



Claiming the Future: Can Book and Claim Support Low-Emission Transport?

Reader's guide

Acronyms and glossary

This section (pages 3-5) provides clear definitions of key terms and abbreviations used throughout the report that are directly relevant to the book and claim ecosystem.

Table of contents

The report includes a general table of contents (page 9) and separate chapter overviews to help readers quickly locate sections and topics of interest.

References

A list of the sources (pages 86-90) that served as the foundation for developing the report's content, providing the context, evidence base, and perspectives that underpin its analysis and conclusions.

Further reading

Suggested additional materials to be found on selected pages for readers who want to explore specific aspects or related topics in greater depth.

Page labels

These thematic markers run throughout the report, indicating the type of information presented on each page. They help readers quickly identify content relevant to their interests or level of expertise and navigate the report more efficiently.

Background overview

Contextual information on the transport and policy landscape surrounding book and claim.

Book and claim ecosystem

Key actors, mechanisms, and relationships that shape how book and claim works in practice.

Case study

Real-world applications and lessons from early adopters of book and claim.

Analysis

Evidence, trends, and insights from case studies, policy review, and system assessments.

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Acronyms

AMI: Actions and Market Instruments

B&C: Book and Claim

B2B: Business-to-Business

BAU: Business-as-Usual

BEV: Battery Electric Vehicle

BCC: Book and Claim Community

BCU: Book and Claim Unit

CII: Carbon Intensity Indicator

CNZS: Corporate Net Zero Standard

CO₂e: Carbon Dioxide Equivalent

EAC: Environmental Attribute Certificate

EU ETS: European Union Emissions Trading System

EWG: Expert Working Group

FEUM: FuelEU Maritime (FuelEU)

GHG: Greenhouse Gas

GMA: Center for Green Market Activation

GO: Guarantee of Origin

HVO: Hydrotreated Vegetable Oil

IATA: International Air Transport Association

IMO: International Maritime Organisation

ISCC: International Sustainability and Carbon Certification

ISO: International Organisation for Standardisation

ITF: International Transport Forum

LCA: Life Cycle Assessment

LETS: Low-Emission Transportation Service

LSP: Logistic Service Provider

MMMCZCS: Mærsk McKinney-Møller Center for Zero Carbon Shipping

MRV: Monitoring, Reporting, and Verification

NDC: Nationally Determined Contribution

NZF: Net-Zero Framework

NGO: Non-Governmental Organisation

PCF: Product Carbon Footprint

PoC: Proof of Compliance

PoS: Proof of Sustainability

REC: Renewable Energy Certificate

RED: Renewable Energy Directive

ReFEUA: ReFuelEU Aviation

RFP: Request For Proposal

RSB: Roundtable on Sustainable Biomaterials

SABA: Sustainable Aviation Buyers Alliance

SAF: Sustainable Aviation Fuel

SAFc: Sustainable Aviation Fuel certificate

SBT: Science-Based Target

SBTi: Science Based Targets initiative

SFC: Smart Freight Centre

SMF: Sustainable Marine Fuel

SMFc: Sustainable Maritime Fuel certificate

SOP: Standard Operating Procedure

TIEC: Transferable Instrument with Entitlement to Claim

tkm: tonne-kilometres

TWG: Technical Working Group

VVB: Validation and Verification Body

ZEMBA: Zero Emission Maritime Buyers Alliance

Glossary (1)

Additionality: Quality of further bending the decarbonisation curve when a low-emission fuel or service is implemented. The term refers to a common assessment in voluntary applications of book and claim.

Alternative fuel: Any fuel that serves as a substitute for conventional fossil fuels and typically offers lower lifecycle GHG emissions, such as biofuels, electricity, hydrogen, or synthetic low-carbon fuels.

Attribute: Characteristic. In the book and claim context, it is used as a noun to describe the characteristics of a transport fuel or service. As a verb, it is used to describe the allocation of the specified characteristics to a product or service.

Book: In the book and claim context, to record the environmental attribute of a fuel or service into a recognised registry or tracking system.

Book and claim: Chain of custody model in which the administrative record flow does not necessarily connect to the physical flow of the verified material or product use (ISO 22095).

Bunker: Act of supplying and loading fuel to a ship.

Buyers alliance: Collaboration among multiple companies, mostly cargo owners, to combine their demand for EACs.

Cargo owner or shipper: Company that owns the goods in transit and engages a carrier or logistics provider to transport those goods at any stage in the supply chain.

Carrier: Company responsible for moving cargo with its own transport assets on behalf of logistics service providers and cargo owners.

Certificate: Administrative record. In the book and claim context, it can contain information about a transport fuel or service.

Certification scheme: Verified system of rules, requirements, and processes that enable sustainability verification and associated records across supply chains. Verification of attributes to a sustainability scheme is commonly pursued as a prerequisite to booking.

Chain of custody: Process by which inputs and outputs and associated information are transferred, monitored and controlled as they move through each step in the relevant supply chain (ISO 22095).

Claim: In the book and claim context, to secure the environmental attribute of a fuel or service from a recognised registry or tracking system and record it in the company's GHG emissions accounting.

Drop-in fuel: Type of fuel, other than fossil fuel, that can be used directly in existing infrastructure and engines with limited or no modification, often blended with conventional fuels up to proportions that vary by fuel type and application.

Environmental attribute certificate (EAC): Administrative record that represents the environmental characteristics of a fuel or a service. It can be decoupled from its physical form (i.e., a product).

Emission factor: Factor that relates GHG emissions to the amount of energy consumed, used in emission accounting. It can be applied either directly in an energy-based calculation or embedded in the emission intensity used in an activity-based calculation.

Emission profile: Collection of attributes, including GHG emissions, associated with a fuel or transport service.

Emissions intensity: Amount of GHG emissions released per unit of activity.

Erroneous double counting: It refers to the risk that a single environmental attribute, such as the lower emission profile of SAF, is inappropriately counted more than once towards climate mitigation goals. This may occur due to fraud or may happen accidentally as a result of erroneous double issuance, use, or claim.

Greenwashing: Misleading stakeholders by making false or exaggerated claims about the environmental sustainability of a product, service, or company.

Inset: GHG reduction or removal that takes place within a company's own value chain.

Inventory accounting: Method used to track GHG emissions and removals within a defined organisational and operational boundary over time. Also known as "attributorial" accounting (GHG Protocol).

Logistics service provider (LSP): Company responsible for organising transport on behalf of cargo owners.

Glossary (2)

Low-emission: Characteristic of a product or a service with lower GHG lifecycle emissions in relation to a context, requirement, or standard.

Mass balance: Chain of custody model in which materials or products with different attributes are mixed in a physically connected system. Buyers or users can obtain different amounts of a specific characteristic as long as it is balanced at the system level (ISO 22095).

Monitoring plan: Document submitted to a verifier that details how a company will track and report the amount and type of fuels used for transport, including emission factors.

Net zero: State achieved by companies, countries or projects when their GHG emissions are compensated by an equivalent removals.

Offset: Reduction or removal of GHG emissions made outside of a company's value chain to compensate for its emissions.

Physical separation: Chain of custody model in which specific inputs are isolated from other potential inputs throughout the entire supply chain (ISO 22095).

Platform: Digital or physical system that allows stakeholders to communicate and share information. Platforms can also serve as marketplaces.

Primary data: Quantified value of a process or an activity obtained from a direct measurement or a calculation based on direct measurements (ISO 14083).

Product: In transport book and claim, it refers to a transport fuel or service. In some contexts, it may refer to a downstream product claim (e.g., a product carbon footprint).

Project accounting: Method to estimate the impacts or changes in GHG emissions resulting from specific projects, actions or interventions relative to a counterfactual baseline scenario. Also known as "consequential" accounting or "impact" accounting (GHG Protocol).

Registry: Formalised traceability system designed to issue, hold, transfer, and retire units, tokens, attributes, EACs, or BCUs.

Residual mix: Chain of custody concept that ensures the attributes of the remaining volume to keep the overall system in balance.

Scheme: Defined system or framework that sets the governance, rules and verification requirements for a specific process (e.g., sustainability certification).

Scope 1: It considers all of the company's GHG emissions produced from owned or operated assets (GHG Protocol).

Scope 2: It accounts for indirect GHG emissions generated from the company's energy consumption (GHG Protocol).

Scope 3: It considers all other indirect emissions sources. These come from the reporting company's upstream and downstream activities, considering the entire value chain (GHG Protocol).

System boundary: Defined scope that determines which actors, activities, products, and jurisdictions can participate in a chain of custody model.

Traceability: Ability to track the origin and movement of a material, product, or data through every stage of its supply chain.

Uplift: To load fuel onto an aircraft, ship, or vehicle for a specific journey or operation.

Value chain: Full sequence of activities involved in creating and delivering a product or service.

Verification: In the book and claim context, it refers to the process of examining the accuracy, credibility, and compliance of sustainability attributes, data, transactions and accounting recorded in a system (e.g., a registry) or GHG emissions report.

Voluntary: In the book and claim context, this refers to actions made by choice rather than by regulation.

Summary

The report examines the book and claim chain of custody model as a potential mechanism to support heavy transport decarbonisation.

Book and claim enables the environmental attributes of low-emission fuels or services to be procured independently of their physical delivery, enabling demand to be matched with supply even when they are physically disconnected. The model emerged in response to infrastructure bottlenecks, fuel scarcity, and uneven access to low-emission solutions, drawing on experience from the electricity and gas sectors.

This work outlines book and claim's benefits and risks with key insights to inform relevant stakeholders. Its flexibility could expand access to scarce low-emission fuels, aggregate demand, reduce costs, and enable broader and more equitable participation across value chains. The ecosystem is coalescing around consistent practice, honed greatly in recent years. At the same time, inconsistent definitions, fragmented registries, risk of erroneous double counting, limited recognition in key reporting frameworks, and differing views on interaction with regulations could undermine its credibility if they remain unresolved. Users are actively engaging with these issues, but the accelerating adoption of book and claim means that addressing them early is critical to ensure the mechanism is robust before it is relied upon more widely.

Book and claim is increasingly used in voluntary decarbonisation efforts. There are a few examples of its application within regulatory compliance, though these remain limited. This reflects a degree of caution, as policymakers currently favour physical traceability and place strong emphasis on greater environmental integrity, fairness to communities and stakeholders, trust, and potential structural implications.

Book and claim is explored through case studies on registries, schemes and standards, stakeholder platforms, and market signalling strategies. The report primarily focuses on applications within aviation, maritime, and road freight, although insights can also be applied to passenger transport and other modes (e.g., rail, inland waterways, hub operations). Analysis highlights good practices and persistent gaps around interoperability, reporting consistency, market confidence, and relation to policy, including mandates and incentives.

The report examines how book and claim may be applied within transport's voluntary initiatives and regulatory frameworks. It focuses more on voluntary applications given their wider use today in freight, and outlines implications and considerations for policymakers operating across these two paradigms. While the use of this chain of custody model has largely grown out of private

sector action, its future will depend on how it interacts with compliance frameworks and its implementation within policy.

This publication provides a snapshot of current dynamics, trends, and discussions shaping the development of book and claim in transport. It outlines ongoing efforts to build a robust, credible system and highlights areas where further progress is needed.

The report can be read in full for a comprehensive view or approached in a modular way, with each chapter designed to stand alone depending on the reader's level of expertise and interests. For example:

- Readers new to book and claim may find Chapter 1 a useful starting point, as it introduces concepts and terminology.
- Those who wish to understand today's transport context and where book and claim fits within the sector's broader decarbonisation strategies may consider prioritising Chapter 2.
- Readers exploring implementation options may benefit most from Chapter 3, which provides a representative, but non-exhaustive, set of case studies on how book and claim is currently being applied.

- Those interested in how book and claim operates across voluntary and regulatory contexts may turn to Chapter 4, which examines their interaction.
- Readers looking for cross-cutting, strategic considerations may look to Chapter 5, which discusses factors that shape how book and claim is applied and interpreted over time, including issues of credibility, transparency, interoperability, and governance.

Looking ahead, book and claim can serve as a transitional mechanism to accelerate transport decarbonisation, but it is not a substitute for structural change. The model's development has been industry-driven, while many policymakers have been observing it from the sidelines.

This report provides strategic insights for stakeholders across the ecosystem in the form of prerequisites and indicators for a credible book and claim model while noting fundamental risks. It offers recommendations for policymakers to support greater awareness and indicates how all stakeholders can play a constructive role in the evolving book and claim landscape.

Find more information on the project:
<https://www.itf-oecd.org/book-and-claim-sustainable-transport>.

Strategic insights for stakeholders

The future role of book and claim is still being explored. If book and claim is to emerge as a credible, clear, and consistent method to support transport decarbonisation, multiple prerequisites must be met. Tracking progress towards maturity and credibility reveals where capacity, market, and regulatory gaps persist.

Key prerequisites for a clear, consistent, and credible book and claim

Normative and comparable accounting

Standardised corporate GHG emissions accounting is essential to ensure book and claim transactions reflect real and comparable emission mitigation. Companies can develop high-quality emission inventories through verified data, alignment with established accounting and reporting frameworks, and strict implementation of ISO standards.

Clarity and transparency around additionality

Transparent communication of the additionality status and relation to regulations is essential. Standard setters and system developers should detail what qualifies as voluntary and when additionality analysis is necessary. Regulators can provide clear policy that enables greater compatibility with voluntary decarbonisation, including book and claim.

Robust book and claim systems

System designers should consider best practices such as verifying key attributes, involving all relevant actors in the certificate lifecycle, and transitioning to robust digital solutions. Book and claim credibility relies on attribute traceability and registry quality, and strong governance and third-party auditing are essential to avoid erroneous double counting.

Indicators of progress towards a mature book and claim ecosystem

Stakeholder capacity

The evolution of book and claim towards credibility depends on users' capacity for sound accounting and reporting, as well as the participation of assurance professionals to convey trust to the wider ecosystem. Clear guidance and guardrails from system designers should support newcomers while preparing the system for scale.

Market maturity

A maturing book and claim market is measured through growing registry coverage, more coordinated practices, and broader alignment among users. System developers should be increasingly interested in how emission reporters apply recognised standards, use flexible chain of custody models and maintain consistency as practices expand to new applications.

Regulatory and voluntary complementarity

Decarbonisation efforts in voluntary and regulatory contexts must work alongside one another to efficiently jumpstart transport decarbonisation at this stage. Regulators and system designers should engage practitioners and provide clear guidance to ensure interoperable and complementary book and claim applications.

Recommendations for policymakers

The transport sector is likely to increase its use of book and claim to accelerate decarbonisation efforts. Policymakers should carefully study and understand regulatory market-based approaches as well as flexible chain of custody practices developed by the private sector for voluntary decarbonisation. Targeted use of book and claim and efforts to clarify how it interacts with existing and emerging frameworks, both regulatory and voluntary, will aid complementarity and deepen impact.

Align with international standards

Policymakers should regularly review existing policies to incorporate emerging international standards, such as the ISO chain of custody series and its recent updates. They should also promote consistent terminology and practices to support a common understanding across jurisdictions and between voluntary and regulatory decarbonisation efforts.

Request transparency of decarbonisation claims

Decarbonisation driven by book and claim is dependent on an associated model requiring traceable attribute certificates and transparency from all actors, and policymakers should ensure that ecosystem tools provide sufficient visibility to support performance audits and attribute verification, enabling credible environmental claims and preventing greenwashing.

Build institutional capacity to understand book and claim

Policymakers can build on emerging voluntary efforts while assessing potential risks, benefits, and book and claim's possible role in national decarbonisation strategies. Strengthening institutional capacity and clarifying responsibilities within relevant national agencies will help authorities understand the model and track market developments.

Clarify the applicability of book and claim within policy

Market-based mitigation practitioners seek clarity on the application of flexible chains of custody within regulatory regimes, including both book and claim and mass balance. Clarity helps users understand the interaction between mandatory and voluntary market-based efforts, which will, in turn, enable complementarity and greater decarbonisation.

Engage with stakeholders to enable voluntary decarbonisation

Private actors are leading early adoption and signalling strong demand for book and claim-based solutions. Policymakers can play a beneficial role by engaging directly with these actors and other relevant stakeholders, helping to set safeguards that ensure integrity concerns are addressed and prevent bad practices without limiting innovation.

Support interoperable expansion if deemed beneficial

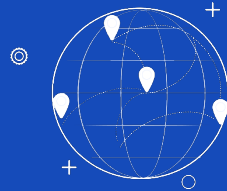
Voluntary book and claim is already spreading across multimodal supply chains worldwide. If book and claim earns more formal recognition, policymakers could anticipate growth and should actively ensure frameworks and infrastructure support interoperability. Practitioners benefit from harmonised or compatible regulation across jurisdictions.

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Introduction to book and claim

An introduction to the chain of custody model and its application in heavy transport decarbonisation.



Chapter 4:

Voluntary and regulatory landscape

A review of existing standards, frameworks, and regulations, alongside an assessment of their current use and potential to incorporate and recognise book and claim.



Chapter 2:

Book and claim and low-emission transport

A review of sector-specific decarbonisation constraints, as well as the book and claim system's potential to enable low-emission transport, along with its risks and limitations.



Chapter 5:

Strategic insights for stakeholders

An overview of key findings relevant for policymakers and other stakeholders, plus potential avenues for action.



Chapter 3:

Case studies on book and claim

A look at how book and claim is being implemented in the transport sector, with case studies that highlight real-world practices and developments.



Annex

List of workshop participants on 5 February 2025 and references.



Chapter 1: Introduction to book and claim

An introduction to the chain of custody model and its application in heavy transport decarbonisation.



Chapter content

Can book and claim help decarbonise transport? (p. 12)

Decarbonising transport will require collaboration from stakeholders across the board, but current solutions face barriers. The book and claim model could offer a flexible solution by linking geographically separated low-emission fuel supply and demand. Its adoption is growing, primarily driven by voluntary decarbonisation applications.

Physical separation, mass balance, and book and claim (pp. 15-16)

Chain of custody model fundamentals have a specific application in the transport sector and are used to track attributes of tangible products, such as fuels and transport services. Book and claim is the most flexible chain of custody model as it allows the separation of the physical product and its environmental attributes.

Chain of custody models (p. 13)

Chain of custody models enable the tracking of inputs, outputs, and related information as they move through supply chains. Three types of models stand out in transport decarbonisation: physical separation, mass balance, and book and claim. Participants in these supply chains share the responsibility for the GHG emissions associated with the transport activity.

Book and claim in context and action (pp. 17-19)

Book and claim's transport applications originated from the voluntary uptake of decarbonising solutions, prior energy sector experience, and market-based precedent in accounting and environmental target standards. Follow along a case study of attribute transfer and observe stakeholder efforts to maintain system balance and integrity.

Main principles and terminology (p. 14)

Some key introductory terms and concepts of this market-based approach to transport decarbonisation include: certification, proof of sustainability, environmental attribute certificate, registry, vintage, erroneous double counting, additionality, and assurance.

Book and claim stakeholders (pp. 20-22)

The key stakeholders in the book and claim ecosystem include low-emission product providers, carriers, logistics service providers, cargo owners (or shippers), verifiers, registry providers, policymakers, and system enablers. They all play an important role in book and claim, whether along the supply chain or outside it, defining system boundaries, rules and mechanisms.

Can book and claim help decarbonise transport?

Book and claim has emerged as a strategy to jumpstart the decarbonisation of hard-to-abate transport modes in response to growing sector emissions.

It takes an ecosystem to decarbonise an industry. Leading corporates, carriers, fuel providers leveraging novel feedstocks, academics, standard setters, and regulators are all looking for ways to further reduce sector emissions. Currently, tracking and reporting progress with low-emission practices, such as electrification or alternative fuel use, requires co-location of the activity and the low-emission energy carrier (i.e., fuel). Requiring physical traceability to the vehicle or cargo not only limits the reach of some low-emission solutions but can also create inefficiencies or require additional infrastructure or transport to physically match supply with demand.

One potential solution to overcome physical limitations and connect low-emission supply and demand is the “book and claim” chain of custody model. Chains of custody describe the interconnected relationships, supply lines, data hand-offs, and the systems that make a supply chain work. Book and claim allows for the attributes of products or services to be traced independently of their physical manifestation. The proponents of this model argue that it could connect the global supply for low-emission transport fuels and services to willing customers, helping to address year-over-year emissions growth and bend the curve towards the sector’s net-zero ambitions.

With growing requirements to track and report greenhouse gas (GHG) emissions and confront climate change, many practitioners have opted for the “learn by doing” path. It is becoming more common for transport stakeholders to develop

their underlying emissions inventory strategy (i.e., data gathering, accounting, reporting) and integrate book and claim into their operations. As book and claim adoption increases, so does the co-operation between stakeholders aiming to co-define best practices and find a common path forward, so far with policymakers observing with marked interest.

Perceptions of the maturity and credibility of book and claim practices diverge, influencing their adoption. Some actors have already established clear processes and multi-year offtake agreements, operating under independent frameworks and standards and using third-party verification for accounting and reporting. Others are waiting for more formal recognition of chain of custody models or feel concerned that this approach may delay the tangible decarbonisation the sector needs. Practitioners continue to use book and claim today, even as experts debate the merits and outcomes of similar market-based approaches. As a result, caution is common, and even supportive voices often recommend gradual, deliberate implementation.

The present report contains a comprehensive compendium of the most relevant information in the transport book and claim space. It explores how book and claim models work and are used today while analysing their implications for transport decarbonisation, GHG emissions accounting practices, and the interaction between voluntary actions and regulations.

Questions this report helps to address

How does book and claim work compared to other chain of custody models?

What are the components of a book and claim model?

Who are the main stakeholders in the book and claim ecosystem?

Who can use book and claim, and in what contexts?

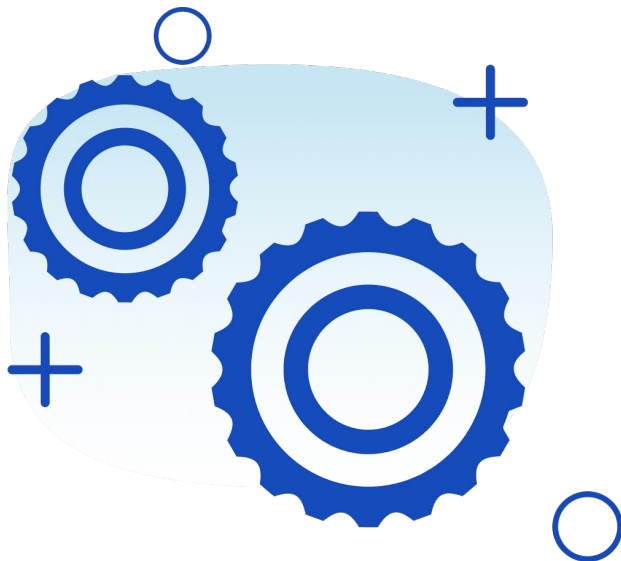
What are the benefits and drawbacks of book and claim?

How does book and claim interact with standards and regulations?

Does book and claim have a real impact on emissions?

Understanding chain of custody models

Chain of custody models track products and services through supply chains. Book and claim enables the traceability of specific environmental attributes separately from the transport fuel or service.



Chain of custody and transport

The 2020 International Organisation for Standardisation’s (ISO) publication, ISO 22095, defines and describes chain of custody as a “process by which inputs and outputs and associated information are transferred, monitored and controlled as they move through each step in the relevant supply chain” [1]. The types of models applicable to transport and discussed in this report include physical separation, mass balance, and book and claim, which are described below. These models can be viewed along a flexibility hierarchy, in which more flexible approaches may encompass or coexist with less flexible ones in certain applications.

Physical separation

As its name suggests, physical separation refers to models in which specific inputs (e.g., alternative fuels) are isolated from other potential inputs (e.g., conventional fuels) throughout the entire supply chain. In this report, three models are grouped under the term “physical separation” to distinguish these approaches from mass balance or book and claim: identity preserved, segregated, and controlled blending. In transport, an example would be a dedicated fuel truck delivering a specific quantity of a specific fuel to a vessel, without it being blended further or mixed with other fuel during delivery. Following this approach implies that buyers are receiving a transport fuel or service that physically reflects the same specified characteristics [1] as the administrative record (i.e., the certificate).

Mass balance

The mass balance model may be utilised when physical separation is not practical. It enables traceability when mixing inputs. In transport, this allows fuels of differing characteristics to be mixed or attributes of transport services to be asymmetrically allocated to physically connected customers, capped by total inputs at the system level. Mixing and flexibility in output allocation reduce infrastructure costs. For example, two cargo owners may be allocated different amounts of low-emission services from a carrier’s pooled fleet operations: one receives more attributes than physically connected to, while the second also receives a non-proportional attribution [2] to balance the system. Outputs and inputs align at the system level, and physical connection is considered maintained.

Book and claim

This is the most flexible chain of custody model, allowing the environmental attributes of a transport fuel or service to be separated from its physical manifestation. In other words, this means that a low-emission fuel or service can be physically delivered in one location, but its attributes can be claimed in a disconnected geographical location (or the same location at an asynchronous time). The attributes and physical product or service are traced within a system boundary to norms established by a requirement setter. System attributes are similarly balanced with the “residual mix” concept [3], ensuring unattributed characteristics go to remaining users. The ability to disconnect the attribute from the physical fuel or service while maintaining traceability of a unique attribute is why book and claim can potentially connect local supply with distant demand.

Explaining core principles and terminology

Certification

Certification is part of the larger world of assurance and conformity assessment. It provides independent attestation that products, services, or processes meet defined standards. In transport book and claim, the term often refers to “sustainability certification” of fuels according to standardised schemes or frameworks used to assess and verify environmental attributes. Independent bodies typically oversee schemes and approve auditors to certify compliance in the field.

Proof of sustainability

A proof of sustainability (PoS) is a certificate that documents the attribute of a specific batch of product, such as a quantity of SAF, sustainable marine fuel (SMF), or biodiesel, under a recognised certification scheme. It details the sustainability attributes of this quantity or batch and is part of the documentation transferred between seller and buyer. A proof of compliance (PoC) may be generated to demonstrate recognition or conformance regarding a compliance scheme via a PoS.

Environmental attribute certificate

An EAC transfers the attributes of a quantity of transport fuel or service, often underpinned by sustainability certification (e.g., via a PoS). An EAC can be formally defined by a system operator or scheme or may refer more generally to an instrument that conveys attributes of a product or service within a chain of custody system. In a registry or other tracing activity, an EAC may be the transferred instrument, often known as a book and claim unit (BCU) or certificate.

Registry

A registry is a formalised traceability system designed to issue, hold, transfer, and retire units, tokens, attributes, EACs, or BCUs. Registries are expected to provide transparent and verifiable tracking of characteristics, ownership, and transactions, including metadata such as emission scope, fungibility, and timestamps. They range from open, “public” platforms to commercial registries, which, in turn, can vary from formal, certified systems to basic in-house ledgers.

Vintage

While physical proximity is flexible in a book and claim system, the timing of related activities remains crucial (e.g., dates of fuel production, delivery, transport activity, EAC transfer, and final inventory claims). The “vintage” may be an identifier – for example, a 2024 barrel of SMF – but more often it refers to the allowable time window between chain of custody events. For example, vintage may refer to the timeframe within which a fuel must be booked after production.

Erroneous double counting

Erroneous double counting refers to the risk that a single environmental attribute, such as the lower emission profile of SAF, is inappropriately counted more than once towards climate mitigation goals. In other words, it may put a unique claim at risk. Sharing responsibility for emissions can be legitimate (e.g., between Scope 1 and Scope 3, or across Scope 3 categories). Erroneous double counting risk must be mitigated, as it can occur in various forms (e.g., double issuance, double use, or double claiming). See page 33 for more information.

Additionality

The concept of additionality protects the “voluntary” quality of such book and claim-based procurement. It communicates that low-emission fuel or freight services are further bending the curve, deepening emission mitigation and ensuring that decarbonisation, per common practice, goes beyond that required by regulation. The concept continues to create friction, as different definitions currently coexist. Transparency is key in systems and among booking and claiming parties. For more information on additionality, see page 34.

Assurance

Assurance is the process of confirming trust and is related to quality management. Certification, validation and verification are the most common assurance activities within the scope of this analysis. A user validates a system ex-ante for recognition that it will operate as planned. A user verifies GHG emission reporting ex-post to create trust that past data are accurately represented and follow the convention. These engagements are carried out by accredited validation and verification bodies (VVBs).

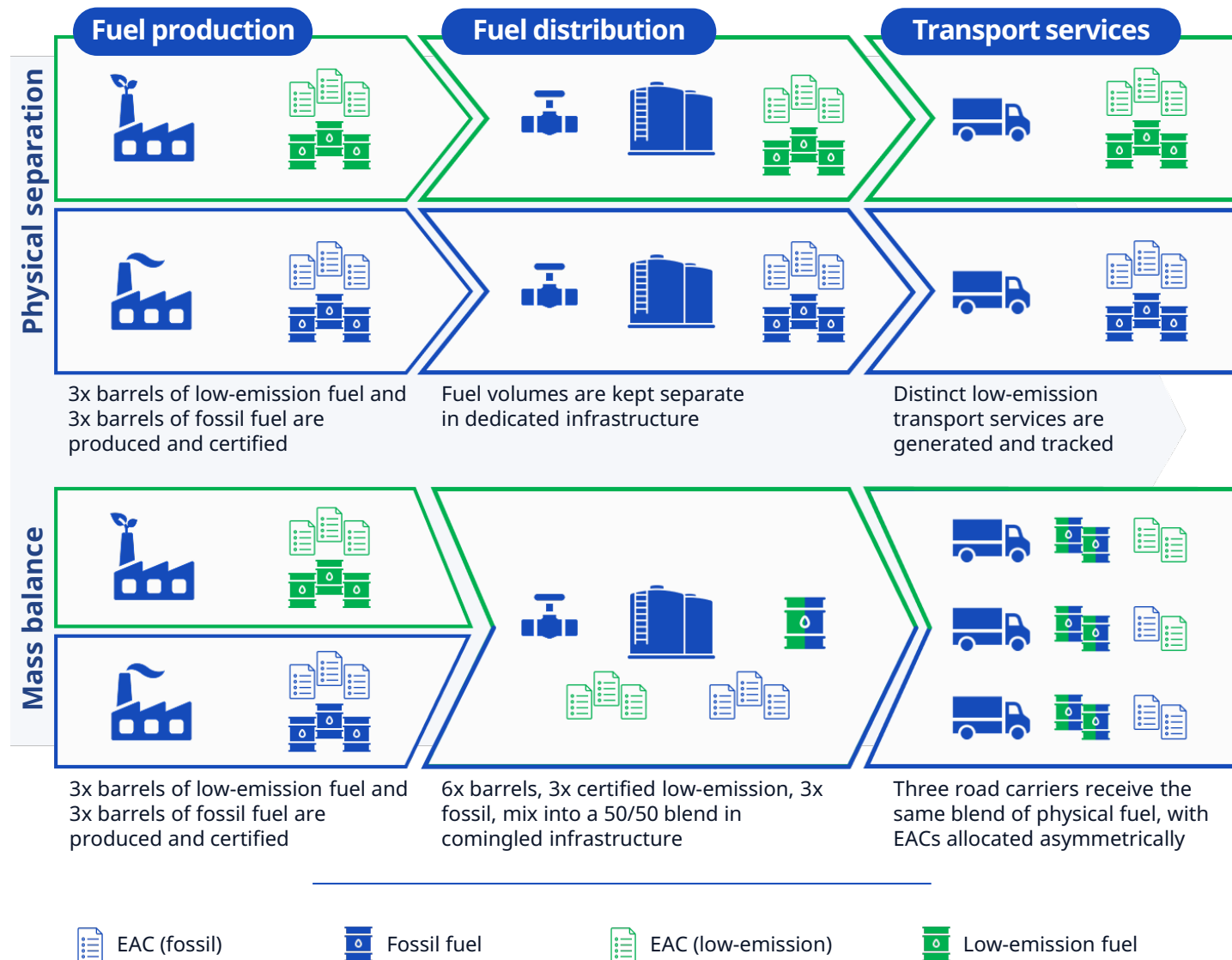
Chain of custody building blocks

A closer look at physical separation and mass balance chain of custody models in today's logistics system.

The transport value chain is heavily interconnected, and its products and activities span across the globe. Many stakeholders enable these value chains and share responsibility for the generated GHG emissions. Four primary actors play key roles: fuel producers enable carriers to conduct transport services on behalf of logistic service providers (LSPs), who co-ordinate services, and shippers, who own cargo.

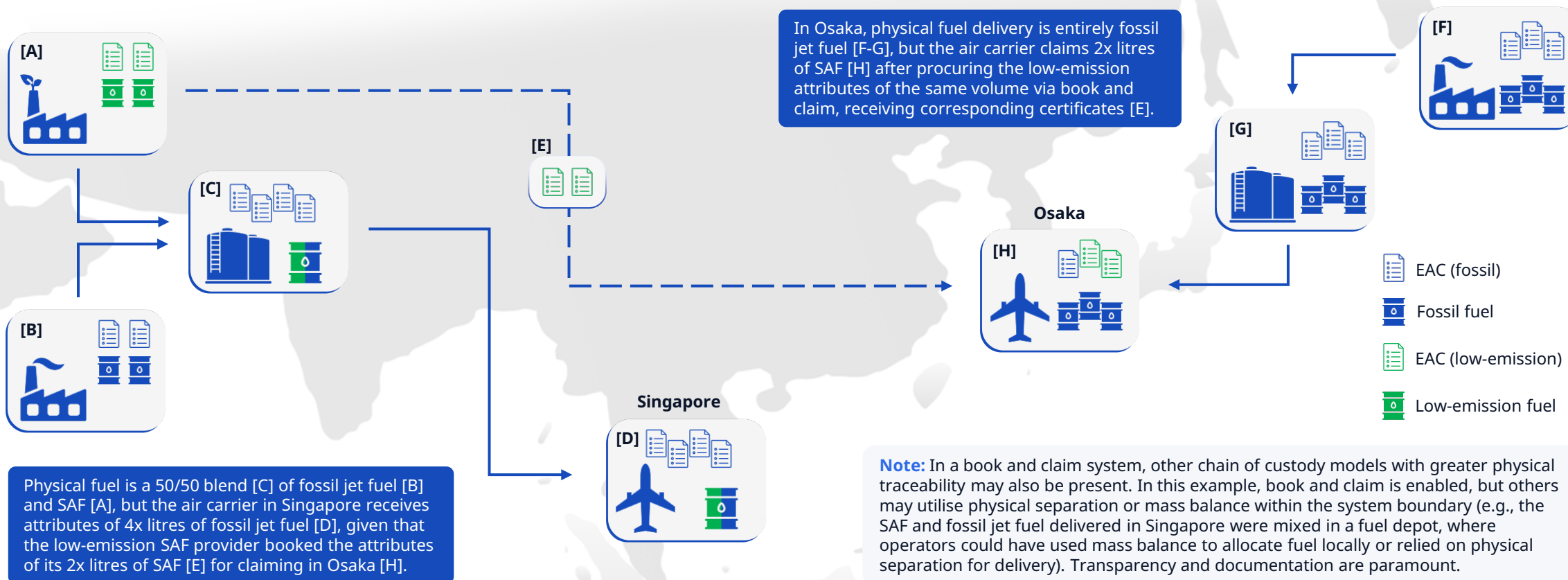
All parties involved in the transport of goods and services account for GHG emissions. To do so, they consider the information contained in EACs (often simply using a PoS document in physical separation and mass balance models) of the energy carriers used to enable market-based transport procurement. EACs are procured along with or in place of the physical energy carrier or related transport service. In the physical separation model, each product carries its specific attributes, making emission allocation straightforward. This system enables multiple vehicles to approach a single fuelling point and receive both a physical product and its administrative record, detailing the attributes received by this customer.

However, when mixed in a common fuel distribution system, environmental attributes can be asymmetrically passed to specific stakeholders along the chain, balanced at a physical system level (mass balance). If one entity receives an asymmetrical allocation of low-emission fuel, another entity will receive a residual mix.



How does book and claim work?

Mass balance demonstrates greater flexibility in delivery method and traceability compared to physical separation. In a book and claim system, this flexibility is taken one step further. This example illustrates flexible fuel delivery via book and claim, with physical sustainable aviation fuel (SAF) delivery to Singapore and attribute delivery to Osaka.



Tracing the origins of book and claim in transport

Multiple factors have laid the foundations for book and claim's adaptation to transport: slow uptake of low-emission solutions, precedents from energy certificate systems, GHG accounting standards, and growth in voluntary corporate commitments.

Slow uptake of alternative fuels and technologies

Uptake of low-emission fuels and transport services remains limited due to constrained supply and higher prices. For example, biofuels have existed for decades, and SAF was first specified in 2009, but it was only 0.3% of the total aviation fuel supply in 2024 [4].

The maritime sector has seen increasing use of alternative fuels, with drop-in biofuels deployed in commercial operations, leveraging existing vessels and infrastructure despite limited supply and uncertain scalability. By contrast, alternative fuels such as green methanol, LNG and ammonia require new engine configurations or newbuild vessels, and availability is still emerging.

Heavy trucking faces similarly slow growth, despite available innovation. In Europe, which stands as the leading region, the first heavy-duty eTrucks emerged in the 2010s and early 2020s, but upfront purchase costs remain high globally, and charging infrastructure is still inadequate. Piecemeal demand and industry misalignment continue to limit adoption.

Experience with certificates in the energy sector

Tracking low-emission fuels is challenging, yet a litre of fuel remains a tangible and largely traceable unit. By contrast, in the electricity and gas sectors, where individual electrons or gas molecules cannot be tracked, market-based systems became essential. The transport sector has adapted these precedents for its own use.

The market-based approach, including book and claim, has been used in the energy sector for decades. Instruments such as Renewable Energy Certificates (RECs) and Guarantees of Origin (GOs) have enabled market-based claims to renewable electricity and low-emission gas.

During the 1990s and 2000s, the use of certificates to transfer ownership, attributes, and claims to renewable energy grew rapidly, mainly because flexible chain of custody models treat all electricity produced within a specified system as interchangeable. These certificates now represent substantial market volume, with RECs used for about 15% of total US electricity sales in 2023 [5].

GHG accounting standards: market-based precedent

As GHG emissions inventory practices grew, so did demand for a common methodology to ensure consistency, comparability, and credibility. The primary accounting standard body, the Greenhouse Gas Protocol (GHG Protocol), released its Corporate Standard in 2004 [6]. Reporting practices deepened, and GHG Protocol met the market with accounting tools for supply chain emissions (Scope 3), publishing corporate value chain guidance in 2011 [7]. In 2015, it introduced market-based approaches for electricity and gas (Scope 2) [8], though the practice already existed. Official inclusion sparked hope for similar recognition in transport.

Despite the market-based option for Scope 2, physical reporting is still the rule for Scopes 1 and 3. However, the GHG Protocol has recently signalled that changes may be coming. Through a comprehensive Technical Working Group (TWG) process, GHG Protocol has convened industry experts in the Actions and Market Instruments (AMI) TWG and committed to new guidance by 2028 [9]. Even the market-based model in Scope 2 is under review (in consultation as of publication).

The Paris Agreement, SBTi, and corporate commitment

In 2016, 175 nation-states committed to the Paris Agreement to reduce GHG emissions and limit global warming to 1.5 °C [10]. Corporations piled on in commitment, responding to public demand.

The Science Based Targets initiative (SBTi) was established to provide a framework for such climate-conscious companies to set emission reduction targets aligned with climate science. Over 9 700 entities have now committed to SBTi-validated targets, making it a dominant voluntary standard for net zero climate action [11]. While these promises don't directly create demand, they signal ambition and can drive procurement.

SBTi currently excludes book and claim as an approved pathway for corporates to achieve targets, but has signalled potential support for EAC use [12]. The body is currently reviewing its program requirements via Expert Working Groups (EWGs), with guidance due 2026-2027.

Further reading: [BEV growth](#); GHG Protocol [Standards and Guidance](#); Scaling of [RECs](#) and [GOs](#); [Paris Agreement](#); SBTi [Target Dashboard](#).

A day in the life of transport book and claim attributes

[See next page for visual](#)

Fuel certification



A book and claim-based procurement starts with small, administrative steps. It begins “upstream”, where the verified, sustainably-grown feedstock is processed into a low-emission fuel, deemed satisfactory to a functional standard (e.g., ASTM D975 in the US or EN 15940 in the EU for hydrotreated vegetable oil (HVO)) as well as certified for its environmental attributes according to an international sustainability scheme (e.g., ISCC Plus). This step involves certifying the fuel as suitable for its intended transport use and establishing the low-emission attribute and related data through verification to an independent sustainability certification scheme.

Fuel distribution



The physical fuel and its attributes are distributed through physical infrastructure such as a pipeline, blending facility, vessel, rail, or truck to a fuel depot. This fuel depot also receives standard fossil fuel and might be owned/operated independently or by the fuel provider. In the visual on the next page, this provider network delivers the low-emission attributes to a public registry in parallel to enable other geographically disconnected carriers to claim this low-emission profile (i.e., via an EAC). The physical fuel itself goes to a gas station and is delivered and reported as the residual mix of the fuel depot (i.e., fossil fuel) for cargo services conducted by Carrier B on behalf of Shipper C.

Transport services



In transport, physical disconnection can occur in two places in the supply chain – during fuel distribution, at delivery of the transport service, or both.* The attributes of the low-emission fuel are claimed and used by Carrier A. The carrier and fleet operator generate large quantities of low-emission transport services and pass some along physically to LSP B and book some for claiming elsewhere by LSP A.

*Note: the product provided by a carrier to an LSP and an LSP to a cargo owner are both described as transport services. As such, a book and claim model can be applied in both stages. Only Carrier to LSP is included on the next page.

System in balance

Demand for low-emission fuel and low-emission transport services is fed by the downstream demand signal, created by Shipper A, LSP A, and Carrier A, enabled by a public registry, the fuel provider’s low-emission product, and the feedstock provider’s choice to create low-emission system inputs. While the low-emission fuel is reported and claimed by the downstream actors, the system must balance, and all actors must avoid erroneous double counting. As such, the residual mix is reported to and claimed by the gas station, Carrier B, LSPs B and C, and Shippers B and C.

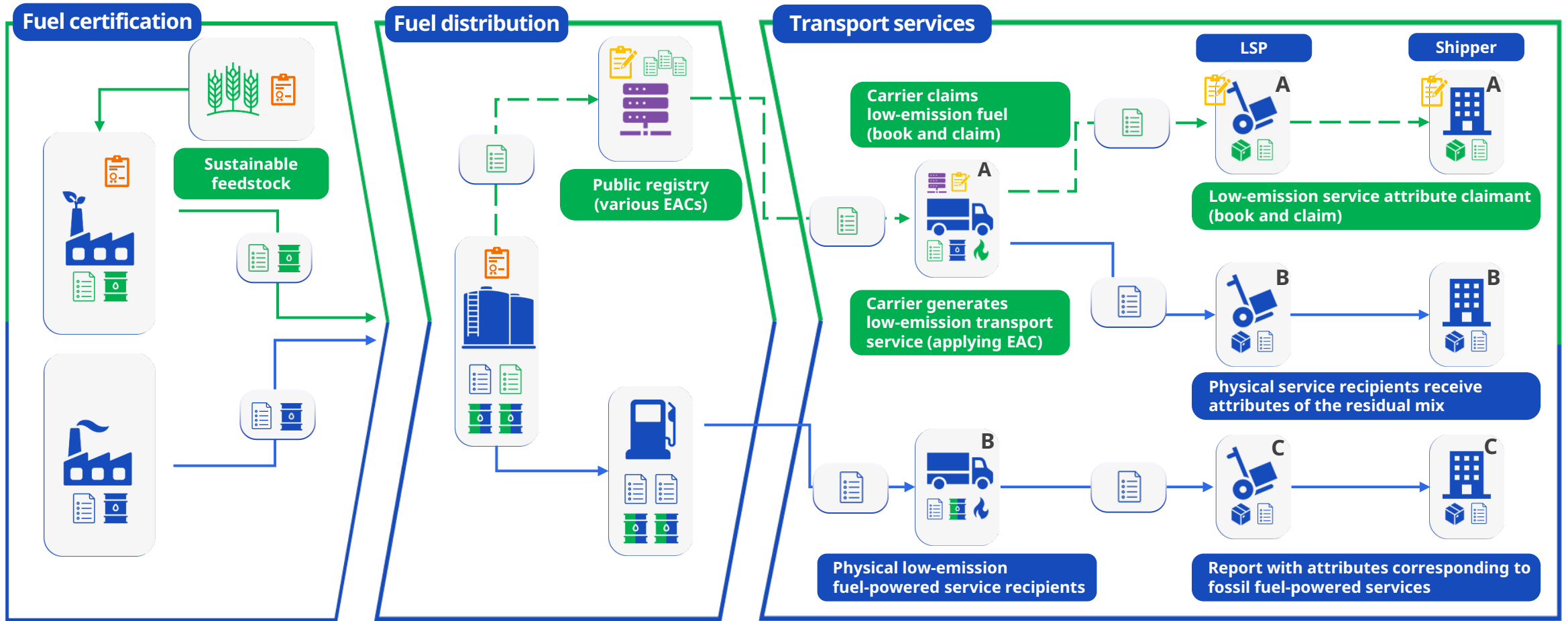
Relevant emission reporters verify that their inventory includes correct attributes to keep the system in balance – inputs equal outputs, and CO₂e claims are conserved across the system.

The attribute’s ultimate “claim” in a reporter’s GHG inventory ideally follows the structure of the traditional transport value chain as best as possible, strengthening the claim by being comparable to the original input, as if the vehicle had the actual fuel itself, as if the cargo had actually been transported with biodiesel on a similar truck.

Users strive to minimise the perceived difference between a book and claim procurement and a physical procurement in order to preserve the integrity and credibility of the end user’s claim. For all intents and purposes, it is as if the claiming party had the fuel. The only exception is that the fuel and services were delivered via a book and claim chain of custody, rather than a traditional physical supply chain.

A day in the life of transport book and claim attributes

See previous page for description <<



Fossil fuel
 EAC (fossil)
 Low-emission fuel
 EAC (low-emission)
 Attribute flow (dashed: virtual; solid: physical)
 Energy use (i.e., Scope 1)
 Cargo service (i.e., Scope 3)
 Verification
 Sustainability certification

Key stakeholders

Low-emission product providers

Product providers sit at the beginning of the chain of custody and are responsible for creating certified low-emission products (fuels, services). They need market signals to better understand needs and scale supply. This group comprises specialist suppliers and integrated majors that offer low-emission alternative products alongside fossil options. Today, co-processing alongside fossil fuels is still prevalent, with hopes that book and claim can help stimulate demand for dedicated facilities.

Carriers

Carriers own assets that move cargo on behalf of LSPs and cargo owners. They are the fuel users and are responsible for providing the demand signal upstream to fuel providers while managing downstream needs – including GHG emission accounting and reporting. This group bears the cost of addressing mitigation and needs to see the demand signal for low-emission transport services to further develop their sustainable offerings.

Logistic service providers

LSPs, often called “freight forwarders”, organise transport on behalf of cargo owners. They do not own assets nor conduct transport activity yet hold an integral position between the supply of sustainable options and demand for low-emission cargo services. In book and claim, their industry knowledge is key for translating the shipper’s demand upstream, facilitating throughput, and managing accounting and reporting. Some LSPs do own assets too, acting also as a carrier.

Cargo owners or shippers

Cargo owners hold the keys to the puzzle by driving demand for low-emission products. They have decarbonisation and net-zero targets and must work with LSPs, carriers, or (less often) directly with fuel providers to ensure cargo may be transported “on” the low-emission attribute, physically or via a book and claim model. They sit at the end of the supply chain but need to communicate low-emission demand upstream by partnering with value chain actors and often paying the majority of the bill.

Verifiers

Commonly referred to as VVBs, a verifier’s services provide trust to the otherwise opaque transport chain and book and claim environment. They are approved under specific schemes, frameworks, and standards, trained to audit participants’ conformance to rules of a requirement setter – verification being an ex-post analysis to ensure, for example, that SAF was produced to a specific standard or that the user’s emissions accounting and reporting is conformant.

Registry providers

Registry providers operate the tracking and tracing functionality in book and claim systems. This is one of the attribute “crossroads” where exchange occurs. A registry is set up according to specific rules, where some of the elements are defined by its operator. Ideally, they operate independently of system users and strive to provide a transparent, robust environment for supply chain participants to book, transfer, and claim profiles of low-emission fuels and services.

Policymakers

Although peripheral to the value chain, the policymaker has significant influence on voluntary book and claim by shaping requirements from certification schemes and providing clear policy that helps practitioners navigate the boundary between mandatory and voluntary. The policymaker provides tools that enable greater sophistication (e.g., databases), reduce costs (e.g., incentives), and may incorporate a flexible chain of custody model, such as book and claim. Effective policy balances requirements and outcomes, promoting clarity for all users.

System enablers

The “system enabler” provides ecosystem services, referring to a broad set of functions in transport book and claim. This role includes standard or scheme authors, non-governmental organisations (NGOs), buyers alliances, digital professionals coding registries, consultants advising supply chain actors developing a product or standard operating procedure (SOP), and professionals who provide tools to assist emission reporters manage data according to GHG emission standards and transport frameworks.

Stakeholder focus: booking party and the claimant

Stakeholders who book

The booking party is generally the low-emission fuel producer or the carrier. They utilise book and claim to connect a product or service to the buyers, earn revenue, mitigate the steep costs of decarbonising their operations, and meet corporate climate commitments.

Booking parties make foundational decisions that determine both the effectiveness of the system and the integrity of a claim. Methodology, use of digital tools or registries, contractual approach, and other choices are integral to the implementation's success and to protecting the integrity of the end-user claim. While booking parties prioritise customer needs, they also seek clarity and simplicity in their own offerings, advocating for clear rules so their customers can comply and smoothly procure and use the booked products.

For example, the authors and adherents of the Book and Claim Community's (BCC) Principles and Best Practices note that booking parties should, as a prerequisite, independently certify the environmental attributes before booking, where possible. Similarly, they should follow credible normative documents, use robust registries, ensure data accuracy, additionality, and implement measures to prevent erroneous double counting [13].

These measures are crucial yet can be challenging. For example, when carriers use physical fuel for transport activities, they may need to report this fuel use in a public database. Such transparency risks an erroneous claim by a party who unknowingly (and mistakenly) uses this public data. Solutions such as customer-specific reporting, dual reporting, or contracts reduce this risk.

Booking parties connect with customers and suppliers by managing transfers independently, establishing a company-specific registry, using a more basic internal sales ledger, or working with external partners who already operate an open, public registry. First movers have made a name for themselves on the supply side of book and claim, pioneering market-based attribute offerings. But at scale, booking organisations may find themselves competing with peers, given that the chain of custody model itself lowers the barriers of access.

Further reading: EU's maritime [Monitoring, Reporting and Verification system](#); Global [SAF Provider Report](#); Katalist's [assurance procedure to book a voyage](#).

Stakeholders who claim

The claiming party seeks to satisfy its demand for low-emission products and services, fulfil emissions promises to stakeholders and reduce year-over-year GHG emissions. Where the booking party seeks to connect to EAC buyers via book and claim systems, claimants seek to decarbonise efficiently and cost-effectively. They seek clarity to use the attributes in their GHG emission inventories and simple, easy-to-understand, easy-to-communicate rules, frameworks, registries, and processes surrounding the book and claim opportunity.

Above all else, the claim must “count” [14]. They seek approval of voluntary book and claim from GHG Protocol and SBTi for use in inventory accounting and towards Science Based Targets (SBTs). Until this clarity is provided by existing TWG and EWG processes, many potential claimants will remain as observers.

While booking parties primarily include fuel providers and carriers, claimants can be any of multiple organisations in the value chain – carriers, logistics service providers, and cargo owners. Carriers claim via a book and claim in order to purchase fuel attributes (e.g., SAF, SMF, biofuels, renewable fuel of non-biological origins) and address their Scope 1 emissions, while LSPs and cargo owners seek the low-

emission attributes of transport services conducted on the above fuels to address their Scope 3 emissions. When carriers cannot fulfil demand for low-emission transport services, LSPs and shippers may choose to purchase the attributes of fuels from a provider and calculate the emissions “as if” their real, physically-consumed transportation had been conducted on a low-emission fuel. This is how a cargo owner or LSP who do not own assets can buy and “use” SAF attributes. This option requires expertise to ensure the claim is as accurate as if the carrier had refuelled themselves.

Without clear guidance from GHG Protocol and SBTi, many claimants have developed their own SOPs and depend on industry frameworks, schemes and product guides that normalise procurement and simplify accounting and reporting. Assuming quality concerns are addressed by providers, the claimant's focus tends to be on the use of the attribute in Business-to-Business (B2B) reporting, product carbon footprints (PCFs), and resulting declarations.

Further reading: [Carrier's role](#) in the supply chain; [Contractual](#) and [Functional](#) role of the shipper; [LSP types](#) (1PL, 2PL, 3PL, 4PL); RSB's [registry retirement statements](#).

Stakeholder focus: policymakers and system enablers

Policymakers and regulators

Policymakers and regulators have their constituencies in mind in their day-to-day operations, and when considering novel approaches such as book and claim, they often focus on costs and public environmental benefits, as well as local or regional effects [15,16]. As they prioritise this foundational responsibility, they are actively expanding their chain of custody knowledge and considering their approach to the book and claim model, including measured implementation in regulations or other activities.

In recent years, policymakers have played a pivotal yet indirect role in supporting the transport applications of book and claim by setting clear regulations, providing public resources, and defining obligations for system users. Clear and simple policies helped users distinguish between voluntary efforts and mandatory requirements, empowering early adopters to act confidently and expand decarbonisation efforts via book and claim (see page 34).

Even when not explicitly labelled as “book and claim”, regulators may adopt flexible chain of custody approaches in mandates because they want the policy objective to succeed, and they face pressure to reduce the user’s compliance

costs while minimising creating winners and losers. In the end, such mandates spur supply and can bring down costs for all low-emission fuels and services, provide stability, encourage investment, and enable voluntary users to deepen the sector’s decarbonisation efforts.

While flexible, mass balance systems remain distinctly different in design and retain an element of local physicality. For example, ReFuelEU Aviation (ReFEUA) prioritises delivery within each member state, despite allowing for a degree of flexible attribute delivery similar to that enabled by book and claim (see page 60).

As such, the use of book and claim is seen by some as a radical shift. For years, regulators have focused on physical traceability and delivery within their own countries or jurisdictions to direct benefits to constituents and achieve greater certainty about the durability and integrity of decarbonisation. Where employed, flexibility has focused on the use of mass balance chains of custody. If policymakers were to formally apply and recognise these flexible models as “book and claim”, it could accelerate adoption and legitimacy, but it would be a measured shift.

The use of book and claim is under study by policymakers, while others await more information before taking action (see page 67).

System enablers

A set of “enablers” provides fundamental infrastructure duties and fills current gaps in today’s transport book and claim ecosystem. They offer formal and informal expert guidance so practitioners don’t need to improvise attribute certification or sector-compliant reporting, helping ensure the achieved decarbonisation is credible and comparable.

It takes a large organisation such as ISO, GHG Protocol, SBTi, or CDP to launch and maintain third-party, independent, and economy-wide standards. Because many of these bodies leverage external personnel to complete this work, either during official deliberations (e.g., an EWG or TWG), in consultations, or as “pilot partners”, leaders must balance a variety of experiences and perspectives, commercial and personal. Together, they discuss and then distil essential elements to develop competent, credible, and comprehensive standards.

While a spectrum of book and claim guidance exists, there are relatively few true frameworks or standards. Much of the written content has arisen in relation to commercial efforts and occupies a grey area between independence and alignment with existing conventions [15,17].

At the same time, leading organisations have developed credible publications and systems to help users navigate optionality and opportunity while maintaining commercial independence and applying existing chain of custody and transport standards. Without auditable and credible requirements, claims would not hold as much weight and legitimacy (see pages 46 and 59).

Enablers provide stability at a pivotal moment in book and claim practices. Consolidation around frameworks and standards is key and demonstrates the growing maturity of book and claim systems and operators. Without the “how” and “what” of an independent, third-party framework or standard to guide the market, utilisation may remain limited.

Other actors provide an enabling function, for example: well-established industry or regional organisations who help socialise and legitimise as members consider book and claim-based products; buyers alliances who bring EACs to market and hone practices in company with peers (see page 44), as well as complementary sector projects such as the aforementioned BCC.

As the market expands, the enabler’s work complements the policymaker’s contributions and plays a crucial role in sector alignment.

Chapter 2: Book and claim and low-emission transport

A review of sector-specific decarbonisation constraints, as well as the book and claim system's potential to enable low-emission transport, along with its risks and limitations.



Chapter content

Decarbonisation context across transport modes (pp. 25-27)

Each transport mode follows distinct decarbonisation pathways, shaped by technological readiness, infrastructure needs, and cost efficiency. This section outlines the main challenges of electrification and low-emission fuel deployment, showing how global alternative fuel scarcity and uneven access define the environment in which book and claim could play a role.

Book and claim's risks and limitations (pp. 32-34)

The lack of clear definitions, rules and co-ordination could undermine book and claim's credibility. This section discusses the major risks, such as fragmentation, limited transparency, and erroneous double counting, and highlights the safeguards needed to maintain environmental integrity and stakeholder trust. It also explores the concept of additionality further.

Weighing the benefits and risks of book and claim (p. 28)

This section explores the potential benefits as well as risks and limitations associated with book and claim, illustrating how the balance between them can shift depending on policy design, market conditions and stakeholder trust. It highlights the complexity of this evolving system and the variety of factors that determine its credibility and effectiveness.

Broader concerns and stakeholder perceptions (p. 35)

This section examines how perceptions of fairness, credibility, and integrity shape attitudes toward book and claim. It reviews the main sources of scepticism, from fears of overstated sustainability benefits to concerns about unequal access and diluted climate action, and how these views influence broader acceptance of the system.

Book and claim's potential benefits (pp. 29-31)

By decoupling attributes from physical delivery, book and claim expands access to low-emission alternatives and reduces cost burdens on operators. Demand aggregation strengthens investment signals, while assured registries enhance trust. The section outlines how these advantages support scaling and promote more equitable access across regions and actors.

Mode-specific decarbonisation challenges

Corporate-driven book and claim development greatly varies between transport modes. Its future implementation for each will depend on governance, fragmentation and complexity of supply chains, and availability of solutions to decarbonise.

Aviation

Aviation is a leading adopter of book and claim in transport. It was among the first industries to adopt the approach, and its characteristics, such as common refuelling infrastructure and rising demand, make it well-suited to the model.

Air transport is the most carbon-intensive mode per unit of cargo or passenger. With few technological alternatives, the primary pathway is the deployment of SAF, as options like hydrogen or electric propulsion remain years away from large-scale commercialisation [18]. By contrast, SAF can be blended with conventional jet fuel today without requiring modifications to infrastructure or aircraft. As such, existing policies focus on increasing SAF via various methods.

Physically transporting SAF to match geographic demand would create significant GHG emissions; however, injecting SAF at the nearest airport while others pay the sustainable premium (book and claim) is not yet widely accepted by standard setters and some policymakers. Voluntary standard setting bodies are assessing chain of custody models. Groups such as SBTi recognised their decarbonisation potential in aviation relatively early [19]. The sector's net-zero 2050 target, selected customer segments willing to share the price premium, and numerous fuel registries together create favourable conditions for book and claim to potentially play a central role in aviation's energy transition.

Maritime

Compared to aviation, maritime transport is far less carbon-intensive per unit of cargo transported. This relative advantage is weakened by the persistence of legacy assets and continued reliance on heavy fuel oil (HFO) and marine gas oil (MGO). Although newer vessels are technically capable of running on biofuels, methanol, ammonia, and emerging e-fuels, these alternatives are yet to be adopted at scale [20].

The International Maritime Organisation's (IMO) 2023 shift to well-to-wake emissions accounting supported progress on sector-wide standardisation and GHG emissions accounting [21]. However, the complex policy environment, which combines the IMO's Net-Zero Framework (NZF) with the EU's regulatory mandates, creates challenges for voluntary book and claim, even though these frameworks leverage chain of custody flexibility in compliance.

Designing a maritime book and claim system is inherently more complex than designing one for aviation. Operations use a wide range of fuel types (predominantly HFO) and vessel types, with long voyages, covering multiple ports, with complex cargo ownership. These factors make precise reporting and strong tracking and tracing systems indispensable. While the sector currently operates fewer registries than aviation, new systems are being developed with these complexities in mind and tailored to maritime needs.

Road

Decarbonising road freight is both essential and complex. The sector produces the largest share of transport emissions [22], yet infrastructure is fragmented, and access to low-emission alternatives remains uneven. Electric trucks are gradually entering fleets, while HVO biofuels are implemented as a conventional fuel alternative.

Unlike other modes, road freight lacks a unifying global governance body. Instead, it operates regionally, under a patchwork of incentives and mandates. National governments impose biofuel blending requirements, cities introduce low-emission zones, and mandates for electric vehicles are increasing. While these measures are critical, they can increase the complexity of voluntary book and claim.

Further obstacles include EV availability and cost, inconsistent accounting practices, diverse data issues, and the so-called "gas station problem" [23], which refers to the difficulty of tracing fuel attributes once batches are delivered, blended, or sold through fuel stations. This issue exists in any mode of transport, but it is especially present in road book and claim.

Several road-specific registries are emerging, but in the near term, voluntary systems are likely to be constrained more by reporting capabilities than by registry design. Many smaller carriers lack the infrastructure for regular emissions reporting.

Limitations of current solutions for clean energy supply

While multiple low-emission energy pathways are emerging, each faces cost, scalability, or infrastructure barriers that limit near-term deployment.

Biofuels: most mature but feedstock-limited

Biofuels, particularly advanced biofuels, such as HVO or SAF, are the most mature substitutes today with the lowest carbon intensity. They can be blended with conventional fuels and used in existing engines, making them a practical near-term option across aviation, shipping, and road freight. Still, feedstock availability constrains growth, with clustered production and questions of sustainability and land use competition limiting global scalability [24]. Book and claim may be able to partly mitigate these constraints by extending access to regions and operators beyond existing production hubs.

Electricity: rapid growth with limited reach

While electrification is advancing in road passenger and freight transport, its applicability remains limited in the aviation and maritime sectors. The deployment of battery electric trucks for long-haul transport has been particularly slow within road transport, hindered by timelines for fleet turnover, limited charging infrastructure and necessary grid upgrades [25]. Furthermore, grid constraints and the cost of expanding renewable energy generation create additional obstacles in less developed regions [26]. Book and claim could potentially build on existing RECs to credibly account for charging emissions, but its real potential lies in extending this approach beyond Scope 2 to the more complex Scope 3 value chains where charging is indirect and dispersed.

Hydrogen and e-fuels: long-term but costly

Synthetic e-fuels and hydrogen appear promising but are constrained by cost, infrastructure, and efficiency. Hydrogen could advance low-emission aviation, shipping and trucking, but supply chains are immature, and energy losses in production, storage, and transport remain high. E-fuels may serve as drop-in solutions for aviation, though their large-scale use depends on inexpensive renewable power, carbon capture and financial certainty, none of which is guaranteed. These factors make both options unlikely to contribute to short-term transport decarbonisation, especially in developing regions [27]. Book and claim may help build early market confidence, narrowing the gap between high costs and scattered demand.

Green methanol and ammonia: promising despite infrastructure gaps

Alternative fuels are gaining popularity in maritime transport, with major shipping lines placing early orders for methanol-based vessels. However, global production remains minimal and is largely concentrated in Western Europe, Asia-Pacific, the US, and a few pilot sites elsewhere. Both fuels require new bunkering infrastructure, face unresolved safety concerns, and depend on abundant renewable electricity for synthesis, which limits their near-term availability globally [28]. With book and claim, demand signals may support early investment and accelerate scaling in the absence of physical supply.



Managing competing demands for clean energy

Global scarcity highlights the need to prioritise low-emission energy sources by their highest climate impact.

The energy transition depends on a limited pool of clean energy resources, from advanced biofuels to hydrogen and synthetic fuels. Their production remains limited, and their emissions performance varies considerably across modes and sectors. Without careful allocation, these resources risk being directed into applications where cheaper or more efficient alternatives already exist, diverting them away from the places where they are indispensable [29].

This creates challenges both in terms of efficiency and fairness. Misallocation can lock in suboptimal pathways and raise system costs, while high-income regions or certain transport services may secure supply at the expense of others. A merit-order approach – steering scarce fuels towards the uses that deliver the greatest emissions savings – is increasingly recognised as essential for an effective and equitable transition.

Book and claim operates within this context. Decoupling attributes from physical supply could enable buyers to support optimal energy use, even when they cannot access the energy source directly. However, without clear guidance, this mechanism could also reinforce misallocation, channelling scarce fuels into uses with less favourable marginal abatement costs, cannibalising the resource from its use in sectors without alternatives, and, ultimately, diluting overall climate impact.

This figure shows the merit order for the use of key resources and low-emission technologies to replace their fossil counterparts. See the full publication for methodology.

Aviation: Decarbonisation relies almost entirely on liquid fuels; scarce biofuels and synthetic kerosene rank high in the merit order, given the lack of alternatives.

Maritime: Long-distance shipping also depends on energy-dense fuels; biofuels, ammonia and synthetic methanol are valuable options where electrification is not practical.

Road freight (trucks): Direct electrification offers a more cost-effective decarbonisation pathway; due to alternatives, allocating biofuels or hydrogen here is less effective than in other applications.

Interaction across modes: Using scarce fuels in trucks could crowd out their availability for aviation or shipping, where they are indispensable.

Further reading: ITF report [“Managing Competing Sectoral Demands for Energy Resources”](#).

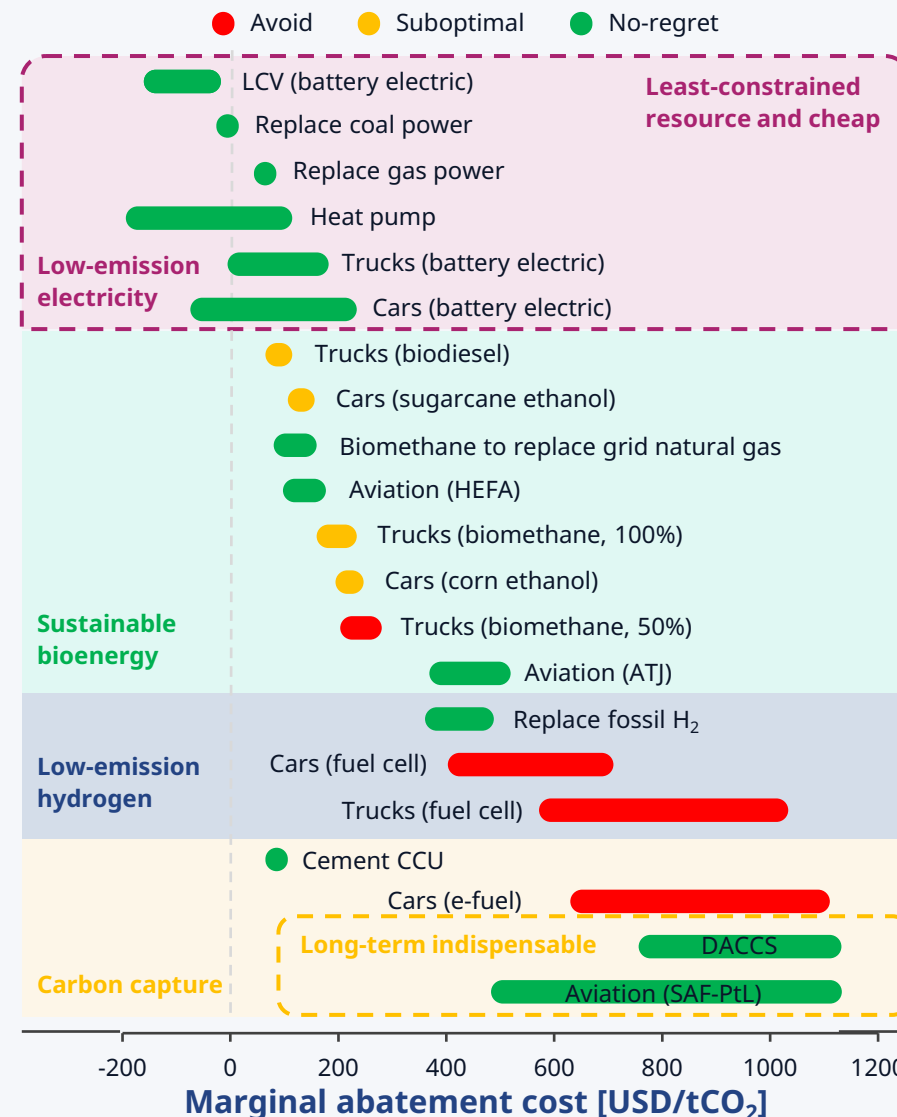


Figure credit: adapted from ITF [29]

Book and claim's potential benefits vs. risks and limitations

Book and claim could potentially support faster decarbonisation – but only if challenges of trust, consistency, and recognition are effectively addressed. Some of these aspects are explained in more detail in the following sections.

Geographical and logistical access

Book and claim decouples decarbonised transport from physical delivery, granting access to environmental attributes even in locations without low-emission fuel supply. This widens participation across regions and modes, avoiding the costly duplication of physical supply chains.

Cost efficiency and market scale-up

By pooling demand within a specific sector and across geographies, book and claim spreads the green premium among more buyers, reducing the burden on individual operators. It also gives producers stronger investment signals, encouraging scale-up where production is most favourable.

System fragmentation and inconsistency

Multiple registries and definitions are emerging in parallel, raising challenges with interoperability. Harmonised standards and mutual recognition are needed to prevent confusion and ensure the credibility of the associated environmental attributes.

Additionality and voluntary decarbonisation credibility

Ensuring additionality is common practice in voluntary book and claim, yet what is considered additional varies according to its definition, the policy frameworks in place, and even users' understanding, creating fragmentation and confusion.

Common trust in emission claims

Well-designed registries with impartial third-party oversight enhance the transparency and comparability of claims. By consolidating into verified and harmonised chain of custody practices, book and claim can actively improve confidence in emission reporting.

Inclusive value chain participation

Book and claim frameworks allow multiple roles (suppliers, carriers, freight forwarders, corporate buyers) to engage and claim in line with Scope 1 and Scope 3 reporting standards guidance. This inclusivity encourages shared responsibility across logistics chains.

Integrity risks and erroneous double counting

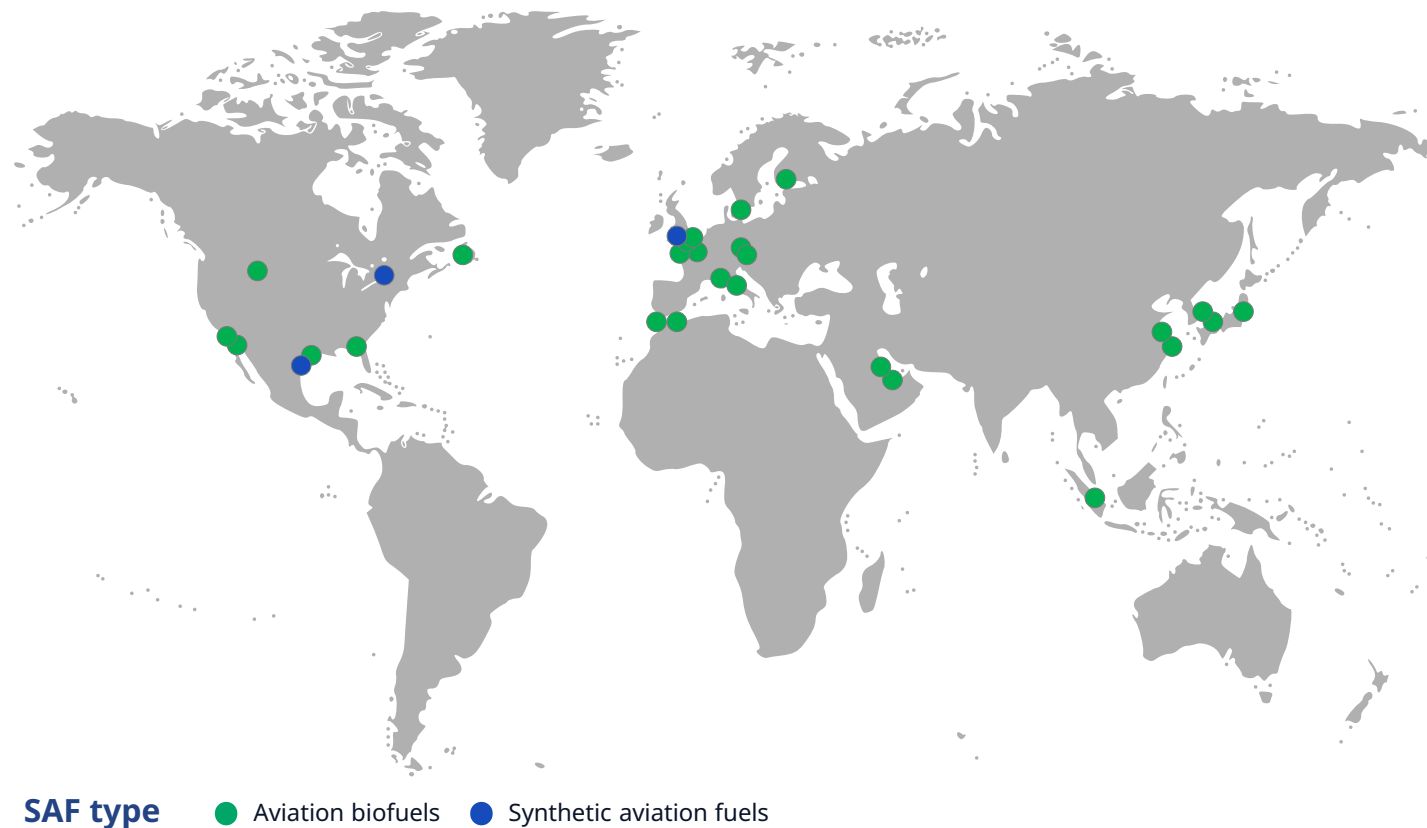
Without rigorous governance, the same environmental attribute could be erroneously claimed more than once. Establishing robust rules for the issuance, transfer, and retirement of certificates is essential to preserving the model's integrity.

Limited recognition in regulation and reporting

Given the nascent status of book and claim in transport, none of the regulatory and reporting frameworks fully acknowledge it yet. This limits uptake in voluntary markets and constrains its ability to deliver systemic change at scale.



Distribution of SAF projects



The map displays the locations of operational SAF plants as of 31 December 2024, including full-scale production and pilots [32]. This clearly demonstrates the uneven distribution of SAF availability globally. According to ICAO, there are currently 175 airports worldwide that use SAF, with a concentration largely in the US and Europe [33].

Geographical and logistical access

Book and claim enables operators to claim low-emission fuel use even where physical supply chains do not exist.

Low-emission fuel production remains heavily concentrated in advanced economies, limiting access for large segments of the transport sector. SAF is available at only a handful of airports in North America and Europe. Maritime biofuel bunkering has occurred in around 60 ports since 2015, predominantly within Europe and East Asia [30]. Meanwhile, in road freight, renewable diesel and biodiesel (notably HVO) are increasingly used in Europe and the US West Coast, yet distribution remains tied to a few production hubs [31]. This concentration reflects both the uneven availability of sustainable feedstocks and the large capital investments and policy support required to make production viable.

Logistical challenges further exacerbate these disparities. Delivering low-emission fuels across distant regions requires specialised storage, blending facilities, and complex transportation. For emerging markets and developing economies with particularly weak fuel distribution networks, these constraints are especially acute.

By separating the low-emission attributes from their physical manifestation, book and claim helps ensure that underserved regions can access and support limited global supplies of low-emission products, and vice versa: underdeveloped regions can become suppliers to high-demand geographies. Such flexibility supports equitable access and more inclusive participation.

Market efficiency and scale-up

Book and claim could concentrate production where it is most efficient while widening market access.

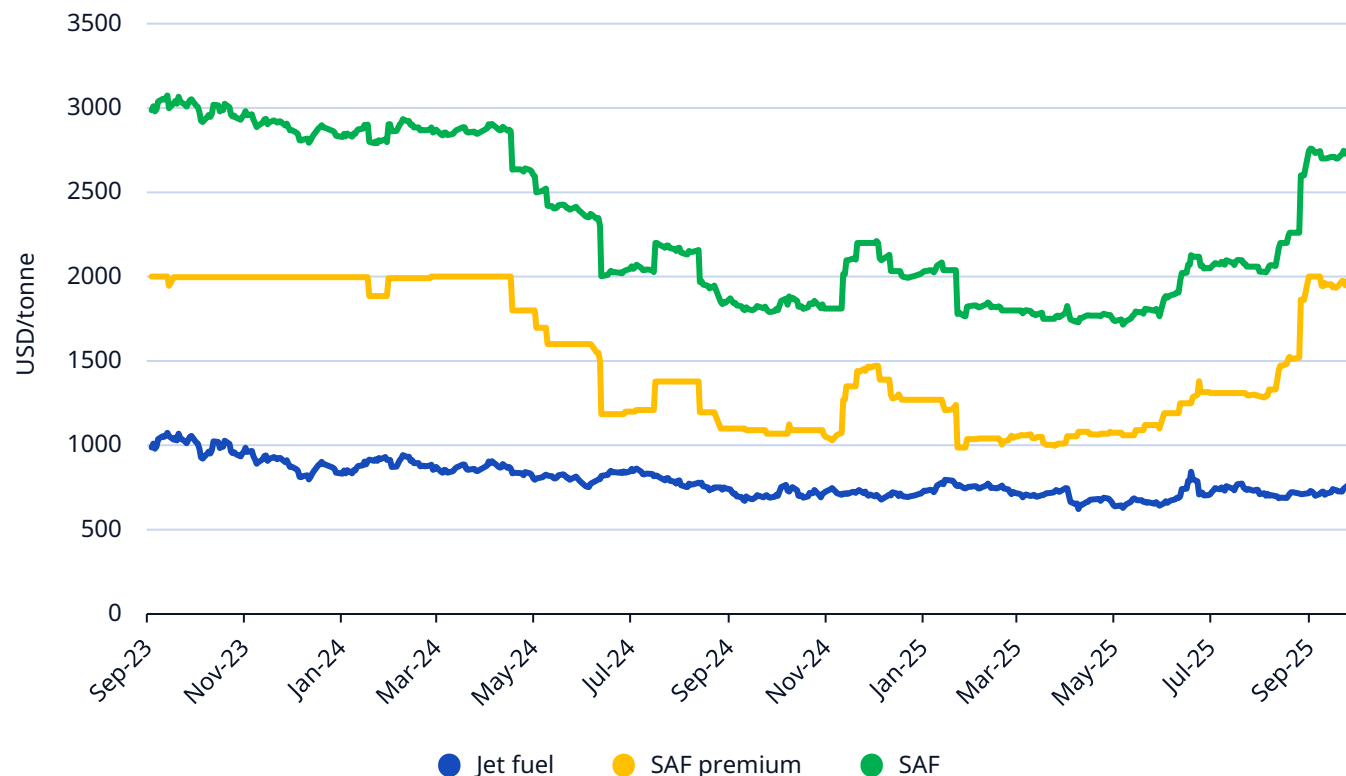
This section situates book and claim within the current market context of sustainable fuels and does not imply a direct influence on fuel price formation.

Book and claim systems improve procurement efficiency by aggregating demand within a selected sector and across geographies, allowing low-emission fuels to be accessed without requiring physical delivery to every point of consumption. This aggregation enables the cost premium of low-emission fuels to be distributed among a wider base of buyers and reduces barriers to participation in regions with limited infrastructure or connectivity.

By decoupling production from consumption, book and claim avoids costly duplication of infrastructure and reduces inefficiencies linked to long-distance distribution. More predictable aggregated demand can support investment certainty and production scale-up where conditions are most favourable, such as regions with abundant feedstocks or renewable energy.

All else being equal, book and claim can help ease logistics-related cost requirements within overall fuel supply costs, while broader supply conditions, policy design, and external factors (e.g., geopolitics) remain the primary drivers of sustainable fuel pricing.

Overview of jet fuel and SAF prices in Northwest Europe, including price premium



A snapshot in time [34]: the graph shows the price evolution of conventional jet fuel compared with SAF in Northwest Europe (Belgium, France, Germany, the Netherlands, and the United Kingdom). SAF prices have fluctuated over the past few years, as a surge in obligated demand in late 2025 amid a tight supply landscape caused a spike in the SAF premium over jet fuel. However, increasing production capacity in Europe and China suggests that price levels could ease thereafter.

Common trust in emission claims

Well-governed book and claim systems can turn fragmented reporting into transparent, verifiable emission claims.

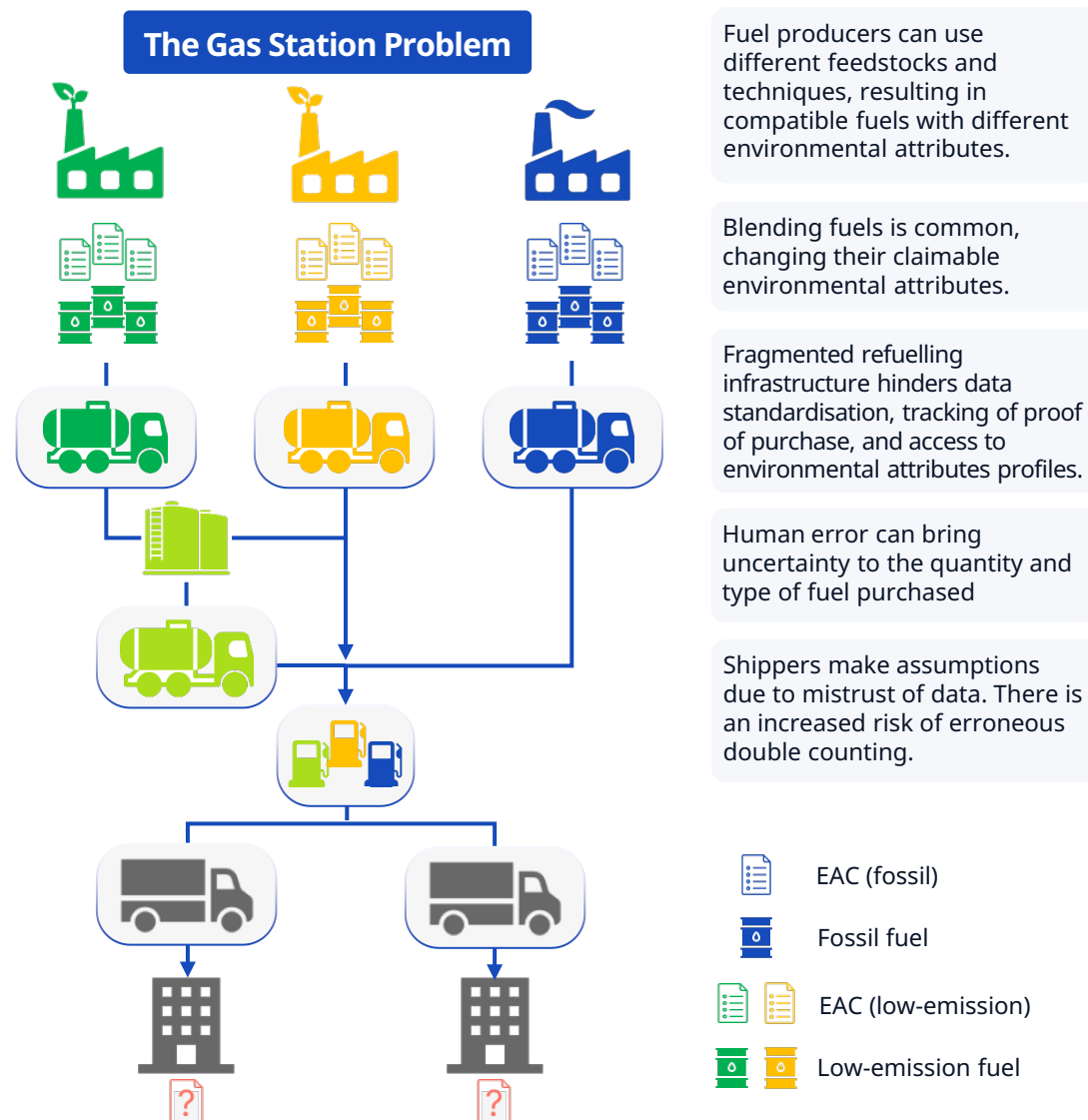
In traditional supply chains, low-emission fuel claims are often limited to specific hubs, where each might rely on unique reporting practices due to local legislation or other factors. Taken in isolation, these systems may function adequately, but once compared across hubs, the lack of alignment makes verification fragmented and inconsistent.

A well-governed book and claim system, in contrast, centralises the issuance, tracking, and retirement of attributes, creating a transparent chain that improves assurance for buyers, regulators, and the public. Global Maritime Forum notes that this model can offer greater clarity than current fuel reporting practices, which are prone to duplication and opacity [35]. Book and claim registries, such as the Roundtable of Sustainable Biomaterials (RSB) Book & Claim Registry, also offer public retirement ledgers to increase transparency and trust. Open information about retirements is essential for registry users to avoid erroneous double counting issues and back their claims against greenwashing accusations.

For road transport, book and claim can enhance data transmission along the fuel

supply chain, addressing traceability challenges that emerge once fuel has been delivered to gas stations. This set of challenges, which the BCC referred to as the “gas station problem”, hinders accurate PoS documentation and other relevant fuel attribute transfer from producers to end users. The Community’s road group identifies several contributing factors, including feedstock variability, the presence of multiple fuel brands offering similar products, and the risk of human error leading to physical misfuelling and incorrect certificate allocation [23]. Road’s fragmented fuelling infrastructure, numerous small carriers, and insufficient labelling requirements further complicate data standardisation and reporting.

Such attribute data verification issues are common across modes. Digitalised book and claim systems can help address these issues by ensuring the reliable transmission of attributes along the supply chain. Registries also play a central role in this process by standardising data for stakeholders. Thus, carriers and shippers can access consistent information, which is fundamental for transparent and verifiable reporting.



System fragmentation and inconsistency

Voluntary book and claim is evolving through a patchwork of players and frameworks that hinders coherence.

Regulatory use of book and claim has been limited. However, the rapid emergence of voluntary book and claim initiatives requires navigation through a fragmented landscape. Different regions, sectors, and actors are advancing at varying speeds and with distinct approaches, resulting in a patchwork of systems that can be difficult to compare or connect. This diversity reflects strong momentum, but it also creates uncertainty for users who operate across multiple modes and markets.

Such fragmentation poses risks not only for consistency in reporting but also for the credibility of claims. Without greater alignment, overlapping initiatives and competing frameworks may dilute trust, discourage investment, and slow down adoption at scale. Developing pathways towards convergence will therefore be essential to increase the likelihood that book and claim can deliver impact as a coherent global mechanism.

Divergent definitions

Basic terms such as “low-emission,” “sustainable,” or “additional” can be interpreted differently across schemes. In aviation, SAF may include a broad range of feedstocks, whereas in shipping, definitions often vary regarding which biofuels qualify. These differences create confusion for buyers and complicate disclosure in corporate reporting. Inconsistent terms also increase the risk that stakeholders do not fully understand one another when describing the same activity, complicating co-operation, hindering deal flow, and eroding trust in reported outcomes.

Multiple registry procedures

A growing number of book and claim registries are being piloted across aviation, maritime, and road freight. While this demonstrates investment and innovation, some registries apply their own procedures for issuing, transferring, and retiring certificates. For companies active in multimodal supply chains, this often means juggling several systems in parallel. The lack of a common framework reduces efficiency and creates uncertainty over whether claims from different registries can be compared or aggregated. Investing in alignment and convergence delivers meaningful value.

Transport mode silos

Each mode advances independently, with aviation shaped by international schemes and airline initiatives, maritime by IMO processes and private pilot projects, and road freight mainly driven through corporate buyers, logistics platforms, and industry coalitions. This siloed development risks locking in incompatible systems. Companies operating across several modes must adapt to different requirements, multiplying costs and administrative burdens. Limited cross-modal co-ordination prevents synergies from shared standards and governance.

Lack of interoperability

Even within sectors, registries and platforms rarely connect to each other. Without mutual recognition, the same unit might risk being claimed more than once, or conversely, may not be recognised outside its original registry. This undermines the integrity of the system and creates extra work for buyers who need to track and reconcile claims across multiple registries and engage verifiers who must assess unique system requirements. Interoperability is therefore not just a technical issue but a prerequisite for credibility and scalability.

Unique regional policies

Regions are advancing low-emission policies at varying speeds and in diverse contexts. The EU is developing robust standards and blending mandates; North America emphasises tax credits and voluntary markets, and Asia is experimenting with regional pilots. For companies with international supply chains, this patchwork means that approaches to voluntary emission claims recognised in one jurisdiction may not be consistent with those in another. Such divergence can appear to limit the credibility of book and claim as a global solution and slow down its uptake.

Limited harmonisation

Several initiatives are now addressing these gaps. ISO is developing standards on chain of custody models, while BCC has emerged as a key actor for convergence. ICAO has introduced eligibility criteria for SAF within the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) Eligibility Framework, which could serve as a template for other modes [36]. However, these efforts are still fragmented and voluntary. Without stronger co-ordination, book and claim risks to remain a collection of pilots instead of becoming a coherent mechanism that can underpin long-term investment.

Integrity risks and erroneous double counting

Robust traceability and accounting are essential to preserve trust and avoid fraud. Without strict safeguards, the same unit of a low-emission solution can be issued, used, or claimed more than once, undermining both climate impact and market credibility.

Double issuance

Double issuance occurs when more than one certificate is created for the same unit of low-emission fuel. This problem generally arises during the registration (booking) stage, when attributes are first converted into tradable EACs [37]. While this could be intentional and fraudulent, it can also unintentionally occur when registries are fragmented and not interoperable, or when multiple certification bodies assess attributes without proper co-ordination.

For instance, if a producer erroneously registers a single batch of SAF under two different certification schemes, or submits the same delivery to multiple registries, this may result in duplicate EACs downstream. A similar error can also occur within a single registry if the same batch of fuel is uploaded twice due to human or technical error, resulting in two certificates being generated for a single delivery.

The result is that two buyers could each purchase what they believe are unique certificates, when in reality, both are tied to the same underlying fuel.

This is one of the most fundamental risks in any book and claim system because it artificially inflates the available supply of environmental attributes and creates the illusion of greater decarbonisation progress than actually achieved.

Double use

Double use occurs when the same batch of fuel is used twice, for example, in two separate use cases or registries. Unlike double issuance, where duplicate EACs are created at the start, here, a single underlying fuel batch is applied twice across different systems, effectively reusing it. This problem often arises at the system integration or transfer stage, when batches or attributes are moved between registries [13].

An example is when a carrier tracks a single batch of SAF in one registry then also uses the EAC on another route. Or they enter the EAC into another registry that does not co-ordinate with the former, allowing double use of the fuel attributes.

Moreover, a batch of fuel could already be linked to EACs in one system and later get transferred into another platform without being cancelled in the first, enabling one issuance to underpin two separate sets of low emission transport claims.

Lastly, a company might mistakenly rebook a batch of fuel or the profile of logistics services that has already been registered and consumed or procured, effectively making these low-emission attributes appear available a second time.

The outcome is that the same underlying decarbonisation benefit is used more than once, increasing the likelihood that downstream actors make multiple claims from a single physical action.

Double claiming

Erroneous double claiming focuses on the end users, specifically when two or more actors assert ownership of the same GHG emission profile. This happens at the claiming stage, when actors report the low-emission profile of fuels and services in inventories or sustainability disclosures [13, 38]. Unlike issuance or use, which are rather technical problems, double claiming is an attribution problem and often occurs due to complex downstream data and reporting.

A common example is when two different corporate buyers, two shipping clients, for instance, each report the same SAF certificate as if the SAF-based, low-emission flight was exclusively tied to their cargo. With complex B2B reporting, both may be looking at a number provided by a shared carrier, one unknowingly applying the wrong data.

Another form occurs when a company presents a voluntary claim while the same mitigation is already counted within a regulatory compliance programme.

Double claiming can also occur across levels of governance, such as when a carrier reports a low-emission product in its Scope 1 inventory in a different host country from where the fuel was supplied, potentially leading both countries to count the same low-emission product towards a national emissions reduction target.

Additionality and voluntary decarbonisation credibility

Consensus on additionality is currently limited to transparency. All parties must clearly communicate how policy interacts with voluntary action. Limited consensus stems from the absence of a single definition, which affects comparability and credibility. Nevertheless, practitioners generally align around common practice in implementation, in particular for regulatory additionality.

The interaction between regulatory and voluntary decarbonisation adds complexity to the use of book and claim. A policymaker may leverage book and claim in a regulatory context. A corporate might use it as a voluntary measure. Voluntary practitioners put great importance on the concept of "additionality", which conveys the notion that procurement further bends the decarbonisation curve.

While voluntary system providers and users have implemented multiple definitions, a common minimum practice has coalesced around an assessment that the voluntary implementation of low-emission fuels and services goes beyond what is required by regulation. This practice can be explained by the relative ease of implementing such a test compared to other definitions, for example, whether the low-emission fuel or service would have occurred without the voluntary investment, which is more difficult to assess. Following regulatory additionality, for example, a carrier's use of a low-emission fuel derived from a fuel producer's compliance with a fuel-blending mandate would not be considered additional because the fuel provider was obligated to produce it.

The BCC's author consortium recognises the common practice of implementing a regulatory additionality assessment in its publication *Principles and Best Practices for Book and Claim Systems in Heavy Transport* [13] while noting the broader conversation, encouraging system operators and developers to

ensure and support additionality assessments generally, and noting that agreement between parties is fundamental. System providers or individual corporates may have a higher bar for what enters their registry, for example, or what they require from attribute providers.

The dynamic and often case-specific nature of additionality presents a barrier to the implementation of book and claim. It underlines the need for greater compatibility between system providers and calls for clarity in local, national and regional policy. The term is used primarily in the voluntary market, as flexible chains of custody applied for regulatory purposes do not require additionality tests – superfluous and incongruent with the use case of a mandate, which fundamentally represents the decarbonisation curve itself.

Registry provider RSB adds one helpful concept in its broad treatment of additionality, noting that the capacity of increased demand for low-emission fuels unlocked by book and claim should result in increased production and, consequently, increased fossil fuel displacement, GHG emissions reductions and a positive impact on climate change [37]. In a 2025 revision to its *Book & Claim Manual*, RSB places greater emphasis on transparency.

To work towards consensus on individual policies in maritime freight, Global Maritime Forum and the Mærsk Mc-Kinney

Møller Center for Zero Carbon Shipping (MMMCZCS) invited four system providers to co-author a paper on additionality for the European Union Emissions Trading System (EU ETS), FuelEU Maritime, and the IMO's Carbon Intensity Indicator (CII) regulations [35]. The paper concludes that only volumes not used towards regulatory compliance can be considered additional for voluntary claims. This publication marked an important milestone in demonstrating external consensus among key bodies, and the exercise is ongoing in the BCC for other modes.

Clarity among system providers and clarity within policy are essential. The possibility that the same low-emission fuel or service could be used to claim both regulatory compliance and voluntary decarbonisation risks undermining the credibility of book and claim. A rigorous and transparent approach to tracking, tracing, and accounting that distinguishes fuels and services used for compliance from those applied to voluntary efforts can help mitigate concerns about greenwashing.

Furthermore, policymakers recognising that the voluntary market aims to uphold strong impact integrity can help ease concerns. Ensuring that policy is written and implemented such that users can make clear distinctions will enable the voluntary market to uptake low-emission fuels and services beyond the aspirations of policy. In turn, this can reinforce decarbonisation and create a positive feedback for regulators seeking to advance ambition.

Fundamental concerns associated with book and claim

Beyond the technical and administrative barriers, book and claim faces a layer of scepticism rooted in perceptions of integrity, fairness, and environmental ambition. These concerns are often voiced by stakeholders who fear that reliance on certificates to achieve decarbonisation targets could mask inaction or dilute pressure for more fundamental changes.

Contradiction with environmental principles

Some experts argue that decoupling certificates from physical fuel use undermines the principle of direct causality in environmental assessment. They fear that book and claim reduces climate action to an accounting exercise rather than real-world decarbonisation.

Risk of delaying structural change

Critics worry that book and claim provides a convenient way for companies to postpone difficult operational or business model changes, relying on certificates instead of reducing activity levels, switching modes, redesigning logistics chains, or scaling up low-emission fuel production globally. This may potentially lock in carbon-intensive practices under a “green” label.

Association with offsetting and greenwashing

For some, book and claim resembles carbon offsets: attractive on paper but vulnerable to accusations that companies are purchasing reputational benefits without real or additional impact. This concern is heightened when additionality is hard to prove, when certificates come from existing mandated fuel use, or when attributes are not sufficiently similar or associated with their underlying activity.

Confusion and mistrust among smaller actors

Some smaller companies express unease with abstract certificate systems. Without the capacity to scrutinise registries, they may default to contractual clauses requiring physical fuel use, or distrust book and claim altogether. This reflects not only knowledge gaps but also a preference for tangible evidence of decarbonisation.

Equity and fairness concerns

As highlighted in stakeholder discussions, there is unease that book and claim could exacerbate inequities. High-income markets may dominate certificate purchases, while benefits (fuel deployment, investment) flow to regions with lower production costs. At worst, this could marginalise Least Developed Countries or Small Island Developing States in the transition if they are priced out of scarce fuel access.

Emissions lock-in and missed investment

There is a common argument that under book and claim, emissions remain locked in within the “losing” geography, while the system further rewards and enforces the “winning” geography where the fuel is produced and the investment is received. Virtual purchase and claim of EACs in the electric

transport sector, for example, still does not change the reality of the particulate matter emissions in the geography of the claimant, even with a robust book and claim system, and the capital flows remain distant too.

Misallocation of scarce sustainable fuels

As the International Transport Forum (ITF) report on managing competing demands for clean energy notes, scarce biofuels and e-fuels should be prioritised for hard-to-abate modes such as aviation and shipping [29]. Stakeholders worry that book and claim, if left unrestricted, could channel scarce resources towards modes that have cheaper alternatives (such as road freight), thereby undermining overall system efficiency and slowing global progress.

These perspectives underscore that book and claim is not only a technical construct but also a social and political one. Even if governance safeguards address the risks of erroneous double counting or lack of additionality, scepticism will persist unless the system is seen as complementary to, rather than a substitute for, direct decarbonisation. Understanding and engaging with these concerns is essential to building the trust and acceptance needed for book and claim to fulfil its intended role.

Chapter 3: Case studies on book and claim

A look at how book and claim is being implemented in the transport sector, with case studies that highlight real-world practices and developments.



Chapter content

Customer integration

(pp. 39-41)

Book and claim systems depend on education, transparency, and verified solutions to build trust. LSPs and carriers enable adoption by integrating these mechanisms into services and supply chains. This section presents three case studies of customer integration: Airbus, DHL Group, and Gruber Logistics.

Co-ordination and engagement platforms

(pp. 47-48)

Voluntary book and claim depends on stakeholder dialogue to align methods and principles, but consensus on key issues like additionality and reporting is still lacking. Neutral platforms such as the BCC and entities like SFC, Global Maritime Forum, and RSB remain vital for co-ordination, balanced discussions, and building credibility and will be studied in this section.

Corporate coalition and market signal creation

(pp. 42-44)

Strong market signals through demand aggregation, certificate trading, buyers alliances, and regulation can build confidence for scaling low-emission solutions. This section takes a closer look at buyers alliances, given their centralised structure and essential role in book and claim. There are three case studies: SABA, ZEMBA, and GMA Trucking.

Registry infrastructure

(pp. 49-51)

Registries are crucial for the credibility of book and claim, facilitating transparent certificate management, traceability, auditing, and accountability while preventing erroneous double counting and fraud. As the system evolves, registries become more robust and interoperable. This section details case studies on Katalist, Avelia, and SAFc Registry.

Schemes and standards

(pp. 45-46)

Book and claim requires clear definitions, standards, and best practices to ensure consistency and credibility. International organisations like IATA, ISO, and SFC provide frameworks, guidance, and standards. This section explores case studies on the work conducted by these stakeholders.

Non-transport sectors

(p. 52)

Book and claim systems have been developed in different sectors with heterogeneous outcomes, offering insights for transport. Palm oil pioneered the model to support smaller producers; electricity highlighted risks such as weak investment incentives and erroneous double counting; and gas demonstrated how credible certificate systems can achieve regulatory acceptance.

From theory to practice

Learning by doing – how the transport sector implements book and claim while waiting for regulation and standardisation.

In a sector defined by complexity, book and claim has emerged as a potential, flexible mechanism to support transport decarbonisation. This chain of custody model allows diverse stakeholders, from corporates to carriers to fuel producers, to connect low-emission practices via traceable systems. However, book and claim's implementation varies considerably within the sector.

The community is growing, and the current landscape reflects cautious optimism: infrastructure is forming, and best practices are being defined, even while formal recognition is likely years away. With climate goals pressing, the transport industry has opted for practical implementation while awaiting approval from standard holders and regulators. Efforts to standardise terminology, units, and the role of digital registries may increase uptake and trust in the model. Collaboration, transparency, and consistency are essential.

The following case studies explore the book and claim methodology while highlighting the work of key stakeholders. The present chapter is a snapshot in time, capturing where learnings, feedback, and forward motion must combine to accelerate scalable decarbonisation across the transport value chain.

Customer integration

Depending on their position in the book and claim ecosystem, transport companies can facilitate book and claim for customers and integrate the practice into their corporate logistics and supply chains.

Customer integration plays a critical role in bridging the knowledge gap between transport service providers and their clients, while also facilitating access to book and claim systems. This can be achieved through the development and dissemination of educational material, the procurement of book and claim solutions from third-party providers, and the incorporation of book and claim mechanisms into the decarbonisation services offered to customers.

Knowledge sharing

Effective knowledge sharing is fundamental for stakeholders to understand the opportunities and risks that the implementation of book and claim could have. Given that book and claim relies heavily on trust, transparency, and standardisation, customer confidence depends on clear communication regarding how the system works, the sustainability criteria applied, and the safeguards and third-party assurances in place. Raising awareness through targeted education and transparent dialogue is essential to building the trust required, particularly as the ecosystem remains in its early stages of adoption.

Purchasing book and claim solutions

Cargo owners are the primary clients for book and claim procurement. In this context, logistics companies can serve as intermediaries between solution providers and the end user. By procuring book and claim solutions on behalf of customers, they not only streamline access but also facilitate knowledge transfer and aggregate demand. Collaborating with verified third-party suppliers ensures compliance with international sustainability standards and enhances the ecosystem's overall credibility.

Offering book and claim solutions

Carriers and LSPs can directly integrate book and claim into logistics service offerings by providing low-emission transport services backed by low-emission fuels or attribute certificates. These certificates can be sourced through external registries, allowing companies to compete and exchange verified environmental attributes. Alternatively, fuel producers or carriers may develop proprietary registries to manage and redistribute attributes among their customers. While the latter requires greater investment and the development of in-house knowledge, it provides a tailored solution that ensures customers have access to unique environmental claims.



Examples of customer integration practices

Airbus

Airbus SAF Knowledge Centre delivers intelligence, context, and a consistent SAF narrative, which is then directly applied, tested, and validated. Under the initiative Book and Claim Demonstrator, Airbus tests book and claim mechanisms as a potential path to increase SAF use while proposing improvements to these mechanisms.

In addition, Airbus acts as a facilitator by purchasing SAF certificates and managing the associated environmental attributes through the RSB registry for a group of companies that confirmed their interest in joining this initiative [39]. With these programmes, Airbus aims to:

1. Gather market intelligence and specific book and claim requirements from the ecosystem and Airbus' customers.
2. Contribute to developing a robust, transparent and easy-to-use book and claim solution, supporting specific use cases.
3. Onboard and guide customers in testing and including the flow of SAF environmental attributes in their offering.
4. Demonstrate the industry's willingness to use book and claim mechanisms and advocate for broader recognition of this solution on the market.

Further reading: [Airbus book and claim press release](#).

DHL Group

DHL acts both as a carrier and a freight forwarder (LSP). This allows it to purchase book and claim solutions from other transport companies and offer its own solutions. The GoGreen Plus products cover a wide range of low-emission alternatives, most often enabled by book and claim, for all DHL's core products and services. As of mid-2025, more than half a million customers have purchased GoGreen Plus [40]. The standard customer journey is as follows:

1. Use of sustainable fuels, physically or market-based.
2. Customers decide on the share of transport they want to be low-emission.
3. DHL provides customers with a quote and explains book and claim before ordering.
4. Customers adhere to GoGreen Plus, having the possibility to purchase a pilot or go all in, depending on product maturity across DHL business units and transport modes.
5. DHL implements, orders and allocates low-emission fuels to customer shipments.
6. Finally, independent auditors check adherence to sustainability criteria, inventory management and allocation to customer shipments.

Further reading: [Book and claim explained](#); [Case studies](#); [Knowledge Hub](#); [Sustainable portfolio](#).

Gruber Logistics

As a road freight forwarder and carrier, Gruber Logistics identified the book and claim system as an effective mechanism to support the deployment of low-emission solutions and enhance attribute traceability across fragmented road transport operations.

The company developed its own proprietary registry to provide book and claim solutions to its customers. This in-house system enables Gruber Logistics to apply internal sustainability criteria, aligned with the EU Renewable Energy Directive (RED) III, with underlying accounting produced by its Smart Freight Centre (SFC) GLEC-certified tool [41], to assess fuel types and ensure robust documentation practices. As a result, fuel provider claims can be verified and translated into fuel-specific attributes with greater transparency and reliability. Gruber Logistics undergoes verification by an external provider of the fuel quantities purchased and used by the company to ensure supply chain traceability.

Customer demand for alternative fuels is increasing. Gruber Logistics reports that approximately 10 000 tonnes of CO₂e emissions have been avoided through the use of alternative fuels, with 80% directly attributable to the company's efforts. Clients seeking to verify their emissions and avoid erroneous double counting are increasingly recognising the value of traceable, transparent book and claim systems in meeting their climate objectives [42].

Further reading: [Certification statement](#); [Sustainability report](#).

Further development around customer-facing value

Stakeholders face several barriers to ensure a wider customer integration with book and claim solutions. These barriers can guide further developments to increase customer-facing value.

Customer demand for low-emission transport services is increasing across regions and industries. This demand creates an opportunity for carriers to provide solutions, enabled by book and claim, to address these decarbonisation needs. However, despite its potential, book and claim remains at an early stage of development.

Progress has been most notable in aviation, where the book and claim market has expanded rapidly and seen increasing interest among both cargo and passenger purchasers, given that SAF is the primary solution to abatement difficulties in this industry. Maritime applications have been thoroughly piloted and continue to mature, while road, rail, and other modes, such as inland waterways and transport hub operations, are also emerging. In particular, the highly fragmented nature of the road transport sector presents both challenges and considerable opportunities for scaling book and claim-based low-emission procurement mechanisms.

Stakeholders consulted for this report identified several barriers to broader customer integration. A key concern is the current incompatibility of book and claim with existing voluntary and regulatory frameworks. The absence of formal recognition from leading standard setting bodies, like the GHG Protocol and SBTi, limits its inclusion in emissions accounting and climate targets. This, in turn, limits the offer of book and

claim solutions for voluntary decarbonisation. Stakeholders also highlighted uncertainty over how book and claim interacts with regulation, as well as the lack of a common understanding of additionality [43].

Smaller companies face further obstacles. Many lack the resources to apply the same level of scrutiny to sustainability claims as larger firms, making it difficult and costly to incorporate book and claim into their supply chains. To avoid the resource burden of ensuring traceability, additionality and the prevention of erroneous double counting, smaller companies often prioritise direct, physical emissions mitigation wherever possible. This approach also streamlines their role of passing the lower emission profile resulting from the use of such fuels and services down the value chain, enabling their inclusion in derivative reporting such as a B2B report, corporate emissions inventory, or product carbon footprint – a practice that is also in its early stages.

Standardising accounting and reporting practices, whether under book and claim or other systems, together with greater transparency and external verification of registries, could help stimulate demand for book and claim solutions among small and medium-sized companies.



Corporate coalition and market signal creation

Corporate coalition building and market signalling are essential enablers of transport decarbonisation, as they enhance certainty and stabilise demand for low-emission, sustainable products and services.

One of the many challenges currently faced by low-emission fuels and transport services is the scattered demand, whether regionally dispersed or shared among multiple market participants. This prevents suppliers from accurately understanding market needs and, overall, slows down the uptake of low-emission solutions.

Demand aggregation, among other factors, constitutes one of the most significant market signals for suppliers of low-emission solutions. Book and claim offers a possible solution, but there are other ways to signal the market, including direct physical procurement. Once the market signal is established, it will enable investment decisions to scale the supply of low-emission solutions.

What are the different ways to create market signals?

Demand aggregation through logistics companies: Logistics service providers play a key role in matching the supply of and demand for low-emission transport services. By consolidating logistics demand, they can send a stronger demand signal for increasing the supply of low-emission solutions. They can procure the solution physically when possible or implement book and claim to overcome geographical or logistics barriers.

Certificate aggregation and management: Companies take the role of facilitators by purchasing environmental attribute certificates from a trusted source and facilitating procurement to interested users and partners, stimulating demand for low-emission transport fuel and services while facilitating access to the book and claim ecosystem.

Buyers alliance: A buyers alliance is a collaboration among multiple companies, mostly cargo owners, to combine their demand for EACs. By aggregating this demand, the alliance sends a strong signal to the market, supports economies of scale, and gives EAC providers the confidence to keep investing in low-emission solutions.

Regulatory mechanisms: Laws, regulations, and incentives can send important market signals by increasing the use and demand of low-emission transport solutions. Compliance schemes have a direct impact on demand, consequently increasing supply. At present, regulations are based on physical procurement, which book and claim stakeholders argue could be flexed to expand impact by embracing other chain of custody approaches. Policymakers can also influence the lower-carbon solutions market by procuring these solutions for the public sector, addressing their own value chain emissions.

Focus: buyers alliance

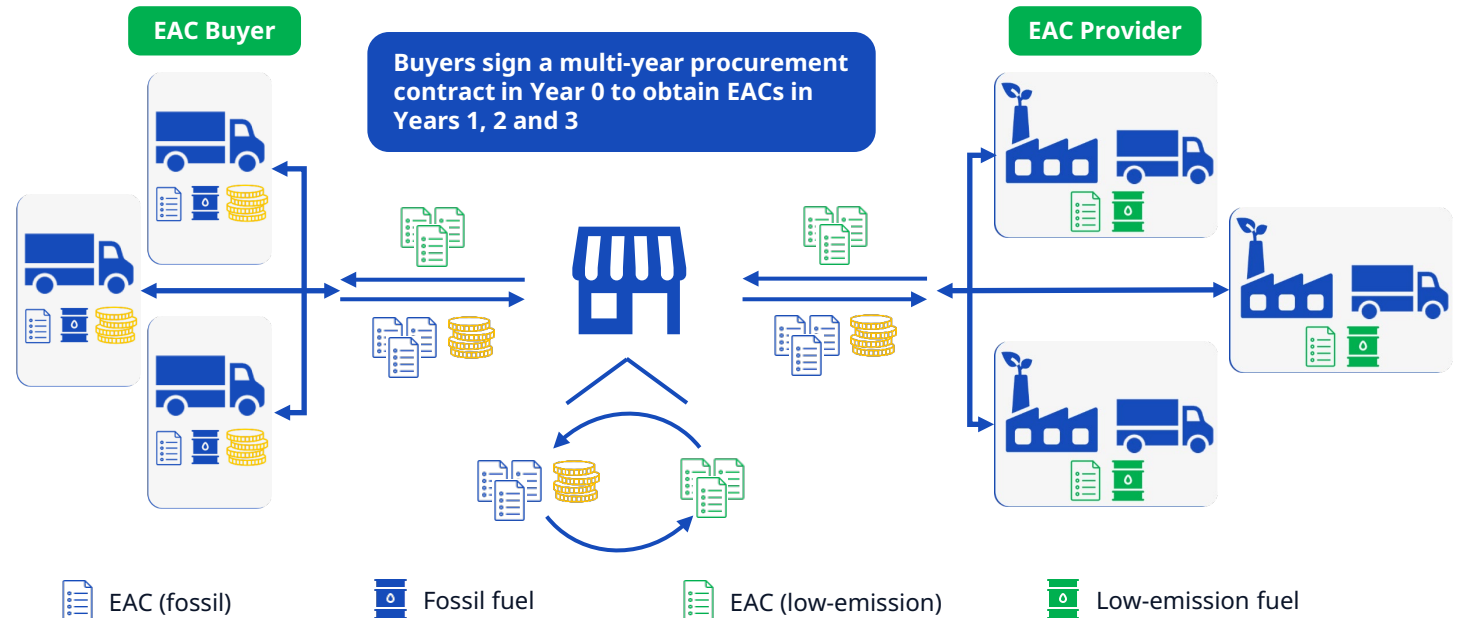
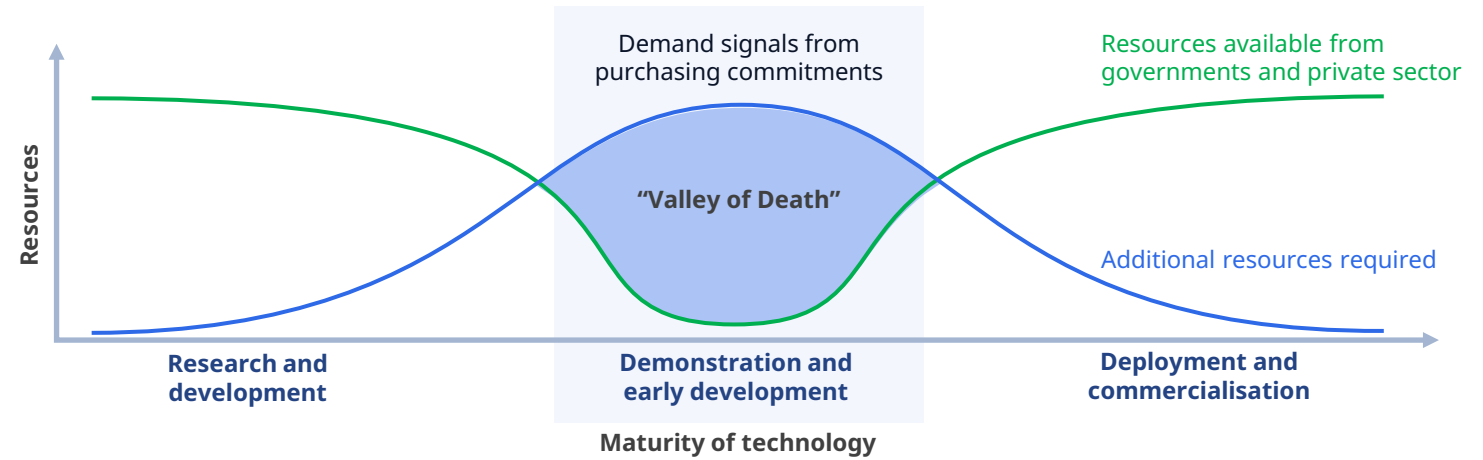
Alliances aim to support technologies in their early deployment to scale up.

This section takes a closer look at buyers alliances, given their centralised structure and essential role in book and claim.

Nascent decarbonisation technologies and products usually struggle to scale up demand when deployed. This is due to the small and unreliable demand that creates uncertainty and prevents suppliers from investing in production capacity [44]. Buyers alliances, among other initiatives, fill in this gap by aggregating demand in procurement processes. The combination of different market signals enables nascent technologies and products to mature and achieve wider commercialisation.

Buyers alliances in particular help create long-term market signals through multi-year processes as EAC buyers disclose their decarbonisation needs to the alliance and commit to buying EACs. This process can enable competitive prices by giving buyers more market power compared to a scenario where they negotiate individually with providers.

These alliances follow recognised best practices by the BCC, for example, to ensure transparency and reliable accounting. This is particularly important when collaborating with reliable registries and procuring verified EACs. By maintaining active relationships with standard setters and third-party accounting frameworks, these systems ensure compliance with rigorous requirements, effectively bridging the gap between investment in low-emission solutions and their practical deployment.



Examples of buyers alliances that send relevant market signals

SABA

Launched in 2021 and managed by Environmental Defense Fund, Center for Green Market Activation (GMA) and RMI, the Sustainable Aviation Buyers Alliance (SABA) supports the transition to net-zero air transport. Its purpose is to drive investment towards high-quality SAF, catalyse new SAF production and technological innovation, and support member engagement in SAF-related policymaking.

SABA currently has around 40 members, among them founding companies such as Bank of America, Boston Consulting Group, Deloitte, JPMorgan Chase, McKinsey & Company, Meta, Microsoft, and Netflix. The alliance offers a range of services, including support for sustainable aviation fuel certificate (SAFc) procurement, book and claim accounting guidance, and management of the SAFc Registry.

In 2025, SABA launched the SAFc Connect database to help members procure commercially available SAF certificates. It will also conduct a next-generation SAF request for proposals (RFP) to aggregate demand for investment in a new SAF production facility. Additionally, SABA will publish the second version of its SAFc Accounting and Reporting Guidance. Future developments include additional RFP iterations informed by current feedback and evolving market conditions, as well as the introduction of an industry-standard SAFc contract [45].

Further reading: [Next-generation RFP press release](#); [SABA homepage](#); [SABA Resources](#); [SAFc Connect press release](#); [SAFc Registry](#); [V1 SAFc Accounting and Reporting Guidelines](#).

ZEMBA

Launched in 2023 by the Aspen Institute's Energy and Environment Program, the Zero Emission Maritime Buyers Alliance (ZEMBA) is committed to accelerating the deployment of sustainable shipping solutions. To do so, it supports the commercial rollout of scalable clean energy options for maritime transport, like SMF, and creates economies of scale for both freight buyers and suppliers, generating a greater positive impact on scaling SMF than any single freight buyer could achieve independently.

ZEMBA currently includes around 35 member organisations, with founding companies such as Amazon, Patagonia, and Tchibo. The alliance offers services including demand aggregation, procurement of sustainable maritime fuel certificates (SMFc), accounting guidance, and stakeholder engagement and activation.

In 2025, ZEMBA will conclude its second RFP, leading to the collective procurement of e-fuel-based environmental attributes. It will also oversee the delivery of the first SMFc purchased through its inaugural RFP. In partnership with Katalist, ZEMBA will work to incorporate best practices into the SMFc framework and the maritime book and claim system. Looking ahead, the alliance plans to launch additional RFPs targeting deep decarbonisation solutions, with the specific scope still to be determined [45].

Further reading: [ZEMBA RFP 1 Results](#); [ZEMBA RFP 2 materials](#); [ZEMBA web page](#).

GMA Trucking

Launched in 2024 by GMA, GMA Trucking is focused on accelerating the decarbonisation of heavy-duty trucking through the procurement of low-emission trucking service attributes. Its goal is to support the widespread deployment of clean trucking solutions that reduce greenhouse gas emissions in freight transport. The alliance is designed to enable first-of-their-kind, scalable partnerships aimed at putting Class 8 battery electric and fuel cell electric trucks on the road.

GMA Trucking currently includes 10 member organisations: Amazon, Pepsi, Reckitt, Meta, REI, eBay, Etsy, Netflix, Kuehne+Nagel, and Green Worldwide Shipping. Key services offered include book and claim accounting guidance, registry development, procurement operations, project due diligence, and knowledge sharing.

In 2025, GMA Trucking will move forward with a pilot procurement initiated through an RFP launched in December 2024. This pilot aims to deploy net new low-emission trucks in the US, targeting an estimated emissions reduction of 60 000 to 100 000 CO₂e tonnes over a four-year contract. The systems, processes, and insights developed through this pilot will lay the foundation for significantly larger procurements. Looking ahead, a second RFP is planned for 2026 [45].

Further reading: [GMA Trucking Pilot RFP materials](#); [GMA Trucking web page](#); [Summary Pilot RFP results](#).

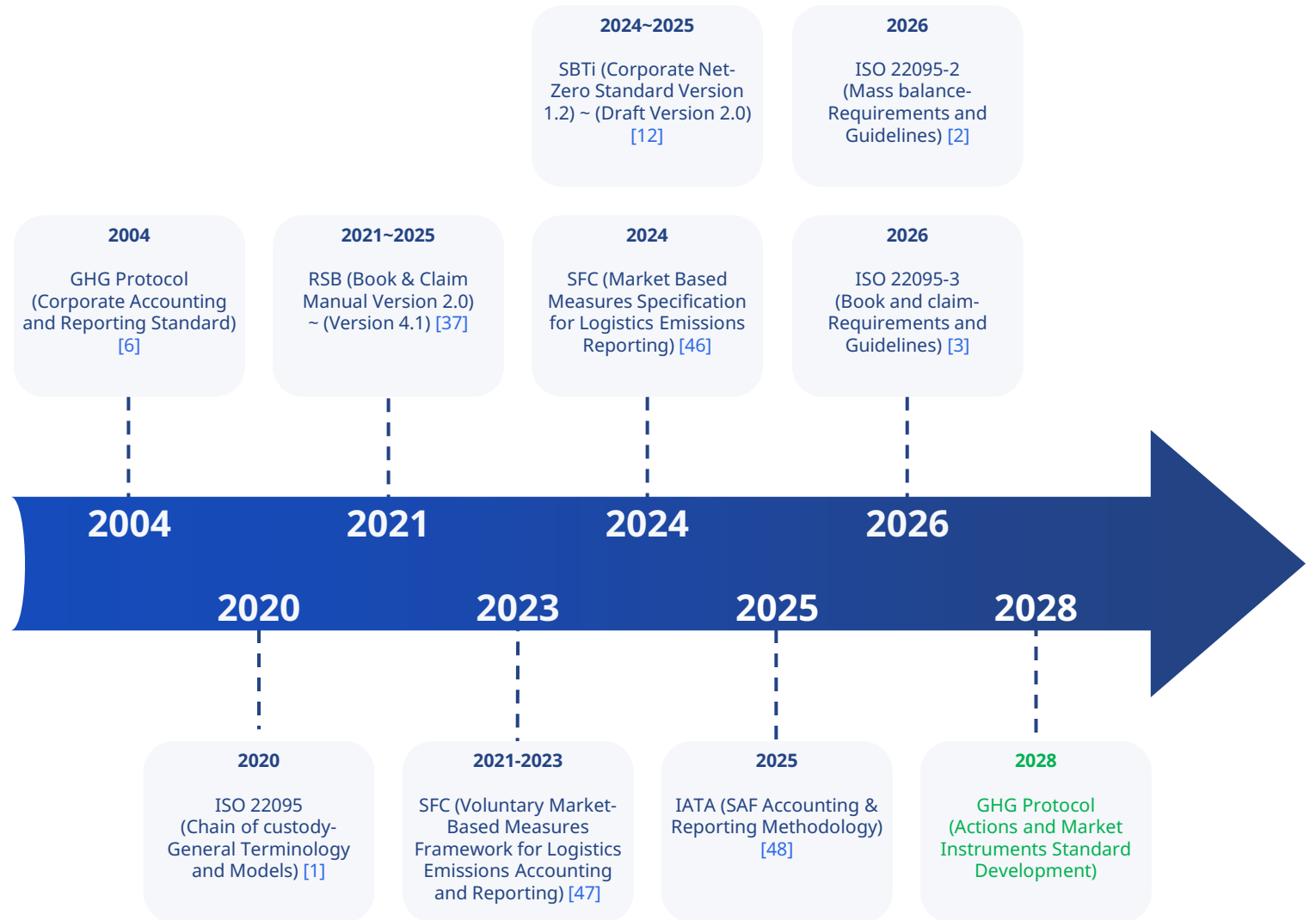
Schemes and standards

Standardisation is a key step towards upscaling and interoperability.

The practice of booking and claiming environmental attributes in transport has gained momentum only in recent years. As the approach continues to evolve, it is essential for the ecosystem to establish clear and consistent definitions, boundaries, and requirements. This prevents confusion with other chain of custody models, ensures that practices operating under book and claim are correctly identified, and can even prescribe a set of principles or best practices to book and claim in a rigorous and transparent manner.

Standard setting bodies, including the GHG Protocol, the SBTi, ISO, SFC, and the RSB, have published schemes and standards relevant to book and claim, applicable for voluntary decarbonisation across all modes of transport. These organisations have been responsible for defining book and claim, the role and architecture of registries, and how to account for environmental attributes.

Additional supports are also being developed by key stakeholders, such as the International Air Transport Association (IATA), to address challenges specific to certain transport modes. These efforts are expected to strengthen the credibility and consistency of book and claim approaches as part of broader decarbonisation strategies.



Examples of schemes and standards that have been essential in shaping book and claim

SFC

SFC is an international organisation focused on reducing global freight emissions through guidance and collaboration. Some of their key programmes are Clean Air Transport, Fleet Electrification Coalition, and Clean Cargo, as well as continued publication of the GLEC Framework [49] and contributions to ISO 14083 [50]. In 2023, SFC published the Voluntary Market Based Measures Framework for Logistics Emissions Accounting and Reporting after development and public consultation initiated in 2020 [47]. This guidance document supports freight transport decarbonisation by facilitating the uptake of low-emission transportation services (LETS) and fuels (solutions) across all transport modes via market-based approaches.

The Framework details how emissions attributes of a solution are converted into a LETS as the fuel is utilised, mirroring the fundamental elements of emission accounting in traditional supply chains. By preserving the link to actual transport activity, it helps users avoid inconsistencies, erroneous double counting, and follow the sector's established practices.

The Market Based Measures Specification for Logistics Emissions Reporting [46] is a complementary publication that translates elements of the Framework into normative, auditable language. Thus, the Specification can be used to verify LETS and their underlying assumptions, controls, definitions and parameter choices. This ensures quality and compliance when reporting book and claim procurement [51].

Further reading: [MBM Framework](#); [MBM Specification](#), and their associated [Assurance Program](#).

IATA

IATA is the trade association for airlines and supports the sector across multiple areas, including the accelerated adoption of SAF to reduce emissions.

To facilitate the scale-up of SAF use, IATA identified the need for a robust, globally applicable accounting framework. In response, it published the IATA SAF Accounting & Reporting Methodology [48], which sets out best practices and a recommended approach for airlines to calculate, account for and report emission mitigation associated with SAF.

The methodology recognises established chain of custody models, such as mass balance and book and claim. The use of chain of custody models can enhance flexibility and capture efficiency gains in the production and procurement of SAF without affecting the quality of the process if done correctly. According to IATA, these models enable SAF production in the most efficient locations, provide access to demand even when production is geographically distant, and reduce the need to transport SAF and feedstocks.

To complement its work on decarbonising aviation, IATA launched the SAF Registry and the SAF Matchmaker in 2025. Together, they form part of IATA's broader strategy to help the industry achieve net-zero carbon emissions by 2050 [52].

Further reading: [About IATA](#); [SAF Accounting and Reporting Methodology](#); [SAF Matchmaker](#); [SAF Registry](#).

ISO

ISO serves as a platform for experts to develop standards across a wide range of subjects, including the definition and boundaries of chain of custody models. ISO 22095 [1] was published in 2020 to establish a common terminology and framework for chain of custody models. The standard introduces multiple models (e.g., identity preservation, segregation, mass balance, and book and claim) without prescribing any one specific model nor how any one industry must trace specific products.

The new book and claim chain of custody model standard, ISO 22095-3, builds on ISO 22095 and sets out common requirements and guidelines for book and claim chain of custody systems. Designed to be sector-agnostic, it offers a consistent framework for applying book and claim across industries, with the goal of improving transparency and ensuring claims can be clearly understood throughout the value chain.

Developed through a consensus-based process involving global experts from industry, regulatory bodies, and academia, the standard reflects broad input and is expected to gain wide acceptance. By establishing cross-sector principles, ISO 22095-3 supports trust and consistency in the implementation of book and claim. The final version is expected by late 2025 or early 2026, alongside ISO 22095-2 for mass balance chain of custody applications [53].

Further reading: [ISO 22095-3](#); [ISO 22095-2](#); [ISO 22095:2020](#).

Co-ordination and stakeholder engagement platforms

Platforms play an essential role in fostering dialogue and creating knowledge.

Book and claim relies on ongoing dialogue among stakeholders to align terminology, methodologies, and principles. Co-ordination and engagement platforms facilitate community meetings, interaction with standard-setting bodies and consultation between companies and international organisations to ensure common understanding and best practices implementation. Without this co-ordination, fragmented approaches risk undermining the credibility and interoperability of book and claim solutions.

Co-ordination remains essential. Stakeholders have not reached full consensus on key aspects of book and claim, such as additionality or the exact way to include book and claim in voluntary accounting and reporting frameworks. With so many newcomers to GHG accounting, in general, and book and claim specifically, there is a need to educate and advance the sector simultaneously.

More dialogue is needed to reach a consensus. Impartiality is a key component of these platforms, enabling balanced discussions and outputs that represent the interests of all stakeholders. Some of the main platforms in this space are the BCC, Global Maritime Forum, and RSB Book & Claim Programme, among others.

Examples of platforms for stakeholder co-ordination and engagement

Book and Claim Community

BCC brings together a wide range of stakeholders across the transport sector to support the development of a unified and credible book and claim system. The goal is to be a central hub, reduce duplication, and communicate a clear and inclusive narrative. Community stakeholders include the whole spectrum: fuel providers, transport operators, end customers, regulators, certification bodies, and public organisations.

The Community's mandate is to foster sector-wide alignment on credible book and claim practices that accelerate decarbonisation in hard-to-abate transport modes. Through collaboration between stakeholders, expert workshops and ongoing engagement, the Community works to align distinct parts of the ecosystem.

A key output is the Principles and Best Practice for Book and Claim Systems in Heavy Transport [13], a consensus document of 35+ experts, designed to ensure environmental integrity and interoperability across transport modes and actors. By establishing a shared foundation, this work enables stakeholders to build trusted systems that support scalable climate solutions and unlock decarbonisation across the value chain. The document covers best practices agreed upon by a wide range of practitioners from private, public, and international organisations. The principles focus on fundamental system elements, core system functionalities and optimising credibility and function.

Further reading: [Overview of book and claim](#); [Principles and Best Practices](#).

Global Maritime Forum

Global Maritime Forum plays a key role in advancing the decarbonisation of the shipping industry by convening stakeholders and fostering collaboration through initiatives like the Getting to Zero Coalition. With a network of over 200 organisations, including fuel producers, carriers, shippers, freight forwarders, researchers, and policymakers, Global Maritime Forum creates space for collective problem-solving and innovation. By convening public and private organisations, Global Maritime Forum creates a space where ideas are generated, relationships are forged, and knowledge is spread. This creates a ripple effect of actions and impact.

In the book and claim space, Global Maritime Forum leads a dedicated task force exploring how this system can support the transition to low-emission fuels in shipping. As part of its knowledge output, Global Maritime Forum publishes white papers, including an early statement supported by nine major stakeholders that validated book and claim as a credible tool to accelerate decarbonisation [54].

In partnership with knowledge group MMMCZCS, Global Maritime Forum also produced a position paper on defining additionality in the voluntary book and claim market, offering guidance to early movers seeking to provide premium green shipping services with greater transparency and effectiveness. As additionality depends on legislation, this position paper defines it for EU ETS, FuelEU Maritime (FEUM), and the IMO's CII [55].

Further reading: [Book and claim joint statement](#); [Defining additionality](#); [Getting to Zero Coalition](#).

RSB Book & Claim Programme

RSB is a global network of partners from industry, civil society, policymakers and academia working towards a sustainable bioeconomy. Its growing membership community of over 150 members is responsible for building a sustainability framework that supports project, knowledge and solution development.

Through the RSB Book & Claim Programme, RSB is leading the development of book and claim as a mechanism that can expand the outreach of low-emission fuels and their role in decarbonising transport. Some of the most significant developments of this programme included in the RSB Book & Claim System are:

1. RSB Book & Claim Manual: Establishes the requirements for registering, transferring and retiring sustainable attributes of SAF.
2. RSB Book & Claim Registry: Digital application that allows the decoupling of sustainability attributes from certified renewable fuels.
3. RSB Procedure for Registry Book & Claim Recognition: Provides the market with a framework for independent registry operators to build trust and market acceptance.

Additionally, the RSB Book & Claim Platform seeks to strengthen the System through stakeholder consultation and dialogue.

Further reading: [Platform](#); [RSB Book & Claim Programme](#).

Registry infrastructure

Book and claim registries are electronic data systems that issue and track EACs while enhancing transparency and minimising erroneous double counting.

Registries are central to the credibility and integrity of the book and claim model. The RSB Book & Claim Manual [37] defines registries as a digital application with a data storage system that enables the issuing, transfer, holding and retirement of BCUs (i.e., certificates, credits). The Manual also provides a detailed list of requirements for RSB's book and claim system, including the functions of the RSB Registry. It is indexed to their recognition framework, one of the only examples of a budding registry "standard" in the ecosystem.

According to the BCC [13], a few of the key best practices of a credible registry are:

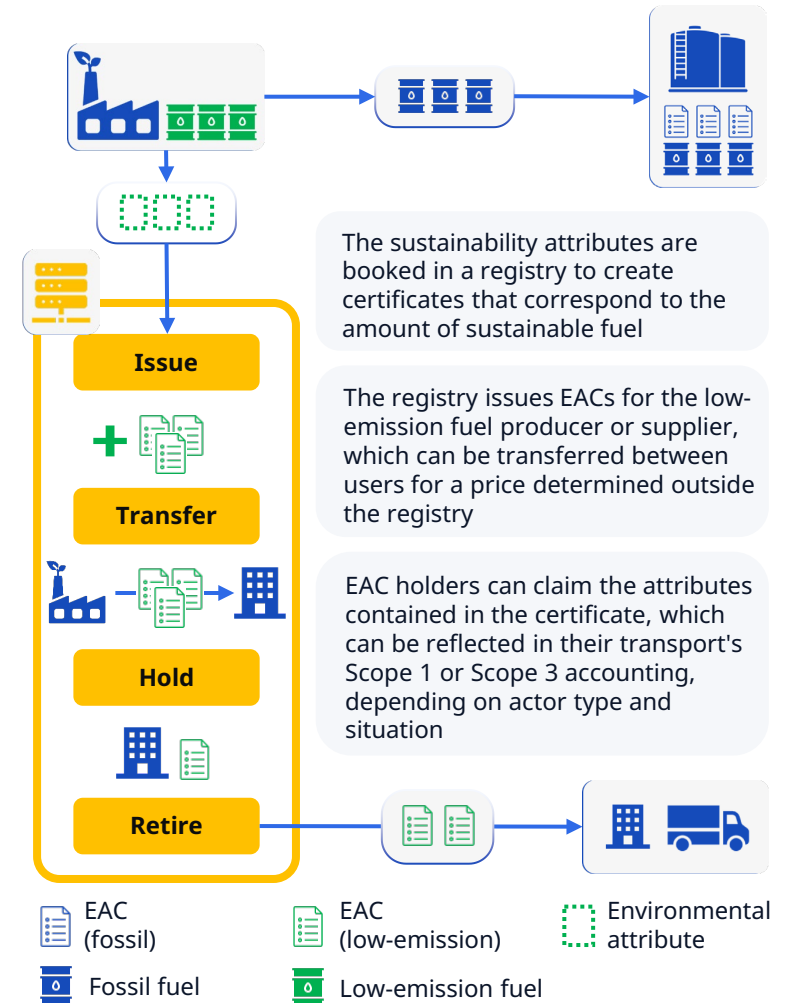
1. Registries should validate information before the issuance of a certificate to ensure participants of its quality and the credibility of their claims.
2. Record-keeping can suffice during the early stages of a new book and claim use case if it gathers all essential information. As use cases mature, migrating towards a more sophisticated and robust digital registry is necessary to ensure the integrity of larger-scale record-keeping.
3. Certificates should be managed by registries that follow principles and best practices recognised by the BCC. All actors involved in the lifecycle of a certificate should have accounts in that registry.

Overall, registries should help maintain accountability from fuel production to consumption and emissions reporting. Their goal is to prevent erroneous double counting and fraud and enable transparent tracking of environmental attributes. Registry interoperability is also becoming more common, with new bilateral agreements signed every year. Eventually, interconnected and standard registries can significantly reduce the likelihood of erroneous double counting and improve the robustness of the model.

Book and claim registries are evolving rapidly as new players and sectors enter the ecosystem. There has been a rise in company-specific ledger offerings, in which firms build proprietary systems to track and verify their use of low-emission fuels and services. At the same time, registries traditionally focused on electricity and commodities are expanding into transport.

Finally, carbon offset organisations are moving in as well, either creating new registries or adapting existing ones to tap into the growing demand for the flexibility provided by book and claim while trying to establish a claim to in-sector mitigation. Together, these developments highlight a dynamic, diversifying landscape in which multiple actors compete for market share.

Once separated from their sustainability attributes, low-emission fuels are considered as regular fuel



Examples of book and claim registries

Katalist

Katalist is a non-profit, maritime registry co-owned by the MMMCZCS and RMI. Developed with input from across the maritime value chain, Katalist is designed to enable Scope 3 emission reductions through the use of verified alternative fuels.

The platform works by allowing shipping companies to submit voyage data and supporting documents, such as PoS and Bunker Delivery Notes, for verification. Verifiers, following Katalist's verification guidelines, confirm the accuracy of the data and documents to a reasonable level of assurance. Once verified, the data is uploaded to Katalist, which issues tokens based on the energy of the alternative fuels used. These tokens can then be transferred to freight forwarders or cargo owners, who retire them to claim Scope 3 emission reductions.

Katalist collaborates with ZEMBA and Swire Shipping, in addition to its direct customers, making it a central piece in maritime book and claim. To prevent erroneous double counting, Katalist enforces strict terms of use, limits each unit of fuel to a single retirement per party, and will launch a public retirement table in the near future. Although currently a standalone platform, Katalist is engaged in interoperability working groups to enable future connections with other registries [56].

Further reading: [Katalist](#); [Terms of use](#), [Manual](#).

Avelia

Avelia is a proprietary registry developed by Shell Aviation, Accenture, Amex GBT, and the Energy Web Foundation to reduce the lifecycle GHG emissions of aviation. It facilitates dispersed airline access to SAF from a still highly concentrated SAF production landscape by using the book and claim chain of custody, lowering geographical barriers. The registry covers both business travel, targeted at corporations and airlines, and air freight, broadening its impact across the aviation sector.

Using blockchain technology, Avelia tracks both the delivery of the fuel into the aviation fuelling network and the allocation of any associated environmental attributes. Depending on contractual terms, these declarations are allocated to users, transferred and ultimately retired to claim the associated environmental benefits.

The registry's SAF accounting methodology has been externally verified by LRQA, an assurance provider accredited to ISO 14064, confirming its transparency and accuracy. According to Avelia, more than 57 corporations and airlines currently use the registry, which has supported the injection of 41 million gallons of SAF into the fuel network and enabled the abatement of over 370 000 tCO₂e [53].

Further reading: [About Avelia](#).

SAFc Registry

The SAFc Registry is an electronic record of environmental attributes owned by RMI and developed in collaboration with the Environmental Defense Fund, SABA and the Energy Web Foundation. Its role is to facilitate a consistent, transparent and auditable option to track SAF EACs and increase confidence in this mechanism.

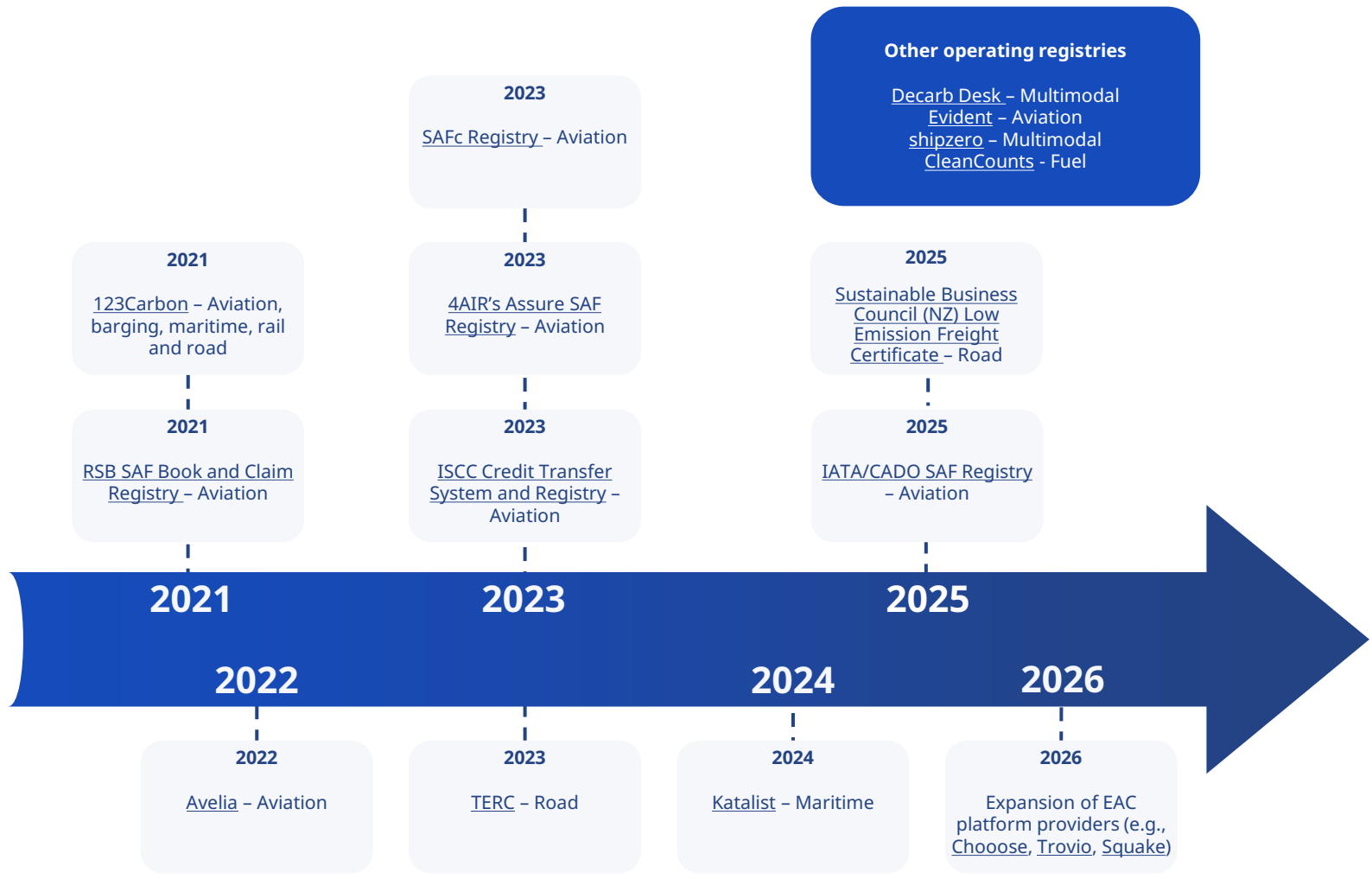
Fuel providers register SAF, which is verified and approved by the registry operator before issuing certificates. These certificates are transferred to customers, who retire them to claim Scope 1 and 3 emission reduction benefits.

Up until the first semester of 2025, more than 70 companies created, or are in the process of creating, accounts. The registry facilitated 47 000 tonnes of neat SAF, equivalent to more than 150 000 tonnes of abated carbon dioxide.

The SAFc Registry also abides by the RSB Book & Claim Manual [37], confirms fuel sustainability certifications in the International Sustainability and Carbon Certification (ISCC) and RSB databases, allows certificates to be retired only once, and is involved in ongoing deliberations on registry interoperability.

The 2025 integration between the SAFc Registry and Choose, a software provider that connects producers, airlines, registries and Scope 3 buyers, represents a step towards transparency, simplification and collaboration [57].

Further reading: [Rulebook](#); [SAFc and Choose Integration](#); [SAFc Registry](#); [Terms & Conditions](#).



Book and claim registry overview

The registry environment has been characterised by high dynamism.

At the time of this report's publication, most registries had been in place for less than 5 years. This is not much compared to other sectors, such as energy and palm oil, which have had registries for more than a decade. In the coming years, many other registries are expected to be launched, with new registries, tracking and tracing products, or integration announcements occurring regularly.

The timeline on the left shows a non-exhaustive list of registries launched since the first pilots in 2021 with notable growth in recent years, particularly in air transport. The list includes both registries developed by not-for-profit organisations (e.g., Katalist, SAFc Registry) and proprietary systems (e.g., Avelia and TERC), showing a wide spectrum of registry types and stakeholders.

Moving towards standardisation, RSB has led an ISEAL-funded effort over the last years to enable interoperability across independent registries, an effort they will bring into the BCC in 2026 to continue supporting crucial integration and alignment across system providers. Bilateral collaborations are also increasing. IATA and 123Carbon, for instance, are working towards interoperability and alignment between SAF registries. Independent digital ledgers and registries created by carriers and other ecosystem stakeholders also fit into the tapestry of registry actors and increasing interoperability.

Lessons learned from non-transport sectors

Book and claim systems have been developed in different sectors with heterogeneous outcomes. These experiences provide insights to stakeholders participating in and developing book and claim for transport.

Palm oil

Palm oil represents one of the first cases of book and claim systems, dating back to 2006, when the Roundtable of Sustainable Palm Oil (RSPO) created GreenPalm. The system was born out of the heavy burden that traceability and transparency represent for small and medium-scale companies to adopt sustainable sourcing [58]. The system allows certified producers to sell sustainability certificates and access the sustainability premium even though they do not have physical access to a certified mill. The implementation of book and claim in the palm oil industry set the foundations for other sectors to follow, including transport.

Electricity

The energy sector has developed market-based mechanisms to redistribute the environmental attributes of renewable energy and to allow their reporting in accordance with the GHG Protocol's Scope 2 Guidance [8]. However, the use of RECs in the US, or GOs in the EU, has brought its own challenges. Researchers [59, 60] have found that the use of RECs does not inherently imply increased investment in renewable energy. This is because the renewable energy procured through market-based mechanisms has been shown to be the cheapest option, which would have been bought in any case.

The same mechanism redirects capital to the cheapest renewable energy projects, undermining efforts to maximise renewable energy capacity. In addition, studies [61] also highlight erroneous double counting risks when grid electricity consumption models and market-based methods to account for the consumption of renewable energy are inconsistently applied.

Gas

The use and tracking of renewable natural gas (RNG) are possible thanks to chain of custody models. Mass balance is mostly used in the EU to comply with regulations and is enabled through PoS certificates, while book and claim is used when sustainability criteria do not have to be verified and is enabled through GOs. In the US, a model closer to the European mass balance is used, ensuring physical connectivity through the pipeline infrastructure [62]. The credibility of this mechanism has led the State of Oregon, for example, to include RNG in its Clean Fuels Program [63]. More states and countries are expected to follow if RNG certificates are included in upcoming revisions of GHG emissions accounting and reporting standards.



Chapter 4: Voluntary and regulatory landscape

A review of existing standards, frameworks, and regulations, alongside an assessment of their current use and potential to incorporate and recognise book and claim.



Chapter content

Systems under construction

(p. 55)

The book and claim ecosystem is shaped by overlapping guidance, methodologies and regulation. This section examines the pillars of voluntary transport decarbonisation through chain of custody models, their state of recognition by key reporting standard setters and regulators, as well as the precedent for chain of custody use in electric sector emissions reporting.

Interaction between voluntary and regulatory

(pp. 61-63)

The interaction between voluntary and regulatory approaches shapes how book and claim evolves. This section explains how policies influence the cost and nature of low-emission fuels, how voluntary actions complement mandates, and why clarity on the interactions between frameworks is crucial for credible accounting and reporting.

Reporting building blocks

(pp. 56-58)

Reliable accounting frameworks underpin transport GHG emissions reporting. This section traces operational data collection up to a market-based inventory, noting how building blocks facilitate B2B reporting and compliance, and empower the shift towards primary data and digitalisation. IMO, Sea Cargo Charter, and Clean Cargo frameworks are used as examples.

Book and claim compatibility

(pp. 64-67)

Book and claim compatibility with existing frameworks remains a key challenge for its upscaling. This section explains the uncertainty around the inclusion of market-based mechanisms in standards, how varying environmental and traceability requirements complicate application, and how book and claim could be integrated into future schemes and regulations.

Voluntary and regulatory frameworks

(pp. 59-60)

Voluntary and regulatory frameworks guide emissions accounting and reporting across the transport sector. This section explains how standards such as ISO, GHG Protocol, and SBTi support consistent reporting while diverse regulatory initiatives such as Fit for 55, the Net-Zero Framework, and CORSIA drive mitigation and illustrate complexities of book and claim amid evolving policy.

Systems under construction: standards, frameworks, and parallel policy

Book and claim users seek clarity and consistency, with a bias towards action, as they navigate a half-built sector landscape while building their strategy.

The theoretical work on book and claim has come a long way, but its implementation in transport is still young. The book and claim ecosystem is shaped by existing conventions in both voluntary and regulatory decarbonisation frameworks. Despite the need to agree on a single methodology (e.g., GHG Protocol, SBTi, ISO 14064, ISO 14083), book and claim practitioners face a plethora of overlapping guidance documents and frameworks of varying scope and formality. Key sector organisations are currently reviewing their rules and guidance, facing the possibility of incorporating book and claim. Future agreements among recognised standard setters may provide the infrastructure upon which industry stakeholders can decarbonise via voluntary market-based approaches and flexible yet traceable chains of custody.

Global policy and regulatory efforts seek to harmonise approaches but face obstacles from capacity, user expertise, and general mandate. A long and careful process may produce a better system in the long term, but some fear that deliberation could hamper sector growth at a crucial moment.

In this context, book and claim system providers have worked to clarify practices and establish a foundation for a consistent approach. This primary path and practice is followed by many. However, the number of newcomers to the book and claim model, many of whom are also navigating their first corporate inventories and GHG mitigation strategies, creates imbalanced growth and inconsistency.

Existing approved use of the market-based approach to Scope 2 has created hope for future acceptance of book and claim in transport and provided a model [8]. However, the lack of formal sector “approval” by standard setters, such as SBTi and GHG Protocol, causes some entrants to pause before investing in book and claim-based transport services.

In parallel, the regulatory response to burgeoning emissions helps define the voluntary space. Low-emission fuel mandates and policies that support the uptake of decarbonised transport services have a large effect on what book and claim GHG emission mitigation action can be considered “voluntary”, namely when an actor pursues it above regulatory obligations.

Users ask for a clear playing field and consistent rules. Otherwise, potential users will struggle to establish, certify, and book environmental attributes, connect to a buyer, and trace the attribute through the chain of custody, ensuring no erroneous double counting. A lack of standardisation results in higher costs for newcomers trying to keep up with first movers.

This chapter builds on previous discussions and explores the standards, regulations, guidance and frameworks users follow to ensure book and claim practices are as sound as possible.

Further reading: [Key sustainability frameworks and initiatives](#); Harvard Law School's [analysis of regulatory shifts in ESG disclosure](#).



Key pillars of voluntary GHG emissions reporting

Fleet operators follow procedures to collect data on their activity to comply with existing regulatory frameworks. Their data collection efforts may also account for the requirements of a chain of custody model and the use of a low-emission solution. This transport chain data is pertinent to, requested by, and even required by other stakeholders along the value chain.

Operational data: input for parallel reporting

An operator completes the voyage and approves logs with data such as fuel, distance, and cargo mass that move through the chain of custody. Operational data is collected at the vehicle or carrier level, normalised, and tracked across a trade lane, fleet, or region, and provided to interested stakeholders. This is the foundation of an organisation's GHG emissions standard operating procedures and input data for a variety of its own, partner, and third-party reporting.

Operations teams and regulatory affairs departments within companies report to authorities – to a competent local jurisdiction (e.g., city government, state agency), regional infrastructure operator, regulatory body (e.g., EU via its monitoring, reporting and verification (MRV) [64]), or industry organisation (e.g., IMO). Other data elements may be part of financial reporting to a national agency (e.g., US Security and Exchange Commission, until reversed in 2025 [65]).

This is the foundation for GHG emissions and related attributes. Data is collected, reported upstream, and may ultimately inform national reporting requirements, such as a country's Nationally Determined Contribution (NDC) [66].

Business-to-Business interconnectivity

While the majority of reporting is based on standardised procedures or previously-mentioned conventions (e.g., ISO 14083, GHG Protocol, or shared regulatory requirements such as MRV), such practices are complemented by collaborative B2B data sharing, including private efforts and agreements to support specific reporting preferences or fill gaps [67].

A variety of stakeholders play a role in the GHG emissions supply chain. Some data is obligatory to share and may be public. A growing number of organisations also request or voluntarily share data for corporate GHG emissions inventory use or as an input to proprietary business platforms for a variety of purposes.

Quality may vary. Standardised reporting facilitates each actor's participation in the system, lowers the barrier to entry, and elevates their own reporting and that of their peers. Practices are still improving, and correlated reporting, APIs, and partnerships will increase trust and enable easier sharing of primary data in the near future. With an increasing number of GHG emission reporters (voluntary or required by regulation), the reliability of shared data is consistently improving.

Standardised GHG inventory practices

Collecting data consistently requires good internal practices, a monitoring plan, and clear external rules. In transport chains, operators quantify and report GHG emissions in accordance with ISO 14083 [50]. This standard itself sits in relation to other ISO standard series, such as 14040 or ISO 14060 (e.g., 14064), but its actual use may ultimately depend on a technical accord, internal quality control, or agreement that make such use mandatory for a class of users.

Transport emissions are compiled next to GHG emissions from other sectors into a corporate inventory, following national requirements, but most commonly also following the GHG Protocol convention. Its publications are supported by a variety of other stakeholders – public, private, industry – giving it legitimacy and providing a standard toolset that creates sector consistency.

In turn, these standards rely on a subset of publications, guidance, or frameworks to explain how to achieve the standardised results or to enable an activity such as verification. For transport, this generally leads to the GLEC Framework, supported by the GHG Protocol [49], SBTi [68], and CDP [69] recommending its use for calculating GHG emissions associated with transport chains.

Preparing environmental attributes for aligned GHG emission accounting and reporting

Underlying data determines GHG inventories and enables alignment of environmental claims.

GHG emission reporting awareness and practice are growing, in spite of recent policy rollbacks that would have expanded emissions disclosure [70]. Voluntary or not, such reporting depends on a common methodology that allows for comprehensive reporting based on specific inputs (i.e., units, emission factors).

Transport GHG emissions accounting is moving towards greater use of primary data, closer (often digital) reporting integration, and a wider stakeholder set that uses such data.

This shift towards more robust data quality began before the publication of ISO 14083 in 2023, which has since reinforced and structured these practices through a consistent cross-modal methodology. Accounting standards are a prerequisite for book and claim and enable the sharing of GHG responsibilities and inventory inclusion across multiple parties.

Further reading: CDP's [Technical Note Measuring Emissions Intensity of Transport Movements](#); CLECAT [guide to ISO 14083](#).

Unit diversity: tonnes, litres, CO₂e, and GHG intensity

Transport emissions reporting uses various, yet standardised, units to reflect activity and fuel use. Common volumetric measures include litres, gallons, or tonnes of fuel consumed, along with their associated mass of CO₂e emissions. Mass is also used in calculating cargo and industry standards for the amount of cargo moved, such as tonne-kilometres (tkm). Consistency enables comparisons across modes, benchmarking, and harmonisation.

Unit practices diverge when comparing fuel providers and carriers to downstream service buyers such as LSPs and shippers. These latter organisations procure services, not fuels, so a standard measure of emissions in relation to service units delivered is practical – the GHG intensity (e.g., CO₂e/tkm). Yet many book and claim systems choose to pass along attributes of fuel quantities, leaving the claimant with the responsibility of making it “fit” within an emissions inventory.

Attention to normative units to minimise a user's post-claim calculation adjustments is important. Emissions practices are steadily improving and aligning, especially as more regulations follow standardised reporting.

Emission factors and data quality

Default emission factors are essential for estimating logistics emissions when primary data is incomplete. For example, when a shipper knows cargo activity in a given region but has not received emissions data from the provider, an appropriate CO₂e/tkm emission factor can be applied to derive an emissions estimate and fill in gaps.

Despite these tools, it is key to use primary high-quality data when possible. Correct usage of default, modelled, or primary data improves overall accuracy and increases transparency and comparability. Default factors bridge gaps by converting fuel use, distance, or weight into CO₂e values, but they also lose fleet-level performance and precision from primary or modelled distance or consumption data.

The lack of a standard methodology for emission factors and common recognition has allowed the coexistence of several emission factors for the same energy carrier or technology. Under these circumstances, a carrier might use the most advantageous default emission factor to reduce calculated emissions, sometimes even choosing default factors over primary data.

ISO 14083 standard, GLEC Framework guidance

ISO 14083 is the standard for reporting GHG emissions from transport chain operations and, like all ISO standards, is updated every five years. This sector moves quickly, and complementary guidance, the GLEC Framework, is updated annually so that users can benefit from predictable and standardised practices while developing their transport GHG emissions monitoring plan. These support systems help users manage activity data, units, and data quality levels, and ensure comparability with other industry partners and players.

The GLEC Framework reflects the industry's reporting maturity, building on and uniting emissions accounting practices from the entire spectrum of the transport sector into one guidance publication, incorporating data from area experts such as the EPA, SmartWay, IMO, FEPOR/EEEG, European Standards (EN), IATA recommended practices (RPs), GHG Protocol, IPCC, and more in order to reflect all transport modes and update emission factors, methodology, and references as necessary [71].

Reporting practices vary by sector and by application – examples from maritime

Multi-faceted practices are prevalent in maritime, where stakeholders deploy diverse and flexible frameworks.

After a brief look at basic GHG emissions data, it is helpful to see how companies use this data in practice. Three maritime examples illustrate the activities of broad stakeholder groups seeking to consolidate their sector's GHG emissions accounting and reporting practices.

These reporting frameworks have approached flexible chain of custody models in different ways, consistent with the scope of the effort and their mission. IMO has proposed a flexible chain of custody compliance that transcends physical reporting, similar to book and claim, changing the tone for maritime reporting. The Sea Cargo Charter illustrates what is possible when a smaller group raises the reporting bar for supply chain stakeholders. Clean Cargo shows the need to take a complex, interconnected emissions reporting framework and make it actionable for container traffic users while also enabling book and claim efforts.

Further reading: [Clean Cargo](#) partnership; IMO's [Net Zero regulations](#); [Sea Cargo Charter](#).

Regulatory level: IMO reporting and Mid-term policy

At the April 2025 Marine Environment Protection Committee meeting, delegates approved changes introducing GHG intensity regulations for fuels and complementary policy support [72]. Maritime has embraced emission intensities, comparing CO₂e per megajoule (CO₂e/MJ) in key mandates such as FEUM and IMO's NZF, whose adoption was postponed to 2026. These practices have advanced MJ as a common reporting unit and have increased awareness of normative reporting for all users. Registries, such as Katalist, also use MJ as their book and claim unit.

Fundamental reporting obligations will shape maritime shipping for years to come, in particular after the IMO aligned with the international convention by adopting well-to-wake GHG accounting.

While the above policy obligations employ flexible chain of custody mechanisms that transcend physical delivery, akin to book and claim, it is the mandatory reporting requirements, even down to the vessel level, that will help the wide spectrum of maritime sector stakeholders reach Net Zero by 2050.

Voluntary level: Sea Cargo Charter

The Sea Cargo Charter is a global, voluntary framework launched in 2020 to help bulk ship charterers align with sector climate goals [73]. It standardises GHG emissions reporting using voyage-based data and emission intensity metrics. By comparing actual emissions to a decarbonisation trajectory, it enables a transparent assessment of climate alignment in support of the IMO's targets.

The Sea Cargo Charter is an example of a voluntary, subsectoral reporting framework. Its focus on verification, data sourcing, and emissions intensity illustrates the level of rigour that can be achieved in maritime accounting within a smaller group of actors. By applying four key principles – assessment of climate alignment, accountability, enforcement, and transparency – it sets a leading standard for the sector.

Agility and a smaller user base are strengths. This focus could provide the opportunity to efficiently incorporate book and claim into its dedicated user base in future revisions. However, the voluntary, narrow application is weighed against wider reporting practices and consistency with the larger market.

Voluntary level: Clean Cargo for container carriers

A project first run by Business for Social Responsibility and now by SFC, Clean Cargo is another example of subsector alignment. The program recognises that reporting specific emissions to any one consignment aboard container vessels is near impossible, collecting emissions data from maritime carriers representing over 85% of global container traffic, processing the data, and publishing standardised values to facilitate reporting for carriers and cargo owners [74].

This does take time. From data collection to reporting, data cycles can be long, and values are posted annually. Thus, emissions mitigation at the vessel level may not be reflected in Clean Cargo values until the following year. Any issue arising from this delay is offset by the comparability and consistency of port-pair data across all users.

In 2025, Clean Cargo recognised its part in book and claim, noting how its data approach helps mitigate erroneous double counting risk, for example. It also announced more granular reporting, flexible outputs, and the inclusion of cargo capacities [75].

Leading voluntary standards expand on their market-based approach in 2025

ISO, GHG Protocol, and SBTi have each undertaken a process to further define the use of flexible chains of custody.

ISO's definitions and accounting standards

The interconnected nature of the ISO standards ecosystem provides context for a specific standard to function effectively within an industry. It has been noted that ISO 14083 standardises transport emissions accounting and reporting. Meanwhile, the larger set of ISO standards on emissions and chains of custody enables clarity, interconnection, and ultimately, effectiveness.

The above sector-specific standard is aligned with ISO 14064 for general GHG emissions accounting [76], ISO 14067 for product carbon footprint, and chain of custody definitions, including book and claim [77], housed in the ISO 22095 series (see definitions in Chapter 1 and new standard work in Chapter 3). These standards provide the structure for physical accounting and tools for growing book and claim-based reporting practices.

To provide further clarity and avoid complexity, in September 2025, ISO and GHG Protocol announced a strategic partnership to unify global standards on accounting, which primarily includes standards from the ISO 14060 series, leveraging ISO's particular strengths for verification and reporting with GHG Protocol's broad sustainability reporting applications [78].

Further reading: GHG Protocol/ISO [partnership announcement](#), [ISO 22095](#) (chain of custody definitions); [TC 308](#).

GHG Protocol accounting and reporting focus

The core set of GHG Protocol-published documents, including Corporate Accounting Standard, Scope 2, Scope 3, and Land Sector and Removals Guidance, provides the backbone of voluntary GHG emissions accounting and reporting practices relevant to book and claim. The GHG Protocol publications are utilised by more organisations than any other GHG emissions accounting toolset – both for voluntary and regulatory use [9]. It is the basis for key reporting frameworks, such as CDP, SBTi, International Sustainability Standards Board, and Corporate Sustainable Reporting Directive.

The Scope 2 Guidance outlines the market-based approach for the electricity sector and is under consultation at the time of publication. The Scope 3 Standard emerged to meet demand for supply chain accounting (i.e., corporate recognition for responsibility for another entity's Scope 1 emissions). Scope 3 describes the majority of emissions for most corporates, and the willingness to address these supply chain emissions also drives enthusiasm for book and claim.

Book and claim is currently under review by the "Actions and Market Instruments" (AMI) TWG, with a white paper published in December 2025, a consultation planned for Q1 2026, and more formal guidance planned for publication in 2028.

Further reading: [Actions and Market Instruments TWG](#); [GHG Protocol Standards](#); [Governance Document Repository](#).

SBTi's framework and book and claim

The SBTi provides a framework for corporate action in line with the research-supported decarbonisation required to effectively combat global warming. Its 11 500+ corporate signatories seek to comply with their commitments of year-over-year decarbonisation.

Flexible mechanisms such as book and claim are, thus, very attractive for enabling less expensive yet credible and traceable solutions, pursued by corporates under pressure to mitigate year-over-year GHG emissions growth. Currently, book and claim activity is often referred to when discussing and reviewing practices of "indirect" mitigation, and is under evaluation primarily by the Scope 3 EWG, with findings expected in 2026.

Previous SBTi guidance, such as an aviation target-setting publication from 2021, said: "Use of SAF by consumers of aviation services could follow a 'Book-and-Claim' approach if consistent with the GHG Protocol", signalling potential recognition while also noting the need for, and value of, industry alignment [19].

At publication, the SBTi recently closed a consultation on its second draft of the Corporate Net Zero Standard (CNZS), which reviewed key chain of custody concepts.

Further reading: Aviation Science-Based [Targets Setting Guidance](#); Corporate Net-Zero Standard 2.0 ([2025 consultation draft](#)); SBTi [Corporate Net-Zero Standard 1.2](#) (current); [SBTi's EWGs](#).

Examples of global policy and regulatory regimes

Policies relevant to voluntary book and claim.

Regulations, mandates, and incentives are responsible for the bulk of GHG mitigation activities and renewable fuel production, and they set the long-term trajectory of countries, regions, and the transport sector as a whole. Importantly, they also establish the context in which actors may pursue book and claim.

These examples are some of the leading global regulatory frameworks currently addressing transport emissions. The European policy portfolio is a particularly interesting case study for its diversity, targeted approach, and overlapping regulations.

Regulations are built on years of precedent and established legal authority, but policymakers walk a fine line when designing programs that address growing sector emissions. At risk is damaging global competitiveness for their stakeholders and creating a system that is difficult for the emission reporter to navigate.

Further reading: California [LCFS summary](#); Guide to EU's ["Fit for 55"](#); ICAO CORSIA [FAQ](#); Report on proliferation of [LEZs](#); [Summary of Global Fuel Standards](#); US State [SAF policy incentives](#).

Incentives

While many policies impose requirements, incentives are voluntary, despite the clear market signal. In book and claim, incentives are generally considered "safe" for additionality assessments and do not jeopardise the voluntary quality of a market-based procurement, but still should be transparently reported, as they typically support producers rather than constituting environmental attributes. Examples include the production tax credit or the blender's credit, as well as benefits such as deductions, subsidies, and bonuses.

EU's "Fit for 55": ReFEUA, FEUM, EU ETS, and RED III

The EU's "Fit for 55" policy package obliges action across the stakeholder spectrum. By establishing regulatory requirements, the related policy defines the playing field for voluntary book and claim. RED III obligates states to implement multi-sector renewable energy targets with options for transport mandates. ReFEUA encourages suppliers to increase SAF provision across EU airports via a flexibility mechanism rooted in mass balance. FEUM regulates maritime carrier carbon intensity. EU ETS created a cap-and-trade system that prices carbon in all sectors.

IMO's flexibility mechanism

In IMO's 2025 proposed NZF (delayed to 2026), regulators created a "flexibility mechanism". Carrier compliance is easier via a flexible chain of custody, and policymakers want reporters to reach targets and help transform the market. While physically separate vessels are not actually claiming the use of another's fuel, the IMO introduces a traceable, non-physical mechanism through which vessels with lower emissions intensity can generate credits to sell to those with higher emissions intensity [79].

California Low Carbon Fuel Standard (LCFS)

In 2009, the California Air Resources Board (CARB) approved the LCFS, with a goal to reduce the carbon intensity of transport fuel by at least 10% by 2020, with various credit mechanisms and flexible compliance options for obligated parties (fuel providers), including: granting credits for SAF use (despite LCFS being a road policy) and allowing flexible chains of custody, including book and claim, for pipeline biomethane [81] and imported electricity [82] in specific cases (e.g., to support green hydrogen production claims).

ICAO's CORSIA targets sector emissions

CORSIA is a global market-based mechanism developed by ICAO to cap net CO₂ emissions from international flights. The policy sits at the crossroads of voluntary and compliance-driven aviation decarbonisation. Starting in 2021, a first cohort of states required airlines to offset emissions above a 2019 baseline via carbon credits, with mandatory worldwide implementation by 2027. Airlines may also use CORSIA-eligible SAF, reducing offsetting requirements given its lower carbon intensity. Furthermore, compliance via book and claim is being studied by ICAO [80].

Local policy

In specific geographical regions, such as states, counties, or even the hyper-local city level, stakeholders navigate targeted mandates that are key to book and claim practice. They move markets, create demand and affect what may be considered additional. The most recognized local policy is the blend mandate, which ensures low-emission fuels enter the supply. Other local policies include low-emission zones (LEZs) where policy is commonly based on vehicle type, fuel use (including electric) and time of day, often enforced with heavy fines [83].

Voluntary book and claim's effect on SAF purchasing

Europe provides a model for strategic regulation, but it can be complex. An air carrier and its stakeholders must navigate a complex landscape of policies that affect the cost of SAF, geographic opportunity costs, and question the “voluntary” nature of their low-emission uplift via book and claim.

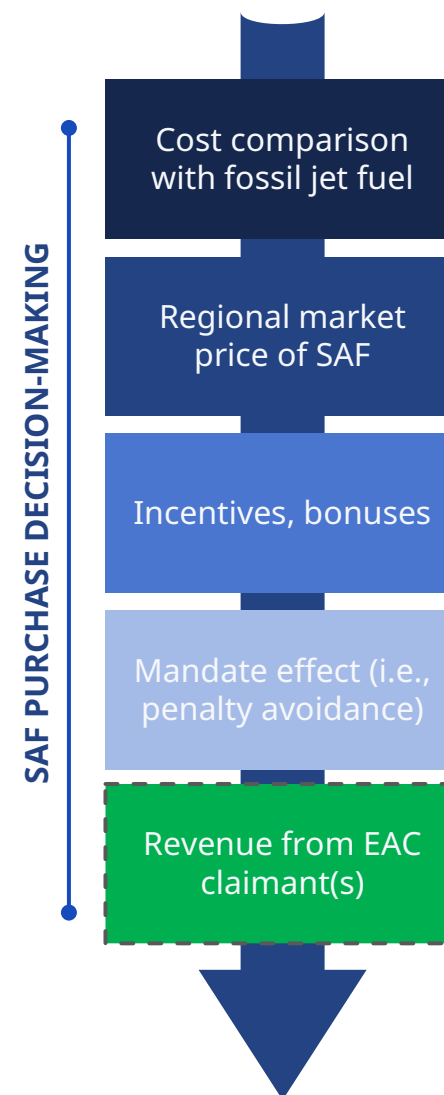
Europe has answered the call for GHG mitigation measures, implementing overarching policies under the “Fit for 55” package that sets the overall direction for the region’s approach to achieving the Paris Agreement’s aspirations. Sub-policies mentioned above (RED III, ReFEUA, EU ETS, and CORSIA) increase complexity and, while they may mandate specific emission outcomes, aren’t without implications [84].

A brief perspective of an air carrier’s experience shows how environmental objectives can stack up and complicate compliance. The same volume of fuel it uplifts at a European airport may have been brought by a mandated provider under ReFEUA, where the incentive to uplift differs between international and intra-EU flights. The emissions will be reported in the carrier’s EU ETS obligations. The carrier must hold allowances equivalent to its associated GHG emissions, and CORSIA applies to a subset of the operator’s flights.

Any voluntary SAF uplift is made more difficult due to the grey area created by the policies themselves. Was this SAF-based flight “voluntary”? Air carriers need clarity on all regulatory interactions to provide transparency to downstream stakeholders.

A similar conflict exists for maritime operators navigating compliance with FEUM, ETS, and IMO’s NZF, with the latter expected to be adopted in 2026. It becomes even more challenging in regions where multiple overlapping policies exist.

Further reading: [EASA EU SAF Policy Actions](#); [SAF mandates in EU and UK shape SAF markets](#); [SAF policies and the “Green Premium”](#).



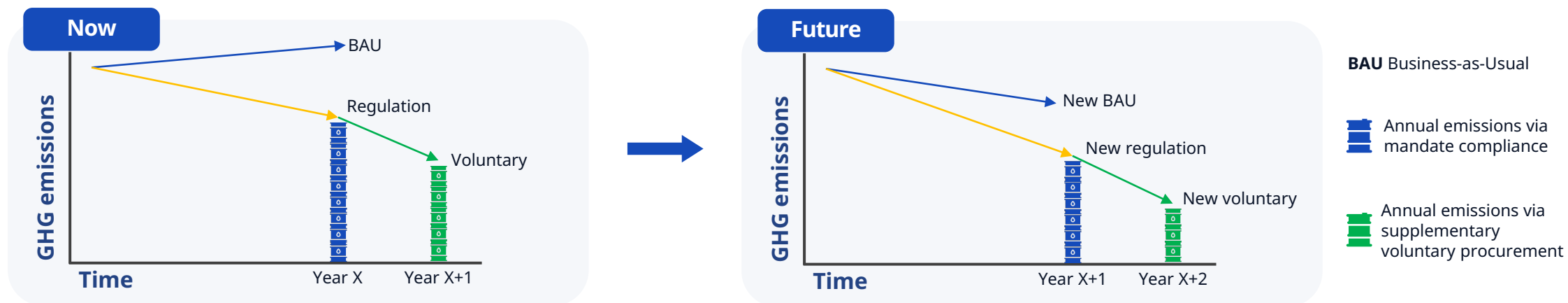
Example: EU air carriers

- Local cost of jet fuel vs. SAF (favourable in Europe, where a greater number of suppliers are located)
- SAF incentives (production incentives, airport-led funds, time-limited bonuses via ETS)
- ReFEUA (jet fuel producer must provide 2% to EU airports; carriers must fuel specific amounts)
- ETS allowance obligation (carrier)
- CORSIA international obligations (carrier)
- Voluntary book and claim-derived revenue

The air carrier considers what it must do and if it is advantageous to purchase in Europe, Asia, the US or elsewhere. The “Voluntary” status of the SAF volume and the low-emission service affect its ability to book and claim environmental attributes with a voluntary purchaser.

Mandates move markets, voluntary decarbonisation pulls the curve further downward

Regulation provides unambiguous and even rules and drives a majority of low-emission product implementation. A mandate is complemented by voluntary action, accelerating sector decarbonisation together.



The interaction between voluntary and regulatory is integral to decarbonisation, and one key element has an oversized, yet often indirect, effect on book and claim: the mandate. Today, book and claim practices exist largely in the voluntary space. Limited regulatory use exists, as highlighted above, in the form of flexibility mechanisms or the explicit use of flexible chain of custody models. This may increase if compelling results emerge, and regulators may become comfortable using the term “book and claim”. Many factors influence the emissions trajectories of organisations, regions, or industries – fuel carbon intensity, economic outlook, incentives, and voluntary adoption of low-emission alternatives. But regulations and mandates uniquely move markets.

The existing trajectory of GHG emissions is referred to as “Business-as-Usual” (BAU). With no intervention or external stimuli, GHG emissions will continue along the BAU pathway. Mandates seek to change the BAU by requiring, for example, that 5% of all diesel sold in a jurisdiction be biodiesel to bend the curve towards emissions mitigation goals. Over time, the 5% becomes the new baseline. Once that mandate takes effect, anything above 5% is where voluntary action begins – whereas before the mandate, any biodiesel uptake qualified as voluntary. Voluntary decarbonisation activities that go beyond mandates are key for at least four reasons. First, voluntary activities help corporates achieve their emissions mitigation goals.

Second, they advance the market, demonstrating readiness to move beyond minimum requirements. Third, they enable solution providers to expand production by providing a stronger demand signal, thereby enabling capital to flow to low-emission products and solutions. Fourth, mandates interact with voluntary procurement to improve overall GHG emissions reporting, verification, and related practices. Mandates provide tools and unite conventions, and the voluntary space builds on this, reaching adjacent users and broadening the practice. Throughout all regulatory applications, clarity, consistency, enforcement, and user compliance level are essential.

Communicating connections between voluntary action and regulatory frameworks protects claims

Consumers must have clarity over which frameworks have affected their low-emission transport procurement in order to use attributes in standard, physical accounting, as well as for voluntary book and claim purposes.

The effectiveness of the voluntary market depends on clarity in the underlying regulatory context, logistics configuration, as well as the fundamentals of subsequent accounting and reporting.

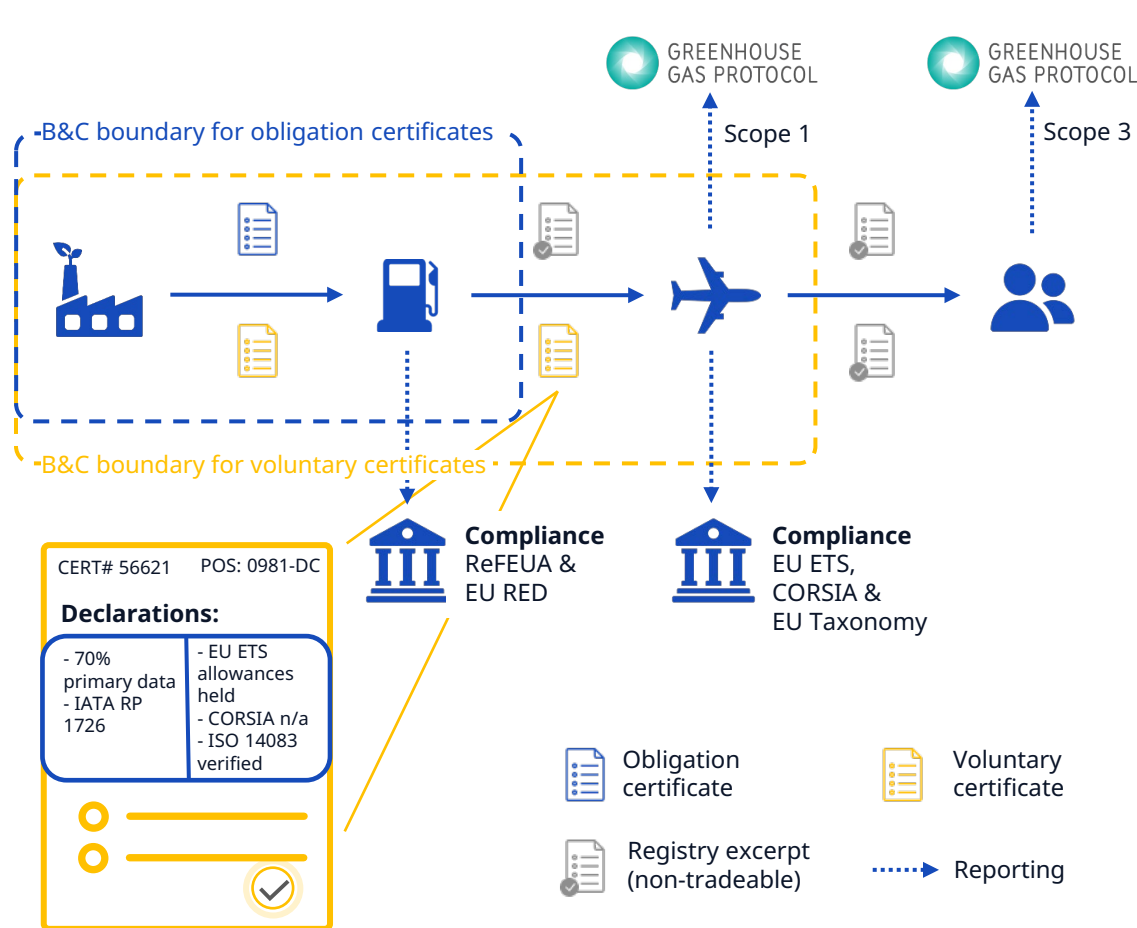
Assessing a policy, its specific requirements, and the multiple stakeholders affected helps organisations report correctly [85]. This includes assessing additionality, for which it has become common practice to ensure that the attributes of low-emission products arising from voluntary decarbonisation across the transport chain of custody are, at least, not already mandated by regulation (see page 34). This, in turn, requires reliably managed data, where full transparency has a significant impact on the EAC's value.

Example aviation sector documentation, declarations, or references that may

accompany the transferable instrument (e.g., EAC), include:

- Airline data quality procedures, including a statement on:
 - CORSIA offsetting compliance
 - EU ETS allowance compliance
 - incentives utilised
- Registry certificate ID
- Fuel/transport chain data and Proof of use/burn
- ISO 14083 accounting/reporting conformance
- IATA RP 1726 (passenger CO₂e calculation)
- tkm or passenger-kilometre (pkm) reports (e.g., from a GLEC-certified tool)
- ReFEUA PoC
- Independent 3rd party assurance statement

Maximum data on EACs and declarations enables the swift identification of verified attributes and clarity on additionality for a user's voluntary decarbonisation claim.



Further reading: 4AIR's [PolicyWatch](#); ICAO's [Environmental Policies on Aviation Fuels](#); ITF's [Sustainable Aviation Fuels: Policy Status Report](#).

BEVs, RECs, and Scope 3 complexity

Market-based accounting for electricity is permitted when dual-reported alongside location-based values.

RECs and GOs represent the environmental attributes of electricity and bioenergy, respectively. When an electric truck charges from the grid, the operator may purchase RECs to substantiate a claim for renewable electricity procurement, despite the physical emissions data associated with its location-based electricity implicating greater emissions.

Scope 2 Guidance from the GHG Protocol currently allows the application of booked and claimed electricity to a corporate market-based inventory. However, Scope 3 does not allow market-based claims for supply chain participants in any sector. As such, the truck owner would be able to report a lower Scope 2, but the cargo owner, with its goods aboard that REC-enabled battery electric vehicle (BEV) service, does not enjoy the lower Scope 3 emission profile achieved through its carrier's book and claim-based attribute purchase.

User clarity is paramount, and practitioners must proceed with caution to ensure that all parties use the correct data. Technically, the Scope 2 emission reporter (carrier) should follow dual reporting when taking a market-based approach. It reports emissions from its location-based energy use, as well as the market-based value based on RECs. The carrier will be transparent to cargo owners which attribute is used, and then the voluntary book and claim transport user may now manage two layers of dual reporting to represent emissions associated with its low-emission transport procurement.

Compatibility and comparability are challenging when book and claim systems are under development

The nascent market-based SOP is tested with varied regulatory and voluntary frameworks, as well as standards. Systems built on these inputs (e.g., registries or platforms) are increasingly interoperable, yet still speak with their own voice.

What level of sustainability is sufficient?

A CORSIA-eligible fuel must achieve a 10% lifecycle reduction compared to conventional fuel – this is a regulation [87]. Some corporates choose to purchase SAF with deeper reductions. In one example of voluntary book and claim via the SABA buyers alliance, SAF must achieve a 60% reduction in emission intensity [88]. While SABA is voluntary procurement and co-exists alongside CORSIA's regulatory context, its threshold gained attention, prompting a common question for a stakeholder who is analysing the market: "How much less emission-intense should a fuel or service be to book and claim? At what cost? Whose rule applies?" Lower fuel intensities yield greater decarbonisation, and each system or program sets a threshold to reflect its ambition.

It is common for an attribute purchaser to request fuels that have achieved a specific relative intensity reduction, even specifying their preferred emission data source to ensure comparability, given that sources may vary. Others note that even low-emission fuel may still be used on an inefficient vehicle or an empty load, and thus the "emissions intensity" of the booked and claimed service attribute is also key.

Finally, confusion may also emerge elsewhere. For example, under the FEUM regulation, eFuels are awarded a 2x bonus for carbon intensity reduction, incentivising their development [89]. Users may ask whether the 2x compliance multiplier can also be applied in inventory accounting. However, this is not permitted.

Inventory vs. project emissions accounting

The GHG Protocol Corporate Standard [6] and the GHG Protocol for Project Accounting publications [90] detail two different methods to account for emissions. Inventory accounting tracks GHG emissions within previously defined organisational boundaries. Project-based accounting, however, estimates changes in GHG emissions for a particular project or intervention relative to a baseline.

With inventory accounting, reporters include positive (but lower than conventional) GHG emissions data when reporting via book and claim. However, with the common term "reduction" and familiarity with offsets, subtracting emissions from the inventory total can seem intuitive. This more closely reflects project-based accounting but can appear to be simpler. Yet, removals and netting associated with project accounting are not permitted under GHG Protocol and SBTi standards for GHG disclosures and targets, while attributional accounting enables similar claims downstream in the value chain more naturally.

As noted, these organisations are revisiting a suite of practices, actively discussing the role of contractual market-based instruments in GHG inventories, subject to quality criteria, and even reviewing project accounting methodology. Meanwhile, users are encouraged to move towards inventory accounting, which aligns more closely with current claims for physically procured transport fuels or services.

Physical traceability

Under the GHG Protocol and SBTi standards, an emission reporter may use the emission profile of a SAF-based flight in their GHG inventory and SBT if physically connected to the SAF and flight. This approach to physicality can be confusing because the market-based approach, including book and claim, is allowed for electricity and biogas, a non-physical yet traceable practice that preceded the publication of the GHG Protocol's Corporate Standard itself. Until these scheme owners clarify what constitutes physical connectivity, traceability, and voluntary reportability, practices may vary.

The chemical industry, for example, employs a more flexible definition of mass balance, utilising a "multi-site" mass balance in production processes. This approach enables users to distribute specified product attributes across multiple production sites worldwide, provided certain criteria are met. This may seem like book and claim and can be a source of confusion when transport stakeholders try to transfer a "physically connected" mass balance logic to their diverse, global assets.

Clarity and consistency in standards and alignment by scheme owners and frameworks are building blocks of comparability.

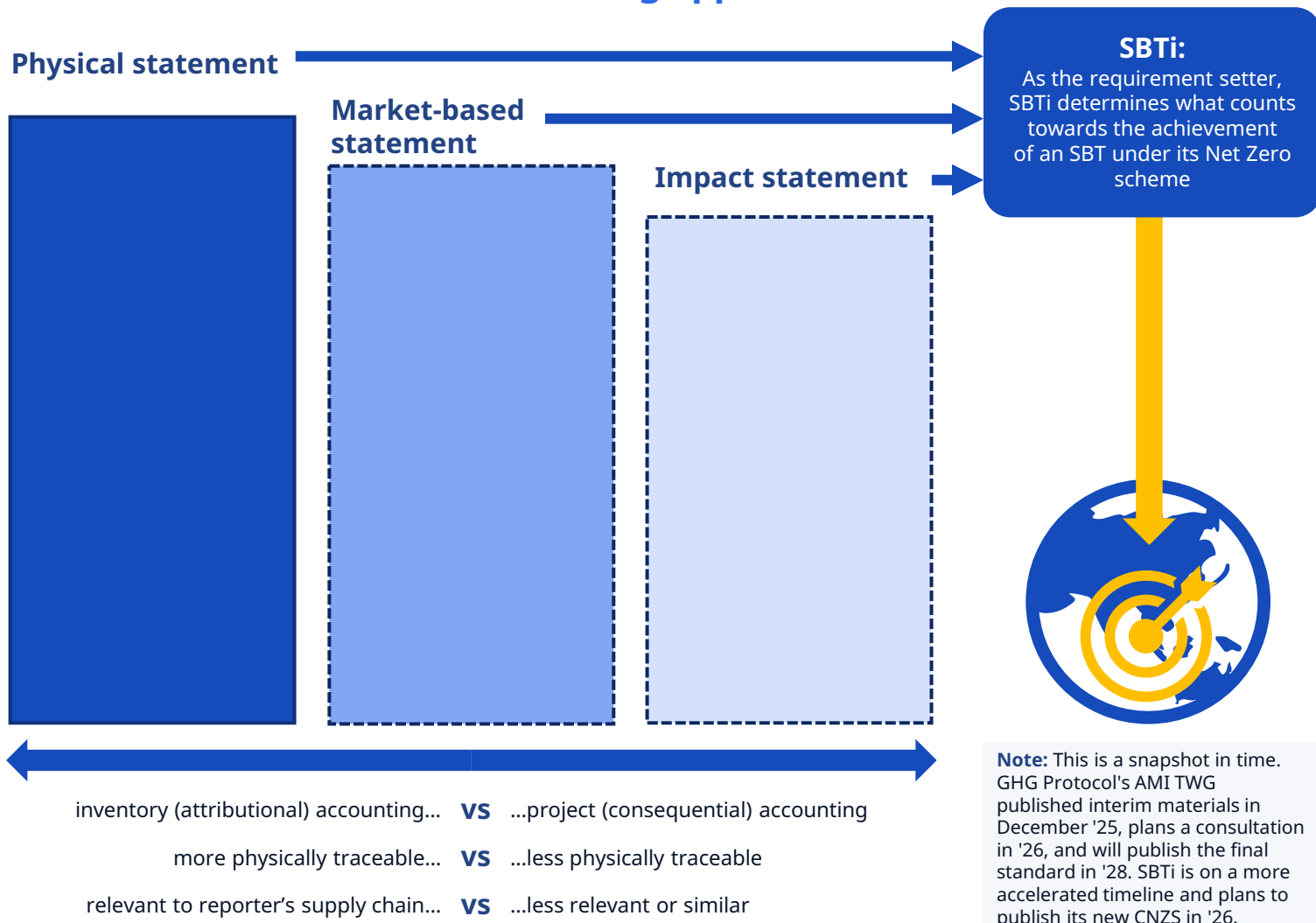
Further reading: CLEVER project's [efforts to harmonise emission factors](#); GHG Protocol's [Inventory and Project Accounting: A Comparative Review](#); ICAO's [Default Life Cycle Emissions of SAFs](#).

How could book and claim fit into the GHG Protocol's emissions accounting approaches?

GHG Protocol and its AMI TWG are considering options for GHG emissions accounting tools and ledger approaches. One leading option is a multi-statement strategy, where the accounting toolset accommodates a spectrum of activities and market instruments, subject to quality criteria. This could mirror the existing Scope 2 reporting structure, where users dual-report a market-based inventory alongside a physical inventory when applicable. Alternatively, this could include three statements (or more) to reflect a physical inventory, market-based inventory, and leave room for project accounting (often associated with offsets and removals) and instruments of lower traceability or lower value chain relevance in an impact statement.

This multi-statement approach aims to help emission reporters accurately account for and report emissions associated with a wide variety of activities, including market-based and traditional ones, while providing a platform for intentional, decarbonised procurement and its associated accounting and reporting.

Users look to AMI TWG to normalise practice and terminology, and to establish clear boundaries. Book and claim practices are argued by some to be considered actions, accountable alongside other traditional low-emission transport in the physical inventory (i.e., "attributional"). Alternatively, the argument is made that they are more appropriate for a market-based inventory, similar to today's electricity reporting (Scope 2). Some book and claim models take a more certificate- or project accounting-based approach (also called "consequential" or "impact" accounting), meaning that the specified characteristics being claimed are the emissions reductions within the transport sector, generally referred to by the industry as an inset. Here, the claimant would likely account within an impact statement.



Reconciling voluntary and regulatory frameworks

Practitioners are already defining good practices and shaping emerging systems.

Opportunities exist to further integrate book and claim into regulations and voluntary frameworks. It will take time for regulations and standards to adopt one approved pathway. As a result, the voluntary user will operate in a grey area for some time to come. However, there are already frameworks where voluntary and regulatory are currently being reconciled:

- Clarity by GHG Protocol and SBTi would define what sort of underlying accounting methodology is appropriate: inventory or project accounting, and what level of traceability allows an organisation to “use” an attribute for corporate accounting or towards an SBT.
- BCC’s Principles and Best Practices, where voluntary system providers have driven consensus on baseline elements to be followed by all practitioners [13].
- European Commission’s “book and claim” study will assess the need and feasibility of an accounting system and other support for alternative fuels. Such a system could clarify both regulatory and voluntary use of compliant fuels [91].
- The Global Framework for SAF, LCAF and other Aviation Cleaner Energies tasks ICAO to explore book and claim, its relevance and applicability. Member States wonder what role ICAO can play to facilitate access to environmental attributes [92].

Chapter 5: Strategic insights for stakeholders

An overview of key findings relevant for policymakers and other stakeholders, plus potential avenues for action.



Chapter content

Key prerequisites for a credible book and claim (p. 70)

Some key prerequisites for book and claim include comparable and clear accounting, clarity on quality criteria such as additionality, and credible databases and robust registries. This section explains the importance of accounting standards, policy boundaries, and registry design to ensure sound foundations for trustworthy book and claim systems.

Building interconnected systems (pp. 75-76)

Book and claim systems must consider the interaction between voluntary and compliant decarbonisation. This section outlines the evolving maritime regulatory landscape, highlighting the convergence of voluntary and compliance GHG reporting in Europe. It explains how interconnection and digitalisation support interoperability and transparent emissions claims.

Standardisation for upscaling (pp. 71-72)

Expanding transport sector tools, such as better accounting and reporting, could also benefit book and claim. This section explains ongoing efforts to simplify and upscale book and claim through collaboration, feedback, and standards. It also highlights the need to streamline emissions reporting, emphasising the roles of regulators, system designers, and reporters.

Book and claim principles and best practices (p. 77)

The BCC has taken the first step towards sector consensus. This section highlights the Community's principles and best practices as a collaborative effort to drive convergence across the ecosystem. It guides policymakers, emphasises collective needs over individual interests, and signals progress towards alignment in the upcoming 2026–27 initiatives.

Strengthening system foundations (pp. 73-74)

The book and claim ecosystem is in constant change. This section explains ongoing efforts to refine definitions and standards, focusing on additionality and registry interoperability. It also highlights the upcoming expansion of ISO 22095 to independently treat mass balance and book and claim, respectively, in ISO 22095-2 and ISO 22095-3.

Strategic insights and policy recommendations (pp. 78-80)

The optimist's book and claim vision may never be fully realised, but it serves as a guide to challenge the current paradigm and shape more ambitious approaches. This section identifies key progress indicators, including stakeholder capacity to apply best practices, market maturity, and regulatory readiness. It also presents insights for stakeholders and policy recommendations.

Key prerequisites for making book and claim procurement comparable, clear, and credible

Regulators and system designers focus on alignment; the book and claim users focus on rigour and execution.

Normative and comparable accounting

Verified emissions data is a prerequisite for credible book and claim, requiring organisations to apply consistent internal approaches and maintain clear reporting with external partners. As with the physical reporting of Scope 1 and Scope 3, when market-based emission profile claims are shared or transferred, alignment is essential to ensure the accuracy of end-user claims.

A clear agreement between key accounting and reporting bodies (e.g., the GHG Protocol and SBTi) would dispel the ambiguity that currently hinders voluntary book and claim efforts, although such clarity may not arrive before 2028.

Until then, the greater use of ISO 14083 accounting ensures that underlying attributes are defined and reported consistently across modes and that system developers can now follow the normative book and claim chain of custody methodology in the new ISO 22095-3 standard [3]. Verification remains crucial for environmental integrity, and continued rigour in inventory emission accounting ensures market-based reporting is similar in nature to traditional emissions reporting. Meanwhile, project-based (impact) methods, where a negative reduction is conferred based on the difference from a baseline, similar to offsetting, are also under review.

Alignment across sectors and modes is imperative. Many organisations are developing their GHG inventory practice while exploring book and claim, underlining the need for co-ordination among both new and experienced actors.

Clarity and transparency around additionality

Voluntary stakeholders strive to uphold widely accepted additionality practices and ensure that book and claim further bends the decarbonisation curve. Users should adhere to these norms, value transparency, and continue to clarify the relationship between voluntary claims and compliance obligations.

Best practices include embedding clear additionality requirements in contracts, disclosing relevant regulatory programs (including incentives), and requiring declarations during certificate issuance [13]. Transparent reporting and third-party audits further strengthen credibility, helping book and claim systems maintain integrity and foster trust.

The policymaker and the standard setter have distinct roles. First, policymakers should design policies with consideration for their complementarity and relationship with other systems, including voluntary book and claim, and they can provide users a consistent, straightforward approach to applying attributes within regulatory contexts when allowed. Second, among other valuable clarifications, the standard setter's position is especially important for facilitating credible and accurate reporting of Scope 3 attributes within flexible chain of custody models.

Relevant data and B2B reporting should be easily transferable through simple documentation, such as a PoS or PoC, conform to industry standard accounting and reporting, and remain harmonised across all transport modes.

Robust book and claim systems

The registry function is closely tied to book and claim's success. The need to track and trace attributes within the complex transport ecosystem is facilitated by credible book and claim registries, databases, and systems that help users manage attribute and certificate issuance, transfer, and retirement – protecting the end user's unique, high-integrity claim.

Best practices emphasise the use of credible registries that verify key attribute data and involve all actors in the certificate lifecycle. In early-stage use cases, basic recordkeeping may suffice, but as systems mature, it becomes essential to transition to robust digital registries with strong governance, simple processes to facilitate third-party auditing, and the ability to handle high transaction volumes. Registries must prevent double issuance and erroneous double claiming through secure systems, digital traceability tools, and interoperability with the registry community. Participants must ensure that their claims align with retired certificates and use established channels to consult auditors who verify the veracity of climate disclosures.

The consistent use of registries by book and claim stakeholders is growing along with the wider recognition of their advantages. While the use of internal ledgers will continue, integrating companies' traceability practices with transparent, secure, third-party-verified, and public registries should build greater trust in individual claims and strengthen the market-based transport ecosystem, especially as systems become more dynamic, reliable, and interoperable.

Universal approaches help simplify book and claim systems

When considering book and claim and its complementary tools, some policymakers and system developers return to the fundamentals – a focus that benefits all users.

Strengthening the system through broad involvement and feedback

Book and claim, whether in a voluntary context or deployed as a flexibility mechanism under regulatory objectives, relies on an interconnected and functional transport ecosystem. First movers and early adopters do not necessarily reflect the broader group of eventual users, and the door must always be open for other organisations to get involved. Moreover, certain features or adjustments might benefit all users of low-emission fuels and services, engaged via book and claim or otherwise. Greater use and feedback give regulators and system designers the confidence that they are developing solutions for the entire ecosystem and ensure market-based mechanisms are durable in the long term.

General accounting principles and independent assurance

Book and claim-based GHG emissions accounting is currently being discussed by relevant parties, with some practices expected to be defined as late as 2028. The building blocks of credible emissions accounting already exist in internationally recognised cross-industry frameworks such as IFRS and GAAP, and credible frameworks embed similar core accounting principles, namely relevance, transparency, completeness, accuracy, and consistency [93, 94], which are also reflected in GHG Protocol and ISO practices. When applied, they enable

clear and rigorous accounting for any application, including transport. The method is not selected for benefit or convenience. Importantly, principles should be complemented by independent, third-party assessments to ensure the “robustness” often sought in book and claim systems, rather than being deferred to the final stages of system development.

Intentional decarbonisation interventions and tools

While the public sector actively engages in transport decarbonisation efforts, it assigns less focus to voluntary book and claim systems. Regulators expect mandates to overshadow voluntary efforts, but they remain optimistic that flexible chain of custody approaches can still play a meaningful role [15,16,17]. Some stakeholders, such as the European Commission, are pursuing a tender process to commission a thematic book and claim study [91]; others are confident that expanding transport ecosystem tools generally, via databases, traceability tools, and focused policy (e.g., incentives), can benefit everyone, whether or not such interventions specifically facilitate voluntary book and claim. Overall, these efforts have the potential to bring much broader benefits. Digitising fuel provider databases brings transparency and enhances traceability and confidence in the underlying infrastructure and data. Requiring disclosures and aligned formatting helps distinguish between compliance and voluntary use of low-emission fuels and services procured via any chain of custody.



Proactive system design streamlines emissions reporting

The corporate emission reporter can become a champion of transport decarbonisation with the right support.

As companies grow and operations expand, the need for clear, repeatable processes for emissions disclosure and compliance becomes critical. They navigate multiple reporting standards while pursuing net-zero targets and greater efficiency through standardisation. A well-designed SOP becomes indispensable, yet each stakeholder still operates within a broad and interdependent context.

Regulators and system designers should work with the individual reporter in mind, understand their competing responsibilities (e.g., other mandates), and try to keep inputs simple and harmonised. A user may be pursuing voluntary sustainability certification (e.g., ISCC), operational compliance (e.g., IMO's Ship Energy Efficiency Management Plan), and also underwriting for a large book and claim-based procurement. Straightforward toolsets enable clear processes for all stakeholders and a more robust ecosystem.

Emission reporters themselves also play a role in simplifying the system. An SOP serves as a roadmap through the complex landscape of emissions disclosure, detailing mandatory actions, options, and choices made to meet varied objectives. Such a standardised internal process flow is the foundation for testing and refining practices. Feedback loops between regulators and companies allow for improvement and system alignment.

Prerequisites for book and claim in active refinement

Additionality and registry interoperability are ripe subjects for regulatory input.

Additionality

While policymakers clarify regulations, system users remain active participants, strengthening processes and addressing prerequisites that they know will align practices with the broader ecosystem and increase credibility. Additionality is one such pillar and serves as a test for sector alignment on voluntary book and claim. In 2024, Global Maritime Forum and MMMCZCS stepped in to harmonise maritime additionality, and the BCC is facilitating discussions to reach a similar consensus in aviation and road transport [35]. This is how characteristics of book and claim systems are determined, and regulators and policymakers might consider collaborating at this crucial moment.

Registry interoperability

The public sector could play an important role in enabling interoperability by increasing the use of systems such as the Union Database (UDB). Beyond the availability of attribute data, interoperability generally involves two key functionalities: interconnection between registries to prevent double issuance, and the transfer of EACs and attributes between registries. The first falls within the scope of RSB’s work under the ISEAL grant and focuses on ensuring system integrity [95, 96]. The second offers greater flexibility and market fluidity. Unless system designers hear from public sector users that this functionality is necessary, it is likely to be deprioritised by registry owners.

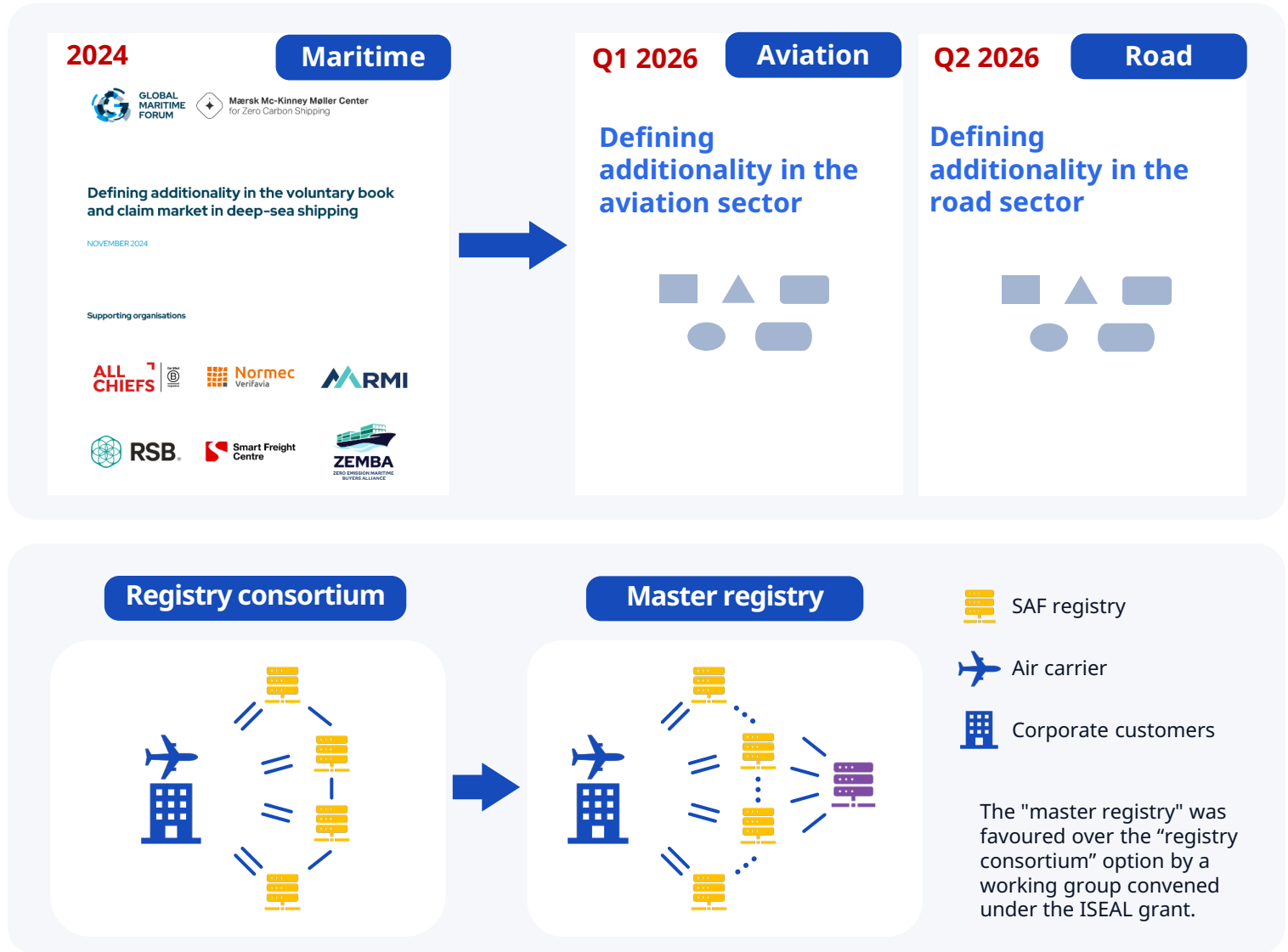


Figure credit: adapted from Shell [97]

ISO's new chain of custody standards provide a structure for transport applications

Requirement setters and users bring consistency to market-based applications through new standards for mass balance and book and claim chain of custody models.

The chain of custody models outlined in ISO 22095:2020 provided enough definition to support nascent voluntary decarbonisation but required further exploration to address emerging needs. With mass balance and book and claim recently gaining wider adoption, new standalone standards for each model (ISO 22095-2 and ISO 22095-3, respectively) promise to help users apply standardised chain of custody logic in their respective industries [1]. When the credibility of the transport sector's decarbonisation efforts is under scrutiny, it is key for industry participants to heed and leverage the agreed-upon principles in their chain of custody applications.

“TIEC”: a new acronym for clear communication

The term “credit” from ISO 22095 was useful for getting the industry started, but in the sustainability context, it can be misleading because of its association with carbon offset credits. The upcoming ISO standards referenced above will use a new acronym: TIEC (transferable instrument with entitlement to claim). This change may require an adjustment period, but its precision benefits all [2, 3]. It clearly defines what actors are doing, namely, transferring something or its attributes to another party for them to claim. When applied consistently, this formal terminology ensures that the data and the nature of the transferable instrument remain unchanged throughout the chain of custody and that only authorised users are entitled to the claim.

A requirement setter that develops the system

The clearly specified role of the “requirement setter” helps address the question posed earlier in this report: “Whose rules do I follow when starting to book and claim?” The language of the new chain of custody standards clarifies two points: first, that a requirement setter exists, and second, that this actor determines key elements of their system. While this does not resolve all issues, it helps users recognise that such authority is inherently subjective. Regulators and other stakeholders, in turn, must understand their roles in confirming, rejecting, or collaborating with the requirement setter. Using a system implies agreement with its rules. Some systems are mandatory, such as regulatory mandates, while others, like voluntary regimes, are not. Nevertheless, voluntary participation still entails a degree of responsibility. SBTi, for example, derives its authority from the trust and consensus of those who choose to follow its guidance. Users of a book and claim system, therefore, act as active partners with the requirement setter in legitimising the mechanism.

Transport-specific application

The new standards will carry different implications across industries, and requirement setters should consider the specific needs of the transport sector while also observing the use of chain of custody models in other sectors. In the chemical sector,

for instance, the “multi-site mass balance” approach is commonly used – a model that shares some similarities with book and claim. While multi-site mass balance may work for chemicals, the physical nature of supply chains will likely need actors and requirement setters to define system parameters more precisely, including geography, balancing period, and physical connection. Such clarity will help voluntary users apply book and claim in transport appropriately, rather than stretching the definition of mass balance or other models.

Residual mix

Lastly, respect for the “residual mix” is paramount and emphasised in emerging standards work (including GHGP's Scope 2 consultation [98] and referenced chain of custody standards). In the new book and claim ISO standard, the residual mix is defined as the “specified characteristics of material or product, within the boundary of a book and claim system, for which TIECs have not been issued or retired and are not allocated within any reliable tracking system” [3]. When one user claims an attribute, and a residual mix is accurately calculated, the second user instead receives a different TIEC representing the other attributes in the system. This concept is directly linked to the uniqueness of claims and the avoidance of erroneous double counting. This perspective situates individual achievements within the collective accounting framework, ensuring transparency, fairness, and credibility across the ecosystem.

Verification and operational reporting under evolving policy

Aligned regulations, systems, and user monitoring plans could decrease downstream friction and increase trust and participation.

European policymakers present a compelling case study for continual improvement and system alignment. Over decades, systems have been connected or repurposed to enable their complementary use. Voluntary book and claim systems benefit from and piggyback on such alignment. System participants, especially carriers, operate within and report to such regulatory regimes and, as a result, consistently change their processes and procedures to adapt to evolving requirements.

Understanding how carriers respond to regulation and incentives can help authorities design more effective frameworks and enable actors to decarbonise further through voluntary action, including the use of book and claim, once initial regulatory objectives are met.

One helpful example comes from maritime, where observers can witness European policy converge in real time:

- The EU MRV Maritime Regulation was adopted in 2015, with the first reporting period in 2018.
- The EU ETS was adopted in 2003, launched in 2005. It is currently in phase four, with a 2024 expansion covering maritime GHG emissions from large ships at EU ports [99].
- FEUM was formally adopted in 2023 and has been active since January 2025. It also leverages MRV and requires participants in the “flexibility mechanism” to register with a single verifier for “pooling” compliance.

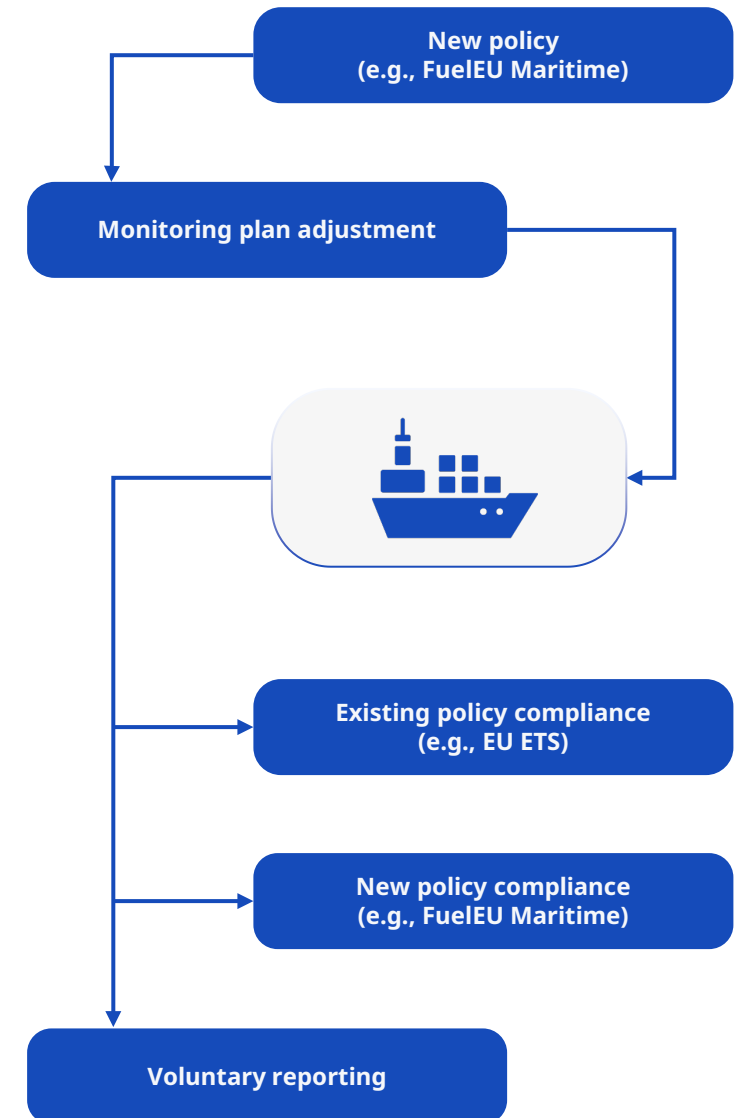
- IMO NZF (adoption postponed to 2026) greatly expands similar reporting practices for European operators and beyond their regulatory geographies.

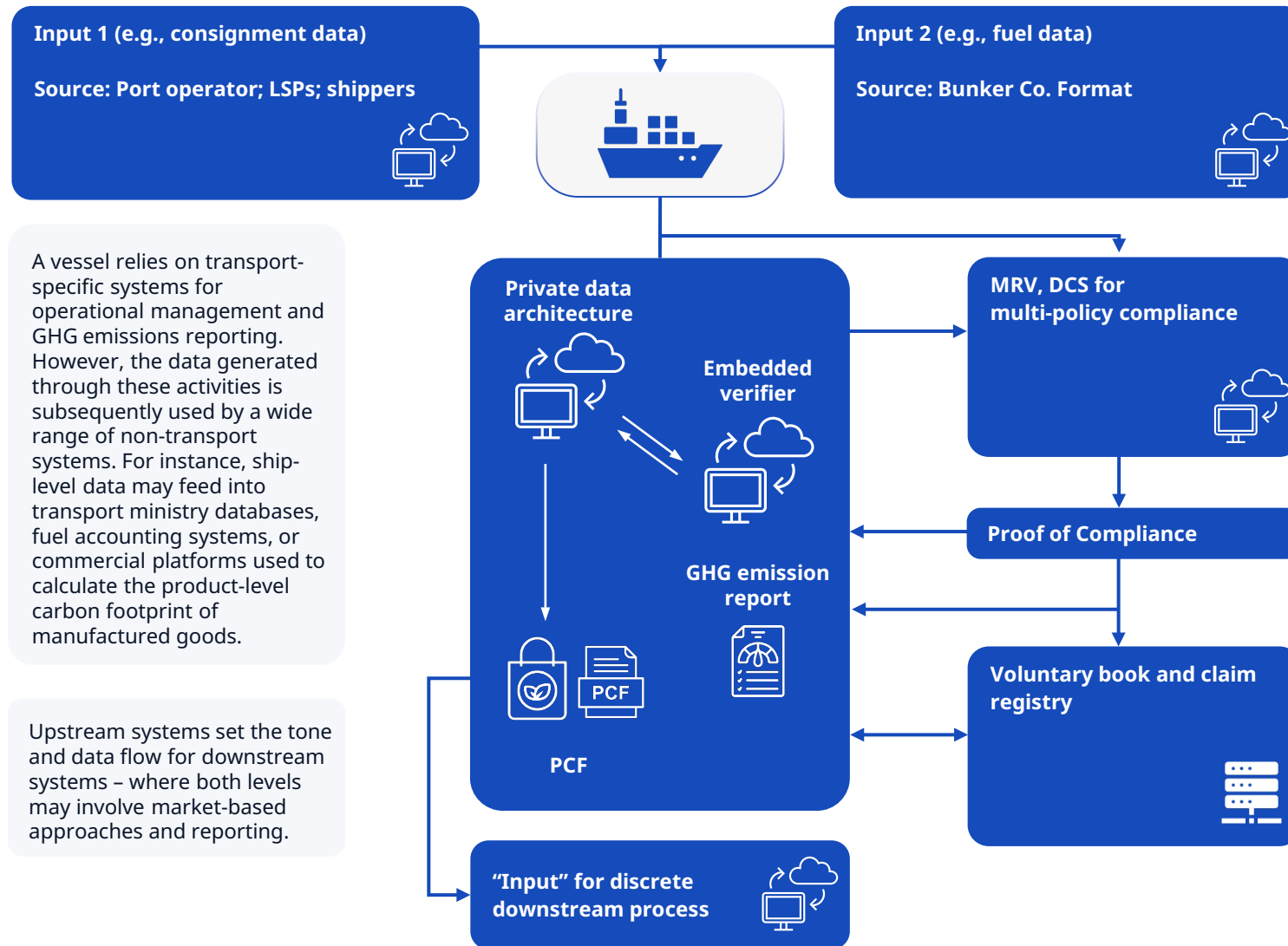
Vessel operators must comply with both old and new regulations, and official documentation (i.e., responses to frequently asked questions) notes that one vessel operator will need to submit two separate monitoring plans for the same vessel to comply with both policies:

“Yes. Two separate sets of required Monitoring Plan elements (in MRV and FuelEU) will require submission of two Monitoring Plans ...In practice, however, once uploaded in the FuelEU database, the Monitoring Plans will, together, allow for complementary submission of data for both MRV/ETS and FuelEU.” [100]

With a focus on the regulator and system level, transport providers are well aware that they operate within and report to systems that are still under development, underpinned by policies in seemingly constant realignment.

Regulatory and voluntary systems are gradually converging, yet the process can still take years. Voluntary systems can help close the gap and advance innovation. For example, Katalist leverages MRV data and common inputs in its discrete verification process when booking low-emission transport into its registry, as detailed in its user manual [101]. Simplicity eases compliance and facilitates decarbonisation.





Interconnection and digitalisation enable smart systems and aligned product claims

Connecting systems is essential for the emerging book and claim mechanism, ensuring that verification and reporting processes feed reliably into all downstream disclosures.

Extending the maritime example, just as regulators have connected data reporting systems in Europe, the IMO has prioritised standardised and harmonised data collection globally. This effort extends to a ship's data reference model, developed with major classification societies, to streamline 140 input parameters and support compliance with multiple systems, e.g.: IMO's DCS, EU MRV, CII, and FuelEU Maritime [102].

Efficient systems generate clear outputs that feed into downstream claims. These claims are increasingly important; for instance, a low-emission product claim, such as one attached to a shipment of ethanol, can convey added value to the end consumer.

Digital systems enable such operations at scale. Without upstream alignment in the chain of custody, initiatives such as the Partnership for Carbon Transparency (PACT) [103] or iLEAP [104] would not be possible. These projects align practices around PCF for the broader economy and the transport sector, respectively.

Interconnection and digitalisation enable outputs from book and claim or physical delivery to be communicated in terms of carbon per unit, which can be easily understood and used as inputs in other systems.

A vessel relies on transport-specific systems for operational management and GHG emissions reporting. However, the data generated through these activities is subsequently used by a wide range of non-transport systems. For instance, ship-level data may feed into transport ministry databases, fuel accounting systems, or commercial platforms used to calculate the product-level carbon footprint of manufactured goods.

Upstream systems set the tone and data flow for downstream systems – where both levels may involve market-based approaches and reporting.

Principles and best practices illuminate a pathway towards consensus

35+ practitioners found preliminary consensus, which can serve as useful input for the regulator navigating in a complex space.

Despite the divergence characterised in the preceding chapters, the publication of the BCC's Principles and Best Practices for Book and Claim in Heavy Transport proves that collaboration can yield a path forward towards convergence.

As illustrated, this document outlines how its 11 key principles are relevant to policymakers and users alike. Its strength lies in focusing on the ecosystem's needs rather than individual stakeholders or emission reporters. While some contributors viewed the document as aspirational, few indicated that they had already met all of the principles and best practices [14].

This signals hope for further convergence. While the Community intends to revisit the document at some point in the future, it is focusing on convergence in its 2026-27 work and, alongside other stakeholders, will judge the appropriate time to expand the work [105].

Further reading: Book and Claim Community's [Principles and Best Practices](#).

Principle	Relevance to practitioners and policymakers
1. Require certification of environmental attributes	Enables alignment with voluntary and compliance schemes; establishes the attribute, streamlines certification
2. Use credible normative documents	Narrows the field of expected normative inputs for practitioners
3. Use credible registries	Provides a framework of what best practice looks like, currently, in the absence of a registry standard and encourages registry use
4. Prevent erroneous double counting	Harmonises varied expectations for erroneous double counting risk prevention
5. Ensure additionality	Harmonises expectations around a difficult and fundamental prerequisite in voluntary book and claim
6. Enable multiple distinct claims for the same voluntary interventions	Clarifies the boundary of erroneous double counting prevention and Scope 1-Scope 3 relationship
7. Implement robust governance	Sets a public bar for what constitutes an independent and deliberate system
8. Ensure data accuracy	Unifies collective responsibility to ensure validity of data and disclosure
9. Make system requirements and functionalities transparent	Sets a public bar for system transparency on methodology
10. Accurately procure and transparently report certificates	Provides a minimum expectation for the system user for attribute relevance
11. Collaborate to mitigate risks	Promotes the interconnected nature of the sector and shared interest for quality

Essential indicators of progress in the pursuit of credible book and claim for transport

As the user pool grows, success can be tracked by how these users apply the toolset, along with market and regulatory response.

Stakeholder capacity

User maturity around book and claim varies greatly. One can assess the relative capabilities of specific actors through many methods: underlying SOP development, existing third-party verification practices, and fundamentals of accounting and reporting.

It is one thing for a participant in book and claim systems to be competent, and it is another to convey that trust to the wider sector. This is where assurance professionals come in, playing an increasingly important role.

As the book and claim market grows, participants may no longer be able to vet transactions and partnerships through bilateral ties, familiarity, or extended pilot projects. Systems must therefore be established to assess each stakeholder's conformance following these questions: "Do they report using GHG Protocol-compliant inventories? Does the underlying accounting follow ISO 14083? How do they leverage third-party assurance to demonstrate trust and credibility?"

The individual stakeholder and system user are central to the system's success and the overall ecosystem's credibility. Market developers such as system designers, policymakers, and first movers must provide sufficient guidance and guardrails for beginners while scaling the system and preparing it for experts.

Market maturity

It is essential to continuously assess market maturity. Key bodies, such as the CDP, SBTi, and the Global Reporting Initiative (GRI), have noted the growth of reporting practices, with 73% of the world's 250 largest companies reporting sustainability data [70]. This signals potential for solid baseline data for transferable instruments and final GHG claims. Furthermore, over 12 500 companies have set SBTi targets. But does this mean the transport sector is ready to take a market-based approach?

Advancing sustainable operations is essential, but assessing an organisation's capability to apply book and claim in transport requires evaluating key factors such as the quality of transport-compliant reporting, the level of chain of custody expertise, and the availability and consistency of credible registries.

It is possible to position oneself among first movers and feel assured that the market is ready, yet system developers and market observers are increasingly focused on organisations operating just outside these expert circles. Key questions arise: "Can an average emissions reporter follow recognised transport standards to ensure comparability of attributes? Is their use of flexible chain of custody models consistent with established standards and the requirement setter's guidance? How consistent and repeatable is this practice?" As observers assess the ecosystem, they should see registries emerge that are credible, harmonised, and aligned with shared norms.

Regulatory and voluntary complementarity

The earlier example of MRV system integration with compliance and data reporting regimes illustrated the potential for dual use of integrated systems. However, it must be equally straightforward to distinguish or separate an attribute from such systems when needed. Regulators and book and claim developers should consider the requirements of market-based users to ensure interoperability and complementarity.

Attention to detail is essential. The specific actions a user can take within a system or regulatory framework must be clearly defined. The ability of stakeholders to avoid risky claims depends on sound system design, and observers expect processes that are straightforward and repeatable. For example, when an actor operates within policy contexts such as the EU ETS and allocates low-emission attributes for voluntary procurement, it is key for the carrier to communicate their voluntary status. Regulators could enable beneficial interaction with their mandate region by design, allowing a carrier the option to cancel an ETS allowance or identify its relevance in order to support the client's preference around a related voluntary claim.

Finally, practitioners also wish to see harmonised regulation and incentives across regions, especially where flexible chains of custody are allowed under mandates. Where harmonisation may not be possible at the system level, one would benefit from clear documentation or supplementary tools that help the reporting body communicate the nature of their transaction transparently.

Policymakers' central role: targeted chain of custody use, clear policy, and voluntary engagement

The regulatory use of flexible chains of custody presents an opportunity to set the tone for high-quality book and claim and clear end-use reporting. Voluntary market-based champions can complement regulatory goals if enthusiasm is harnessed correctly.

Align with international standards and evaluate best practices

Attendees at ITF's workshops were optimistic about system expansion and approval for voluntary book and claim efforts by standard holders such as GHG Protocol and SBTi. However, they also noted an opportunity for policymakers to leverage flexible chain of custody models in regulatory contexts [14, 43]. Users are eager to accelerate decarbonisation with this model in both contexts by efficiently aggregating customer demand and enabling the uptake of low-emission transport solutions. The moment is ripe to better define the book and claim's contribution. Regulators and system developers should step into the "requirement setter" role, consider targeted book and claim applications in alignment with international chain of custody standards, especially ISO's new chain of custody and book and claim standards, and ensure that tools, rules, and systems also enable complementary, voluntary decarbonisation efforts.

Engage, drive transparency, and support complementarity

By engaging book and claim practitioners early to understand common needs, policymakers build crucial institutional capacity to understand the model. Ultimately, it can help ensure more effective and complementary decarbonisation efforts while mitigating greenwashing events that will damage both paradigms. Mistakes will happen, but with tools that bring transparency to fuel

certification, align accounting and reporting, and communicate demand to low-emission product providers, the sector can foster broad trust and confidence.

While regulators and key standard setters are currently reluctant to grant book and claim practitioners too much freedom, implementing tools that benefit both regulatory decarbonisation efforts (potentially including book and claim) as well as voluntary book and claim-based mitigation is a safe place to focus initial efforts. Examples include the UDB, harmonised emission factors, and clear policy when leveraging flexible chain of custody models. Corporates seek ways to comply with mitigation commitments while also implementing voluntary measures. Without engagement, the social and reputational fear of greenwashing is an effective yet inefficient integrity measure. The majority of practitioners do operate with noble caution. However, with engagement, the sector can align efforts and shift its underlying foundations for more durable change.

Implement clear policy to guide flexible chain of custody approaches

Policies that incorporate flexible chain of custody models may help the private sector comply at lower costs and ensure goals are met, but they can be complex. Examples referenced above include ReFEUA's flexibility mechanism or the IMO's approach to pooling decarbonisation efforts. Confusion about their implications limits effectiveness. Following common chain of custody standards is a

start, but setting clear and consistent requirements will enable all users to understand their relation to the policy or system faster. The flexibility mechanism aids compliance, but should users also count flexible chain of custody-enabled fuels within relevant reporting? This and similar questions are difficult for the voluntary community to answer on its own.

Support beneficial modal and geographic expansion

Early book and claim practices generate repeatable processes and expand application to new regions, modes, and adjacent use cases. Such efforts can align with policymakers' objectives and integrate effectively with clear regulation, supported by complementary tools referenced above. Officials might find regulatory regimes and policies tested sooner rather than later. Carriers and cargo owners generally start with a pilot, then expand the application of book and claim while keeping practice low-risk, close to centres of operation and existing partner networks. As confidence grows, an organisation embraces book and claim and engages related yet physically distinct supply chains or expands to a new transport mode. The savvy regulator tracks these developments and can gather data that justifies matching voluntary enthusiasm with a policy change – a fuel mandate increase, for example. In turn, this establishes the new normal for all operators and moves the goalposts of the voluntary space further towards transport's net-zero ambition.

Transport's vision for book and claim impact

Stakeholders build the market-based future, sharing optimism for its potential to drive change and decarbonise.

While it sometimes appears distant or complex, the vision is simple: a booking party creates a credible, certified attribute based on the generation of a low-emission transport fuel or service. They utilise a registry to mitigate the risk of erroneous double counting, communicate with all relevant stakeholders, and verify accounting and reporting against independent transport standards according to its regulatory or voluntary application.

The claimant applies its unique EAC to “similar in nature” transport, transparently reports the GHG emissions associated with its procured transport activity – Scope 1 by the carrier, Scope 3 by supply chain actors – and follows all regulations.

As a result, fuel and solution providers receive the demand signal and produce more low-emission products, while standard setters, system developers, and policymakers have sufficient vision to ensure systems operate in a complementary manner. All parties use book and claim to advance transport towards net-zero goals.

This vision serves as a guide to challenge the current paradigm, shape more ambitious approaches, and increase the physical availability of low-emission products. With continued care and measured application, book and claim has the potential to support and accelerate the sustainable transition of the transport sector.



Annex

List of workshop participants on
5 February 2025 and references.



List of workshop participants on 5 February 2025 (1)

Affiliation	First name	Last name	Presence
Airbus	Andrea	Caderon	In-person
Airbus	Tony	Derrien	Online
Airbus	Simone	Rauer	Online
Amazon	Javier	Cerda	In-person
Amazon	Marina	Lussich	Online
Amazon	Anna	Kerner	Online
Amazon	Zainab	Naqvi	Online
Amazon	Shayan	Momeni	Online
Aramco	Mohamed Ali	Saafi	In-person
bp	Sebastian	Hirsz	In-person
bp	Jenna	Wilson	In-person
bp	Stephanie	Abbott	Online
Center for Green Market Activation (GMA)	Laura	Hutchinson	In-person
Council on Sustainable Aviation Fuels Accountability (CoSAFA)	Madison	Carroll	In-person
DHL Group	Noelle	Froehlich	In-person

List of workshop participants on 5 February 2025 (2)

Affiliation	First name	Last name	Presence
DHL Group	Lara	Voigt	Online
European Commission, DG Mobility and Transport	Marco	Paviotti	In-person
European Commission, DG Mobility and Transport	Alexis	Chausteur	Online
Exxonmobil	Christophe	Pouts	In-person
Exxonmobil	Jason	MacDonald	Online
French Agency for Ecological Transition (ADEME)	Marc	Cottignies	In-person
French Agency for Ecological Transition (ADEME)	Pierre	Lupoglazoff	In-person
GHG Protocol / World Resources Institute (WRI)	Kevin	Kurkul	Online
GHG Protocol / World Resources Institute (WRI)	Michaela	Wagar	Online
Global Maritime Forum	Elena	Talalaso	In-person
Gruber Logistics	Andrea	Condotta	In-person
Gruber Logistics	Ettore	Gualandi	In-person
ICF	Inma	Gomez	Online
International Air Transport Association (IATA)	Azim	Norazmi	In-person
International Power-to-X Hub	Frank	Mischler	Online

List of workshop participants on 5 February 2025 (3)

Affiliation	First name	Last name	Presence
International Sustainability and Carbon Certification (ISCC)	Adam	Kirby	In-person
International Transport Forum (ITF)	Young Tae	Kim	In-person
International Transport Forum (ITF)	Sharon	Masterson	In-person
International Transport Forum (ITF)	Yaroslav	Kholodov	In-person
International Transport Forum (ITF)	Andreas	Kopf	In-person
International Transport Forum (ITF)	Diego	Botero	In-person
International Transport Forum (ITF)	Dominique	Bouquet	In-person
International Transport Forum (ITF)	Stella	Checa Cañas	In-person
Kuehne+Nagel	John	De Dryver	Online
Kühne Logistics University (KLU)	Alan	McKinnon	Online
Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping (MMMCZCS)	Frederik	Jacobsen	In-person
Pirelli	Stefano	Porro	Online
Rocky Mountain Institute (RMI)	Oscar	Hernandez	Online
Rolls-Royce	Raphael	Fabian	Online
Rolls-Royce	Katja	Loehnert	Online

List of workshop participants on 5 February 2025 (4)

Affiliation	First name	Last name	Presence
Roundtable on Sustainable Biomaterials (RSB)	Max	Eichelbaum	In-person
Roundtable on Sustainable Biomaterials (RSB)	Gill	Alker	Online
Shell	Karin	Liebreks	In-person
Shell	Mark	Staples	In-person
Smart Freight Centre (SFC)	Quintin	Barnes	In-person
TotalEnergies	Sophie	De Richecour	In-person
TotalEnergies	Alexander	Rech	In-person
TotalEnergies	Bernard	Hoffait	In-person
TotalEnergies	Christophe	Girardot	Online
Transport Canada	Alissa	Boardley	Online
Volvo Group	Bert	D'Hooghe	Online
World Business Council for Sustainable Development (WBCSD)	Nisalyna	Bontiff	Online

Disclaimer: The workshop participants provided insights on the subject. Their participation does not in any way constitute an endorsement of the content of this report.

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The report is based on original research and builds upon discussions held during an expert workshop on 5 February 2025 with members of the ITF Corporate Partnership Board (CPB) and external guests. A workshop participant list is included at the end of this report. The work for this report was in the context of a project initiated and funded by the CPB. These projects combine policy discussion with insight from the private sector. They are launched where CPB member companies identify emerging issues in transport policy or where they feel that innovation is challenged by the transport system. Led by the ITF, work is carried out collaboratively in working groups consisting of CPB member companies, external experts and ITF staff.

About ITF

Who we are

The International Transport Forum is an intergovernmental organisation with 69 member countries. It acts as a think tank for transport policy and organises the Annual Summit of transport ministers. The ITF is the only global body that covers all transport modes. The ITF is politically autonomous and administratively integrated with the OECD.

What we do

The ITF works for transport policies that improve people's lives. Our mission is to foster a deeper understanding of the role of transport in economic growth, environmental sustainability and social inclusion and to raise the public profile of transport policy.

How we do it

The ITF organises global dialogue for better transport. We act as a platform for discussion and pre-negotiation of policy issues across all transport modes. We analyse trends, share knowledge and promote exchange among transport decision makers and civil society. The ITF's Annual Summit is the world's largest gathering of transport ministers and the leading global platform for dialogue on transport policy.

About CPB

The Corporate Partnership Board (CPB) is the ITF's platform for engaging with the private sector and enriching global transport policy discussion with a business perspective. The members of the ITF Corporate Partnership Board are: Airbus, Alstom, Amazon, Aramco, AutoCrypt, Bosch, bp, Dekra, DHL, DP World, ExxonMobil, FS Italiane, Honda, Hyundai Motor Company, Kakao Mobility, Michelin, Microsoft, Pirelli, RATP Group, Rolls-Royce, Shell, Siemens, TotalEnergies, Toyota, Uber, and Volvo Group.

Claiming the Future: Can Book and Claim Support Low-Emission Transport?

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This report examines the book and claim chain of custody model as a potential mechanism to advance transport decarbonisation through the flexible procurement of low-emission fuels and services. It explores how environmental attributes can be transferred independently of physical delivery via this approach, broadening access to decarbonisation opportunities across regions and value chains. The report examines book and claim at the intersection of voluntary initiatives and regulatory frameworks, identifying the practical factors that determine its integrity and effectiveness.

The publication maps stakeholders, schemes, platforms, voluntary frameworks, policies, and governance models that define current practice. It distinguishes between prerequisites for a robust and transparent system and indicators of progress that track its ongoing development. The report also provides guidance for policymakers, many of whom are not yet fully engaged with this topic, outlining how they could play a constructive role as facilitators across emerging industry and policy initiatives.

Book and claim's application in transport is rapidly evolving. The report is a snapshot in time that aims to help actors navigate this complex and fragmented landscape by consolidating existing knowledge and perspectives on book and claim to inform future dialogue and policymaking with balanced evidence that serves the interests of all stakeholders.

Find more information on the project:
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