






New and emerging research areas

Climate Future Lab

Next key date: 30 October 2024

This call for proposals supports the establishment and implementation of a research consortium to address the microclimate in urban areas as part of the Climate Future Labs of the Lower Saxony Centre for Climate Research (ZKfN). The aim of the Climate Future Labs is to develop multidisciplinary solutions for a safe and just climate future and to establish and expand a broad (scientific) network in Lower Saxony and beyond. Through transdisciplinary and interdisciplinary research and by linking both university and non-university researchers as well as implementation partners from business and the community, the intention is to develop urgently needed approaches for changing our lifestyles and economic practices in a way that will be environmentally, socially and economically viable and sustainable. The aim of this year's call for proposals for support is to research the impact of climate change in urban areas, with the involvement of cities, municipal authorities and citizens, and to develop approaches that promote climate protection and adaptation.

-  **Field: transdisciplinary, interdisciplinary and multidisciplinary**
-  **Form of support: research consortium (made up of at least three different scientific research institutions located in Lower Saxony)**
-  **Target group: scientific research institutions located in Lower Saxony in cooperation with external partners**
-  **Up to EUR 5.0 million**
-  **Up to 6 years**



1 Scientific background and support objective

In its 2023 report (<https://www.ipcc.ch/report/ar6/syr/>), the Intergovernmental Panel on Climate Change (IPCC) showed that measures to combat climate change will have to become more ambitious and far-reaching to meet the target set out in the 2015 Paris Agreement of limiting global warming to a maximum of 1.5 degrees. It places a responsibility on scientists to research the roles, expertise and strategies needed for climate change prevention, mitigation and adaptation. With a view to significantly expanding expertise in the area of climate and climate impact research over the coming years, the Ministry of Science and Culture (MWK) has extended current research supports to include the Climate Future Labs series of calls for proposals. The **Lower Saxony Centre for Climate Research (ZKfN)** was founded in 2023 in this context.

The aim of the ZKfN and the Climate Future Labs is to develop multidisciplinary solutions for a safe and just climate future and to establish and expand a broad (scientific) network in Lower Saxony and beyond. Through transdisciplinary and interdisciplinary research and by linking both university and non-university researchers as well as implementation partners from business and the community, the intention is to develop urgently needed approaches for changing our lifestyles and economic practices in a way that will be environmentally, socially and economically viable and sustainable. In addition to promoting research excellence, the ZKfN aims to support knowledge exchange by establishing new formats and platforms for scientific communication and implementing innovative, action-oriented cooperation with various stakeholders.

Funding comes from the zukunft.niedersachsen programme, which aims to find responses to current and future challenges and permanently strengthen Lower Saxony's position as a centre for research. The emphasis is on knowledge sharing and concluding new cooperation arrangements. The funding programme focuses on the areas of transformation, digitality and cutting-edge research. zukunft.niedersachsen is run and funded by the Volkswagen Foundation and the MWK.

This call for proposals supports the establishment and implementation of a research consortium that will:

- network the relevant research actors in Lower Saxony and beyond,
- develop solutions and strategies for a safe and just climate future,
- provide sustainable inputs on climate change mitigation and adaptation,
- conduct interdisciplinary and transdisciplinary research together with implementation partners and with the involvement of civil society,
- devise proposals for compatible third-party funding,
- develop approaches for changing our lifestyles and economic practices in a way that will be environmentally, socially and economically viable and sustainable,
- and thus contribute to knowledge sharing.

2 Topic

Microclimate in urban areas

There is a strong link between climate change and ongoing urbanisation. For example, 75% of people in Germany already live in urban areas and this figure is expected to rise further (Steuri et al., 2018). Through the concentration of people, economic output and infrastructure, urban centres are responsible for a large proportion of energy and resource consumption and thus for emissions of CO₂ and other greenhouse gases. At the same time, these areas in particular have great potential for tackling the climate crisis. For example, per-capita CO₂ consumption is lower in urban areas and infrastructure can be planned more cost-effectively (Wagner, 2021).

However, densely populated areas are also highly vulnerable to and severely affected by the impact of climate change. Forecasts indicate that the frequency, duration and severity of extreme weather events will increase (IPCC, 2021). This will manifest itself in floods triggered by extreme rainfall, heat waves and (especially in conjunction with excessive traffic and lack of vegetation) persistent periods of poor air quality. In urban areas in particular, these climate-related changes may have an extreme impact on people, the environment, economic activity, mobility and infrastructure as well as energy and water supplies.

The aim of this Climate Future Labs 2025 call for proposals for support is to research the impact of climate change in urban areas, with the involvement of cities, municipal authorities and citizens, and to develop approaches that promote climate protection and adaptation. In the context of the call for proposals, the term “urban areas” is taken to mean “[...] settlement structures with appropriate compactness and density in urban and rural areas” (New Leipzig Charter, 2020, p. 11).

A variety of disciplines, such as geography, sociology, building physics, biology and much more as well as interdisciplinary approaches, are explicitly invited to participate. Individual or combined focus areas may be taken into consideration. The following list is intended to prompt ideas:

- **Impact of the microclimate on urban populations and their health:** A potential focus could be analysis of the connections between local atmospheric conditions and health indicators in urban areas aimed at deriving preventive measures for reducing health risks, e.g. posed by heat events. Under the One Health approach, health is not limited to people.
- **Biodiversity in urban microclimates and its significance for the ecosystem:** Biodiversity plays an important role in ecosystem resilience in urban microclimates as well, which could be examined by analysing the environmental and climatic functions of green spaces and biotopes with respect to microclimate regulation and biodiversity conservation.
- **Development of adaptation strategies and measures for improving the microclimate:** The aim would be to develop an evaluation matrix for evaluating and prioritising measures based on the most important model parameters (surfaces on a building scale, radiation, vegetation, water surfaces, wind, etc.) for thermal comfort as well as the water balance, translate this into a climate model and validate the model in application scenarios, e.g. by recommending and evaluating suitable protection strategies for heat islands and flood scenarios with the involvement of cities, municipal authorities and the population.
- **Interaction between social structures and microclimate conditions in urban areas:** There is little information about the influence and impact of social participation processes on the quality of adaptation measures and the actual representation of the interests of marginalised groups also. The aim could be to use specific participation and communication processes in the area of microclimate to research modes of action (also in relation to democratic education) and derive



concrete courses of action for spatial planning processes.

- **Microclimate modelling and simulation:** Microclimate modelling and simulation: This aspect builds on the current state of the art through national and European projects and addresses the extension of a numerical prediction model using a large-eddy approach to predict thermal comfort in built-up areas based on the interaction of thermal radiation with infrastructure surfaces, thermally induced flow, humidity and wind (by coupling to a mesoscale climate model such as **WRF**[☞]). The coupled model must be capable of being run on multi-GPGPU architectures in order to achieve practice-based computing times at spatial resolutions up to the metre scale. The validation of the simulations of specific scenarios should be realised by collecting or using suitable data (e.g. based on sensor networks, satellites, drones, etc.).
- **Collecting microclimate data:** The aim could be to specify simulation scenarios and validate simulations by collecting suitable data, e.g. based on sensor networks, satellites, drones, etc., as well as transfer these to suitable models.
- **Development of bioclimatic approaches in the area of spatial planning and building design:** This would involve examining possibilities for urban spatial planning, such as support for ventilation corridors and façade greening, the integration of green areas and roofs as well as water features, and passive solar usage or energy efficiency. Other aspects could include optimising the indoor climate in buildings and conserving resources in the interest of climate protection (for example, renovating older buildings vs. constructing new ones).
- **Examination of the role of green areas and water features in regulating urban microclimate temperatures:** The aim would be to research green areas and water features from the point of view of regulating temperatures, reducing heat stress, improving air quality and protecting against floods. Preferably, the findings would be integrated into a model for implementation in a sponge city with a high proportion of green spaces.

3 Eligibility and support format

The call for proposals is open to state-run universities in Lower Saxony (Section 2 of the Lower Saxony Higher Education Act [NHG]) as well as publicly funded non-university research institutions based in Lower Saxony.

Each consortium must consist of at least three research proposers from at least three different research institutions in Lower Saxony. In order to fulfil the overarching goals, the composition of the research consortia must adequately reflect the competences across locations and disciplines in Lower Saxony. Universities, technical universities (**Fachhochschulen**) and non-university research institutions may be part of a consortium.

Funding will solely be provided for the aforementioned universities and non-university research institutions. Staff and operating expenditure are eligible for funding. The number of working hours for research assistant positions may be freely determined, but should correspond to what is typical for such roles in the respective disciplines. Operating expenditure may not exceed 2% of the total funding amount. In very rare circumstances, an exceptional justification must be agreed beforehand with the MWK.

External partners and research institutions as well as international universities outside of Lower Saxony should be involved in the consortium. The proportion of funding for external partners may not exceed 20%

of the total funding amount.

Funding of up to EUR 5 million for six years will be provided for one Climate Future Lab. The funding will initially be restricted to three years and then extended by three years subject to a positive interim evaluation. Please include only the direct project costs in the cost plan. Allowances for administrative and infrastructure expenditure will be calculated by the MWK on approval of the proposal.

From the ranks of the parties involved, a project lead at a university or research institution in Lower Saxony must be appointed for the research consortium. This person and his/her institution will be the proposer and, in the event of a successful proposal, the funding recipient who will forward the funding to the consortium partners in accordance with the proposal. At the same time, this person agrees to function as a spokesperson for the Future Lab for the duration of the project, to assume chief responsibility for organising the Future Lab and to collaborate with the ZKfN Administrative Office. For coordination purposes, the proposal must include at least a TVL-E 13 (75%) position who will be responsible in cooperation with the ZKfN Administrative Office for the organisation, coordination and public image of the Future Lab as well as top-level coordination with other Future Labs.

The project team composition should be gender- and diversity-equitable.

It must also be stated whether and to what extent aspects of equal opportunities and diversity are relevant to the research project (methods, work programme, objectives). Compliance with the **Equity and Diversity Standards** [☞] of the German Research Foundation (DFG) will be considered in the funding decision for the approval of the funding.

If researchers in the qualification phase will work on the project, the opportunity for further academic qualification must be considered in the proposal content.

All involved in the project are naturally expected to respect the DFG's rules for good research practice, any rules for **good research transfer/cooperation practice** [☞] of their institutions and the DFG's guidelines on the **handling of research data** [☞]. The project results are also expected to be published, especially in jointly peer-reviewed publications that are as internationally accessible as possible. Publication in open access journals would be particularly welcomed.

The planned date for project commencement is 1 April 2025.

4 Proposal and selection process

The proposal must be written in English and should be structured as follows:

1. **Proposal for Climate Future Lab support form** [☞]
2. Project description with the following information:
The project description may not exceed 20 pages (Arial, 11pt, 1.5 line spacing).
 - Summary in German and English (maximum of two pages in total):
 - Key research question(s)
 - Name, institutional affiliation and role of the participating researchers and implementation partners
 - Topic, objective, reason for the project

- Contribution to the overarching objectives of the series of calls for proposals
 - Latest research (incl. literature) and description of the research gap(s)
 - Research approach, methods, hypotheses
 - Description of sub-projects, if relevant
 - Description of the transdisciplinary, interdisciplinary and, if relevant, application-oriented approach
 - Description of the promotion of early career researchers
 - Differentiation from other ongoing supports
 - Contribution to the strategic objectives of the institutions involved
 - Future/subsequent prospects for the project
3. Schedule and work plan (in table form)
4. **Plan of expenditure in table form** [↗] (for the project as a whole and the individual working groups), with explanations for the individual items:
- Staff
 - Operating costs, such as:
 - Travel expenses (e.g. meetings, conference attendance, workshops)
 - Equipment and software
 - Scientific communication (forms of public relations, publications)
 - Events
 - Other ongoing operating costs (e.g. consumables)
5. Short CVs (one-pager) for the researchers involved in accordance with **DFG standards** [↗] (mention of up to ten of the most important/relevant publications and up to ten of the most important/relevant cooperation projects with implementing partners)
6. **Research data management plan in accordance with DFG standards** [↗]
7. Favourable opinion from the board of the university/institution of the proposer (project lead)
8. Letters of intent from the external partners (organisation)
9. Declaration from the designated project lead that he/she will serve, without payment, as the spokesperson for the respective Climate Lab and collaborate with the Administrative and Coordinating Office.

The deadline for proposals is 30 October 2024.

The proposal must be submitted as one single PDF document (max. 10 MB) via email to:
zkfn@tu-braunschweig.de [↗]

In the event of a positive assessment, the following must also be provided to the MWK prior to any funding being granted:

- A cooperation agreement between the proposing university/research institution and the ZKfN Administrative Office setting out the joint collaboration
- A cooperation agreement between the proposing universities/research institutions setting out, among other things, responsibility for staff in respect of the coordinating research assistant position

The eligibility of proposals for support will be assessed based on the following **criteria**:

- Potential for the project to contribute in a relevant way to climate change research, climate impact research or climate protection
- Suitability of the content of the research project to the main focal points of the respective Future Lab
- Composition of the scientific research consortium, with the greatest possible consideration of relevant scientific skills in Lower Saxony
- Scientific quality of the research proposal
- Methodological fit of the research project
- Innovation potential of the project
- Interdisciplinary composition of the research consortium and organisation of the cooperation
- Integration of the non-research partners in terms of content and organisation
- Involvement of civil society
- Expected advancement of knowledge and transfer potential of the planned project
- Compatibility of the project with ongoing or planned research projects and supports
- Involvement of people in the scientific qualification phase, mention of specific qualification goals
- Involvement of students in research, in particular to strengthen their transformation and problem-solving skills
- Feasibility of the research plan and schedule
- Consideration of aspects of equal opportunities and diversity

The independent scientific evaluation will be organised by the Volkswagen Foundation and documented in a funding recommendation. The Lower Saxony Ministry of Science and Culture will make the funding decision on the basis of the funding recommendation.

5 Contact details

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6 Additional information

Additional information in the form of an FAQ can be found at the [ZKfN website](#).