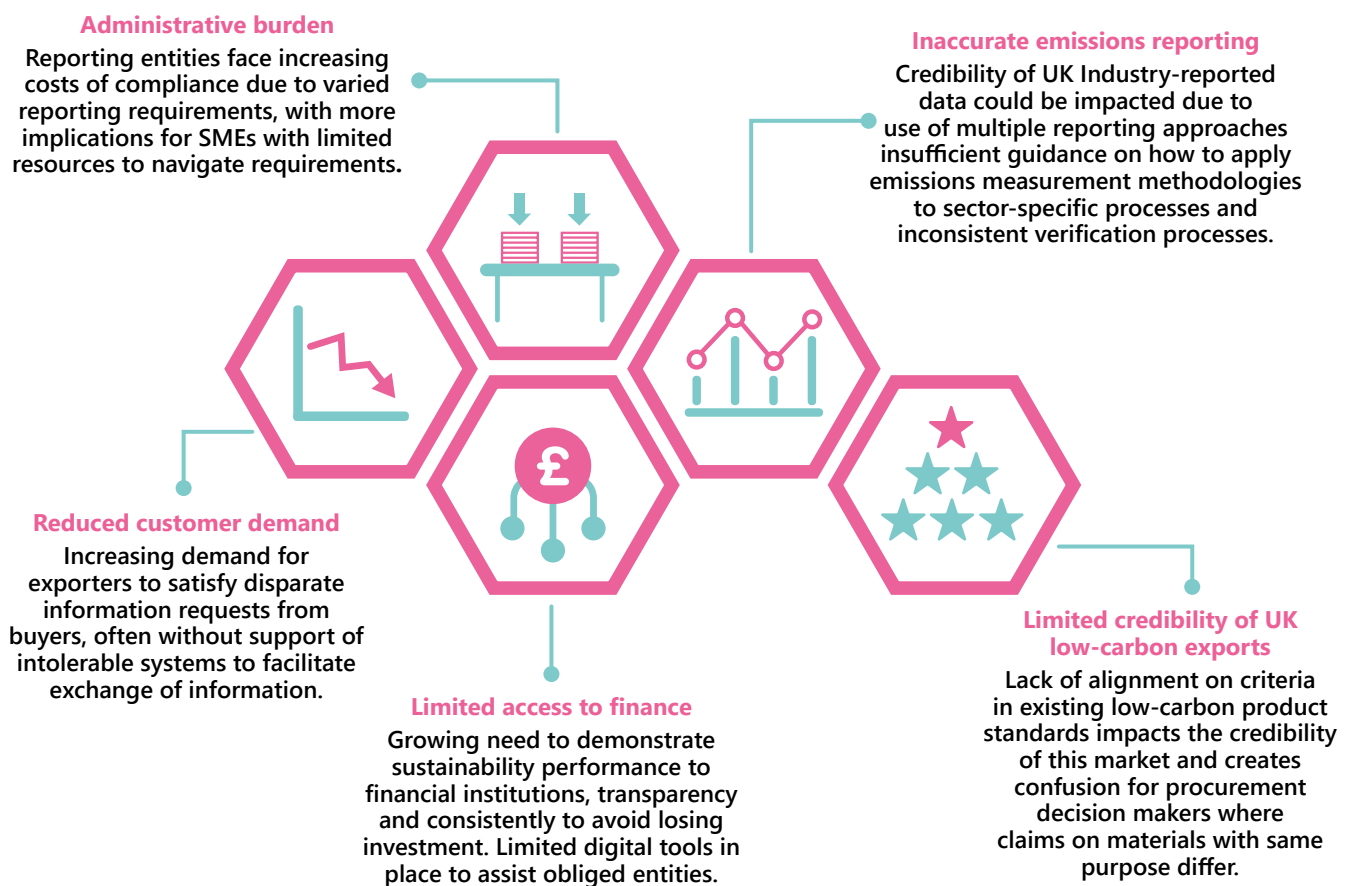


Figure 3; Summary of Limited credibility of UK low-carbon exports

Across the international landscape, UK companies are obliged to adhere to disclosure requirements from foreign jurisdictions in two ways:

- Directly as a consequence of owning significant operations in a foreign jurisdiction, namely the EU CSRD, EU CBAM, EU Green Claims Directive and US SEC Climate Disclosure rules.

- Indirectly via climate-related information requests from buyers of UK exports, namely EU CBAM.

The UK government may choose to prioritise engagement and harmonisation of carbon accounting methods with these trading partners in contrast to jurisdictions where existing policies are assumed to have no or low impact to UK exporters (see Figure 4). However, this paper appreciate that other factors will contribute to that decision. In this report, no or low impact to UK exporters is assumed where the country only has policies addressing domestic companies, existing policies lack clarity on applicability to foreign entities (e.g., Canada’s Policy on Green Procurement³⁹), or UK companies do not currently participate in market systems targeted by the policies (e.g., Japan’s Corporate Governance Code⁴⁰).

³⁹ Canada’s Policy on Green Procurement requires suppliers for federal government procurements over \$25M to disclose their GHG emissions and set reduction targets. The policy does not explicitly cover foreign suppliers.

⁴⁰ Japan’s Corporate Governance Code requires listed companies on the Tokyo Stock Exchange’s Prime Market to disclosure disclose climate-related information, including GHG emissions, on a comply-or-explain basis. There are no UK companies listed on the Tokyo Stock Exchange’s Prime Market as of June 2024.

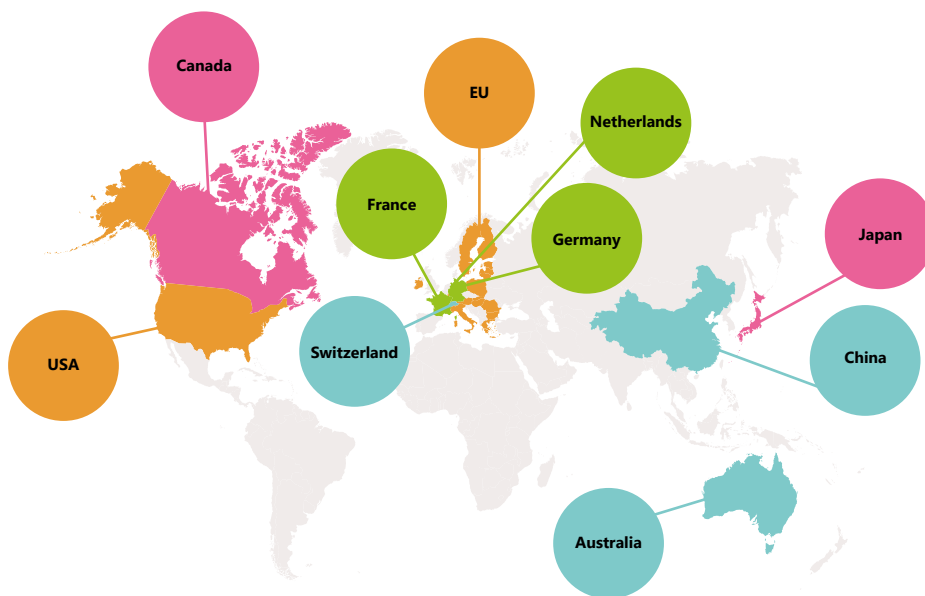


Figure 4 Major trading partners with mandatory disclosure requirements for UK industry.

	Mandatory
	Mandatory only under EU directive
	Mandatory - low impact to UK exporters
	No policies with disclosure requirements for UK exports
	Out of scope

As discussed in sections 2 and 3, where national policies are applicable to UK exports, the GHG reporting requirements across these policies vary, with lack of consistency in areas such as reporting boundaries, emissions measurement frameworks and verification requirements. This introduces

challenges for firms required to adhere to disclosure requirements of countries and regions to which they export, in addition to UK requirements.

For instance, UK companies exporting CBAM goods into the EU would need to provide product-level information for calculating embedded emissions of their exports⁴¹. Assuming these firms also met the applicability criteria under the EU CSRD and US SEC Climate Disclosure rules, they would also be obliged to disclose corporate-level GHG emissions data in their annual reports in a method compliant with those policies. To provide accurate information to both customers and regulators, firms would need to obtain significant data due to the varied GHG reporting requirements. Such firms face increased costs of compliance to demonstrate their integrity and increase their value proposition to customers.

In addition to challenges introduced by varied disclosure requirements, inconsistent progress in the harmonisation of emissions measurement methodologies within specific sub-sectors and a lack of supporting guidance places certain firms at a disadvantage. UK companies operating in Automotive Manufacturing, Glass, Pharmaceuticals, and Chemicals are likely to be more dependent on international standards such as GHG Protocol and have less tailored methodology guidelines, which may allow for different interpretations, leading to incomparable and potentially misleading emissions data with lower accuracy. Furthermore, accessibility to comparable and accurate emissions data across industry supply chains to inform future decarbonisation efforts is hindered by absence of digital tools based on standardised data protocols and inconsistent verification processes.

UK exporters of low-carbon products face similar challenges due to gaps in claims and low-carbon product standards in the existing landscape. Existing policies lack specificity on emissions measurement and reporting methods for companies to apply to avoid making misleading claims on their low-carbon products. For example, both the UK Green Claims Code and the proposed EU Green Claims Directive require companies to account for the lifecycle of a product when substantiating environmental claims of their products. However, there is an absence of detailed methodologies and calculations guidance within these policies to inform how to meet this requirement. This may lead to inconsistencies

⁴¹ UK Government. Summary of European Commissions guidance on the EU CBAM for UK exporters. [Summary of European Commission guidance on the EU CBAM for UK exporters - GOV. UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/118117/Summary_of_European_Commission_guidance_on_the_EU_CBAM_for_UK_exporters_-_GOV_UK.pdf)

as companies adopt different approaches to comply to the carbon accounting principles under these claims policies.

Additionally, lack of harmonisation exists where low-carbon product standards are increasingly developing, i.e., in Iron & Steel, Cement and Aluminium sectors, while there are no international standards for companies operating in other high-emitting industrial sub-sectors such as Chemicals and Glass on how to demonstrate credibility of low-carbon products. These factors make it more difficult for UK companies to develop credible low-carbon products and creates confusion for potential buyers when comparing products with competing claims.

A Carbon Regulator can be pivotal in providing assurance that UK industry reported data (regulated by a UK regulator) is sufficiently credibility to meet reporting requirements. A Carbon Regulator can also support government to promote harmonisation towards standards that address the complexity of the landscape. This will enable the UK to avoid duplication of efforts and provide sufficiently flexible policies to facilitate industrial decarbonisation. Such functions will help mitigate the risks outlined in Figure 3 and ensure ongoing competitiveness of UK exports globally. The proposed opportunities to achieve this through international engagement are detailed in section 5.



5. International Engagement – Recommendations

5.1. Overview of Recommendations

This section identifies opportunities for the UK Government to promote international alignment in carbon accounting for industry, supported by a UK Carbon Regulator. A Carbon Regulator can utilise its position as a first mover in the regulatory landscape to promote the credibility of UK low carbon industry and demonstrate the value of having nationally coordinated carbon accounting regulations, supported by a clear strategy for low carbon economic activity. The opportunities presented build on the understanding of the practicalities of operationalising a well-regulated carbon accounting framework explored in previous reports.

To effectively implement the proposed recommendations, a Carbon Regulator would require a mandate that enables continuous international engagement to improve coordination. Allocating resources for international engagement within the scope of a national regulator would present challenges, which warrant further exploration. Support from other areas of Government, such as the Department for Business and Trade will likely be required to support these recommendations. Therefore, the subsequent section outlines potential engagement approaches for the UK within the international landscape, including proposed action for a Carbon Regulator to implement the recommendations.

Recommendations

1. The design and development of national policies requires international engagement to promote harmonisation of standards and avoid additional hurdles for reporting entities.
2. Enhanced coverage of sector-specific carbon accounting resources across the international landscape is required to address diverse emissions reporting needs, promote accurate data collection, and enable effective sustainability measures for industry.

3. Improved exchange of interoperable emissions data across global industrial value chains requires multi-stakeholder promotion of open-source digital platforms and/or digital infrastructure based on a standardised data model for storing and sharing GHG emissions data.
4. Improved coordination to promote standardisation of accreditation requirements for verification bodies to the international community and provide assurance of credibility of UK verified industry emissions data.
5. UK green claims policies, such as the Green Claims Code, should ensure the on-going competitiveness of UK exports by considering the criteria outlined in international low-carbon product standards and claims.

5.2. Recommendations

Recommendation 1

The design and development of national policies requires international engagement to promote harmonisation of standards and avoid additional hurdles for reporting entities.

How to achieve this

Harmonisation of carbon accounting standards refers to the process of aligning different methodologies and reporting requirements to create more consistent approaches for: (1) measuring and reporting GHG emissions; (2) defining thresholds for low-carbon products.

This involves coordinating with regulators, industry, and other key stakeholders, within and outside the UK, to align on methodologies for emissions measurement and low-carbon product or production standards, especially where gaps driving incompatible reporting exist. Active multi-stakeholder engagement enhances the effectiveness of carbon accounting policy to drive industrial decarbonisation while ensuring fair competition practices. Collaboration across policy makers, affected stakeholders, and experts enables adoption of credible, scientifically backed methods for measuring emissions while minimising likelihood of pushback from industry.

Who to engage with

- **IEA, ISO, UNIDO, WBSCD, and WRI** are currently leading international coordinating efforts to address gaps in carbon accounting standards across industry. These organisations facilitate multi-stakeholder engagement by creating opportunities for participation from the private and public sector, through direct participation and/or consultation.
 - IEA hosts several initiatives, including the Climate Club, which aims to build international collective understanding of comparable and interoperable standards, including both emissions accounting methodologies and definitions for what constitutes 'near zero emissions'.
 - The IDDI, hosted by UNIDO, works to standardise carbon assessments, initially by developing a standardised methodology for reporting on embodied carbon through the steel and cement value chains.
 - ISO is responsible for the development and update of the widely-adopted ISO standards for carbon accounting, including ISO 14064 which provides guidance at the organisation level for measurement and reporting of GHG emissions and removals.
 - WRI and WBSCD are responsible for the development and update of the GHG Protocol .
 - WBSCD also hosts the Partnership for Carbon Transparency (PACT) which developed the Pathfinder Framework as an open-source framework to provide clear guidance for carbon accounting along value chains. Given the global reach of such organisations, such frameworks are likely to be widely adopted.
 - WRI also works very closely with local partners and government affiliated agencies to maximise climate policy impact. Taking a position to not be a standard setting body, WRI makes policy recommendations based on what standards are being developed globally⁴².

⁴² Insight from stakeholder interviews with intergovernmental organisation.



- These initiatives encourage engagement across policy makers, industry, and other relevant stakeholders to map existing carbon accounting standards, establish consensus on best-practice methods for measuring emissions, and define low-carbon products.
- Monitor progress and direction of travel from ISSB, EFRAG, and GRI who are working closely to coordinate the sustainability requirements in their respective standards, i.e., IFRS S1 & S2 (which recently incorporated the TCFD framework and announced same intent with the Transition Plan Taskforce), European Sustainability Reporting Standards, and the GRI standards.
- Consult with global industry bodies in hard-to-abate industrial sectors, including international trade associations and industry leaders in carbon accounting, to effectively identify corporate challenges in applying existing emissions measurement and reporting methodologies. This will enable carbon accounting standards to be developed with information from industry experts, reducing burden on firms to meet GHG reporting requirements. Buy-in from affected stakeholders will improve the scale of adoption of internationally set carbon accounting standards.

Rationale for the recommendation

There is a lack of harmonisation of carbon accounting standards across the UK's major trading partners. Current carbon accounting standards use various emissions measurement methodologies, allowing for different interpretations. This particularly applies to sector-specific rules, product-specific rules, and emission factor databases. This leads to:

- Lack of consistency and comparability of GHG emissions data.
- Gaps in sector-specific guidelines for emissions measurement, especially for product-level and Scope 3 emissions reporting.
- Lack of standardised definitions for low-carbon industrial products.
- Interchangeable application of emissions factor databases despite difference in measure of activity, i.e., similar use of LCA (measure of value chain activity),

EEIO (measure of economic activity), and combustion emissions factors (measure of technical activity).

- Growth of a “fake marketplace for competing standards”⁴³. Governments are increasingly being incentivised to have ownership of emissions measurement standards. This is leading to an increase in the variety of methods used to measure emissions, but it is not resulting in a significant improvement in the accuracy of reporting.

Improving harmonisation of global carbon accounting standards will reduce the administrative burden on UK industry by reducing the number of disparate requirements with which companies need to comply. Harmonisation should also facilitate consistent emissions reporting and monitoring for both companies and their stakeholders.

The UK can establish itself as a leader amongst regulators by taking the lead in improving the compatibility of carbon accounting standards. This will not only enhance the credibility of emissions data but also enable governments to aggregate company emissions data effectively. Such efforts are crucial for establishing nationally determined contributions and advancing global climate action.

Recommendation 2

Enhanced coverage of sector-specific carbon accounting resources across international landscape is required to address diverse emissions reporting needs, promote accurate data collection, and enable effective sustainability measures for industry.

How to achieve this

G7 member states, including the UK, play a substantial role in ongoing international coordination initiatives, exerting major influence over these programs’ objectives and results. The UK could leverage its existing influence to ensure advancements in carbon accounting across industrial supply chains, achieved through international coordination initiatives, align with the UK’s long-term climate goals.

As such, the sectoral coverage of sector-specific resources should increase, focusing on: (1) Establishing robust MRV requirements for industrial sub-sectors that currently lack best-practice guidelines for carbon accounting, such as Glass

⁴³ Insight from stakeholder interview with academic research institute.



and Pharmaceuticals; (2) Improving emissions measurement standards for high-emitting UK industrial sectors facing gaps in supply chain coverage (i.e., Refined Oil) and product-specific guidance (i.e., Chemicals).

Who to engage with

- Leverage current engagement with IEA and UNIDO, specifically through their WPID and IDDI initiatives, which provide a platform for governments to accelerate industrial decarbonisation by establishing standardised methodologies for emissions reporting and definitions for low-carbon products.
 - Given the UK government is currently a part of IDDI as co-lead, the UK can use this position to influence the initiative's direction and objectives, including increasing coverage of industrial sub-sectors in future activities in alignment to UK industrial decarbonisation strategy. A Carbon Regulator could also coordinate with sector regulators and the wider government to share understanding of UK industry challenges to meet disclosure requirements to maximise value of these initiatives to companies.
- Engage with global industry bodies to promote UK industry's adoption of credible resources from international organisations such as RMI, TFS, and Ipieca. These organisations are currently leading efforts in the global landscape to improve interoperability of emissions data in the Chemicals and Refined Oil sectors. Active engagement in such initiatives will allow UK to address gaps currently hindering that sector's industrial decarbonisation while improving alignment on best-practice between UK and international firms.

Rationale for the recommendation

It is valuable to have detailed guidance for sub-sectors to address industry-specific challenges to emissions measurement and reporting because applying sector-agnostic emissions measurement methodologies to specific industrial processes presents challenges. Currently, development of sector-specific carbon accounting standards with cradle-to-gate supply chain and emissions coverage is concentrated in Iron & Steel, Cement, and Aluminium sectors. This leaves gaps in best-practice guidelines for emissions measurement in industrial sub-sectors with lower

global trade volumes, such as Glass, and have complex production pathways, such as Chemicals. Additionally, in Oil & Gas the existing frameworks focus on measuring and reporting upstream methane emissions.

The lack of relevant sector-level guidance and standards, particularly Scope 3, MRV and PCR guidance, may hinder a firm's ability to identify emission hot-spots across its supply chain and progress towards reducing those emissions. This may lead to:

- Reduced customer demand for highly carbon intensive products and increased demand for vendors with more accurate supplier-specific emissions data. This is particularly relevant for exports of UK goods covered by EU CBAM and industries with increasingly sustainability-conscious consumers, who may be willing to pay a green product premium today and in the future.
- Reduced access to financing, if firms are unable to adequately demonstrate achievement of emissions reduction targets to investors. However, it is worth noting that liquid international capital markets may mitigate this risk as not all financial institutions will have emissions reduction targets.

The UK has an opportunity to leverage its influence in existing international coordination initiatives to ensure a larger share of its high-emitting industrial sectors have tailored guidelines to help these sectors accelerate decarbonisation based on sector-specific processes and value chains.

Recommendation 3

Improved exchange of interoperable emissions data across global industrial value chains requires multi-stakeholder promotion of open-source digital platforms and/or digital infrastructure based on a standardised data model for storing and sharing GHG emissions data.

How to achieve this

The UK can advance the use of technology systems to facilitate the seamless exchange of emissions data across industrial supply chains, promoting transparency while



The lack of relevant sector-level guidance and standards, particularly Scope 3, MRV and PCR guidance, may hinder a firm's ability to identify emission hot-spots across its supply chain

setting a global standard to improve sustainable supply chain management practices. Existing approaches to promote the use of digitisation for effective GHG emissions data management focus on: (1) establishing platforms for environmental reporting; (2) developing open access data standards to enable the exchange of emissions data across technology platforms and stakeholders throughout the value chain. With specific and consistent principles on data sharing in open access data standards, government can also address industry competitiveness concerns due to disclosure of company-sensitive information.

Who to engage with

A UK Carbon Regulator could collaborate and support organisations playing a key role in building a technology ecosystem for emissions reporting. This will allow the UK to identify opportunities to scale effective digital carbon accounting solutions while promoting international alignment.

Examples of relevant actors identified in this study include:

- **CDP**, a non-profit which runs an environmental disclosure system for companies, cities, states, and regions. CDP aligns their corporate questionnaire with the most relevant frameworks and standards, such as Task Force on Climate-Related Financial Disclosures (TCFD) and GRI standards, to support entities disclosing information against the different market and regulatory demands⁴⁵.
- **WBSCD, host of the PACT initiative**, developing a network for the exchange of supplier-specific product carbon footprint (PCF) data (Pathfinder Network)⁴⁶.
- **RMI, specifically the Climate Intelligence workstream**, supporting the establishment of open-source data platforms for emissions reporting. RMI's engagement with policy makers focus on calls for inputs with a focus on standardising data⁴⁷. RMI also engages with civil society experts, major buyers, suppliers, and industry non-profits globally, providing the UK with access to relevant information from across the supply chain to improve carbon accounting.

⁴⁵ CDP. [Corporate questionnaire alignment with environmental frameworks and standards - CDP](#)

⁴⁶ WBSCD. Pathfinder Framework: Guidance for the Accounting and Exchange of Product Life Cycle Emissions.

⁴⁷ Insight from stakeholder interview with intergovernmental organisation.

- **The Open Group**, a non-profit leading the development of open GHG data management standards through the Open Footprint Forum. Members range from major corporations, small to medium-size businesses, government organisations and consortia, and universities⁴⁸.
- **The London Metal Exchange (LME) hosts an ESG data platform, LMEpassport**, for suppliers to store sustainability credentials for LME-listed metals, including aluminium. This is done in collaboration with producers and standards bodies around the world to improve access to comparable and verified sustainability information⁴⁹.
- **Carbon Accounting Alliance (CAA)** brings together carbon accounting providers who offer accounting services, datasets, and digital platforms to support companies calculating their carbon footprints and promote consistency in carbon accounting methodologies.
- **Major UK exporters and large buyers of UK exports**, prioritising those with supplier information requests driven by mandatory disclosure requirements like EU CBAM. A UK Carbon Regulator could consult with stakeholders affected by lack of transparency in supply chain emissions data to create high impact, useful digital solutions.

Rationale for the recommendation

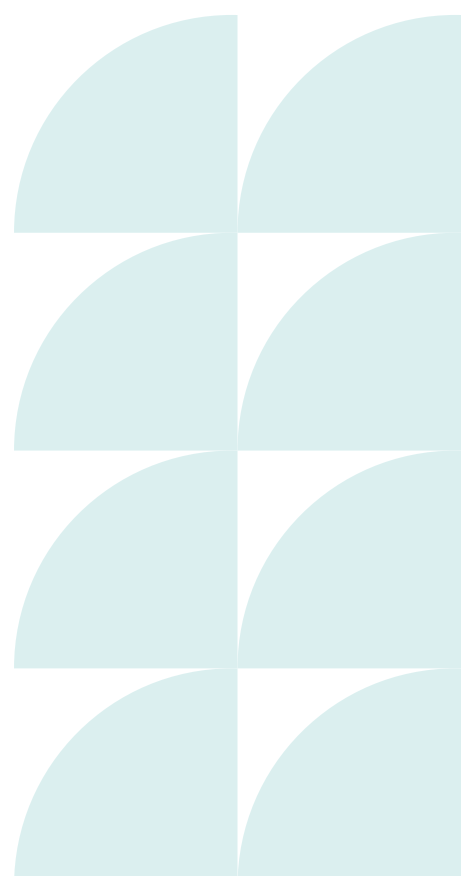
There does not currently exist a globally accepted standard for collection, storage and sharing of GHG emissions data for industrial production. There are increasing digital platforms for reporting GHG emissions data, such as CDP, which are valuable tools for annual reporting. However, the lack of a common data protocols for emissions reporting is a barrier to the compatibility between existing digital platforms. Their focus on corporate-level reporting also overlooks the potential for more actionable insights based on product-level data, which could assist companies in making operational decisions to reduce carbon emissions.

This makes it difficult for:

- Companies to report their GHG emissions data in a consistent manner.

⁴⁸ The Open Group. The [Open Footprint Forum. Open Footprint® Forum | www.openfootprintforum.org](https://www.openfootprintforum.org/)

⁴⁹ London Metal Exchange. [LMEpassport. LMEpassport | London Metal Exchange](https://www.lme.com/our-services/lmepassport/)



- Regulators to access, analyse and aggregate company emissions data efficiently.
- Customers with GHG emissions disclosure requirements to access supplier-specific information.
- Buyers procuring low-carbon materials to make timely, informed purchasing decisions.
- Investors to access climate-related information for all business activities to make timely, informed sustainable investment decisions.
- Third-party organisations, such as academia and the Climate Change Committee, to hold UK accountable for climate targets.

⁵⁰ ISO 14065 defines requirements for bodies that validate and verify GHG statements. It can be used as a basis for accreditation and other forms of recognition in relation to the impartiality, competence, and consistency of validation and verification bodies.

A digital infrastructure to facilitate the interoperability of emissions data will result in greater transparency of how not only firms, but also UK industrial emissions are progressing towards emissions reductions targets. Greater transparency of emissions data will also support the firm's financiers who are increasingly requiring quality emissions data and climate-related information from their clients. Additionally, the amount and type of data required to obtain accurate emissions reports is sensitive to company operations and raises concerns on competitiveness across firms. A Carbon Regulator can support government to provide assurance for companies around the use of company data by promoting presumed open data principles within the carbon accounting regulatory framework.

Recommendation 4

Improved coordination to promote standardisation of accreditation requirements for verification bodies to the international community and provide assurance of credibility of UK verified industry emissions data.

How to achieve this

This involves coordinating with regulators and other key private sector stakeholders, within and outside the UK, to:

- Agree on accreditation requirements to conduct carbon accounting audits as a qualified verification body, ensuring alignment with existing international processes and standards such as ISO 14065⁵⁰.
- Ensure that any verification requirements, such as

accreditations provided by a Carbon Regulator to third-party verifiers, are considered adequate to meet international standards for UK exports. This would prevent industry from having to undergo verification processes twice, potentially against two different methodologies.

⁵¹ [Validation & Verification Body Accreditation \(ukas.com\)](https://www.ukas.com)

Who to engage with

- **Coordinate with the Carbon Accounting Alliance (CAA) and the United Kingdom Accreditation Service (UKAS) to develop and uphold an internationally recognised professional qualification for carbon accounting verification.** CAA brings together carbon accounting providers who offer accounting services, datasets, and digital platforms to support companies calculating their carbon footprints and promote consistency in carbon accounting methodologies. Working with government, UKAS have accredited several verification bodies under ISO 14065⁵¹.
- **Consult with national accreditation bodies** such as COFRAC in France and other regulators such as US EPA to obtain acceptance of accreditation requirements under professional qualification.
- **Monitor voluntary schemes developed by the private sector, NGOs and trade associations** aiming to provide carbon accounting certifications for verification bodies, e.g., AEE's Certified Carbon Auditing Professional program. Such schemes could influence direction of verification standards internationally. Engagement would ensure global alignment as the carbon accounting policy landscape matures.

Rationale for the recommendation

Existing national policies do not provide detailed and consistent accreditation requirements for verification bodies to qualify to perform carbon accounting audits.

The most common standard stated in policies for the carbon accounting verification process is ISO 14064-3, which provides guidance for verifying and validating GHG statements. Meanwhile there is limited reference to standards like ISO 14065, which directly address accreditation requirements for verification bodies. Regulators are developing varied accreditation requirements for verification bodies to support firms to comply with



national disclosure policies. This is currently achieved primarily through national registration of verification bodies based on fulfilment of eligibility criteria set out in regulation, such as practical auditing experience or a Certified Public Accountant (CPA) qualification.

By developing a professional qualification or accreditation programme for carbon accounting verification that builds on existing international standards, such as ISO 14065, and maintains acceptance by other countries' regulators, the UK can be a leader in promoting standardisation of carbon accounting verification requirements. Streamlining accreditation requirements for verification of GHG statements will reduce administrative burden for UK industry mandated to verify emissions data across multiple jurisdictions with disparate requirements. Additionally, it will reduce the challenge of inaccurate emissions tracking resulting from a lack of standardisation of carbon accounting standards.

Recommendation 5

UK green claims policies, such as the Green Claims Code, should ensure the on-going competitiveness of UK exports by considering the criteria outlined in international low-carbon product standards and claims⁵².

How to achieve this

To consider the criteria in international standards and claims, the UK Carbon Regulator would need to:

- Maintain awareness of carbon accounting requirements under relevant international standards and claims policies;
- Work with other regulators, industry and other key stakeholders to identify gaps or barriers in existing low-carbon product definitions;
- Coordinate with relevant government bodies, such as the Competition and Markets Authority (CMA), to ensure UK claims policies align with global best-practice and increase harmonisation of methodologies for defining low-carbon products;
- And support UK government to develop sector strategies to maintain competitiveness of UK exports as low-carbon product market grows.

⁵² The UK Green Claims Code, in effect from 20 September 2021, was developed by the Competition and Markets Authority to outline principles that companies making environmental claims need to adhere to, to ensure they are properly substantiated and do not mislead consumers.

Who to engage with

A UK Carbon Regulator could support government to account for and monitor international standards, NGOs, and regulators developing carbon accounting requirements for low-carbon products and production such as:

- IEA and UNIDO, specifically their WPID and IDDI initiatives which provide a platform for governments to engage in establishing standardised definitions for low-carbon products.
- RMI, one of the founding partners of the international coalition responsible for running the Mission Possible Partnership (MPP). Its Industrial Transition Accelerator is mapping low emissions products standards for six key materials including cement, steel, aluminium with the aim to harmonise existing standards and reduce confusion of stakeholders mainly government and buyers⁵³.
- Regulators across the UK's major trading partners, including the US EPA, developing national benchmarks for low-carbon products as criteria for public procurement are being developed.
- International organisations taking a role as standard setting bodies in industrial sub-sectors, such as ResponsibleSteel which outlines requirements for responsible processing and production of steel and ASI which set requirements for the responsible production, sourcing, and stewardship of aluminium.

Rationale for the recommendation

Accounting for the lifecycle of a product or service is the primary carbon accounting principle in existing claims policies such as the EU Green Claims Directive. However, there is a notable lack of specificity in emissions measurement and reporting requirements for companies to comply with this principle, which increases the challenges that firms face in complying with these directives consistently. This may also lead to application of an inappropriate GHG accounting method, in turn driving poor decision making for producers, customers and regulators. For example, a consequential approach can provide information on the potential emissions resulting from a future product. Inaccurate application

⁵³ Insight from stakeholder interview with non-profit initiative.

of the attributional method in this scenario can mislead companies into implementing actions that lower their entity's attributed emissions while inadvertently increasing global emissions^{54,55}.

Development of international low-carbon products and production standards is mostly occurring in the Iron & Steel, Cement and Aluminium sectors, but the standards are not always harmonised. Additionally, there is no best-practice guidance for companies operating in other high-emitting industrial sub-sectors such as Chemicals and Glass on how to manufacture low-carbon products. Both factors make it more difficult for UK companies to develop credible low-carbon products.

To ensure the future competitiveness of UK exports, it is important that future UK policy considers the international carbon accounting requirements for "green products" to ensure that UK products are not perceived as less sustainable, potentially reducing international demand. The UK can significantly improve its effectiveness in policy-led actions to combat greenwashing by establishing consistent carbon accounting requirements and best practice guidelines under claims policies. Robust guidelines enable UK companies to accurately measure and report their environmental impact, to promote transparency, accountability, and trust among consumers and stakeholders, and to strengthen the UK's position as a leader in sustainable practices.

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To ensure the future competitiveness of UK exports, it is important that future UK policy considers the international carbon accounting requirements for "green products" to ensure that UK products are not perceived as less sustainable, potentially reducing international demand.

⁵⁴ Energy Systems Catapult (2022). [Carbon Accounting in Industry: Learning From the South Wales Industrial Cluster to Develop a Consistent and Coherent National Framework.](#)

⁵⁵ Matthew Brander (2021). [The most important GHG accounting concept you may not have heard of: the attributional-consequential distinction.](#)

The UK can significantly improve its effectiveness in policy-led actions to combat greenwashing by establishing consistent carbon accounting requirements and best practice guidelines under claims policies. Robust guidelines enable UK companies to accurately measure and report their environmental impact, to promote transparency, accountability, and trust among consumers and stakeholders, and to strengthen the UK's position as a leader in sustainable practices.



6. Appendix

6.1. Methodology

An Overview of the Approach Taken

This section outlines the scope of this report and the approach taken to assess the international carbon accounting landscape. The assessment was conducted in six stages: scoping, literature review, stakeholder interviews, insights, and draft recommendations development, case studies, and quality assurance.

At the project inception, ten countries and eight sectors were selected for the international assessment. The sectors chosen are a selection of industrial sub-sectors that are included within existing international policies (i.e., EU and UK CBAM), a large sources of UK emissions, or represent sectors that sit within supply chains. For example, aluminium sits within the automotive manufacturing supply chain and refined oil sits within the chemicals supply chain. The sectors informed the international coordinating initiatives selected for this assessment.

The countries selected for this assessment were chosen based on the following considerations:

- Size of the UK export market
- Geographic diversity
- Jurisdictions with notable carbon accounting regulations from which there may be interesting learnings for the UK.
- UK exports to the chosen country substantially include industrial products.

ONS data was reviewed to support the identification of countries and sectors based on the criteria outlined above.

Based on the agreed criteria, the following countries and sectors were selected:

- Countries – Australia, Canada, China, the EU, France, Germany, Japan, Netherlands, Switzerland, and the USA.
- Sectors – Aluminium, Automotive Manufacturing, Cement, Chemicals, Glass, Iron & Steel, Pharmaceuticals, and Refined Oil.

Next, five specific regulator policy types were identified, including:

- Claims – Mitigate against “greenwashing” i.e., misleading claims and marketing about the positive environmental impact of a company’s products and services.
- Carbon Markets – Trading systems in which carbon credits are sold and bought.
- Disclosure – Establish requirement for companies to declare emissions related to a specific product, project, financial activity, or company-wide operations.
- Procurement – Outline emissions-related conditions on the procurement of goods and services.
- Transition Plans – Define pathway to achieve Net Zero and/or interim emissions targets.

The policy types are consistent with the Catapult’s prior reports on Operationalising a Carbon Regulator⁵⁶.

The policy type, country, and sector scope definitions subsequently informed the selection of policies and international coordinating initiatives in the literature review. The following table summarises the specific policy selection criteria used to set the scope of policies and initiatives assessed in the literature review⁵⁷.

ID	Criteria	Description
CR1	Documentation must be current	If multiple versions of the policy / initiative exist, only most current version will be included.
CR2	Requirement for disclosure of GHG emissions	Where a policy / initiative addresses disclosure of environmental impact, it must include a direct or indirect requirement for disclosure of GHG emissions to be included in scope.
CR3	Jurisdiction	Policy / initiative must be applicable to countries within agreed scope, i.e., Australia, Canada, China, EU, France, Germany, Japan, Netherlands, Switzerland, USA.
CR4	Regulatory influence	Current policy/proposed policy does/may have a notable impact on global carbon accounting regulatory landscape.
CR5	Relevance to the UK	Policy / initiative has / may have notable impacts on considerations for UK exports; or includes relevant lessons for future UK Carbon Regulator.
CR6	Sector relevance	Policy / initiative must be applicable to industrial sub-sectors within agreed scope, i.e., Aluminium; Automotive Manufacturing; Cement; Chemicals; Glass; Iron and Steel; Refined Oil; Pharmaceuticals. This includes indirect industrial sub-sector coverage through policy / initiatives targeting disclosure of financed GHG emissions from actors in the Finance sector.
CR7	Type of regulation	Policy / initiative must fall under one or more of the outlined types of regulation, i.e., claims, disclosures, procurement, transition plan, or carbon market

Table 4 Policy and Coordinating Initiative Criteria

⁵⁶ Reports published as part of this series can be found on the Catapult’s website: <https://es.catapult.org.uk/project/operationalising-a-carbon-regulator/>

⁵⁷ Based only on international coordination initiatives reviewed in this study.

In addition to the inclusion criteria listed above, international coordinating initiatives were excluded if:

- The policy's only objective is to promote technology innovation and R&D.
- The focus of the initiative or policy is only to improve the standardisation of carbon offsets.

Note that carbon offset-related policies/initiatives are only assessed when they are included within an industrial carbon accounting policy or initiative.

Lastly, the policies and international coordinating initiatives reviewed contain either direct or indirect GHG reporting requirements. A direct requirement is an explicit requirement to measure and report GHG emissions while an indirect requirement is defined as a requirement for an entity to be aware of their GHG emissions to comply with the policy; or the guideline relates to accreditation for emissions reporting.

Literature Review

The objective of the literature review was to identify and research the in-scope international coordinating initiatives and national policies. The first step in the literature review was to complete a desk-based research assessment. Policy-specific information was recorded into spreadsheet-based database. For each policy and initiative, the following data points were recorded:

- Regulation, policy, or initiative name
- High-level categorisation of the policy requirement
- Description of the policy requirement
- Sectoral and/or product scope
- Country/jurisdiction
- Whether the policy is existing or proposed
- Whether it applies to imports and/or exports
- Requirements for UK exports, if any
- Whether it addresses Scope 1, 2 and/or 3 emissions
- Greenhouse gasses (GHGs) covered
- Enforcement (i.e., mandatory, or voluntary)

- Recommended GHG measurement framework if any
- Reporting period
- Submission protocol and verification requirements if any
- Entities covered within the policy's scope
- Key delivery institutions
- Sources/references
- Initial Insights for UK regulation/regulator
- Impact to UK industry, if any
- Estimate/opinion of behavioural impact

Stakeholder Interviews

Twenty-two interviews were conducted with stakeholders from NGOs, think tanks, universities, trade associations, and corporates. The purpose of these interviews was to supplement the desk-based literature review. The interviews focused on topics including:

- Compliance and enforcement mechanisms for policies or initiatives
- Indication of pushback to policies or initiatives, such as impact to innovation and SMEs
- Initial insights for UK regulation/regulator
- Key consideration for UK exports
- Existing requirements on UK industry to disclose emissions

Insights and Recommendations Development

Following the stakeholder interviews and literature review, insights per policy were aggregated into themes and key overall insights, before using these to inform draft recommendations relevant to UK carbon accounting regulation and regulators.

Case Studies

Five case studies were investigated to help review the draft recommendations and support their development into to final recommendations. The prioritises insights from



the previous step were used to steer areas of research in further detail, to ensure that the evidence underpinning the recommendations is robust.

⁵⁷ Based only on international coordination initiatives reviewed in this study.

Final Recommendations and Quality Assurance

Following the case study investigation, the recommendations were updated considering further evidence. Lastly, peer reviewers were engaged to complete an external review of the recommendations and insights. Select interviewed stakeholders were requested to review relevant sections of the document, in part or in whole.

6.2. Key Mechanisms in International Coordination Initiatives

Key	
✓	Active policy
—	Proposed
✗	None

Sector	Status (in place, proposed, none)						
	Carbon accounting standard	Certification	Collaborative network	Supply chain management	Sustainability reporting platform	Sustainability reporting standard	Transition planning initiative
Aluminium	—	✓	✓	✗	✓	✗	✓
Automotive manufacturing	—	✗	✓	✗	✗	✗	✗
Cement	✓	—	✓	✗	✗	✓	✓
Chemicals	✓	✗	✓	✓	✗	✗	✓
Glass	✗	✗	✗	✗	✗	✗	✗
Iron & Steel	—	✓	✓	✗	✓	✗	✓
Pharmaceuticals	✗	✗	✗	✓	✗	✗	✗
Refined Oil	✓	✗	✗	✗	✗	✗	✓

Table 5 Summary of objectives of international coordination initiatives by sector⁵⁷

6.3. Case Studies

Working Party on Industrial Decarbonisation

This case study reviews the Working Party on Industrial Decarbonisation (WPID) as an example of a leading initiative a UK Carbon Regulator could engage with to promote harmonisation of carbon accounting standards. The case study focuses on WPID's approaches to obtain international alignment, including how multi-stakeholder engagement is used to achieve this.

The WPID was launched in 2023 within the Committee on Energy Research and Technology (CERT), one of the standing groups and committees under the IEA⁵⁸. CERT "coordinates and promotes the development, demonstration and deployment of clean energy technologies", and has established five working parties to achieve this one of which is the WPID⁵⁹. The WPID consists of representatives of IEA member countries, the European Commission and IEA candidate countries. Associated countries, which include emerging economies like China and India, may also be invited⁶⁰. As such, all the UK's trading partners assessed in this study can participate in this initiative (of which all countries excluding China are current members).

The WPID aims to provide a forum for IEA member governments, industrial organisations, and other relevant public and private stakeholders, to work together on key issues towards accelerating industrial decarbonisation. The WPID seeks to improve the effectiveness and influence of the IEA's efforts in industrial decarbonisation by serving as the primary advisory group to IEA member governments, the IEA Secretariat, and relevant stakeholders on industrial decarbonisation matters⁶¹. Therefore, strengthening the correlation between the IEA's analysis and government policy development on matters related to industrial decarbonisation.

⁵⁸ IEA Research Cooperation. Overview of the Working Party on Industrial Decarbonisation. [Working Party on Industrial Decarbonisation \(WPID\) - IEA Research Cooperation \(nachhaltigwirtschaften.at\)](https://www.iea.org/research-cooperation/working-party-on-industrial-decarbonisation-wpid).

⁵⁹ IEA. [Structure - About - IEA](https://www.iea.org/structure/about)

⁶⁰ IEA Research Cooperation. Overview of the Working Party on Industrial Decarbonisation. [Working Party on Industrial Decarbonisation \(WPID\) - IEA Research Cooperation \(nachhaltigwirtschaften.at\)](https://www.iea.org/research-cooperation/working-party-on-industrial-decarbonisation-wpid).

⁶¹ Organisation for Economic Co-operation and Development (OECD). [On-Line Guide to OECD Intergovernmental Activity. On-Line Guide to OECD Intergovernmental Activity \(Archived April 2023\)](https://www.oecd.org/intergovernmental-activity/).

The WPID operates under periodic 2-year working programs, the current one running from October 2023 to September 2025. It has identified two priority areas of work for its first term:

- Advancing emissions data collection and technical dialogue on measurement methodologies and definitions;
- Enhancing industrial decarbonisation policies with the aid of measurement methodologies and definitions.

The primary focus area of the WPID is to define climate-friendly production standards in heavy industry and explore how these standards can bolster effective decarbonisation policies. Both production and product level definitions and methodologies are within the scope of this work. Initially, the WPID will concentrate on steel and cement, with the goal of eventually undertaking similar initiatives for aluminium and chemicals.

Since its establishment last year, the WPID has facilitated technical dialogues on innovative technology adoption and policy alignment, to harmonise and ensure interoperability of measurement methodologies, definitions, and emissions data collection for embodied carbon⁶². In addition to facilitating a collaborative network for IEA member governments, the WPID engaged with relevant international stakeholders including ISO, the IDDI, the World Trade Organisation (WTO), the World Steel Association, the Global Cement and Concrete Association (GCCA), and ResponsibleSteel⁶³.

Cooperation between the UK government, supported by a Carbon Regulator, and the WPID will thus enable UK to implement carbon accounting policy aligned with its major trading partners, mitigating risk of administrative burden for UK industry and inaccurate emissions tracking.

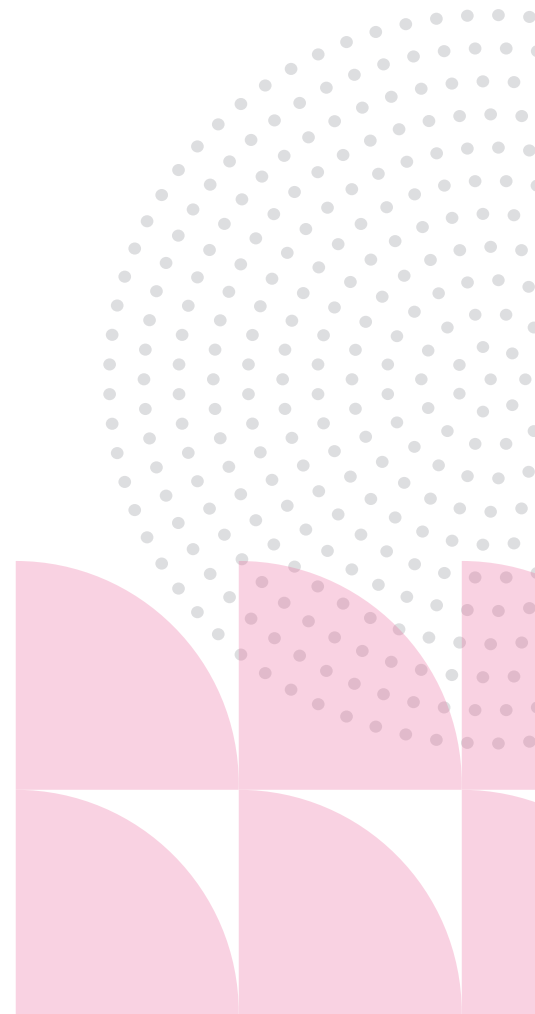
G7 Industrial Decarbonisation Agenda

This case study explores the G7 Industrial Decarbonisation Agenda (IDA), which has shown examples in changes in prioritisation of initiative objectives and target sectors as a consequence of changes in the initiative's leadership.

The Climate and Environment Ministers of Canada, France, Germany, Italy, Japan, the UK, the US, and the Climate

⁶² EA. Communique of the 287th Meeting (2024) of the IEA Governing Board at Ministerial Level. 2024 IEA Ministerial Communique - News - IEA

⁶³ IEA Research Cooperation. Overview of the Working Party on Industrial Decarbonisation. Working Party on Industrial Decarbonisation (WPID) - IEA Research Cooperation (nachhaltigwirtschaften.at).



and Environment Commissioners of the European Union endorsed the launch of the G7 Industrial Decarbonisation Agenda in 2021⁶⁴. This forum aims to develop joint approaches to industry decarbonisation among G7 members, advancing the G7's collective ambitions for Net Zero by coordinating efforts across existing engagements, both within G7 members and across multilateral organisations, such as the Clean Energy Ministerial (host of the IDDI initiative). Improved coordination among the world's leading developed countries will accelerate the transition to Net Zero industries and lower the cost of decarbonisation for the rest of the world.

The G7 IDA requires coordinated actions to obtain alignment across three spheres identified as necessary for the transition to Net Zero, i.e., policy, finance and innovation. Working closely with the G7 Presidency, the G7 IDA thus prioritises initiatives with the aim to:

- Establish shared approaches, including development of carbon accounting standards, consistent with agreed principles, namely a commitment to⁶⁵:
 - human rights, dignity, and equity, prioritising a people-centred energy transition that creates opportunity and is inclusive of all communities;
 - market-orientated approaches that set conditions for a level playing field, thereby fostering free and fair trade, while promoting innovation;
 - sustainability across industry that harnesses the best of our innovative practices in science, technology, and engineering, in the face of accelerating climate change;
 - shared scientific principles, informed by the highest standards for data generation, scientific integrity, and the need to create robust ecosystems for innovation.
- Achieve Net Zero outcomes which address the 'first mover' challenge, such as the high initial costs and risks associated with investing in new, unproven green technologies and infrastructure⁶⁶.

The G7 IDA's focus work areas have changed under each G7 presidency since its formation in 2021. The UK held the G7 Presidency in 2021, leading the establishment of the IDA together with the US, to unlock market potential through high-level G7 government coordination, with a focus on

⁶⁴ Department for Environment, Food & Rural Affairs, Department for Energy Security and Net Zero and Department for Business, Energy & Industrial Strategy. [G7 Climate and Environment Ministers' meeting, May 2021: Industrial Decarbonisation Agenda \(IDA\) - GOV.UK \(www.gov.uk\)](#)

⁶⁵ Department for Environment, Food & Rural Affairs, Department for Energy Security and Net Zero and Department for Business, Energy & Industrial Strategy. [G7 Climate and Environment Ministers' meeting, May 2021: Industrial Decarbonisation Agenda \(IDA\) - GOV.UK \(www.gov.uk\)](#)

⁶⁶ Department for Environment, Food & Rural Affairs, Department for Energy Security and Net Zero and Department for Business, Energy & Industrial Strategy. [G7 Climate and Environment Ministers' meeting, May 2021: Industrial Decarbonisation Agenda \(IDA\) - GOV.UK \(www.gov.uk\)](#)

market regulation, investment flows, and procurement strategies⁶⁷. Given this was the first working period of the G7 IDA, no target sectors were initially identified, and priority was to agree on governance of the forum, including agreement on an initial programme of work and schedule of meetings, a mechanism to review progress annually, and a timeline for broader inclusion of other important countries in the future⁶⁸.

Under the G7 German Presidency in 2022, the IDA forum established the Climate Club, an international coordination initiative with a joint IEA and OECD Secretariat working through three thematic pillars⁶⁹:

1. Advancing ambitious and transparent climate change mitigation policies,
2. Transforming industries to advance the enabling conditions for substantial industrial decarbonisation by discussing and aiming to align methodologies, standards, sectoral strategies and expanding markets for green industrial products.
3. Boosting international climate cooperation and partnerships.

The G7 IDA group also compiled a set of joint actions for decarbonisation in the steel and cement sectors under the German G7 Presidency in 2022. These actions included '[agreeing] on common measurement standards and reporting frameworks to use for evaluating the emissions intensity of production' for steel and cement; and development of a policy toolbox to accelerate industry decarbonisation, especially in hard-to-abate sectors⁷⁰.

Further outcomes included a commitment to implement a Global Data Collection Framework for steel production and product emissions, and G7 agreement to adopt the recommendations given by the IEA in the "Achieving Net Zero Heavy Industry Sectors in G7 Members". These recommendations include efforts from G7 governments to:

- Consolidate existing work on measurement standards to ensure their fitness for purpose and avoid duplication;
- Engage in other technical dialogues on measurement methodologies to create synergies across existing

⁶⁷ G7 Ministers' Meeting on Climate, Energy and Environment. Conclusions regarding the Industrial Decarbonisation Agenda. [000128286.pdf \(env.go.jp\)](#)

⁶⁸ Department for Environment, Food & Rural Affairs, Department for Energy Security and Net Zero and Department for Business, Energy & Industrial Strategy. [G7 Climate and Environment Ministers' meeting, May 2021: Industrial Decarbonisation Agenda \(IDA\) - GOV.UK \(www.gov.uk\)](#)

⁶⁹ The Climate Club. Areas of work. The Climate Club, industry decarbonisation - [The Climate Club \(climate-club.org\)](#)

⁷⁰ G7 Ministers' Meeting on Climate, Energy and Environment. Conclusions regarding the Industrial Decarbonisation Agenda. [Microsoft Word - 2022-05-26 G7 Annex - Conclusions IDA_Bern \(g7germany.de\)](#)

national data collection efforts and extend the current focus on steel to other materials⁷¹.

Under the G7 Japan Presidency in 2023, the IDA forum built on the work in the previous year to examine emissions measurement methodologies and data collection frameworks, to advance the discussion on definitions and procurement of near-zero emission materials. In contrast to normative standards that define specific thresholds, measurement methodologies describe procedures for data collection, measurement and analysis⁷². In contrast to the approach taken under the G7 German Presidency, this work was limited to the Iron & Steel sector.

The G7 IDA shows a clear example of how leadership plays a key role in prioritisation of sectors and objectives under international coordination initiatives, especially in government-led initiatives. Focus work areas for the IDA forum shifted to advance industrial decarbonisation in alignment to the goals of the G7 Presidency while enabling improved harmonisation in carbon accounting policy globally.

In accordance with the afore-mentioned IEA recommendations, the UK government could leverage its position as a global leader in climate action to extend focus in current global technical dialogues on measurement methodologies and definitions for low carbon products to cover more than steel and cement. This will enable the UK to meet its climate targets, ensuring similar progress in effective emissions measurement and creation of credible low carbon product markets is observed across all hard to abate industrial sectors.

6.3.3. Use of digitalisation in carbon accounting by the private sector

This case study explores the use of digitalisation in international coordination initiatives led by the private sector, with a focus on key approaches taken to facilitate interoperability of emissions data. The case study also highlights the role regulators can play to promote digitalisation in the landscape while ensuring international alignment.

The private sector is advancing the use of digital tools for

⁷¹ IEA.

⁷² G7 Ministers' Meeting on Climate, Energy and Environment. Conclusions regarding the Industrial Decarbonisation Agenda. [000128286.pdf \(env.go.jp\)](https://www.env.go.jp/000128286.pdf)



effective GHG emissions data management across the global carbon accounting landscape. This is mostly being achieved through two main approaches as identified in this study:

- Establishing interoperable digital platforms for environmental reporting.
- Developing open access data standards to enable the exchange of comparable emissions data among stakeholders across a value chain.

Environmental reporting digital platforms

Several approaches are taken to disclose emissions data in the current carbon accounting landscape, ranging from publication in annual statements on company websites to direct reporting via vendor surveys. With increasing national policies to mandate disclosure of emissions, governments are increasingly implementing centralised reporting platforms to collate and publicly share reported emissions data (e.g., the ECCC Single Window system and the Emissions Reporting System in Canada). However, many governments are implementing archaic processes (e.g., data collation in Excel datasheets), with limited interoperability across reporting platforms⁷³.

The private sector is developing more advanced digital reporting platforms to facilitate storage and exchange of sustainability related information, including GHG emissions data. This is seen from a range of stakeholders, including industry leaders in climate action, software companies, non-profit organisations and commodities exchange entities. Key examples of international coordination initiatives undertaking development of robust sustainability reporting platforms include the CDP (formerly Carbon Disclosure Project) and the London Metals Exchange (LME) Passport.

The CDP established a disclosure system where participating entities collect, compile and submit information on their environmental impact (e.g., climate change) according to CDP's reporting requirements. Submitted information from corporates is scored and rankings are shared to provide a comparative assessment of organisations' sustainability efforts⁷⁴. According to the CDP website, over 23,000 companies worth over half of global market value report TCFD-aligned environmental data to CDP. The LME founded the LME Passport for suppliers to store and maintain certificates of analysis (COAs) and sustainability credentials

⁷³ Insight from stakeholder interview with climate policy consultant.

⁷⁴ CDP. [Corporate Data - CDP](#)

for listed metal brands traded at the exchange, with a current focus on aluminium⁷⁵.

⁷⁵ London Metal Exchange. LMEpassport. LMEpassport | London Metal Exchange

⁷⁶ London Metal Exchange. [LMEpassport. LMEpassport | London Metal Exchange](#)

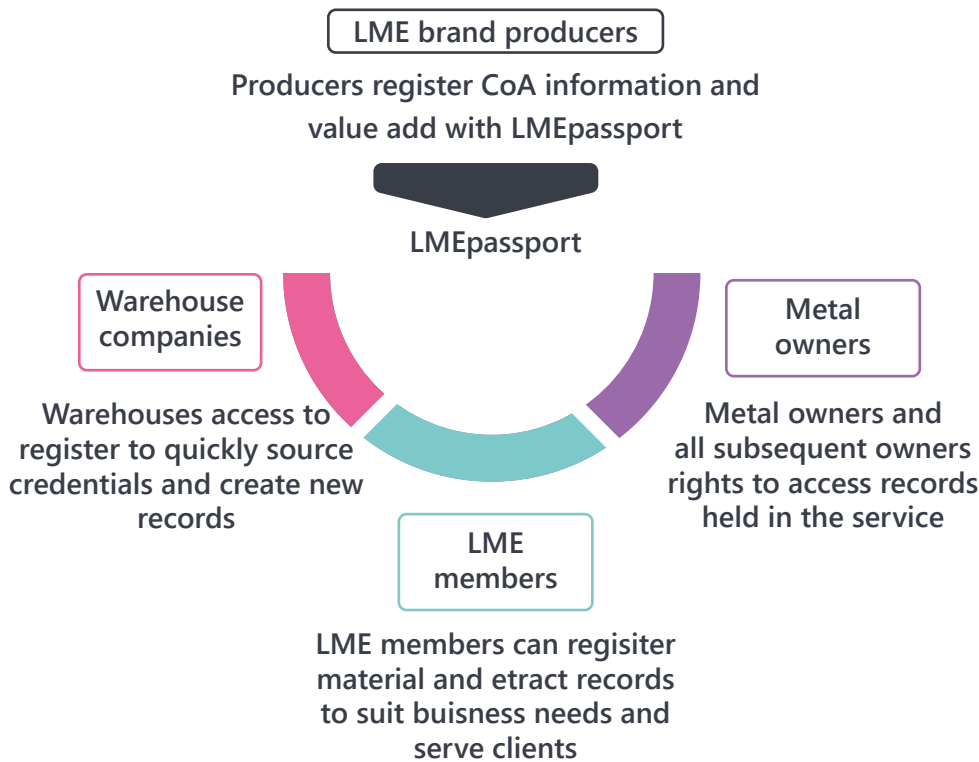


Figure 5 Illustration to provide an overview of how the LMEpassport works⁷⁶

These platforms play a valuable role in promoting transparency, fostering accountability for industry decarbonisation commitments and accelerating growth of low carbon product markets.

Data standards for exchange of emissions data

The effectiveness of digital systems to facilitate accurate emissions tracking is constrained by lack of globally agreed standards for collection, storage and sharing of GHG emissions data. In response, organisations such as the Open Group, through its Open Footprint Forum, are developing open data management standards to enable compatibility between existing digital GHG reporting platforms and comparability of data throughout supply chains.

The Open Footprint Forum provides a platform for members across industry, government and academia to collaborate to establish a common model for footprint-related data covering emissions, consumptions (e.g., water, land, energy),

and base calculations to normalise and aggregate data. The first version of the Open Footprint Data Model Standard was published in 2024 in alignment with the GHG Protocol, and other sustainability reporting standards (e.g., ISSB IFRS, Global Reporting Initiative (GRI) Sustainability Reporting Standards)⁷⁷. By integrating the increasing range of existing emissions protocols, standards, and regulations into a common data model, the Open Footprint Data Model Standard will enable companies to effectively manage and communicate emissions information, regardless of the complexity of the regulatory environment and their global footprint.

Role for regulators

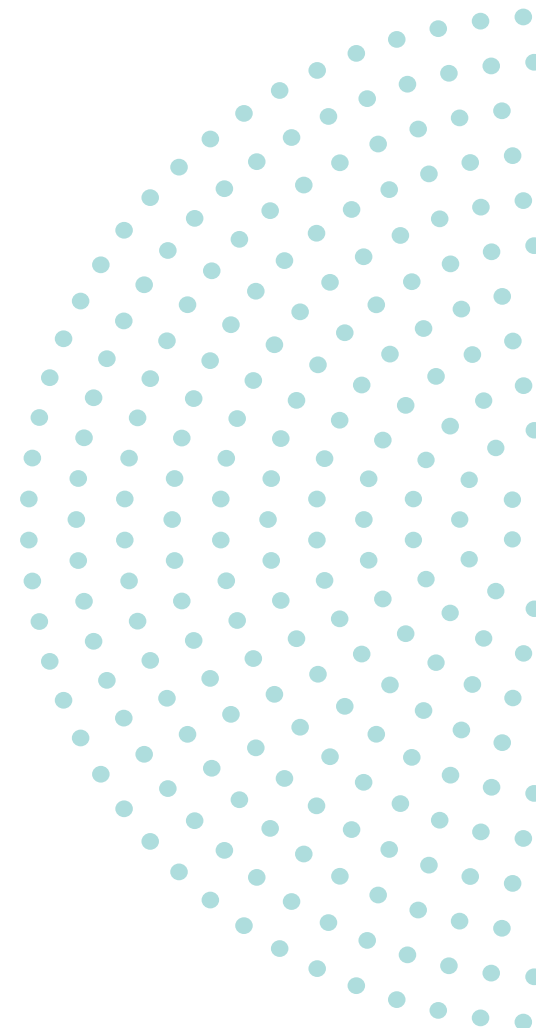
Regulators can play a key role in reducing the risk of administrative burden for firms by accelerating the use of digitalisation by collaborating and supporting such initiatives led by the private sector. This can be through promoting emissions disclosure in national policy via existing commonly used, digital platforms where inconsistent, archaic methods are in place or reporting systems are yet to be developed. For example, to comply with the Federal Supplier Climate Risks and Resilience Proposed Rule in the US, major federal contractors receiving more than \$50 million in annual contracts are required to submit annual climate disclosures and science-based emissions reduction targets through the CDP⁷⁸.

By engaging with these organisations, regulators can ensure digital platforms and data standards are created in alignment with globally accepted measurement and reporting standards, protocols and policies. For example, the Open Footprint Forum operates as a member-driven initiative where multi-stakeholders, including governments and regulatory agencies, collaborate to develop data management standards⁷⁹. Similarly, CDP invites governments to become collaborative partners to drive faster progress towards international and national climate and environmental objectives through endorsing CDP's disclosure system. Participation via the CDP Government Partnerships programme will allow UK government to access CDP insights from environmental information disclosed by corporates and sub-national jurisdictions and make data-driven policy decisions. Examples of regulators involved in the programme include the Netherlands Ministry of Economic Affairs and Climate Policy and the French ADEME.

⁷⁷ The Open Group. The Open Footprint Forum. [Open Footprint® Forum | www.opengroup.org](https://www.opengroup.org)

⁷⁸ Office of the Federal Chief Sustainability Officer. [Federal Supplier Climate Risks and Resilience Proposed Rule | Office of the Federal Chief Sustainability Officer](#)

⁷⁹ London Metal Exchange. [The Open Group. The Open Footprint Forum. Open Footprint® Forum | www.opengroup.org](https://www.opengroup.org)



EU Accreditation and Verification Regulation

This case study examines the EU Accreditation and Verification Regulation (AVR), as an example of good practice from regulation and regulators to promote standardisation of the verification (specifically accreditation) requirements for carbon accounting.

The EU ETS mandates operators of installations or aviation operators to submit annual emissions reports, which must be verified by an independent verifier in compliance with the Accreditation and Verification Regulation (AVR). The AVR outlines detailed requirements for the accreditation of verification bodies, also referred to as verifiers, and implementation of the verification process, based on Regulation (EC) No 765/2008 which outlines general requirements for national accreditation bodies⁸⁰.

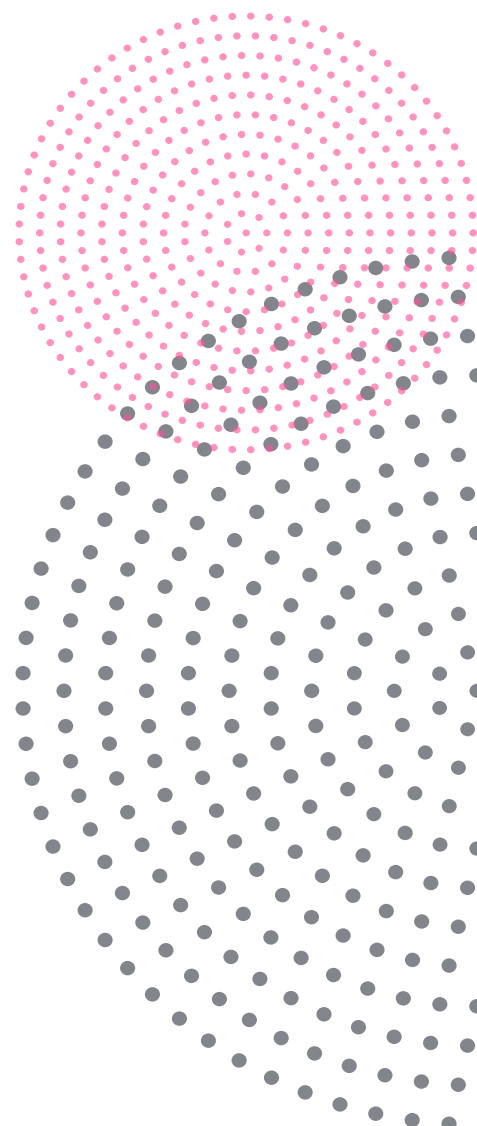
To further explain the requirements of the AVR, the EU Commission also developed a suite of guidance documents consisting of:

- explanatory guidance on the articles of the AVR, including a user manual;
- an overview of the guidance documents and their connection with the relevant legislation;
- key guidance notes on specific verification and accreditation issues;
- specific guidance on the verification of aircraft operator's reports;
- templates for the verification report and information exchange requirements;
- examples of filled-in templates and checklists;
- frequently asked questions.

Implementation of the AVR, supported with guidance documents, fosters a highly standardised approach to accreditation and verification across EU Member States, bolstering confidence in the ETS.

The EU regulation defines a verifier as a legal entity or legal person accredited by a national accreditation body (NAB) or a natural person that is certified by a National Certification

⁸⁰ International Partnership on Mitigation and MRV. Accreditation and Verification approaches under the European Union Emission Trading Scheme (EU ETS). [GPA | Mexico | Building a comprehensive national MRV framework \(transparency-partnership.net\)](#)



Authority (NCA) in compliance with the requirements of the AVR⁸¹ (i.e., NABs are COFRAC in France, Deutsche Akkreditierungsstelle (DAkkS) in Germany and Raad voor Accreditatie (RvA) in the Netherlands). Potential verifiers can apply for accreditation with NAB or the NCA and will be requested to provide information on the company / person, competence of staff, processes to ensure independence, processes for ongoing training of staff and quality management systems⁸².

Both certification and accreditation systems aim to ensure that verifiers have required expertise and processes in place to comply with AVR requirements and maintain credibility of the verification process. Accreditation and monitoring of authorised verifiers involves interconnected activities including⁸³:

- Assessing the verifier's quality management system and procedures for verification activities;
- Visiting the verifier's premises in an observer role to:
 - assess implementation of controls;
 - perform 'witness audits' in which the NAB's assessment team accompanies the verifier's personnel to observe how they conduct their verification activities.

Following the completion of the initial accreditation process and the issuance of the accreditation certificate, the verifier's competence and actual performance are monitored through annual surveillance and additional witnessing. A reassessment of the verifier will be conducted before the accreditation certificate expires⁸⁴.

In addition to accreditation and assessment of verifiers, the AVR also requires that the competence and performance of the NAB or NCA is monitored by the EU Member State that has appointed that body. To support this, the European Cooperation for Accreditation (EA) organises independent peer evaluation to assess whether the NAB or NCA meets the requirements of the AVR⁸⁵. The AVR also includes requirements on information exchange between the CA and NAB where a verifier performs in an EU Member State other than the one where they have been accredited. This

⁸¹ Office Journal of the European Union. Regulation (EU) 2018/2067. L_2018334EN.01009401.xml (europa.eu)

⁸² International Partnership on Mitigation and MRV. Accreditation and Verification approaches under the European Union Emission Trading Scheme (EU ETS). GPA | Mexico | Building a comprehensive national MRV framework (transparency-partnership.net)

⁸³ European Commission. Guidance Document: The Accreditation and Verification Regulation - Quick guide on verification for operators and aircraft operators. fd837e25-50d3-421b-a673-4a310d1ae17e_en (europa.eu)

⁸⁴ European Commission. Guidance Document: The Accreditation and Verification Regulation - Quick guide on verification for operators and aircraft operators. fd837e25-50d3-421b-a673-4a310d1ae17e_en (europa.eu)

⁸⁵ Office Journal of the European Union. Regulation (EU) 2018/2067. L_2018334EN.01009401.xml (europa.eu)

could include sharing of information where recurring errors in verification reports are identified⁸⁶. These approaches also aim to facilitate knowledge-sharing of best practices between the NABs and NCAs under evaluation.

Overall, the AVR sets a flagship example of good practice for standardisation of accreditation rules in carbon accounting given current gaps and inconsistencies in verification requirements. In this study, the recommended approach for a UK Carbon Regulator builds on the approach observed in the AVR to streamline requirements for the accreditation of verification bodies, by establishing a consistent benchmark to assess technical competence of verifiers. This would provide further assurance in a verifier's understanding of verification requirements in alignment to international best-practice, including compliance to globally accepted standards for verification such as ISO 14064-3. Given the lack of consistent accreditation requirements in the landscape, a UK Carbon Regulator can lead the implementation of a professional qualification for verification endorsed by relevant accreditation bodies across major trading partners to the UK.

6.3.5. Responsible Steel & German LESS

This case study assesses the definitions of two existing low-carbon steel product standards, the ResponsibleSteel International Production Standard, and the German Low Emissions Steel Standard (LESS). Focus is given to their carbon accounting requirements and subsequent key considerations for a UK Carbon Regulator.

Overview of the standards

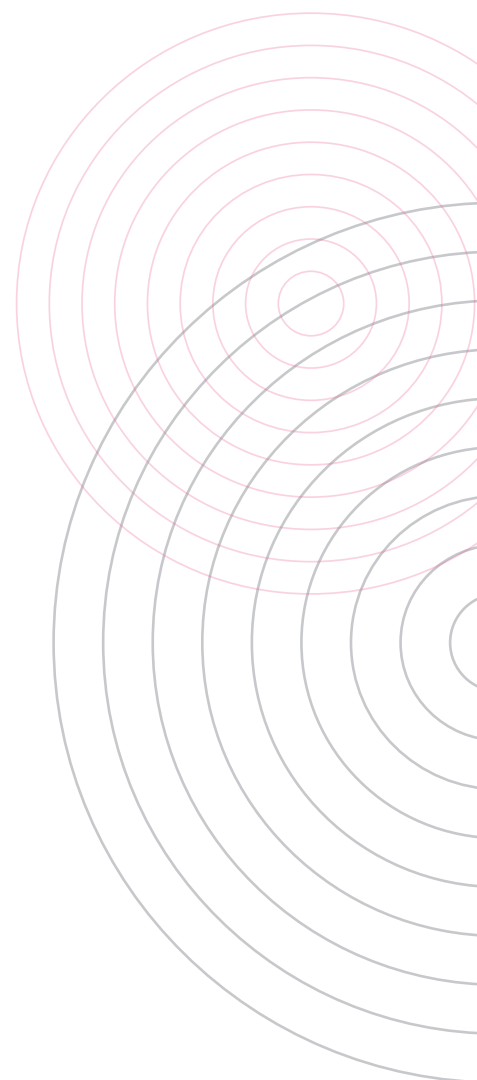
The ResponsibleSteel International Production Standard:

The first international standard to set certifiable requirements for responsible processing and production of steel. The standard applies to steel production, processing and finishing, and outlines requirements for the responsible sourcing of input materials. It does not apply to service providers, mining sites or sites producing multi-component products⁸⁷.

The standard consists of thirteen principles covering a wide range of environmental, social and governance criteria, including Principle 10: Climate Change & Greenhouse Gas Emissions. To comply with this principle, ResponsibleSteel

⁸⁶ International Partnership on Mitigation and MRV. Accreditation and Verification approaches under the European Union Emission Trading Scheme (EU ETS). [GPA | Mexico | Building a comprehensive national MRV framework \(transparency-partnership.net\)](#)

⁸⁷ Responsible Steel. ResponsibleSteel International Production [Standard Version. Standards | ResponsibleSteel](#)



certified sites are required to:

- Define and implement a long-and-medium-term strategy to reduce their GHG emissions to levels compatible with the goals of the Paris Agreement.
- Implement the recommendations of the TCFD.
- Measure and record key aspects of facility-level GHG emissions (and product-level if intending to market or sell ResponsibleSteel certified steel) in accordance with a recognised international or regional standard.
- Publicly disclose their GHG emissions on the ResponsibleSteel website.

The German Low Emissions Steel Standard (LESS): LESS is an initiative led by the German Steel Association and supported by the Federal Ministry for Economic Affairs and Climate Protection (BMWK) to accelerate demand for low emission steel. Established in 2024, LESS is a labelling system providing a calculation standard to classify and certify steel products according to their CO₂ emissions⁸⁸. This system allows comparison of different steel products and enables steel users to track the progress towards reducing climate-relevant emissions in steel production based on standardised rules and incorporate this information into their sustainability strategies. LESS is open to all companies aiming to voluntarily determine, communicate and verify their progress in reducing their emissions during steel production up to the hot-rolled product. To obtain a LESS label on a finished steel product, information on the product carbon footprint and the global warming potential in accordance with an Environmental Product Declaration is required.

Comparative analysis of the standards

Both standards adopt the sliding scale approach when classifying low-carbon steel, building on the internationally recognised proposal of the IEA^{89,90}.

The ResponsibleSteel standard defines quantitative performance levels according to four levels ranging from the basic threshold to the near-zero threshold⁹¹. The threshold values to classify the steel are based on the GHG intensity per tonne of produced crude steel as well as on the specified scrap input. LESS applies a classification scale in the labelling system to determine whether the steel is near-zero or low emission (A to D) steel. The threshold values to classify the

⁸⁸ Wirtshcafsvereingigung Stahl. Introduction of Low Emission Steel Standard (LESS). [20240422 concept-paper_LESS_final.pdf \(stahl-online.de\)](https://www.stahl-online.de/concept-paper_LESS_final.pdf)

⁸⁹ The sliding approach sets variable thresholds for embodied GHG emissions to account for the share of scrap used in production and allow comparison of steel products using different shares of scrap.

⁹⁰ IEA. Achieving Net Zero Heavy Industry Sectors in G7 Members. [Achieving Net Zero Heavy Industry Sectors in G7 Members \(iea.blob.core.windows.net\)](https://iea.blob.core.windows.net/Achieving%20Net%20Zero%20Heavy%20Industry%20Sectors%20in%20G7%20Members)

⁹¹ ResponsibleSteel International Production [Standard Version Standards | ResponsibleSteel](https://www.responsiblesteel.org/standards)

steel are based on the GHG intensity per tonne of produced hot-rolled steel as well as on the specified scrap input⁹².

In addition to the disparities in GHG reporting requirements seen in Table 3, the key differences between the ResponsibleSteel standard and LESS can be summarised as⁹³:

- **Supply chain boundary** – LESS covers hot rolling, highlighting this step of the supply chain as particularly important for the secondary route since there is currently no viable alternative to re-heating the steel other than fossil fuels. By including this step, EAD steelmakers will face a significant additional responsibility to transition to using hydrogen to achieve higher performance levels.
- **Differentiation of steel qualities** – LESS encompasses two variants, one for quality steel and one for lower grade construction steel with the quantity of alloys (with particularly high scope three emissions) as the difference. In contrast, the ResponsibleSteel standard has limitations in accounting for high alloy steel – a contributing factor to why German steelmakers endorsed LESS despite many of them being ResponsibleSteel members.

⁹² Wirtshcafsvereinigung Stahl. Introduction of Low Emission Steel Standard (LESS). 20240422 [concept-paper_LESS_final.pdf \(stahl-online.de\)](#)

⁹³ Insights from a stakeholder interview with a research institute.

Low-carbon steel standard	Comparison of key GHG reporting requirements			
	Level of reporting	Emissions coverage	Recommended measurement framework	Third-party verification required
ResponsibleSteel international production standard	Facility and product	Scope 1, 2, and Scope 3 upstream emissions (all GHGs)	The GHG protocol, EN 19694, ISO 14404	Yes
The German low emissions steel standard (less)	Product	Scope 1 and 2 (CO ₂ only) & Scope 3 upstream emissions (all GHGs)	Based on customer requirements	Yes

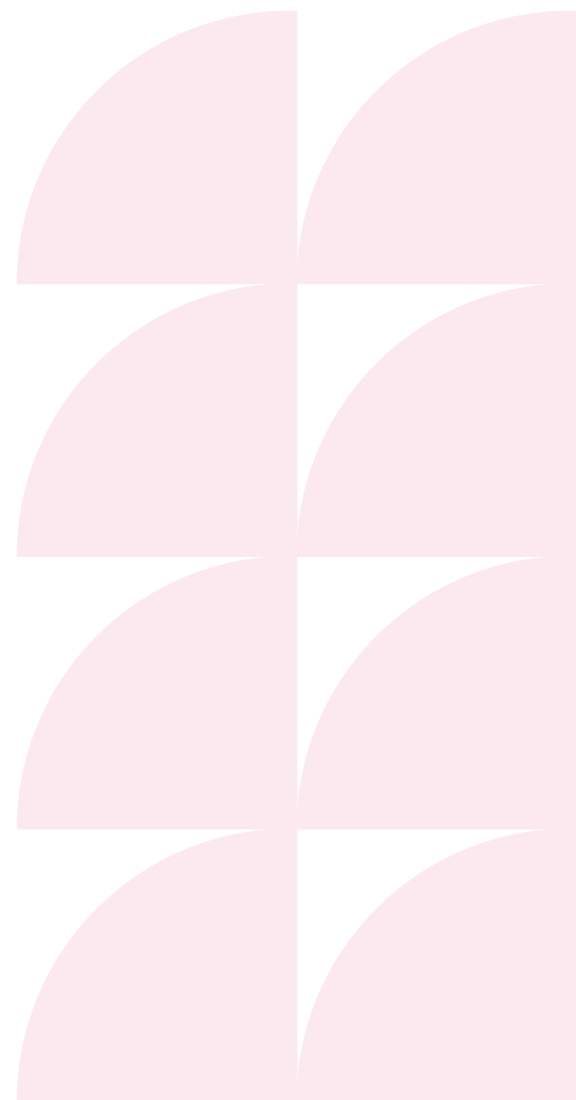
Table 3 Comparison of Low-Carbon Steel Standards

Key considerations for a Carbon Regulator

While there is considerable overlap in the standards' definition of low-carbon steel, their different methodologies reflect that there is no globally uniform definition for low-carbon steel. As demand for low-carbon products grows, there is a risk that more standards will be developed tailored to the production capabilities of specific regions or companies⁹⁴. Lack of alignment on criteria in existing standards impacts the credibility of a low-carbon product market and creates confusion for procurement decision makers where claims on materials with same purpose differ.

Therefore, it is important for a Carbon Regulator to maintain awareness of disparate carbon accounting standards and regulations to ensure that any future regulation related to substantiating low-carbon claims does not increase complexity or administrative burden to covered entities. A Carbon Regulator can leverage this understanding to support UK government to develop sector strategies to maintain competitiveness of UK exports as low-carbon product market grows.

⁹⁴ Insight from stakeholder interview with academic research institution.





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