

GENIORS, the Current European Actinide Separations Programme — Consolidating the Outcome of Preceding Projects

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The current open nuclear fuel cycle utilizes only approximately one percent of the energy contained in natural uranium. Spent fuel recycling (as done e.g., in France) results in significantly increased fuel efficiency. Future multi-recycling strategies to be deployed in fast reactors will lead to further improvement, eventually rendering further uranium mining unnecessary if depleted uranium stockpile is available.

In this context and in the continuity of previous European projects (NEWPART, PARTNEW, EUROPART, ACSEPT, SACSESS), GENIORS addresses research and innovation in fuel cycle chemistry and physics. 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 most promising options developed in prior projects are further developed to address the challenges specific to GEN IV. To deliver the full picture of a MOX fuel cycle, GENIORS works in close collaboration with the European 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 contributes to the provision of more science-based strategies for nuclear fuel management in the EU. It will support nuclear energy to contribute significantly and sustainably to EU energy independence. In the longer term, it will facilitate the management of ultimate radioactive waste by reducing its volume and radiotoxicity.

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