



France 2030: the two startups Stellaria and Thorizon working in consortium with Orano selected as winners of the call for projects to develop molten salt reactors

Thorizon, Stellaria and Orano press release
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The startups Stellaria and Thorizon are proud to jointly announce that each of their consortia with Orano, the recognized international group in the field of nuclear materials, have been selected as winners of the "innovative nuclear reactors" call for projects, within the framework of the France 2030 investment plan.

Each consortium is going to receive € 10 M of subsidies from the French state. The two projects are the fruit of collaboration between these three partners over a period of several months, with the desire to pool efforts and contribute to the emergence of a European Molten Salt Reactor (MSR) industry.

Stellaria and Thorizon are developing two innovative MSR-type small reactor designs. Each of these two liquid fuel, fast neutron MSR designs is capable of generating the equivalent of 250 MW thermal power or 110 MW of electrical power to decarbonize industrial applications with round-the-clock energy needs. This power generation capacity corresponds to the continuous power needed to supply a major industrial site, or the equivalent of 250,000 households.

MSRs are a promising technology with multiple benefits: high energy output, safety by design, and very rapid tracking of fluctuations in electricity demand. Moreover, by coupling them with the processing of used fuel in a plant such as the one at Orano La Hague, these types of reactors will make it possible to recycle not only the plutonium contained in the used fuel from current reactors, but also "minor actinides" which, to date, are not recycled and are conditioned as vitrified waste. The recycling of these materials in MSRs would make it possible to go even further in terms of nuclear safety, the recovery of materials, and reducing the quantity and lifetime of nuclear waste (to around 300 years).

Thorizon is developing a molten salt reactor powered by modular cartridges, which resolves numerous materials-related constraints, meets nuclear safety concerns and reduces time to market. As part of its development, Thorizon has joined forces with Orano and Oakridge, a nuclear engineering and consulting company, as well as the University of Lille and Centrale Lille.

Stellaria is designing the first reactor to regenerate 100% of its fuel income during operation, making it possible to provide electricity-intensive industrial users with continuous and controllable supply of renewable energy, to guarantee stable and competitive prices, and ensure energy autonomy for decades to come.

With the ambition of achieving a circular economy, Stellaria, Thorizon and Orano offer a comprehensive response to the need to create an MSR industry that covers the whole of the reactor and the front end and back end of its fuel cycle. With its technological expertise, Orano is actively contributing to the emergence of these new types of molten salt reactors and to the development of molten salt fuels.



"Historically, France has been the center of nuclear expertise worldwide", says Kiki Lauwers, CEO of Thorizon. "We are extremely grateful for this opportunity to work together with established industry leaders such as Orano, the CEA and our consortium partners within the framework of France 2030. We are very proud to have been selected along with our partners, as it confirms that the design of our reactor is considered to be both scientifically and economically viable."

"Our collaboration with Orano, Thorizon, the CEA, Schneider-Electric, and Technip Energies, within the framework of France 2030, is the first building block in the creation of a European industry which will usher in a new era of renewable and low-carbon nuclear energy, with the potential to offer over 3,000 years of energy autonomy thanks to use of France's existing stocks of nuclear materials. We are convinced that our low-pressure molten salt battery opens up the prospect of a future of sustainable and safe energy for future generations, thanks to the renewal of 100% of its fuel incore. We are rising to the challenge of making these plants available as rapidly as possible to allow Europe to reindustrialize competitively and independently. " underlines Nicolas Breyton, CEO of Stellaria.

"Orano has long been committed to the development of international partnerships, in the USA and Europe, to support the emergence of a molten salt reactor industry", emphasizes Guillaume Dureau, Senior Executive Vice President, New Activities, Innovation and R&D of Orano. "The two consortia created with Thorizon and Stellaria within the framework of the France 2030 investment plan are an opportunity for Orano to accelerate our development activities to supply fuel salt common to all reactors of this type, thanks to our unique expertise and experience in high activity nuclear processes. The results obtained will also be useful to other MSR designers."

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About:

Orano

As a recognized international operator in the field of nuclear materials, Orano delivers solutions to address present and future global energy and health challenges. Its expertise and mastery of cutting-edge technologies enable Orano to offer its customers high value-added products and services throughout the entire fuel cycle. Every day, the Orano group's 17,500 employees draw on their skills, unwavering dedication to safety and constant quest for innovation, with the commitment to develop know-how in the transformation and control of nuclear materials, for the climate and for a healthy and resource-efficient world, now and tomorrow.

www.orano.group

STELLARIA is a startup co-incubated by the French Alternative Energies and Atomic Energy Commission (CEA) and Schneider Electric. Technip Energies joined the venture in the first funding round. It is developing a new-generation 2*110MWe chloride salt fast neutron reactor with its partners. Created in 2023, its ambition is to deliver its Stellarium® demonstrator in 2033. A further funding round is planned in 2024 to accelerate its development.

www.stellaria-energy.com

Thorizon is a French-Dutch company, a spin-off of NRG, the national nuclear research institute of the Netherlands, with offices in Amsterdam and Lyon. Its ambition is to develop an ultra-safe and modular molten salt fast neutron reactor as a step towards closing the fuel cycle. At the same time, Thorizon is launching a funding round to be able to build a non-nuclear molten salt demonstrator within the next three years.

www.thorizon.com

These projects have received funding from the French State under the France 2030 plan

