

The Growth of Gas in Road Transport:

Build-out of infrastructure offers pathways to a renewable mobility platform

Road-transport Gas demand is now concentrated in markets where natural gas distribution, vehicle deployment and refuelling infrastructure have scaled together.

Compressed natural gas (CNG) has grown primarily in urban and regional mobility, where compressed methane can be served through city-gas networks and used by taxis, buses, three-wheelers, refuse fleets and light commercial vehicles. India is the clearest example: city-gas expansion, urban air quality policy and high-utilisation fleet demand have supported more than 8,600 CNG stations and a large CNG vehicle base. Brazil, Argentina and Italy show a similar legacy pattern, built around domestic Gas availability, fuel-price advantages, mature conversion industries and dense retail networks.

Liquefied natural gas (LNG) serves a different segment. Because liquefaction increases energy density and supports longer driving range and faster refuelling, LNG is better suited to heavy-duty and long-haul trucking. China is the leading case, with around 530 TWh of natural gas use in transport and the largest LNG trucking platform, supported by domestic liquefaction capacity, diesel-displacement economics and policy support for LNG refuelling corridors.

Bio-CNG and Bio-LNG are renewable methane pathways that can use much of the same downstream system once biomethane is upgraded, certified and delivered through pipelines, stations, liquefaction assets or book-and-claim systems. The strongest markets are, therefore, not starting from zero. The United States has shown how lifecycle-based credits can convert natural gas for vehicles (NGV) demand into renewable natural gas demand; Sweden and Germany stand out as leading European markets for Bio-CNG/Bio-LNG penetration in Gas-fuelled road transport; France, Italy, Spain and the Netherlands are building policy and certification systems around biomethane injection, biomethane for vehicles (Bio-NGV), LNG terminal services and renewable fuel units.

The implication is strategic: countries that already have natural gas vehicles and stations can convert fossil CNG/LNG demand into bio-CNG/bio-LNG demand quickly. In practical terms, the market grows fastest where policy creates a bankable value for reduced emissions. Such measures could include blending mandates, fuel-supplier obligations, low-carbon fuel standards, tax exemptions, green certificates, or greenhouse gas (GHG)-quota systems.

Building the Gas Mobility Platform: Infrastructure and Fleet Scale in Key Markets

Gas use, CNG/LNG fuelling networks and fleet growth across key road-transport markets, 2010–2025

	Total gas use in transport, TWh	Total CNG and LNG fuelling stations	CNG fleet size: 2010-2025	LNG fleet size: 2010-2025
China*	530	7K	985K → 3.7M	15K → 1M
India	125	8.6K	862K → 9.3M	0 → 1.3K
United States**	27.2	1.5K	115.9K → 171.5K	3.4K → 3.5K
Brazil	16	1.7K	1.6M → 2.6M	0 → 50
Argentina	20.7	2.1K	1.4M → 1.5M	
Italy	11.1	1.6K	722.2K → 1M	0 → 4.3K
France	5.4	362	0 → 38.2K	
Spain	9.4	259	0 → 32.1K	0 → 3.5K

Sources: India, Parliament of India / Digital Sansad Portal (sansad.in parliamentary answer PDFs), Petroleum and Natural Gas Regulatory Board (PNGRB), Petroleum Planning & Analysis Cell (PPAC); U.S., U.S. Environmental Protection Agency (EPA), U.S. Energy Information Administration (EIA), Data.gov / U.S. General Services Administration catalog metadata, U.S. Department of Energy / AFDC / NREL, California Air Resources Board; China, National Bureau of Statistics of China; Brazil, EPE – Empresa de Pesquisa Energética, MME – Ministério de Minas e Energia, ANP – Agência Nacional do Petróleo, SENATRAN / Ministério dos Transportes, ANFAVEA – Associação Nacional dos Fabricantes de Veículos Automotores, ABEGÁS – Associação Brasileira das Empresas Distribuidoras de Gás Canalizado; Argentina, ENARGAS; Spain, SEDIGAS (Asociación Española del Gas), IDAE, Gasnam-Neutral Transport / GASNAM, CNMC; France, Open Data Réseaux Énergies (ODRÉ), data.gouv.fr / DINUM, SDES / Ministère de la Transition écologique, France Mobilité Biogaz, NaTran; Italy, MASE / SISEN — Ministero dell'Ambiente e della Sicurezza Energetica, GSE — Gestore dei Servizi Energetici, ACI — Automobile Club d'Italia / Open Data Parco Veicoli, Federmetano, RIE — Ricerche Industriali ed Energetiche. European Alternative Fuels Observatory

Methodology: For each country, where an end-2025 figure was not published, we used the latest available 2025 snapshot to imply the whole year statistics. Where one component was available but the other was missing, we marked the missing values as empty, or used a lower bound such as "≥" when project or partial network data showed a range. For countries with inconsistent sources or different definitions, for example, some countries report public stations only, others include private, depot, bus, or fleet stations, and some report refuelling points rather than unique physical sites, we reconcile the differences using our judgement to keep the public physical counts as relevant. Values are indicative and rounded; bio shares shown after correcting arithmetic inconsistencies or using the latest available published share where more reliable.

* China's annual CNG and LNG vehicle-fleet series was independently synthesised by EnDepth AI from multiple publicly available and contemporaneous sources. The resulting series is an analytical estimate and does not reproduce any single third-party database or proprietary time series.

** For the U.S., underlying EPA data are combined CNG/LNG truck counts with interpolation/extrapolation, and we then estimated the LNG/CNG split. EPA explicitly says its MOVES-based single-unit and combination truck counts use registration data for selected years and interpolate intervening years.



China: one of the world's largest natural-gas trucking platforms

China is the largest natural gas transport market, with around 530 TWh of total natural gas use in transport, about 7,000 refuelling stations and a strong CNG/LNG growth trend from 2010 to 2025.

Several factors have propelled China's CNG and LNG truck growth. First, LNG has offered a practical dieseldisplacement route for heavy-duty transport, particularly when LNG prices are lower than diesel. Second, China's domestic liquefaction capacity and lower-cost natural gas feedstocks have supported the expansion of LNG refuelling networks. Third, policy has encouraged the replacement of older diesel trucks through emissions standards, subsidies and infrastructure promotion. Fourth, local restrictions of diesel-truck access and incentives have supported lower-emission trucks.

China, is therefore a scale opportunity, but not yet a mature Bio-LNG market. The policy options to move from fossil LNG to certified renewable methane could include national biomethane certification, grid-injection rules, and corridor-based bio-LNG pilots.



India: one of the clearest policy-led Bio-CNG growth stories

India's growth has been driven by city-Gas distribution, urban air-quality objectives, CNG use in taxis, buses and three-wheelers, and the expansion of CNG retail infrastructure. The government reports that the Petroleum and Natural Gas Regulatory Board (PNGRB) has authorised city-Gas distribution in 307 geographical areas covering almost all of mainland India, with over 8,600 CNG stations commissioned as of 2025. By contrast, LNG retail for road use is still early-stage, with 13 state-owned and 16 private LNG retail stations reported as operational, making India primarily a CNG market today, with LNG positioned for future long-haul trucking.

The Compressed Bio-Gas (CBG) Blending Obligation gives India a direct mechanism to convert this large CNG base into a bio-CNG market. The obligation is voluntary through financial year (FY) 2024–25 and becomes mandatory from FY 2025–26, rising from 1% to 5% of total CNG/ piped natural gas (PNG) consumption by FY 2028–29. This sits alongside the SATAT programme, which aims to encourage entrepreneurs to build CBG plants and supply automotive fuel through public-sector oil-marketing companies; the programme envisaged 5,000 CBG plants producing 15 million tonnes per year.

India's advantage is that Bio-CNG connects directly to existing city-Gas distribution, CNG retail networks, agricultural-residue management, municipal-waste policy and import-substitution objectives.



United States: most mature credit-driven Renewable Natural Gas (RNG) transport market

The U.S. has achieved strong renewable natural gas use because policy monetises lifecycle emissions reductions. The federal Renewable Fuel Standard is important because renewable CNG and LNG can generate Renewable Identification Numbers (RINs) when used for transportation. The Environmental Protection Agency (EPA) specifies that renewable CNG/LNG must be used as transportation fuel to generate RINs, and the use or sale must be demonstrated through contracts or affidavits.

California is the most important state-level case. The Low Carbon Fuel Standard (LCFS) rewards fuels according to lifecycle carbon intensity, and California Air Resources Board's (CARB) 2024 update increased the programme's ambition to reduce the carbon intensity of California's transport fuel pool by 30% by 2030 and 90% by 2045. For trucking, this matters because bio-CNG and bio-LNG can generate credits when biomethane attributes are properly matched to fuel dispensed to vehicles. CARB guidance allows book-and-claim accounting for biomethane, subject to controls against double counting, which enables biomethane injected into a common pipeline system to be matched with CNG or LNG dispensed at California stations.

The result is a powerful commercial model: low-carbon RNG can reduce the effective fuel cost for fleets, increase project revenues for RNG producers, and support truck operators seeking immediate emissions reductions without replacing the entire vehicle platform.



Brazil: moving from potential to compliance-based demand

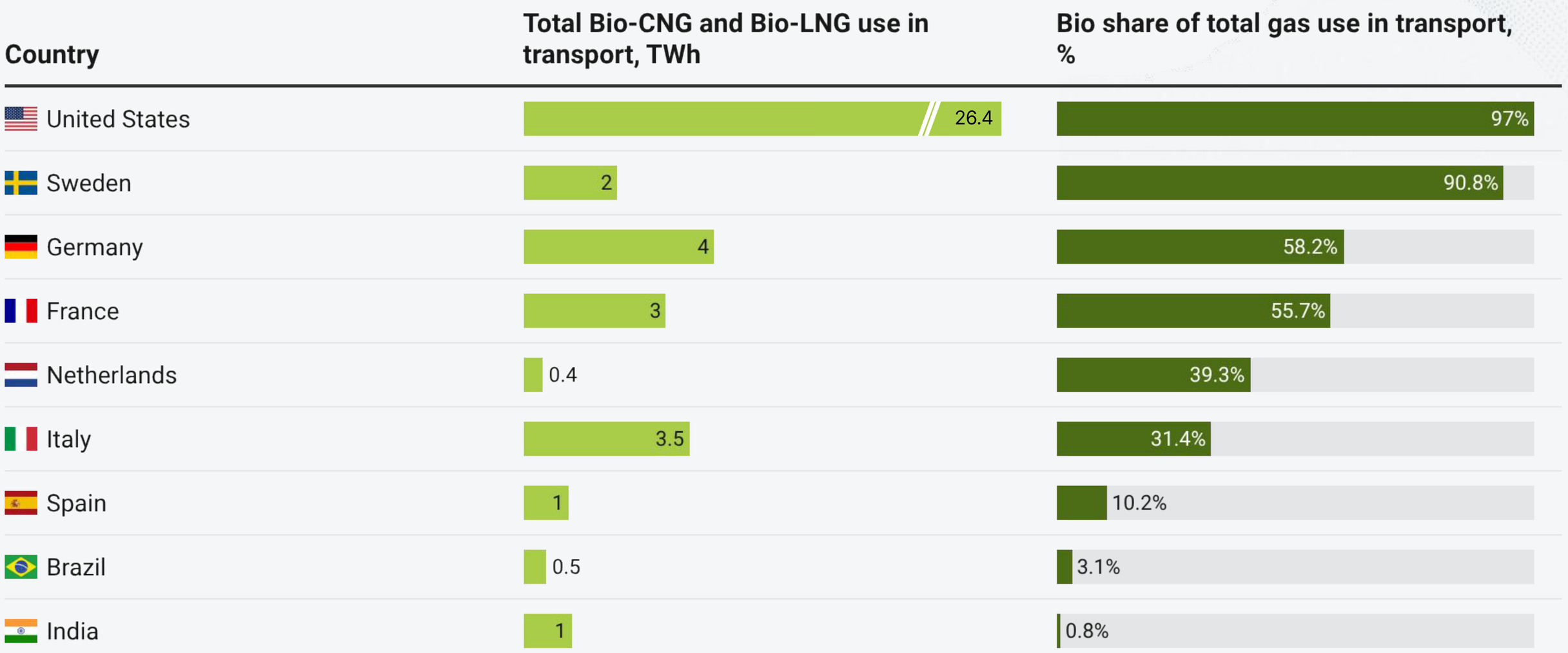
Brazil has a significant Gas transport base of 16 TWh, about 1,700 CNG/LNG fuelling stations and a CNG fleet of roughly 2.6 million vehicles. This market developed around domestic Gas availability, favourable CNG-versusgasoline economics, state-level tax incentives, a mature vehicle-conversion industry and the expansion of piped-gas distribution in large urban regions.

The existing CNG platform is now becoming relevant for Bio-CNG/Bio-LNG. The Fuel of the Future Law, enacted in October 2024, explicitly expands the role of biomethane and is expected by Brazil's Ministry of Mines and Energy to support predictable demand, large-scale investment and lower-carbon mobility. In September 2025, Brazil regulated the National Biomethane Program, creating a decarbonisation model for natural-gas producers and importers based on biomethane use or Biomethane Guarantee of Origin Certificates. For 2026, the target is set at a 1% reduction in GHG emissions in the natural-gas sector and potentially rising to 10%. Brazil has the agricultural residues, sugarcane by-products, livestock waste and urban organic waste to become a large biomethane transport market.

Goiânia is moving ahead with Brazil's first biomethane-powered articulated buses, with an initial eight units and a programme that anticipates 501 biomethane buses by 2027. São Paulo is also advancing biomethane use in public transport and waste fleets, building on 125 garbage trucks already operating with biomethane produced from municipal landfills and setting targets to replace more than 600 diesel vehicles by 2027. These developments shift Brazil's biomethane narrative from resource potential to visible urban mobility deployment.

Bio-CNG and Bio-LNG Adoption in Road Transport

Bio-CNG/Bio-LNG use in road transport and their share of total transport Gas demand, 2025



Additional Sources: Germany, Umweltbundesamt (UBA), BDEW, DIE GAS- UND WASSERSTOFFWIRTSCHAFT / gas-h2 (Gasbilanz 2025 – Erdgas, Wasserstoff und Biogas in Deutschland); Sweden, Statistics Sweden (SCB), Trafikanalys, Energigas Sverige; Netherlands, Nederlandse Emissieautoriteit (NEa), CBS (Statistics Netherlands), RIVM.

Argentina: a mature CNG market looking for its next growth phase

Argentina is an important legacy CNG market, with 20.7 TWh of natural gas use in road transport, around 2,100 CNG/LNG fuelling stations and a CNG fleet of over 1.5 million vehicles. Argentina's CNG market developed through a combination of domestic natural gas availability, fuel-price differentials between CNG and gasoline, an extensive natural gas distribution system, a mature vehicle-conversion industry and a long-standing technical and safety regulatory framework.

The foundation was the Plan Nacional de Sustitución de Combustibles Líquidos, launched to use domestic gas resources, reduce oil dependence and substitute liquid fuels in transport. The successor phase institutionalise safety, technical standards and private-sector participation. The regulatory base was central: NAG-415, NAG-416 and NAG-417 framed vehicle conversion, while NAG-418 governed CNG stations; later, NAG-420 created a pathway for existing stations to serve buses and heavy vehicles safely.

The forward outlook is tied to heavy transport and supply reliability. ENARGAS is now promoting CNG corridors for trucks and passenger public transport, defined as routes linking stations able to serve heavy trucks and buses; current corridors include the NOA corridor, the central corridor, and the Vaca Muerta–Patagonia corridor.

Sweden: circular-economy benchmark

Sweden is one of the strongest renewable-gas performers in transport, with 2 TWh of total Bio-CNG/Bio-LNG use, about 90.8% of total Gas use in transport. Tax treatment has been central. Sweden has granted exemptions from energy and CO_2 taxes for sustainable, non-food-based biogas and bio-propane used as motor fuel since 2003, and the schemes have been applied to both domestic and imported eligible fuels. These exemptions help bridge the cost gap between renewable gas and natural gas. The European Commission reapproved Sweden's tax exemption schemes in 2024 after a formal State Aid review.

Sweden's success is also supply-chain based. Local biogas production, municipal waste systems, public transport procurement and digestate use are linked to a circular-economy model. Sweden has also opened a SEK 1.035 billion production support package for gaseous and liquefied biogas, including manure-based biogas and upgraded biomethane, strengthening the supply base for Bio-CNG and Bio-LNG.

Germany: LNG trucks are already moving toward climate-neutral refuelling

In Germany, the renewable share of transport Gas has risen materially, with 4 TWh of bio-CNG/bio-LNG use and a 58.2% bio share in total Gas use in transport. The most striking recent development is in heavy-duty LNG trucking. The German Gas and Hydrogen Industry reported that in 2025, 98.5% of LNG sales at German filling stations consisted of Bio-LNG.

Germany's growth has been helped by greenhouse-gas quota mechanisms which replaced a volume-based biofuel quota with a performance-based obligation. Certified biomethane and bio-LNG can generate compliance value for obligated fuel suppliers, creating an additional revenue stream that improves project economics and helps lower the effective cost of renewable gas for truck operators. The policy case is positive, but Germany will need stable GHG-quota rules, fair road-toll treatment and long-term fleet signals to preserve the bio-LNG momentum.

France: BioNGV is moving from niche to structured fleet fuel

France combines a smaller but fast-growing Gas-mobility platform with strong bio-CNG conversion, BioNGV fleets and certificate reform. In transport, it combines 5.4 TWh of Gas use, 3.0 TWh of bio-gas and a 55.7% bio share, while the CNG fleet trend line rises steeply to 38.2K. France's refuelling networks reached over 360 public distribution points in 2025, doubling since 2020. BioNGV has benefited from local public transport procurement, refuse fleets, logistics operators, urban air-quality objectives and biomethane injection into the Gas grid.

Public transport is a major anchor. Île-de-France Mobilités has pursued a major bus and coach decarbonisation programme since 2018, with a target to fully decarbonise regional buses and coaches by 2029. Its chosen mix is 70% biomethane and 30% electric.

France produced 13.5 TWh of injected biomethane in 2025 and has ambitions of 44 TWh by 2030 and 150 TWh by 2050. This supports BioNGV growth, which would provide a broader renewable-gas base for BioNGV if transport demand is prioritised toward high-utilisation fleets.

Italy: a legacy CNG market that can be progressively renewable

Italy is one of Europe's most important Gas-mobility markets with over 1 million CNG vehicles and 1,620 refuelling stations in 2025. Italy's CNG market developed over decades because of domestic Gas availability, a dense refuelling network, consumer familiarity with methane vehicles, domestic original equipment manufacturer (OEM) capability and a well-developed Gas system.

Italy's 2018 biomethane decree created a direct policy bridge between the legacy CNG market and renewable methane. The decree introduced a support scheme for biomethane injected into the Gas grid and advanced biofuels used in transport, and it required the advanced-biofuel sub-target to be fulfilled 75% by biomethane and 25% by other advanced biofuels. Italy's National Energy and Climate Plan reinforced this direction, identifying an advanced-biomethane target of at least 1.1 billion m^3 by 2030 from agricultural waste and the organic fraction of municipal solid waste.

Italy's strategic advantage is therefore clear: it can use its legacy CNG/LNG assets, OEM capability and advanced-biomethane policy to increase the renewable share of transport Gas.

Spain: emerging conversion markets

Spain has a sizeable Gas-transport base, with 9.4 TWh of total Gas use, but only 1.0 TWh of bio-CNG/bio-LNG and a 10.2% bio-share. Enagás has launched a bio-LNG service at its terminals in Barcelona and Huelva from March 2025, Cartagena from July 2025 and Musel from November 2025. The service includes trucks loading as well as bunkering. It uses an equivalence-liquefaction model under which biomethane injected into the natural gas network can be recognised as bio-LNG at regasification terminals, with proofs of sustainability linked to physical loading operations.

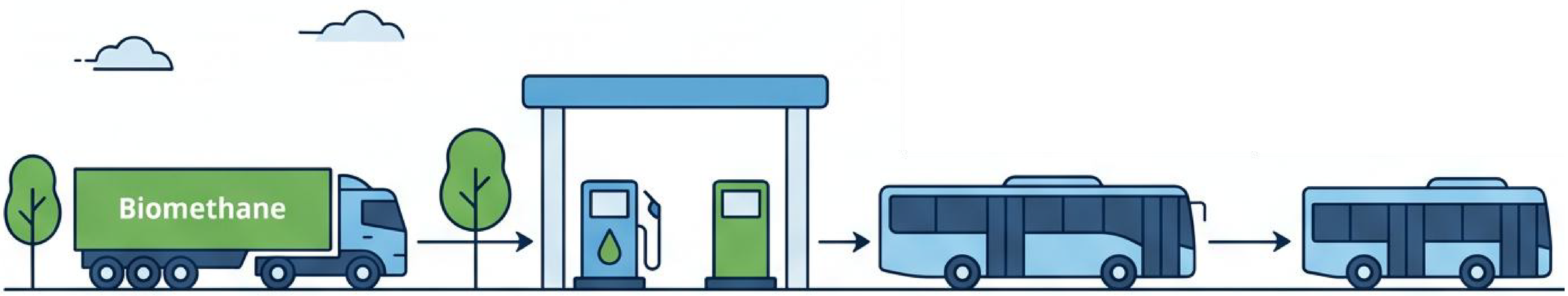
On the station side, Grupo HAM announced that its Monegros, Baix Ebre and Gironès Nord stations began supplying only BioLNG and BioCNG in December 2025, with the group aiming for its entire network to operate exclusively on biomethane by 2026. Spain's forward opportunity is therefore to connect biomethane production, LNG-terminal certification and freight-corridor refuelling into a coherent transport-facing system.

Netherlands: emerging as a certificate-and-logistics hub

The Netherlands has a smaller market, with 1.1 TWh of total transport sector Gas use, 0.4 TWh of bio-CNG/bio-LNG and a 39.3% bio-share. Its significance is not scale but market design.

The Dutch Emissions Authority states that companies delivering gaseous fuels to the transport sector can register those deliveries in the Energy for Transport Registry and receive renewable energy units, known as HBEs. Since 2022, the option to green CNG has been expanded to include LNG deliveries that meet specific requirements. One HBE represents 1 GJ of renewable energy delivered to the Dutch transport market, and HBEs can be traded by compliance participants. The Netherlands is moving toward a GHG-savings-based ticket system under RED III, which should benefit fuels with high emissions savings, including biomethane.

The Netherlands' first bio-LNG plant in Amsterdam converts organic waste-derived biogas into bio-LNG for long-haul, heavy-duty road transport, with Shell as offtake partner and Renewi as biogas supplier. At the same time, more than 30 companies and organisations have urged the Dutch government to preserve the bio-LNG terminal-route mass-balancing system, indicating that certification rules will be decisive for future scale-up.



Supportive Policy Options to drive Bio-CNG and Bio-LNG uptake



Dedicated transport biomethane obligations

Governments could set a binding bio-CNG/bio-LNG share for transport Gas sold through CNG/LNG stations and city-Gas distributors, rising on a fixed schedule.

The obligation is best placed on fuel suppliers and city-Gas distributors, not on individual fleet operators - keeping compliance simple and ensuring that biomethane is pulled into the fuel supply chain.



Public fleets acting as anchor buyers

Public Procurement can be used to create early, bankable demand. Cities that operate CNG buses, refuse trucks or municipal vehicles could be required to procure a minimum share of certified bio-CNG under long-term fuel contracts. The same logic applies to ports, airports and logistics zones.

The strongest model is a closed-loop local contract: municipal food waste, landfill gas, wastewater sludge or agricultural residues are converted into biomethane, injected into the Gas system or delivered directly, and then used by local buses or refuse trucks. This creates demand certainty for producers and visible emissions reductions for cities.



Low-carbon fuel standards or GHG quotas can reward carbon intensity, not only volume

A simple blending mandate rewards all qualifying biomethane similarly. A low-carbon fuel standard or GHG quota is more powerful because it rewards fuels according to lifecycle emissions performance. This is especially important for manure, landfill and wastewaterderived RNG, where avoided methane emissions can deliver strong climate value.

The U.S. case is instructive. The federal Renewable Fuel Standard allows renewable CNG and LNG to generate RINs when used as transportation fuel, while California's LCFS gives value to fuels based on lifecycle carbon intensity. This type of credit stack can materially improve bio-CNG and bio-LNG economics for trucking and high-utilisation fleets.



Certificate systems that allow flexibility but prevent double counting

Biomethane does not always need to move physically from a digester to a truck stop. Pipeline injection, mass balancing and book-and-claim systems can connect distributed biomethane production with transport fuel demand. California's LCFS already uses book-and-claim accounting for biomethane under defined reporting rules, and the Dutch system awards renewable energy units, HBEs, for registered gaseous biofuel deliveries to transport.

Flexibility must come with strict controls. Each biomethane unit would have a unique certificate ID, feedstock record, production location, sustainability status, lifecycle GHG score and retirement record. The same molecule must not be claimed simultaneously for grid decarbonisation, industrial Gas use and transport compliance.



Enabling ease of grid injection and liquefaction

A major bottleneck is not vehicle technology; it is the cost and complexity of connecting biomethane plants to Gas networks or liquefaction routes. Governments can standardise gridinjection rules, publish clear Gas quality requirements, cap connection approval timelines and allow network operators to socialise part of the connection cost where public benefits are clear.

For bio-LNG, policy can support equivalence liquefaction models: biomethane injected into the grid can be converted into certified bio-LNG through terminals or liquefaction assets, provided the certification chain is robust. This is especially relevant for Spain, Italy, Germany and the Netherlands, where LNG trucking corridors and gas infrastructure already exist.



Fleet incentives for biomethane adoption

Vehicle incentives can be targeted and conditional. The most effective support tools are accelerated depreciation for heavy-duty Gas trucks, reduced road tolls for certified bio-LNG use, low-emission-zone access for bio-CNG fleets, and purchase support for municipal vehicles tied to renewable fuel procurement.



Build-out of regional freight corridors, not isolated stations

For bio-LNG, scale depends on corridor density. A single station does not create a market; a connected network does. Governments should identify priority freight corridors linking ports, logistics hubs, industrial zones and border crossings, then coordinate station locations, fuel certification and fleet commitments.