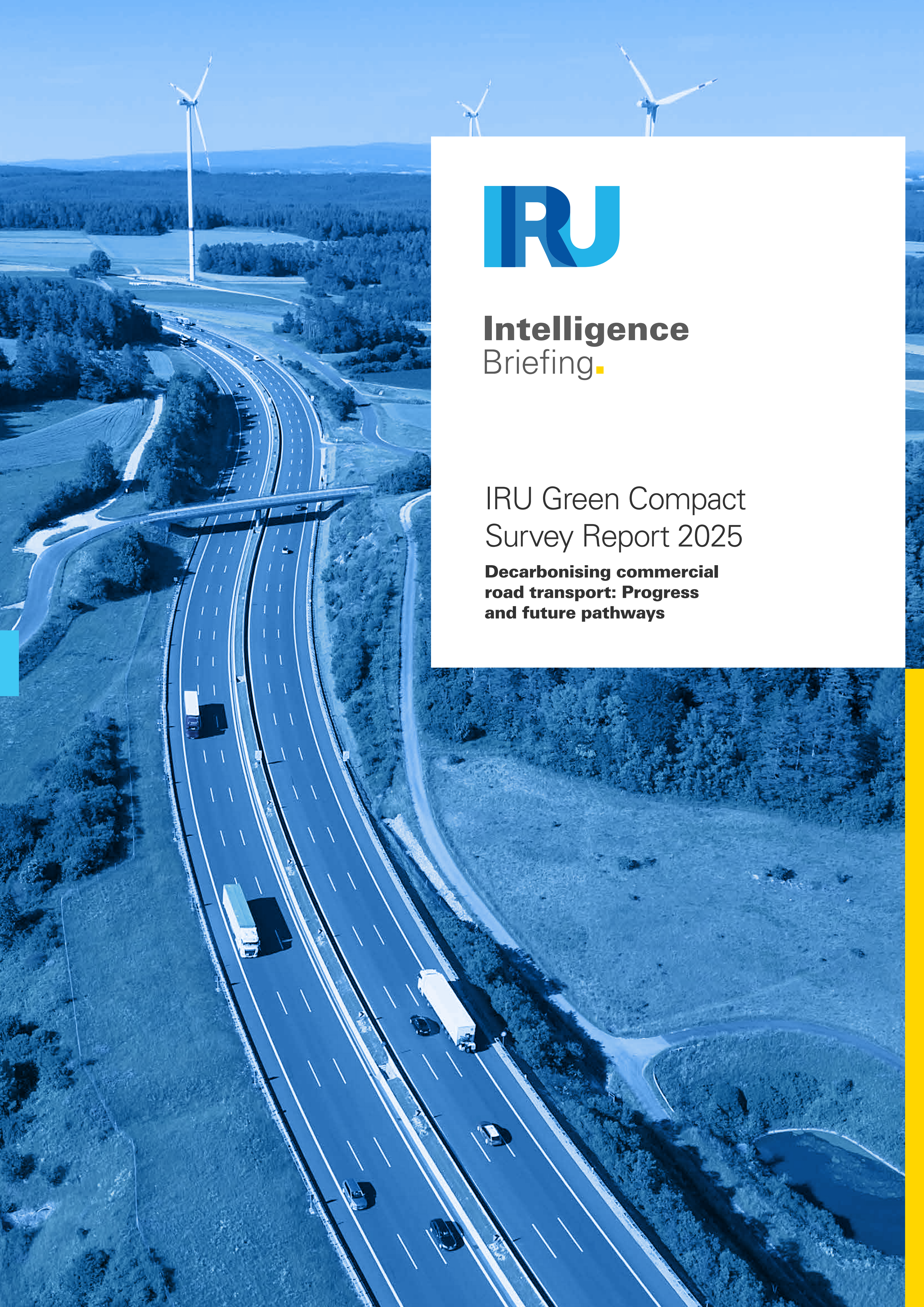


Intelligence
Briefing.

# IRU Green Compact Survey Report 2025

**Decarbonising commercial road transport: Progress and future pathways**

# Contents

## Acknowledgements

Thank you to all IRU members and partners that have contributed to this report.

# Executive summary

The IRU Green Compact Survey Report examines the decarbonisation status of commercial road transport operators in Australia, Central Asia, Europe, Mexico and Türkiye. The findings reveal both achievements and challenges on the path to net-zero emissions.

Transport operators are deeply concerned about the challenges posed by decarbonisation. In Europe, they expressed the highest level of apprehension (around 80%). This worry stems primarily from uncertainties about cost recovery and customers' willingness to absorb higher operational costs. Despite these concerns, less than a third of operators believe the industry is becoming too complex, demonstrating remarkable resilience.

This report is structured based on the main workstreams of the IRU Green Compact: efficiencies, alternative fuels, collective mobility and enabling conditions.

On efficiency measures, the survey probes operators' efforts to leverage more efficient drivers, vehicles and logistics. Human factors, particularly driver efficiency, can reduce fuel consumption by 15%. However, only 40% of operators have eco-driving programmes, with a notable disparity between Western Europe (70%) and Central Asia (20%). Vehicle efficiency improvements – through technologies like low rolling resistance tyres, aerodynamic devices, and preventive maintenance — are being adopted at varying scales across regions. Logistics optimisation, including reduced empty runs and increased load factors, is widely practised, with European operators having the most comprehensive approach to efficiency measures.

The adoption of alternative fuels also varies across regions. Biofuels dominate current alternative fuel usage across all surveyed areas, while electric vehicles are gaining momentum, particularly in Western Europe. Battery-electric vehicles face challenges due to higher acquisition costs (two to three times higher than diesel vehicles) and infrastructure limitations (only 1,000 plugs for 40,000 electric commercial vehicles in Europe). Adoption of hydrogen technology is limited, with current use mostly confined to passenger transport in Western Europe.

Collective mobility already offers the potential to reduce passenger transport's carbon intensity, which can be further amplified with efficiency measures and alternative fuels. Lawmakers and stakeholders can leverage pull and push measures to incentivise a modal shift from private cars to buses and coaches. The survey revealed that most operators believe decarbonisation will lead to increased passenger traffic for buses and are preparing to adapt accordingly.

Globally, the enabling conditions for decarbonisation remain insufficient. Infrastructure development lags behind needs, with estimates suggesting that Europe alone still requires 50,000 public charging stations. In addition, energy availability is a significant challenge: some countries would need to dedicate 25% of their current electricity production to power a fully electric truck fleet. Financial support also varies by region, with purchase incentives and toll exemptions available but often limited in scope and duration.

The regulatory landscape largely influences decarbonisation efforts. The EU has introduced a comprehensive set of regulations, including Euro 7 standards, the Alternative Fuels Infrastructure Regulation, and the upcoming ETS2. However, the survey results indicate that many operators, especially SMEs, struggle to fully understand these regulations: 20% of European operators are unaware of the upcoming regulatory changes.

Looking ahead, the industry is facing unprecedented challenges in achieving carbon neutrality by 2050. Success requires coordinated efforts across multiple fronts: substantial infrastructure development, enhanced financial support mechanisms, improved technology accessibility and stronger collaboration between stakeholders. While most operators plan to continue investing in diesel vehicles in the near term, they are also exploring various decarbonisation solutions, indicating a gradual yet steady transition towards low- or zero-emission vehicles.

While the industry demonstrates commitment to environmental goals, accelerated action and support are still needed. This includes more robust financial mechanisms, clearer regulatory frameworks, and enhanced cooperation between transport operators, energy providers, vehicle manufacturers and government authorities to ensure a successful transition that maintains operational and economic viability.

**Chapter 1**

# Introduction

**The rapid change needed to achieve carbon neutrality by 2050 is unprecedented for an industry already grappling with other significant challenges**

The Paris Agreement aims to limit the rise in average global temperature to below 2°C above pre-industrial levels, ideally to 1.5°C.

All industries, including road transport, are transitioning. Today, trucks and buses rely on fossil fuels, primarily diesel, to power the transport of goods and passengers on roads. Fossil fuels offer several advantages: they are stable under ambient conditions, easy to distribute, relatively inexpensive and widely available. Shortcomings, such as pollutant emissions, have now been almost completely resolved with advanced exhaust gas treatment and higher fuel quality, at least in advanced economies. However, the use of fossil fuels in combustion engines inherently emits carbon dioxide.

Decarbonisation presents the road transport industry with some of its greatest challenges and opportunities. The current structure of the industry has evolved gradually since the early 20th century. Over time, new practices and technologies have emerged, reducing vehicles' total cost of ownership (TCO), improving reliability and uptime, and shortening delivery times. However, the rapid change needed to achieve carbon neutrality by 2050 is unprecedented for an industry already grappling with other challenges, such as driver shortages, capacity expansion and digitalisation efforts.

While there is a global commitment to reduce greenhouse gas (GHG) emissions, progress varies worldwide. Other political and economic crises also affect efforts. Some regions have more resources to deploy decarbonisation solutions, while others face greater constraints. Each country tackles decarbonisation from a different starting point, with varying access to carbon-free energy at viable prices and quantities.

IRU, the world road transport organisation, helps transport operators, suppliers and regulators decarbonise with the Green Compact. This report presents the current state of carbon emissions and available decarbonisation solutions for commercial road transport. It provides a snapshot of progress made by transport operators, freight forwarders and fleet-owning shippers. The report also presents concrete and successful decarbonisation strategies from IRU members and examines the road ahead.

already switch to alternative fuels, while others need to reduce energy consumption per operation to reach the right cost threshold for transitioning towards low- and zero-emission powertrains.

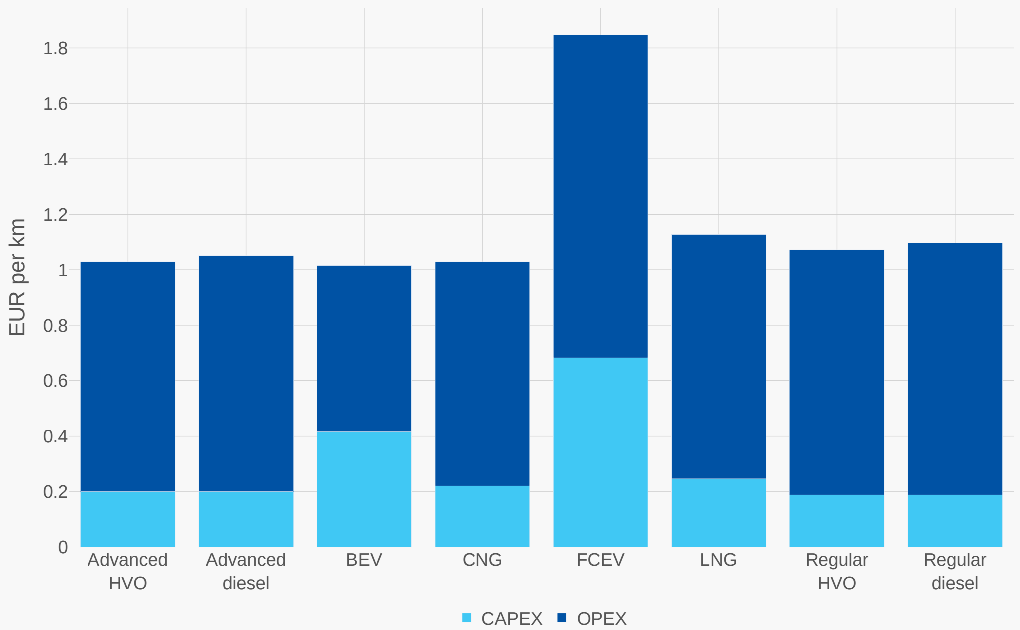
Efficiency gains often lead to greater consumption due to lower prices. History has shown multiple times that, for a given budget, reducing the price per unit results in a greater unit consumption instead of budget reduction. This applies to road transport, as despite greater vehicle efficiency, road transport volumes have increased over the last decade.

However, the decarbonisation challenge will also need alternative fuels in addition to efficiency measures. Yet such alternatives are costly to operate, as vehicle prices, residual values, energy prices and energy consumption result in higher TCOs than experienced today by operators when using diesel powertrains.Additionally, the infrastructure will need to be put in place for alternative fuels to become operational. Efficiency measures are key to mitigating the expected increase in TCO by either reducing energy consumption or the number of vehicles needed to meet transport demand.

The 2023 Green Compact results showed that efficiency measures can cut the industry's emissions by half, with the other half coming from alternative fuels, much of which is also driven by greater efficiency through increased use of alternative fuel trucks.

## Efficiency measures can cut the industry's emissions by half

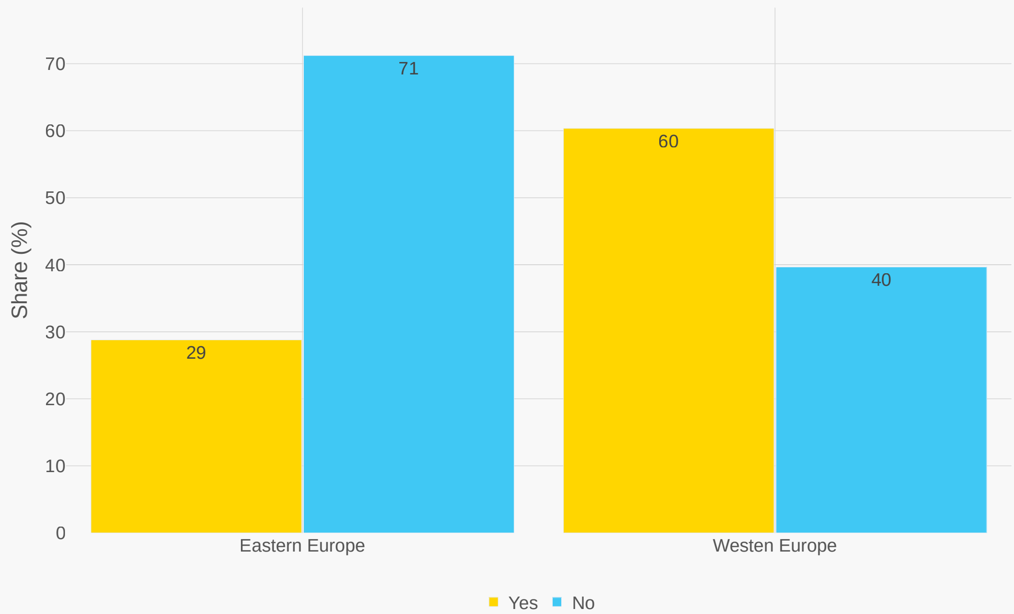
**Figure 6. FCEVs are at least 60% more expensive than other powertrains**
*Cost structure by powertrain for 15-tonne payload in Germany*




Source: IRU, ***IRU Intelligence Briefing (Alternative vs traditional truck powertrains in the EU: Total cost of ownership 2024)***

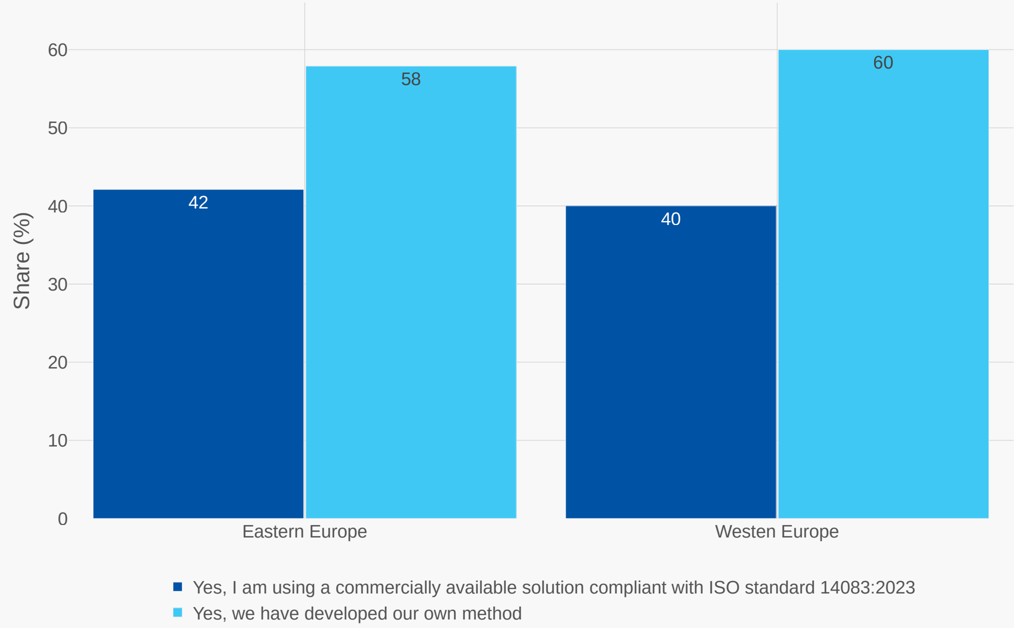
However, when zooming in on Europe, Western European operators are more likely to monitor their $CO_2$ emissions. This is likely influenced by transport customers' need for scope 3 data and the European Commission's work to harmonise the monitoring framework. In 2023, the International Organization for Standardization (ISO) released ISO 14083, a standard for $CO_2$ reporting in transport, which is being used as a basis for future EU regulations. Survey data shows that ISO 14083 is not yet widely adopted, with many operators still relying on their own reporting frameworks. Although the standard is more commonly applied in Europe, only 40% of transport operators currently monitor their emissions using ISO 14083 as a baseline.

**Figure 12. About 60% of operators in Western Europe monitor their carbon emissions**
*Do you monitor your carbon emissions?*




Source: IRU Green Compact Survey 2025

**Figure 13. More than half of operators use their own methods to monitor emissions**
*Do you monitor your carbon emissions?*




Source: IRU Green Compact Survey 2025

**Figure 51. ETS covering road transport are already in use in several regions worldwide, including certain US states and Canadian provinces**
*Map showing the implementation of ETS covering road transport*

Source: IRU

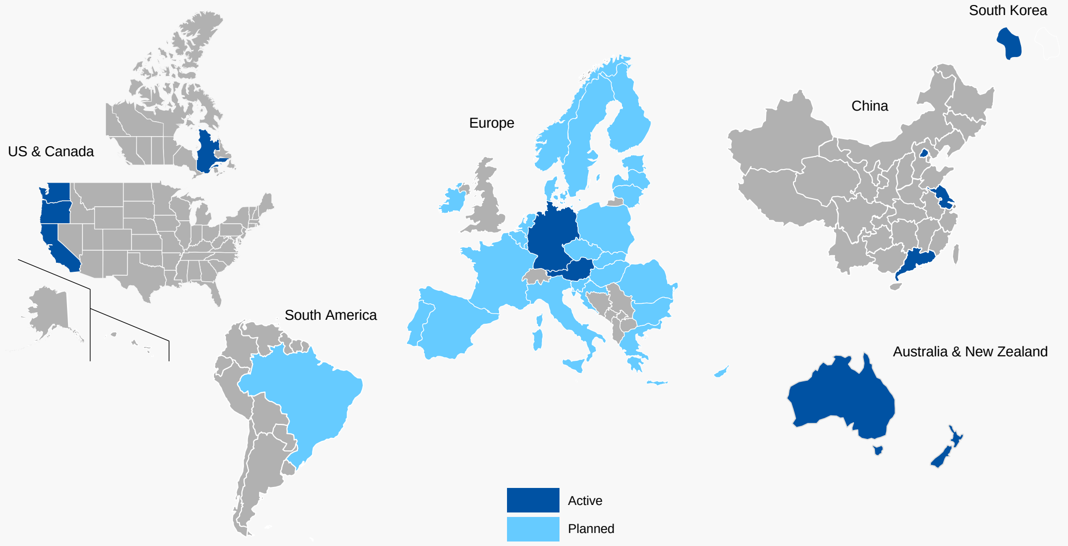



**Figure 52. ETS2 will increase the TCO of diesel vehicles**
*TCO index and ETS2 for a long-haul articulated diesel class 1 vehicle operating in Germany*

Source: IRU estimates