



IN PURSUIT OF GREENER LNG

Atlantic's Carbon Abatement Strategy







ON THE
GREEN
AGENDA



Cleaner energy is still the priority, so fossil fuel markets are moving away from more pollutant coal and oil towards cleaner-burning natural gas.

According to most experts, humanity's best chance at avoiding irreparable and catastrophic climate change in the next three decades hinges on us building a carbon neutral world. An attainable goal in principle, its actualisation is nevertheless some way off. Some of the technologies on which we are placing reliance are still in their infancy; for others, deployment on any significant scale remains commercially or logistically infeasible. Barring new design breakthroughs or rapid advancements in battery technology, we will continue to rely heavily on our staple hydrocarbons to meet our energy needs over the medium term.

That said, cleaner energy is still the priority, so fossil fuel markets are moving away from more pollutant coal and oil towards cleaner-burning natural gas.

A role for LNG

With natural gas serving as a bridge fuel in the energy transition, LNG trade is likely to remain strong for some time, and Trinidad and Tobago, as an exporter of LNG, would be well-placed to leverage into new markets. However, while natural gas is relatively clean-burning, its value chain — particularly downstream LNG production — has a considerable carbon footprint.

Given increasing pressures to neutralise the carbon impact of energy production and consumption, some believe that 'green LNG' could soon become the new accepted norm for the industry. On the supply side, certain producers have started selling carbon neutral cargoes; on the demand side, some companies have signed contracts requiring producers to disclose the carbon footprint of their LNG production process.¹ It is therefore not unreasonable to presume that carbon-conscious production could become a baseline criterion for entry into certain LNG markets in the near future.

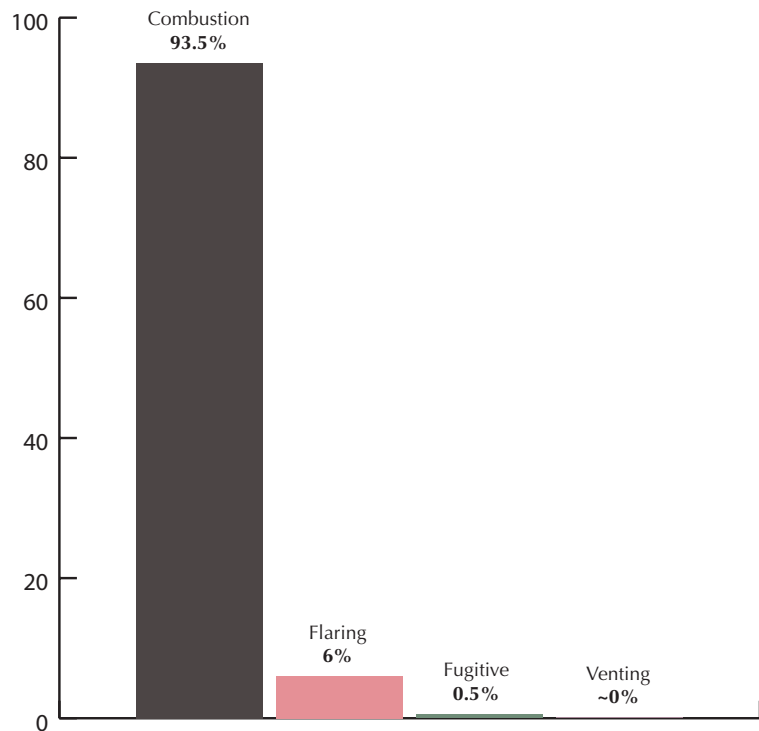
So, what does this mean for Trinidad and Tobago and its LNG business, led by the Atlantic LNG Company of Trinidad and Tobago (Atlantic)? Through Atlantic's operations, Trinidad and Tobago has earned a spot among the top 10 exporters of LNG in the world, despite being a relatively small gas province by reserve volume. The country has built a global network of trading partners and is well-positioned and resourced to capitalise on emerging demand. However, the LNG business is currently a major local contributor to CO₂ emissions, with Atlantic's operations releasing over 4.5 million tonnes of carbon dioxide equivalent (tCO₂e) in 2020 alone.² If markets start demanding cleaner LNG, our competitiveness as an LNG exporting nation will hinge on a cleaner production process and LNG supply chain.

Atlantic has taken heed and since 2017, has been on a mission to reduce its GHG intensity levels at its facilities, through a series of technology upgrades, process improvements and collaborative work with shareholders NGC, bpTT and Shell.

¹ <https://www.naturalgasintel.com/green-lng-rapidly-becoming-new-normal-across-the-world/>

² <https://atlanticlng.com/wp-content/uploads/2021/07/Atlantic-Sustainability-Report-2020.pdf>

THE COMPANY HAS FOUR MAIN EMISSIONS SOURCES



Atlantic targets cleaner operations

Whereas in the past, greenhouse gas (GHG) monitoring was conducted to ensure compliance with industry regulations, Atlantic has implemented a more proactive emissions management plan that goes beyond bare minimum requirements. The intent is not only to preserve the commercial viability of its product in a more demanding market, but to support Trinidad and Tobago's commitments under the Paris Agreement.

Emissions management strategies

The company has four main emissions sources:

Combustion (93.5%)
 Flaring (6%)
 Fugitive (0.5%)
 Venting (~0%)

Emissions comprise carbon dioxide, methane, nitrogen and sulphur oxides, as well as volatile organic compounds. However, CO₂ from combustion is the dominant GHG in the emissions profile.

FIRST STREAM
OF INITIATIVES
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POTENTIALLY
20%
OF EMISSIONS

Having mapped its emissions sources, Atlantic has been seeking to curb its GHG output via two work streams. The first stream of initiatives is addressing potentially 20% of emissions. Since 2017, Atlantic has been screening and implementing carbon abatement projects aimed at:

- increasing thermal efficiency,
- reducing fuel consumption,
- optimising processes to convert every molecule of natural gas into LNG, and
- energy efficiency improvements in building facilities.



STRATEGIC ORGANISATIONAL CHANGES HAVE ALSO BEEN IMPLEMENTED ALONGSIDE THESE PROJECTS:

GHG EMISSIONS ARE MONITORED AND REPORTED ON THE CORPORATE SCORECARD AS A METRIC IN THE 'ENVIRONMENT' CATEGORY

GHG REDUCTION IS EMBEDDED AS A **KEY PERFORMANCE INDICATOR** FOR THE PRODUCTION OPERATIONS DEPARTMENT

SPECIFIC **ACCOUNTABILITIES** HAVE BEEN ASSIGNED TO THE VICE PRESIDENT HEALTH, SAFETY, SECURITY AND ENVIRONMENT, AND A RECENTLY APPOINTED CARBON ABATEMENT MANAGER.



Atlantic's Low Carbon Project gives industry veterans the opportunity to aggregate their experience and apply their learnings to support decarbonisation efforts in one of our country's most important industrial sectors.

— Ramesh Harrylal
Vice President of Operations, NGC

Several have been conceptualised in this work stream and are being rolled out systematically, with hundreds of thousands of tCO₂e already avoided thanks to these initiatives.

Asset integrity management is one of the major focus areas — the company has an active Leak Detection and Repair (LDAR) programme and is working to build a digital twin of its facilities to monitor infrastructure for vulnerabilities and leaks.

Strategic organisational changes have also been implemented alongside these projects:

- GHG emissions are monitored and reported on the corporate scorecard as a metric in the 'Environment' category

- GHG reduction is embedded as a Key Performance Indicator for the Production Operations department
- Specific accountabilities have been assigned to the Vice President Health, Safety, Security and Environment, and a recently appointed Carbon Abatement Manager.

The second work stream concerns the larger portion of emissions. These emissions are harder to abate, and require more extensive and technical upgrades. In 2021, Atlantic launched its Low Carbon Project to tackle these emissions in collaboration with its major shareholders NGC, Shell and bpTT.

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Our commitment to considerably reduce the carbon intensity of our LNG not only upholds our responsibility to environmental, social, and corporate governance, but it is also a major step along our journey to becoming a world-class LNG producer.

— Shawn Garcia

Carbon Abatement Manager, Atlantic



Through various mechanisms of exchange and consultation, Atlantic is benefitting from the expertise of these shareholders, who collectively bring decades of global experience in managing natural gas infrastructure to the table.

All three companies are also members of the Oil and Gas Methane Partnership (OGMP) and are working closely with Atlantic to align with OGMP methane emissions and abatement reporting. A proposed approach was to break down goals and supporting activities into short-term (2021), medium-term (2022-2023) and longer-term ambitions (2024+).

One of the short-term activities identified for Atlantic's involvement was the ongoing Work Stream 1 of the OGMP Flare Working Group, which looks at improving flare measurement. Atlantic began actively participating in this group in May 2021 through a representative from its Engineering and Projects team, and takeaways are expected to inform more robust management of emissions from flares.

According to NGC's Vice President of Operations, Ramesh Harrylal — who was appointed to Atlantic's Low Carbon Project as NGC's representative — the dialogue and knowledge transfer facilitated by this collaborative approach among shareholder members, in combination with Atlantic's expertise, will greatly support Atlantic's efforts towards achieving its GHG intensity targets.

"Atlantic's Low Carbon Project gives industry veterans the opportunity to aggregate their experience and apply their learnings to support decarbonisation efforts in one of our country's most important industrial sectors.

"LNG is a business interest held in common across our companies, and we are committed to ensuring that Atlantic — and by extension Trinidad and Tobago — remains a formidable LNG player in the changing energy landscape. NGC will keep working alongside all stakeholders to make cleaner energy a reality across all spheres of activity in Trinidad and Tobago, the LNG industry prime among them."

Atlantic's commitment

As Atlantic moves forward with its carbon abatement initiatives, the country stands to benefit tremendously from the targeted outcome of a cleaner LNG business, against a backdrop of LNG playing a central role during a time of global energy transition.

Atlantic's recently appointed Carbon Abatement Manager, Shawn Garcia, summarised the potential takeaways for company and country:

"Our commitment to considerably reduce the carbon intensity of our LNG not only upholds our responsibility to environmental, social, and corporate governance, but it is also a major step in our journey to becoming a world-class LNG producer.

"Atlantic continues to collaborate with our shareholders to identify future-proofed solutions to build a sustainable company with a step change in GHG intensity, to meet expectations of stakeholders, competitive global markets, and society." ■