



GIIGNL - THE INTERNATIONAL GROUP
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LNG Insight

LNG carbon offsetting: fleeting trend or sustainable practice?



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Executive Summary

Climate change and new threats such as Covid-19 are leading governments, companies and individuals to rethink the way they produce and consume energy and to accelerate their efforts in order to avoid and reduce greenhouse gas (GHG) emissions. When emissions cannot be avoided or reduced, they can be offset through the purchase of credits from carbon removal projects. The present article focuses on carbon offsetting of liquefied natural gas (LNG). Based on interviews with LNG industry participants, this article presents the existing initiatives to offset the GHG emissions associated with the LNG supply chain. It reviews the main challenges and opportunities associated with carbon offsetting and concludes that LNG carbon offsetting is likely to become more widespread and demanded by customers when emissions cannot be directly avoided or reduced.

Introduction

Climate-change mitigation policies are evolving around the world and companies across all sectors are paying more attention to the sustainability of their activities. In recent months several energy companies have announced ambitious carbon-neutrality targets, with more or less distant time horizons. Despite the fact that natural gas is the cleanest burning hydrocarbon, GHG emissions associated with the natural gas supply chain - including LNG - are increasingly scrutinized by regulators and public opinion. In a decarbonizing world characterized by a growing share of renewables, removing emissions from natural gas is unavoidable in order to ensure a role for the fuel in the energy transition.

In this context, LNG players are realizing the value of GHG mitigation and are deploying further efforts to reduce the climate impact of their activities, either for compliance reasons or to respond to shareholder and customer requirements.

LNG players face several options to mitigate the carbon footprint of LNG.

The first and most obvious solution consists in avoiding and reducing existing GHG emissions in the LNG supply chain. From upstream to downstream, a number of initiatives aiming to improve performance and to increase transparency on emissions - mainly CO₂ and methane - are currently being led by oil and gas companies, international organizations, NGOs and academia.

When emissions cannot be avoided or directly reduced, another solution to mitigate the climate impact of LNG activities consists in selling or procuring “carbon neutral” LNG or, in other words, purchasing carbon credits to mitigate the carbon footprint of LNG activities.

For both emission reduction and offsetting, a robust emission monitoring, reporting and verification system (MRV) is a prerequisite to guarantee the effectiveness of each solution.

Since June 2019, several agreements for the delivery of “carbon-neutral” LNG cargoes have been signed. The transactions often resulted from long discussions and cooperation between LNG suppliers and buyers. Among the recent LNG transactions associated with carbon offsets, the following were publicly announced, all concerning LNG imports into the Asian region :



- Shell-Tokyo Gas (June 2019) – for delivery in Japan¹
- Shell-GS Energy (June 2019) – for delivery in South Korea²
- JERA Global Markets-ADNOC (June 2019) – for delivery in India³
- Shell-CPC (March 2020) – for delivery in Taiwan⁴

Broader initiatives are also being launched: in April 2020, Pavilion Energy issued a request for proposal for long-term LNG, requesting potential LNG suppliers to commit to jointly develop and implement a GHG quantification and reporting methodology, covering emissions from the well to the discharge terminal.

The above initiatives are not all similar and use various methodologies for offsetting emissions which we will see ahead.

While initiatives related to carbon offsetting of LNG imports seem to develop, they remain quite scarce with regard to the total traded volumes. Should they be regarded as a mere trend or as a sustainable practice? How are LNG carbon offsetting mechanisms implemented and at what cost? What are the associated challenges and opportunities for the LNG industry?

¹ <https://www.shell.com/business-customers/trading-and-supply/trading/news-and-media-releases/tokyo-gas-and-gs-energy-to-receive-worlds-first-carbon-neutral-lng-cargoes-from-shell.html>

² <https://www.shell.com/business-customers/trading-and-supply/trading/news-and-media-releases/tokyo-gas-and-gs-energy-to-receive-worlds-first-carbon-neutral-lng-cargoes-from-shell.html>

³ [http://www.jeragm.com/press-releases/JERA-Global-Markets-Pte-Ltd-first-carbon-Neutr-\(1\)](http://www.jeragm.com/press-releases/JERA-Global-Markets-Pte-Ltd-first-carbon-Neutr-(1))

⁴ <https://www.shell.com/business-customers/trading-and-supply/trading/news-and-media-releases/cpc-corporation-taiwan-receives-carbon-neutral-lng-cargo-from-shell.html>



What is a “carbon-neutral” LNG cargo?

The “carbon-neutral” denomination does not mean that a cargo does not cause any emissions, but rather that the GHG emissions have been offset through the purchase of credits from carbon removal projects, for instance projects linked to afforestation, reforestation, or to renewable projects.

To take into account the full climate impact of LNG activities, the notion of carbon neutrality needs to be extended to include not only CO₂ emissions but also methane emissions, two of the largest components of emissions from the LNG value chain, the total of which can then be expressed in CO₂ equivalent.

Based on the Greenhouse Gas Protocol⁵ which represents the most widely used GHG accounting standards, lifecycle GHG emissions can be divided and measured according to three “scopes” (Scope 1, 2 and 3):

- Scope 1 emissions are direct emissions from owned or controlled sources.
- Scope 2 emissions are indirect emissions from the generation of purchased energy.
- Scope 3 emissions are all indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions.

Product lifecycle emissions are all the emissions associated with the production and use of a specific product, from cradle to grave, including emissions from raw materials, manufacture, transport, storage, sale, use and disposal.

The classification in “scopes” can be interpreted differently depending on the type of activities of a given company (producer, trader, utility...) which can sometimes be confusing and lead to double counting issues.

Let’s take the example of an LNG importer importing an LNG cargo on a DES basis:

If the importer is importing DES LNG and using the LNG directly, the LNG importer’s GHG emissions along the value chain can be classified as follows:

- raw gas extraction, liquefaction and transport to importer – Scope 3 (Well-to-Tank)
- regasification, distribution, combustion of the LNG – Scope 1 & 2 (Tank-to-Wheel)

If the importer is passing the LNG through, the LNG importer’s GHG emissions can be classified as follows:

- raw gas extraction, liquefaction and transport to importer – Scope 3 (Well-to-Tank)
- regasification, distribution to customer – Scope 1 & 2
- combustion of LNG by customer – Scope 3

⁵ https://ghgprotocol.org/sites/default/files/standards_supporting/FAQ.pdf



In the case of the cargoes supplied by Shell to Tokyo Gas, GS Energy and CPC, all three scopes (from extraction to use by the final consumer) were included into the calculation. This is not always the case. In the case of the cargo supplied by JERA GM and sourced from ADNOC, only emissions from the downstream use of LNG were offset⁶.

In order to offset the emissions related to a cargo, it is necessary to take into account the full product lifecycle emissions from all three scopes (1, 2, 3) within the calculation. Typically, a “carbon-neutral” cargo is a cargo from which the **entire product lifecycle GHG emissions (from Well to Wheel) are offset**.

Offsetting: how does it work?

In order to declare a cargo as carbon-neutral, stakeholders involved in the trade of an LNG cargo agree to buy carbon credits for the equivalent amount of GHG emissions associated with the cargo. Each credit represents one tonne of CO₂ removed or reduced from the atmosphere as a result of emission reduction projects, examples of which are reforestation, conservation or cookstoves distribution projects to name a few.

The first step thus consists in **quantifying the emissions** associated with an LNG cargo. However, a frequently encountered issue is the fact that quantifications of emissions related to an LNG cargo are difficult to verify. In order to quantify emissions from LNG activities, actual measurements or public tools for GHG reporting can be used. The UK Government GHG Emission Factors are sometimes used in place of assessing emissions through the supply chain if actual data are not available⁷. To ensure more accuracy, putting in place a universally accepted framework for monitoring, reporting, and verifying (MRV) emissions which can assess emissions at all stages of the LNG supply chain is necessary. Such universal methodologies are however still in their infancy and could take a long time before being developed for all segments of the LNG value chain.

On average, the product lifecycle emissions of a conventional LNG cargo (~175 000 cubic meters) are generally estimated at around 250 000 tons of CO₂ equivalent. This amount can vary depending on various factors such as the source of the LNG, the type of liquefaction technology, the vessel used to transport the LNG, or the equipment and procedures in place at the regasification terminal. Based on the UK Government GHG Conversion Factors, around 75% of GHG emissions from LNG are associated with its consumption (i.e. linked to the combustion of natural gas).

In 2019, the UK Government Emission Factors estimated that GHG emissions from the LNG supply chain were as follows⁸:

- 2.54 kg of CO₂ equivalent generated for each kg of LNG for the fuel combustion (Tank-to-Wheel)
- 0.88 kg of CO₂ equivalent generated for each kg of LNG for the extraction, refining and transportation of the fuel (Well-to-Tank)

⁶ [http://www.jeragm.com/press-releases/JERA-Global-Markets-Pte-Ltd-first-carbon-Neutr-\(1\)](http://www.jeragm.com/press-releases/JERA-Global-Markets-Pte-Ltd-first-carbon-Neutr-(1))

⁷ <https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting>

⁸ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/847122/Conversion-Factors-2019-Full-set-for-advanced-users.xls



Once quantified, the emissions that could not be avoided or reduced can be offset by purchasing carbon credits.

There are many standards available for both compliance and voluntary carbon markets. The two leading ones are explained below:

Clean Development Mechanism and CERs (Certified Emission Reductions)

The most widely traded compliance credits are credits which have been generated through emission reduction projects falling under the United Nations' Clean Development Mechanism (CDM). This mechanism allows emission-reduction projects in developing countries to earn certified emission reduction (CER) credits, each equivalent to one tonne of CO₂. Under this mechanism, reductions in developing countries produce credits that could be used to offset increased emissions in developed countries. CERs are certified by UNFCCC (United Nations Framework Convention on Climate Change). They can be traded and sold, and are used by industrialized countries to meet a part of their emission reduction targets under the Kyoto Protocol.

- Ex: In the case of the LNG cargo sourced from ADNOC by JERA Global Markets and imported into India, the Japanese company purchased certified emissions reductions (CERs) from Indian renewable electricity projects to offset the emissions generated by the downstream use of LNG in India.

The Clean Development Mechanism has faced many issues since its inception, including the fact that the reduction targets defined for some countries were too liberal and result in a massive surplus of assigned credits.

In the future, the Clean Development Mechanism (CDM) is expected to be progressively replaced by the Sustainable Development Mechanism (SDM) defined by article 6.4 of the Paris Agreement. This article sets up a centralized, global platform to trade standardized carbon credits. In order to avoid repeating the mistakes of the CDM the key aims of the SDM are:

- a) Promoting greenhouse gas emissions mitigation while fostering sustainable development
- b) Delivering an overall mitigation in global emissions and preventing double counting

Verified Emission Reduction (VER) carbon credits from international carbon offsetting standards

Voluntary markets for emissions reductions are used by buyers and sellers of Verified Emission Reductions, who wish to manage their emission exposure for non-regulatory purposes. In many countries, the legal framework for carbon credit trading is not yet mature, which is why companies prefer to buy credits certified by international rather than national standards.

Several international standards exist, which offer credits from emission reduction projects which have been selected for their environmental but also, increasingly, for their sustainable development characteristics. These standards guarantee that the emission reduction projects comply with a set of environmental and societal requirements that can vary widely from one standard to another. Credits can then be sold over the counter.



Among the most commonly used carbon offsetting certification standards are Verified Carbon Standard (VCS)⁹ and Gold Standard Verified Emissions Reduction (GS VER)¹⁰. These organisations hold their own registries where they record, transfer and/or retire voluntary carbon credits from the market, promising to prevent double counting. The largest certification framework VERRA now includes several standards under the same umbrella.

In addition to the main standards, a number of complementary standards exist, which can be additionally applied in order to value the socioeconomic benefits of emission reduction projects. These standards are for instance Social Carbon Standard¹¹, Climate, Community and Biodiversity Standards (CCB)¹² or Water Benefit Standard¹³.

- Ex: In the case of the LNG cargo supplied by Shell to GS Energy and CPC, the credits used were bought from Shell's global portfolio of nature-based projects, including both Afforestation and Conservation projects under the VCS, CCER and CCB Standards.

Some programs are not standards as such but methodologies specific to one sector, such as the REDD+ methodology. REDD+ credits can be issued under the VERRA Standard. REDD stands for "Reducing Emissions from Deforestation and Forest Degradation". It is a United Nations-backed framework that aims to curb climate change by stopping the destruction of forests. Through this framework, countries, the private sector, multilateral funds and others can pay countries to prevent them from cutting down their forests. This can take the form of direct payments or can be in exchange for "carbon credits," which represent reductions in greenhouse gas emissions to offset emissions.

One of the main issues associated with the market for carbon credits is that it is an illiquid market. Another issue is the limited clarity on article 6 of the Paris Agreement and how it is going to be developed/expanded further. As of today, there is no certainty regarding which type of offsets will be allowed or when different Emission Trading Systems will be linked together at the global level.

It is sometimes challenging to distinguish business-as-usual emissions reductions from truly additional reductions that can be credited and traded. In addition, the environmental and social quality of emission reduction projects can vary greatly. A hydroelectric project resulting in displacing populations or a reforestation project involving local communities do not hold the same value. Companies should therefore pay close attention to the comprehensive value of a project and ensure that the project emissions are real, additional and permanent.

Increasingly, the focus on carbon dioxide and GHG emissions is shifting to a more comprehensive set of requirements than looking only at carbon dioxide emissions. Many companies now prefer to talk about "nature-based" solutions (NBS).

Nature-based solutions are defined as solutions inspired and supported by nature, which provide longer term benefits, including social and economic benefits.

⁹ <https://verra.org/>

¹⁰ <https://www.goldstandard.org/>

¹¹ www.socialcarbon.org

¹² www.climate-standards.org

¹³ <https://www.goldstandard.org/articles/water-benefit-standard>



Selecting adequate offsetting standards and nature-based solutions is therefore essential to ensure a truly beneficial impact for the climate, for biodiversity as well as for society.

How much does it cost to offset the CO₂ footprint of an LNG cargo?

Given the intrinsic carbon content of natural gas and despite the fact that this content is lower than in other liquid fuels, **offsetting the carbon from an LNG cargo is not cheap**.

When investing in reforestation projects to offset the carbon footprint of a cargo, the cost can easily rise to USD 10/tCO₂e or more. At this cost, if one assumes the total GHG emissions of a conventional LNG cargo at around 250 000 tCO₂e, offsetting GHG emissions for one LNG cargo amounts to USD 2.5 mln per cargo, i.e. approximately USD 0.60/mmBtu. Compared with JKM prices at around USD 2.00/mmBtu, it is a substantial additional cost which will not be easily borne, even if it is shared along the chain or if it gets passed on to the consumers.

Nevertheless, **carbon offsetting should not be addressed only from a cost perspective**. Carbon-neutral LNG can also be viewed as a premium product and as a new offering for LNG suppliers in order to differentiate themselves in times of harsh competition. Being able to offer carbon-neutral LNG and natural gas is increasingly attractive to downstream customers, who can in turn boast about their carbon neutrality efforts in their marketing actions and in their CSR reports, thus meeting at the same time shareholder and customer expectations.

As an example, two customers of Tokyo Gas showed an interest in purchasing carbon-neutral natural gas, one in the cosmetics industry and one in real estate (Mitsubishi Estate Co.) who builds district heating and cooling systems in the Marunouchi area of Tokyo¹⁴. This may have facilitated the execution of the transaction announced in June 2019.

Furthermore, given the relatively low emissions from natural gas compared to fuels like coal, LNG could remain well positioned provided that lifecycle GHG emissions of competing burning fuels get equally accounted for and offset.

¹⁴ https://www.tokyo-gas.co.jp/Press_e/20191023-01e.pdf



Who pays for what: a strategic decision?

GHG emissions from the LNG supply chain vary widely depending on the segment of the chain and the procedures and practices in place. One can distinguish the emissions from the upstream sector (venting and flaring), emissions from liquefaction, from shipping, from regasification, from transportation and distribution, as well as from the combustion of natural gas.

The quantity of emissions also depends on the type of facilities or ships considered, on the reporting rules in place or on the methodologies used for the quantification (bottom-up, top-down, theoretical calculation or actual measurements...).

Who should bear the cost of offsetting the CO₂ is often **a strategic choice** for LNG companies as well as **a result of the balance of power between suppliers and buyers**. Logically, it is unlikely that companies would be willing to pay for other companies' inefficiencies. As a result, companies are usually aiming to offset the portion of the emissions that:

- a) they are responsible for and
 - b) that they can monitor precisely
- Ex: In the case of the carbon-neutral cargo supplied by JERA Global Markets to India in June 2019, the amount of carbon dioxide equivalent to the emissions associated with the production and transportation of LNG was not part of the carbon offset initiative, since it was deemed challenging for the company to take responsibility for ADNOC's own upstream or shipping emissions. Instead, JERA Global Markets selected to offset the emissions generated by the downstream use of LNG in India.

Pavilion Energy is tackling the issue from a gas company perspective: the LNG importing company wants to jointly develop with its supplier(s) an emissions monitoring, reporting and verification methodology in order to have a view of the emissions associated with its natural gas procurement from the wellhead to the discharge port. The aim is to create an internationally recognized and accepted methodology that can be applied industry wide and promote sustainability within the LNG industry. This underlines the need to ensure MRV systems are in place before any offsetting strategy can be discussed. Applying carbon offsetting to a single cargo is one thing, doing this on a multi-year LNG SPA with all of its contractual flexibilities looks like a more arduous - and possibly more costly - task. Separately, Pavilion Energy also aims to tackle emissions from the next segment of the value chain (from discharge at the terminal to the cogeneration plants) although this part was not included in the request for proposal.

It is to be noted that **all companies are not equal in terms of ability to assess or measure GHG emissions**. For vertically integrated companies like Shell, Total or BP who have visibility on the entire supply chain, assessing the amount of emissions from upstream to downstream may be easier than for traders, who may have less operational control on emissions from upstream or shipping. Equally, utilities buying DES/DAP LNG cargoes have no visibility on the emissions upstream of the discharge port, while FOB buyers might have more visibility on the emissions from the shipping segment.



Since access to **actual data on emissions is key to ensuring accuracy**, the choice of the entity responsible for quantifying and/or verifying the carbon dioxide emissions associated with an LNG cargo will be important to guarantee true carbon neutrality. As carbon offsetting initiatives develop, LNG suppliers and buyers will also need to find a balanced and fair approach to calculate and share the costs related to offsetting the emissions.

Which factors will drive the development of carbon-neutral LNG?

First, **regulatory developments** may have an impact on the development of carbon trading markets and of carbon offsetting initiatives in LNG.

In Europe, the EU ETS (Emission Trading System) set up in 2005 is today by far the world's first international emissions trading system. Outside Europe, several LNG importing countries have also started to adopt emission trading systems as well as legal or regulatory frameworks for the reporting or taxation of GHG emissions. The Korean emissions trading system (KETS) was launched in 2015 and covers around two thirds of Korea's total greenhouse gas emissions. China is expected to launch a cap-and-trade system by the end of 2020 to cover emissions from its power sector. However, these frameworks generally apply to the emissions generated at the national level and not to the emissions from an entire fuel supply chain. In Singapore for instance, any industrial facility that emits equal to or above 2,000 tCO_{2e} direct GHG emissions is required to report emissions while any industrial facility that emits equal to or above 25,000 tCO_{2e} annually is required to be registered as a taxable facility and to submit a Monitoring Plan and an Emissions Report annually. Taxable facilities also have to pay a carbon tax, which is currently of \$5/ton CO_{2e} from 2019 to 2023 and is scheduled to increase to between \$10 and \$15 by 2030.¹⁵ Gas-fired power plants using regasified LNG may be subject to a carbon tax, but the emissions from the production and shipping of LNG are not included in the calculation.

Policies are nevertheless starting to evolve to take into account entire supply chains, from production to consumption. Ursula von der Leyen, EC President recently stated that *“A Carbon Border Tax is a key tool to avoid carbon leakage and ensure that EU companies can compete on a level playing field”*. In this context, methane emissions from energy supply chains are increasingly in the limelight: in the EU, the Commission will publish in September 2020 a “Methane Strategy” which will serve as a foundation for a new legislation on methane emissions from June 2021. These evolutions may well have an impact on the development of GHG reporting for LNG cargoes, and consequently on the offsetting of carbon from LNG activities. Suppliers willing to sell a cargo into the European market may have to show a certificate showing the level of associated emissions, otherwise the value of their cargo could depreciate. From a lifecycle standpoint, natural gas generates the lowest CO₂ emissions of any fossil fuel, but – in Europe at least - this argument is now insufficient to guarantee a long-term role for LNG in the energy mix. In Europe, the narrative according to which LNG can support decarbonization by facilitating the coal to gas switch and

¹⁵ <https://www.nea.gov.sg/our-services/climate-change-energy-efficiency/climate-change/carbon-tax#:~:text=The%20carbon%20tax%20is%20set,of%20GHG%20emissions%20by%202030.>



backing up renewable electricity generation is struggling to convince policy makers, who are requesting more transparency on GHG emissions from the LNG supply chain, in particular methane emissions.

However regulation may not be the sole driving force for carbon-neutral LNG.

From a marketing or commercial standpoint, the rise of carbon offsetting initiatives could also simply result from the evolution of **companies' positioning regarding sustainability**. Companies are increasingly seeking to respond to the ever growing demand of customers for climate-neutral goods and services. In Asia in particular, customers are increasingly aware of air quality issues and of climate change, thus requesting carbon reduction efforts from corporations. In China, the retailer Alibaba is leveraging digital technologies to offer millions of customers the possibility to offset online purchases¹⁶.

A company as large as Apple claims to have reduced its carbon footprint by 35% since 2015¹⁷ and to purchase only renewable electricity for its facilities. This type of positioning could become more widespread. It could lead natural gas suppliers to boost efforts to reduce the carbon intensity of their products, making carbon-neutral LNG a **premium product** able to meet demand for lower carbon energy sources.

From a corporate strategy standpoint, LNG players also have different interests and different means when it comes to offsetting the carbon footprint of their activities. Oil and gas majors like Shell, Total and BP have announced plans to significantly cut carbon emissions or to become carbon-neutral over the next three decades and they will have to meet strong expectations from the financial community. This gives them an additional incentive to offset the carbon emissions associated with LNG since lowering carbon intensity is now fully part of their corporate strategy.

Therefore, despite the existing gaps in data, methodology and reporting systems, the current LNG market environment characterized by oversupply is an unprecedented opportunity for LNG importers to request more transparency and more support from suppliers in order to reduce the carbon intensity of their LNG supplies. After all, food retailers request full traceability on the products that they import. Why wouldn't energy buyers be entitled to request the same transparency? As explained by Professor Jonathan Stern in his paper "Challenges to the Future of LNG: decarbonisation, affordability and profitability"¹⁸: *"the LNG community needs to replace an 'advocacy' message, based on the generality of emissions from the combustion of natural gas being lower than other fossil fuels, with data on carbon and methane emission data from specific value chains, calculated using transparent methodologies."* In order to ensure the accuracy and objectiveness of emissions reports, the verification of emissions reports by independent and accredited verifiers and certification companies will be key.

¹⁶ <https://unfccc.int/climate-action/momentum-for-change/planetary-health/alipay-ant-forest>

¹⁷ https://www.apple.com/environment/pdf/Apple_Environmental_Responsibility_Report_2019.pdf

¹⁸ <https://www.oxfordenergy.org/publications/challenges-to-the-future-of-lng-decarbonisation-affordability-and-profitability/>



Conclusion

LNG trade has experienced strong growth over the last decade and global LNG demand is set to double by 2040 according to most forecasts¹⁹. Nevertheless, the emergency situation caused by climate change requires drastic carbon reduction efforts from the natural gas sector for such growth to become reality.

Regulatory requirements could reinforce the focus on GHG emissions from the LNG supply chain. The Covid-19 crisis and the growing awareness of both customers and investors are also likely to accentuate the interest in sustainability and the demand for low carbon activities. Suppliers and buyers could thus voluntarily use offsetting solutions to maintain the value of their product and even build a competitive advantage, making LNG a premium product and a differentiation factor.

In this context, “carbon neutral” LNG trade achieved through emission offsetting mechanisms are likely to become more frequent regardless of the level of LNG prices.

Quantifying and certifying emissions from the LNG supply chain is a challenging but not impossible task. To this end, the implementation of a sound and universally accepted monitoring reporting and verification system is necessary. It will require cooperation between sellers and buyers and efforts from both sides to avoid delaying its development. When it comes to offsetting mechanisms, not all initiatives are of equal quality and the various emission reduction standards should therefore be thoroughly evaluated and benchmarked.

Finally, before any offsetting, avoiding and reducing emissions from the LNG value chain should remain the priority, as they are the most rapid, effective and sustainable ways to achieve carbon neutrality. Since ecosystems are impacted by climate change, the more global warming progresses, the more difficult to implement emission reduction solutions will become. Carbon offsetting mechanisms should therefore not replace emissions reductions, but they could well become a significant piece of the industry’s efforts to curb climate change.

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