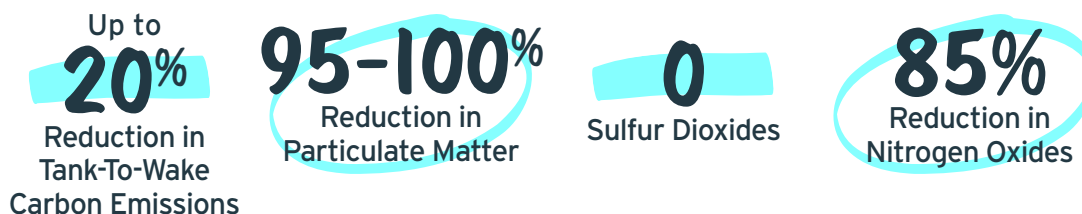




# PIONEERING LIQUEFIED NATURAL GAS

## SWITCHING FROM MARINE DIESEL TO LNG



### 11 LNG-POWERED CRUISE SHIPS

are expected to join the fleet through 2025, eight of which have been delivered.  
In total, these ships are expected to represent 20% of our total capacity by summer 2025.

## LNG PROGRAM TIMELINE

2018	<b>AIDAnova</b> 1 <sup>st</sup> 100% LNG-powered cruise ship
2019	<b>Costa Smeralda</b> 1 <sup>st</sup> Costa ship with LNG, 2 <sup>nd</sup> for the company
2020	<b>IONA</b> 1 <sup>st</sup> P&O Cruises UK ship with LNG, 3 <sup>rd</sup> for the company
2020	<b>Mardi Gras</b> 1 <sup>st</sup> Carnival Cruise Line ship with LNG, 4 <sup>th</sup> for the company
2021	<b>AIDAcosma</b> 5 <sup>th</sup> 100% LNG-powered cruise ship
2021	<b>Costa Toscana</b> 6 <sup>th</sup> 100% LNG-powered cruise ship
2022	<b>Carnival Celebration</b> 7 <sup>th</sup> 100% LNG-powered cruise ship
2022	<b>Arvia</b> 2 <sup>nd</sup> P&O Cruises UK ship with LNG, 8 <sup>th</sup> for the company
2023	<b>Carnival Jubilee</b> 9 <sup>th</sup> 100% LNG-powered cruise ship
2023	<b>Princess Cruises</b> 1 <sup>st</sup> Princess Cruises ship with LNG, 10 <sup>th</sup> for the company
2025	<b>Princess Cruises</b> 11 <sup>th</sup> 100% LNG-powered cruise ship

## WHAT IS LNG?

Liquefied Natural Gas, or LNG, is the world's cleanest burning fossil fuel. LNG not only burns more cleanly than traditional marine fuel, but it is also much less impactful to the atmosphere. As the name suggests, it is made from natural gas that has been cleaned, cooled and compressed until it becomes a liquid (at -259°F). This makes it easy to store in tanks and to carry as our fuel-source for generating power and propulsion. Due to the way it is liquefied and stored, it only burns in the right conditions as fuel when we want it to.

LNG is a fossil fuel and generates carbon emissions. Its direct CO<sub>2</sub> emissions are lower than those of conventional fuels and emits effectively zero sulfur oxides, reducing nitrogen oxides by 85% and particulate matter by 95%-100%. The types of engines that we use are subject to small amounts of methane slip (the passage of un-combusted methane through the engine). We are working closely with our engine manufacturers and other technology providers to further mitigate methane slip and have recently joined the Methane Abatement in Maritime (MAM) Innovation Initiative, where we will partner with other major maritime players to seek solutions for this challenge. [Click here to learn more.](#)

## BRINGING LNG TO NORTH AMERICA

With its arrival in Port Canaveral in 2020, *Mardi Gras* became the first cruise ship in North America to be powered by LNG. Carnival Corporation & plc has worked closely with the Meyer Turku Shipyard in Finland, its energy and technology partner, Shell, the team at Port Canaveral and a host of other parties. Facilities at Port Miami to support LNG fuel operations were finalized in 2022 to welcome *Celebration*, our second LNG-powered vessel in North America.