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HEXANA: a sodium advanced modular reactor for sustainable industrial decarbonization

HEXANA is a French start-up committed to the design and development of an innovative small modular sodium fast reactor. Its objective is to deal with the key challenges of the energy transition that are still poorly addressed today, mainly through the decarbonization of the hard to abate energy intensive industries and the need for flexible power sources in addition to renewable energies. The Sodium Reactor technology has been chosen because of its favorable technical specifications for end-users (high temperature, good electrical efficiency⋯), but above all because of the high technological readiness level and the high level of credibility that it offers and which results in a quite short time-to-deployment compared to other systems. The proof of concept is already demonstrated at an industrial scale, but HEXANA brings several innovations in terms of architecture and of use of energy.

The power of this reactor is 400 MWth for each module, and HEXANA provides two twinned reactors associated with thermal storage (molten salt) offering flexible power delivery in response to the needs of its customers for industrial process needs. HEXANA integrates design options offering high guarantees from the point of view of safety, relying in particular on passive safety devices. The design of the nuclear island is made modular, so that factory-building and transport on-site by sea or by river is possible, which is a key driver for competitiveness. HEXANA is primarily targeting the combined production of heat and electricity, bases for the production of hydrogen or synthetic fuels. The level of heat (up to 500℃) actually gives access to all the amenities needed to defossilize our economy: steam, hydrogen, CO2, synthetic fuels, green steel, chemical molecules, etc. All these features confirm that the solution proposed by HEXANA is relevant to decarbonize industrial hubs in a robust and credible way.

Country OR International Organization

France

Email address

jean-baptiste.droin@hexana.fr

Confirm that the work is original and has not been published anywhere else

YES

Author: DROIN, Jean-Baptiste

Co-authors: GAUTHÉ, Paul; NIZOU, Sylvain

Presenter: DROIN, Jean-Baptiste

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