Circular materials characterisation at the ESRF synchrotron through the European project ReMade@ARI

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ReMade@ARI (remade-project.eu) aims to give a boost to circular materials research through advanced materials characterisation. It provides Trans-National Access (TNA) and assistance for advanced materials characterisation at 50 research infrastructures (RIs) across Europe, Switzerland and UK. It enables new users to discover multiple complementary techniques for materials characterisation at facilities including synchrotrons, neutron sources, laser facilities, electron microscopes, ion and positron beams and high magnetic field facilities.

The presentation will also introduce the ESRF (www.esrf.eu) as an example of a European infrastructure open to academic and industrial research. Each year around 10,000 Users come from all around the world to use the 46 X-ray laboratories, called beamlines, or mail-in samples for remote experiments. Application is through proposal rounds in March and September and selection is based on scientific merit. Use of the facility is free for publishable research, while industry can choose a fast and confidential access track that is charged at cost. Travel is reimbursed for academic users from member countries.

Now in the ReMade project's final year, experiments are ongoing but the period for accepting new proposals is over. The presentation will report on some of the successes of the project and present examples of the ReMade supported research carried out at the ESRF.

Assistance and training of users was the key to the success of ReMade. Twenty junior scientists with extensive experience of materials characterisation guided users at all stages of an experiment, from proposal writing to carrying out an experiment to data analysis. They helped with selection of the best techniques, guided preparation for experiments and assisted during experiments. Users could request additional training, for example, on sample preparation, sample environment setup and data analysis.

Tailored access was also available for industry. Small companies, SMEs, could benefit from confidential access which included sample mail-in, experiment support and data analysis. A second industry access route provided grants to knowledge providers to partner with industry to solve a particular challenge. In this way, the expertise of academics, Research and Technology Organisations (RTOs) and service providers was harnessed for experiment preparation as well as for data collection and analysis.

ReMade received over 280 proposals for standard TNA access and accepted about 190. This 70% success rate is much higher than typical for direct access to a facility thanks to preproposal guidance from the junior scientists. Proposals were received from researchers based in over 30 countries, with the top six including Germany, Italy, Spain, Sweden, Switzerland and the UK. Industrial access attracted 34 requests from SMEs of which 28 were accepted. Furthermore, 12 projects were selected from 17 proposals for the knowledge provider assisted research grants. All the priority areas of the EU's circular economy action plan have been included in the research facilitated by ReMade. The areas most represented were Construction and Buildings, and Batteries and Vehicles.

The ReMade project will end in February 2027. We hope that users who learnt to use the RIs through ReMade will continue to use the facilities for exceptional materials characterisation. ReMade is succeeded by RIANA, Research Infrastructure Access in Nanoscience & Nanotechnology (riana-project.eu), which provides TNA access to RIs for research into nanomaterials.