

iENTRANCE@ENL: a research infrastructure on nanoscience and nanotechnology for energy transition and circular economy within the NextGenEU Program

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A revolution in materials, processes and systems for energy generation, storage, distribution and use is of fundamental importance for the future of the planet. The project, “Infrastructure for Energy Transition and Circular Economy @ EuroNanoLab” (iENTRANCE@ENL - <https://www.ientrance.eu>), aims to become the first research infrastructure of European excellence in Italy with the mission to provide the scientific community with access to facilities for: 1. Nanomaterials for energy; 2. Processes and devices for green energy production, storage and management; 3. Micro and nanoscale characterization; 4. Technologies for the realization of devices and systems. It will be structured across 6 geographical nodes, internationally recognised in complementary research domains, but will operate through a Central Hub acting as single-entry point and unique catalogue of all the methods and technologies available within the consortium. In the Design and Implementation phase (M1-M18), the operational and management backbone of the RI will be constructed, and the digital infrastructure, based on FAIR principles, will play a key role. In the Ramp-Up phase (M19-M30), users from academia and industry will have access to the facilities, and new instrumentation will be acquired and commissioned to further enable cutting-edge research. Access policies will take into account Open Science best practices and the pivotal role of excellent science. In-house research, enabled by the investments, will push technologies beyond the state-of-the-art to provide sustainability after the NGEU project. In the Full Operation phase, continuing for at least 10 years, Italy will have a distributed, integrated and fully interoperable structure to perform clean energy transition research up to TRL 4. Cooperation with other NGEU infrastructures and research innovation programs will ensure Italian competitiveness, autonomy and sovereignty in the field, covering the entire value chain from low to high TRL.