



# Terms of References

## Interdisciplinary Centre for Environmental Systems



The University of Luxembourg is establishing a new Interdisciplinary Centre (IC) for conducting research on complex environmental systems under the broad umbrella of sustainability science. The new IC for Environmental Systems is being established to foster transdisciplinary research and to contribute to higher education in the domain of environmental and sustainability sciences. It will create a forum to provide insights into the complex interplay between the environment and society. This new centre is the centrepiece of the focus area "Sustainable and Social Development" – one of the three core research areas of the University of Luxembourg, along with "Digital Transformation" and "Medicine & Health".

### Scope and Purpose of the new IC

The new IC aims to address the critical issues related to the environment, including climate change, the loss of biodiversity and ecosystem services, diminishing natural resources, rising pressure on land and the mutual impacts society and environment have on one another. The new centre will use systems approaches to study the complex interrelationships between the environment and society. It will create a knowledge base to develop sustainable solutions for a more resilient and sustainable society.

In the process of developing a sustainability science research agenda, the new IC will focus on excellence in environmental research including among others: circular and sustainable economy, land systems, biodiversity and ecosystem services, nature-based solutions, climate science and climate mitigation; and will engage at the science-policy and stakeholder interfaces.

To achieve this ambitious objective, the new IC at the University of Luxembourg will establish and engage in broad collaborative networks of interdisciplinary<sup>1</sup> research teams in environmental sciences connected through transdisciplinary<sup>2</sup> approaches integrating the environmental, social, and health sciences. Through these joint and built-in interdisciplinary and transdisciplinary endeavours, the centre aims to transcend traditional boundaries in research and between research and society in order to connect new knowledge and deeper understanding of complex environmental systems to sustainability and resilience. With the aim to grow to around 150 employees, including about 5-10 professors within a ten-year period, the new IC is expected to achieve a unique and distinguished position within existing international initiatives and

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<sup>1</sup> Interdisciplinarity refers to a mindset or methods that merges multiple academic disciplines into one activity (e.g., a research project). It draws knowledge from several distinct fields to create knowledge or innovative solutions by thinking across boundaries (e.g., collaboration of environmental science and health science to decipher the origin of a new pathogen outbreak)

<sup>2</sup> Transdisciplinarity integrates the natural, social and health sciences in a humanitarian context, and transcends their traditional boundaries. It aims at a holistic approach to study various interrelated systems (e.g., relation between climate change, environment, and society).

become an international reference centre. With its science-policy and stakeholder engagement interface, the new ICs is embedded in and provides support to the Luxembourg environmental and socio-economic context. In addition to basic and applied research, its core tasks will include academic education, through which Luxembourg aims to attract new talents, as well as knowledge and technology transfer. The IC will collaborate with academic institutions and networks of environmental experts from Luxembourg and worldwide, linking local priorities with global challenges.

### The new IC for Environmental systems demonstrates:

- Ambition and realisability to become an international centre of excellence and reference centre in **Environmental Systems and Sustainability Sciences**, including the interdisciplinary and systemic relevance to a sustainable society and economy;
- **International perspective, collaborative networking and long-term relevance** of the research topic and the potential for rapid growth. A contribution to international initiatives such as the European Green Deal<sup>3</sup>.
- Contribution to **higher education and continuing academic education**;
- **Integration with and contribution to the Luxembourg socio-economic system** and its strategy plans (e.g. National Research and Innovation Strategy<sup>4</sup>, National Energy and Climate Plan<sup>5</sup>, *Stratégie pour une économie circulaire*<sup>6</sup>, Spatial visions for the low-carbon and sustainable future<sup>7</sup> or *Luxembourg Stratégie*<sup>8</sup> which includes a large list of ongoing national strategies<sup>9</sup>).
- **Collaboration potential within the University of Luxembourg**, based on both existing scientific activities (across the fields of science, technology, engineering, mathematics, and medicine - STEM & social sciences and humanities - SSH in its Faculties and Interdisciplinary Centers), University's research infrastructures such as the Facility for High-Performance Computing (HPC) and data science, the University's Institute for Advanced Studies (IAS) etc.

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<sup>3</sup> The European Commission adopted a set of proposals to make the EU's climate, energy, transport, and taxation policies fit for reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. More information on [Delivering the European Green Deal](#).

<sup>4</sup> Sustainable and Responsible Development is one of the four interdisciplinary research priority areas to prepare Luxembourg for the future: <https://gouvernement.lu/dam-assets/documents/actualites/2020/02-fevrier/25-mesr-strategie-recherche-innovation/mesr-strategy-research-innovation.pdf>

<sup>5</sup> Luxembourg's Integrated National Energy and Climate Plan for 2021-2030 mandated by the European Union to each of its member states in order for the EU to meet its overall greenhouse gases emissions targets: [https://ec.europa.eu/energy/sites/default/files/documents/lu\\_final\\_necp\\_main\\_en.pdf](https://ec.europa.eu/energy/sites/default/files/documents/lu_final_necp_main_en.pdf)

<sup>6</sup> *Stratégie pour une économie circulaire Luxembourg-2021*, reconciling innovation and data driven economy with sustainable use of resources, nutrients and material flow, and climate protection : <https://gouvernement.lu/dam-assets/documents/actualites/2021/02-fevrier/08-strategie-economie-circulaire/20210208-Strategie-economie-circulaire-Luxembourg.pdf>

<sup>7</sup> Luxembourg in Transition - Spatial visions for the low-carbon and sustainable future of the Luxembourg functional region which aims to gather strategic spatial planning proposals and produce "towards 2050" ecological transition scenarios for the Grand Duchy of Luxembourg and neighbouring border territories: <https://luxembourgtransition.lu/en/>

<sup>8</sup> Luxembourg Stratégie ( <https://luxstrategie.gouvernement.lu/fr.html> ) will broaden and deepen the reflections launched in the context of the third industrial revolution strategic study ( <https://www.troisiemerevolutionindustrielle.lu> ) , in order to accelerate the transition to a sustainable and resilient economy and will set up the continuation of the discussions within the framework of an open forum with a holistic and collaborative approach,"

<sup>9</sup> Tableau de suivi des stratégies nationales, Luxembourg Stratégie (Travail en cours), version du 20.07.2022.

<https://luxstrategie.gouvernement.lu/dam-assets/documents/tableaux-de-suivi-prospectifs/tableau-strategies-nationales-ls-200722.pdf>

Consideration of the collaboration potential with the Luxembourg Institutes (LIST, LIH, LISER)<sup>10</sup> and other stakeholders involved in environmental sciences in Luxembourg<sup>11</sup> .

### What we expect from the founding director

- The applicant is an integrative thinker who combines an outstanding academic record in environmental/sustainability sciences, with a demonstrated strategic ability to think long-term, and beyond her/his own area of expertise, ideally bridging the natural and social sciences.
- She/he has proven experience of leadership and team management in academic/research institutions, including the building of organisational structures and collaborative networks.
- She/he shows proven experience to work interdisciplinarily and transdisciplinarily. The director will ensure the interdisciplinary interactions between the IC's research teams (5-10 professors and their collaborators) as well as the transdisciplinary approaches in collaboration with the University, national, and international partners.
- She/he has a track record of attracting competitive and collaborative funding for large research projects/programs on the national and international level.
- Candidates must be compelling in their communication and be quickly able to gain credibility with internal and external stakeholders through their advocacy- and relationship-building skills.

### Objectives of the new IC

- To promote interdisciplinary and transdisciplinary frontier research in the domain of environmental sciences to understand and create knowledge of complex environmental systems.
- To attract talent and to create a research environment that is propitious to collaboration between scientists from different disciplines, such as environmental sciences and social sciences.
- To establish a unique knowledge-based competence centre that will serve to develop sustainable solutions that will lead to a more resilient and sustainable society.
- To involve stakeholders from society, including policy makers, in the research process and ensure that the research outcomes are relevant to their needs, notably through citizen science, outreach activities, and advice. The new IC will include a science for impact and stakeholder engagement unit.
- To contribute to higher education, notably doctoral education, in the domain of environmental sciences.
- To establish a reputation as an international leading centre for research, education, and impact in the domain of environmental sciences.
- To integrate into the socio-economic landscape and contribute to conserve the environment of Luxembourg

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<sup>10</sup> Luxembourg Institute of Science and Technology (LIST, [www.list.lu](http://www.list.lu)), Luxembourg Institute of Health (LIH, [www.lih.lu](http://www.lih.lu)), Luxembourg Institute for Socio-Economic Research (LISER, [www.liser.lu](http://www.liser.lu)).

<sup>11</sup> Relevant information on the Luxembourg research and innovation ecosystem: <https://www.fnr.lu/research-in-luxembourg/#1461325462687-4024382d-5f20>

## Activities of the new IC

- Undertake interdisciplinary frontier research with systems and holistic approaches in the domain of environmental and sustainability sciences to develop a knowledge base on complex environmental systems.
- Embark on transdisciplinary research programmes, in citizen science initiatives, and in debates with stakeholders to ensure environmental and societal benefits while facilitating adoption of sustainable measures.
- Operate the science for impact and stakeholder engagement unit and develop sustainable solutions based on the research outcomes that can lead to a more resilient and sustainable society.
- Organize seminars, workshops, and conferences to promote interdisciplinary research in complex environmental systems, at the national and international scale.
- Involve stakeholders from society in the research process and ensure that the research outcomes are relevant to their needs, including the delivery of advice to industry and policy makers, and publications aiming at the greater public.
- Develop and deliver courses and training programs related to environmental sciences for higher education and notably doctoral education while reaching out to the next generation.
- Define a unique and distinguished positioning of the new IC compared to existing initiatives and foster international collaborations with other centres of excellence in the domain of environmental sciences.

## Operation of the new IC at the University of Luxembourg

- The new IC for complex environmental systems will be governed by the founding director, a professor appointed by the University.
- The director will be responsible for the overall research leadership, management, and administration of the centre. The director will be instrumental in attracting external funding.
- The director will be supported by a deputy director, a head of administration, and an adequate management staff for the day-to-day operations of the centre.
- The new IC will establish an advisory board consisting of international experts in environmental, sustainability, social, and health sciences as well as stakeholders from society.
- The advisory board will provide guidance and advice to the director and his research team on the activities of the centre.