

INNO4GRAPH Consortium

1. Electricité de France, EDF, France
2. Empresa Nacional De Residuos Radioactivos S.A, Enresa, Spain
3. Graphitech, France
4. Cyclife Digital Solutions, France
5. Commissariat à l'Energie Atomique et aux Energies Alternatives, CEA, France
6. Societa Gestione Impianti Nucleari, SOGIN, Italy
7. Lithuanian Energy Institute, LEI, Lithuania
8. Consorzio Interuniversitario Nazionale per la Ricerca Tecnologica Nucleare, CIRTEN-POLIMI, Italy
9. The University of Manchester, United Kingdom
10. Westinghouse Electric, Spain
11. Ansaldo Nucleare, Italy
12. TECNATOM, Spain
13. ARTTIC, France



INNO4GRAPH PROJECT COORDINATOR

Electricité de France

inno4graph-coordination@eurtd.com

INNO4GRAPH PROJECT OFFICE

ARTTIC

inno4graph-arttic@eurtd.com



INNOvative tools FOR
dismantling of GRAPHite
moderated nuclear reactors



September 2020 – August 2023

www.inno4graph.eu

This project has received funding from the Euratom research and training programme 2014-2018 under grant agreement No 945273



What is INNO4GRAPH?

INNO4GRAPH is a 3-year European collaborative Research and Innovation project focusing on the decommissioning of graphite moderated nuclear reactors. The consortium has received 3,011,061€ of funding from the Horizon 2020 Euratom Research and Training Programme of the European Union.

Why INNO4GRAPH?

Even if reactor types worldwide have some differences in design (and thus different dismantling scenarios), all these decommissioning projects are facing common technical and industrial challenges, such as:

- The dimension and complex geometry of such reactors.
- A huge quantity of irradiated and contaminated materials to remove.
- Little information concerning mechanical behaviour of graphite bricks.
- Access difficulties for remote operated tools.
- Operators' training.

In this context, European actors concerned by these challenges have joined forces, to develop and test innovative physical and digital tools and models both for decision-making regarding the optimal dismantling scenario, and for the graphite removal.



THE MAIN AIM OF INNO4GRAPH:

- The INNO4GRAPH project aims to provide different types of innovative physical and digital tools and methods that can be used **during** graphite reactor **dismantling operations**, but also in the **pre-dismantling study phase** to assess the feasibility and interest of adopting these new tools and methods.
- INNO4GRAPH is an integral part of an intensive testing process prior to real operations, allowing to optimise dismantling operations and minimise risks.

Expected results

INNO4GRAPH will develop:

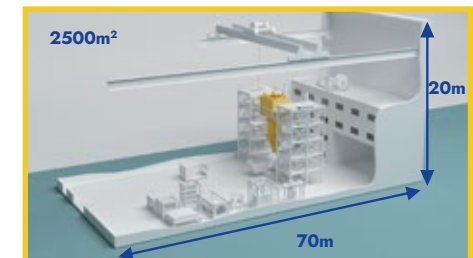
1. Tools and methods which will be used in tests and studies before the actual dismantling operations to:
 - Get an extensive knowledge of the graphite properties and the dismantling tools to be used. These include in-situ measurement of cracks and corrosion, digital tools and testing protocols.
 - Evaluate the efficiency of innovative tools to define the most adapted scenario for each reactor considering the local context (technical constraints, regulations, etc.), safety and cost-efficiency. These include scenario grid analysis, mock-ups for physical tests and digital 3D models.
2. Innovative cutting and handling tools to be used during the dismantling operations.



Simulation of graphite retrieval of Chinon A2 and tests to be performed in the industrial demonstrator

Beyond INNO4GRAPH

The launch in 2022 of a full-scale graphite reactor dismantling demonstrator in Chinon, France, will facilitate the uptake and further development of the INNO4GRAPH methods and tools. It will allow the testing of new physical and digital tools, methods and alternative scenarios in industrial conditions.



INNO4GRAPH is supported by:

