

# SUSTAINABLE MATERIALS, PROCESSES AND SYSTEMS FOR ENERGY TRANSITION

## MUR DM 117/NEWCLEO - Development and characterization of coatings for corrosion protection of nuclear fuel claddings in Lead Fast Reactor environment

<b>Funded By</b>	NEWCLEO S.R.L. [Piva/CF:12517780016] MINISTERO DELL'UNIVERSITA' E DELLA RICERCA [Piva/CF:97429780584] Politecnico di TORINO [Piva/CF:00518460019]
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<b>Context of the research activity</b>	<p>The corrosion of fuel cladding steels by liquid lead is a technological challenge for the development of LFRs. The solution under consideration consists of a protective coating deposited on the outer surface of the cladding tube. Various deposition processes (e.g., PLD, HiPIMS) and coating materials (e.g., Al<sub>2</sub>O<sub>3</sub>, FeCrAl) are being evaluated. This study aims to develop and qualify coatings for cladding corrosion protection in terms of key properties, e.g., adhesion during tube deformation and resistance to high temperature. Microstructural and mechanical characterization, as well as lead corrosion and irradiation experiments, will be conducted.</p> <p>Progetto finanziato nell'ambito del PNRR – DM 117/2023 - CUP: E14D23002050004</p>
<b>Objectives</b>	<p>Progetto finanziato nell'ambito del PNRR – DM 117/2023 - CUP: E14D23002050004</p> <p>Scientific responsible: Giovanni Pastore, giovanni.pastore@newcleo.com</p> <p>Main seat to carry out the reserach activity: Politecnico di Torino / NEW CLEO</p>
<b>Skills and competencies for the development of the activity</b>	<ul style="list-style-type: none"><li>• Preferably, M.Sc. degree or equivalent in Nuclear Engineering, Materials Science, Metallurgy, or similar</li><li>• Preferably, a thesis work with connection to experimental characterization of materials (e.g., testing of mechanical properties, electron microscopy applications) or materials development.</li><li>• Knowledge in corrosion and protection of materials would also be an asset.</li></ul>