

Leaders in heavy liquid metal technology join forces for deploying Lead-Cooled Small Modular Reactors

Five leaders in heavy liquid metal technology join forces to speed up the industrial deployment of Small Modular Reactors (SMR). These prominent international partners are Ansaldo Nucleare, ENEA, RATEN, SCK CEN and Westinghouse Electric Company. Their collaborative journey begins with the demonstration of Lead Fast Reactor Technology, showcasing its potential. Today, all partners formalized their commitment with the signing of a Memorandum of Understanding. The signature took place in the presence of Alexander De Croo, the Prime Minister of Belgium, Klaus Iohannis, the President of Romania, and representatives from the Italian and United States embassies in Belgium. This collaboration positions sustainable nuclear energy as a key component of the global energy transition.

Last year, the Belgian government entrusted the nuclear research center SCK CEN with the task of researching innovative Small Modular Reactors (SMRs). This research also marked the beginning of the search for suitable partners to realize lead-based SMRs. This search proved successful, banking on the development programs for lead-based nuclear technologies that have been carried out by several leading entities during the past years. Five of these entities teamed up for this ambitious project.

Lead-based SMRs have very robust safety thanks to the concept of passive safety and offer the advantage of more efficient nuclear fuel utilization and reduction of long-lived radioactive waste in a closed fuel cycle approach. With their combined efforts and shared drive to implement a cost-competitive energy-generating solution, the partners will nurture this promising technology, facilitating the commercial-scale deployment of sustainable nuclear energy.

Belgian and Romanian precursors of a commercial SMR

The commercial rollout will require extensive research and intensive testing. The newly formed collaboration has outlined a clear vision, based on a step-wise approach to demonstration. Beginning with a small-size reactor to demonstrate the technological and engineering aspects of the commercial SMR-LFR in Mol, Belgium..

Meanwhile, the consortium will work towards the next development phase, which is the construction of ALFRED in Pitești, Romania, focusing on the technical and economic feasibility of future commercial SMRs. It will leverage and expand the work done in the past 10 years toward this objective by Ansaldo Nucleare, ENEA and RATEN under the FALCON consortium.

The Lead-cooled Fast Reactor design developed by Westinghouse will be the starting point for this project ultimately targeting its global commercialization.

A Robust Collaboration

The five international partners will jointly fulfill all requirements for the successful implementation of lead-cooled small modular reactors as a low-carbon sustainable and competitive source in a future energy mix by providing a combination of electricity, heat and hydrogen production. To expedite its adoption, each member brings its unique strengths to the table, and these strengths are complementary and synergistic.

Nuclear technologies using liquid metal as a coolant are not uncharted territory for European pioneers like the Italian ENEA, the Romanian research institution RATEN and the Belgian nuclear research center SCK CEN. Thanks to the MYRRHA project, SCK CEN is a global leader in lead-bismuth research, and it will merge its acquired knowledge with RATEN's extensive expertise in lead and ENEA's widespread experience in lead technology development. All this knowledge is crucial in building the two precursors needed for the full demonstration of the commercial SMR-LFR.

As the ultimate goal of this SMR journey is the commercial deployment of this technology with a time-to-market that remains as short as possible, the collaboration is driven by industrial interest. Westinghouse Electric Company and Ansaldo Nucleare will bring extensive experience in design, licensing, construction and commercialization of nuclear power plants globally.

Presidential and Ministerial Congratulations

Together, the five international partners bring sustainable nuclear energy closer to reality. Their efforts have earned them recognition and congratulations from presidents and ministers. "A year and a half ago, we took the strategic decision to

accelerate our energy transition. Reducing our dependence on fossil fuels, limiting our gas emissions and our dependence on countries like Russia, by investing massively in offshore energy, hydrogen infrastructure, but also the nuclear power of the future. We have decided to do this by drawing on the expertise developed in Belgium, and by allocating 100 million euros to the research and development of small modular reactors (SMR's). From the beginning, we are convinced that this would be set up in cooperation with international partners. The agreement SCK CEN has just signed today with Ansaldo Nucleare, ENEA, RATEN and Westinghouse is the first visible milestone in this strategy, a solid foundation on which we will continue to build", says Alexander De Croo,

Today, Klaus Iohannis, President of Romania, visited SCK CEN. "The exchanges I had with the experts, including the Romanian ones, were particularly interesting as there are excellent prospects of cooperation between Romania and Belgium in the field of nuclear research."

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Boilerplates

Ansaldo Nucleare

Ansaldo Nucleare, fully owned by Ansaldo Energia, has developed expertise in the domain of nuclear systems and components engineering and testing, contributing to various projects for new NPPs as well as for PLEX and safety upgrades of operating units, and developing innovative designs and advanced technologies both in the fields of nuclear fission and nuclear fusion. Ansaldo Nucleare strives for innovation and proudly invests in sustainable nuclear technologies.

More info: <https://ansaldonucleare.com/>

ENEA

ENEA, the Italian National Agency for New Technologies, Energy and Sustainable Economic Development, is leading the nuclear research and technology development on innovative nuclear systems in Italy, supporting the most relevant European and international projects aiming at contributing to the decarbonization of the energy mix. For over 20 years, ENEA has developed heavy liquid metal technologies and reactor core design solutions for innovative and enhanced sustainability nuclear applications.

RATEN

RATEN, the Romanian State Owned Company "Technologies for Nuclear Energy" coordinates the R&D activities in the field of nuclear energy, while offering and developing scientific and technological support for the National Nuclear Energy Program. For more than 20 years, RATEN has been developing a dedicated LFR program, building competences, investing in large experimental infrastructure and actively participating in European research and development projects.

SCK CEN

70 years of experience in nuclear research and technology

SCK CEN is one of the largest research institutions in Belgium. Every day, more than 850 employees dedicate themselves to developing peaceful applications of radioactivity. SCK CEN's research activities focus on three main areas: innovative nuclear systems, nuclear waste management and dismantling, and the crucial fight against cancer. SCK CEN is world-renowned and shares its knowledge through countless publications and training courses, so that this pool of exceptional competence can be maintained.

More info: www.sckcen.be

Westinghouse Electric Company

Westinghouse Electric Company is shaping the future of carbon-free energy by providing safe, innovative nuclear technologies to utilities globally. Westinghouse supplied the world's first commercial pressurized water reactor in 1957 and the company's technology is the basis for nearly one-half of the world's operating nuclear plants. Over 135 years of innovation make Westinghouse the preferred partner for advanced technologies covering the complete nuclear energy life cycle. For more information, visit www.westinghousenuclear.com and follow us on Facebook, LinkedIn and X.