

# **newcleo, Fincantieri and RINA working together on feasibility study for nuclear naval propulsion**



## **Companies sign agreement to explore closed mini reactor design application for use on large vessels, with potential to decarbonise shipping industry**

LONDON, UK, 25 JULY 2023 – *newcleo*, the clean and safe nuclear technology company developing innovative Generation IV reactors using nuclear waste as fuel, announced today that it has signed an agreement with Fincantieri (BIT: FCT), one of the largest shipbuilding companies in the world, and RINA, the inspection, certification, ship classification and consulting engineering multinational.

Under the terms of this agreement, the three companies are combining their deep international expertise and innovation experience to carry out together a feasibility study for nuclear applications to the shipping industry, including *newcleo*'s lead-cooled small modular reactors (SMRs) technology.

The deployment of *newcleo*'s innovative LFR (Lead-cooled Fast Reactor) for naval propulsion would involve placing a closed mini reactor on vessels as a small nuclear battery producing a 30MW electric output. This would require infrequent refuelling (only once every 10-15 years), very limited maintenance and easy replacement at end of life.

Using clean nuclear energy to power marine vessels would help rapidly decarbonise a sector grappling with huge fossil fuel consumption and its consequent carbon emissions. The shipping industry, via the International Maritime Organization (IMO), approved last week at MEPC(80) the new targets for GHG emission reduction, to reach net-zero GHG emissions by or around (i.e. close to) 2050.

While the shipping industry still carries 90% of the world's goods, and the [fourth IMO GHG Study 2020](#) confirms that its carbon dioxide emissions are less than 3% of the total global man-made CO2 emissions, the actions of the big players of this industry have the potential to drive trends and markets.

Also, using nuclear power on ships would safeguard the marine ecosystem in the event of an accident. With *newcleo*'s design the liquid lead inside the reactor would solidify as it cools down in contact with the cold water, enclosing the reactor core in a solid casing, and containing all radiation thanks to the shielding properties of lead.

Finally, the *newcleo* naval propulsion reactors would eliminate the current need for frequent refuelling, and at the end of its life, the whole LFR unit would be simply removed and replaced with a new one in the ship, and the spent unit taken away for decommissioning and reprocessing.

**Stefano Buono, newcleo Chairman and CEO**, commented:

*"I am delighted that we are launching a project for civil nuclear naval propulsion with this important feasibility study. Fincantieri and RINA are two global leaders in the shipping sector, and combining their expertise with our technology innovation can bring a real solution to the issue of carbon emissions in maritime transport.*

*From our conception, newcleo's ambition is to contribute to accelerating decarbonisation and providing clean, sustainable and affordable energy to meet the needs of communities and businesses.*

*I look forward to the results of the feasibility study and the next steps of the project."*

**Pierroberto Folgiero, CEO and General Manager of Fincantieri**, commented:

*"Today Fincantieri reaffirms its vocation to be a pioneer and catalyst for progress in the maritime sector with cutting-edge, efficient and sustainable technologies. Indeed, the agreement allows us to explore the possibility of adding a new and visionary solution among those at our disposal to achieve the ambitious decarbonisation goals the industry has set for itself.*

*Nuclear power holds enormous potential and, as such, it needs the best expertise to be expressed, and we are proud to join with partners like newcleo and Rina to help get this done".*

**Ugo Salerno, Chairman and CEO of RINA**, commented:

*"The improvement of fuel efficiency and vessel design is already giving good results in reducing shipping footprint. But, in order to reach the targets fixed for this industry, we need alternative fuels with low carbon content from well to waste.*

*Nuclear will be one of the answers to these objectives.  
In addition, small modular reactors will be the most efficient solution to apply nuclear to shipping.*

*We are proud to cooperate with newcleo and Fincantieri in order to make feasible, as soon as possible, the implementation of SMRs on vessels".*

## Notes to editors

### About newcleo

Privately funded and headquartered in London, newcleo was launched in 2021 – and since raised a total of EUR 400m – to be an innovator in the field of nuclear energy. Its mission is to generate safe, clean, economic and practically inexhaustible energy for the world, through a radically innovative combination of existing, accessible technologies.

With visionary co-founders, newcleo capitalises on thirty years of R&D activity in metal-cooled fast reactors and liquid-lead cooling systems, and our senior management and advisory team can boast hundreds of years in cumulative hands-on experience.

Counting around 360 highly skilled employees across the UK, Italy and France, *newcleo* has business, scientific, operations and industrial manufacturing capabilities in a vertically integrated model designed to deliver its ambitious timeline for its plan-to-market.

*newcleo*'s technology, mostly comprising a novel approach to already qualified solutions, addresses equally well the three challenges affecting the nuclear industry to date: waste, safety and cost.

- **Waste:** fast reactors are capable of efficient “burning” (i.e., fission) of depleted uranium, plutonium and Minor Actinides. When operated with MOX fuel generated from reprocessed nuclear waste, *newcleo*'s reactors not only ensure sustainability by closing the fuel cycle, but can also boost energy independence.
- **Safety:** lead-cooled reactors operate at atmospheric pressure. The properties of lead (thermal capacity and conductivity, very high boiling point, chemically inert, shielding properties) together with *newcleo*'s passive safety systems ensure very high levels of safety.
- **Cost:** *newcleo*'s reactor design has been optimised over the last 20 years leading to the concept of an ultra-compact and transportable 200 MWe module with improvements in energy density compared to other technologies. Costs are kept low by means of simplicity, compactness, modularity, atmospheric pressure operation and elevated output temperature.

*newcleo* is also working to significantly invest in MOX fuel manufacturing in developed countries, extracting energy from the current nuclear industry by-products.

*newcleo* is ready to develop a new, sustainable, and completely safe way of generating nuclear energy that will help humanity reach zero emissions, and mitigate against global warming.

## About Fincantieri

Fincantieri is one of the world's largest shipbuilding groups, the only one active in all high-tech marine industry sectors. It is leader in the construction and transformation of cruise, naval and oil & gas and wind offshore vessels, as well as in the production of systems and component equipment, after-sales services and marine interiors solutions. Thanks to the expertise developed in the management of complex projects, the Group boasts first-class references in infrastructures, and is a reference player in digital technologies and cybersecurity, electronics and advanced systems.

With over 230 years of history and more than 7,000 ships built, Fincantieri maintains its know-how, expertise and management centres in Italy, here employing 10,000 workers and creating around 90,000 jobs, which double worldwide thanks to a production network of 18 shipyards operating in four continents and with almost 21,000 employees.

[www.fincantieri.com](http://www.fincantieri.com)

## About RINA

RINA, leading certification company and engineering company in Italy, provides a wide range of services across the Energy & Mobility, Marine, Certification, Infrastructure & Real Estate and Industry sectors.

With net revenues in 2022 of 664 million euros, 5,300 employees and 200 offices in 70 countries worldwide, RINA is a member of key international organizations and an important contributor to the development of new legislative standards.

[www.rina.org](http://www.rina.org)

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