

Option 12 – Fuel Card-Based Transaction Monitoring

Description of Technology

This framework operates on a transactional verification principle - rather than a physical or in-vehicle verification of fuel use - where each refueling event is uniquely linked to a standardised fuel product code. By leveraging existing retail, payment, and fleet management infrastructures, every transaction is digitally recorded at the point of sale. Its primary role is to support transparency, reporting and auditability of fueling events.

Transaction records are securely stored and can be aggregated at vehicle, fleet, or group level, ensuring traceability and consistency across organisational and geographic boundaries.

Captured data elements include:

- Fuel type, identified via standardised product codes (e.g., HVO100, Bio-LNG, RFNBO-based fuels)
- Refueled volume
- Transaction timestamp (date and time)
- Retail location
- Merchant and product identifiers
- Customer or fleet reference

The framework delivers the following regulatory-relevant advantages:

- No requirement for additional vehicle hardware or software integration
- No reliance on chemical fuel marking or physical fuel identification measures
- Exclusive use of existing retail, billing, and payment infrastructures
- Rapid applicability and scalability across European markets, with no regional or geographical limitations to coverage beyond the existing retail infrastructure network

Customer & Retail Perspectives

Advantages:

- Rapid deployment across professional and commercial fleets: the system is ready for use across existing vehicle fleets today, requiring no vehicle retrofitting or software integration.
- Zero capital expenditure: implementation requires no incremental hardware investment, as it leverages existing system infrastructure.
- Comprehensive scalability: the framework is easily scalable across all vehicle classes and fleet types, including trucks and mixed-vehicle fleets, and deployed within an already extensive, established network of filling stations.
- High-integrity data: monitoring is built on auditable, invoice-backed transaction records, providing a secure audit trail at the vehicle, fleet or group level.
- Prevents double counting within the fuel card ecosystem: the system ensures fuel volumes are exclusively assigned and used.

Disadvantages:

- No physical detection or chemical verification of fuel composition within the vehicle.

- No direct in-vehicle confirmation of fuel use, however, eligible fuel types can be restricted and enforced at transaction level within the fuel card acceptance network, with controls on fuel volume and frequency.
- Fuel cards are primarily B2B instruments and thus do not provide an immediately universal solution for the entire vehicle population.

These limitations can be mitigated by combining fuel cards with additional controls, such as the use of telematics or other fuel use digital tracking solutions, thereby integrating the fuel-card based approach into broader system-level solutions.

Regulatory Assessment

Fuel card-based monitoring serves as a pragmatic, low-complexity and immediately deployable solution for the regulatory oversight of eligible fuels usage. This transaction-based framework can function as a complementary control layer alongside existing or future physical detection technologies, providing a scalable pathway for the regulatory recognition of eligible fuels in road transport.

Standardised Fuel Classification Requirement

For transaction-based monitoring to be effective, fuel categories must be harmonized and clearly defined across markets. As fuel card systems rely on standardised product codes and certified classifications, regulatory recognition depends on a uniform definition of eligible fuels – rather than multiple market-specific blends. Such standardisation is essential to ensure consistent identification across retail networks and to maintain the comparability of monitoring data.

Key requirements include:

- Standardised fuel product classification
 - Fuels must be assigned to clearly defined and harmonised product categories. A standardised market definition of relevant fuel types is essential to ensure consistent identification across retail networks and comparability of monitoring data.
- Accurate product coding at point of sale
 - Retail systems must correctly assign fuel product codes during each transaction to ensure reliable monitoring and reporting.
- Alignment with sustainability certification systems
 - Where monitoring is used for regulatory or sustainability reporting (e.g., eligible fuels), certification of the fuel itself remains the responsibility of fuel suppliers and recognised certification schemes. Fuel card systems record and verify the transaction data but do not independently certify fuel origin or production pathways.
- Defined regulatory eligibility criteria
 - Regulatory frameworks should clearly define which fuel categories are considered eligible fuels recognition to ensure consistent monitoring across markets.