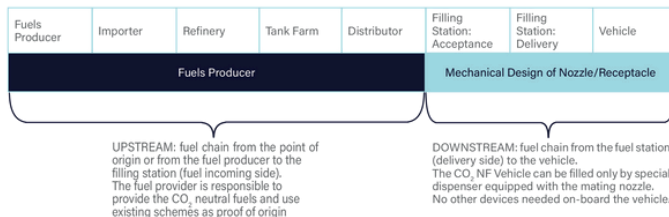


Option 1 – Mechanical Adaption of tank Filler / Nozzle

Responsible Stakeholders Involved



Description of Technology

The mechanical adaptation of the tank filler/nozzle ensures a dedicated connection between the filling station and the vehicle, preventing misfuelling by using specific nozzles that are incompatible with fossil fuel receptacles. However, for a complete monitoring system, this method must be paired with an upstream verification process to ensure the correct fuel reaches the station, is stored properly, and is dispensed correctly (like for example a certification scheme). The system varies based on fuel type. For liquid fuels, such as Diesel and gasoline- standardised nozzle spouts with different diameters are used. For gaseous fuels, where a leakproof connection is required, specific interface connector geometries are standardised for the different gas types (e.g. CNG, LPG, H₂). While effective in preventing misfuelling, this approach has challenges, including the need for duplicate nozzles in the fuel stations during the transition phase, vehicle dependency on CO₂-neutral fuel availability, and the potential for tampering, which current mechanical designs cannot fully eliminate.

- Simplicity and Accessibility
- Low Total Cost of Ownership
- Global Reliability and Interchangeability
- Environmental Benefits
- Simplicity for All EU-Regions

Disadvantages:

- Adapter Requirement for Non-EU Regions
- Potential for Tampering with Adapters
- Dependence on Nozzle and Receptacle Availability
- Supply chain duplication at the retail stations

Implementation requirements:

- European Agreement on Nozzle Requirements, Diameter, and Shape
- Standardization and Global Compatibility

Regulatory Assessment

This option requires a new standardisation effort for tamper evident fuelling technologies, involving several product standards for the refilling interfaces, related working groups and amendments to Directive 2009/126/EC of the European Parliament and of the Council of 21 October 2009 on Stage II petrol vapour recovery during refuelling of motor vehicles at service stations (required only for liquid fuels such as renewable petrol, because gaseous fuels -bioCNG, bioLNG, bioLPG, biopropane have leak-proof connections). The large number of new standardisations required illustrates the significant effort and time required to implement this monitoring methodology. From a policy perspective, a mechanical solution requiring new nozzles would entail a high administrative burden, significant international coordination efforts and a long implementation period.

Customer & Retail Perspectives

Advantages:

- Implementation is straightforward and widely accepted if the current nozzles are compatible and future nozzles follow a similar design. This is only feasible if existing dispensers are usable and future dispensers remain consistent in design.
- Experience with differentiation of existing liquid and gaseous fuels
- Introduction of New Standards
- No need of further onboard monitoring system
- Adaptability of Legacy Fleet by possible retrofit
- Existing Globally Recognized Standards for Liquid and Gas Refuelling receptacles and nozzles