

Competitive Bio-LNG means full recognition and support of all liquefaction pathways

Enabling all certified liquefaction pathways to strengthen Europe's home-grown biomethane production and accelerate maritime & transport decarbonisation

Biomethane, when liquefied as bio-LNG, is a renewable fuel with significant potential to support short- and medium-term, cost-efficient decarbonisation in the maritime and wider transport sectors. Realising this potential, however, requires a clear and enabling EU regulatory framework that recognises and supports all credible and certified liquefaction pathways available.¹ Bio-LNG offers an important advantage over many other renewable energy carriers: it can make use of Europe's extensive and interconnected gas-grid, storage, LNG-terminal and bunkering infrastructure, allowing the market to scale efficiently and cost-effectively. This is evident in liquefaction by equivalence, centralized physical liquefaction, including re-condenser liquefaction and on-site liquefaction with the first two options relying on the mass-balance principle and the accounting framework established under Implementing Regulation (EU) 2022/996.

In the context of centralized liquefaction as well as in the case of equivalence liquefaction, mass balancing means that certified biomethane produced at one or more biomethane plants is injected into the interconnected gas grid. An equivalent quantity of gas is then either physically liquefied at a central liquefaction facility or matched with fossil LNG withdrawn from a grid-connected LNG terminal under liquefaction by equivalence.

Physical molecules do not need to be traced one by one from the production site to the liquefaction site. Instead, the system tracks the certified quantity, sustainability characteristics and GHG emissions data associated with the biomethane through a controlled chain of custody. As long as the amount of certified biomethane injected into the system is sufficient to support the amount claimed as bio-LNG, after the applicable conversion factors and liquefaction losses, the bio-LNG can carry the corresponding sustainability and GHG attributes. Together, these mechanisms provide the flexibility needed for economic operators to meet relevant mandates such as those under the FuelEU Maritime and other transport decarbonization markets.

The robustness of the mass balance chain of custody model for centralized liquefaction as well as liquefaction by equivalence is achieved by the fact that there are on-site verifications by voluntary certification schemes to ensure that all the sustainability characteristics and GHG emissions associated with the certified biomethane chain of custody are properly calculated and fraud and double counting are avoided. Therefore, the integrity of the system is ensured. Against this background, the forthcoming revision of Implementing Regulation (EU) 2022/996 should provide market participants with regulatory certainty and stability. The European Commission should explicitly recognise liquefaction by equivalence as a viable and credible pathway for scaling up bio-LNG, while ensuring rigorous, transparent and harmonised certification requirements and technology neutral GHG

¹ According to the market practices, there are three valid pathways for bio-LNG: a) **On-site liquefaction** (bio-LNG produced directly at the biogas facility), b) **Centralised physical liquefaction** (biomethane injected into the grid at one point and an equivalent quantity of gas physically withdrawn at a liquefaction facility, including liquefaction through re-condenser technology at an LNG terminal, under certified mass-balance rules and liquefied into bio-LNG), c) **Liquefaction by equivalence** (biomethane injected into the grid at one location and under the mass balance principles the sustainability attributes are transferred to a European LNG terminal where an equivalent quantity of LNG becomes bio-LNG, subject to traceability, volume integrity and no double counting safeguards)

accounting that allocates emissions consistently with the certified chain of custody and supports the practical viability of all recognised liquefaction pathways. Regulatory changes that unnecessarily restrict or burden this pathway could reduce the availability of renewable maritime fuels, increase the cost of decarbonising the transport sector and significantly weaken investment in biomethane production.

At the same time, significant capital has already been committed to on-site and centralised liquefaction facilities. These investments remain essential not only in regions with limited or no access to the gas grid, but also in areas where growing demand for bio-LNG, particularly from the road transport sector, has driven investment in local and centralised liquefaction capacity and where physical on-site liquefaction is necessary to bring biomethane to market. Existing investments should be protected while future local on-site liquefaction should be facilitated where economic conditions allow it and where it is needed to bring biomethane to market.

The regulatory framework, under the Implementing Regulation (EU) 996/2022, should therefore recognise the complementary role of physical liquefaction and liquefaction by equivalence and establish fair and predictable conditions for both. Concretely, once we have liquefaction by equivalence explicitly recognized by the EU, only then will this model fulfil its mission as a reliable and complementary pathway to physical liquefaction and ensure that maritime and road transport buyers do not turn to other liquid biofuels but invest in bio-LNG. Competitive liquefaction pathways mean competitive and credible bio-LNG for a decarbonized Europe.