SIEMENS MARINE

# A TRULY HYBRID POINT OF VIEW

Thanks to the diesel-electric SISHIP EcoProp system, CCN's Vanadys superyacht has obtained the 'Hybrid Power' Lloyd's Register certification

Hybrid propulsion projects in the boating sector keep advancing gradually but relentlessly.
We asked Andrea **Franchini** - Sales Director Vertical Markets - Process Solutions at Siemens Energy a few questions on the subject.

**Hybridization could be regarded as the 'cadet branch' of (and, as such, sometimes more viable than) electrification. What are Siemens' solutions for commercial vessels in that field?**
*Siemens' solution for the hybrid segment is based on the SISHIP Bluedrive Plus C system, a diesel-electric platform that includes variable-speed gensets, a direct current power distribution system fit for connection to battery-based storage modules, and a motor/inverter unit to drive the propellers electrically. The onboard electric equipment is entirely connected to the distribution system via auxiliary inverters. It's a scalable system that can cover diverse power rating requirements up to 7 MW per propeller shaft.*
*It's a well-proven, reliable solution that makes it possible to cut operational costs by up to 20 percent thanks to lower consumption levels, reduced wear-and-tear of combustion engines that can work less and under optimal conditions, and extended maintenance intervals.*

Reliability and reduction of operating costs and emissions are the main demands of commercial operators. Flexibility and the possibility to access marine protected areas is what leisure boat owners are asking for

**Siemens SISHIP EcoProp: we saw it onboard the MY Vanadis. Could you tell us in more detail about it?**
*The SISHIP EcoProp platform meets a variety of needs by offering a compact automotive-derived solution that, as such, is well-proven and reliable. It's based on a series of water-cooled brushless drives. Its perfectly reversible permanent magnet motors can also be used as generators. Again, in this case one or more gensets can be coupled to a DC bus via decentralized drives to which batteries are connected. Thereon, other components in the same family operate the reverse electrical transformation feeding inverters and electric motors that drive propellers or manoeuvring thrusters.*
*In addition to the hybrid-series solution we just described - typical of larger vessels - the system can also be used to create hybrid-parallel configurations suitable for medium-sized yachts whose diesel engine and electric motor are both directly coupled to the propeller shaft.*
*In this case the electric motor, whose rated power is usually lower than that of the combustion engine, also works as a generator thus providing energy flow to batteries.*
*This way the yacht can be run in a purely electric mode at a low speed, while the 'Diesel mode' can be used for cruising speeds. While cruising, the electric unit will recharge the batteries thus allowing to use the Diesel mode at its top-performance level.*
*Moreover, this offers the possibility to get some extra "boost" by adding up the power output of the diesel engine to that of the electric motor. That's precisely the solution we devised for the Vanadis.*

**The SISHIP EcoProp, consisting of the classic inverter-motor-generator triad, has been on the market for some 12 years now. How has it developed over time?**
*The EcoProp stands out for its well-proven robustness and reliability. Since the very first projects, over the years we have been expanding its range and application sectors. More in detail, we added lithium-ion batteries for energy-storage, we included new sizes for both synchronous and asynchronous motors, we standardized the managing software and simplified parameterization.*

## WHO'S IN CHARGE OF LEISURE BOATING?

«*Italy is the world leader in the superyacht segment with a global market share of over 40 percent. Italy's prominent position led to investments in the creation of a national team that has evolved into a global competence centre for the development of hybrid and electric propulsion solutions for leisure boating*», added Andrea Franchini.
«*Clearly, we mainly focus on Italian and foreign shipyards. In synergy with diesel engine providers, we constantly strive to find the best solutions in terms of innovation and environmental sustainability. We are also working on hydrogen fuel cell-based generation systems. As for onboard electric equipment we have developed protection devices for DC networks based on quick-acting static devices to replace fuses and electromechanical switches with a view to achieving faster, more reliable response. We also developed simulation software for propeller systems and their interaction with the overall boat architecture, capable of creating a digital twin of the boat itself. This makes it possible to create virtual prototypes thus curbing development costs and time-to-market*».