

L A T E R A L

NAVAL ARCHITECTS

T Ū H U R A

In collaboration with

LOBANOV

oceAnco



LATERAL

Lateral Naval Architects provides complete engineering expertise to the superyacht industry, from project conception to delivery.

Our core competence is engineering, but our unique focus is on meaningful innovation, to enable superyachts that meet the demands of today's owners.

We believe that meaningful innovation starts with asking new questions.





Engineering is a search for answers.

Innovation is a new answer to an old question.

L A T E R A L is an answer to a new question.

Ask new questions.



QUESTION

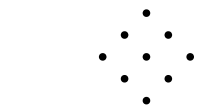
How does the past inspire the future?

Way out in the middle of the Pacific is a vast region known as the Polynesian Triangle. Covering 10 million square miles of open sea and with over a thousand archipelagos, also known as the island of wonder.

Until recently most of the world barely knew that the early Polynesians were the greatest explorers on earth. They navigated using little more than the directional roll of the ocean swell, a cluster of clouds at the horizon, or the specific species of birds who circled overhead.

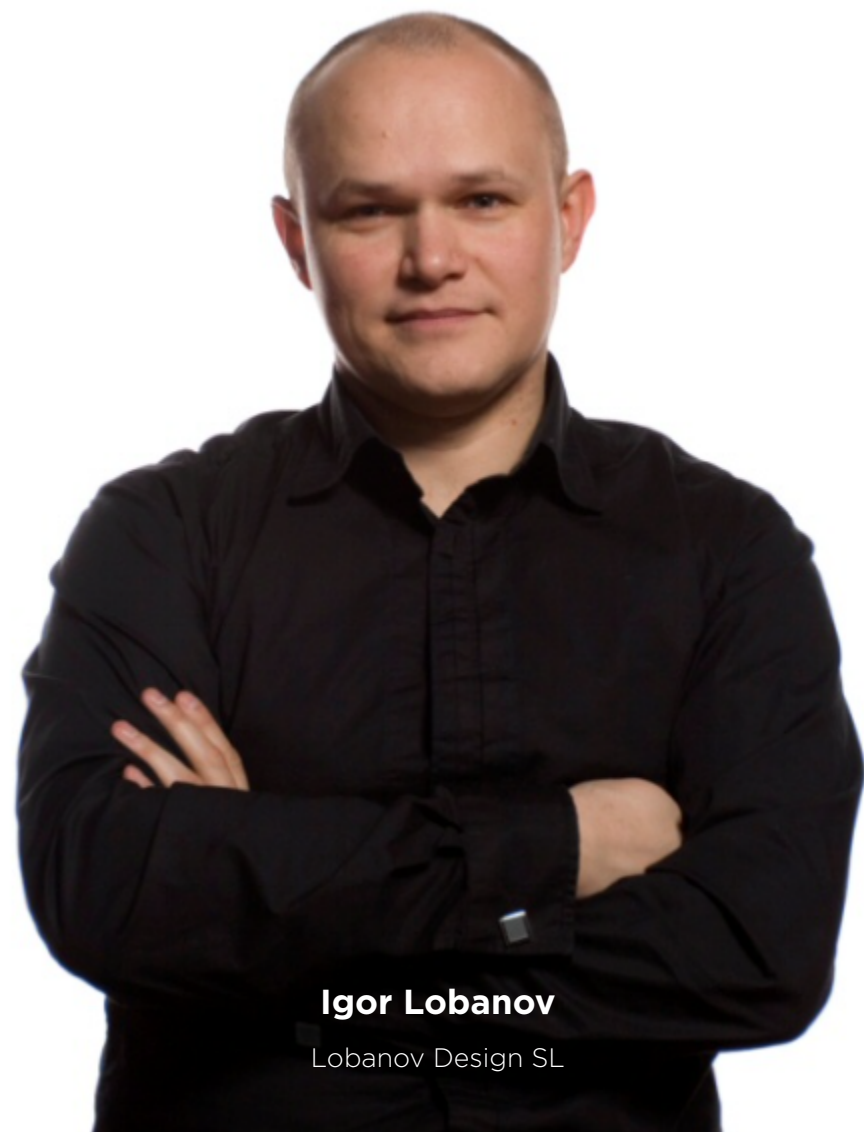
Pioneers with a deep connection to nature. Discovering new land in wooden canoes so pure and simple that they remain unchanged, for millennia; the inspiration for Tuhura.

Some of mankind's greatest ideas **evolve** the least.



L A T E R A L

LOBANOV



Igor Lobanov

Lobanov Design SL

“It was a childhood dream of mine to design an ultra-modern yacht with a very classic hull. I love the shape of canoes and wanted to make a serious yacht project out of it. I think this hull works very well and deserves its revival. It's a project we did without having any particular client in mind, just the chance to create a pure beauty, just as herself.”



“It all depends on the individual as to how radical a particular project is perceived, everyone has a different concept as to what is radical and what is not. I don't see Tuhura as a radical concept at all. Radically beautiful – yes. This project can be built and will work well.”



L A T E R A L



T Ū H U R A

FROM MAORI (VERB) (-HAI,-INA,-TIA)

TO DISCOVER, DISCLOSE, BRING TO LIGHT, UNEARTH,

OPEN UP, EXPLORE, INVESTIGATE.

.....
L A T E R A L

A portrait of James Roy, a man with short brown hair, wearing a light blue button-down shirt and dark jeans, standing with his hands in his pockets against a dark grey background.

HOW DOES THE PAST INSPIRE THE FUTURE?

The inspiration for Tuhura's technical underpinnings are driven by the DNA that is inherent in the design narrative. A design inspired by the early Polynesian canoe, a naturally efficient hull with low overall resistance, good seakeeping and excellent manoeuvrability.

However the canoe form does not naturally complement the integration of a conventional twin screw propulsion system, but rather a single screw solution lends itself to capitalising on the natural efficiency of the hull form. This in turn suggests leveraging further efficiencies by utilising a contra rotating propeller (CRP) system.

Through this sequence of naturally complementary factors, the use of a hybrid CRP system is perfectly suited to the canoe form. There is a very pure synergy between the efficiency of the hull form, and that of the propulsion system, leading to a yacht which marries an evolutionary simple hull with an evolutionary advanced propulsion system.

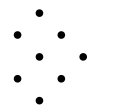
Employing the world's most efficient medium speed diesel engine, the system is configured to offer multiple operational modes, each matched to the variable operating profile of a yacht designed to adventure autonomously across the world's oceans with the minimum of environmental impact.

●
James Roy

Director - Lateral Naval Architects



“The main challenge behind Tuhura is how to fit the most innovative technologies into one of the most traditional hull forms.”



L A T E R A L




ACHILLE SALVAGNI ATELIER

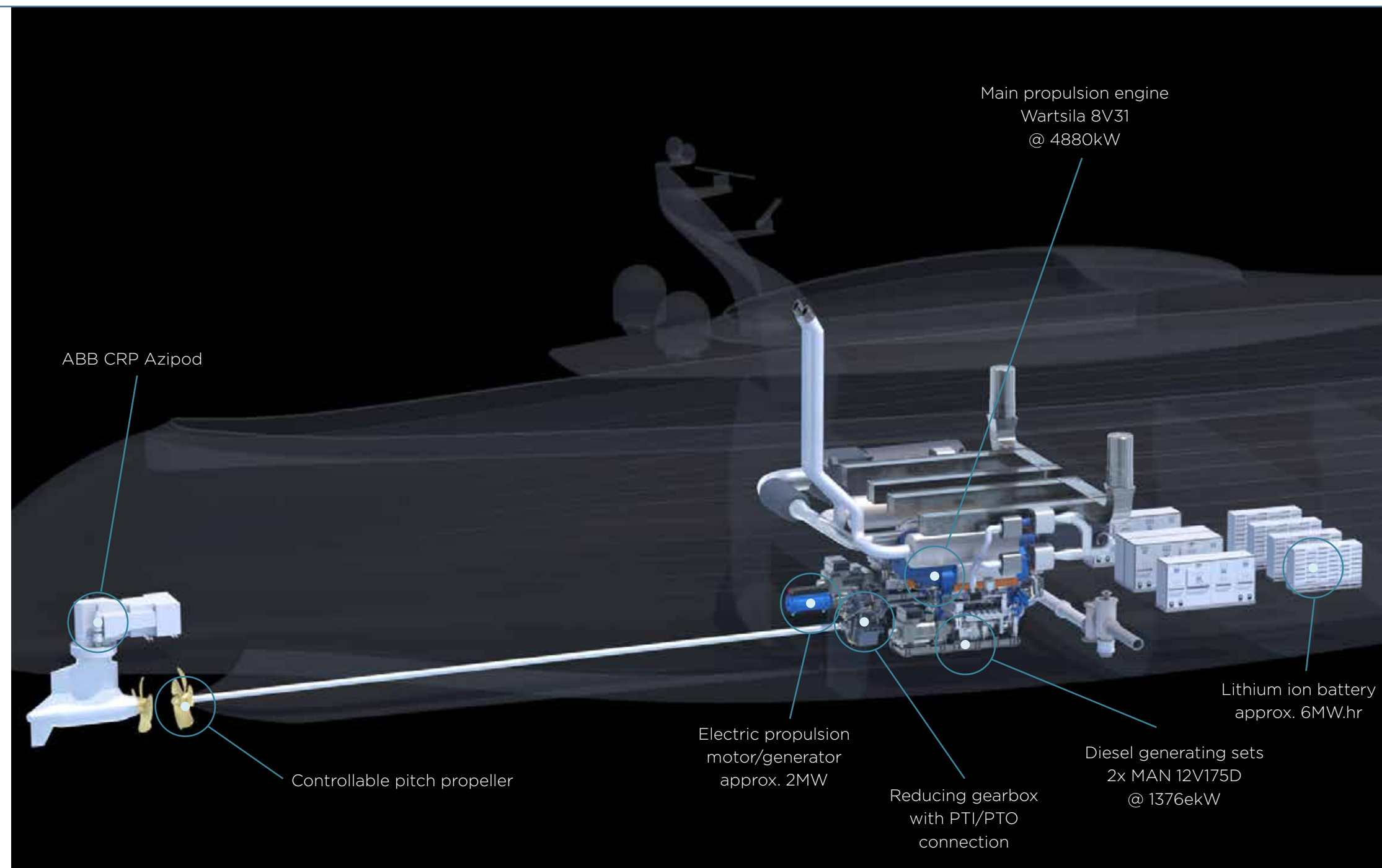
SA

THE MEDIUM SPEED

-HYBRID CRP

Recognised as the world's most efficient 4-stroke diesel engine, the Wärtsilä 31 has been selected to be at the heart of Tuhura's propulsion system, coupled to the ABB CRP Azipod® (contra-rotating) which achieves 30% improvement in hydrodynamic propulsion efficiency.

The machinery arrangement has been developed around the Lateral -HYBRID system, which incorporates the use of batteries, electric motors and highly efficient diesel generators.



ENERGY SYSTEM OBJECTIVES

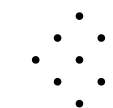
- High efficiency.
- Flexible in operation.
- Enhances enjoyment of the yacht.

DESIGN FOR ENERGY REDUCTION

- Most efficient main engine possible.
- Generator package optimised for efficiency and energy density.
- Energy storage to ensure optimum machinery efficiency.
- Intelligent energy optimised air conditioning.
- Heat and energy recovery and optimisation.
- Intelligent specification of systems combining commercial marine best practice with yacht requirements.

DESIGN FOR ENVIRONMENT

- Carbon Use - Reduced fuel usage, Reduced energy consumption, Higher fuel efficiency.
- Able to meet all possible ECO class requirements.
- Emissions - Reduced Air pollution, fully compliant with all worldwide emissions regulations, capable of zero emissions mode.



L A T E R A L

MODES OF OPERATION

Tuhura has four principle modes of operation:

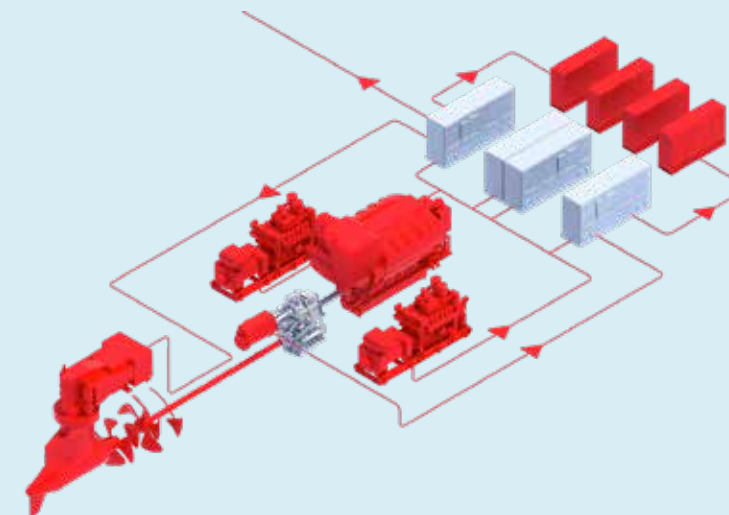
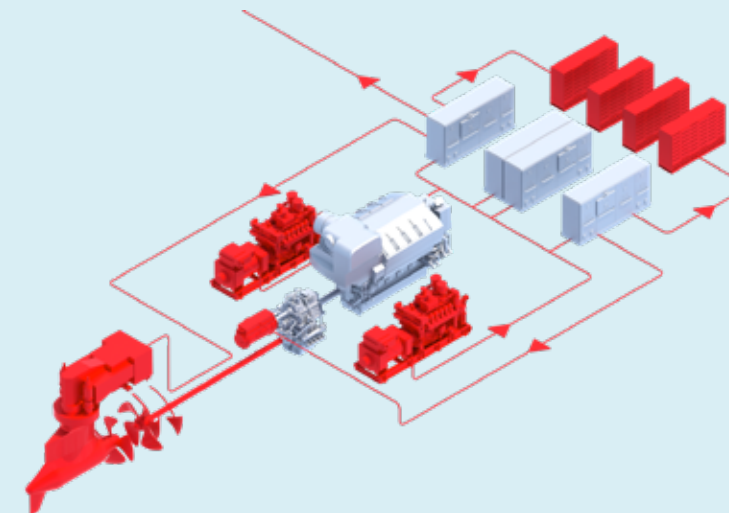
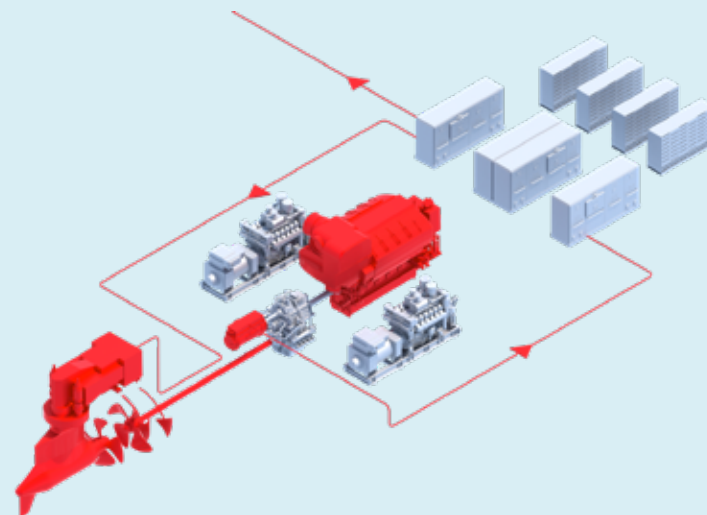
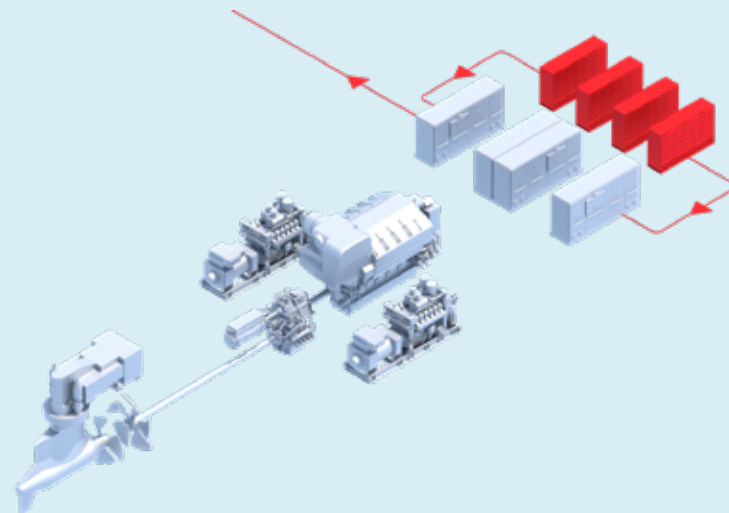
- At Anchor
- Efficient cruise
- Leisure cruise
- High Speed

AT ANCHOR

All power is supplied via the battery pack for 14-16 hours. This provides the opportunity to enjoy day time and night silent operation periods. The battery is charged by the onboard generators operating at maximum efficiency. The generators are selected not to match variable power requirements (as is current practice) but to provide optimum fuel efficiency and energy density.

ECO CRUISE

For covering long distance effectively the Wartsila V31 main engine provides propulsive power and also generates all the yachts electrical power with a power take off fitted to the main gearbox. This results in between 20-25% fuel savings when compared to a typical conventional yacht.

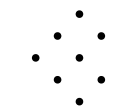


LEISURE CRUISE

To provide full operational flexibility Tuhura can cruise at up to 14kts using just generators and electric motors. The main prop is driven by a power take in connection on the main gearbox. In this mode the machinery is optimised to eliminate smoke soot and noise. At lower cruising speeds the batteries are used to facilitate zero emission silent operation such that silent overnight cruising can be achieved.

FAST CRUISE

All of Tuhuras power can be used to produce a top speed of 20kts . In this mode the main engines and generators work seamlessly together to deliver maximum power.



L A T E R A L

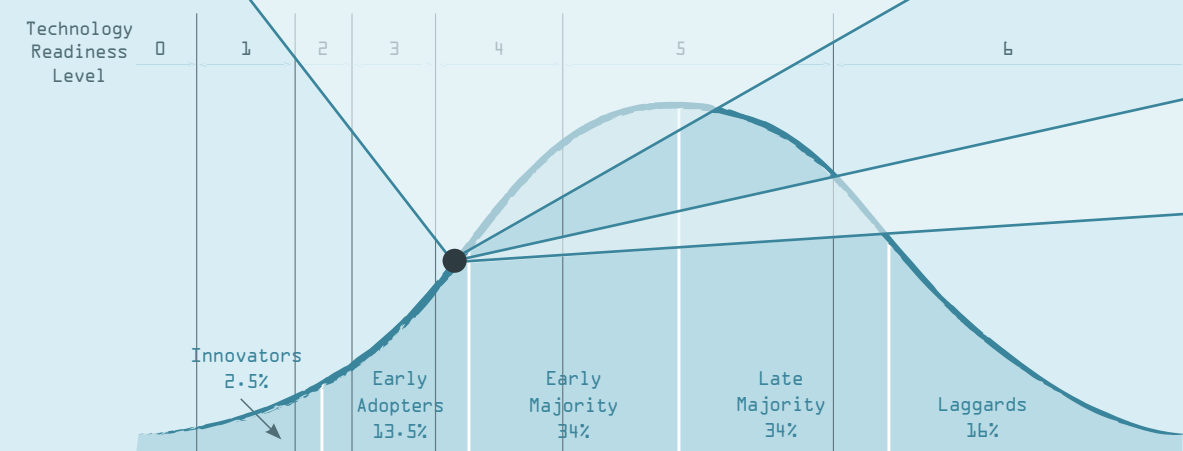
T U H U R A

Lateral employs a structured system to broadly illustrate the potential technical risks associated with the application of new, novel or unconventional technologies. The system gives a Technology Readiness Level (TRL) score and positions this against a diffusion of innovation curve.

In this way innovative ideas can be benchmarked.

The use of a CRP propulsion system with a medium speed diesel engine has several existing applications in both yacht and commercial marine operations, however its use is not common.

The use of large scale marine batteries is developed and established in both yacht and commercial marine markets. The size and ambition of the Tuhura system is unusual which will present some technical risk.



Technology Readiness Level vs Diffusion of Innovation

TECHNOLOGY READINESS LEVEL

- **TRL 0 – Blue Sky Idea**
Anecdotal concept with no analytical proof of feasibility.
- **TRL 1 – Paper Concept**
Exists only in paper proposals or academic research, analytically proven.
- **TRL 2 – Industrial Development**
Product is not being developed for a marine industry application however a test rig or prototype product exists to develop the technology to a real world application.
- **TRL 3 – Marine Product Development**
Product is not offered for sale, however a test rig or prototype product/ installation exists.
- **TRL 4 – First User**
At least 1 reference yacht, concept fully certified by authorities for marine use.
- **TRL 5 – Common Practice**
Multiple reference yachts and vendors available.
- **TRL 6 – Obsolete**
Obsolete by increased regulation or alternative technology.



| | | | |
|---------------------------|--|----------------------------|--------------------------|
| Length Overall | 115.0m | Boot Mode Speed | 20.0 knots |
| Length Waterline | 112.2m | Maximum Speed | 18.0 knots |
| Beam | 18.0m | Eco Cruise | 16.0 knots |
| Draught (Half Load) | 3.75m | Main Propulsion Engines. . | 1x Wartsilla 8V31@1053kW |
| Gross Tonnage | 3400 | Generator Package | 2x MAN 12V175D@1376ekW |
| Class | ✱ 100 A1 SSC YACHT MONO G6 ✱ LMC, UMS, ECO (IHM) | | |
| Notation | REG Yacht Code Part A | | |



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ASK FURTHER QUESTIONS

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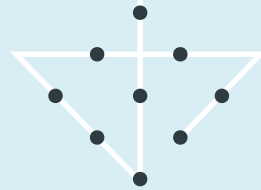
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