

99

Xvintage

dual-fuel





Photo Daniele Del Castillo



A handwritten signature in black ink, appearing to read 'Stefano Pastrovich'.



The general arrangement. Contrary to what many might think, designing a new vessel with multiple technical requirements can be not merely a challenge, but actually a somewhat easier way to sort out new design ideas. The technical constrains dictate the goal that we want to achieve, and it was on this premise that the design of the **Xvintage** 99m motor yacht was born.

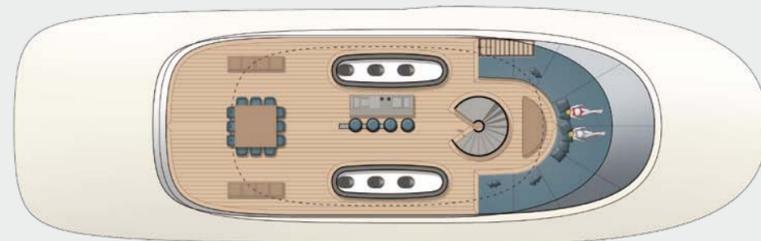
The scope was clear in that certain requirements that Fincantieri, Pastrovich and Wärtsilä thought very challenging and forward thinking, needed to be satisfied - design born around function.

"In life, finding a way to increase adrenaline, and to discover a means for solving problems in a greater way, can be difficult. In the end, culture and experience are the necessary ingredients to get a clear vision of what we are doing"

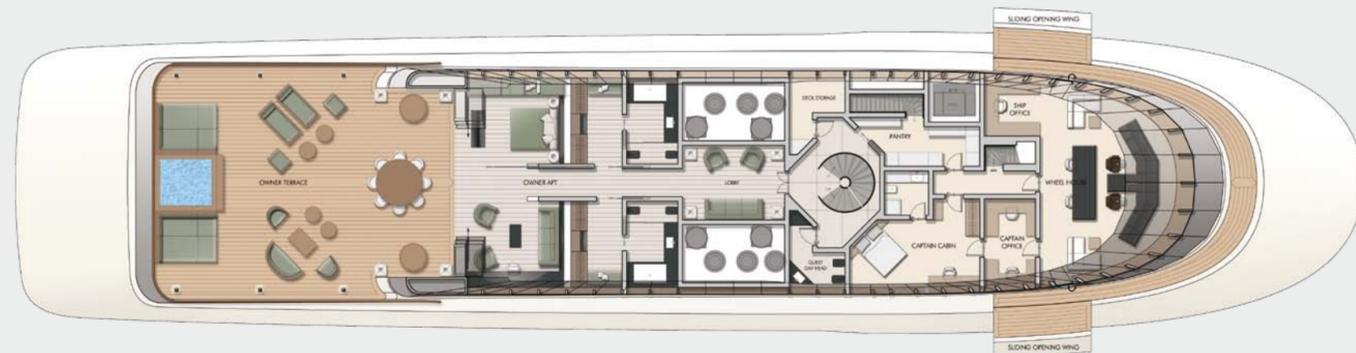
The philosophy of the interior layout is to create a number of spaces, all with a different purpose, look and view, and to avoid the typical wedding cake deck lay-out of most large vessels. The aft beach club is a large transformable area where the tender garage also acts as storage space for the day toys and the exterior lounge furnishings. The LNG tank has been placed very close to the tender garage because both need a very high ceiling. On the upper deck, the idea is to dedicate the entire area from the bow to the aft terrace, for the use of the owner and guests, giving them the possibility to experience the interiors from different angles, lights and sounds. The aft interior salon is connected to the exterior terrace through a large sliding door, thus giving a feel of continuity of space between interior and exterior. The walls around the cinema are built with large sliding panels, which makes this area transformable into a playroom for kids, or for watching F1 or PlayStation. And just forward of the bar we have placed another lounge with a transformable table that can become a formal dining room. Finally, the bow lounge is the place to sit and view the panorama, while the bow terrace is the most peaceful place in Italy to have a romantic dinner. The owner's apartment and terrace are on the aft bridge deck. This choice of location comes from the designer's personal spirit of life on board, where privacy and the need to spend time together is very important. The terrace on the sun deck is covered with a large bimini, and the exhaust stacks are discretely placed so as to leave the view as the main attraction.

technical specifications

- type** Luxury vessel
- length overall** 99,00 m 325'
- beam** 15,5 m 50,8'
- draught** 4,8 m 15,7'
- propulsion** dual-fuel propulsion system
- Wärtsilä 20DF/LNG pac
- exterior design** Stefano Pastrovich
- interior design** Stefano Pastrovich
- shipyard** Fincantieri
- engines** Wärtsilä



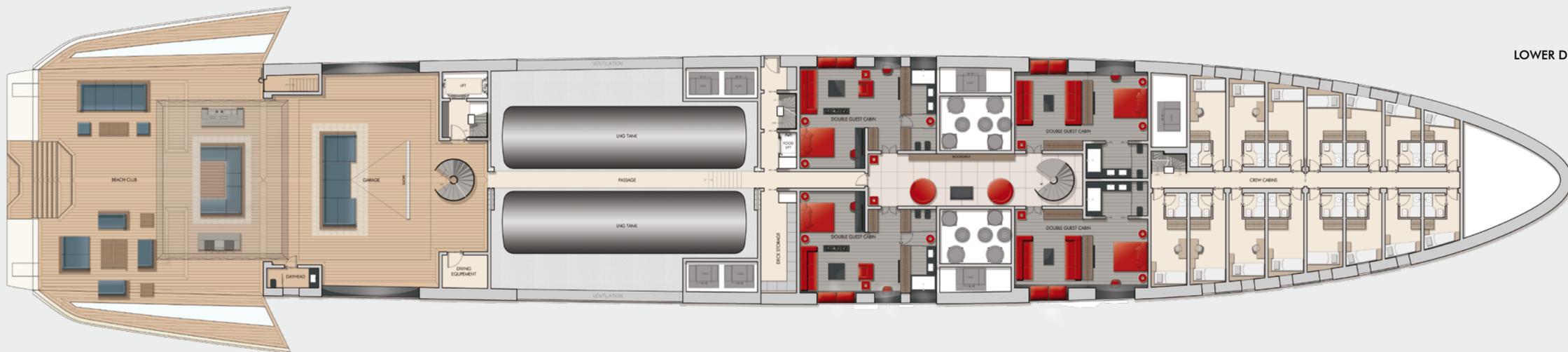
SUN DECK



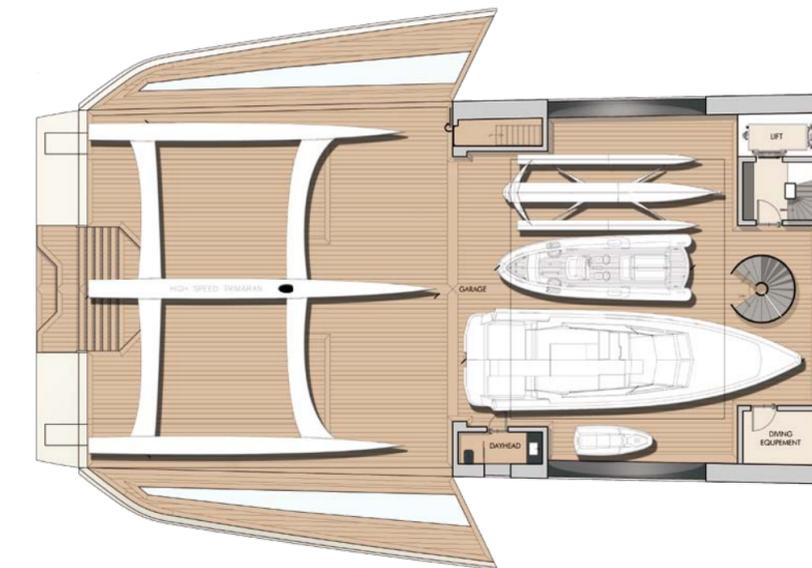
BRIDGE DECK



MAIN DECK



LOWER DECK



Lots of toys...

Equipment. The layout is conceived to create a large aft deck area and an interior garage to accommodate various sizes and types of tenders, as well as the toys, sofa and tables. The list isn't just long, it's also diverse: a 12m power boat, a 6m rubber tender, a 12m trimaran, many jet skis, and a submarine if required. The sides of the hull are closed during navigation to protect the exterior deck from heavy seas. The tender launching system is guaranteed using two J-frame cranes recessed on the exterior deck. The simplicity of this particular system makes for a stable launching operation, which is key to accelerating the process and saving crew time.

The hangar is used as a large tender garage during navigation



the beach club.



The aft platform is transformed into a beach club when the tenders are launched at sea

Concept design. A beach house with a private island is what we have in mind; the dream of “the island” or “Niki beach”. The soul of this project is to reflect the luxury of a simple life at sea. Sand, teak, linen, water, fire, bamboo, exotic fruits – these are some of the elements that we have used as inspiration. Once the tender has been launched at sea, the aft deck becomes a terrace. The side hull opens to become an extension of the terrace. The hangar ceiling slides outside to give shade during lunch, or while watching a movie on the large screen. The advantage of such a large open area is the flexibility the space offers to be adapted to different uses.





the aft terrace

Space development. The **Xvintage** 99m motor yacht has been designed with open spaces and loose furniture. This provides a free and peaceful atmosphere, without designer constraints but with a lot of flexibility to let the owner decide his best view, his best sofa for reading, his best table to have breakfast, his best place to dance. We decided not to offer layout options, such as double table, single table, triple sofa, and so on. Instead, we decided to give him our personal choice and provide 100% freedom to change. "Pure luxury is probably freedom".

Since we cannot compete with nature in terms of beauty, elegance and emotions, we decided to play with it and use all natural materials where possible to increase the feeling. Candles to light the deck at night, sofas made with bamboo, flowers, coconut wood, natural rugs, Japanese paper to soften the artificial lighting and...





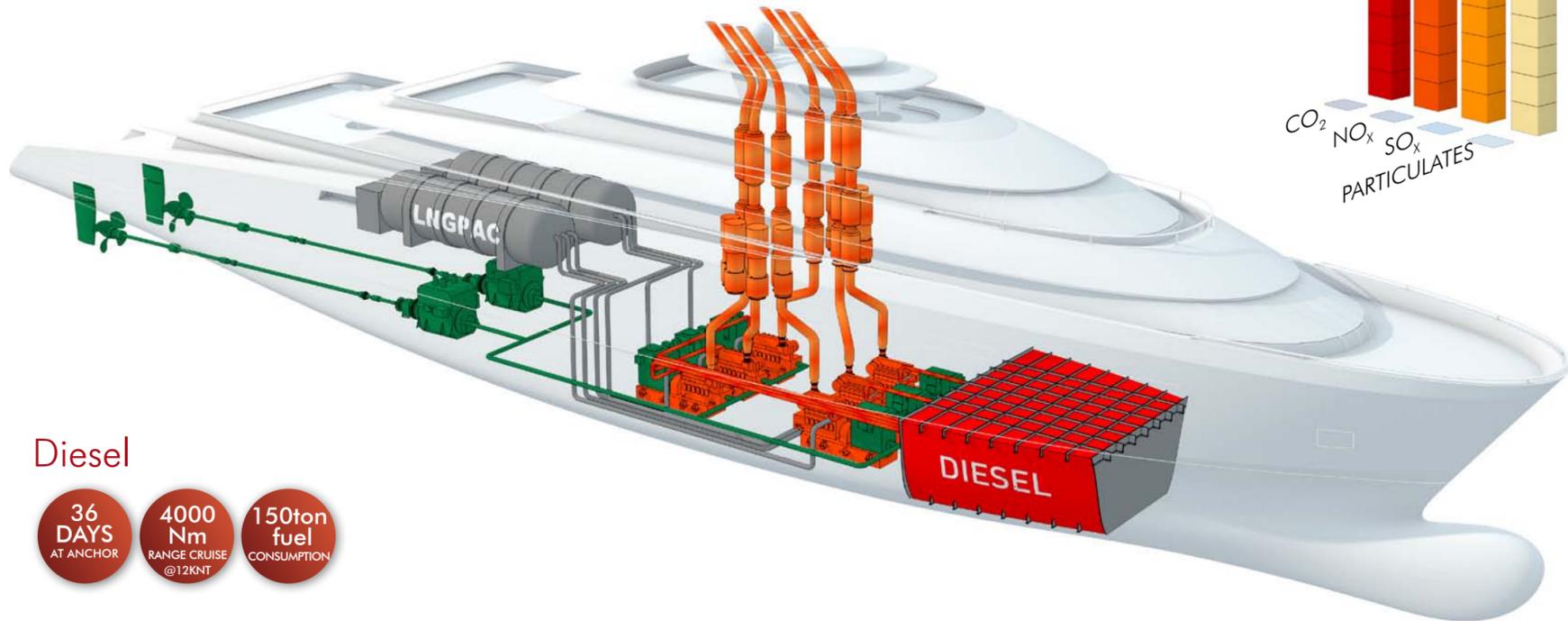


Materials, view and emotions. There are several external details which characterize the soul of the **Xvintage** 99m motor yacht. All of them are designed with the same intention of contributing towards increasing the quality of space. The main philosophy is based on the consciousness that the yacht is a platform for letting us, the spectator, view the world with all its colours, sounds and lights. This is why, in my designs, the materials used for the interior and exterior are always based on a soft and natural finish; giving the feeling of a gentle need for communication with the world around. Teak floors inside and out maintain a constant temperature and humidity, to feel better beneath bare feet in the summertime. The exterior deck extends inside the interior salon to increase the continuity of the space. Fabric made of linen with soft colours to inspire relaxation. The shape of the superstructure's windows, horizontally oriented to enhance the exterior view, designed with a teak window frame all around, as a way of merging them with the saloon and terrace areas. The size of the eight bulwark windows has been designed to maximize the exterior view while keeping the privacy of the interiors. Finally the xxl size Chinese umbrella above the dining table makes for a cosy space that increases the value of chatting with friends in the quietest and more private areas of the vessel.

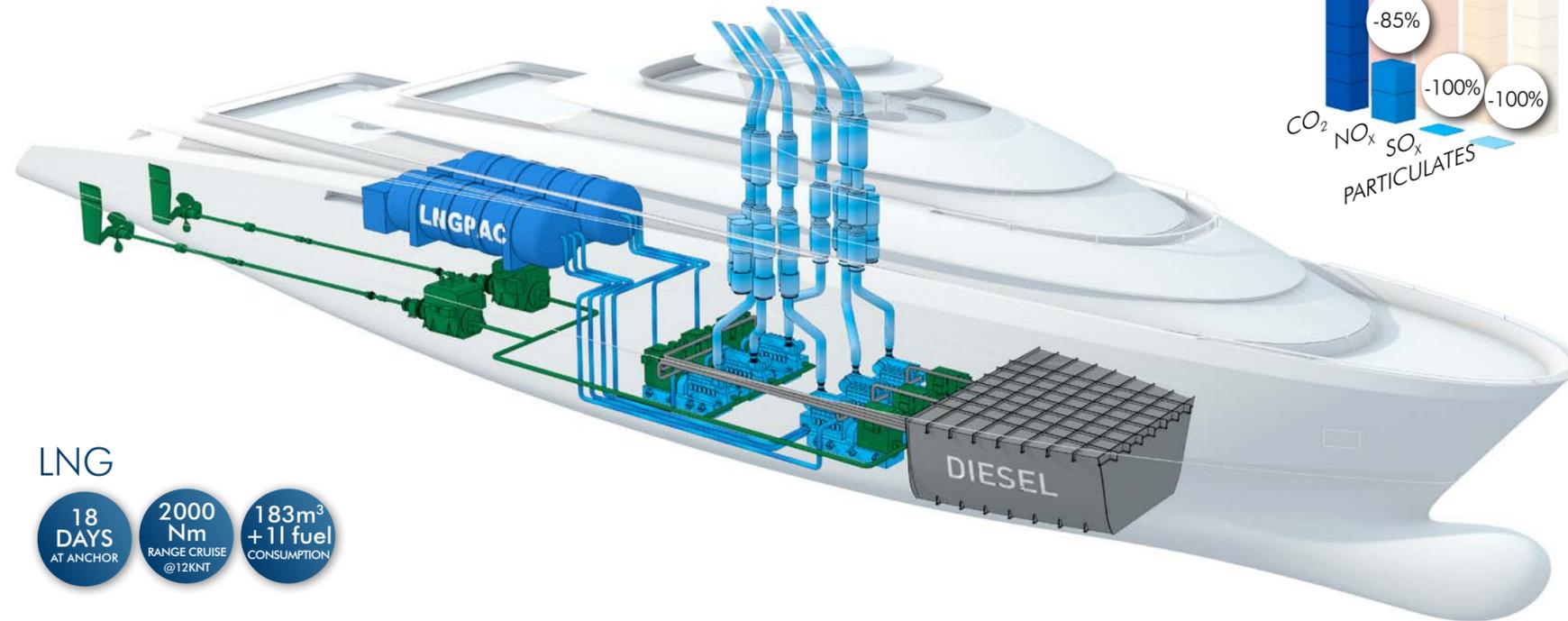
Architecture is a way to listen to nature, not the other way around.

Flexible dual-fuel power

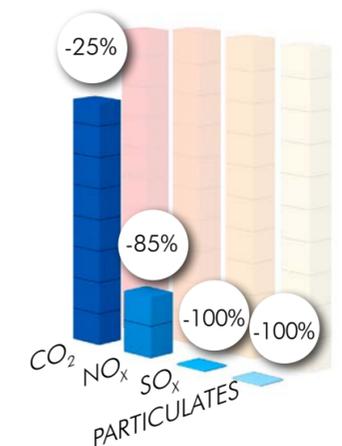
Let's save energy, but let's also calibrate our living space to make a lighter vessel that accommodates what we need for living a beautiful life, one crazy enough to satisfy our needs. Energy can only be saved by finding the right balance between architecture, technology, and mostly human awareness.



Diesel



LNG



Above: 3D model of a dual-fuel engine comparing diesel mode with LNG propulsion and the respective emission values.

Wärtsilä 20DF generating set

- Cylinder bore 200 mm
- Piston stroke 280 mm
- Cylinder output 176 kW/cyl
- Total output Wärtsilä 6L20DF 1056 kW
- Engine speed 1 200 rpm
- Mean effective pressure 20.0 bar
- Piston speed 11.2 m/s
- Generator voltage 0.4-13.8 kV
- Generator efficiency 0.95-0.96
- Natural gas fuel specification**
Methane number: 80, LHV: min. 28 MJ/Nm³, 5.5 bar
- Diesel fuel specification**
ISO 8217, category ISO-F-DMX, DMA and DMB

Flexible dual-fuel power and propulsion systems. The dual-fuel power and propulsion system of the **Xvintage** 99m motor yacht is based on the Wärtsilä 20DF dual-fuel engine, a compact unit providing all the advantages of fuel flexibility. This allows owners and operators to opt for the most suitable fuel (natural gas, marine diesel oil, heavy fuel oil, or even liquid biofuel) taking into account local environmental restrictions, fuel price variations, and fuel bunkering possibilities. Additionally, Wärtsilä dual-fuel engines have the ability to automatically switch from one fuel to another without any loss in speed or power output. In gas operation mode, Wärtsilä DF engines are already compliant with the forthcoming IMO Tier III regulations without the need for any secondary exhaust gas purification systems. Wärtsilä's dual-fuel engine sets are fitted

with alternators mounted on a common bedframe, and by utilizing double mounting arrangements, even the most stringent standards for low levels of noise and vibration can be met.

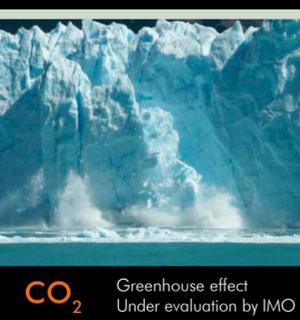
Safe and convenient onboard storage of LNG. Wärtsilä's LNGPac is a complete solution for LNG bunkering, and the safe and convenient storage of gas fuel on board. The LNGPac is designed with safety and simplicity in mind. It is a complete system with a seamless interface to all other Wärtsilä equipment and systems in the yacht, thereby ensuring efficient operations. LNGPac is a safe and cost efficient approach!

Innovative and integrated systems. Wärtsilä's integrated solution for the **Xvintage** 99m motor yacht, includes:

- Complete dual-fuel generating sets and propulsion systems; from the bridge system to the environmental seals, integrated solutions tailored to your operational needs
- A complete solution for LNG bunkering, and the safe and convenient storage of gas fuel on board
- Low Loss Concept – a patented, space-saving Wärtsilä innovation that improves electrical efficiency
- Wärtsilä's Compact Silencer System, technology which allows machinery-related noise to be selectively tailored out of a vessel
- Unnoticeable noise and vibration based on engineering expertise acquired through years of experience

- Extended intervals between overhauls, and replacement of parts at the optimal time through the Condition Based Maintenance system
- Total service packages covering engineering work, start-ups, maintenance and more
- Service points around the globe and remote monitoring around the clock.

All of the above is supplied with an integrated approach, which translates into optimized overall performance and substantial energy savings. As all the systems are engineered to work together, their compatibility and functionality are guaranteed. Furthermore, they are engineered to comply with high requirements for silence, lack of vibration, compactness, operational flexibility and efficiency.



LNG Liquefied Natural Gas.

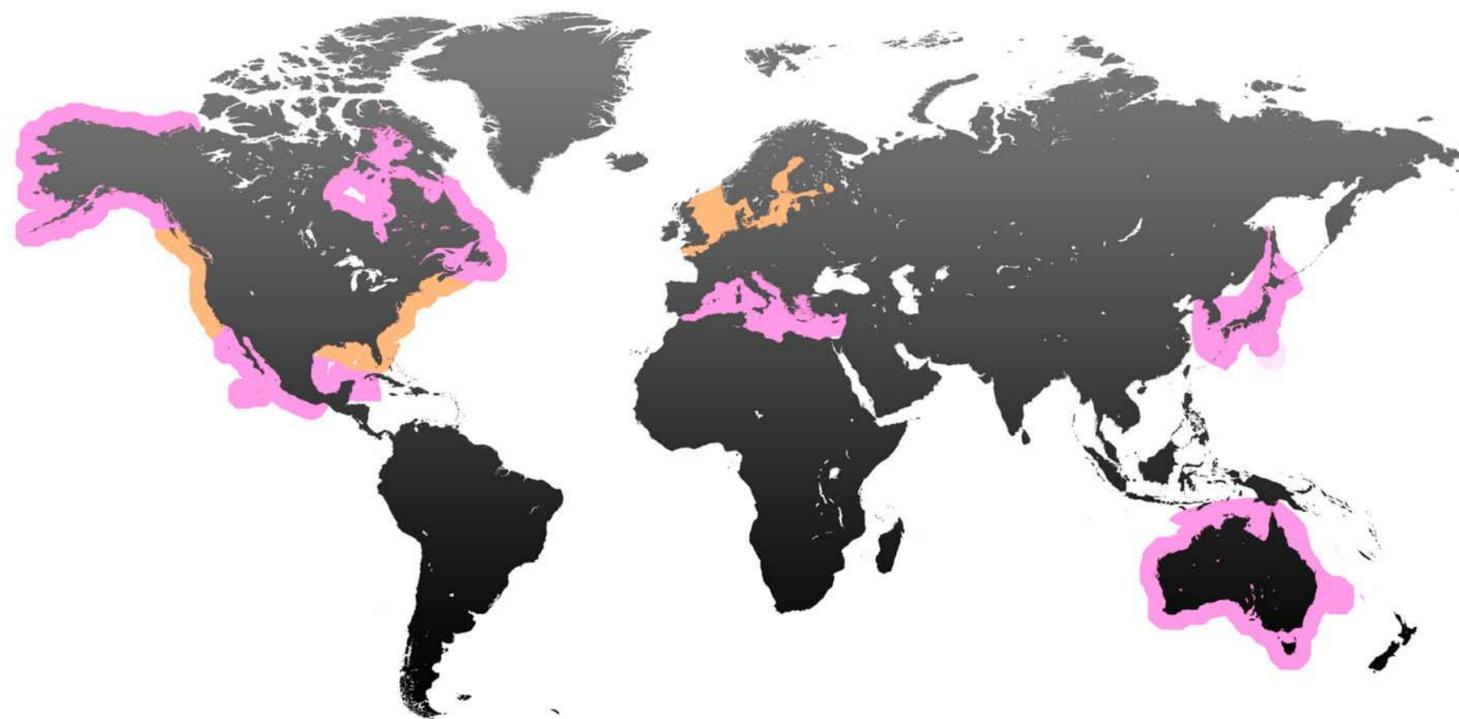
Natural gas (NG) is a mixture of different gases consisting primarily of methane. It is usually found in association with fossil fuels and in the past represented a by-product of oil production. Unwanted natural gas was burned off at the well site or pumped back into the oil reservoir with an "injection well". Today, natural gas is traded around the world by pipeline (in its gaseous form) or by sea in liquid form (Liquefied Natural Gas, LNG). The advantage of transporting LNG is clear since a defined volume of LNG contains approximately 600 times more energy than the same volume of NG.

The phase transformation from gaseous to liquid implies that cryogenic temperatures are reached. Liquefied Natural Gas is the most advantageous way for the transportation and onboard storage of gas.

GAS, the Green Solution. For a truly environmentally sound yacht, Fincantieri Yachts worked in co-operation with Wärtsilä, the company fully responsible for the complete dual-fuel diesel electric propulsion system.

Wärtsilä's state-of-the-art dual-fuel technology minimizes the ecological footprint of the vessel, going even beyond environmental regulations, in an economically sound way. Wärtsilä dual-fuel engines in gas mode produce roughly 85% less NO_x compared to IMO Tier I levels and practically zero SO_x and particulates, and are, therefore, compliant with the most stringent regulations. Moreover, when gas is used in a dual-fuel engine, CO₂ emissions are reduced by about 25% compared with liquid fuels.

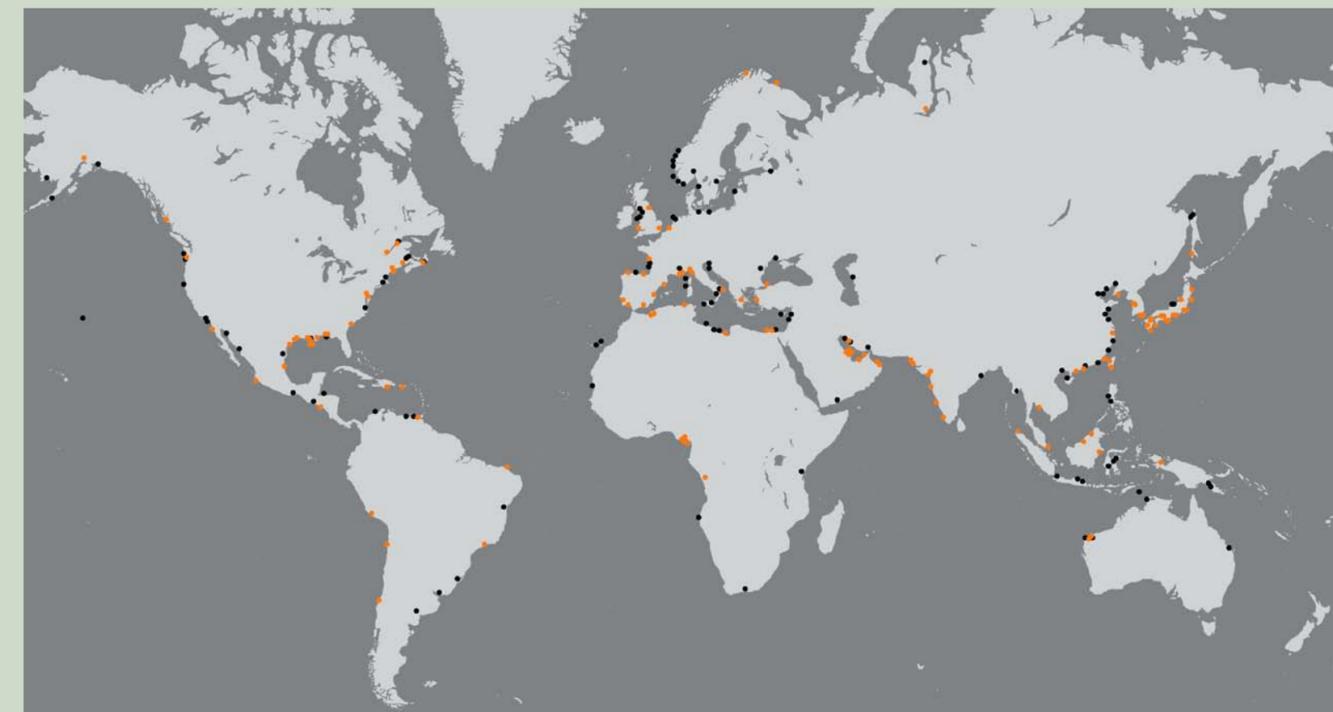
In 2016, IMO Tier III rules, imposing a severe reduction in NO_x emissions, will enter into force.



- EMISSION CONTROLLED AREA UNDER CONSIDERATION
- ESTABLISHED EMISSION CONTROLLED AREA

Compliance with IMO Tier II emission regulations. The tightening emission regulations under IMO Tiers II & III, as well as the ECA zone implementations, mean that yacht owners and operators are facing serious challenges. There are a number of options for complying with the new environmental rules while maintaining cost-efficient operations, but switching to natural gas as a marine fuel fulfils all the requirements. In addition to the environmental advantages, the use of LNG fuel also has positive effects on the yacht's operating costs. Depending on the initial purchase price, LNG used to power the engines can be expected to have a comparable, or slightly lower, price per energy content than heavy fuel oil.

Availability of GAS - marine LNG terminals.



- PROPOSED
- EXISTING OR UNDER CONSTRUCTION

Availability of GAS. Natural gas is traded in its liquid form via seaborne transportation. Liquefied Natural Gas Carriers move massive quantities of natural gas from liquefaction terminals to re-gasification terminals, all around the globe. Liquefied natural gas is available at all these on-shore facilities. Marine LNG import and export terminals are to be found virtually everywhere, meaning that LNG is basically available anywhere in the world. A number of new additional terminals are planned to come on stream during the next few years.

We serve you whenever, wherever. Wärtsilä's services organization currently features more than 11,000 dedicated professionals in 70 countries. The choice available extends from parts and maintenance services, to a variety of comprehensive, customized long-term service agreements, including performance and operations & management agreements, as well as customized training services for the crew. Wärtsilä ensures the yacht's availability and performance, offers productivity gains and cost benefits, and above all, gives peace of mind in the knowledge that the installation is being serviced by the most experienced partner you could have.



In 2016, less than five years from now, the IMO Tier III rules will enter into force, imposing a severe reduction in NOx emissions. These restrictions will apply to important designated areas, such as the Baltic Sea and the USA coastal waters. According to marine engine manufacturers, if conventional fuel is used the means for complying with the new regulations cannot be found on the engine itself. Instead, post-treatment of the exhaust gases will probably be the most popular solution. However, the dedicated urea tank and system will require significant space for the arrangement, and it may also have a negative effect on the exhaust back pressure, especially if combined with soot particle filters.

An alternative answer is to simply change the fuel from diesel to LNG. More than 100 vessels in merchant, offshore, and ferry applications are successfully operating on gas. The great benefit of this approach is that no exhaust gas treatment is needed to fulfil the NOx level requirements. At the same time, SOx levels are practically zero, no soot is produced, and CO₂ emissions are also significantly reduced. Of course there are challenges: from the ship design point of view, the biggest is related to the volume required to store the fuel. LNG requires two to three times the volume of an equivalent quantity of Marine Gas Oil and from an operational point of view, the logistics of LNG refuelling can be problematic. So, what would it mean to design a yacht with LNG, or better still, dual fuel (LNG and MGO) propulsion? How would it look? Where do we stand and what can we expect regarding the availability of LNG fuel?

Fincantieri Yachts decided to explore these points, and to get real know-how and feedback on LNG and dual fuel installations from Wärtsilä. For the subsequent project, Fincantieri Yachts developed the naval architecture while Wärtsilä was fully responsible for the propulsion system. Since it was immediately clear that a totally new yacht had to be developed around the concept, Stefano Pastrovich, who is very active in the research of new solutions for minimizing environmental impact, joined the project to provide his exciting interpretation as exterior and interior designer. Pastrovich Studio developed a new concept for the general arrangement, which is based on an extraordinary integration of LNG technology with the general layout. The result is a smooth harmony that unites the onboard lifestyle, the functional use of the yacht, and finally the décor. Thus we have an innovative 99m concept, the first dual fuel, IMO Tier III compliant yacht.