

## **Photonis, a leading brand of Exosens, and *newcleo* have signed their first purchase order to explore the deployment of the nuclear instrumentation detectors in the reactor core**

PRESS RELEASE

BRIVE-LA-GAILLARDÉ, FRANCE – MAY 15<sup>TH</sup> 2024

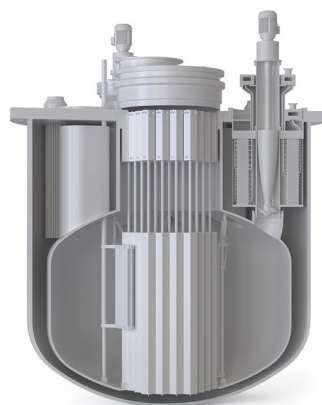
***Photonis, part of Exosens, a market-leading global provider of electro-optic solutions used in the detection and amplification of photons, ions, electrons, and neutrons, confirms its commitment into supporting key actors of the nuclear industry, in order to meet the safety and performance challenges faced by the new generation of nuclear reactors. Photonis is providing newcleo, a renowned European leader in nuclear innovation, development and technical support to explore the deployment of nuclear instrumentation detectors in the reactor core of newcleo's Small Modular Reactor demonstrator.***

*newcleo's* reactor design has been optimised over the last 20 years leading to the concept of an ultra-compact and transportable 200MWe module with improvements in energy density compared to other technologies.

The company is designing and building the next generation (Generation IV) of nuclear reactors: a lead-cooled fast reactor (LFR) fuelled with Mixed OXide (MOX) that will effectively close the nuclear fuel cycle, using what is today considered waste, as fuel.

The reactor design developed by *newcleo* was selected as part of the "Innovative Nuclear Reactors" call for projects under the France 2030 investment plan.

*newcleo* will contribute to climate change mitigation and global decarbonation. The nuclear player is combining available and proven technologies with new developments to create a sustainable business and deliver a new generation of safe, clean, more efficient reactors at competitive cost.



*Lead fast reactor overview. newcleo source*

*Ludovic Vandendriesche (Managing Director of newcleo SA) said:*

*"We are pleased to be teaming up with Photonis - this important partnership will allow us to explore how best to incorporate cutting-edge detection instrumentation at the heart of our reactor design. We have an ambitious R&D timeline to realise what is a game-changing concept in low-carbon generation and the components provided by Photonis alongside their technical expertise will play a valuable role in our development work."*

*Cyril Barre's testimony (General manager of Exosens Nuclear Instrumentation business unit):*

*"We are delighted to announce that Photonis and newcleo have signed their first contract to define the best fitted customized solution for the nuclear instrumentation of innovative lead-cooled fast reactors. Thereby, newcleo's projects expand the ability of nuclear reactor technology to decarbonize the economy in sectors including and beyond electricity generation. The LFR technology operates at higher temperatures than conventional reactors – thus generating electricity more efficiently and without emissions – for which Photonis can bring solutions thanks to its long-lasting experience at such operating conditions. "*



*Ex-core neutron detectors (Image: Photonis)*

Credit: <https://www.exosens.com/products/nuclear-instrumentation>

Photonis has been manufacturing neutron detectors such as proportional counters with boron deposits and fission chambers with uranium deposits for more than 50 years for monitoring neutron fluxes in nuclear reactor cores.

Photonis' detectors are renowned for their precision, reliability, and long operating life, making them the ideal choice for a project as groundbreaking as *newcleo's* LFR concept.

With their high level of knowledge, Photonis' engineers will continue to contribute to overcoming the limits of science and work towards making tomorrow's clean energy a reality!

This first step not only marks a significant achievement for both Photonis and *newcleo*, but also signifies a crucial milestone in the global pursuit of cleaner and more sustainable energy solutions.

### **About Photonis**

Photonis is a leading brand of Exosens, a high-tech company with more than 85 years of experience in the innovation, development, manufacture and sale of high-end electro-optical technologies used in the detection and amplification of ions, electrons, and photons. Photonis offers its customers photo-detection and low light conditions imaging solutions for extremely demanding environments such as Defense & Security, Nuclear Safety, Life Science and Industrial & Non-Destructive testing. Photonis is internationally recognized as a leading brand and a major innovator in its fields with production and R&D sites in Europe and North America.

For more information: [exosens.com](https://exosens.com)

### **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 on around 700 highly skilled employees across the Europe, *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, boiling point, chemically inert, low neutron activation, 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 200MWe 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 global warming.

For more information: [newcleo.com](http://newcleo.com)