

What is liquefied biomethane?

Liquefied biomethane (LBM), also known as bio-LNG, is chemically identical to LNG (liquefied natural gas). In North America biomethane is sometimes also known as renewable natural gas (RNG).

How is liquefied biomethane 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 liquefied biomethane compete with food production?

Biomethane is produced from sustainable biomass feedstocks, which are nationally, or regionally defined, for example by the EU (RED III)¹ in Europe and the EPA² (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 liquefied biomethane deliver?

Emissions reduction will depend on how the liquefied biomethane is produced and the engines in which it is used. In general, the use of liquefied biomethane as a marine fuel can reduce GHG emissions by up to 80% compared to marine diesel on a full well-to-wake basis. When produced from the anaerobic digestion of waste materials, such as manure, methane that would otherwise be released into the atmosphere is captured, resulting in negative emissions of up to -190% compared with diesel.

How much liquefied biomethane is available now?

Production of biomethane, is currently running at approximately 30Mt pa, or 10% of shipping's total energy demand.

What is the potential for liquefied biomethane 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 liquefied biomethane has the potential to play a significant role in decarbonizing shipping. If used in the form of a 20% blend with LNG, it could cover up to 16% of global shipping demand by 2030.

Is liquefied biomethane available to shipping?

Liquefied biomethane is an established bunker fuel and is commercially available in Europe, North America and Asia.

1. European Union Renewable Energy Directive III raises the share of renewable energy in the European Union's overall energy consumption to 42.5% by 2030, with an additional 2.5% indicative top-up to allow the target of 45% to be achieved.

2. The Renewable Fuel Standard (RFS) is a federal program that requires transportation fuel sold in the United States to contain a minimum volume of renewable fuels. The RFS originated with the Energy Policy Act of 2005 and expanded under the Energy Independence and Security Act of 2007.

How expensive is liquefied biomethane?

All biofuels and biogases such as liquefied biomethane are significantly more expensive than traditional marine fuels. However, negotiations are on-going in the International Maritime Organization (IMO) to introduce a global pricing carbon mechanism or economic measure that will effectively narrow the price gap.

How is liquefied biomethane typically sold?

Liquefied biomethane is typically sold as a blend with fossil LNG.

Are there any blending issues with liquefied biomethane?

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

How is liquefied biomethane delivered to ship owners?

Liquefied biomethane can be delivered in the form of physical molecules from liquefied biomethane plants to a ship, or through a system of mass balancing and certified guarantees of origin, whereby biomethane is injected into the gas network and delivered from LNG terminals or liquefaction plants using existing infrastructure.

Does using liquefied biomethane impact methane slip?

Methane slip is a function of engine technology and is not impacted by the use of liquefied biomethane.

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

