



LIQUEFIED GAS FOR CLEANER MARITIME TRANSPORTS

A cleaner tomorrow

The International Maritime Organization (IMO) has set clear goals for how international shipping must reduce its greenhouse gas emissions. By 2030, carbon dioxide emissions shall be reduced by 40% and then continue to decrease by 70% until 2050. To reach these goals, shipowners are switching to fuels that produce less emissions. With liquefied gas, the goals set by the IMO are easier to achieve.

Gasum can assist you to navigate forward

In order to fight climate change, emissions from the use of conventional fuels – such as heavy fuel oil in maritime transport – need to be reduced. Liquefied Natural Gas (LNG) is becoming more common and it is the cleanest maritime fuel available. Compared to heavy fuel oil, LNG has significantly lower CO₂ emissions, and local emissions are almost nonexistent. Gasum is one of the largest distributors of LNG to the shipping industry in north-western Europe. We are also one of the fastest growing biogas producers in our area.

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The EU, the IMO, the world's logistics buyers and consumers demand less CO₂ emissions

REDUCTION OF CO₂ EMISSIONS

UNTIL 2030

UNTIL 2050

40% ↓ 70% ↓



Future-proof

Less climate impact

Roadmap to zero emissions

A sustainable trend

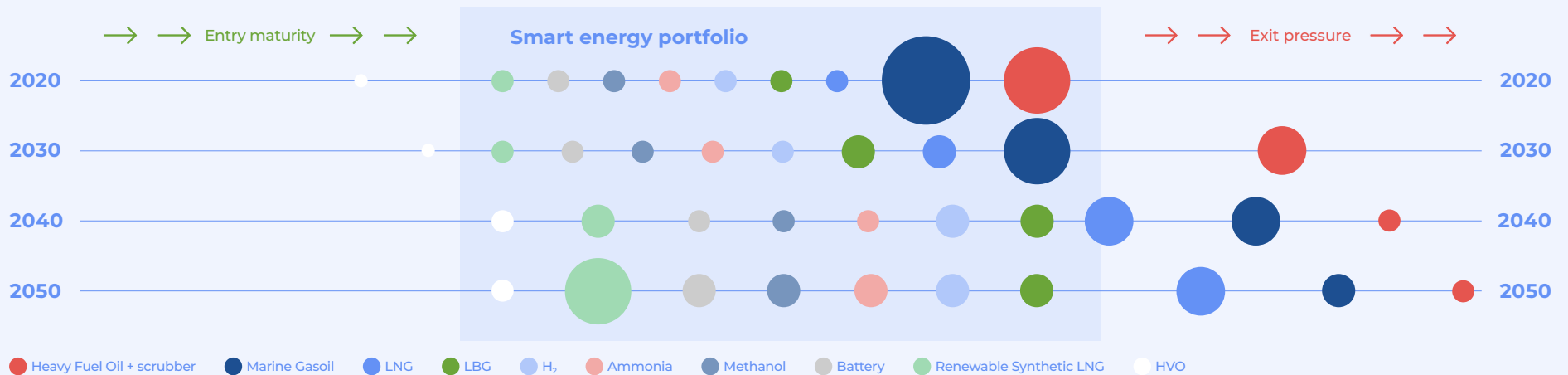
Future-proof

Liquefied gas has been used as a fuel in shipping for over 50 years. Liquefied gas is the only fuel that can initiate the environmental change in shipping. There is great access to liquefied gas and a well-developed infrastructure for distributing the fuel. Since both liquefied natural gas (LNG) and liquefied biogas (LBG) consists of methane, you can switch to, switch between or blend the fuels however you want. With liquefied gas as fuel, you are future-proof.

Decarbonization starts with LNG

LNG produces over 20% less carbon dioxide emissions compared to conventional fuel. With liquefied biogas, you get a completely renewable fuel that produces 90% less carbon dioxide emissions than conventional fuel. In the future, there will be renewable synthetic LNG available. The synthetic gas will give 0% carbon dioxide emissions and will be chemically identical to natural gas and biogas. Renewable synthetic LNG is predicted to be the dominant fuel in international shipping in 2050. And your LNG powered vessel will be equipped to use it!

OUR PREDICTION OF THE FUEL MARKET TOWARDS 2050



Future-proof

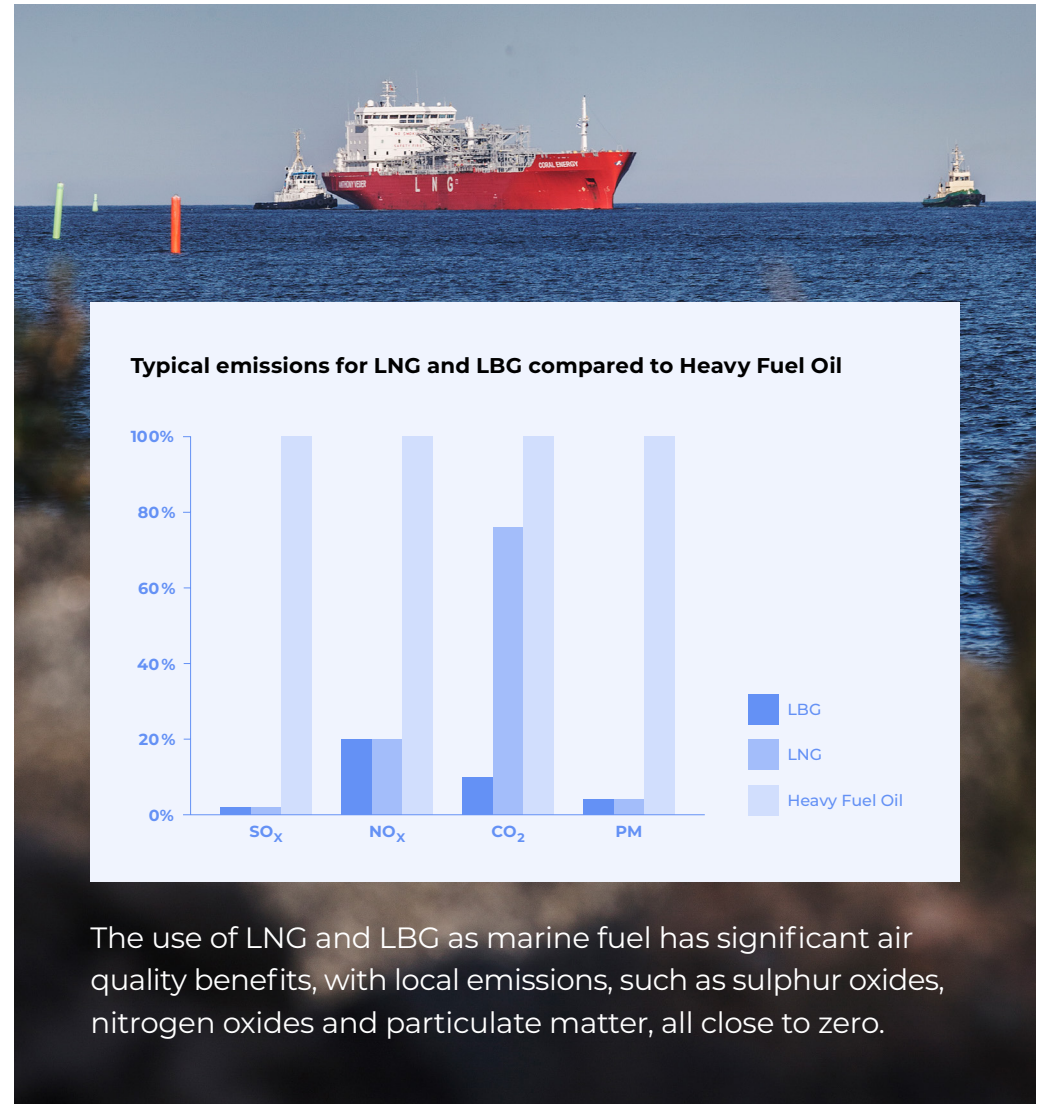
Less climate impact

Roadmap to zero emissions

A sustainable trend

Less climate impact

In addition to carbon dioxide emissions, vessel traffic also emits local emissions such as sulfur oxides, nitrogen oxides and particles – emissions that are particularly harmful to human health. From 2020 vessel emissions may only contain 0,5% (outside of the Sulfur Emission Control Areas, SECAs) sulfur oxides compared with the previous 3,5%. Nitrogen oxides are also regulated. Solutions on how to de-Sulphur oil already exist today, but neither conventional fuels nor scrubbers meet the International Maritime Organization's tough objectives in terms of Carbon dioxide emissions. The only available fuels that meets all the requirements are liquefied natural gas (LNG) and liquefied biogas (LBG).



Future-proof

Less climate impact

Roadmap to zero emissions

A sustainable trend

Roadmap to zero emissions

The shipping sector's 70,000 vessels account for around 3% of global CO2 emissions. Changing this reality is not something you can do entirely on your own. Everyone from consumers to logistics buyers and shipping companies must do it together. Retailers and consumers are already convinced that change must take place and are willing to pay for more sustainable products. Logistics buyers have now begun to demand that transporters use sustainable fuels. In a few years, we will also see tougher global regulations for vessels in terms of emissions.

How can we navigate forward together?

Stay one step ahead. When it's time to invest in a new vessel, you should scan the market and the fuel options available today and those that experts believe will exist tomorrow. In addition to the standard newbuild vessel design, vessels can be designed to be prepared for other fuels or retrofitted with different or new technologies throughout a vessel's lifetime.

THE JOURNEY TOWARDS ZERO CARBON SHIPPING IN 2050 IN SHORT



Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping

“We need to speed up the transformation toward zero-emission ocean shipping. By collaborating with like-minded partners, companies and organizations across the value chain we can create strong movements.”

Elisabeth Munck af Rosenschöld

Sustainability manager, Supply chain operations, Inter IKEA Group
(www.washingtonpost.com)

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A sustainable trend

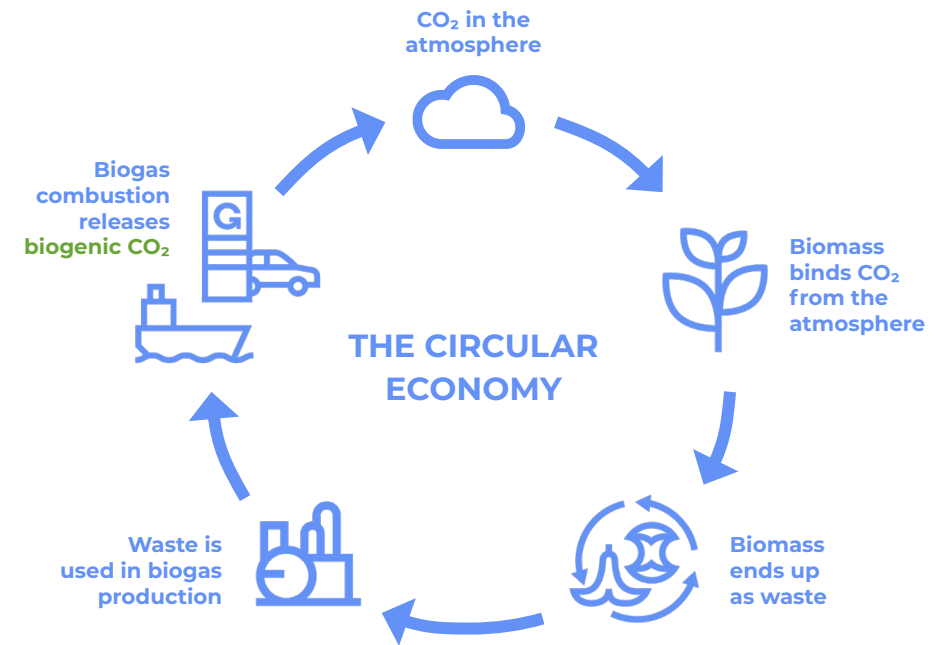
In 2021, Amazon, Ikea and Unilever signed up to only move cargo on vessels using zero-carbon fuels by 2040. With liquefied biogas (LBG), vessels can reduce their carbon dioxide emissions by up to 90% compared to heavy fuel oil. And become part of the circular economy.

Join the circular economy!

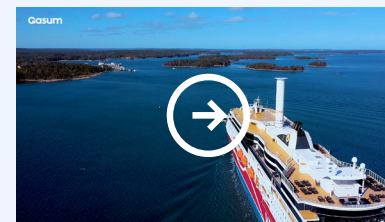
Gasum's LBG is made from biodegradable waste such as manure, food waste, sewage and process water from industry. During production, we also get biofertilizer as a by-product that can be used to grow new crops. When you choose LBG, you become part of the circular economy.

Your wastewater – part of the circular economy

Technical development makes it possible for you to become even more circular. The Baltic Sea Action Group has launched an initiative that aims to produce biogas from sewage discharged by vessels at the Finnish port of HaminaKotka. The wastewater sludge created in the process is refined into renewable energy at Gasum's biogas plant. Similar projects are in progress in Sweden, where Gasum produces LBG from wastewater at Stora Enso's paper mill in Nymölla. Join the cycle!



WATCH OUR FILMS



Biogas – A part of the circular economy



Creating value from the circular economy

[Lower emissions](#)[Good examples](#)

Lower emissions. More business.

There is a need for alternative maritime fuels to reduce the environmental and climate impact of shipping. Logistic buyers and vessel passengers demand to transport goods and themselves in a more sustainable way. For many shipowners, this means large investments in new vessels with engines that can run on alternative fuels. Shipowners who switch to liquefied gas have a lot to gain.

Sustainability is more important than price

We live in a value-driven time where consumers are willing to prioritize sustainable alternatives even in economically tougher times. A majority of retail companies have a sustainability manager with responsibility for producing as climate-smart products as possible. Transport is included in the product's climate footprint, which makes transportation one of the more important topics when retail companies prioritize sustainability issues*. In addition, experience from heavy road transport shows that the price is becoming subordinate to the sustainability aspect when buying transports.

"We are setting an ambitious goal for ourselves to reach 50% of all Amazon shipments with net zero carbon by 2030. We believe that lower costs include lowering the costs to the environment we all live and work in every day"

Dave Clark
CEO, Amazon Worldwide Consumer
(aboutamazon.com)

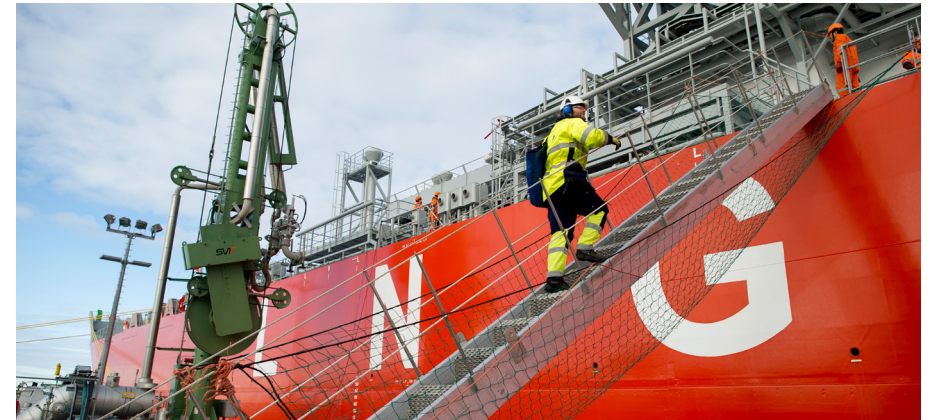
28% OF THE TRADING COMPANIES BELIEVE THAT TRANSPORT IS THIS YEAR'S VERY IMPORTANT SUSTAINABILITY ISSUE*



[Lower emissions](#)[Good examples](#)

Good examples

About 250 vessels are currently powered by liquefied natural gas (LNG). Investing in and building LNG vessels has become the new normal. Many major shipowners have already made the transition to LNG, and some have taken the step to run their vessels on liquified biogas (LBG). The following cases allow some insights on how the shipowners were reasoning before their investment.



High-capacity vessels run on LNG

Samskip Kvitbjorn and Samskip Kvitnos operate scheduled shipping between Rotterdam and Norway and travel all the way to Europe's northernmost city, Hammerfest. They are ocean-going high-capacity vessels and run a regular route with fixed timetables. The partnership with Gasum allows Samskip to bunker LNG in Risavika, Norway. As the LNG plant is only 200 meters from the quay, fresh and cold LNG can be stored quickly and safely directly from the plant via a loading arm.

[READ MORE ABOUT SAMSKIP](#)

Climate-smart passenger trips

One of Sweden's most well-known passenger shipping companies, Destination Gotland, have increased its LBG blend from one to ten percent in its gas-powered vessels. Destination Gotland is the first passenger shipping company to continuously use a ten percent blend of LBG in its natural gas fuel composition. By doing so, the company is reducing its carbon fuel emissions by 9,000 tons a year. Destination Gotland are determined to switch to a climate-smart Gotland trip no later than 2045.

[READ MORE ABOUT DESTINATION GOTLAND](#)

The best time to replace vessels

ESL Shipping, the leading carrier of dry bulk cargo in the Baltic region, promotes sustainability through LNG powered vessels. Using LNG has awakened ESL Shipping's customers' interest and lowered their fuel costs. "Vessels have to be replaced by newbuildings every now and then, which is the best moment to think about how to make them more sustainable", says Matti-Mikael Koskinen, Managing Director of ESL Shipping.

[READ MORE ABOUT ESL SHIPPING](#)

Is liquefied gas a fuel that you should invest in?



Eight questions to show you how to navigate forward

- 1. Do you want a fuel that is future-proof?**

How future, low-carbon vessels will be powered has yet to be decided. Consequently, new vessels must be designed with energy flexibility in mind. We believe LNG will be part of the fuel mix in the future, together with liquefied bio-gas (LBG) and renewable synthetic LNG.
- 2. Do you want to be able to bunker in all the ports you arrive at?**

LNG is a global commodity with 21 countries exporting to 42 importers and accounts for approximately 11% of worldwide gas consumption. You may use the same infrastructure for fueling LNG as for LBG and renewable synthetic LNG. The global network of terminals, bunkering vessels and trucks are constantly growing and are able to support your vessels on almost any trade.
- 3. Do you want to be able to offer sustainable transport for goods and people?**

LNG, like other energy sources, has an impact on the environment. Greater use of LNG has contributed to reduced carbon emissions and provided reliable support for renewable energy. LNG leads the way in decarbonization emitting at least 20% less CO₂ than conventional fuel. Your customers, and customers' customers, are growingly requesting transportation of goods and passengers in a more sustainable manner.
- 4. Do you want to be sure that you follow the IMO's emission rules regarding sulfur limits?**

Vessels can have engines which use alternative fuels, which may contain low or zero sulphur. Reducing sulphur oxide (SOx) emissions from vessels have major health and environmental benefits, particularly for populations living close to ports and coasts. SOx is harmful to human health, causing respiratory, cardiovascular and lung disease.
- 5. Do you want to be able to protect yourself from large price variations?**

Hedging, fixed price or alternative products can be used by businesses to manage their energy price risks and as protection against energy price volatility. Gasum's range of services includes several of these products.
- 6. Which fuels should you compare with before you decide?**

Typical alternative fuels are low Sulphur fuels, Liquefied Natural Gas (LNG), Methanol, Liquefied Petroleum Gas (LPG) and Hydrotreated Vegetable Oil (HVO) together with ammonia, hydrogen and electricity.
- 7. Would it be nice to have a plan on how to achieve net zero carbon?**

Your first step should be to use the least carbon emitting fuel available today, going for an even more sustainable fuel tomorrow. Using LNG will enable you to use the zero carbon fuels LBG and renewable synthetic LNG, the latter when it becomes available.
- 8. Do you need expertise and training for your first vessel on alternative fuel?**

To guide our customers with their energy transition we lean on our extensive experience. We share our technical insight and advice on needed training for office and on-board staff.

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