



## Ensuring the successful integration of future reactors into the **European energy system**

In the face of growing environmental challenges, the need for clean and affordable energy generation technologies is increasingly important. Nuclear energy offers a solution, but to ensure its successful integration into the European energy system, it is necessary to demonstrate its safety and ability to meet societal needs.

Coordinated by the CEA, ESFR-SIMPLE is a 48-month EU-funded project bringing together 16 partners from nine countries to improve three key aspects of the European Sodium Fast Reactor.

➤ Safety through innovative monitoring and intrinsic safety

➤ Cost competitiveness through innovative components and experimental research

➤ Service provided through the development of power level flexibility



# Research areas

The project aims to lay solid foundations in three research areas:



## Sodium Fast Reactors

Maintaining and strengthening European knowledge and skills on SFRs using European facilities and the expertise of the consortium.



## Reactor Design

Using the knowledge acquired in recent years to propose a reactor design that meets the needs of new and evolving markets.



## Digital Technologies

Demonstrating the advantages of new digital technologies to provide real-time operational data processing of future reactors.

# Objectives

To design a simpler, more flexible and safer reactor, the project set five objectives:

- 1 Rethink a simpler, more cost-competitive ESFR design that is safe and sustainable in terms of resources.
- 2 Assess the impact of alternative technologies, such as metallic fuel and compact secondary system design, on safety and cost-competitiveness.
- 3 Propose, develop and assess advanced methods for monitoring and processing operational data using artificial intelligence.
- 4 Produce new experimental data in order to facilitate the qualification of innovative components, such as expansion bellows, core catcher and thermos-electric pumps.
- 5 Ensure that the knowledge generated in the project is shared not only among the consortium partners, but also with a range of EU and international stakeholders.

# Partners

16 partners from 9 countries



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