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GENIORS, an EU R&D project on MOX fuel reprocessing in GEN IV systems

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The current open nuclear fuel cycle uses only a few percent of the energy contained in uranium. This efficiency can be greatly improved through the recycling of spent fuel (as done today in France for instance), including, in the longer term, multi-recycling strategies to be deployed in fast reactors. In this context, and in the continuity of the FP7 EURATOM SACSESS project, GENIORS addresses research and innovation in fuel cycle chemistry and physics for the optimization of fuel design in line with the strategic research and innovation agenda and deployment strategy of SNETP, notably of its ESNII component. GENIORS focuses on reprocessing and fuel manufacture of MOX fuel potentially containing minor actinides, which would be reference fuel for the ASTRID and ALFREDO demonstrators. More specifically, GENIORS carries out research and innovation for developing compatible techniques for dissolution, reprocessing and manufacturing of innovative oxide fuels, potentially containing minor actinides, in a “fuel to fuel” approach taking into account safety issues under normal and mal-operation. The different promising options developed in SACSESS are currently further developed to address the specific challenges of GEN IV. For delivering a full picture of a MOX fuel cycle, GENIORS works in close collaboration with the INSPYRE project on oxide fuels performance. By implementing a three step approach (reinforcement of the scientific knowledge => process development and testing => system studies, safety and integration), GENIORS will lead to the provision of more science-based strategies for nuclear fuel management in the EU. It will allow nuclear energy to contribute significantly to EU energy independence. This paper presents the strategy and current results of GENIORS.

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Country or International Organization

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