RESTORE
Short Term Scientific Missions

RESTORE Short Term Scientific Mission Hosting proposal

STSMs are research visits to a host institution where the applicant will perform research activities that advance the objectives of RESTORE. STSMs must be between 5 and 90 days (although, they may exceed that duration in specific instances for Early Career Investigators). Successful STSM applicants are financially supported by the Action with a fixed contribution of up to 2500 EUR. STSMs do not fund research activities, only travel related costs. This information will be posted on the RESTORE website for potential applicants to review.

HOST Institution:	Name:	Luxembourg Institute of Science and Technology (LIST)		
	Country:	Luxembourg		
	ITC Country	yes		
	Website:	www.list.lu		
Supervisor of the STSM:	Name:	Antonino Marvuglia		
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	RESTORE MC Member:	yes	**ECI:**	no

The scope of the proposed research and its relevance for RESTORE Action

The increasing digitalization of manufacturing and consumption practices, along with the introduction of new technologies (Internet of Things - IoT, Blockchain, Industry 4.0) is likely to disrupt the way such software tools may operate in the future, e.g. regarding the collection of inventory data or the definition of scenarios based on real time feedback from users. Within this context, taking into account life cycle assessment (LCA) when managing production chains poses the challenge of fast modelling of the dynamic production chain (quick programmatic creation of life cycle assessment inventories), retrieval (in real time) of information from the production chain to update the life cycle inventories (LCIs) and assessment based on the new data. Future IoT-enabled homes pose similar challenges. Particularly interesting is the assessment of the relationship between indoor environment and people metabolism, with the analysis of post occupancy evaluations, and sentient buildings that adapt to occupants' living conditions (recorded for example via social media feedback).

The aim of the STSM is to collaborate with the Environmental Sustainability Assessment and Circularity (SUSTAIN) unit of LIST to the organization of data and the development of a software infrastructure for the integration of current life cycle assessment tools with IoT data. In particular, the recipient of the STSM should:

- Help the LIST team in the identification of IoT data available to test the software infrastructure currently being developed at the LIST to allow IoT-based LCI creations for Industry 4.0 (like building materials production chains or automated homes). The software infrastructure hinges upon the LCA calculation framework Brightway2 (https://brightwaylca.org/)
- Collaborate in prototyping IoT-based tool to create life cycle inventories, through programming
- Contribute to the conception of a LCI update mechanism based on information coming from the data collected.

The selected candidate will work with the SUSTAIN team of LIST, which counts around 30 scientists and engineers from life science, environmental science, and IT science. The SUSTAIN team owns a high scientific reputation in the LCA community worldwide, working on cutting-edge methodologies and applications for computational sustainability. The successful candidate will leverage the expertise of the team and, if needed, will have access to the high power computing infrastructure owned by LIST. The work conducted during this STSM will be relevant for the RESTORE WG2 (Processes, Methods and Tools for Restorative Design).

Potential applicant requirements:

The ideal applicant should have at least some basic knowledge about life cycle assessment and own some programming skills in Python. Fluent knowledge of spoken and written English is mandatory; knowledge of French is an asset. The candidate should have high motivation and team working capability.

In order to maximise the success of the STSM, ideally the candidate should have access to some data, possibly coming from a IoT-enabled building. If data for a case study are not immediately available, the first part of the STSM will be dedicated to an inventory of existing (national and European) projects where data could be potentially available.

NOTE: This form should not exceed one page.