Connecting capital to carbon

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Transport decarbonization is, at its core, a financing challenge. The fuels exist, the technologies are advancing, and the regulatory frameworks are also developing at a pace. The challenge that remains in many cases is the availability and movement of capital to speed up these projects. Book and Claim, and the marketplace infrastructure being built to facilitate it, is one of the more credible mechanisms available to close this financing gap.

The scale of the task is well understood. The maritime sector alone is estimated to require around $4.0 trillion in investment by 2050 to complete its energy transition. Aviation, accounting for the full atmospheric warming effect of contrails and NOx emissions, contributes roughly 4.0% of global greenhouse gas output, yet current technological progress is trimming that figure by only 1.0-2.0% per year. Road, rail, and sea shipping face structurally similar constraints. These are not industries that can decarbonize by swapping one energy source for another overnight. The transition is long, capital-intensive, and complicated by the current fragmentation of global supply chains.

Toward the greatest impact

But that complexity is precisely what makes Book and Claim so relevant. It cuts the physical dependency. Under this methodology, a fuel producer or a carrier issues an Environmental Attribute Certificate (EAC) representing a verified carbon reduction associated with a defined volume of sustainable fuel or any other decarbonization technology. The EAC buyer, usually a cargo owner or freight forwarder, purchases the certificate – not the fuel itself – acquiring the environmental attributes associated with the verified emissions reductions achieved through the use of that fuel. Therefore, EAC buyers would finance verified emissions reductions that have occurred within the transport sector, and by aligning on the applicable framework and claim guidance, they would be able to account for those reductions within their decarbonization strategy.

This structure allows a European freight operator to finance a marine biofuel project in Southeast Asia, or a logistics company in North America to contribute to sustainable aviation fuel development at an airport that is not necessarily connected to their value chain. As a result, geography ceases to be a barrier; capital can flow toward the projects with the greatest impact, rather than only to those within physical reach.

At scale and across multiple transport modes, this demand aggregation creates something else that is currently absent from much of the decarbonization landscape: clear pricing signals. When enough buyers participate in a Book and Claim marketplace, producers gain the demand and revenue visibility they need to increase scale, and investors gain the market evidence they need to back new projects. The acceleration of sustainable fuel production, which remains one of the sector's most acute bottlenecks, becomes an increasingly attractive investment prospect.

Convergence of regulatory recognition

Book and Claim is not operating in a policy vacuum. Frameworks including FuelEU Maritime and ReFuelEU for aviation are already reshaping how transport companies approach their energy mix and associated reporting obligations. These regulations create incentives as well as requirements to demonstrate credible engagement with sustainable fuels.

In parallel, the recognition of Book and Claim within voluntary and mandatory reporting frameworks has strengthened considerably. The Science Based Targets initiative, the GHG Protocol, and the Corporate Sustainability Reporting Directive (CSRD) have each updated their guidance to accommodate Book and Claim as a legitimate component of a net-zero strategy. The International Organisation for Standardisation has published ISO 22095, which provides guidance on chain-of-custody models, including Book and Claim systems, with specific attention to system boundaries, defined timeframes for certificate issuance and retirement, as well as safeguards against double-counting.

This convergence of regulatory recognition represents a meaningful shift. It reduces the ambiguity that has historically made some corporate buyers cautious about engaging with Book and Claim instruments, and it creates a more consistent foundation for cross-border transactions.

The integrity question

Scepticism surrounding Book and Claim tends to focus on three concerns: whether the emissions savings are genuine; whether they can be claimed by more than one party; and whether the methodology is transparent enough to satisfy corporate and regulatory scrutiny. These are reasonable questions, and the answers have become considerably clearer as the market has matured.

Double-counting is the most frequently cited risk and the most tractable. Independent registries, such as the 123Carbon Registry, track the full lifecycle of each EAC, from issuance through ownership transfer to retirement, ensuring that a single verified carbon reduction can only be claimed once. Engagement with reputable, independent registry infrastructure is not optional for a credible Book and Claim program; it's foundational.

Transparency remains inconsistent across the market. Buyers operating under CSRD or equivalent frameworks need assurance that the life-cycle emissions data underpinning a certificate has been rigorously calculated, independently verified, and reported consistently. The market does not yet uniformly deliver this. Research conducted by 123Carbon in collaboration with Smart Freight Centre and Normec Verifavia recently assessed 22 data

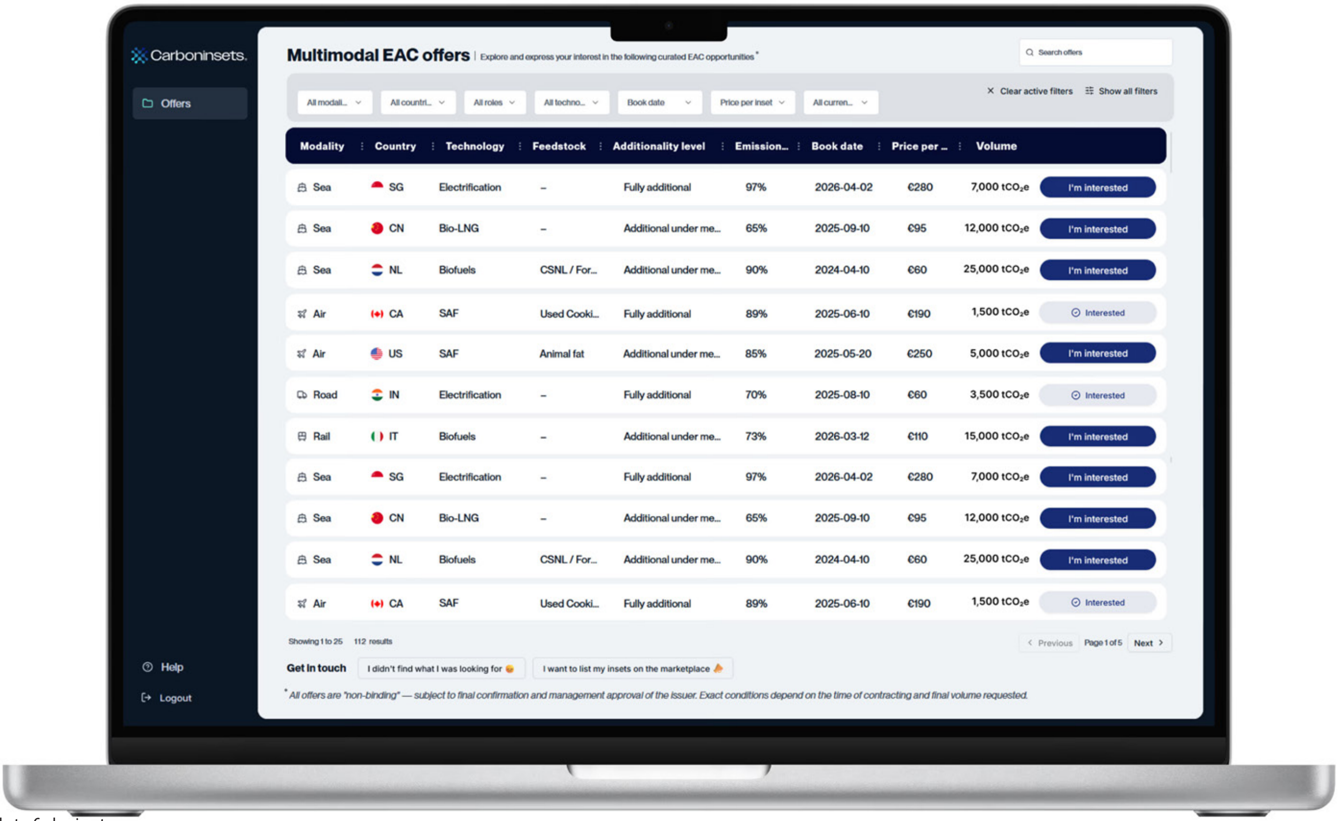

Photo: Carboninsets

points across certificates from five airlines and fuel providers, as well as two major SAF suppliers. Their analysis revealed that only three data points achieved a full score across the seven assessment criteria, uncovering a significant gap in the quality and completeness of information available to buyers. Consistent, independent standards for certificate quality, alongside more effective registry interoperability, are needed to provide market assurance in the quality and transparency of the accounting data held within an EAC.

Additionality remains one of the most important considerations in assessing the quality and impact of an EAC. At its core, additionality seeks to ensure that certificate revenue contributes to accelerating the adoption of sustainable technologies, rather than just monetizing activity that would have occurred regardless. While approaches vary across transport modes and regulatory environments, stronger EAC frameworks increasingly incorporate safeguards designed to strengthen additionality, helping direct capital toward projects and fuel pathways where demand can play a meaningful role in scaling deployment.

Removing commercial friction

Integrity alone, however, does not make a market function. Supply is distributed across different registries, fuel types, transport modes, and geographies. Sellers, conversely, often lack visibility of where qualified demand exists.

This is the market infrastructure problem that Carboninsets was built to address. We have recently launched the first marketplace for global and multimodal EACs, designed to bring verified supply and qualified demand together across road, rail, marine, and aviation decarbonization. The platform is designed to remove commercial friction by giving buyers the tools to discover supply, compare different quality levels, access transparent pricing, and transact across multiple transport modes within a single environment. Of course, all EACs that are transacted via the marketplace are already 'compliance ready' as they have been issued and are ready to transfer through the 123Carbon Registry.

For cargo owners and freight forwarders, this means a more direct route to credible, verifiable decarbonization contributions, without being limited by the physical availability of sustainable fuels in a specific port trade lane. For fuel suppliers and carriers, it means access to a broader demand base and the market signals needed to support investment decisions.

Book and Claim, supported by robust marketplace infrastructure, represents one of the most practical mechanisms available to accelerate transport decarbonization at scale. Yet, again, market integrity alone is not enough. Buyers must be able to identify credible opportunities, suppliers must be able to access qualified demand, and both must be able to transact efficiently at scale. They need transparent access to supply, clear pricing signals, trusted data, and efficient ways to transact across transport modes and geographies.

This is the role that the marketplace infrastructure is increasingly playing. By bringing together verified EAC supply and qualified demand in one marketplace, Carboninsets helps turn Book and Claim into a scalable financing mechanism – improving transparency, increasing liquidity, and accelerating capital toward the sustainable fuel projects that will underpin transport's long-term transition. □