

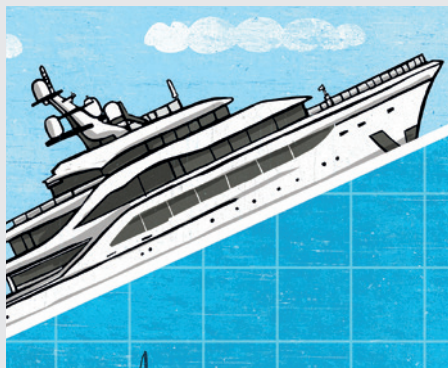
# Tech and Sustainability Take a Cruise

by Domenico Pellegrino\*

**I**n the post-pandemic scenario, the world of cruise tourism is facing extremely complex challenges. The latest reports on the state of the industry highlight the progress made and underscore the persistent efforts to innovate and promote more responsible tourism. The case of MSC Crociere demonstrates that the future of the sector is linked to technological innovation, environmental sustainability, and the reconsideration of traditional itineraries, with a different method of optimizing tourists' time and local territories.

The complex reality that we came to know starting in 2020 – the year in which the world of tourism in general and the cruise industry in particular faced unimaginable challenges – contrasts sharply with the year immediately before it.

In 2019, the cruise industry as a whole had welcomed almost 30 million passengers, creating jobs for 1.8 million people around the world and contributing more than 154 billion dollars to the global economy.<sup>1</sup> This growth reflects the now widespread perception of cruises as one of the best ways to experience a vacation and to get to know the world in general.



## THE CURRENT SCENARIO

With the Covid-19 emergency, in mid-March, all of the cruise companies voluntarily decided to suspend operations. In the subsequent months, the sector invested skills and money to construct health protocols, approved by the various government authorities involved, that were able to withstand the pressure and limitations imposed by the pandemic.

With the adoption of such special measures, an initial recovery of cruises began in Europe, and then in other areas of the world, winning over the trust of

consumers and oversight entities, and thus de facto reopening the path towards the sector's future.

The reports on the state of the cruise industry in 2021 highlight the progress made and stress the leadership of the cruise industry, recognizing the persistent efforts to innovate and promote more responsible tourism. As is known, 2022 began with uncertainty due to the spread of the Omicron variant, to which international geopolitical instability was added following Russia's aggression against Ukraine.

This scenario of war, in addition to provoking changes in some itineraries involving Baltic cities due to the cancellation of stops in Russia and Ukraine, also eliminated the component of Russian demand, that was precious in particular for high value added services.

The full normalization of the cruise sector and the flows it is able to activate have thus been further postponed. But the strength and trust of the industry is intact, as confirmed by the "Cruise Ship Orderbook,"<sup>2</sup> which shows that as of today, contracts have been confirmed for 70 new ships in the next 5 years, with estimated investments of 55 billion dollars.

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THE NUMBERS OF SUCCESS

As stated, to provide a correct picture of the sector we cannot but refer to the pre-Covid period, i.e. 2019, when there was a total of slightly less than 30 million cruise passengers (29.7 to be exact, 1.2 million more than in 2018), of which 15.4 million North Americans, 7.7 million Europeans, 3.7 million Asians, and the rest from others parts of the world. We thus see a sector that is in full health and growth. If we look at the last decade, the figures have gone from 17.8 million cruise passengers in 2009 to approximately 30 million in 2019, with a constant increase each year, where the effective driver has been the gradual growth of the offering (new ships) (Figure 1). In fact, potential demand is always estimated as much lower than available beds.

The result is a load factor essentially at 100 percent over 365 days of operation (total deseasonalization), with a complete internationalization of demand flows.

In Italy as well, the numbers for 2019 reflect the global trend. With 12.27 million passenger movements in Italian ports,<sup>3</sup> 2019 was a record year.

The global cruise offer consists of 393 ships, belonging to Carnival Corporation, Royal Caribbean Cruises, Norwegian Cruise Line Holding, MSC Crociere, and other companies. The market share of the first four is equal to 77.18 percent.

Carnival Corporation, that is the owner of 9 brands, owns 86 ships, for a total of almost 8.8 million tons. The group also has the highest number of overall beds

(244,579, equal to 38.89 percent of the total, a slight reduction compared to the previous year). Royal Caribbean follows, with 49 ships – 27 of which are owned by Royal Caribbean International – that correspond to slightly more than 5 million tons. The number of beds, 119,987, represents 19.08 percent of the total in the sector. Norwegian Cruise Line Holding and MSC Crociere have 27 and 18 ships, respectively (2.5 and 2.2 million tons); however, compared to 2020, we can see that MSC Crociere is ahead of Norwegian Cruise Line Holding in terms of number of beds: 61,584 compared to 59,246 (corresponding to shares of 9.79 and 9.42 percent).

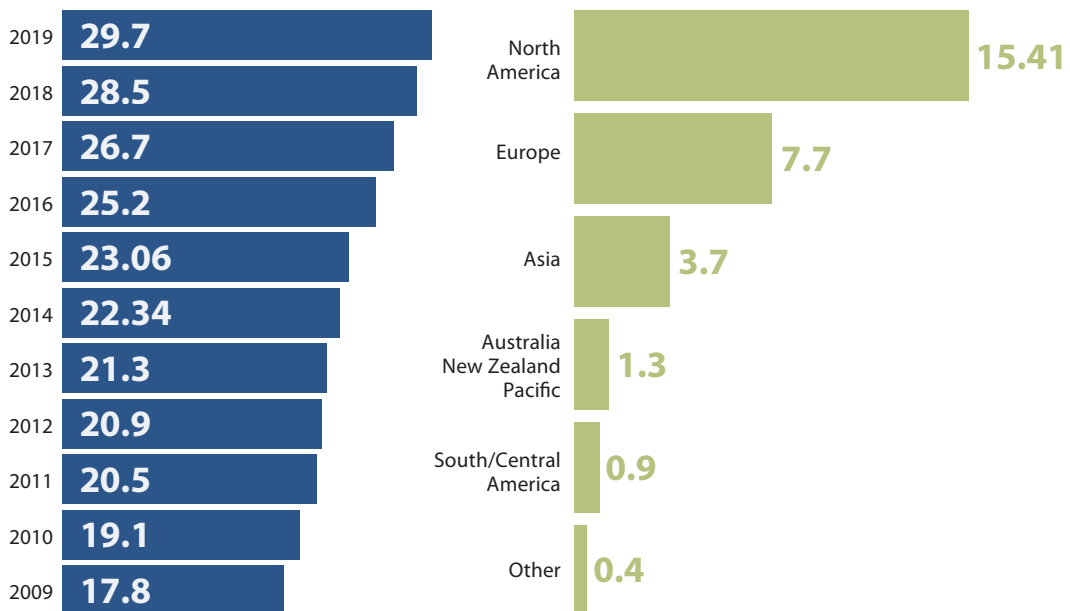
The remaining companies own 213 cruise ships, for a total of 143,540 beds (22.82 percent of global supply) and 5.4 million tons.<sup>4</sup>

Such a dynamic shipbuilding sector, and the companies' investment capacity of tens of billions of dollars per year, require processes of evolution not only in quantitative terms, but above all from the standpoint of quality.

THE FUTURE OF CRUISES

An industry that operates with a long-term logic and that lives exclusively on commercial success constantly questions the correct evolution of the model to offer the market. The recurring theme for the proposition of a new cruise experience is thus always the ship of the future.

Figure 1 - Cruise ship passengers (by total volume and geographic area). (Data in millions)



Thinking of the history of the sector, it is evident how much a series of aspects have changed and are changing, the most evident of which regard size (guests on board and thus cabins, number of decks, tons), as well as services provided.

These aspects, as well as types of furnishings, hotel accommodations, entertainment areas, architectural solutions, etc., respond to precise indications that arrive from the reference target and also the prevalent area of destination on which to insist.

The changes in terms of organization of spaces, new areas, new technology, and new interior design choices are impressive, aimed at intercepting the tastes and needs of a cruise passenger who changes over time.

The ships that are being designed and planned today need to be able to include and manage these changes for a life cycle of a single ship of at least 30 years. To attract consumers for the coming decades, the aim is to focus on innovation and intelligent design, with a clear and visible inclination towards sustainability.

The first trend that is increasingly influencing the tourist panorama is technological progress, which is linked to the concepts of digitalization and automation. Digitalization has brought tourists to increasingly use digital technologies en masse to choose, reserve, and manage their trips. They desire to directly and rapidly access all of the information they need to make decisions. That activity, in addition to being online, tends to take place on mobile devices, everywhere and without limitations (and thus including during navigation).

Experiences tend to be “phygital,” with the right hybridization of online and offline processes, not only in the search and reservation phase of cruise vacations, but also while in progress, interacting with onboard activities. This approach will be increasingly natural and taken for granted by consumers, and inevitably tend to orient shipbuilding.

For example, there has already been a consolidation of the use of apps among all of the principal companies, allowing cruise passengers to exchange messages on board, make reservations for restaurants, shows, or spas, and find directions for their cabin; or also to obtain personalized discounts and facilitations in real time for on board shopping.

Wearable technology (smart bracelets) is also common on board now, allowing passengers to open their cabins, access restricted or reserved areas, make payments, and even order food and drinks from the lounge chair next to the pool.

In addition, all of the environments of the ship are characterized by an integrated design, scientifically produced to allow the passengers to easily flow from one area to another, for example favoring socialization,



relaxation, or the search for food and wine options, as well as specific entertainment experiences.

Ships are thus floating smart cities; innovative solutions create new accommodation experiences, including virtual visits in internal cabins and outside life in cabins with verandas. Virtual assistants, interconnection of mobile devices, and personalized smart lighting, are only some of the experiences that are already part of the on-board life of a cruise passenger today.

#### THE EXPERIENCE OF MSC CROCIERE

Merely by way of example, specifically to indicate how companies are seeking innovative technological solutions in terms of both software and hardware, we report here what is happening at MSC Crociere, the only European company among the four global companies, and the only one not listed on the stock market and that is markedly Italian. Last year, the MSC Starship Club was inaugurated with Rob, the first humanoid barman in the world on a cruise ship (MSC Virtuosa). MSC Starship Club is not only a bar, but a true futuristic entertainment experience. The robotized island is completely automated and integrated with all of the machines and restaurant tools necessary to prepare and serve drinks. Rob, who has a human voice and expressions (reproduced on a LED face), does not work alone, but is assisted by human bartenders, to make the experience even more complex. The environment also includes 3D holograms, a digital art wall, and an interactive table with 12 seats for guests, to give them the possibility to explore the space with a personalized virtual tour.

Rob is able to autonomously prepare a vast range of cocktails and can interact with clients in eight different languages (English, Italian, Spanish, French, German, Brazilian Portuguese, Chinese, and Japanese), based on the language chosen by the passenger when ordering,

evolving its personality based on the surrounding environment and atmosphere.

When Rob is not busy making cocktails, he scans the environment around him, identifying the guests through a smart system for recognizing human movements placed on his head, so as to greet and engage them.

The next trends in consumption, however, will not be satisfied only with that type of technology. There is an entire world of values, balance with the surrounding environment, and recovery of authenticity and sustainability in the long term, that is strongly influencing shipbuilding.

For example, on the subject of sustainability, the use of Liquid Natural Gas (LNG) as ship fuel is an important issue at this time, having recently received considerable impetus when the maritime industry committed to respecting stricter emissions standards.

Used as fuel, LNG helps to reduce:

- sulfur emissions by 99 percent;
- particle emissions up to 99 percent;
- nitrous oxide emissions up to 85 percent;
- greenhouse gas emissions by approximately 20 percent;

The use of LNG produces a significant improvement in air quality, in particular for communities in coastal areas and port cities.

The new MSC Crociere ships fueled by LNG starting in 2022 will be among the most technologically advanced in the world and will introduce a series of important environmental innovations on the market. One of the main innovations is 50-kilowatt solid oxide fuel cells, that allow for reducing greenhouse gas emissions by an additional 25 percent compared to a conventional LNG motor.

The company is already looking even further down the road toward decarbonization, and has already launched strategic alliances (SNAM-Fincantieri) for the hydrogen-based fuels of the future. Maritime transport currently represents approximately 3 percent of global CO<sub>2</sub> emissions. The use of hydrogen can contribute to reaching the goal of net zero emissions in this sector.

The development of hydrogen-fueled large cruise ships requires a new organization of on-board spaces to host the new H<sub>2</sub> technologies and fuel cells, the definition of the technical parameters of the on-board systems, the calculation of the potential savings on

greenhouse gas emissions, and a technical and economic analysis of the supply of hydrogen and the relative infrastructures.

The cruise division of the MSC Group is working to reach the goal of zero emissions for the operation of its fleet by 2050 (decarbonization). To reach this goal, the company is working in a partnership with a vast number of shipyards, suppliers, producers and other organizations, in addition to investing in different technologies and solutions for its fleet.

In this process toward decarbonization, “ground energy” plays a fundamental role as it allows ships docked at ports to turn their engines off and connect

to the local electricity network to power their on-board systems. With the electricity transmitted to the ship through a specifically-designed transformer on the dock, this process avoids the emissions produced by diesel generators, significantly improving air quality and reducing noise levels and vibrations.

Since the end of May 2022 and for the entire summer season, for the time two ships in the MSC Crociere fleet will be constantly using ground power during their

stops at two ports in Northern Europe: MSC Virtuosa, that will use power from the new Horizon Cruise Terminal in the port of Southampton, in the United Kingdom, and MSC Poesia, that will connect to the electricity network of Rostock-Warnemünde, in Germany.

By the end of 2022, 11 of the 21 MSC Crociere ships, including all of the new ships built since 2017, will be equipped with ground power capacity.

Various ports around the world are developing infrastructure to support ground power for cruise ships, even though, according to the Cruise Lines International Association-CLIA, there are currently no more than 14 ports equipped with ground electricity capacity.

Ground power, we repeat, is only one example among the numerous interventions foreseen by the Company regarding sustainability:

- 14 MSC Crociere ships have been equipped with hybrid systems for cleaning exhaust emissions, guaranteeing a reduction of sulfur oxides by 98 percent. By the end of 2022, the company's five most modern ships will have selective catalytic reduction systems, that convert nitrous oxide into innocuous nitrogen and water;
- MSC World Europa and MSC Euribia – ships cur-



rently under construction with delivery anticipated in 2022 and 2023, respectively – will be the first MSC Crociere ships fueled by LNG;

- MSC World Europa will also be the first cruise ship to use solid oxide fuel cell technology (SOFC). This technology reduces carbon equivalent emissions up to 60 percent compared to existing propulsion sources, and emits a negligible amount of harmful atmospheric pollutants. The experience acquired through the initial installation on MSC World Europa should allow for scaling future systems of this type.

Obviously, environmental sustainability is not exhausted with special types of engines and fuel for the quality of emissions. The technologies applied for the protection of the marine environment are also very important, with both the management and treatment of waste water, and the reduction of the noise emanated under water, thanks to the special design of the hull and the engine room that minimize the acoustic impact. The scenario is completed with tools for energy efficiency, that help reduce and optimize the use of energy on board. These include various technologies such as smart ventilation and advanced air conditioning systems, LED illumination controlled by smart management systems, remote energy monitoring and advanced analysis, allowing real-time support on the ground to improve operating efficiency on board.

Ultimately, all of this technology exalts the beauty of and respect for the environment, and to be perceived and be effective, needs to be known, and supported.

An original way of doing this, for example, is to give the ship itself artistic value, able to strengthen the message and its circulation, such as International Artist Day. This is a program that will give artists and designers from around the world the opportunity to transform the hull of the new MSC Euribia into a gigantic floating canvas to communicate the importance of respect for the environment.

It is with this goal that MSC Crociere invited artists from around the world to create a unique work of art inspired by the sea and its important ecosystem; a design that will remain on the ship's hull while it navigates the oceans of the world.

Obviously, the future does not consist of only designing, implementing, and spreading on-board technology, but also planning or literally constructing destinations that until now did not exist or could not be used by cruise traffic.

An example is the Ocean Cay MSC Marine Reserve, MSC Crociere's private island in the Bahamas, created thanks to a strong effort made by the Company for the preservation of marine life, with 64 thousand square miles of protected waters around the island. From the

time of its conception, the objective of Ocean Cay has always been to restore the former industrial site used for sand extraction to its uncontaminated beauty, both repopulating the island with the local species of flora and fauna and reconstructing the surrounding marine environment. Since it opened to the public at the end of 2019, the island has been gradually transformed into a tropical paradise with a rich ecosystem, that for example has allowed Loggerhead marine turtles to reneest on the island.

During the reconversion of the island, a freshwater area was identified that is particularly suited to the proliferation of the bird population; today various species have been seen there, including owls and pairs of birds that choose the island to reproduce. One of the priorities of Ocean Cay is the restoration of coral, that as an integral part of the marine ecosystem, must be protected to ensure biodiversity and protect the coasts. The marine life around the island is florid and the waters have become popular for various local species.

This sustainable destination offers activities that allow guests to connect with nature, and plans are underway to study the protection of the oceans and enhance awareness of the importance of preserving coral reefs through dedicated edutainment programs.

### NEW AND OLD ITINERARIES

Generating new destinations, however, can also pass through rereading traditional itineraries, providing new value to time and local territories, and focusing principally on the areas of home ports.

From this perspective, we can evaluate the Going & Cruise project launched in April 2022, with a pilot program in the Mediterranean, to then be extended at the global level. With the introduction of new tourist packages (created by Going, the Tour Operator 100 percent owned by MSC), cruise passengers will have the opportunity to spend up to two days on land to explore Venice or Athens, before setting off on seven days of vacation at sea. At the end of the summer, the offer will be introduced also for trips to the United States with departures from Miami and Port Canaveral/Orlando and starting next season it will be possible to make use of the offer also for cruises departing from New York and for all other MSC destinations.

The selected hotel facilities will have staff dedicated to MSC guests, for a cruise experience that extends to land, but is perfectly integrated with the style and aims of the experience at sea.

Looking at a consumer who has changed and also understanding their excessive evolution in time, though, does not end with attention to the environment, life, and on-board spaces that are adequate for new privacy needs, the phygital experience, and the authenticity

and originality of destinations.

For particularly sophisticated users, it is in fact necessary to also design a new model of cruises, regarding both hardware and software, that is able to respond in a personalized and dynamic way to these needs over time, at the highest possible levels, seeking to systematically exceed expectations. At MSC, this goal is called *explora journeys*.

*Explora journeys* has the ambition of redefining trips at sea for a new and more demanding generation of explorers. Explora I is the first of four luxury ships, whose entry into operation is planned for 2023 (the subsequent ones will be delivered in 2024, 2025, and 2026). It will combine renowned destinations with less crowded ports, for a trip that exalts the concept of discovery.

The four new ships, that required an investment of over 2 billion euros, are characterized by cutting-edge environmental solutions and a highly innovative design. They are destined for a particularly demanding segment of travellers, paying particular attention to comfort and relaxation and offering exclusive global itineraries. Each ship will have 461 seafront suites, all with private balconies.

A guest-crew ratio of 1.25 to 1 ensures prompt, customized service to satisfy the needs of every passenger; for example, in the nine on-board restaurants,

meal times are flexible and an exceptional variety of food choices will be offered. Each location will celebrate global culinary talents, with a focus on healthy and sustainable ingredients coming from local partners. The service formula is all-inclusive, such that relaxation begins the moment the guest comes on board, knowing that everything is included, and they will not have to pay any additional costs.

### A LOOK AHEAD

What we have said to this point is simply aimed at demonstrating the incredible dynamism, liveliness and creativity that animates the processes of innovation in these large companies.

These are processes that, by their nature, are perfected on each ship and are all born with the ambition of anticipating and managing tomorrow. What is certain is that the cruise industry has embraced the obligation to interpret the needs of its guests even before they emerge, concentrating all of its (considerable) investments to shape a vision of cruise vacations today that can remain relevant for decades to come.

It is in this spirit, with this approach, and this courage that we can find the keys to success of the cruise industry and understand the hope with which it continues to look to the future.

<sup>1</sup> *State of the Cruise Industry Outlook 2021*, "Cruise Lines International Association-CLIA."

<sup>2</sup> "Cruise Ship Orderbook".

<sup>3</sup> "In the year 2020, there were only 645,071 passengers moved, a drop of 94.7 percent. More in detail, there were 220,714 embarkations and disembarkations (of which more than 210,000 concentrated in the top ten ports in terms of passenger movement), while transits reached 420,700 (of which almost 413,000 in the top ten ports). So there were drops of 95 and 94.5 percent, respectively, compared to the previous year. Ship touches also saw an unprecedented reduction, going from 4,931 in 2019 to 368 in 2020, corresponding to a negative change of 92.5 percent in two years ("Italian Cruise Watch," 2021). In 2021, according to the estimates of *Risposte Turismo*, cruise traffic in Italian ports reached 2.7 million passengers moved (embarkations, debarkations, and transits), with a growth of 325 percent over the 645,000 passengers moved in 2020. In 2022, forecasts are for approximately 6 million passengers moved in over one-half of the 70 Italian cruise ports (+118 percent over 2021 estimates) thanks to approximately 3,000 ship touches.

<sup>4</sup> "Italian Cruise Day 2021".