

What is bio-LNG?

Bio-LNG is liquefied biomethane and is chemically identical to LNG. In North America biomethane is sometimes also known as renewable natural gas (RNG); and in Europe as synthetic natural gas (SNG).

How is it produced?

Biomethane is mainly produced from anaerobic digestion of agricultural and human waste streams eg animal manure, silage, wastewater and landfill. It can also be produced through gasification of cellulosic waste, such as sawmill and forest harvest residues. This is a less mature technology.

Does bio-LNG compete with food production?

Biomethane is produced from sustainable biomass feedstocks, which are nationally, or regionally defined, for example by the EU (RED II) in Europe and the EPA (Renewable Fuel Standards) in the USA. This means that it does not compete with the production of food, fibre or fodder.

What emissions reductions does bio-LNG deliver?

Emissions reduction will depend on how the bio-LNG is produced and the engines in which it is used. In general, the use of bio-LNG as a marine fuel can reduce GHG emissions by up to 80% compared to marine diesel on a full well-to-wake basis. If avoided emissions are taken into account, bio-LNG, when it is produced from anaerobic digestion of manure, can achieve negative emissions of up to -190% compared with diesel.

How much bio-LNG is available now?

Production of biomethane, from which bio-LNG is produced, is currently running at approximately 30Mt pa, or 10% of shipping's total energy demand.

What is the potential for bio-LNG in the future?

Biomethane produced from sustainable biomass has massive global potential – up to 20 times current production levels by 2050. Once demand from other sectors is taken into account bio-LNG has the potential to meet up to 3% of the total energy demand for shipping fuels in 2030 and up to 13% in 2050. If used as a 20% blend with LNG, it could cover up to 16% and 63% of global shipping demand by 2030 and 2050, respectively.

Is bio-LNG available to shipping?

Bio-LNG is an established bunker fuel and is commercially available in Europe, North America and Asia.

How expensive is it?

It is the cheapest biofuel / biogas as it is the simplest molecule. However, it is typically two to three times more expensive than LNG.

How is it typically sold?

Bio-LNG is typically sold as a blend with fossil LNG.

Are there any blending issues?

Bio-LNG is pure, liquefied methane and effectively identical to the highest quality LNG, so there are no blending issues.

How is bio-LNG delivered to ship owners?

Bio-LNG can be delivered in the form of physical molecules or "virtually" whereby biomethane is injected into the gas network and virtually transported to liquefaction plants and LNG terminals using the existing infrastructure through a system of mass balancing and guarantees of origin.

Does using bio-LNG impact methane slip?

Methane slip is a function of engine technology and is not impacted by the use of bio-LNG.

For more information on the role of bio-LNG in shipping industry decarbonization, please see the report published by the Maritime Energy and Sustainable Development Centre of Excellence in October 2022.

