Key Issues in the Net-Zero Transition of the Transportation Services Sector

Lo, Shih-Fang | Research Fellow, The Second Research Division, CIER

Su, Pei-Yi | Analyst, The Second Research Division, CIER

This paper aims to examine critical issues faced by Taiwan's transportation services sector in pursuing net-zero carbon emission goals, particularly focusing on the government's mandatory greenhouse gas (GHG) inventory measures set to take effect from 2025, which are designed to accelerate the industry's decarbonization transformation. The study focuses on three core issues, including mastering domestic and international decarbonization information, how transportation service providers respond to mandatory GHG inventory requirements, and the opportunities and challenges arising from the surging market demand for transportation-related carbon footprint data.

Background and Targets of Carbon Reduction in the Transportation Sector

Based on the Climate Change Response Act, the Taiwanese government has increased its 2030 emissions reduction target to 28±2% compared to the base year (2005), with the transportation sector specifically tasked to achieve a 20% reduction. Under these regulations, railway, metro systems, and passenger and freight transportation companies operating more than 200 vehicles are now included in the mandatory GHG emissions inventory. This initiative aims to enhance corporate awareness of their own carbon emissions and promote effective carbon management practices.

Issue 1: Transportation sector GHG reduction policies involve extensive coordination; timely integration of international and inter-ministerial information is essential for precise planning and strategic adjustments

Decarbonization policies within the transportation services sector are extensive and complex, covering multiple dimensions such as climate policy, energy and fuel regulations, vehicle manufacturing standards, and infrastructure development. Precise integration of international experiences and domestic ministerial data is required for effective strategic adjustments. For instance, the European Union's "Fit for 55"

package serves as an illustrative example, encompassing comprehensive strategic integration across emission standards, carbon trading schemes, charging infrastructure, demand-side policies, and financial support mechanisms, thereby providing a clear international reference.

Issue 2: Transportation services face dual pressures from regulatory mandates and market demands; it is urgent for both large and small-medium enterprises (SMEs) to build GHG inventory capabilities

The transportation service industry currently faces dual challenges from policy regulations and market expectations. The Ministry of Environment anticipates adding around 500 enterprises to the mandatory GHG inventory list, including approximately 36 transportation service providers. Even SMEs below mandatory reporting thresholds might be indirectly compelled to conduct carbon inventories due to ESG demands from upstream and downstream supply chain partners. However, transportation companies typically lack internal carbon management systems, qualified personnel, and appropriate inventory tools. Additionally, complex fleet management structures and data integration challenges significantly hinder the implementation of carbon inventories, generating considerable operational anxiety among businesses.

Issue 3: Market demand for transportation carbon footprint data is surging; standardized processes are needed to transform this demand into business opportunities in vehicle electrification and carbon reduction

With the growing prominence of ESG practices, market demand for accurate transportation carbon footprint data is rapidly increasing. Nevertheless, industry-wide standardized disclosure mechanisms and efficient real-time data collection capacities remain lacking. Currently, government-disclosed carbon footprint data are neither timely nor methodologically consistent. Companies often rely on government-provided estimates, resulting in insufficient data accuracy to satisfy client demands. However, with increasing vehicle electrification and advancements in IoT technology, transportation providers are expected to generate more precise and transparent carbon footprint data through electrified vehicles and real-time monitoring systems, thereby enhancing their market competitiveness and capturing low-carbon business opportunities.

This study concludes that the success of the transportation industry's net-zero transition hinges on effective communication and coordination among the government, industry stakeholders, and academic research institutions. Therefore, it recommends

establishing cross-sectoral dialogue platforms to promote the practical implementation of policies, progressively achieving sustainable transformation objectives within the transportation services sector.

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