

Unleashing a Research Agenda for the EU Mission “Climate Neutral and Smart Cities” in the 10th Framework Programme

NetZeroCities Input Paper

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Executive Summary

Climate action must be at the core of the EU priorities for research to have a chance at meeting the ambitious objectives of the Paris Agreement and the European Green Deal. The Mission “100 Climate Neutral and Smart Cities by 2030” provides a key contribution to these priorities by laying the foundations for capacity building, effective replication and scaling, monitoring and assessment and evidence-based policy and decision making, as well as financial, digital and technological innovation. Here, research plays a pivotal role in enabling climate neutrality in cities, while at the same time promoting European competitiveness and quality of life, ensuring that funds for research are effectively spent on creating evidence. A strong connection and coordination between research activities and policy development ensures that policy design is both evidence-based and addresses core needs. **The Cities Mission provides a platform for researchers to collaborate towards the common objective of urban climate neutrality with municipalities, innovators, policymakers, urban stakeholders (including citizens and organisations) and researchers bringing different types of knowledge and capabilities to act together.**

Effective **Mission implementation demands systemic approaches** that acknowledge and implement the interconnections between social, environmental, technological, financial and governance-related systems. The [EU Framework Programme 10](#) should support transdisciplinary research in the Mission Cities that coordinates the understanding, adoption, testing and diffusion of systemic change, based on collaboration of disciplines (environmental, technological, financial, social) on concrete cities’ challenges, with the final aim of developing sustainable climate-neutral urban ecosystems. The discussions facilitated by [NetZeroCities](#) to define a research agenda for the Mission Cities in FP10 highlighted key recommendations for research topics for enabling the transition towards climate neutrality within the Mission through the implementation of a systemic approach:

1. **Innovation in Policy and Governance:** more research should be funded to investigate changes in governance and public organisations’ structures, aiming at systemic change for reaching climate neutrality through adaptive governance. Research should aim to understand and optimise how the implementation of the systemic approach to climate neutrality reshapes municipal operations and governance at local, regional and national levels, and understand

how municipalities can collaborate more effectively with academia and research institutions to become self-sustainable climate-neutral urban ecosystems.

2. **Effective Funding of Urban Climate Actions:** longitudinal research is needed to investigate effective financing instruments of portfolios of climate actions, related legal aspects and policy incentives for municipalities (including mechanisms for derisking), developing effective training programmes in climate finance for public administrators to mobilise, plan and orchestrate the necessary funds for achieving climate neutrality in cities, aiming at carbon reduction as well as carbon removal. Research should be funded to accelerate project preparation for access to finance, supported by the assessment of advanced solutions for regulatory streamlining and policy development.
3. **Learning and Capability Building for Systemic Climate Action:** research should focus on investigating the effectiveness of capability-building programmes for public administrators and experts in diverse formats (including online and in-person learning between cities) on the ability of local governments to adopt a systemic approach to climate planning and implementation, which enables the activation of the local ecosystem toward the most effective climate actions. More research is needed for longitudinal and comparative analysis to understand the effectiveness of portfolios of climate actions implemented by cities across projects and Missions (on emission domains, levers of change, financing methodologies, regional and demographic factors), in order to support cities in learning how to unlock systemic innovation with an integrated portfolio approach and deriving generalisable knowledge for the scientific community and for informing European and national capability-building activities.
4. **Leverage Monitoring and Assessment Frameworks for Cities' Learning and Planning:** research funds should be provided for coordinating in-depth longitudinal data analysis and sharing across climate projects and initiatives. Research should be funded to develop and analyse integrated, adaptive climate quali-quantitative longitudinal monitoring systems that allow a systemic understanding and monitoring of the city. Monitoring and learning systems should be based on interoperable digital infrastructure that align and coordinates local, regional, and national governance levels, enabling cities to identify the most effective climate actions, track their implementation and outcomes in terms of GHG emissions and co-benefits through a catalogue of standardised plus customizable process and outcome indicators that integrate mitigation, adaptation and climate-related governmental planning as well as well-being. These systems should be complemented by qualitative reflexive learning mechanisms that link real-time data with city-level interventions, enabling cities to monitor, assess, recalibrate, and scale climate strategies based on continuous feedback and evolving conditions.
5. **Cross-sectoral collaboration on Infrastructure and Technology:** Further research is needed to support cities' experiments with new and risky climate-critical cross-sectoral technologies for mitigation through pilots, replicating and upscaling them. More research is needed to identify current best practices developed by cities in integrated climate action planning that include transport, energy and built environment infrastructures, as well as deriving knowledge on cities' experimentations with novel technologies and decarbonisation solutions, such as carbon removal technologies, and their financing. Such funded research projects should have structured mechanisms for pan-European knowledge sharing in learning programmes, to

provide cities' climate leaders and experts guidance on preparing the uptake of novel technologies: knowledge-based decision making is central when selecting novel technologies based on GHG/economic/social return on investment, especially when technologies are immature, costly and with uncertain viability. Integrated planning of actions across emission domains should specifically be directed toward measuring and ensuring equitable access to infrastructures.

6. **Scaling and Replication:** More research is needed to understand how climate action can be prioritised and sustained even when political support is lacking, integrating cultural change initiatives into urban planning and policy frameworks, media communication and institutionalising collaborations with research projects on education. Research should be funded to investigate the effectiveness of replication strategy through funding mechanisms that support widening the participation of Mission Minded cities and "satellite cities", defined as smaller cities that are geographically and culturally near large (i.e., Mission) cities, that wouldn't otherwise have the capacity to participate in ambitious EU-funded projects.



[Interactive visual summary of the input paper](#)

Context: Placing research at the core of the Mission “100 Climate Neutral and Smart Cities”

This input paper proposes a research agenda to inform the EU Framework Programme 10, focusing on climate-neutral, smart and liveable cities. It addresses current gaps in EU research programs and initiatives, aiming to support the widespread adoption of systemic approaches, enabling cities to achieve their sustainability goals with the approach of research through implementation, to inform forthcoming EU policies on sustainable, liveable cities. In this context, the EU's Mission, '100 Climate-Neutral and Smart Cities by 2030', hereafter also referred to as Cities Mission, plays a pivotal role, serving as a flagship initiative to transform cities into hubs of innovation and sustainability, in line with the [Paris Agreement](#) and the [European Green Deal](#). This Mission is one of the leading efforts by the European Union (EU) to combat climate change by committing to reducing emissions by at least 55% by 2030 and achieving climate neutrality by 2050. As the EU is aligning its agenda with a stronger focus on competitiveness and security as outlined by the [Draghi](#) and [Letta](#) reports, and is designing

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the next long-term budget potentially reshaping and directing research funds, this input paper emphasises that **the [Mission approach](#)¹ remains fundamental for navigating complex challenges**, continuing to serve as a vital tool to mobilise and align different actors towards sustainability goals.

Through the Cities Mission, the EU aims to **improve the quality of life** for its citizens while facilitating the transition to an economic model that supports ecological sustainability and secures European competitiveness in the long term. **Within the Cities Mission, research emerges as a cornerstone in shaping experimentation, supporting informed decision-making, and fostering the development of coordinated, innovative and systemic interventions.** NetZeroCities (NZC), as the Cities Mission platform that consolidates tools, resources, and expertise to support cities in their transition to climate neutrality, **explored how research contributes to this transformation and identified key areas for future EU research programmes.** To achieve this, three mutual learning events were organised by NetZeroCities bringing together researchers, cities, representatives of the European Commission, government networks, businesses, civil society, and technology experts working within the Mission framework, at the Cities Conference 2024 in Valencia (with the participation of over 50 researchers belonging to 28 universities; see the whitepaper and report for more details), in Brussels in 2025 (hybrid event with over 40 people in presence and 20 online), and a session at the [Cities Conference 2025 in Vilnius](#), attended by over 40 people. Recommendations provided in this input paper are also based on [NetZeroCities policy briefs, CCC highlights, and insights](#) gained from the interaction with Mission Cities and Mission Minded Cities, captured in the NetZeroCities deliverables and other projects implemented by the Mission Cities.

The concept of EU Missions is based on systemic change; therefore, effective Mission implementation requires an **understanding of the interconnections** between social, environmental, and technological factors supported by governance and financial capacity, their planning and implementation. A systemic perspective recognises that different systems, such as transportation, buildings, energy, governance, and communities, are all connected. Changing one part of the system can impact many others. For example, decisions about public transport influence not only mobility but also air quality and social inclusion. Systemic thinking and actions enable moving beyond short-term solutions and create long-term and adaptive strategies; however, it also poses unprecedented challenges in the integration of cross-disciplinary knowledge, mindsets and operations.

¹ European Commission: Directorate-General for Research and Innovation and Mazzucato, M., *Mission-oriented research & innovation in the European Union – A problem-solving approach to fuel innovation-led growth*, Publications Office, 2018, <https://data.europa.eu/doi/10.2777/360325>

Gaps and Recommendations

The discussion facilitated by NetZeroCities to define a research agenda highlighted key research topics for enabling the transition towards climate neutrality within the Mission through the implementation of a systemic approach. Next, each key research topic is presented in detail, outlining main gaps and recommendations for future research projects.

1. Innovation in Policy and Governance

KEY RECOMMENDATION 1: More research should be funded to investigate changes in governance and public organisations' structures, aiming at systemic change for reaching climate neutrality through adaptive governance. Research should aim to understand and optimise how the implementation of the systemic approach to climate neutrality reshapes municipal operations and governance at local, regional and national levels, and understand how municipalities can collaborate more effectively with academia and research institutions to become self-sustainable climate-neutral urban ecosystems.

GAPS

Addressing climate change is an unprecedented challenge: the Mission approach (EC, 2018) requires public administrations to change their role into orchestrators and creators of the urban ecosystem to unlock funding and change citizens' behaviour toward climate neutrality: this **shift of role of the municipality to adaptive governance² requires profound changes in governance and public organisational structures³**, such as by creating transition teams for easier collaboration across sectors, and facilitating long-term structured cross-sectoral collaborations with research institutions and urban actors outside the municipality⁴, while supporting capability building for reshaping municipal operations and governance at local, regional and national levels to achieve long-lasting systemic change in resilient socio-ecological systems. An [analysis of the Climate City Contracts](#) of the first cities that received the Mission label highlights that "institutional barriers are the most significant obstacles cities face in achieving climate neutrality. The primary institutional barriers consist of regulatory challenges and fragmentation of responsibilities across different government levels."

Research funding should be dedicated to investigating best practices, barriers and enablers to understand and thus optimise this historical shift in the role of public administration toward a Mission approach. Cities define research as an "enabler"; working with researchers gives public administrators access to cutting-edge research⁵. Yet, cities suggest that research funding should provide **incentives for increasing the mutual understanding of researchers and municipalities** to improve on-the ground

² Folke, C., Hahn, T., Olsson, P., & Norberg, J. (2005). Adaptive governance of social-ecological systems. *Annu. Rev. Environ. Resour.*, 30(1), 441-473.

³ Research event at the City Conference 2024 in Valencia. Report section "Mission-oriented policy approach"

⁴ Mutual Learning Event, Brussels 2025

⁵ Session on research at the City Conference 2025 in Vilnius; Finnish city

collaboration⁶, for example, with secondments⁷ or shadowing programs⁸ aimed at developing “research through implementation”. To achieve this, researchers highlight the **barriers posed by academic careers⁹ evaluated on the basis of academic publications, while making research relevant for cities requires additional effort**, not only in “translating” academic work into products that are used by cities, but also time to understand the processes of municipalities, which cannot be directly translated into scientific outputs. Thus, academia needs to consider a different system of incentives for the promotion of researchers who create a valuable impact for society in addition to scientific papers, i.e., designing structured processes and mechanisms to translate research outputs into products relevant and directly usable by cities. These collaboration mechanisms between municipalities and research should be studied to identify best practices of transdisciplinary research to replicate.

Municipalities and regions share that they feel overwhelmed by the complexity of having to learn to tackle climate mitigation and adaptation in addition to their operations, and are constrained by existing plans and a lack of funding. An [analysis of Mission Cities Climate City Contracts](#) found that they are built on existing planning and implementation efforts: “Over 50% of cities referenced their existing (Sustainable Energy and Climate Action Plan (SECAP)/Social Economy Action Plan (SEAP) or SUMP as foundational elements of their CCCs. The analysis reveals a notable gap in cross-sectoral integration at the action planning level.”

RECOMMENDED RESEARCH

Cities would benefit from support in selecting actions and policies to implement that have been successfully tested in other similar cities¹⁰. Thus, research funding should support analysing **large-scale policy experimentation with (randomised) control trials**, similar to extra-European policy labs¹¹. NetZeroCities is a notable example of such large-scale long-term policy experimentation, which allows comparisons across geographical and national contexts, as well as across cities that are part (more than 100), or not part, of the programme: a longitudinal analysis of cities’ path from climate action planning to project preparation for funding, to implementation and iteration can provide very valuable knowledge for all European cities, in particular if research supports cities to become climate-

⁶ Session on research at the City Conference 2025 in Vilnius; Finnish city

<https://openresearch.amsterdam/en/page/115434/european-city-science-initiative-csi-eu> ;

<https://www.london.ac.uk/london-research-policy-partnership/blogs/rise-european-city-science>

⁷ Research session at the City Conference 2025 in Vilnius: “We are pushing for a program where we can have university interns so that we can align and understand the implications of municipalities and struggle they have.” (Prato, Italy); “In Catalonia (Spain) PhD positions are embedded within local governments, not just industry- an innovative model worth exporting”

⁸ Mutual Learning Event in Brussels 2025. Roundtable with the City of Paris facilitated by Wiebeke Pankauke, European Commission DG RTD

⁹ Research event at the City Conference 2024 in Valencia; Mutual Learning Event in Brussels 2025; research session at the City Conference 2025 in Vilnius

¹⁰ Research event at the City Conference 2024 in Valencia; Mutual Learning Event in Brussels 2025; research session at the City Conference 2025 in Vilnius, NetZeroCities Sensemaking sessions with all pilots. “We would like to know what other cities similar to us have done and worked well, so we can do it too”

¹¹ i.e., [JPAL policy lab of MIT](#)

neutral urban ecosystems not dependent on public funding for climate action at the end of the Mission timeframe.

Future research fundings should require EU funded projects not only to support cities in designing and testing actions for improving internal governance, policies and regulatory models, but also in providing evidence from scientific research¹² that informs the selection of actions: for developing comparative analysis, funded projects should have incentives (i.e., requiring dedicated tasks) **to analyse scientific evidence from multiple sectors and domain (not only technological), define actions based on scientific evidence, and then have structured processes to compare academic literature with data from cities, and share results with related funded projects utilising harmonised categories**, in order to build cross-project pan-European knowledge on effective governance structures, best practices in orchestrating cross-sector collaboration, development of policy labs and prototyping “Mission-oriented Policy approach”¹³ mindsets in the public administration. Such knowledge should be coordinated with research call, projects and programmes (such as Erasmus+) to inform policies in next-generation curriculum and training pedagogy, including professional and executive education in sustainability.

2. Effective Financing and Collaboration with the Private Sector

KEY RECOMMENDATION 2: longitudinal research is needed to investigate effective financing instruments of portfolios of climate actions, related legal aspects and policy incentives for municipalities (including mechanisms for derisking), developing effective training programmes in climate finance for public administrators to mobilise, plan and orchestrate the necessary funds for achieving climate neutrality in cities, aiming at carbon reduction as well as carbon removal. Research should be funded to accelerate project preparation for access to finance, supported by the assessment of advanced solutions for regulatory streamlining and policy development.

GAPS

As municipalities can only provide 10-20% of the massive investment of €307bn ([NetZeroCities, 2025](#)) required to achieve climate neutrality in cities, public organisations need to shift their role to become orchestrators of non-governmental actors that can finance and implement the required portfolio of actions to lower GHG emissions at the required pace, financing infrastructures and projects¹⁴. This unprecedented change requires public administrators to acquire competence in finance literacy, legal aspects, risk analysis and decision making, as well as the ability to collaborate and co-create strategic urban plans with the private sector and finance specialists and institutions. Cities voice the need to have support in **understanding the most effective, feasible and legally viable ways for municipalities to collaborate and co-design the city’s portfolios of actions with the private sector, utilising diverse**

¹² Research event at the City Conference 2024 in Valencia (focused on the Mission approach); Mutual Learning Event in Brussels 2025 (table on “learning and capacity building”; research session at the City Conference 2025 in Vilnius

¹³ Research Event at the City Conference 2024 in Valencia

¹⁴ “Limited funding” is an issue shared in all research events (Research event at the City Conference 2024 in Valencia; Mutual Learning Event in Brussels 2025; research session at the City Conference 2025 in Vilnius) and sensemaking sessions

financial mechanisms for different projects and bundles of projects¹⁵ and blended finance, in order to be able to finance the entire portfolio of climate actions required to reach climate neutrality. Future research should investigate which type of infrastructure, actions and projects are best financed with which instruments, in particular, regarding bundles of projects, blended finance, and specific return on investment of actions by emission domain/sub-domain.

Contrary to the past, cities cannot limit themselves to what they can finance if they want to achieve climate neutrality, and yet the portfolio of climate actions required to achieve climate neutrality cannot be decided by the municipality a priori for then looking for funding: in order for the portfolio of climate actions to be financeable, it needs to be co-designed with potential funding entities¹⁶. Consequently, cities highlight the **need for public administrators to acquire abilities in mapping (local, regional, national and international) actors with whom to co-design the city's climate action plan, to ensure the plan can be financed and implemented.**

NetZeroCities provides a flagship example of large-scale support in increasing urban public administrators' finance literacy, support and implementation for over 100 European cities through dedicated experts and a [Climate City Capital Hub](#). The Capital Hub has been set up to act as a two-way bridge, bringing finance into Mission cities and taking evidence from the Mission cities back into financing markets. By leveraging the Capital Hub, NetZeroCities ensures that research leads to implementation and finance gets embedded in actionable pathways, replication strategies, and even policy frameworks at EU and national levels. The Capital Hub is amplifying the impact of the Mission Cities and accelerating Europe's transition to climate-neutral urban systems, making sure that what we learn through the Mission can translate into financeable, scalable action. The knowledge gained through the implementation of what is possibly the largest experiment in the world in providing support to cities' financing for climate actions should be investigated in depth to provide insights for policies and replication in other cities.

RECOMMENDED RESEARCH

While important knowledge and practices exist, scientific research remains fragmented and underdeveloped. There is a need for systematic, comparative, and long-term research to guide the design of financing instruments, legal frameworks, and training programmes that can effectively support cities in reaching climate neutrality. Analysing data derived from the NetZeroCities Capital Hub can support scaling up cities' finance intelligence, investor matchmaking capacity while producing evidence through longitudinal comparative analysis that includes public finance capacity-building frameworks and standardised data systems that inform policymakers and municipalities in strengthening their ability to scale investment for becoming sustainable, climate-neutral cities.

Planning and project preparation phase:

¹⁵ Mutual Learning event in Brussels 2025: "marriage proposal of the cities with the private sector"; Research session at the City Conference 2025 in Vilnius

¹⁶ Research session at the City Conference 2025 in Vilnius (table 3); NetZeroCities sensemaking session of cohort 2, breakout room on stakeholder engagement

Based on NetZeroCities' experience, research could study cities' best practices and barriers in **co-designing with the private sector, financing actors, civic organisations (as intermediaries or multipliers)**, including close collaboration and early involvement of investors for the best possible alignment of public interest and financial requirements, starting at the pre-feasibility level.

As NetZeroCities advances, new data is expected to be available on the type of financing instruments and business models that are most typically successful for specific typologies of projects and emission sub-domains: **research on identifying the most effective financing instruments and type of business model/investor for specific infrastructure/sectors/actions/bundles of actions** (including analysis or risks and rewards) would be particularly beneficial for all cities to scale.

Cities find difficulties in project preparation: more research is needed for developing tools and mechanisms to support cities in the **preparation of projects for access to finance**. Research would be beneficial on the organisational structures and support services which substantially increase the speed of the project preparation process with the cities, facilitating access to finance for sustainable infrastructure. In addition, research should be funded on **simplification and shortening of feasibility assessments**, e.g. through benchmarking, international know-how management and exchange, digital twins and simulation tools.

Future research could fund selected pilots in partnership with municipalities and regulators to test the **de-risking innovative financing mechanisms** (e.g. outcome-based contracts, municipal debt swaps, blended finance structures) and then scale the learning and support to all EU cities.

As procurement is a relevant lever for sustainability, more research into **innovative procurement models** (e.g. outcome-based procurement, pre-commercial procurement) and (national) strategies that can de-risk investments and accelerate the adoption of climate-neutral solutions should be conducted.

Financing phase:

Longitudinal research on the long-term effects of support mechanisms and funding models implemented in the Mission Cities (Capital Hub) and related initiatives would be beneficial to support policy development while concurrently informing EU-related projects and the design of future EU calls. Such longitudinal research would also inform financial and regulatory training necessary for public administrators and consultants to take on this unprecedented role¹⁷. The results of research on financing climate action would inform policy frameworks on **how the public sector can effectively shape markets**¹⁸ and orchestrate the collaboration between diverse actors to co-develop and finance actions toward the Mission of climate neutrality.

¹⁷ City Conference 2025 in Vilnius, session on tools: cities shared the challenge to understand financial and legal topics (already outside their domain of expertise) in English

¹⁸ Mariana Mazzucato (2013) *The Entrepreneurial State*, Mariana Mazzucato (2021) *Mission Economy*

Specifically, research should be funded to understand **how to design and operationalise financial instruments that can fund integrated portfolios of urban climate actions** (not single projects), reflecting the systemic nature of climate neutrality transitions.

Further research is needed, particularly on identifying **enabling governance models that allow municipalities to blend EU, national, and private finance** effectively, as well as on **regulatory sandboxes to attract and test investment** for (market-ready, socially empowered) climate innovations^{19,20}.

More research projects to study the assessment of **risk sharing mechanisms and innovative insurance and re-insurance solutions** would allow to test novel funding mechanisms.

Future research should be funded to assess the **implications of on financing instruments for infrastructure investments, resulting from carbon pricing, carbon certificates and carbon removal and resulting cash flow streams**, investigating ways to integrate climate adaptation actions (in coordination with the Mission Adaptation), calculate and monetise co-benefits, and facilitate possibilities to establish viable business cases.

3. Learning and Capability Building for Systemic Climate Action

KEY RECOMMENDATION 2: Research should be funded to investigate the effectiveness of capability-building programmes for public administrators and experts in diverse formats (including online and in-person learning between cities) on the ability of local governments to adopt a systemic approach to climate planning and implementation, that enables the activation of the local ecosystem toward the most effective climate actions. More research is needed for longitudinal and comparative analysis to understand the effectiveness of portfolios of climate actions implemented by cities across projects and Missions (on emission domains, levers of change, financing methodologies, regional and demographic factors), in order to support cities in learning how to unlock systemic innovation with an integrated portfolio approach and deriving generalisable knowledge for the scientific community and for informing European and national capability-building activities.

GAPS

European municipalities voice the need to increase practical knowledge on all aspects of sustainability (mitigation, adaptation, pollution, justice, etc.) and institutionalise internal capacity to guide their cities toward climate neutrality²¹. Strengthening multi-sectoral and multi-stakeholder climate planning requires institutionalised learning. As enacted in NetZeroCities, Pan-European learning should continue being supported and expanded to cater for a larger number of participants, who would benefit to learn from other cities. Thus, research should be funded to **investigate in the long term and depth, cities' climate actions through data collection for identifying best practices for**

¹⁹ Research session at the City Conference 2025 in Vilnius "we cannot test anything in our country because everything is regulated: we need regulatory sandboxes"

²⁰ Sønderborg carbon removal project <https://projectzero.dk/en/>

²¹ Mutual Learning Event in Brussel 2025, table on "learning and capacity building". Quote: "need for validation on what is most effective, and what is most efficient for cities who are building capability through learning"

diverse contexts, to be shared in learning programmes²² for cities²³, with the academic community, as well as to inform EU and national policies. Such a learning programme to up-skill and re-skill city stakeholders should thus be based on research evidence and include, in addition to the sustainability topic, developing capabilities in public finance data and digital²⁴, artificial intelligence and/or integrated planning²⁵ future literacy/scenarios, climate leadership, media communication, and systemic innovation. Skills shortage in climate and energy is considered a threat to Europe's competitiveness²⁶.

The EU Cities Mission is a prime example of how the EU can effectively support the collaboration between research institutions and local administrations, proving the potential of research as a catalyst for more effective local climate action. Within the Mission, the NetZeroCities Pilot Cities Programme has supported planning and implementation of systemic change at a large scale, with peer-to-peer learning mechanisms. In NetZeroCities, research on municipalities' needs, transition teams' development, and requests for expertise on specific topics provide structured pathways for developing knowledge and learning programmes that respond to cities' needs.

RECOMMENDED RESEARCH

Future research should also **connect municipalities' needs and lessons learned from the Mission and other funded projects with scientific literature to foster evidence-based interventions and reciprocal learning**, providing evidence of "*change through learning*"²⁷. Quantitative insights should be complemented by cities' lived experiences, capturing barriers and effective implementation strategies. **Calls for research projects could request two-way learning mechanisms** that integrate evidence-based insights from applied, transdisciplinary research, enabling mutual exchange across sectors and creating reflexive learning loops to support systemic, long-term climate action – while informing research²⁸. Such learnings would be valuable for establishing a EU academy on learning programmes for cities and regions, which would foster collaboration between the academic community, as well as to inform EU and national policies, by developing a curriculum/academy to train city practitioners.

²² Research session at the City Conference 2025 in Vilnius. Presentation of the city of Aachen "From research comes training... so collaboration with researcher helps to train future professionals who may work in municipalities"

²³ Research session at the City Conference 2025 in Vilnius. Quote: "No offence to universities... but when it comes to the practical use of their knowledge, they often don't have the capacity to respond to practical questions. We end up working with consultancies and that is a very missed opportunity."

²⁴ Research event at the City Conference 2024 in Valencia; Mutual Learning Event in Brussels 2025; research session at the City Conference 2025 in Vilnius

²⁵ Research event at the City Conference 2024 in Valencia

²⁶ https://commission.europa.eu/document/download/97e481fd-2dc3-412d-be4c-f152a8232961_en?filename=The%20future%20of%20European%20competitiveness%20%20A%20competitiveness%20strategy%20for%20Europe.pdf

²⁷ Research Event at the City Conference 2024 in Valencia

²⁸ Research Event at the City Conference 2024 in Valencia. Quote: "Ability and possibility to reflect and learn from actions is crucial for connecting research with strategic processes"

Such long-term **research & learning frameworks** should be city-centred, therefore integrated with other initiatives that cities are part of, such as the **other Missions**: [Adaptation](#), [Oceans & Water](#), and [Soil](#), as well as initiatives including the [New European Bauhaus \(facility\)](#), and [moonshots](#) (i.e., automated transport and mobility, zero water pollution and next generation AI) would also allow an easier coordination between EU funded projects. Future research calls could request projects to embed tasks dedicated to aligning and integrating with relevant projects, initiatives and Missions, through joint events or publications (scientific or pragmatic), to avoid replication of work across projects. Such collaborations should also include educational institutions²⁹ funded projects and activities (i.e., funded with the Erasmus+ programme) to investigate how to enhance knowledge on climate action at all education levels and their effect on societal norms (for scaling), informing the upcoming [Council of Societal Challenges](#) (outlined in the Align, Act, Accelerate EU report³⁰).

4. Leverage Monitoring and Assessment Frameworks for Learning and Planning

KEY RECOMMENDATION: Research funds should be provided for coordinating in-depth longitudinal data analysis and sharing across climate projects and initiatives. Research should be funded to develop and analyse integrated, adaptive climate qualitative-quantitative longitudinal monitoring systems that allow a systemic understanding and monitoring of the city. Monitoring and learning systems should be based on interoperable digital infrastructure that align and coordinates local, regional, and national governance levels, enabling cities to identify the most effective climate actions, track their implementation and outcomes in terms of GHG emissions and co-benefits through a catalogue of standardised plus customizable process and outcome indicators that integrate mitigation, adaptation and climate-related governmental planning as well as well-being. These systems should be complemented by qualitative reflexive learning mechanisms that link real-time data with city-level interventions, enabling cities to monitor, assess, recalibrate, and scale climate strategies based on continuous feedback and evolving conditions.

GAPS

Monitoring and assessment mechanisms are fundamental for climate action to support cities in defining urban, regional and national plans based on evidence of climate actions' effectiveness, track progress of actions, and adapt strategies based on data. Such data are relevant to inform policies and research. Cities often struggle to measure baselines and progress and to identify useful and standardised, quantifiable metrics that are harmonised across all urban and regional planning systems. The reasons lie in (i) the lack of alignment across local, regional, and national levels of governance and the related monitoring systems; (ii) lack of data or disperse data from diverse sources (and projects) and difficulty in their integration and continuous update in a single system due also due

²⁹ Research Event at the City Conference 2024 in Valencia. Quote: "investigating the trickling up effect of educating children to influence parental behaviour and broader societal norms can amplify the impact of educational initiatives"

³⁰ European Commission: Directorate-General for Research and Innovation, *Align, act, accelerate – Research, technology and innovation to boost European competitiveness*, Publications Office of the European Union, 2024, <https://data.europa.eu/doi/10.2777/9106236>

also to diverse standards and requirements across initiatives³¹; (iii) dependence on data literacy of decision makers and policy makers at urban and regional level to analyse actions' effectiveness and impact of behavioural, (iv) the need of adaptability of such monitoring systems to the diverse needs of small, medium, large cities that have diverse capacity and dedicated personnel, and (v) the lack of integration of citizens' behaviour tracking and detailed information on citizens' needs based on their gender, age, and potential vulnerabilities³². Cities ask for support in integrating circular economy and measuring/impacting Scope 3 emissions³³ and progress (not only outcomes)³⁴.

In NetZeroCities, the 112 Mission Cities are monitoring their progress in GHG emissions through existing platforms (MyCovenant and CDP-ICLEI Track) and assessing the progress toward their plan through the Climate City Contracts iterations. In addition, structured sensemaking sessions for knowledge sharing between cities are organised at set timeframes to allow for reflexivity during the process³⁵. The experience, **cities' challenges and data generated during the process can provide a wealth of knowledge for all European cities if research funding is provided for comparative, in-depth, longitudinal analysis of NetZeroCities data and integrated with other projects of the Mission(s).**

RECOMMENDED RESEARCH

Scientific support is needed to **develop a catalogue of indicators and a related tracking system and instructions that are relevant for cities' planning needs and coordinated** across EU Missions (in particular the Mission Adaptation³⁶), funded projects³⁷, as well as ³⁸EU and international initiatives³⁹, including [EU Covenant of Mayors](#), [NEB](#)⁴⁰, [UN SDGs](#), [C40](#), as well as possibly coordinated with national governments' monitoring systems. Such a system should be based on available monitoring

³¹ Mutual Learning Event in Brussels, Feb 2025, table "Monitoring and Assessment". Quotes: "How can we scale city-level indicators to specific interventions in pilots?"; "How do indicators help us and the cities understand how we make impact and enable replication? The indicators should not only be made to create data, but should be made for practical use to create impact".

³² <https://netzerocities.eu/wp-content/uploads/2024/10/SGA-NZC-D4.14-Anticipation-Horizon-Scanning-and-Foresight-Report-V1.pdf>

³³ City Conference 2025 in Vilnius, session on Scope 3 emissions

³⁴ Research event at the City Conference 2024 in Valencia "Measurement, Data, and Adaptation". Cities often face challenges such as lack of collected data, or a too large amount of data that needs specific capabilities to be managed and understood. Participants advocate for (i) prioritising impactful and targeted data collection expanding the scope to include comprehensive emissions (Scope 3); (ii) tracking progress towards targets; (iii) developing faster feedback loops within project to facilitate timely adjustments."

³⁵ NZC-SGA D4.8 - Mid-project Insight Reporting on Sensemaking. Data use and access (Barcelona): Difficulty using and sharing data transparently due to political pressures; limited access to existing knowledge leading to duplication of effort; need for standardised datasets and a centralised platform to balance local specificity with broadly applicable insights.

³⁶ <https://netzerocities.eu/wp-content/uploads/2024/10/SGA-NZC-D4.14-Anticipation-Horizon-Scanning-and-Foresight-Report-V1.pdf>

³⁷ Related EU funded project: CapaCITIES, CrAft ,UP2030, RE-VALUE, CLIMABOROUGH, SPINE, UPPER, ASCEND, NEUTRALPATH, GKEC, metaCCAZE, MOBILITIES FOR EU, BIPED, TIPS4PED, EXPEDITE

³⁸ The project CLMS-Cities leverages Copernicus satellite data for Mission Cities <https://clms-cities.eu/>

³⁹ DUT; Civitas initiative <https://civitas.eu/>

⁴⁰ Research event at the City Conference 2024 in Valencia

technologies, including digital twins and sensors (under development in EU-funded projects⁴¹), to ease cities' data collection and **integration**⁴², and provide user-friendly data visualisation and decision support systems for urban planners (especially for small and medium-sized cities that might not have the capacity and capability for advanced data analysis). It should include machine learning and green AI, especially for the sectors producing the highest amount of GHG emissions (stationary energy/buildings and transport). A EU coordinated monitoring and assessment framework (i.e., based on initiatives such as the EU Covenant of Mayor) that include also behavioural progress data and social benefits of actions, should ensure that **indicators and data requirements are based on cities (and regions) real needs for planning, financing and implementation (with process indicators in addition to outcome indicators) rather than top down choices, and that are coordinated across EU funded projects and Missions related to Climate with data-sharing protocols**, to provide cities a useful, timely, standardised but customisable platform for data integration and visualisation⁴³ (lowering their data collection burden by integrating data requirements across projects and initiatives). Facilitating collaboration across governance levels is strictly related to the development of **standardised data-sharing protocols**. Research should investigate how data and learning can support the communication, interplay and alignment among various levels of government to support understanding how cities-national-regional governments learn together. **To this aim, research should be funded to improve interoperable data spaces and IT infrastructures that simplify cities' data collection, including governance and policy measures for data sharing across governance levels and with external organisations, as well as structured learning loops.**

Research should be funded to develop a standardised and customizable **city-centred and user-friendly data collection and visualisation platform and dashboard**⁴⁴ **based on cities' journey in climate planning** (based on user journeys) and thus integrates cities' participation to EU-funded projects, learning events and pan-European sensemaking sessions for integrating data with reflexivity. Such mixed-methods data collection that integrated standardised and customisable quantitative data with reflexivity and sensemaking would allow cities to have a structured digital climate planning "diary" beyond single projects. Such systems can help cities assess the performance of their climate actions effectively and consistently, while also facilitating the exchange of knowledge and learning across different levels of government and between municipalities.

Equipping cities with scientific tools aimed at supporting adaptive decision-making is a crucial aspect to help cities track, compare, assess, and select the most suitable climate actions to implement and, even more importantly, to adapt through time. To support this process, funding should be provided to

⁴¹ i.e., the projects metaCCAZE and BIPED in the Mission Cities

⁴² NetZeroCities sensemaking session with Mission Cities and pilot projects, reported in NZC-SGA D4.8 - Mid-project Insight Reporting (2025)

⁴³ Research Session at the City Conference 2025 in Vilnius. Quote: "various types of visualizations and results interpretations tools and functions"

⁴⁴ Example: the integrated dashboard of the Mission city Florence "Smart City Control Room"
<https://netzerocities.app/resource-4180>

develop **integrated decision-support systems** (DSS) that support cities in integrated planning and monitoring, based on such structured data through multicriteria decision making⁴⁵ and AI⁴⁶.

Additionally, designing user-friendly interfaces and standardising how data and public participation are visualised can significantly improve how stakeholders engage with climate data and the production of visuals to be directly utilised on media for the communication of progress and results in GHG reduction and co-benefits, to improve citizens' participation and commitment. Cities, as well as recent research findings, emphasise the need for platforms that support participatory approaches⁴⁷ towards data collection, knowledge co-creation and **collective sensemaking** towards systemic climate transitions. This makes data platforms more inclusive and responsive, helping to ensure that cities' climate actions are transparent, evidence-based, and aligned with contextual needs and priorities⁴⁸. To ensure that climate strategies remain adaptable to changing conditions over time, the development of qualitative reflexive monitoring systems that enable "[learning through reflection](#)" is fundamental. Reflexive learning will allow cities to assess, reflect, and recalibrate their strategies based on real-time insights and stakeholder feedback. However, developing capacities and organisational structures that support these processes still represents an open challenge, especially in terms of institutionalisation of those practices beyond research projects, which should be tackled through long-term collaborations with academia and research institutions for mutual benefits (research institutions can collect data while cities receive support).

Cities voice the need to monitor **citizens' behaviour** to assess actions and policies' effectiveness, thus such monitoring and learning platforms should be developed to integrate social and behavioural metrics⁴⁹, including citizens' and the private sector's behaviour, engagement with cities' climate initiatives and the development of social innovations. Research on behavioural change⁵⁰ tools, is necessary for cities adopting a systemic approach to integrate behavioural climate actions. Furthermore, there is a need for scientific research on behavioural change and citizens' bottom-up involvement in developing climate actions to enable cities to monitor, evaluate and learn the impact of their planned systemic climate actions on citizens' behaviours. Scientific literature provides limited insights on how to enable, monitor, evaluate, and support citizens' behavioural change within systemic transformations: research is needed to adapt or extend existing behavioural change assessment frameworks to track and evaluate behavioural shifts at the systemic level, explicitly linking

⁴⁵ Session on research, City Conference 2025 Vilnius, table 3

⁴⁶ Session on research, City Conference 2025 Vilnius

⁴⁷ Mutual Learning Event in Brussels 2025. Quote: "how can digital tools be leveraged for the consultation and engagement of stakeholders?"

⁴⁸ Example: the Mission City of Bergamo (Italy) developed an AI platform for stakeholder online engagement in defining the climate city contact actions and tracking <https://comunedibergamo.forimpact.ai/>

⁴⁹ Research event at the City Conference 2024 in Valencia

Results from NetZeroCities Pilots presentations: Addressing social inequalities in UrbanWISE; CoLAB (Germany) aims to bring about behavioural change through targeted interventions. This initiative recognizes that achieving climate goals is not just about technological solutions but also about transforming societal attitudes and behaviours

⁵⁰ Research event at the City Conference 2024 in Valencia. Quote: " *The need for cultural and behavioural changes to achieve climate goals is crucial. Therefore, citizen understanding, and acceptance of the efforts needed to reach those goals becomes strategic for garnering widespread support and ensuring the success of climate actions.*"

climate actions to stages of behavioural change. It is also essential to study the degree to which the success of climate actions depends on behavioural change: a model for assessing and predicting this dependence would allow cities to design bottom-up interventions that enhance citizens' readiness to adopt new behaviours, thereby increasing the likelihood of achieving climate neutrality. Research should address how to optimize citizen science⁵¹ and the involvement of citizens in data collection by embedding in standardised indicators, set options and recommendations for promoting participatory data collection and co-creation of knowledge with communities and stakeholders.

EU funded projects should be dedicated to the continuous (yearly) monitoring of quantitative and qualitative cities' data, providing insights to cities based on analysis and comparison to other similar cities (with aggregated data), as well as providing insights to national and EU policy makers, and coordinating across projects the communication and dissemination of best practices through scientific and media outlets (instead of having separate websites for each project), creating a **joint repository of data, learning and communication material**. Data sharing protocols should ensure that data is accessible to all relevant stakeholders, enabling them to make informed decisions in support of climate goals by effectively managing resources.

Equally important is research that supports the development of **data literacy within local authorities**. Strengthening this capacity ensures that data-driven strategies are not only technically robust but also contextually meaningful and actionable. Enhanced data literacy can improve both the relevance and practical application of climate-related data.

Finally, **long-term longitudinal monitoring and qualitative-quantitative assessment** are needed to ensure that all the learning enabled by the Mission is not lost but can be replicated by all European cities. NetZeroCities can be considered a best practice compared to most current research projects in terms of providing the structure to consider long-term changes and impacts, and research on the project outcomes should be funded to assess in depth coordinated analysis for the academic and practitioner communities.

5. Cross-sectoral collaboration, infrastructures and technologies

KEY RECOMMENDATION: Further research is needed to support cities' experiments with new and risky climate-critical cross-sectorial technologies for mitigation through pilots, replicating and up-scaling them. More research is needed to identify current best practices developed by cities in integrated climate action planning that include transport, energy and built environment infrastructures, as well as deriving knowledge on cities' experimentations with novel and converging technologies and decarbonisation solutions, such as energy generation, carbon removal technologies, and their financing. Such funded research projects should have structured mechanisms for pan-European knowledge sharing in learning programmes, to provide cities' climate leaders and experts guidance on preparing the uptake of novel technologies: knowledge-based decision making is central when selecting novel technologies based on

⁵¹ Mutual Learning event in Brussel 2025, table on learning; research session at the city conference 2025 in Vilnius. Quote: "promote science for citizens through new narratives and broader communication strategies. Target diverse audiences including students, children, the general public"

GHG/economic/social return on investment especially when technologies are immature, costly and with uncertain viability. Integrated planning of actions across emission domains should specifically be directed toward measuring and ensuring equitable access to infrastructures.

GAPS

The [analysis of Climate City Contracts](#) of the first half of the Mission Cities that received the city label found that **cross-sectoral barriers** are the most significant challenge, with over 350 identified Barriers. This strong finding highlights the need for stronger collaboration across sectors to overcome institutional-related challenges in climate actions. Cities⁵² recognise that their biggest issue is to **coordinate stakeholders to move together in the same direction, aligning timelines**. Researchers also face the challenge of working with academics of other domains due to different mindsets, research methods and typologies of target publications⁵³. In addition, “**infrastructure barriers**, namely those inherently linked to the infrastructure and technologies necessary to achieve climate neutrality, were [...] significantly identified by the cities (18%). The required size of infrastructure and high upfront costs of climate mitigation were most often mentioned for this category”⁵⁴.

The systemic innovation of urban socio-technical systems necessary to reach deep decarbonisation requires an orchestrated portfolio of **cross-sectoral, integrated urban systems and Infrastructures**. While the need is recognised and shared among academics, experts and public administrators, its planning and implementation is still challenging in terms of integrated urban planning, climate action planning, integrated funding, and **harmonised monitoring and decision making** that involves numerous actors at different levels (politicians, municipal experts across various city departments, owners and managers of local buildings and climate-critical infrastructures and systems) with different political agendas. The NetZeroCities [impact pathways](#) and [Transition Map](#) provide a valuable example of theorisation and guidance of the systemic approach for urban transitions. In addition, cities voice the **need for support in coordinated systemic planning** among projects and Missions, and other initiatives such as [SECAPs](#) (currently adopted by over 4000 cities).

RECOMMENDED RESEARCH

More research is needed to identify best practices developed by cities in **integrated climate planning** that include developing and decarbonising [transport, energy, and built environment infrastructures](#), and integrating innovative technologies and solutions⁵⁵ into those (e.g., [smart grids powering EVs and energy flexibility, district heating linked to retrofits](#)). Special focus would be needed on developing viable means for financing, funding and business models for these integrated solutions, since [fragmented infrastructure has high upfront costs](#). Integrated planning requires [cross-sector capacity](#)

⁵² I.e., research session at the City Conference 2025 in Vilnius: City of Eindhoven presentation

⁵³ Research event at the City Conference 2024 in Valencia

⁵⁴ <https://netzerocities.eu/wp-content/uploads/2025/01/CCC-Highlights-Barriers-to-climate-neutrality-May-2025.pdf>

⁵⁵ Policy brief of the project NeutralPath (Mission Cities) on urban decarbonisation: it recommends sustainable financing models (e.g. retrofits, district heating), clear regulatory frameworks to de-risk investments, and inclusion of energy poverty considerations in building and district planning. <https://neutralpath.eu/news/neutralpath-and-mobilities-for-eu-co-organised-the-policy-session-towards-climate-neutral-cities-integrating-sustainable-energy-and-mobility-solutions/>

building for systemic integration of solutions of diverse emission domains, which is a necessary element when making climate neutrality a shared responsibility⁵⁶.

Further research is needed to support cities in enabling **experiments for new and risky climate-critical technologies for mitigation through pilots and adaptive governance**, which would also support Europe's entrepreneurship and competitiveness in green technologies, as well as energy independence, reducing external vulnerabilities⁵⁷. This should be followed by models and guidelines for replicating and upscaling them to a larger scale and deriving knowledge to be shared with all cities to be embedded in structured learning programmes, so that all cities can support and enable informed decisions. Providing effective knowledge communication and co-design methodologies specific to diverse types of decision makers (including sceptical politicians, building owners, private companies) to collaborate effectively through shared plans and visions, is vital when selecting novel technologies based on GHG/economic/social return on investment (i.e., CCS/BECCS, hydrogen, and advanced retrofit technologies)⁵⁸ especially when technologies are immature, costly, have an uncertain viability and could create lock-ins for the surrounding area or other technological systems. Funded projects should support academia, industry, and municipalities to co-develop deployment roadmaps for integrating technologies into infrastructures⁵⁹.

Further research on **carbon removal solutions** would be beneficial to understand how to integrate them into infrastructures. Research is needed to understand their financial and non-financial impacts and co-benefits and their potential, including bioenergy with carbon capture (BECCS) and their effects on the city's net-zero targets and policies. This includes the work with carbon certificates as well as carbon trading and pricing for solutions, which are established in addition to the existing trading of emission allowances in the EU-ETS market.

Finally, as improved infrastructure and technology rollouts risk deepening inequalities, future research should be specifically directed toward measuring and **ensuring equitable access to novel solutions and services integrated to infrastructures**⁶⁰ (e.g., affordable EV charging, community-owned renewables, inclusive retrofit schemes), developed through co-design for developing just infrastructure solutions.

Such research would provide the EU with relevant information for strategizing technologies to support competitiveness, increasing security and decreasing dependencies.

⁵⁶Research session at the City Conference 2025 in Vilnius: City of Eindhoven presentation

⁵⁷ https://commission.europa.eu/document/download/97e481fd-2dc3-412d-be4c-f152a8232961_en?filename=The%20future%20of%20European%20competitiveness%20%20A%20competitiveness%20strategy%20for%20Europe.pdf

⁵⁸ <https://netzerocities.eu/wp-content/uploads/2025/02/Policy-brief-Industry-Decarbonisation-2025-02-18.pdf>; <https://netzerocities.eu/wp-content/uploads/2024/12/Policy-brief-Built-Environment-2024-12-19.pdf>

⁵⁹ <https://netzerocities.eu/wp-content/uploads/2025/01/CCC-Highlights-Bold-Commitments-2024-12-16-vf.pdf>

⁶⁰ <https://netzerocities.eu/wp-content/uploads/2025/06/CCC-Highlights-%E2%80%93Diverse-Perspectives-on-Climate-Justice.pdf>

6. Scaling and replication

KEY RECOMMENDATION: More research is needed to understand how climate action can be prioritised and sustained even when political support is lacking, integrating cultural change initiatives into urban planning and policy frameworks, media communication and institutionalising collaborations with research projects on education. Research should be funded to investigate the effectiveness of replication strategy through funding mechanisms that support widening the participation of Mission Minded cities and “satellite cities”, defined as smaller cities that are geographically and culturally near large (i.e., Mission) cities, that wouldn’t otherwise have the capacity to participate in ambitious EU-funded projects.

GAPS

Scaling strategies in transition are typically categorised in [three typologies](#)⁶¹: scaling out, scaling up and scaling deep:

- **Scaling out** involves replicating successful innovations in new locations or contexts to a larger number of stakeholders. In NetZeroCities, structured replication strategies have been conceived since the start of the project with a Twinning programme, peer to peer online at paced timeframes between Mission Cities, in-person learning and knowledge sharing, as well as scaling by sharing the methodology and key learnings with Mission-minded Cities⁶² through learning programmes and development of National coordination platforms. In the context of the Mission, gaps in scaling out remain in investigating the effectiveness of the scaling strategies deployed if no specific support is provided for the financing of projects planned by cities that do not have access to the Capital Hub. Most large European cities are Mission Cities: they have the capacity and internal structures to undertake the climate-neutral Mission. Smaller cities face the challenge in terms of human resources, skills in English, finance, data integration and analysis and sustainability, and funds to be able to replicate Mission cities’ approach. Likewise, volunteer and civic organisations might be willing to collaborate on EU-funded projects for free but lack the connections and administrative skills to be formally part of projects: the EC could consider agile and diverse forms of participation.
- In addition, more in depth research is needed on replication drivers and amplifiers, for example, policy drivers and high-intensity capability support as amplifiers.
- **Scaling up** involves influencing higher-level systemic structures, including policies, regulations, governance structures and institutional norms, to create broader and more sustainable change. NetZeroCities is addressing policies, regulations, governance structures and institutional norms as a core lever of change, at European level and addressing the variety of Member States’ different political and regulatory environments. It supports the development of policy labs, policy sandboxes for experimentation, as well as national dialogues for the development of coordination platforms. Yet, further work is needed to adapt and sustain scaling-up mechanisms to local contexts and beyond political will and support, and even in

⁶¹ Moore, M. L., Riddell, D., & Vocisano, D. (2015). Scaling Out, Scaling Up, Scaling Deep*: Strategies of Non-profits in Advancing Systemic Social Innovation. In *Large Systems Change: An Emerging Field of Transformation and Transitions* (pp. 67-84). Routledge.

⁶² <https://netzerocities.app/resource-4748>

the absence of political support⁶³.

- **Scaling deep** focuses on changing cultural values, beliefs, and practices to sustain long-lasting transformation. In the context of the Mission Cities, scaling out has not yet been directly addressed as the Mission focused on providing cities with support for planning and implementation, yet cities have pointed to the relevance of addressing communication and cultural norms first⁶⁴, as a prerequisite for stakeholder involvement in deep decarbonization⁶⁵.

RECOMMENDED RESEARCH

To address these gaps, research should be funded to address the following aspects:

- **Scaling out:** Longitudinal research is needed to understand if, how, and under which conditions the replication strategies deployed by NetZeroCities enable ecosystemic long-lasting changes, investigating how to support the innovation of public administration organisational structures to strengthen collaboration across stakeholders and sectors for effective policy design and implementation. Future research funding should provide smaller cities the opportunity to join ambitious research projects by involving “satellite cities⁶⁶”, which are defined as smaller cities geographically and culturally near large (i.e., Mission) cities, that wouldn’t otherwise have the capacity to participate in ambitious EU-funded projects.
- **Scaling up:** research should develop and test the effectiveness of institutional frameworks that facilitate the transfer of climate innovations from local to regional and national levels for long-term climate planning. More research is needed to understand how, in the diverse national contexts, climate action can be prioritised and **sustained in the absence of political lack of support**⁶⁷. The efficacy of diverse push-pull strategies should be studied: aggregating funded projects and open access communication kits organised in local languages, media monitoring, media agenda setting and increasing collaboration between funded projects to share resources, with a harmonised resource tagging structure⁶⁸.

⁶³ Mutual Learning Event in Brussels, 2025; research session at the City Conference 2025 in Vilnius; NetZeroCities City panels with Mission-minded Cities

⁶⁴ Mission cities examples: Mannheim communication campaign, Romanian National platform development with promotion city by city

⁶⁵ Geels, F. W., Sovacool, B. K., Schwanen, T., & Sorrell, S. (2017). Sociotechnical transitions for deep decarbonization. *Science*, 357(6357), 1242-1244. <https://www.science.org/doi/10.1126/science.aao3760>

⁶⁶ Sorensen, A. (2001). Subcentres and satellite cities: Tokyo's 20th century experience of planned polycentrism. *International planning studies*, 6(1), 9-32. <https://doi.org/10.1080/13563470120026505> Mutual Learning Event in Brussels 2025, table on capacity and capability building; Research Session at the City Conference 2025 in Vilnius. Proposal by German cities with the support of the local universities of applied sciences. Already taking place in Finland

⁶⁷ Research session at the City Conference 2025 in Vilnius, presentation of the city of Aachen

⁶⁸ Mutual Learning Event, Brussels 2025

- **Scaling deep:** Research on climate action should focus on investigating the piloting of **reshaping societal values and practices** towards sustainability by examining how cultural and social contexts' influence can be innovated to activate long-lasting ecosystemic change toward deep sustainability as a societal value, integrating cultural change initiatives into urban planning and policy frameworks, involving artists⁶⁹, famous personalities, collaborating with national and private media. Lastly, funded projects within the Missions should have **institutionalised collaborations with research projects on education**⁷⁰ (including the Erasmus+ programme).

Meta-recommendations on EU research funding in the Mission cities

The research events with cities and researchers have provided suggestions that transcend specific topics to optimise research in the Mission(s).

- To strengthen the impact of research funded through the Mission, support the development of a robust **community of researchers and network of universities/research institutions on climate action in cities** (including climate neutrality, adaptation and beyond) should be supported, as they bring different strengths and cultural perspectives, in addition to formal disciplinary expertise
- The European Commission should consider actively supporting bridging research and researchers across funded projects on related topics through the **funding of projects that aim at coordinating projects across topics with online and offline events and joint open-access indexed publication opportunities**⁷¹.
- The European Commission is suggested to provide calls in the Mission Cities with **open topics** to allow agile bottom-up research proposals from co-designing such research proposals on cities' needs⁷².

⁶⁹ Examples from the Missions Adaptation and Ocean & Water:

HORIZON-MISS-2023-OCEAN-01-11: Ocean & water and arts: the contribution of creative sectors to Mission Ocean and waters; Neuroclima (Mission Adaptation)

⁷⁰ I.e., all the STEAM and open schooling projects such as HORIZON-WIDERA-2022-ERA-01-70: [Open schooling for science education and a learning continuum for all](#) STEM projects, STEAM projects

⁷¹ Research event at the City Conference in Valencia, 2024; Mutual Learning Event in Brussels, 2025

⁷² Mutual Learning Event in Brussels 2025

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