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World leader Carnival Corporation's goal is to promote environmental responsibility as it paves the way for a more sustainable cruise industry »



Above Workers offload recycling collected while at sea from a Carnival ship in port

Right Recycling is encouraged on board ships as part of Carnival's ongoing sustainability efforts

Cruises are the fastest-growing sector in the global travel industry. The sector grew by over 2,100 percent between 1970 and 2009, contributed over \$117bn to the global economy in 2013, and is predicted to draw in more than 23 million passengers in 2015. The US is currently the largest cruising market, but it is enjoying particularly pronounced growth around the world, including Asia, New Zealand and Australia, where cruises are just beginning to gain a firm footing. And it's not expected to slow down any time soon.

But as the sector grows, cruise companies are continuing to place a great deal of focus on protecting the environment, oceans and communities they visit throughout their journeys. It is important to take measures to protect the ocean and air for a number of reasons, including maintaining the idyllic image associated with going on a cruise.

The global maritime industry is making environmental responsibility an utmost priority, achieving a 20 percent reduction in greenhouse gas emissions between 2007 and 2012, according to the Secretary General of the International Chamber of Shipping.

Leading the charge is the world's largest cruise company Carnival Corporation, whose nine, industry-leading brands include Carnival Cruise Line, Seabourn, Cunard Line, Costa Cruises, P&O Cruises (UK), P&O Cruises (Australia), Holland America Line, Princess Cruises and Aida Cruises. The company has published its sustainability reports since 2011 – the first cruise company to do so, putting it first in the world for transparency – and has implemented far-reaching initiatives that go beyond current requirements and regulations. In 2014, it met its goal to reduce CO₂ emissions by 20 percent (a full year ahead

of schedule) and this year it will put the world's most environmentally friendly cruise ship into action – the 3,300 capacity *AIDAprima*.

While ship construction has slowed in recent years, Carnival Corporation has continued to build new vessels – all of which have incorporated fuel-efficient designs, hulls and exhaust systems. The company is set to increase its fleet capacity in coming years with the introduction of 10 ships between 2015 and 2018, including the biggest vessel the British market will ever have seen, the *Britannia*, which was christened in March by Her Majesty the Queen. With its new, innovative approaches to sustainability, Carnival is setting a precedent others in the industry would do well to follow.

Fleet Fuel Conservation Programme

Carnival Corporation has certainly been active in its aim of driving sustainability in the cruise industry, signing up to the Sustainable Shipping Initiative, developing its Code of Conduct and Ethics programme, and establishing partnerships with environmental organisations such as the Nature Conservancy. The company has also created a number of its own initiatives: among them is its Fleet Fuel Conservation Programme, under which it seeks to establish fuel-efficient ship designs and energy-saving approaches across its fleet of 100-plus ships.

The efforts are starting to pay off: by the end of 2014, the company had saved over one billion gallons of fuel and reduced fleet carbon emissions by 12 billion kilograms over the past seven years, while improving the fleet's efficiency by 24 percent since 2007 – generating savings of around \$2.5bn in fuel costs. “The programme has become a cornerstone of the corporation's strategy to collaborate across its nine

“*The company has published its sustainability reports since 2011 – the first cruise company to do so*”

industry-leading brands and leverage its scale, while supporting sustainability initiatives designed to reduce environmental impact from maritime operations”, says Elaine Heldewier, Sustainability Director at Carnival Corporation.

That success has been reached through several tenets, all of which come under a wider initiative: Ships for Greater Efficiencies. From cleverly thought-out hull coatings and designs that minimise drag, to systems that utilise waste heat for water and steam, to energy-efficient lighting, air conditioning, and automatic heating control systems, its reach is comprehensive – and it's little surprise other lines are set to follow suit. Other key focuses include improving how the ships move through the water to optimise speed and cruise distances, developing fuel homogenisers that improve combustion, reducing the use of onboard water, and optimising plant energy consumption alongside diesel generator use.

The company is also pumping significant investment into designing more fuel-efficient itineraries, developing effective waste management practices, and educating onboard officers, crew and guests in energy saving issues.

Port power

Carnival Corporation is also upping its use of ‘cold ironing’ – that is, using power installations on shore when ships are docked and drawing on the local grid for electricity, rather than generating power on board by running their engines. Currently, 35 percent of Carnival Corporation's fleet is equipped with cold ironing capabilities.

Hamburg – whose port is key for the Germany-based AIDA fleet – has now taken things one step further with *Hummel*, a floating LNG Hybrid Barge that uses liquefied



1,500
Tonnes of drinkable water produced by the *Britannia* each day

7%
Operating power saved by the Mitsubishi Air Lubrication System

natural gas and CHP engines to generate power for docked ships. It prevents emissions from sulphur oxide and soot particles entirely, can cut CO₂ levels by approximately 30 percent and reduces nitrogen oxide emissions by up to a staggering 80 percent.

“With this pilot project, Becker Marine Systems and AIDA Cruises are together setting an example for environmental and climate protection, not only for the city of Hamburg but also for the entire maritime industry”, said AIDA President Michael Ungerer at the project's opening. “With the LNG Hybrid Barge, we have again demonstrated that environmental protection and economic interests are not a contradiction for us”, he added.

Driving innovation

It's an exciting time for Carnival Corporation and the industry as a whole, with new technologies constantly being developed to transform cruise lines and limit their impact on the environment. Innovation is at the heart of the company's eco-strategy – as shown by a world-first gas cleaning technology, ECO Exhaust Gas Cleaning technology, which it has invested \$400m in developing, building and installing.

Carnival worked with the US Coast Guard, the US EPA and Transport Canada to develop a breakthrough solution for cleaner air that will allow for a more cost-effective compliance with strict regulatory requirements in Emission Control Areas (ECA) where, in 2015, the fuel sulphur limit was reduced to 0.1 percent. It will also assist the firm in meeting global International Maritime Organisation standards, whose limit in non-ECA areas is set to drop to 0.5 percent by 2020 (from a current level of 3.5 percent). The company »



Left The scrubbers installed on AIDA ships remove major pollutants from their exhaust gases whether at sea, manoeuvring or in port

Below AIDA has introduced electric cars to its motor fleet so it can reduce its carbon footprint onshore as well as at sea

is pioneering a revolution in the cruise industry by removing major pollutants from exhaust gases at any operating condition (whether at sea, while manoeuvring or in port). The two-pronged system uses filters that reduce particulates from the ship's engine emissions and seawater to remove sulphur compounds from the exhaust gases.

According to Heldewier, this is a rare breakthrough: "Due to the limited availability of shipboard exhaust gas cleaning systems, we decided to lead the way by developing the technology and by making the necessary investments", she says. "This is the first time this combination is being applied within the restricted spaces on existing ships to perform in the marine environment." The company plans to install the system across 70 percent of its fleet over the next three years.

The technology has already been introduced to various ships within the Carnival brands.

Additionally, P&O Cruises' (UK) newest *Britannia* ship is the most fuel efficient and green ship in that company's fleet and will deliver greater levels of operational and environmental efficiency than in the past. Its new hull form will reduce its unit fuel consumption by up to 20 percent. And, on top of that, the ship can produce 1,500 tonnes per day of drinkable water from seawater using heat from the ship's diesel generators.

What's more, the next generation of AIDA Cruises ships, set to be rolled out in 2015 and 2016, will be the first in the world to feature Mitsubishi Air Lubrication System technology. The system, which the company claims will save seven percent of operating power, works by creating bubbles between the ship's hull and water to reduce friction ("enabling the ships to glide on an air-bubble carpet", in Heldewier's words). The vessels will also feature dual-fuel engines, powered by eco-friendly, almost emission-free, liquefied natural gas.

The newest ship, *AIDAprima*, entering service in 2015, will use 20 percent less energy than its predecessor (*AIDAstella*) despite being substantially bigger. That's being achieved through improved insulation, alongside the use of electronically controlled pumps and eco-friendly LED lighting.



AIDA's sustainable excursions

127 shore excursions

230 biking tours

160 destinations

AIDA is also focusing on making its interiors more sustainable; its newest vessel will feature eco-friendly and recyclable carpeting, which is made from sheep's wool and, when no longer needed for the ships, can be returned to the manufacturer. "*AIDAprima*, the latest AIDA ship which enters service in 2015, not only sets new standards in environmental technologies, but also in sustainable interiors", says Heldewier. "An essential part of the environmental strategy of AIDA Cruises is to use resources efficiently", she adds.

Waste not; want not

It's not just AIDA stepping up its game in the sustainability arena; Costa Cruises, another key brand within the Carnival Corporation group, has implemented a €2.7m three-year 'Sustainable Cruise' project. It's being backed by the European Commission, which is contributing 50 percent of the funding as part of its LIFE programme. Launched in 2011, the initiative has seen Costa Cruises test a variety of shipboard waste-management models and techniques in order to comply with the European Directive on Waste, basing its focus around the 'three Rs': reduce, reuse and recycle.



Above The plugging in of AIDA's LNG Hybrid Barge, which generates power for docked ships

The project has focused on three types of shipboard waste: packaging, paper and biodegradable materials. Among the tests on the *Costa Pacifica* (one of the line's newest ships) was a Turbo-Dryer, installed to treat biodegradable food waste. By removing moisture and so reducing its volume, the new technology is able to convert the waste into animal feed and make efficient use of it. Laboratory tests revealed the oil and fat derived from processing the bio-waste could potentially be turned into biofuel and used as an eco-friendly energy source. Passengers also got involved with a campaign to raise awareness about paper waste. These waste-management practices have now been implemented across the entire Costa Cruises fleet.

Supporting local regions

Sustainability in the cruise industry isn't limited to the ships themselves – something Carnival Corporation has recognised and responded to.

AIDA opened a new sustainable office building in October (known as the AIDA Home), constructed using the latest eco-friendly tech. The building's temperature will be controlled using geothermal technology and compression refrigeration. "AIDA Home will also feature a modern indoor climate concept with hybrid facade, thermal component activation, displacement ventilation, as well as radiant heating and cooling ceiling panels", says Heldewier. "This guarantees a perfect working climate any time of the year." The building is set to save up to 60 percent on energy and considerably reduce CO₂ emissions.

AIDA has extended its environmentally friendly footprint yet further, recently introducing BMW i3 electric cars into its motor fleet, meaning members of its workforce can reduce their carbon footprint before even arriving at the cruise terminal. The corporation is also working to standardise shore excursion sustainability programmes. For example, AIDA now counts 127 sustainable shore excursions and 230 biking tours (across 160 destinations) among its list of eco-friendly trips.

“Taking ecological and social criteria into consideration during our trips is a matter of responsibility”

The company scores its tours against criteria within different categories to help customers gauge what effect they're having on the area. "Taking ecological and social criteria into consideration during our trips is a matter of responsibility and an expression of respect for the countries we visit as well as their culture and people", says Dr Monika Griefahn, Chief Sustainability Officer at AIDA Cruises. "The new catalogue of criteria makes it possible for guests to compare the options."

Carnival fosters and encourages community partnerships, philanthropic donations and employee-driven volunteer activities geared to build better communities throughout the world. Over the years, the corporation's various community programmes have helped create stronger communities, strengthen its corporate values and generate extraordinary personal satisfaction among its employees.

The AIDA Friends of the Ocean foundation is one example of Carnival Corporation's brand community programmes. It is initiating several garbage collection events at beaches in Rostock and Hamburg, raising awareness about the negative impact of microplastics and giving out beach-friendly ashtrays to keep the shores cigarette-free.

As part of Carnival's commitment to supporting the communities it touches, during times of regional or global crisis, it works closely with various national and international relief organisations, coordinating corporate and employee donations. Typhoon Haiyan, which impacted the Philippines, affected Carnival at a very personal level. Not only do its ships visit the Philippines, but it is also the home of many of its crewmembers and their families. Carnival and its brands donated over \$1.5m, which was distributed among various organisations, including UNICEF, Direct Relief, Save the Children, International Red Cross and the International Medical Corps.

"We have plans in place to continue to build a diverse and inclusive workforce and to strengthen our engagement with our stakeholders to further identify and employ sustainability-related gains, both local and globally", says Heldewier.

With a \$700m investment in making its existing ships safe and environmentally sound, plans to knit ever-closer ties with stakeholders, an ambitious strategy to expand its presence in Asia, and new ships set to be the most efficient the ocean has ever seen, Carnival Corporation appears to have a bright, green future ahead. Its pioneering vision could lead important change in the wider cruising industry, helping passengers bask in the beauty of nature without worrying about clouding it with pollution – safe in the knowledge they are travelling sustainably, and supporting, rather than disrupting, the destinations they explore. [TNE](#)