

# European Partnership

# Driving Urban Transitions to a Sustainable Future Roadmap

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the 1990s, the number of people in the UK who are aged 65 and over has increased from 10.5 million to 13.5 million (19.5% of the population).

There is a growing awareness of the need to address the health care needs of the elderly population. The Department of Health (1998) has set out a strategy for the care of the elderly, which includes a commitment to improve the health of the elderly population and to ensure that they have access to the services they need to live well in old age.

The aim of this paper is to explore the health care needs of the elderly population in the UK and to identify the factors that influence these needs.

## Methodology

The data for this study were derived from the 1997 Health Survey for England, a nationally representative survey of the adult population in the UK.

The survey included questions on a range of health and social factors, including self-rated health, chronic conditions, and functional limitations.

The analysis presented in this paper focuses on the relationship between self-rated health and the presence of chronic conditions and functional limitations in the elderly population.

## Results

The results of the analysis are presented in Table 1. The table shows the prevalence of self-rated health, chronic conditions, and functional limitations in the elderly population.

As can be seen, the prevalence of self-rated health is lower in the elderly population than in the younger population. This is particularly true for those aged 75 and over.

The prevalence of chronic conditions and functional limitations is also higher in the elderly population. This is particularly true for those aged 75 and over.

## Discussion

The findings of this study suggest that the elderly population in the UK has a higher prevalence of self-rated health, chronic conditions, and functional limitations than the younger population.

This is likely to be due to a number of factors, including the natural process of ageing, the presence of chronic conditions, and the presence of functional limitations.

It is important to note that the prevalence of self-rated health, chronic conditions, and functional limitations is not necessarily a reflection of the overall health of the elderly population.

For example, some elderly people may have a self-rated health that is lower than their actual health status due to a number of factors, including the presence of chronic conditions and functional limitations.

## Conclusion

The findings of this study suggest that the elderly population in the UK has a higher prevalence of self-rated health, chronic conditions, and functional limitations than the younger population.

This is likely to be due to a number of factors, including the natural process of ageing, the presence of chronic conditions, and the presence of functional limitations.

It is important to note that the prevalence of self-rated health, chronic conditions, and functional limitations is not necessarily a reflection of the overall health of the elderly population.

For example, some elderly people may have a self-rated health that is lower than their actual health status due to a number of factors, including the presence of chronic conditions and functional limitations.

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- Department of Health (1998) *Strategy for the Care of the Elderly*. London: Department of Health.
- Health Survey for England (1997) *Health Survey for England 1997*. London: HMSO.

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# 1. A Roadmap for the Driving Urban Transitions Partnership

The DUT Partnership builds upon and steps up the ambition and efforts of the JPI Urban Europe. With its partners from 28 countries, it does not only facilitate the cooperation across countries but creates a platform for connecting and aligning European and national strategies and activities.

DUT Partnership aims for significant contribution to the mission on climate neutral cities, the European Green Deal, and the Urban Agenda for the EU by developing and implementing a transformative research and innovation (R&I) programme. Comprehensive programme management measures are enhancing the impact of DUT activities and projects and build capacities to address the urban related anthropogenic crises and challenges.

As such, the DUT Partnership represents the new programme of the Joint Programming Initiative (JPI) Urban Europe and builds upon its achievements, procedures and learnings. Created in 2010, JPI Urban Europe addresses global urban challenges with local, context specific actions. The ambition is to develop a European research and innovation hub on urban matters and create European solutions and approaches by means of coordinated R&I. So far, JPI Urban Europe has implemented 15 joint calls, out of which six were co-funded by the EC and three realised in international cooperation. With 137 funded projects<sup>1</sup>, bringing together more than 1100 project partners from 34 countries throughout Europe and the world it has contracted EUR 130.4 million. It has published two strategic research and innovation agendas, in co-creation with urban stakeholders and R&I actors which have effected a transnational European urban programming interface.<sup>2</sup> In addition, an active AGORA community and city network groups have been established.<sup>3</sup> While DUT will build upon all these achievements, the partnership will allow to enhance the ambition: creating a critical mass of knowledge and action for urban transitions by increasing the portfolio of projects significantly, and set up new measures towards capacity building, urban policy support, demonstration and mainstreaming of results.

<sup>1</sup> Proposals for the last call are still under evaluation.

<sup>2</sup> JPI Urban Europe. (2019). Strategic Research and Innovation Agenda 2.0. <https://jpi-urbaneurope.eu/wp-content/uploads/2019/02/SRIA2.0.pdf>

<sup>3</sup> For more details on the achievements of JPI Urban Europe, see <https://jpi-urbaneurope.eu/explore/>

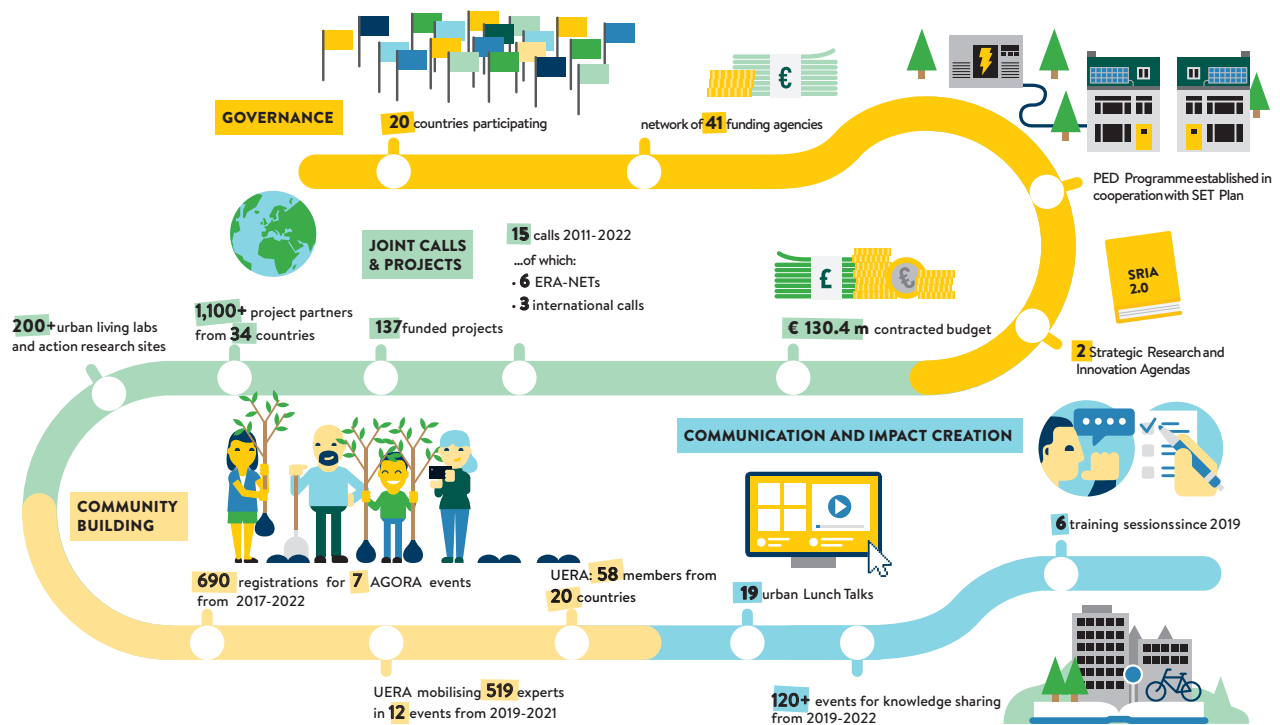


Figure 1: JPI UE Facts & Figures

The DUT Strategic Roadmap sets the thematic and conceptual framework for the implementation of the partnership, defining the thematic scope of the DUT Transition Pathways (TP) and corresponding missions to drive urban transitions in an integrated way as well as indicating important principles and measures for their implementation to enhance the impact. The Strategic Roadmap also includes a multi-annual call agenda, translating the identified priorities for research and innovation into a sequence of joint calls that will allow building a comprehensive portfolio of R&I projects towards the defined TP missions. This document thus provides a longer-term framework for the DUT partners to prepare joint actions, align priorities and join forces. At the same time, the DUT community can identify topics of interest and plan their engagement for the years to come.

### Development process of the DUT Strategic Roadmap

The DUT Strategic Roadmap and the related multi-annual call agenda were co-designed with DUT partners and urban stakeholders. It builds upon JPI Urban Europe’s SRIA 2.0, its principles and aims to provide a strategic framework for the DUT partnership and its Transition Pathways. Continuing the participatory approach from the SRIA 2.0 process<sup>4</sup>, the roadmap was co-designed with national and European-wide stakeholders and partners, including representatives from municipalities, city administration, research organisations, civic society actors and business in a process that spanned over more than two years. First sketches of the DUT Transition Pathways were put forward to an open public consultation, followed by AGORA stakeholder dialogues to help shape the main orientation of the DUT thematic priorities, resulting in the development of the three transition pathways. This was followed by focus group meetings with representatives of municipalities and city administration to identify the potentials and priority challenges for each TP. Considering cities’ strategies in the development process ensured that the DUT programme corresponds to local urban needs and sustainable transformation ambitions. The result of this development process are the proposed three missions, one for each transition pathway including key innovation areas. Combined, the three transition pathways missions will fulfil the overarching objectives of the DUT Programme and to boost the urgently needed urban transformations towards a sustainable future with enhanced quality of life in cities.

While the consideration of local needs and ambitions is necessary to ensure the operative relevance for urban and regional transformations, the alignment with national urban and related sustainable transformation programming and policy priorities is crucial for underlining the strategic importance. Hence,

<sup>4</sup> See Bylund, J. (2020) ‘Joint programming for urban transformations: the making of the JPI Urban Europe Strategic Research and Innovation Agenda’, in Urban Transformations 2, <https://urbantransformations.biomedcentral.com/articles/10.1186/s42854-020-00012-y>.

national consultations organised in the development process reflected the DUT strategic roadmap against the national priorities. Furthermore, the consultation offered the opportunity to inform other national (policy) stakeholders, prepare national decision-making for the engagement in DUT and increase awareness of the links between DUT and national programmes and activities.

Finally, the agreed key areas and issues were translated into a multi-annual call agenda that will guide the operational implementation of the joint calls and accompanying measures. Based on these references regular reflections of upcoming issues and priorities against the TP missions and overall DUT objectives are possible.

## 1.1 The vision

The vision of the Driving urban transitions to a sustainable future (DUT) partnership:

*The DUT Partnership steps up the game to tackle urban challenges. Through research and innovation and capacity building we enable local authorities and municipalities, service and infrastructure providers, and citizens to translate global strategies into local action. We develop the skills and tools to make urban change happen and boost the urgently needed urban transformations towards a sustainable future with enhanced quality of life in cities.*

Today, it is clearer than ever that global efforts and implementation of actions and activity to prevent the climate catastrophe are not ambitious enough. The alarm bells are deafening<sup>5</sup>. According to the latest IPCC Report<sup>6</sup>, human activity is set to pass the goal of the Paris Agreement<sup>7</sup> to keep temperature rise to 1.5°C compared to pre-industrial levels by 2040. Overshooting the Paris goal will result in a significant increase of vulnerabilities and exposure of people and ecosystems. Even more so, the tipping point of irreversible damage to the planet and the thus connected bunch of crises is becoming closer. If we are to ensure a decent human life on vast areas of the planet, the urgency to reach agreed goals and significantly change human activities away from linear model of exploitation towards processes within planetary boundaries has never been more pressing.

<sup>5</sup> United Nations (2021) Secretary-General Calls Latest IPCC Climate Report 'Code Red for Humanity', Stressing 'Irrefutable' Evidence of Human Influence. Press Release. Retrieved from: <https://press.un.org/en/2021/sgsm20847.doc.htm> on 01 August 2022.

<sup>6</sup> IPCC (2022) Summary for Policymakers [H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor, A. Alegría, M. Craig, S. Langsdorf, S. Lösschke, V. Möller, A. Okem (eds.)]. In: Climate Change 2022: Impacts, Adaptation, and Vulnerability. Cambridge University Press. In Press.

<sup>7</sup> United Nations / Framework Convention on Climate Change (2015) Adoption of the Paris Agreement, 21st Conference of the Parties, Paris: United Nations.



Figure 2: Overview strategy process towards DUT Roadmap

The United Nation's Sustainable Development Goals (SDGs) illustrate that the main societal challenges are global ones and require actions on all levels. All countries are called for intensified and concerted actions in order to meet our ambitions and the climate and sustainability targets<sup>8</sup>. Europe has answered this requirement, among others, with the Green Deal, the development of European missions, the Urban Agenda for the EU or the New European Bauhaus movement. However, in order to achieve these goals these European level activities must be supported and mirrored by national and regional ones. Mechanisms are needed that mobilise all forces and help to take advantage of available competences, resources, and knowledge. Success will depend on our ability to bring research results, like new technologies, approaches, tools, processes, policy recommendations, etc., into action in all our cities and form multi-stakeholder alliances for change. The DUT Partnership, building upon the various national and regional efforts, provides a framework to leverage these activities, join forces on common priorities to increase effectiveness and mutually take advantage of good practice. It adds and complements the activities at the European level, as DUT aims to also reach out and mobilise smaller cities and towns through national and regional channels.

## 1.2 DUT objectives contributing to European and global (urban) policies

*“If we want to have a chance of achieving the SDGs, we need to get our cities right.”<sup>9</sup>*

It stands without question that the challenges in urban areas are crucial to address the overarching grand societal and planetary challenges in the contemporary world. These challenges revolve around the transformation to cities, towns, and urban areas that are inclusive, safe, resilient, and sustainable. The wide variety of urban forms of life and the importance of sustaining our societal cohesion by attractive and just urban built environments is underlined by the fact that over 70% of the EU population lives and works in urban areas, and nearly a quarter (22.5%) of the EU population is still at risk of poverty and/or marginalisation.<sup>10</sup> Although urban areas generate about 85% of European GDP, they also account for 60-80% of the EU energy use and face common challenges in e.g., congestion, shortage of adequate housing, air pollution, declining infrastructures, and migratory pressures.<sup>11</sup>

Besides the urgency to change urban and human practices to ensure a good life for all in the future given the cluster of climate, biodiversity, water, and other crises happening on the planet, urban areas are facing the effect of a bunch of global disruptions, stresses, and geopolitical shifts. While the first waves of the Covid-19 pandemic required immediate action, adaptations, and experimentation in cities to decrease the risk of infections, secure public (health) services and ensure that critical infrastructures is functioning, the full scale of the longer-term effects on urban areas are still unfolding. However, in urban areas, major economic, social, socio-economic shifts, among others, with strong thematic links to all three of DUT's transition pathways could be witnessed already. Furthermore, European cities are on the forefront of dealing with the effects of the tremendous geopolitical and economic shifts of the last decades: forcefully displaced people, energy crises due to the dependence of fossil fuels and disrupted global supply chains, high inflation rates and socio-economic problems, and the concentration of capital, opportunity and decision-making power, just to name a few.

The times are truly turbulent. Urban areas are key to build the robustness to deal with the bunch of crisis and uncertainty. For that reason, renewed efforts are required to address the stresses and challenges with innovative solutions and approaches in cities and enhance the capacities of municipalities, urban

<sup>8</sup> UN-Habitat. (2020). World Cities Report 2020. <https://unhabitat.org/World%20Cities%20Report%202020>

<sup>9</sup> Maimunah Mohd Sharif, Executive Director of UN-Habitat in her opening speech at the World Urban Forum #9, Kuala Lumpur in February 2018

<sup>10</sup> EC (2019) 'Towards a sustainable Europe by 2030: Reflection paper', COM(2019)22 <[https://ec.europa.eu/commission/sites/beta-political/files/rp\\_sustainable\\_europe\\_30-01\\_en\\_web.pdf](https://ec.europa.eu/commission/sites/beta-political/files/rp_sustainable_europe_30-01_en_web.pdf)>, pp. 11, 21, 52, 99.

<sup>11</sup> EC (2019) 'Towards a sustainable Europe by 2030: Reflection paper', COM(2019)22, <[https://ec.europa.eu/commission/sites/beta-political/files/rp\\_sustainable\\_europe\\_30-01\\_en\\_web.pdf](https://ec.europa.eu/commission/sites/beta-political/files/rp_sustainable_europe_30-01_en_web.pdf)>, p. 21.



governance and society to act and drive innovation, and therefore enhance the robustness of urban systems to unforeseeable circumstances.

By 2022, we are about mid-way of the implementation time of the UN Agenda 2030 and its Sustainable Development Goals (SDGs). Yet the global efforts and progress to meet the ambitions and targets laid out in Agenda 2030 are insufficient to bring the needed transformations.<sup>12</sup> The years from 2020 to 2030 are of essence to drive transition pathways and make the global ambition a reality. It is *The Decade for Action*, ten years in which governments, national as well as local, commercial actors and civil society *must* accelerate responses and the driving transformations to achieve the shared vision and tackle the world's biggest challenges.

Urban areas are central to driving this change and transformations in the Decade for Action and research and innovation contributes to the co-creation of evidence-based knowledge and approaches in cities. As the recent World Cities Report<sup>13</sup> states as a key message:

*Fostering collaborative networks to drive research and development: Cities should foster strong research and development institutions and collaborative networks between levels of government to build the research, data and regulatory capacities to ensure that new technologies address urban problems rather than exacerbate them or create new challenges. Finding pathways towards global cooperation to confront these challenges and opportunities is critical, including through city networks that share innovative ideas.*

While there is a common agreement on the challenges for sustainable urban development globally, we need to act locally and consider the particular European urban context to identify and develop appropriate processes and solutions. The dense urban pattern, with a large share of smaller and mid-sized cities, the historically diverse and contrasting urban structures' morphologies of organic and various design paradigms, and European social and cultural characteristics define the urban systems we need to address and advance. Anticipating the UN Agenda 2030 in the European context, the model for integrated urban development needs to be reinforced. This is taken up in the New Leipzig Charter and consequently considered the next phase of the Urban Agenda for the EU<sup>14</sup>. While the New Leipzig Charter continues to promote integrated urban planning and development, the requirement to follow place-based approaches from neighbourhood scale up to functional urban areas, consider multi-level governance, foster participation and co-creation as well as create inclusive, affordable and accessible infrastructures and services as common goods is highlighted.

Complementing this, the new strategic priorities of the European Commission summarised in the European Green Deal, includes achieving climate-neutrality by 2050. Horizon Europe establishes urbanisation as a possible driver for strengthening the role of cities and urban areas as centres for innovation to improve quality of life for its inhabitants and including them in the process. Due to its resources and organisation, Europe is seen as a possible global driver for change. This includes transitions of the energy and mobility sector, realising circular economy and utilising nature-based solutions.

The DUT Partnership with its vision, objectives, Transition Pathways and the portfolio of activities, strongly contributes to these policies, through its thematic priority setting as well as the DUT approach and portfolio of implementation measures. Accordingly, the DUT Partnership has defined its intervention logic and objectives as summarised below.

### **Objective 1: Increase the effectiveness of urban solutions, approaches and processes**

From the point of city administrations, integrated approaches and planning is seen as one of the key elements to accelerate urban transformations and sustainable urban development. This entails capacity building to connect the dots between silos and knowledge(s) and to address dilemmas<sup>15</sup> which result from conflicting or competing strategies, interventions, interests, or policies. The selected R&I issues to be programmed in calls and actions ensure that various perspectives across disciplines, sectors or stakeholder needs are considered and connected. Conditions for such projects will be specified in a way to give room for the required collaboration across sectors and types of actors.

<sup>12</sup> United Nations (2020) The Sustainable Development Goals Report 2020.

<sup>13</sup> UN-Habitat (2020:xxx) World Cities Report 2020.

<sup>14</sup> The process to update the Leipzig Charter was coordinated by Germany in view of the German Presidency to the European Council in 2020. The new Leipzig Charter was signed by the Ministers responsible for Urban Matters in Dec 2020.

<sup>15</sup> For more detailed information on dilemmas see JPI Urban Europe (2019:14) Strategic Research and Innovation Agenda 2.0

**Objective 2: Shape a multi-actor innovation ecosystem on urban transitions**

The urban innovation ecosystem should offer different ways of interaction between science, policy, business, and society to ensure that research efforts better meet the needs of urban actors and society. DUT will support not only the mobilisation of urban actors to join research projects, but to ensure that R&I projects are co-designed and challenges are identified with stakeholders, so that the specification of R&I needs are genuinely relevant for the problem owners. To this end, formats are needed to strengthen the role of urban actors in R&I projects and offer settings to engage in all phases of innovation projects.

**Objective 3: Strengthen benefits for neighbourhoods and urban areas across Europe**

The DUT Partnership aims to bring results, good practice and evidence to urban actors across Europe and support dissemination, exploitation, uptake, and replication of solutions and approaches. With this, a contribution to a strong European Research Area (ERA) is expected, creating benefits for city authorities and municipalities of cities of different sizes and situations. Furthermore, DUT will be positioned as *the* European hub for international cooperation on sustainable urbanisation.

## 1.3 A European Transformative Research and Innovation Programming for Urban Transitions – the DUT approach

Urban areas are the nexus for the required transitions. The role and importance of sustainable urbanisation for our national and global development is acknowledged in the UN-Habitat *New Urban Agenda* and by the United Nations by including an urban goal (SDG 11) in the *UN Agenda 2030* Sustainable Development Goals (SDGs) as well as by the *Urban Agenda for the EU* (UAEU). Furthermore, urban-related goals and issues are cut across the 17 SDGs with 90 out of the 169 indicators encompassing urban areas underlying the importance of sustainable urban transformations for the future of humanity on the planet. While this on the one hand demonstrates the pertinent role urban areas – from villages and towns up to cities and metropolitan areas – play for our future development, it results, on the other hand, in an interrelated set of challenges and dilemmas urban areas have to face. The localisation of large-scale strategies to different urban contexts will determine if the transformative change outlined by the *New Urban Agenda*, the *UN Agenda 2030* with its SDGs will be achieved.<sup>16</sup>

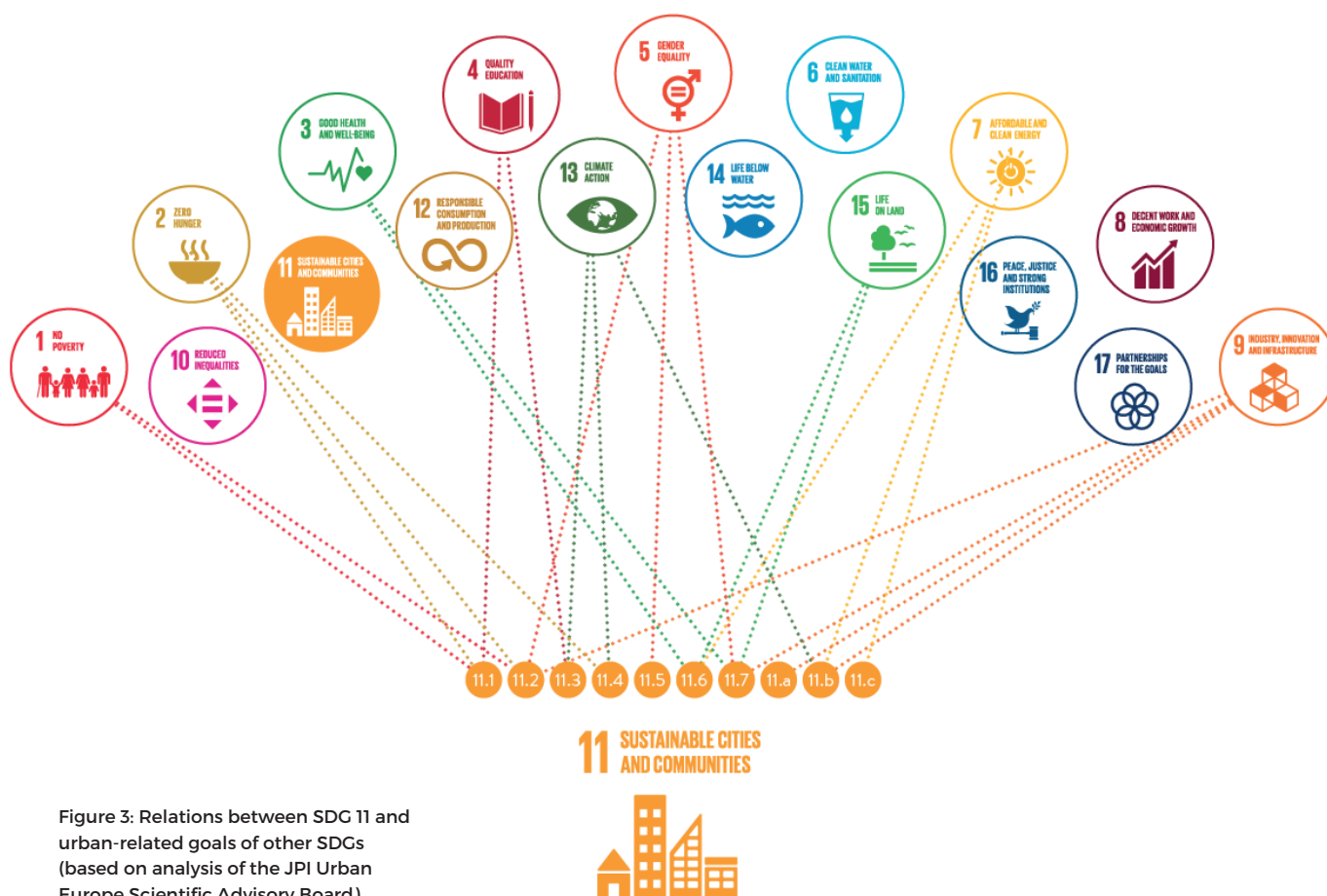
For addressing urban issues in their full complexity and transforming urban areas towards sustainable and liveable urban futures, the interrelatedness of sectors, systems, strategies, goals, rights, and interests has to be considered. In particular as the plurality of urban goals and related strategies leads to an interrelated set of ambitions and actions which might be in conflict with each other, where achieving one goal or strategy might hamper achieving another (Figure 3). The importance of addressing critical interlinkages, issues caused by conflicting goals, strategies or interests and exploiting synergies across the SDGs and related strategies to speed up transformations has been acknowledged already in the JPI Urban Europe Strategic Research and Innovation Agenda 2.0 (SRIA2.0), published in 2019<sup>17</sup>.

From the perspective of the urban dimension and the built environment, green and digital transitions are inextricably intertwined with questions around liveability and quality of life, urban design governance and architectural development, urban robustness and regeneration, public space dynamics and placemaking, diversity and democracy, urban consumption, and climate change, to list a few areas. Put simply, if these ambitions are to succeed, integrated approaches that ‘fuse’ and can accommodate a broad diversity of practices (across sectors, across societal groups, etc.) are required. Not least when fostering evidence-based policy making and co-creative experimental approaches in cities and urban areas.

<sup>16</sup> UCLG (2019) *The Localization of the Global Agendas. How local action is transforming territories and communities.*

<sup>17</sup> JPI Urban Europe (2019) ‘Strategic Research and Innovation Agenda 2.0’. <https://jpi-urbaneurope.eu/wp-content/uploads/2019/02/SRIA2.0.pdf>

“Transformational change will be local or will simply not be.”<sup>18</sup>



It is not a matter of merely providing solutions. While many technologies have been tested, it has been shown that the application of novel approaches must be coupled with institutional innovation instead of being perceived as a substitute for innovative governance. Innovative approaches to meet the targets of the SDGs, especially SDG 11, have to be people-driven to drive transitions.<sup>19</sup> Research and innovation actors across the urban innovation ecosystems have an important role to drive the urgently needed change towards 2030. Summarising all these requirements and conditions for urban transitions, it can be concluded that a more comprehensively integrated, inter- and transdisciplinary and cross-sectoral approach is needed that:

1. creates evidence for urban transitions involving all stakeholder groups and considering technological, social, economic, cultural, planning and governance aspects;
2. addresses urban dilemma interrelationships between various goals, strategies and interests as they define key policy areas critical for achieving SDGs and urban strategies;
3. offers an environment for urban experimentation, capitalising knowledge, and science-policy cooperation beyond joint calls to more effectively achieve city authorities' strategies and strengthen exploitation and scaling-up of research and innovation actors' results aligned towards urban transformations.

<sup>18</sup> United Cities and Local Governments (2019:2) The Durban Political Declaration.

<sup>19</sup> United Nations (2020) The Sustainable Development Goals Report 2020.

*“Municipalities must commit to a new kind of partnership with the scientific community – a partnership based on data, research and innovation – to guide investment and policy decisions.”<sup>1</sup>*

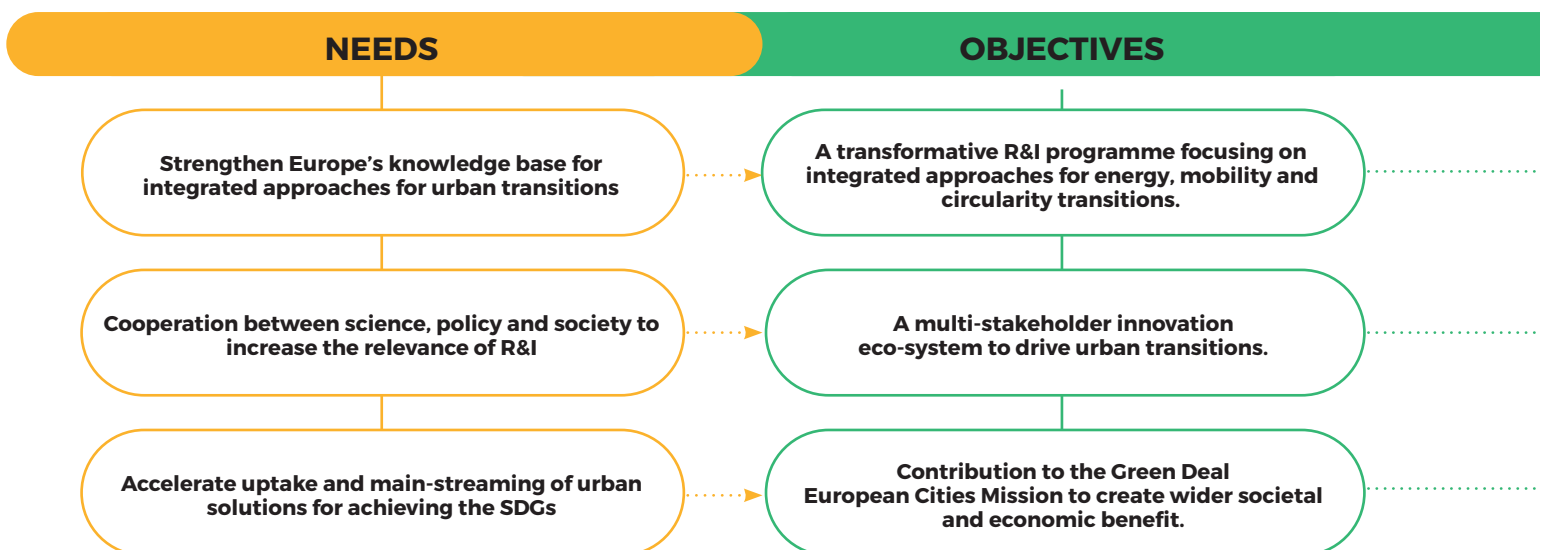
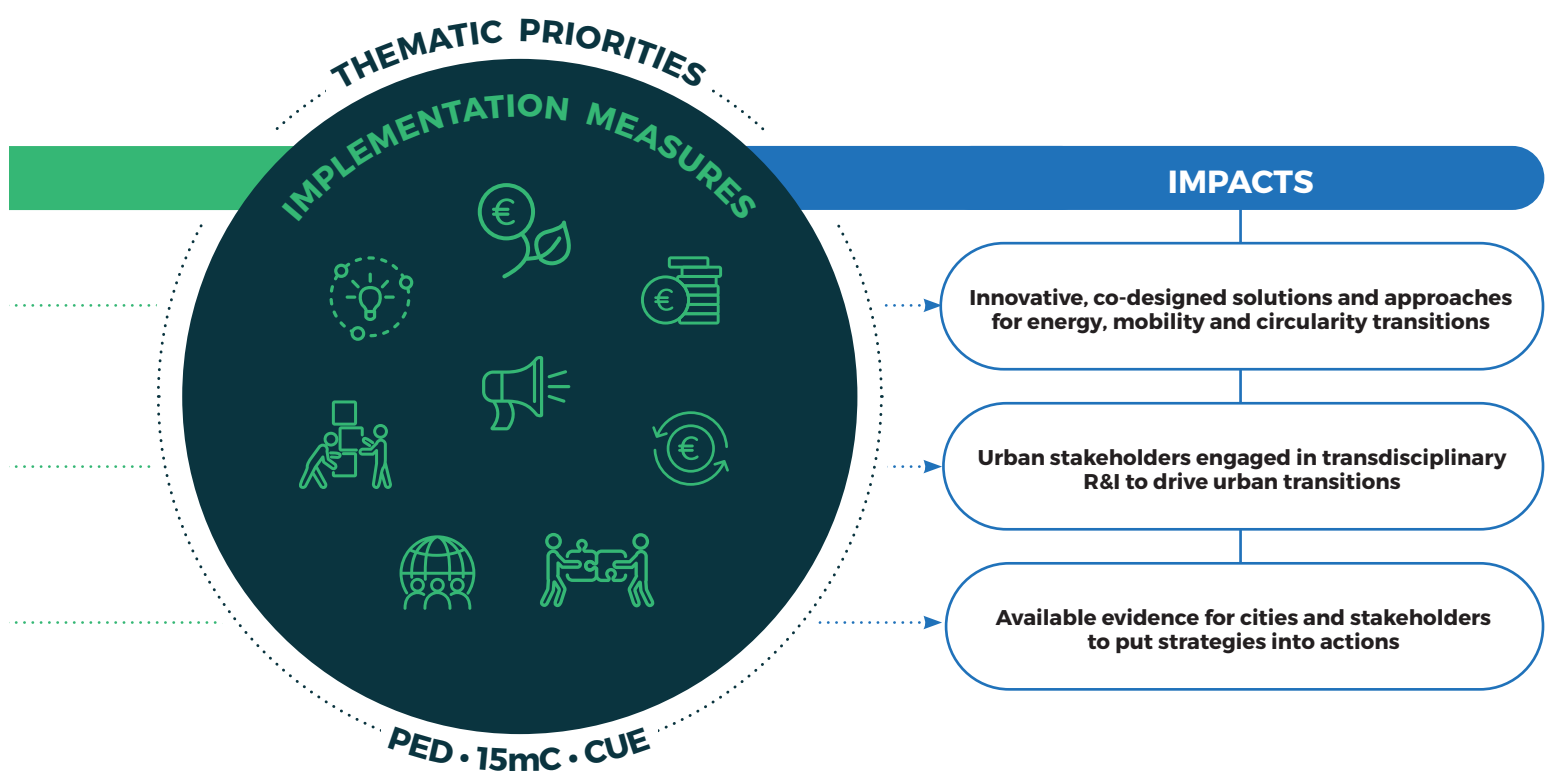


Figure 4: Overall DUT intervention logic and key elements of the DUT programme

<sup>1</sup> Don Iverson, Mayor of Edmonton in: World Climate Research Programme (2019). Global Research and Action Agenda on Cities and Climate Change Science - Full Version.

In response to all these requirements and subsequent demands for the urban related research and innovation system, DUT is designed and realised following a set of principles:

- While research and innovation are called to continue co-creating knowledge, technologies, and solutions for the various urban challenges at hand, this work has to be conducted with a sufficient collaborative (inter- and transdisciplinary) approach to strengthen relevance and impact of scientific results.<sup>20</sup> All forms of innovation – socio-technical, organisational, systemic, policy, etc. – will be covered to strengthen the potential of the innovation eco-system.
- In this sense, challenge-driven formats are needed to align research and innovation with every day-life problems and opportunities, which calls for a strong role of problem owners in research and innovation projects from the beginning and requires improved framework conditions to support science-policy-society cooperation. The gap between research and policy has to be addressed explicitly and efforts are needed to take better use of scientific achievements for urban policymaking.
- In support of such co-design of solutions and approaches, local experimentation is an important element. Urban living labs and other experimental formats have shown promising results but have to advance to allow a wider uptake of such experiences in urban practice and daily business of city administration. However, such experiments need to be well embedded in the local governance and shall inspire and ultimately drive urban transformations.
- Finally, an understanding of and appropriate conditions for learning and knowledge utilisation are needed to support replication, scaling up and mainstreaming. According to the plurality of urban situations there is no simple transfer from one neighbourhood, municipality, or city to another. Nevertheless, we need to take more advantage of research and innovation results across Europe and globally by facilitating the internalisation into the different local contexts. In other words, capacity building in urban public administrations as well as in urban innovation ecosystems is needed. Making research results available, transparent and accessible for all actors and creating learning formats that fit the various stakeholder needs is key to ensure that European and national R&I investments are boosting urban transformation.



<sup>20</sup> The necessity for inter- and transdisciplinary co-create knowledge to support urban transitions has been widely recognised by city and municipality networks and the R&I community, e.g. in: IPCC. (2019) Global Research and Action Agenda on Cities and Climate Change Science; JPI Urban Europe (2019) Strategic Research and Innovation Agenda 2.0; ICLEI (2018) The ICLEI Montréal Commitment and Strategic Vision 2018-2024; United Cities and Local Governments (2019) The Durban Political Declaration.

# 1.4 The DUT programme builds upon 3 Transition Pathways

Following the specified principles, the partnership’s objectives will be addressed through a comprehensive programme management approach that invests in challenge-driven research and innovation activities, based on the principles defined in a Strategic Research and Innovation Agenda (SRIA) and along three Transition Pathways. It will, in tandem implement a portfolio of accompanying measures to create and manage a wider innovation ecosystem involving all relevant stakeholder groups and strengthen impact creation.<sup>21</sup>

The DUT Partnership enables a systemic approach to boost urban transitions through the three Transition Pathways, which in themselves are designed as three mission-oriented sub-programmes. Their interrelations and interplays with cross-sectoral issues such as governance, digitalisation, resilience, land use, infrastructures and public spaces is articulated in that neighbourhoods need new mobility solutions and more circular use of resources to become a positive energy district. Put differently, new mobility solutions necessitate innovative energy technology and design thinking. Sustainable energy systems and smart mobility solutions are mandatory, if cities are to achieve the circular economy.

**The Circular Urban Economies Transition Pathway (CUE TP)** aims to support the planning and design of inclusive urban spaces sustained by circular resource flows. The CUE TP operates from the assumption that such spaces can only emerge if transformative interventions understand and address urban areas as simultaneously characterized by their resource use and socio-economic aspects. Thus, it encourages a multitude of tools and approaches that combine efforts towards increased urban resource efficiency and liveability. By collecting examples and grouping them according to topic and context, the CUE TP will provide a portfolio of 50+ solutions that can contribute to the circular transformation of urban areas until the end of the partnership.

**The Positive Energy Districts Transition Pathway (PED TP)** aims at supporting urban energy transitions through innovative solutions for the planning, large-scale implementation and replication of PEDs with the mission to have at least 100 PED by 2025. Furthermore, it will contribute to the Mission on Climate-Neutral and Smart Cities by building a portfolio of PED-related solutions towards climate-neutrality. PEDs build on the optimisation of energy efficiency, (local) energy generation from renewables and energy flexibility and will be synergistically connected to the energy system in Europe. Based on active cooperation with key stakeholder groups and by applying an integrative approach including technology, spatial, regulatory, legal, financial, environmental, social and economic perspectives, PEDs are embedded in holistic urban planning concepts and will contribute to liveable, inclusive, climate-neutral urban environments.<sup>22</sup>

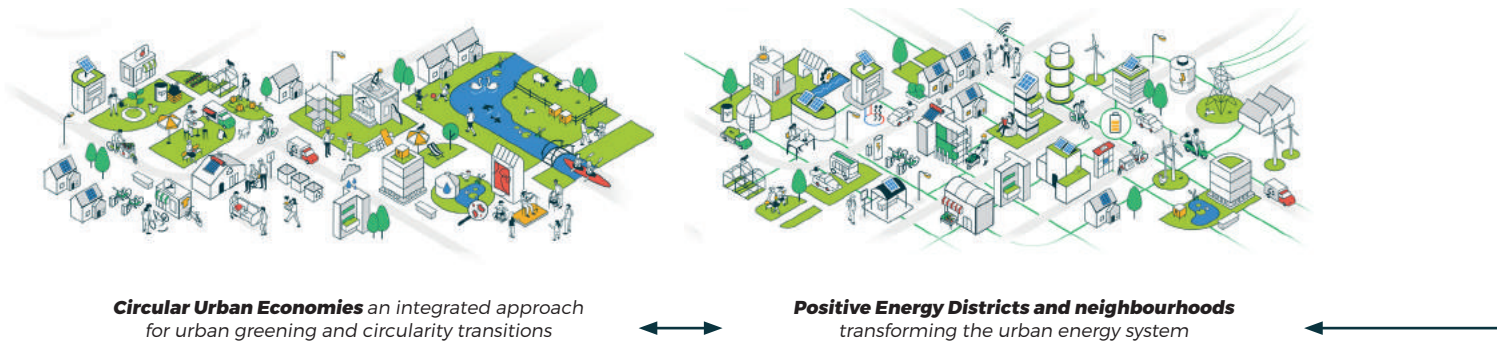


Figure 5: The DUT Transition Pathways

<sup>22</sup> For reference, the PED Programme has developed a short video, explaining vision and challenges for PED implementation: <https://www.youtube.com/watch?v=jCu98jq-62U>

<sup>21</sup> This approach corresponds strongly with the concept for missions as proposed by Marianna Mazzucato. JPI Urban Europe has already established several elements of such a programme management. The DUT Partnership will offer the framework for widening the portfolio of activities and instruments.

### The 15-minute City Transition Pathway

**(15mC TP)** fosters urban mobility transitions by improving accessibility and connectivity for sustainable forms of transportation and logistics, starting from the neighbourhood-level. The concept of the 15-minute City is based on the idea that city dwellers should be able to cover the vast majority of their daily needs within a 15-minute radius, by walking and cycling, while connecting to further districts and travelling larger distances by other forms of sustainable transport. The 15-minute City seeks to establish integrated and mixed-used neighbourhoods at large, which are key to reduce GHG-emissions in the transport and logistics sector and adapt urban environments to the challenges of climate change. Thus, the 15mC wants to account for the diversity of contemporary lifestyles and boost action towards climate-neutral, liveable, and inclusive cities. Our mission is to facilitate analysis, elaboration, experimenting and testing of innovations for 15-minute cities in co-creative settings, bringing these together in a 15-minute City Innovation Portfolio of 50+ experiences and practices, recognising different urban contexts and focusing on transferability. Activities and projects will be communicated actively and shared frequently with a wide audience.



**15-minute Cities** rethinking the urban mobility system and space

To address these domains and the challenges identified within each sectoral concern, DUT will foster challenge-driven R&I and technological development. This will allow to shape thematic innovation eco-systems that take the particularities of the respective domain into account. The efforts towards co-creating integrated transition pathways and strategies will be pursued to address the wicked issues of sustainable urbanisation. Evidence will be created with and for city administrations, municipalities, business, and society, aiming at all kinds of innovation and capacity building needed to transform our neighbourhoods and urban areas. DUT will offer a framework for innovation, demonstration and preparing larger scale implementation of solutions.

For DUT to maximise impact for the European and global policies, the three Transition Pathways are to be programmed in an integrated manner and with a firm commitment to urban, regional and city authority capacity building in terms of ambitious policy-making and implementation. Evidence will be created with and for city administrations, municipalities, business, and society, aiming at all kinds of innovation and capacity building needed to transform our neighbourhoods and urban areas. This requires research and science-policy cooperation in the fields of new governance models, public sector innovation, social, socio-economic and socio-technical innovations and new kinds of business models, to ensure sustainable investments and a substantial transformation of urban systems. DUT offers a framework for innovation, demonstration and preparing larger scale translation of solutions and approaches into local urban settings.

The DUT Transition Pathways are embedded in the doughnut economy model, which aims to ensure that our societal needs are met within the planetary boundaries<sup>23</sup>. This approach is adopted by an increasing number of city authorities to guide their planning and decision making. It thus seems appropriate to anchor the DUT transition areas in this wider context of sustainable development.

Downsizing city doughnuts hinges on the three Rs of reduction, regeneration, redistribution across all three Transition Pathways in order to break the unsustainable linear economies of make-sell-waste. Increased efficiency in resource use alone comes with risks of rebound effects, hence reuse is not enough, and a reduction of consumption is needed

<sup>23</sup> The doughnut principle, see e.g., Raworth, K. (2017), 'A Doughnut for the Anthropocene: humanity's compass in the 21st Century', *The Lancet*, 1 (May 2017), pp. 48–49. <[https://www.thelancet.com/pdfs/journals/lanplh/PIIS2542-5196\(17\)30028-1.pdf](https://www.thelancet.com/pdfs/journals/lanplh/PIIS2542-5196(17)30028-1.pdf)>. See also the pilot activities by the City of Amsterdam to launch a city doughnut approach, <<https://www.kateraworth.com/wp/wp-content/uploads/2020/04/20200406-AMS-portrait-EN-Single-page-web-420x210mm.pdf>>.

to keep within the ecological ceiling. In turn, this means that Transition Pathways towards regenerative cities and urban areas are needed, in order to be active and upcyclist and drive a planetary economy. As boundaries and operational limits are set, this furthers redistribution among practices and actors to foster sustainable urbanisation.

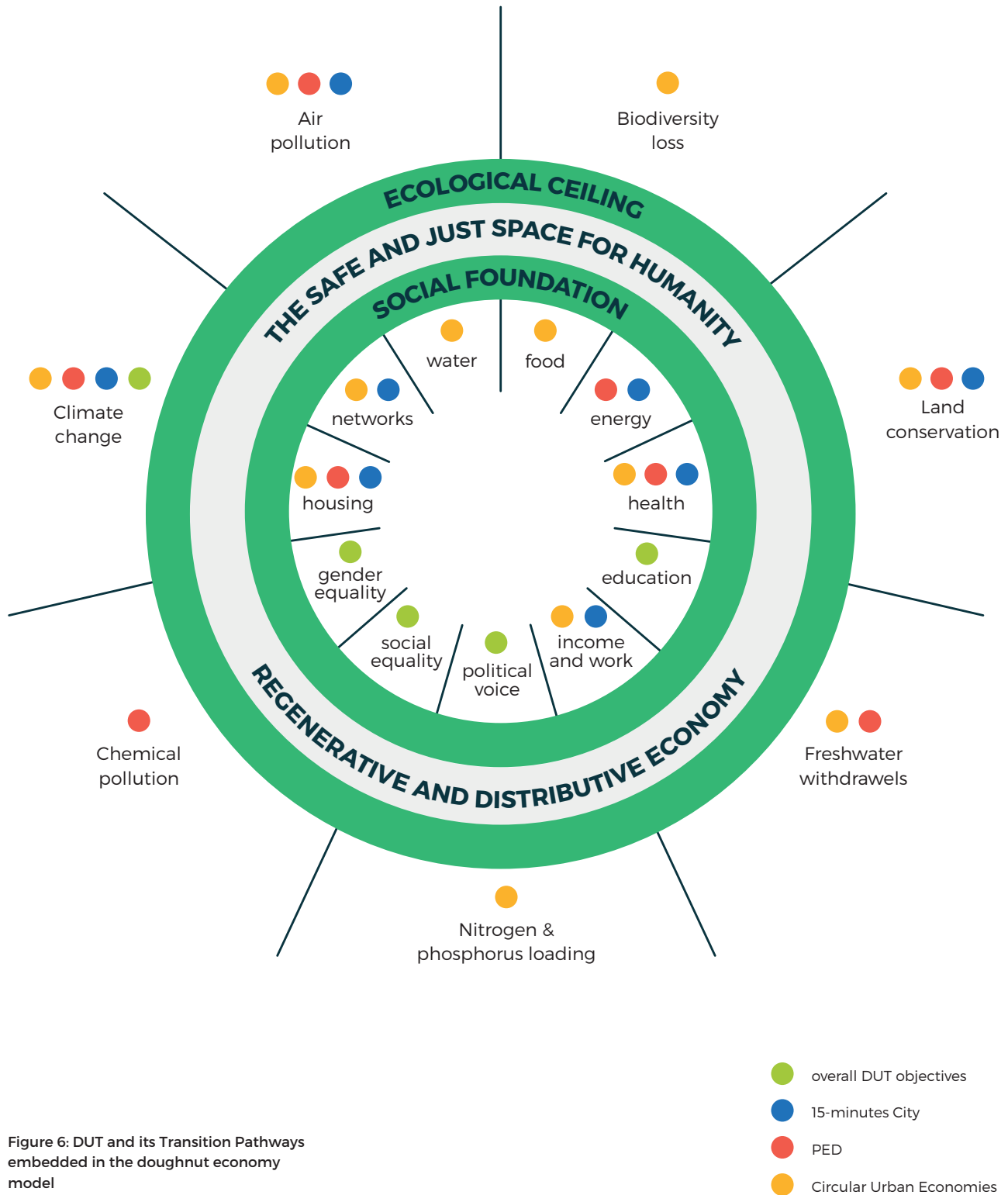


Figure 6: DUT and its Transition Pathways embedded in the doughnut economy model



Table 1 provides an overview of the key TP activities over the DUT running time.

	Horizon Europe										
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
<b>activities</b>	<b>phase 1</b>			<b>phase 2</b>				<b>phase 3</b>			
Strategic development of 15mC TP and key topics	█										
Mobilising and exchange with key stakeholders	█							█			
Preparation of calls and call topics	█										
Connecting and synthesising projects				█							
Building up Innovation Portfolio	█										
Dissemination of activities and project results	█										

Table 1: TP activities according to DUT phases

## 1.5 DUT implementation

DUT will, in tandem, implement a portfolio of accompanying measures to create and manage a wider innovation ecosystem involving all relevant stakeholder groups and strengthen impact creation. These measures and activities are key to achieve the objectives of DUT. Activities beyond joint calls ensure that the knowledge(s), approaches and solutions developed by DUT funded projects address the most pressing urban issues, build a critical mass for boosting urban transitions, and that the whole of DUTs portfolio is generating a greater impact than the sum of its parts globally and will continuously inform the strategic development of DUT. With these measures, DUT ensures that its ambition of being a transformative research and innovation programme is met.

### Joint Calls for urban R&I projects

DUT is jointly funding projects along the defined transition pathways. The co-creation of knowledge(s), solutions, approaches and experiences with all relevant urban actors and stakeholders and local experimentation (in e.g. urban living labs) in the funded projects is key to achieve urban transitions. DUT is continuously improving the framework conditions to meet the needs for inter- and transdisciplinary urban research and innovation, such as, balancing knowledge creation, innovation and implementation efforts by choosing and developing

the most appropriate funding instruments and calls to support the uptake of research results in urban practice. As such, DUT acts as a testbed for developing and piloting new instruments and integrating new conditions and requirements to substantially trigger and support urban transitions.

### Strategic development of the three TPs

The strategic development of the three DUT Transition Pathways builds on engagement and co-creation with key stakeholder groups, strategic exchange with the DUT Partners in Steering Groups for each TP, synthesis of the outcomes from DUT projects and mapping of international approaches, and cooperation with initiatives and institutions in national and transnational contexts. Continuous dialogue with stakeholder groups is key. Most prominently, the TPs have set up three individual City Panels, each consisting of 25 to 30 representatives from city administrations across Europe. Two annual City Panel meetings and further engagement opportunities will ensure that the key stakeholder group will contribute to shape priorities of DUT by bringing in local expertise, experiences and needs, and actively will contribute to developing strategies towards climate-neutral, sustainable, inclusive and liveable urban environments. Furthermore, the City Panels offer opportunities for cities to exchange, discuss and learn from experiences of other European municipalities. Together with the TP Steering Groups, the TP Managements will conceptualise input from stakeholders and elaborate strategic concepts regarding frameworks and priorities for PED-, 15mC- and CUE development.

### **AGORA – DUT’s stakeholder mobilisation and engagement platform**

AGORA is DUT household name for an engaged community of urban change makers and organising co-creative events that bring together the knowledge(s) of stakeholders and urban actors with different backgrounds. AGORA offers a low threshold entry point to DUT for all urban stakeholder groups and serves as both a community of urban stakeholders working on urban transitions and as a marketplace of ideas with the aim to share ideas, experiences, to co-create and build capacities for urban transitions by learning from cases across Europe and beyond. The results of AGORA Dialogues and workshops support the strategic development of DUT and the three transition pathways by offering a platform for co-creation for a wider audience. Each year, two to four AGORA Dialogues and additional (co-hosted) session at conferences are organised.

### **Capacity-building for public administration and civil society**

The heterogeneous groups of social innovators, urban community and neighbourhood associations and initiatives, NGOs, SMEs, social entrepreneurs, activist groups and civil society organisations (bunched together under the term urban doers in DUT), play an important role in developing urban transitions pathways to sustainable future(s). However, experiences from JPI Urban Europe have shown that without dedicated empowerment, urban doers rarely have the capacity and resources to join European R&I activities. This is because the work logics, business models and modus operandi are significantly different compared to ‘typical’ R&I actors. The DUT Urban Doers Grant addresses this gap in a novel grant scheme aiming at connecting local initiatives on a neighbourhood level more strongly to urban research and innovation, and thus, tapping into local knowledge(s) and experiences. Additionally, specific support measures are required to enhance the capacity of civil servants to step up the game in research and innovation processes at local level. DUT will support and mobilise an active community of public officers and practitioners to connect DUT activities with local actions. This includes the identification of gaps in the fields of 1) finance; 2) procedures and procurements; 3) organisational; 4) technology.

### **Enhance the transformative potential of urban living lab (ULL) experiments**

ULL are considered a flagship initiative as DUT strongly supports the implementation and development of urban living labs by its funded

projects. ULL are defined as methods, approaches and projects that ensure a high level of stakeholder participation, co-creation, co-production, learning-loops, and experimental approaches to improve urban life. Additionally, DUT promotes ULL concepts and supports showcasing of good practice examples in sessions, webinars, and conferences to create awareness of the transformative potential of urban. Furthermore, trainings on how to plan, design and implement ULL for urban stakeholders to address an urban challenge by using experimental methodologies, as well as, regular workshops for ULL managers to meet and exchange experiences are organised.

### **Develop and implement a valorisation strategy**

However advanced the technologies available, the transformation of our cities towards climate neutrality is far behind expectations and possibilities, and the process now requires a high degree of participatory action. The aim of the DUT valorisation strategy is to explore and develop new formats and funding schemes in the context of real transformative action to make results of applied R&I tangible and visible in local urban contexts. The valorisation strategy will bring together existing sociotechnical innovation, the research communities, civil society and the investment opportunities of market actors – interconnecting technology, society and economy. All involved actors – including planners, architects, construction industry, suppliers, arts, real estate, and the general public – should be able to understand and experience the potentials and benefits of transformation, the look and feel of future neighbourhoods. Exhibition, showcasing and competition formats will compose the valorisation framework to substantially catalyse the impact of DUT, building on structures already set up in the PED Programme. As an interdisciplinary initiative, the DUT valorisation strategy clearly links with and will contribute to the New European Bauhaus.

### **Synergies with European urban policy**

DUT continues JPI Urban Europe’s support and engagement in European policy processes. Hence, DUT is assessing synergies with the upcoming Presidencies of the Council of the European Union with the organising member states to identify opportunities for joint activities. Whenever possible, joint workshops or webinars are organised or synthesis provided on strategic issues in order to connect R&I more strategically to urban policy making and take advantage of R&I results. Furthermore, DUT is a permanent overseer to the Urban Agenda for the EU (UAEU) process

and participates in UDC/DGUM meetings. Besides the engagement in the UAEU process, JPI Urban Europe/DUT is listed as a partner of the knowledge platform of the European Urban Initiative, the urban programme of DG Regio and aims at creating such interfaces to other European programmes by DG Regio on urban matters such as Urbact and the Urban Innovative Actions.

**International cooperation**

DUT aims to establish as a knowledge hub on urban transitions globally. Therefore, DUT uses an approach to mobilise three levels of international cooperation related to urban transitions: 1.) Urban stakeholder communities in regions outside of Europe: organising stakeholder workshops and mobilisation activities such as webinars, joint sessions at conferences co-organised with international networks (START International, ICLEI Africa, etc.) to broaden DUT's AGORA community and ensure that the urban issues addressed in DUT are connected to urban contexts outside of EU. 2.)

Funding agencies, programmes and initiatives: Besides mobilising international stakeholder communities DUT aims to activate international funders outside of Europe to join DUT activities. Via JPI Urban Europe, DUT is co-lead in the Mission Innovation Urban Transitions Mission (MI UTM)<sup>24</sup> and is leading the MI Funder's Dialogue. With that, DUT activities will be widened to the global level. 3.) Networks, agencies, and programmes on global urban policy: DUT will contribute to international conferences and forums on a regular basis through (co-) organised sessions and trainings. Examples for such events are the UN-Habitat's World Urban Forum, the Sustainable Urbanisation Forum organised by the Chinese Centre for Urban Development or the United Cities and Local Governments Congress UCLG.

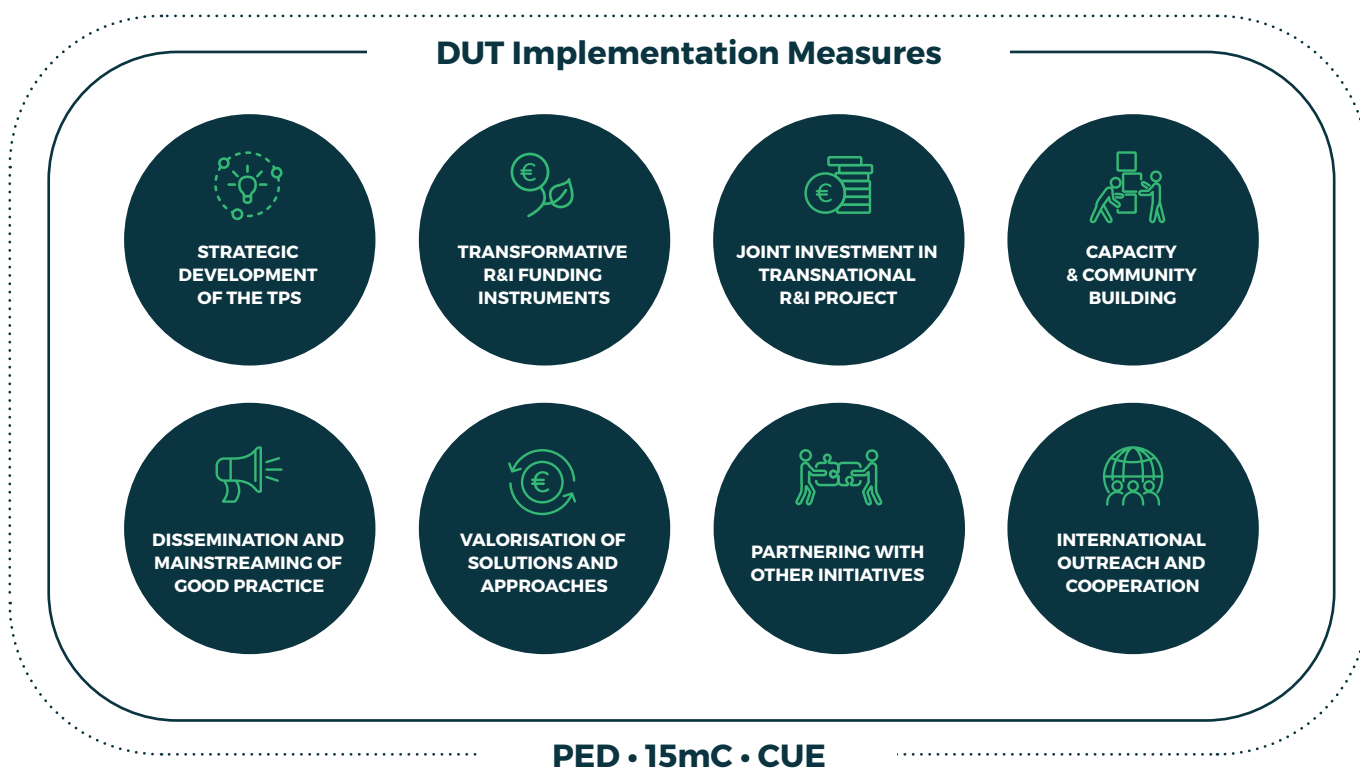


Figure 7: Key elements of the DUT programme

<sup>24</sup> <http://mission-innovation.net/missions/urban-transitions-mission/>



## 2. Roadmap for Positive Energy Districts Transition Pathway

### 2.1 Urban energy transitions through Positive Energy Districts

Urban areas are key actors in achieving climate change mitigation targets, decarbonisation, and the energy transition. They consume more than two-thirds of the world's energy and account for more than 70% of global CO<sub>2</sub> emissions – moreover, cities as the hubs of communication, commerce and culture also provide the key resources for sustainable solution pathways. Positive Energy Districts (PEDs) are key tools to urban energy transition. PEDs are a subsystem within cities that aim towards energy efficiency and generation of an energy surplus and are synergistically connected to the regional, national, and European energy system. As an integral part of comprehensive sustainable urbanisation strategies, PEDs shift the focus from the individual positive energy building towards neighbourhoods and thus a comprehensive level of impact on sustainable urban development and the energy transition process.

The focus on the urban neighbourhood as the “nucleus” for urban sustainability creates opportunities and requires systemic approaches regarding technological, social and economic innovation. Neighbourhoods offer a manageable size in terms of integrating urban planning and energy planning, including technological, spatial, regulatory, financial, legal, environmental, social and economic perspectives. Resulting in a network of sustainable urban neighbourhoods, PEDs will substantially contribute to a sustainable urban future in general. PED implementation serves as a tool to bring forward overall strategies for innovative development of the energy system in urban neighbourhoods, cities and the regional context. Integrated approaches support re-consideration of planning procedures and governance structures, thus influencing policies on different levels. Need for behavioural changes and new forms of energy consumption, energy flexibility (e.g., sharing, trading) and energy production will have impact on the organisation of daily life and therefore have an impact on society. New technologies and system integration require new business models and support green business.

## 2.2 The Positive Energy Districts mission

### 2.2.1 Where are we?

The DUT PED Transition Pathway builds on the existing SET Plan Action 3.2 / JPI Urban Europe Programme on Positive Energy Districts for Sustainable Urban Development (PED Programme), kicked-off in 2018. The Implementation Plan<sup>25</sup> of the Programme is still the main basis for developing strategies for mainstreaming PED development in Europe. The outcome of the ERA-NET Smart Cities and Communities Co-fund revealed the need to address the urban energy transition in a place-based rationale and suggested the conclusion that a “Smart Cities” narrative would not lead to a broad take-up on urban level. Therefore, the concept of a place-based programme on Positive Energy Districts was developed together with SET Plan Action 3.2.



Figure 8: Illustration of a Positive Energy District

Based on this insight, the consortium decided to fund the administrative and structural set-up of the transnational programme on Positive Energy Transition. After building a programme management structure and a Europe-wide consultation process on PED strategies in 2019, the programme launched two transnational calls in 2020 and 2021<sup>26</sup>, respectively. The programme is unique in its mission to establish 100 positive urban energy districts in Europe by 2025 and in its pledge to do this by working with cities and the real-estate sector on eye-level. It is following the place-based rationale developed in the JPI Urban Europe.

The PED Programme has developed a first PED Framework Definition as the outcome of broad consultation processes with stakeholders. PEDs are defined as

*energy-efficient and energy-flexible urban areas or groups of connected buildings which produce net zero greenhouse gas emissions and actively manage an annual local or regional surplus production of renewable energy. They require integration of different systems and infrastructures and interaction between buildings, the users and the regional energy, mobility and ICT systems, while securing the energy supply and a good life for all in line with social, economic and environmental sustainability.<sup>27</sup>*

Since the PED Programme kick-off in 2018, PEDs have been established as an important strategic tool for sustainable urban policies, specifically addressing the urban energy transition. With a growing portfolio of

<sup>25</sup> European Commission (2018): SET Plan Action 3.2 Implementation Plan; [https://setis.ec.europa.eu/system/files/setplan\\_smartcities\\_implementationplan.pdf](https://setis.ec.europa.eu/system/files/setplan_smartcities_implementationplan.pdf)

<sup>26</sup> <https://jpi-urbaneurope.eu/calls/ped-pilot-call/>; <https://jpi-urbaneurope.eu/calls/ped-call/>

<sup>27</sup> <https://jpi-urbaneurope.eu/wp-content/uploads/2020/04/White-Paper-PED-Framework-Definition-2020323-final.pdf>

PED-related projects and strategies in Europe, this multitude of approaches will contribute fostering PEDs as building stones towards climate-neutral cities.

### 2.2.2 What do we want to achieve?

With the SET Plan Action 3.2 Implementation Plan<sup>28</sup>, the PED Programme has committed to a clear vision:

*Positive Energy Districts raise the quality of life in European cities, contribute to achieve the COP21 targets and enhance European capacities and knowledge to become a global role model. The TWG 3.2 “Smart Cities and Communities” has developed an integrative approach including technology, spatial, regulatory, legal, financial, environmental, social and economic perspectives, to support the planning, deployment and replication of PEDs for sustainable urbanisation.*

*Europe is a global role model in integrated, innovative solutions for the planning, deployment and replication of Positive Energy Districts with the aim by 2025 to have at least 100 Positive Energy Districts, synergistically connected to the energy system in Europe.*<sup>29</sup>

With PEDs as important building blocks on the road towards climate-neutrality, the PED Mission of supporting the development of 100 PEDs in Europe by 2025 will be linked to the Horizon Europe Mission on Climate-Neutral and Smart Cities as an intermediate objective towards 100 climate-neutral cities until 2030. In providing integrated innovation solutions, considering technological, spatial, environmental, social, legal/regulatory, financial, and economic perspectives, the PED Transition Pathway aims at creating an environment that supports and contributes to the HEU Cities Mission 2030 and beyond.

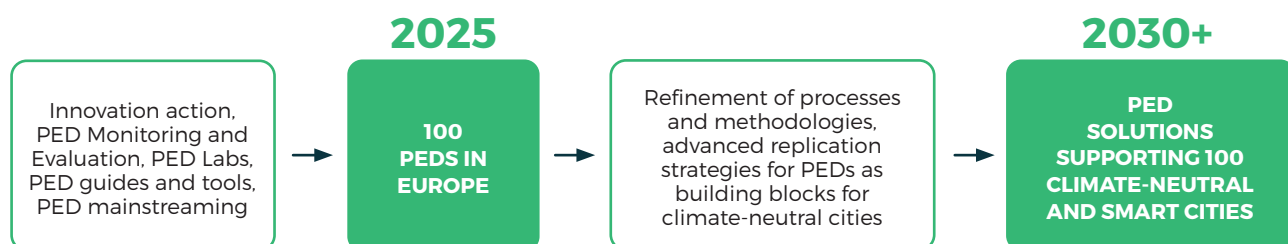


Figure 9: PED Mission aligned with Mission on Climate-Neutral and Smart Cities

With the PED Programme being integrated as a Transition Pathway of the DUT Partnership, through PED implementation the partnership aims to:

- Implement Positive Energy Districts on a large scale with at least 100 PEDs across Europe by 2025
- Mainstream integration of planning on neighbourhood-, city- and regional levels with energy planning and climate-neutrality
- Optimise the essential energy transition functions: energy efficiency, energy production and energy flexibility
- Adapt governance structures through cross-sectoral approaches, integration of top-down and bottom-up approaches and innovative stakeholder engagement strategies.

### 2.2.3 How are we going to get there?

The mission of a large-scale implementation of 100 PEDs by 2025 and contributing to 100 climate-neutral cities by 2030 shall be achieved through a circular pathway (see Figure 10)<sup>30</sup>. Activities towards the PED Transition Pathway mission are organised in three phases and refer to the six modules of the circular pathway.

<sup>28</sup> European Commission (2018): SET Plan Action 3.2 Implementation Plan; [https://setis.ec.europa.eu/system/files/setplan\\_smartcities\\_implementationplan.pdf](https://setis.ec.europa.eu/system/files/setplan_smartcities_implementationplan.pdf)

<sup>29</sup> European Commission (2018): 5

<sup>30</sup> European Commission (2018): 10

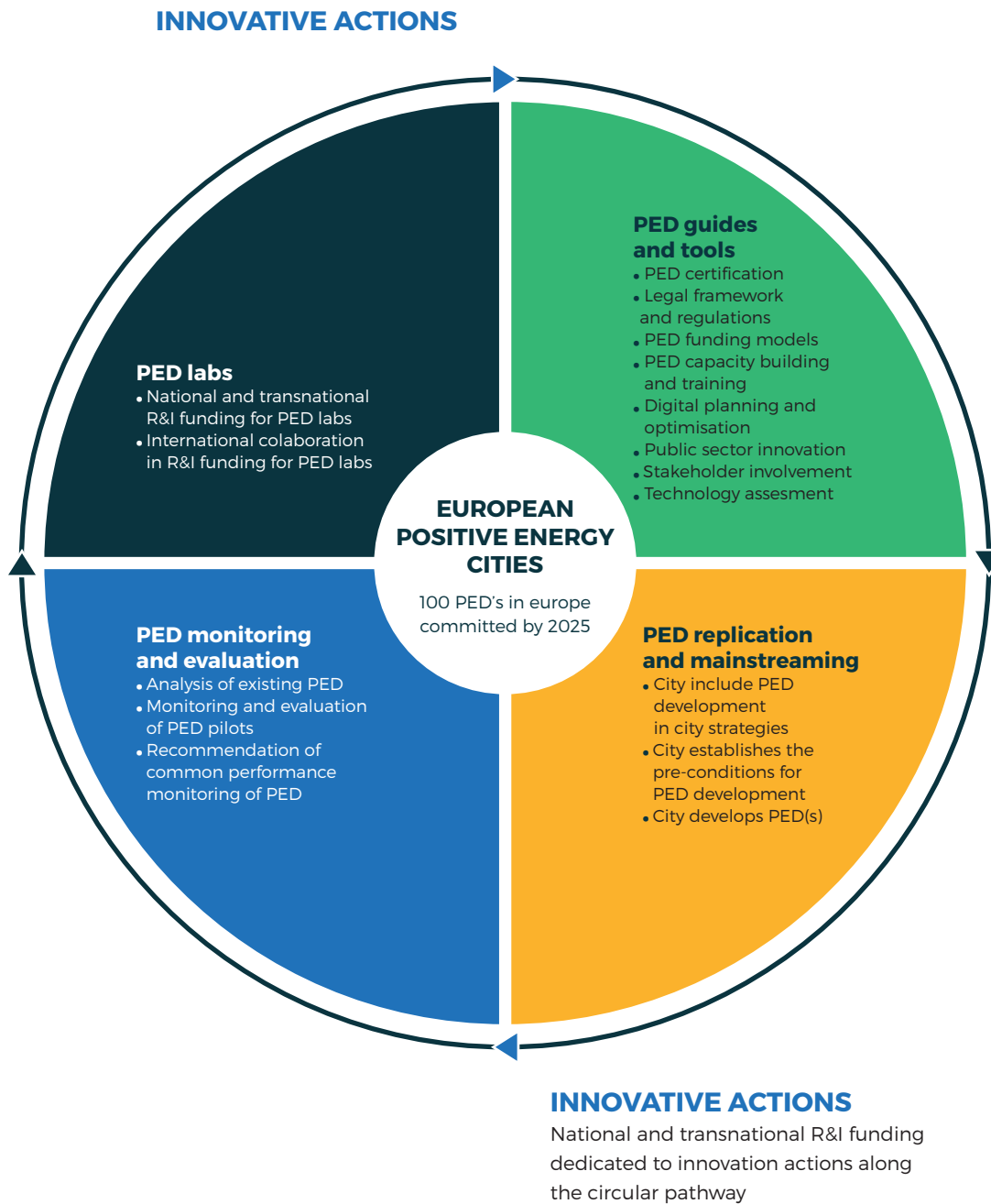


Figure 10: Pathways to Positive Energy Districts in Europe



- **Module 1 – European Positive Energy Cities:** Involvement of and co-creation with cities, city networks and related urban stakeholders (utilities, developers, etc.) on the planning, financing, deploying and replication of PEDs; ensure an integrated open innovation process on PED development.
- **Module 2 – PED Labs:** Develop city-driven PED Labs through joint calls according to individual cities' needs and approaches towards PED.
- **Module 3 – PED Guides and Tools:** To be developed on the needs of the PED stakeholders and the learning experience from PED Labs as a basis for successful planning and designing, implementation and operation, as well as replication and mainstreaming of PEDs.
- **Module 4 – PED Replication and Mainstreaming:** Support European cities in replication and mainstreaming to have 100 Positive Energy Districts in Europe committed by 2025.
- **Module 5 – PED Monitoring and Evaluation:** Will take place at the local level, but findings will be linked at the national and European level to develop recommendations for common monitoring and evaluation activities across Europe.
- **Module 6 – Innovation Action:** Innovation Actions funded by National and transnational R&I funding aim to support innovation activities along the circular implementation pathway to avoid or alleviate potential risks and ensure knowledge flows through the different modules.

The achievement of the PED Mission for 2025 will be evaluated through agreed quantitative and qualitative indicators. The relative novelty of the PED concept, as well as the dedicated local approach to the concept, has led to a multitude of local PED definitions. PED definitions were primarily pursued by projects trying to operationalise the PED idea in their given context. As such, the developed definitions were focused primarily on achievability on a project level rather than a unified framework that facilitates comparability. As a result, until today there is no common transnational definition of PEDs with measurable indicators. This gap has been discussed extensively in the PED Programme and will be filled within the DUT Partnership by developing a PED Framework that allows for both context-sensitive local solutions and transnational comparability under the primate of zero carbon emissions.

### 1st phase (2022-2025)

Until 2025, activities focus on further building a portfolio of PED solutions, resulting in the achievement of the intermediate goal of supporting the implementation of 100 PEDs by 2025. Short term goals focus on developing a transnational joint understanding of PEDs, awareness-raising, support of key stakeholders, development of guides and tools for the process design and last, but not least, the development of tailored calls for projects. This includes:

- **Innovation Action & Module 2:** Supporting the implementation of challenge-driven, innovation-driven projects through joint calls and joint actions, addressing technology relevance and social innovation through tailored R&I activities:
  - Consolidation of key areas of action through re-evaluation loops with problem-owners (PED City Panel, AGORA and other formats),
  - Learning from and evaluating project results and identify further R&I requirements in an iterative process, involving stakeholders and policy makers,
  - Support of implementation of testing beds and Urban Living Labs (ULL)/PED Labs,
- **Module 1:** Activities for capacity-building and guidance for decision-makers, city administrations and other urban stakeholders:
  - development of a web-based PED edition of the Smart City Guidance Package (SCGP)<sup>31</sup>, trainings and other formats,
  - fostering of dialogue between R&I, policy makers and practitioners
- **Module 1 & 4:** Integrating PED strategies into broader policies on national and EU level: focus on mobilisation of national PED stakeholder ecosystems and alignment with national strategies,

<sup>31</sup> <https://smart-cities-marketplace.ec.europa.eu/news-and-events/news/2019/smart-city-guidance-package>

- **Module 3:** Fostering of a joint vision of PED development among policy makers, practitioners:
  - operationalisation of a joint PED Framework Definition including indicators and context factors (built environment/density, climate, heritage, etc.) for European comparability, and lay foundations for a potential PED certification scheme as part of climate-neutral neighbourhoods,
  - embedment of PED strategies in national energy system, definition of balancing share of renewable energy from national energy system,
- **Module 4:** Elaborate PEDs as key building stones for achieving the European Mission on Climate-Neutral and Smart Cities of 100 climate-neutral cities by 2030,
- **Module 5:** Further mapping of European PED projects and development of a web-based database (“PED Inventory”) to
  - provide key target groups with an accessible platform for practical PED implementation strategies,
  - support the achievement of the mission of 100 PEDs by 2025,
- **Milestone:** Achievement of intermediate PED Mission by end-2025.

### 2nd phase (2026-2028)

In the 2nd phase, the portfolio of solutions will be further built, with a focus on characterising pathways towards climate-neutrality, refinement of processes and methodologies and the implementation of replication strategies for PEDs and climate-neutral neighbourhoods. Key activities will include reinforced efforts to support mainstreaming PED development and climate-neutral neighbourhoods in national strategies and integrate local developments into regional, national and transnational contexts (i.e., not least the regional and national energy systems).

- **Innovation Action:** Portfolio extension with at least 8 - 10 additional innovative solutions per year. These solutions can be ULL, demonstrations, projects or innovations developed through stakeholder involvement (e.g., business models, calculation methods etc.) aiming at supporting climate-neutral urban neighbourhoods and cities.
- **Module 1:** Further activities for capacity-building and guidance for decision-makers, city administrations and other urban stakeholders
- **Module 2:** Further implementation of ULLs/PED Labs through annual calls addressing PED development
- **Module 3:** Synthesising project results
- **Module 3 & 5:** Further elaboration and refinement of PED concept as a tool towards climate-neutrality and the achievement of the Horizon Europe Mission on Climate-Neutral and Smart Cities
- **Module 4 & 5:** Further development of standardisation and certification schemes as part of concepts for climate-neutral neighbourhoods

### 3rd phase (2029-2032)

The 3<sup>rd</sup> phase will extend the portfolio to 150+ PED solutions (case studies, labs, strategies, guides, etc.) in total to create and provide substantial input to strategies in the Mission on Climate-Neutral and Smart Cities.

- **Innovation Action:** Portfolio extension with at least 8 - 10 additional innovative solutions per year (2029) and integration into the EU Mission on Climate-Neutral and Smart Cities. These solutions can be ULL, demonstrations, projects or innovations developed through stakeholder involvement (e.g., business models, calculation methods etc.) aiming at supporting climate-neutral urban neighbourhoods and cities.
- **Module 1:** Further activities for capacity-building and guidance for decision-makers, city administrations and other urban stakeholders
- **Module 3:** Synthesising final project results
- **Module 4:** Established standardisation and certification schemes for large-scale PED implementation
- **Module 4:** Mainstreamed PED implementation, integrated in sustainable urban development strategies supporting climate-neutrality
- **Milestone:** Mission achieved.

## 2.3 Enabling systems: the PED European innovation ecosystem / landscape

The PED Transition Pathway of the DUT Partnership both aims to contribute to the EU initiatives and networks supporting urban transformation, energy transition and climate-neutrality and refers to them as enabling innovation ecosystems on transnational level.

Among existing initiatives, the PED Programme has already established cooperation with the Smart Cities Marketplace and European Lighthouse Projects<sup>32</sup> on both programme and project levels, aiming at a joint learning from different approaches and implementation strategies. The Lighthouse Projects since 2018 have a particular focus on developing PEDs. European city networks, such as Eurocities, ERRIN, Energy Cities and the Covenant of Mayors have been involved in the PED Programme and support its ambition of large-scale PED development.

With the European Green Deal<sup>33</sup>, the EU has set ambitious targets for becoming climate-neutral by 2050. The DUT PED Transition Pathway aims to contribute to the Renovation Wave Initiative<sup>34</sup>, as the task of transforming the existing urban structure is of particular relevance for PED development, as well as to the New European Bauhaus Initiative<sup>35</sup> with its ambition of innovatively connecting sustainability, inclusiveness, functionality and aesthetics. The Urban Agenda for the EU<sup>36</sup>, launched in 2016, involves 14 partnerships of which the partnership on Energy Transition and Climate Adaptation are of particular relevance for the PED Transition Pathway. The European Mission on Climate-Neutral and Smart Cities<sup>37</sup> aims at implementing 100 climate-neutral cities by 2030. The PED Transition Pathway will establish strong links to that mission, with PED development as a key element for achieving it. The people-centred approach of the mission (“by and for the citizens”) will be a fundamental enabling factor for broad ownership of the transformation process. Among the partnerships under Horizon Europe, the European Partnership for Clean Energy Transition<sup>38</sup> and People-centric sustainable built environment (Built4People)<sup>39</sup> Partnership will be strong partners in developing the strategies for the DUT PED Transition Pathway. As they build on existing initiatives, such as the European Construction, built environment and energy efficient building Technology Platform (ECTP)<sup>40</sup>, the Strategic Energy Technology Plan (SET Plan)<sup>41</sup> with SET Plan Action 4 (on Energy Systems) and SET Plan Action 5 (on Buildings), cooperation links have already been established and will be further developed.

For driving the implementation process, the PED Transition Pathway strongly builds on a stakeholder ecosystem that is very much defined by national and local frameworks, regarding policies, regulations, culture etc. (Figure 11). Links to and cooperation with the European Commission, the European Green Deal, the Horizon Europe Mission on Climate-Neutral and Smart Cities, New European Bauhaus and neighbouring SET Plan Actions (esp. SET Plan Action 4 on energy systems and SET Plan Action 5 on buildings), etc. have been established. Respective links to the Clean Energy Transition Partnership and other European Partnerships under Horizon Europe will be concretely defined in the framework of the DUT Partnership, including extensive exchange and potential joint working groups/task forces.

<sup>32</sup> <https://eu-smartcities.eu/>

<sup>33</sup> [https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en)

<sup>34</sup> [https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/renovation-wave\\_en#a-renovation-wave-for-europe](https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/renovation-wave_en#a-renovation-wave-for-europe)

<sup>35</sup> [https://europa.eu/new-european-bauhaus/index\\_en](https://europa.eu/new-european-bauhaus/index_en)

<sup>36</sup> <https://ec.europa.eu/futurium/en/urban-agenda>

<sup>37</sup> [https://ec.europa.eu/info/publications/100-climate-neutral-cities-2030-and-citizens\\_en](https://ec.europa.eu/info/publications/100-climate-neutral-cities-2030-and-citizens_en)

<sup>38</sup> [https://ec.europa.eu/info/sites/info/files/research\\_and\\_innovation/funding/documents/ec\\_rtd\\_he-partnerships-clean-energy-transition.pdf](https://ec.europa.eu/info/sites/info/files/research_and_innovation/funding/documents/ec_rtd_he-partnerships-clean-energy-transition.pdf)

<sup>39</sup> [https://ec.europa.eu/info/sites/info/files/research\\_and\\_innovation/funding/documents/ec\\_rtd\\_he-partnerships-built4people.pdf](https://ec.europa.eu/info/sites/info/files/research_and_innovation/funding/documents/ec_rtd_he-partnerships-built4people.pdf)

<sup>40</sup> <http://www.ectp.org/>

<sup>41</sup> <https://setis.ec.europa.eu/>

## EUROPEAN AND NATIONAL FRAMEWORKS: STRATEGIES, REGULATORY FRAMEWORK, INTERNATIONAL COOPERATION



Figure 11: PED innovation ecosystem

The PED Programme has established formats of involving the key stakeholders from cities, real estate industry and utilities, specifically by establishing a PED City Panel and a PED Mobilisation and Replication Group, which is now a DUT work package. The AGORA format, involving a wider group of urban stakeholders, will be used to create a joint ambition towards PED development.

There are basic structural dilemmas to be considered: for example, cost and benefits do not necessarily come to the same stakeholders; different stakeholder groups work with different time horizons.

Therefore, identifying the different interests, developing strategies for facilitating and balancing them and defining processes towards a joint vision are key. This needs to touch different levels:

- Addressing stakeholder-specific language and culture, trust-building and creating safe spaces for transparency and open discussion
- Focusing on and mobilising for a shared vision and the awareness of societal benefit
- Regulatory conditions need to address the future and not the past and be common for all stakeholders - regulatory framework to establish fairness!

Tackling complex land ownership structures – specifically in existing urban neighbourhoods – requires special attention. For the PED Transition Pathway and the operationalisation of the PED Reference Framework, this finding indicates the need to dig deeper into concrete local conditions and locally suitable strategies.

A roadmap for PED implementation must build on:

- the basic interaction between technological solutions, process innovation and social innovation,
- the mobilisation of stakeholder ecosystems enabling PED development

Aiming at a comprehensive urban transformation process towards ecological, social and economic sustainability, it is therefore not only a matter of technical sciences, energy planning and urban planning, but decisively so for humanities, economics and social sciences. Building on the established network of JPI Urban Europe, the links to other initiatives will be fostered and further developed, aiming for an innovation network for strategies building on evaluation loops and lessons learnt.

## 2.4 Key areas of action

The PED Programme and neighbouring initiatives have developed key areas of action (KA) and themes (TH) based on requirements of city authorities and consolidated through consultation processes with R&I organisations and stakeholder networks. This needs to be considered as a flexible framework for bringing forward PED implementation (Figure 12).

A roadmap for PED implementation aims at consolidating a framework of addressing the key areas of action, developing joint calls involving R&I and joint actions and their re-evaluation and result in a set of guides and tools supporting hands-on PED implementation in different national and local framework conditions. PEDs shall be integrated in a broad urban transformation process towards climate-neutrality based on the optimisation of energy production, energy flexibility and energy efficiency, with a special focus on transforming the existing built environment.

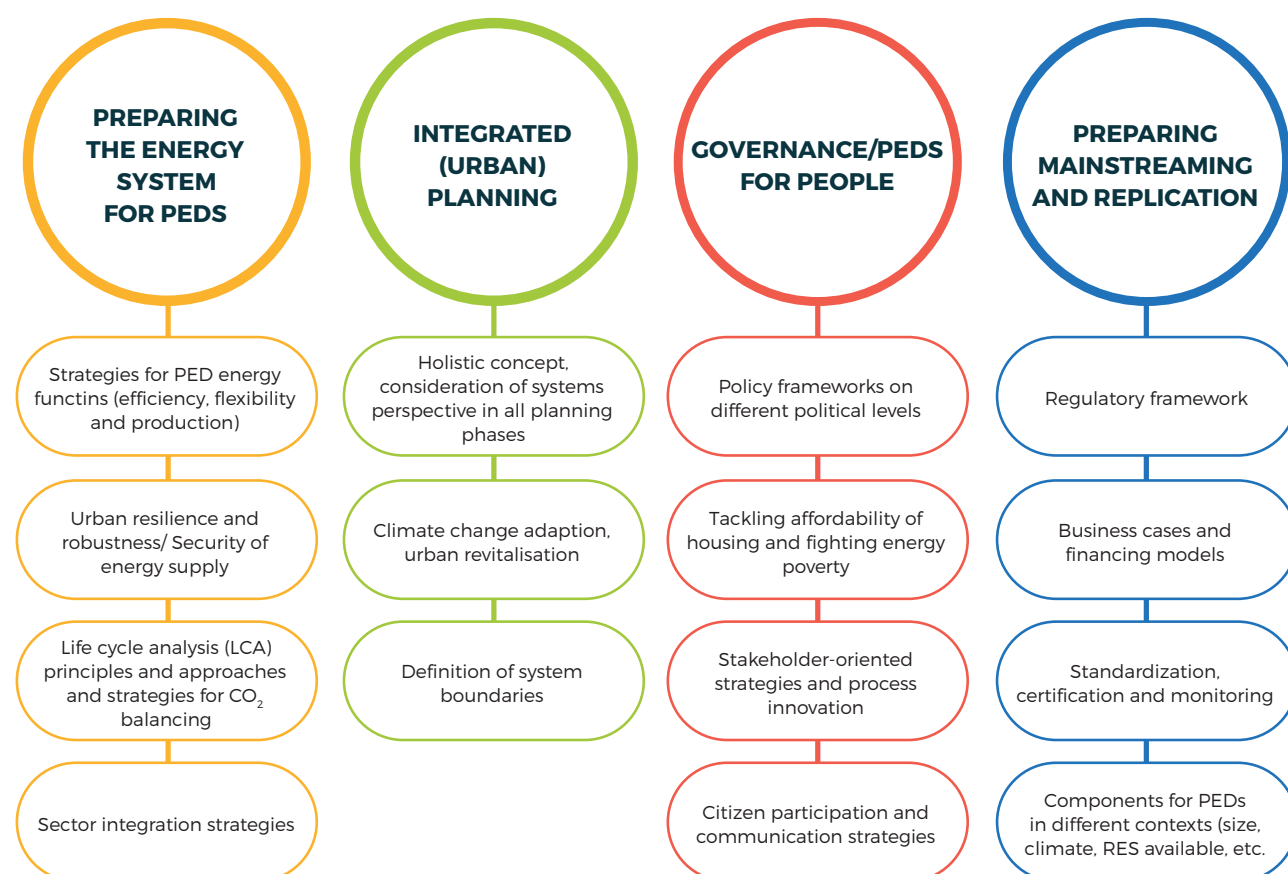
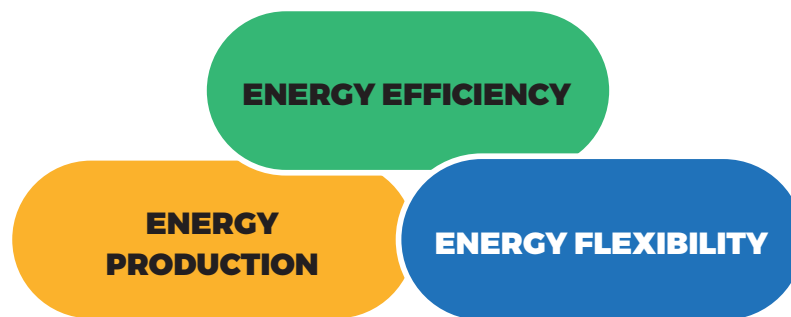


Figure 12: Overview of key areas of action for PED development

### 2.4.1 KA 1 - Preparing the energy system for PEDs

This KA aims at adapting the current energy system through optimisation of the basic energy functions, securing energy supply and preventing energy poverty while considering social, ecological and economic sustainability – it is therefore key for paving the way towards PED implementation. PEDs are considered as integral elements of the regional energy system (Figure 13).



**Target:** Optimisation of the three functions of PEDs (energy efficiency, energy flexibility and energy production) towards climate neutrality and energy surplus by taking into account the guiding principles

**Guiding principles:** Quality of life. Inclusiveness, with special focus on affordability and prevention of energy poverty. Sustainability. Resilience and security of energy supply

**Enablers:** Political vision and governance framework. Active involvement of problem owners and citizens. Integration of energy and urban planning. ICT and data management

Figure 13: Functions of PEDs in the regional energy system

#### TH 1:1 Strategies for PED energy functions (efficiency, flexibility and production)

**Energy Efficiency Function:** The aim is an optimal reduction of energy consumption needs within the PEDs, balancing out the needs of the different sectors, building infrastructure, the use of energy, settlement typology, as well as transport and mobility. Due to its relevance, the focus is not only on new urban development areas but very much also on the existing building stock (urban revitalisation/retrofitting).

**Energy Flexibility Function:** PED energy flexibility strategies need to address the need to actively contribute to the resilience and balancing of the regional energy system by active management for balancing and optimisation, peak shaving, load shifting and storage with the optimal benefit for the regional energy system in mind. In addition, they need to find solutions for managing any interactions between the urban neighbourhood and the regional energy system such as to enable carbon neutrality and 100% renewable energy in the local consumption and an additional surplus of renewable energy over the year.

**Energy Production Function (locally and regionally):** Locally and regionally produced renewable energy will enable a substantial reduction of greenhouse gas emissions and ensure economic viability. PED strategies towards renewable and local energy production need to consider local/regional availability of RES (climate zones, industrial waste heat, etc.) and the integration of energy production into urban structure (buildings, public spaces).

#### TH 1:2 - Urban resilience and robustness / Security of energy supply

Securing the energy supply, thus supporting urban resilience and robustness is a key aspect in all phases; long-term strategies including the transformation phase, need to be well elaborated. Applying a systems perspective furthermore includes the consideration of Life cycle analysis (LCA) principles and approaches in all phases and business models, innovative sector coupling strategies, digitalisation and data management, and strategies for CO<sub>2</sub> balancing (hourly/annual basis).

### TH 1:3 - Life cycle analysis (LCA) principles and approaches and strategies for CO2 balancing

With the overall sustainability ambition of PED development, business models need to apply a life-cycle approach (LCA)<sup>42</sup> – including all stages of planning, investing, operating and disposal as well as externalities regarding long-term ecological, economic and social impact. For applying LCA principles to the urban context<sup>43,44,45</sup>, innovative strategies are called for. Considering the comprehensive ambition of PEDs, designing innovative LCA-based business models is an imperative for bringing PED development forward. The PED Framework operationalisation strategy aims to specifically address utilities and the real estate sector in order to include these stakeholders in co-creating feasible business models addressing life circle assessment and circularity as a basic prerequisite for long-term and economically sustainable PED solutions.

### TH 1:4 - Sector coupling strategies

Sector coupling strategies aim at the integration of end-use sectors (heating, cooling, electricity, mobility) and supply-side coupling, involving innovative district heating and cooling as well as all-electric strategies. Sector coupling facilitates the optimisation of the energy flexibility function and is therefore a key element for efficiently tackling decarbonisation and the implementation of PEDs and need to be further explored and developed into feasible mainstreaming strategies.<sup>46</sup>

## 2.4.4 KA 2 - Integrated urban planning, implementation and operation of PEDs

PED development needs to be integrated in an urban planning and design process that ensures that PEDs not only focus on positive energy balance but are also attractive places for living and working with a high environmental quality. PEDs need an integrated and holistic approach with consideration of a systems perspective in all planning phases. This requires the understanding of the system boundaries and definition of district and neighbourhood sizes, legal frameworks, local planning cultures and procedures, climate conditions, etc. Cities must be prepared and equipped with appropriate technological solutions, legal instruments and digital planning and optimisation tools for the development of PEDs. Consequences of climate change for planning and operation of green and blue infrastructure need to be taken into account on the neighbourhood level, which is also valid for the crucial role of mobility and sustainable mobility concepts.

For large-scale impact of PED implementation regarding sustainable urban transformation, ambitions need to focus on existing urban structures and neighbourhoods, connecting them with urban retrofitting and revitalisation strategies regarding the mobility system or the quality of public spaces. Achieving an energy surplus is significantly more challenging in such existing urban areas and might therefore hinder a full-scale PED ambition due to increased complexity and less room for manoeuvre in existing structures. For example, large-scale PV instalment is obviously a limited option and therefore more of a challenge in existing neighbourhoods, while developing the DH system seems to be more applicable in different urban contexts. Therefore, the regional context becomes all the more important and a smart mix of different energy typologies used key. Including the important aspect of retrofitting and revitalisation into the PED concept is an obvious challenge and needs to be addressed in further operationalisation strategies.

### TH 2:1 - Consideration of a systems perspective in all planning phases

All sustainability aspects - ecological, social and economic sustainability - must be considered and aim at securing high quality urban environments, high quality of life and inclusiveness through the mix of functions (social infrastructure, local economy, productive city, etc.), a sustainable building structure (density, green areas, accessibility with green mobility, etc.), and the quality of open, inclusive public spaces. The PED Transition Pathway emphasises the need for integrating urban planning processes with energy planning from the beginning through adapting planning procedures, zoning and building codes. With all ambitions towards standardisation, PED strategies need to consider the specifics of the concerned neighbourhoods, cities and countries, respectively, to find holistic, locally adapted solutions.

<sup>42</sup> For LCA definition by ISO, refer to: International Organization for Standardization (ISO), 2006: Environmental Management – Life Cycle Assessment - Principles and framework. European standard EN ISO 14040, Geneva.

<sup>43</sup> For example: Ylmén, P. et al (2019). Life Cycle Assessment of an Office Building Based on Site-Specific Data. In: Energies 2019/12 (MDPI).

<sup>44</sup> Albertí, J. et al, 2017: Towards life cycle sustainability assessment of cities. A review of background knowledge. Science of The Total Environment, Vol. 609, p. 1049 - 1063.

<sup>45</sup> See also: <https://www.esci.upf.edu/en/latest-news/news/application-of-life-cycle-assessment-towards-sustainable-cities>

<sup>46</sup> For details regarding sector coupling, see:

[https://www.europarl.europa.eu/RegData/etudes/STUD/2018/626091/IPOL\\_STU\(2018\)626091\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2018/626091/IPOL_STU(2018)626091_EN.pdf)

### **TH 2:2 – PED development contributing to climate change adaptation**

The PED Transition Pathway supports the overall ambition towards climate-neutral cities and neighbourhoods and therefore contributes to climate change adaptation in the urban environment. Particular consideration is needed for the development of green-blue infrastructure (on neighbourhood level) building on existing infrastructures and the linking to (neighbourhood-oriented) greening strategies and nature-based solutions (NBS). The integrated perspective on sustainable urban development particularly includes the transformation of existing urban structures and the existing building stock: PED development as a support for sustainable, climate-neutral retrofitting and revitalisation strategies of neighbourhoods. Mobility plays an important part in this regard, strengthening the role of mobility in neighbourhood concepts in general and integrating mobility into PED strategies is therefore key. Within the DUT Partnership, this implies strong interfaces with 15mC TP and the CUE TP, respectively.

### **TH 2:3 – Definition of system boundaries**

The definition of system boundaries is highly dependent on local conditions regarding urban morphology and the energy system and will therefore not only refer to physical boundaries, but also include virtual boundaries (contractual interaction with regional energy system). There have been approaches of categorising PEDs according to their system boundaries defined by circles of considered energy uses: 1) Heating, cooling, electricity, 2) Mobility, 3) Grey Energy. The integration of PEDs into the regional/national energy systems as a “buffer” regarding energy flexibility or through balancing factors/context factors defining shares from the national energy system regarding density, mobility, etc. is an integral part of the PED Transition Pathway approach. This also includes the consideration of interconnection between different PEDs in a given geographical context.

### **2.4.3 KA 3 – PED Governance and PEDs for people**

A PED is not just an energy standard, it is rather an innovative concept to promote sustainable urban energy system development at neighbourhood scale.

For the implementation of these concepts a close cooperation between citizens, businesses and the public sector is needed, as well as advancements in energy policy and regulation, urban governance and decision-making processes, changes in consumer behaviour and sharing services, digitalisation and technological innovation and new business models. Innovative business models, which provide economic feasibility, and innovative governance concepts that build upon participation of civil society are essential to achieve economic and social sustainability of PED concepts. A just energy transition calls for successful tackling of both co-creative organisation of the transition process and the social impact regarding energy security and prevention of energy poverty.

Stimulating innovations in the face of the above challenges and proposing and validating new ‘governance’ approaches considering the dynamic interactions between multiple domains, actors and needs across scales and policy spheres are key assets for PED development. Stakeholder-oriented processes should focus on key actors for PED implementation that lay the basic conditions, invest and are the future users: city administrations, utilities, real estate developers and the inhabitants/users. SME’s bringing in innovative solutions need to be involved in the process. Public-private cooperation, e.g. in the form of contracts, are essential attributes to PED development.

“Leaving no one behind” must not be an empty slogan, inclusiveness as a guiding principle is an imperative for a transformation task that needs the active support of all actors and people involved. An innovative governance structure needs innovative pathways of integrating top-down and bottom-up approaches and actively involve community-based initiatives. Decentralisation strategies in general with e.g. Local Energy Communities will play a decisive role. In the end, benefits need to be visible for all groups involved.

Regulatory sandboxes and other novel solutions on PEDs such as living labs and testing environments should provide testing frameworks for the process complexity needed for successful implementation.



**TH 3:1 - Policy frameworks on different political levels**

There is a need of re-designing governance structures to tackle the complex challenge of performing the energy transition - in terms of decentralisation of decision-making, overcoming silo-thinking and improving cooperation between different geographical levels. The PED Transition Pathway aims to facilitate both vertical cooperation (top-down and bottom-up approaches: EU - national - regional - local) and horizontal collaboration (cross-departmental) and promote innovative public-private cooperation. Regulatory sandboxes, living labs and testing environments will be important formats to explore innovative modes of cooperation.

**TH 3:2 - Tackling affordability of housing and fighting energy poverty**

For successful mainstreaming of PED implementation in Europe, the strong consideration of social issues is an imperative. PED strategies and business models must ensure affordability of housing, therefore ensure access to PEDs for the largest share of the population. With this, process design for PED development needs to contribute significantly to overcoming energy poverty. While energy poverty needs to be addressed on different levels (e.g., by direct income support schemes for vulnerable groups of the population), PED development itself should become a tool for supporting low-income groups. A certain degree of standardisation will be useful to achieve this ambition.

**TH 3:3 - Stakeholder engagement and communication strategies**

Stakeholder involvement is an imperative for developing challenge-driven solutions in the urban context. The PED Transition Pathway will involve key stakeholder groups, specifically city authorities, real estate developers and utilities, to identify needs and challenges, to mobilise PED stakeholder ecosystems on European, national and local levels and to promote innovative models for public-private cooperation. As consultation processes have shown, cities are demanding stronger support for capacity-building as a pre-condition for tackling the challenges of the urban energy transition and reaching climate-neutrality. The PED Transition Pathway aims to address this requirement through different formats like developing guidelines and roadmaps (e.g., Smart City Guidance Package) or trainings for key stakeholder groups. The behavioural aspects of the energy transition (efficient use of energy) can only be addressed through multiplying communication channels directed at the general public and by actively involving local residents in a specific PED project from the beginning. Energy communities play an important part as organised local initiatives addressing the energy transition.

**2.4.4 KA 4 - Preparing Mainstreaming and Replication**

Mainstreaming and replication of tested solutions in urban development remains a widely discussed challenge. Picking up solutions from other cities and adapt them to local conditions needs guidance and communication and detailed information. Addressing the need for widespread development in the urban energy transition, the PED TP aims at elaborating dedicated mainstreaming and replication strategies by identifying key components of PED development and elaborating guidelines and schemes for replication.

**TH 4:1 - Components for PEDs in different contexts**

Identification of the key components such as building structure/density, functional mix, availability of RES and developing measurable outputs/KPI's for PED development is substantial for developing standardisation schemes. These components will be elaborated in the operationalisation of a joint European PED Framework Definition including indicators and context factors for European comparability.

**TH 4:2 - Standardisation, certification and monitoring**

Considering the vastly different conditions on national and local levels regarding regulatory frameworks, natural resources, energy systems or planning culture, the PED TP aims at elaborating a European framework for PED implementation by identifying a set of minimum criteria/KPI's allowing for solutions based on local conditions and in different urban morphologies. With the perspective of working towards a PED certification scheme, the PED TP aims at integrating the PED ambition into existing certification schemes for sustainable neighbourhood-oriented development Supporting Urban Living Labs/PED Labs as on the ground areas for experiment are therefore a significant tool for testing different process designs and overall feasibility.

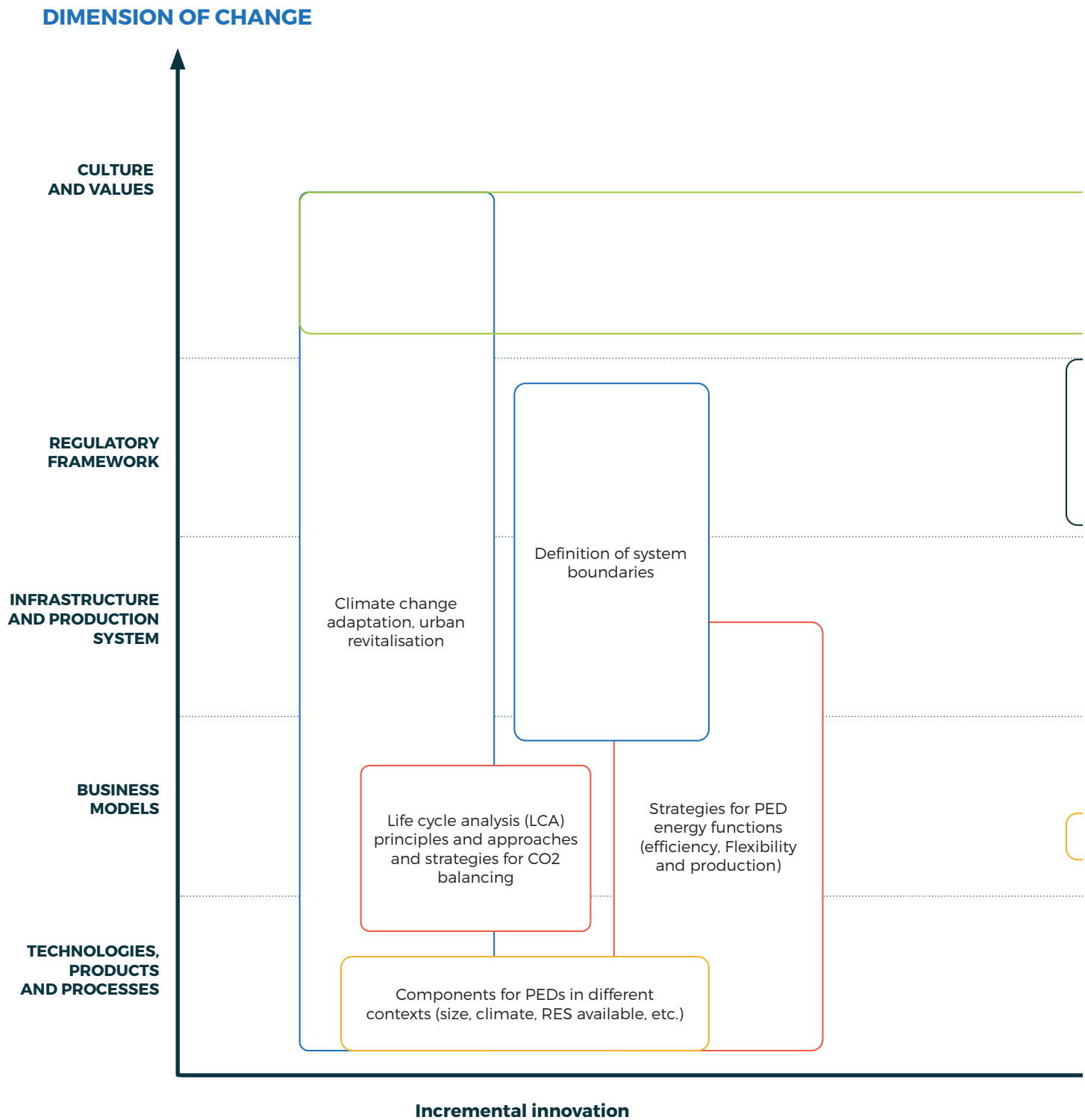
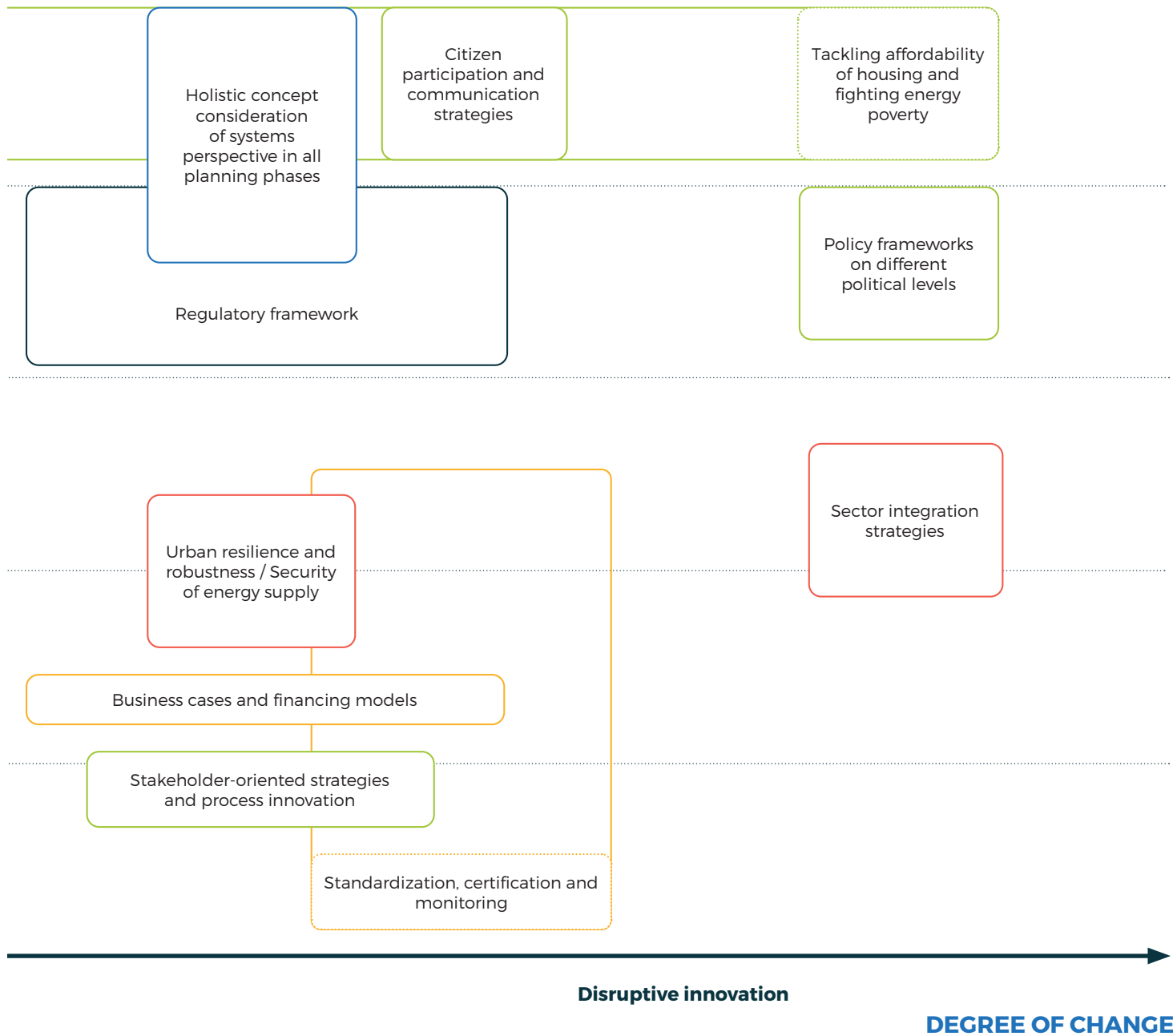


Figure 14: Innovation graph – identified emerging topics of innovations for the PED Transition Pathway

### INNOVATION GRAPH PED



**Key Area 1**  
Multi-Model and Sustainable urban Mobility

**Key Area 2**  
Human-centered Urban Spaces and Morphology

**Key Area 3**  
Smart Urban Production, Logistics and Services

**Key Area 4 (+1)**  
Urban Government and Governance for Transition



#### TH 4:3 - Overcoming legal barriers

Regulatory frameworks serve as both enabling factors and barriers for PED development. To support replication, identification of these factors and elaboration of policy recommendations for adapting the regulatory framework accordingly is key. This specifically involves urban planning regulations (zoning), building codes and regulation for energy communities.

#### TH 4:4 - New business cases and financing models

Financing and the development of feasible business models are top challenges for PED implementation. This firstly implies the need for tailored funding options that address the challenges of the problem-owners, providing also support for capacity-building and process innovation. It is therefore an imperative for the PED Transition Pathway to stay in close contact with problem-owners in order to develop both a suitable call agenda and additional activities supporting PED implementation. In the long run, feasible business models are essential. Regulatory frameworks or certification schemes may serve as incentives to trigger interest of insurances, pension funds and generally draw focus of investors to PEDs. Therefore, the development of business models involving public authorities, developers and utilities, based on LCA, fitting into national and European (regulatory) frameworks and integrated into broad strategies for transformation processes towards climate neutrality are key assets for replication and mainstreaming.

## 2.5 A systemic perspective on system innovation - the PED Innovation Graph

In order to support the transformation of an urban energy system through, the PED TP has to recognise innovation in a systematic way. Miedzinski et al. (2019) define system innovation as “portfolio of interdependent and mutually reinforcing innovations which together have a potential to transform systems delivering key services to societies”. This understanding emphasises the interdependence between dimensions of change, as sustainable urban energy systems depend on synergies of the development of attractive products (dimensions “technologies, products and processes” and “business models”), investment in physical infrastructure (“infrastructure and production systems”) and elements to really enable and deepen innovation (“regulatory framework” and “culture and values”) (Miedzinski et al. 2019: 6f). Figure 14 shows the arrangement of the PED Key Areas of Action between the two axes “dimensions of change”, and “degree of change” from “incremental innovation” to disruptive innovation”. This visualisation provides indication of thematic priorities and supports the development of the PED Multi-annual Call Agenda (PED MCA; chapter 5.3)



## 3. Roadmap for 15-minute City Transition Pathway

The 15-minute City Transition Pathway (15mC TP) fosters urban mobility transitions by improving accessibility and connectivity for sustainable forms of transportation and logistics, starting from the neighbourhood-level. The concept of the 15-minute City is based on the idea that city dwellers should be able to cover the vast majority of their daily needs within a 15-minute radius, by walking and cycling, while connecting to further districts and travelling larger distances by other forms of sustainable transport. The 15-minute City concept seeks to establish integrated and mixed-use neighbourhoods at large, which are key to reduce GHG-emissions in the transport and logistics sector and adapt urban environments to the challenges of climate change. Thus, in the 15mC we want to account for the diversity of contemporary lifestyles and boost action towards climate-neutral, liveable and inclusive cities.

Our mission is to facilitate analysis, elaboration, experimenting and testing of innovations for 15-minute cities in co-creative settings, bringing these together in a 15-minute City Innovation Portfolio of 50+ experiences and practices, recognising different urban contexts and focusing on transferability. Activities and projects will be communicated actively and frequently shared with a wide audience.

### 3.1 Driving mobility transitions by making sustainable transport the standard in cities

The introduction of the individual vehicle has led to profound transformation in urban daily life and the form of cities. While providing for personal mobility and new economic and social opportunities, the rising number and increasing dependency on cars led to manifold negative effects, such as congestion, air pollution or over-use of urban public space and accelerated unsustainable large-scale developments like urban sprawl and the decline of liveability in cities. Today, the transport sector accounts for a quarter of all GHG-emissions in the EU and is the primary cause of urban air pollution, noise and accidents in public space. Furthermore, it is the only sector above the GHG-emission levels of 1990.

Especially the comparison with emission levels from today and 30 years ago demonstrates the urgency of action and the challenges ahead for urban mobility transition. These must build on, but must go far beyond technological solutions and digitalisation. It is necessary to think mobility, as material flow of people

and goods, together with its social, institutional and physical embeddedness in the built environment and innovative ways of steering it. Thus, the transport sector, together with urban planning, plays a central role in reaching climate change mitigation goals as well as for adaptation by guaranteeing healthy living conditions for city dwellers and providing space for climate-neutral mobility in public space.

In this situation, the 15-minute City concept provides an attractive narrative that emphasises the benefits of a dense, diverse and polycentric cityscape, rethinking of the current distribution of public space across transport modes and connecting urban services, production and logistics to create attractive and human-centred streets within vibrant neighbourhoods. Thus, it argues for a reorientation towards the neighbourhood level, where social exchange, integration, participation and urban vitality take off. Especially in times of climate crisis, these this local focus promotes an efficient use of resources and underlines principles of urban resilience.

DUT's 15mC TP understands and takes up the concept of the 15-minute City as a mosaic of measures and activities for urban transitions in the fields of sustainable urban mobility, with a focus on personal mobility, urban planning and public space, urban logistics, and innovative governance - which is represented in the four Key Areas of the 15-minute City TP (section 3.4). Therefore, we want to recognise, learn from and make use of the widely existing diversity of strategies, approaches, instruments and measures in the field of urban mobility and logistics.



Figure 15: Illustration of a 15-minute City

## 3.2 The 15-minute City mission

### 3.2.1 Where are we?

The mobility system in European cities remains a tough nut for reaching urban climate neutrality. While motors are getting more efficient through gradual technological progress and EU-regulation, the travelled distance continuously increases, similar to the size and weight of vehicles – resulting in overcompensating rebound effects and GHG emissions that grow rather than sink. Individual mobility is a highly sensitive and polarised topic, as it touches directly the accessibility of opportunities and personal lifestyles. The debate culminates in the distribution of urban public space, where every intervention into the status quo reaches the level of an affair of state.

Here, 15-minute City concept brings in an attractive and holistic perspective that helps demonstrating co-benefits for climate change adaptation, health and social cohesion. Its focus is set on rethinking the existing mobility system and urban morphology to encourage sustainable mobility choices, redistribute urban space and reorganise daily activities, while creating attractive and integrated neighbourhoods. However, a 15-minute City represents by no means a standardised template for each city. Approaches to it are referenced



in much older debates and theories (see Figure 16) and practical implementation much rather highly context dependent and will have to take varying forms in different neighbourhoods – according to demography, local socio-economic structure of population and economy, morphology and institutional setup.

One central challenge of the 2020s will be to speed up transforming urban economies and societies for climate neutrality, considering the socio-economic balance as well as maintaining flexibility and resilience when facing global shocks while doing so. To promote such a transformation, RTI-policy cannot lose time striving to find “perfect solutions”. Instead, bringing innovative projects to implementation and city practice quickly, and taking these learnings to a larger audience for the next learning circle, has to be at the top of the list.

Many solutions in mobility and urban planning for lowering GHG emissions are already tested and available. However, the interconnectedness of challenges, action in fragmented silos, a complex tangle of (often contradicting) financial incentives, tenacious stakeholder positions and attitudes, and the lack of affordable and/or accessible sustainable transport options delay an encompassing shift of mobility behaviour that truly contributes to urban climate neutrality.

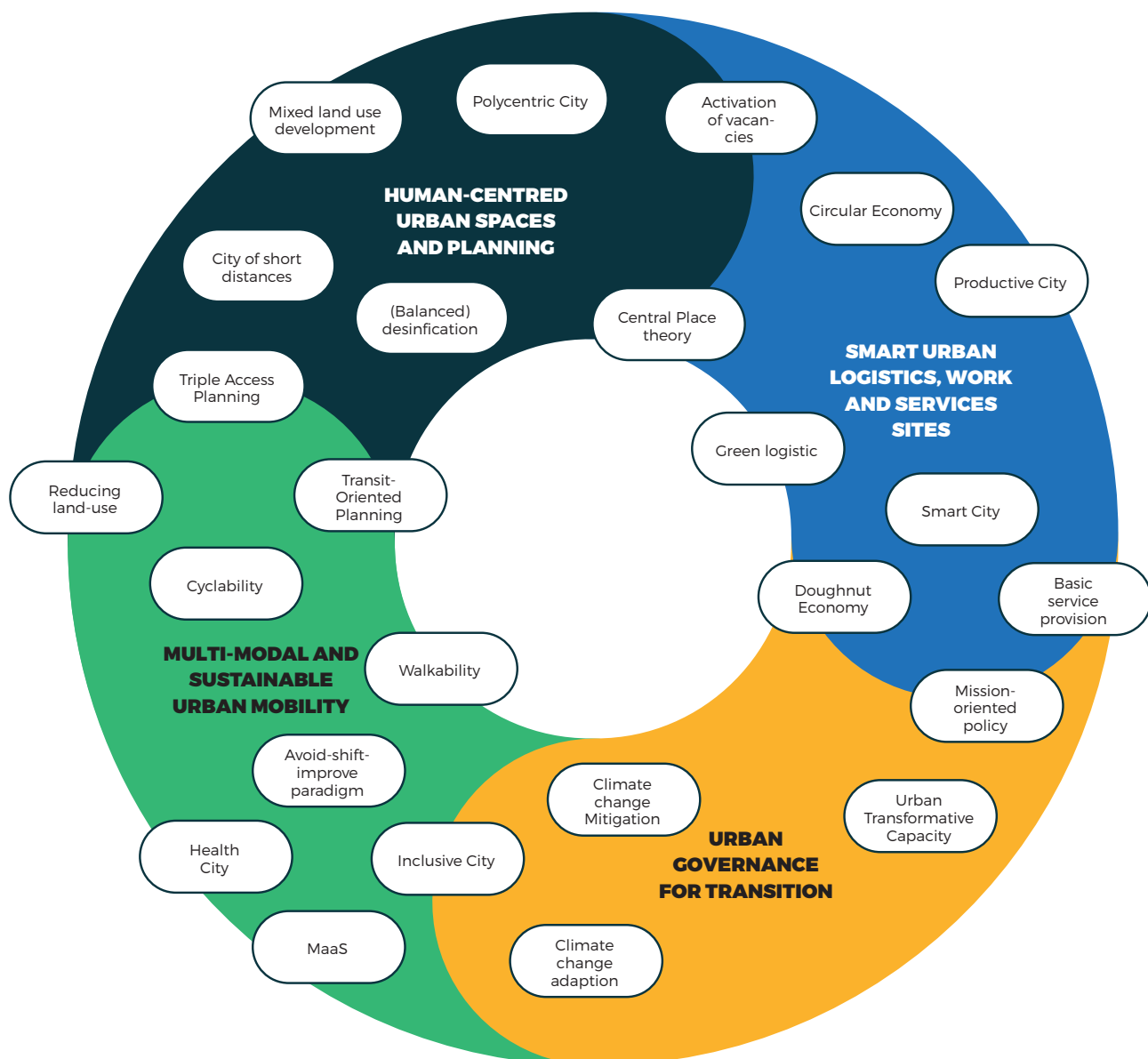


Figure 16: Overview on foundations of theories and debates that the 15-minute city concept builds on

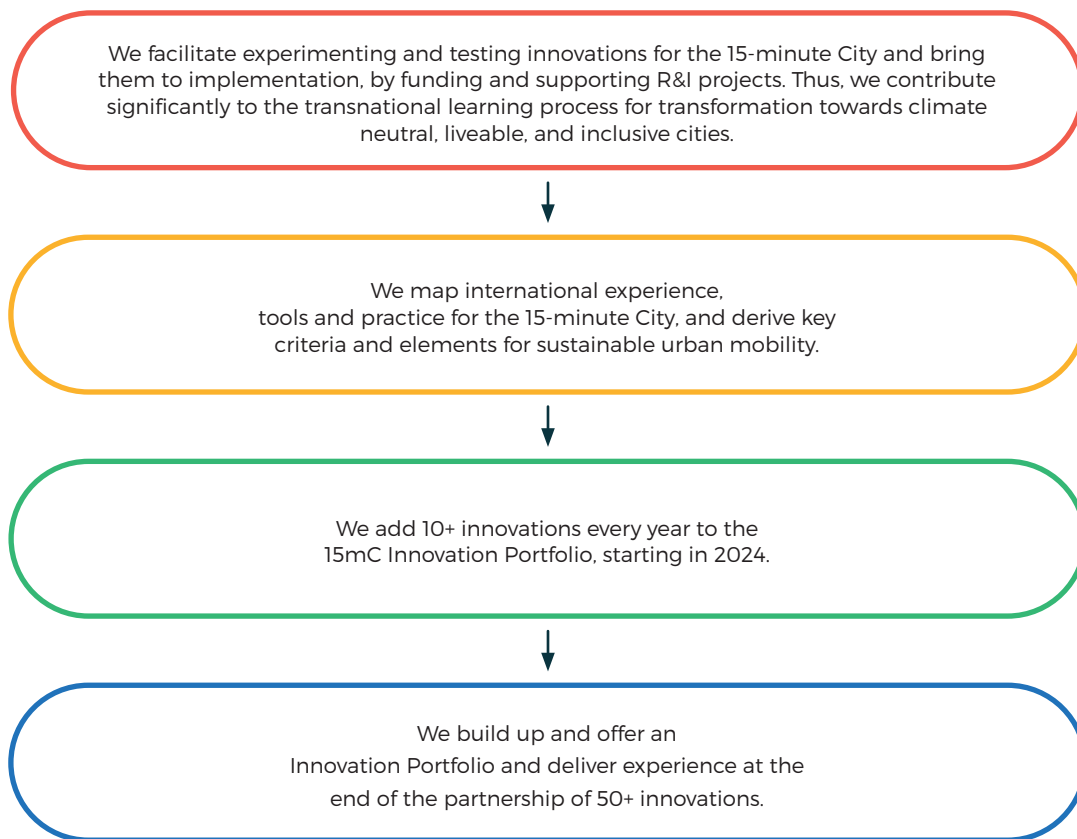


Figure 17: The 15mC Mission

### 3.2.2 What do we want to achieve?

The 15mC TP facilitates experimenting and testing innovations for 15-minute cities and supports implementation through R&I calls. Promising innovations – in a broad understanding, including both defining new practices as well as applying existing experience in a new context and encompassing social, organisational, institutional and technological innovations – will be identified, collected and disseminated in the “15-minute City Innovation Portfolio”. This portfolio builds on the structure of the key areas and starts from the baseline of existing knowledge set out by an initial mapping of strategies, policies, practices, methods and tools for a 15-minute City. It recognises different urban contexts and focuses on transferability and implementation. Starting in 2025, we will add 10+ new, improved or adapted innovations every year to the portfolio. At the end of the partnership, we will have contributed significantly to the transnational learning process for transformation towards climate neutral, liveable, and inclusive cities by offering a portfolio and delivering experience of 50+ innovations in the field of urban mobility transition. This proposition is represented in the mission of the 15mC TP:

### 3.2.3 How are we going to get there?

#### 1<sup>st</sup> phase (2022-2025)

Starting in 2022, the first activities in the DUT partnership will focus on preparing the ground for ten years of activities. This includes setting strategic directions and definitions as well as internal organisation and working structure. The latter is centred on inputs from national DUT partners, which are further developed in exchange with our problem owners and stakeholders from city administrations, research, companies, and civil society. Together with them, we want to advance the knowledge base on 15-minute cities and incentivise co-creative environments for testing and learning from innovative, practical approaches for urban mobility transitions.

At the core of our activities is the development of annual research and innovation calls. Promising innovations for 15-minute City approaches will be identified, focusing on the one hand on quick wins and “low hanging fruits” first, to bring the concept to life and lay the ground for public and political support. On the other hand, it is essential to start tackling options and approaches for the “hard nuts”, being specifically challenging topics for urban mobility, by covering these early in order to start learning circles and make use of the full duration of the partnership. The learnings and results of funded projects will be collected and disseminated in the Innovation Portfolio, which builds on existing activities and instruments for the 15-minute City and will continuously extend its range and scope throughout the partnership.

From the beginning, it is key to connect to relevant platforms and networks with similar goals to grasp synergies for thematic exchange, common formats and action. We intend to dock on to and build communities, mobilise stakeholders and support the alignment of activities of DUT partners. Additionally, local civil servants and city representatives represent a central stakeholder group for the 15mC TP. Therefore, we will build a City Panel to involve feedback from the local level, which will help us informing calls and activities with their needs and inputs, and co-create in shared strategies and priorities.

#### 2<sup>nd</sup> phase (2026-2028)

While the 1st phase focuses on the build up of contents, cooperation and first calls, in the 2nd phase emphasises the will to step up our activities within the 15-minute City. Therefore, we plan on broadening the range of stakeholders involved in the calls (such as front-runner, follower and starting cities, transdisciplinary research and companies) and taking advantage of the full field of innovations – especially business models, social and institutional innovation – to contribute holistic, new concepts and solutions for climate-neutral, inclusive and liveable cities. These inputs will inform further the strategic and thematic activities as well as the call development in DUT.

In the mid-term, first project results and evidence in the field of urban mobility transition will be available within DUT, enabling learning and take-up in further cities and contexts. In order to communicate results and recommendations further, we plan to extend our reach to and cooperation with other EU-partnerships, initiatives and platforms and continue mobilising relevant stakeholders. We want to go further beyond the scope of urban mobility and logistics, which also entails strong relations and interdisciplinary cooperation with the PED and CUE Transition Pathways in DUT.

Building on to the mapping of existing experiences in the Innovation Portfolio during the 1st phase, we will add 10+ new, improved or adapted solutions per year to the “15-minute City Innovation Practice”, starting in 2025.

#### 3<sup>rd</sup> phase (2029-2032)

In the last phase of the partnership, learnings will be made broadly available and disseminated, describing adaptation and necessary local capacity building processes for 15-minute City approaches. Elaborated next generation concepts will be open for take-up, testing, adaptation and translation into new contexts. Furthermore, this stage is about identifying and synthesising what has worked (and what has not) and what needs to be followed-up on – such as essential open questions, barriers and challenges. By collecting examples and grouping them according to topic and context, an overview of a colourful mosaic of 15-minute City innovations will be given and diffused, exchanging with various networks and the Knowledge Hub.

At the end of the partnership’s activities, we will have significantly contributed to the transnational learning process for transformation towards climate neutral, liveable, and inclusive cities by offering a portfolio and delivering experience of 50+ solutions in the fields of innovative urban mobility and planning, considering varying local contexts.

## 3.3 Enabling systems: European 15-minute City innovation ecosystem

Fulfilling DUT's ambition of driving the urban mobility transition, in the realms of urban mobility, public space and logistics, we must connect and add up to existing initiatives, exchange perspectives and harvest synergies, wherever possible. With the aim to establish strategic directions for partnerships in this thematic pathway of DUT, this section describes and cooperation with essential institutions, active in sustainable urban policy on mobility, public space and logistics.

As such, the 15-minute City Transition Pathway aligns with key strategies and directly connects to the UN Sustainable Development Goals, especially in the areas of goals 3 (health and well-being – mainly 3.6), 5 (gender equality – 5.1, 5.5 and 5.c), 9 (industry, innovation and infrastructure – 9.1 and 9.4), 10 (reduced inequalities – 10.2), 11 (sustainable cities and communities 11.2, 11.3, 11.6, 11.7 and 11.a) and 13 (climate action – 13.2 and 13.3).

The European Green Deal (2019) is the central point of orientation, being the instrument for achieving climate neutrality by 2050, and aiming at turning climate and environmental challenges into opportunities. In the New Leipzig-Charta (2020), we agree with the triple goal of creating inclusive, sustainable and productive cities. Furthermore, we emphasise the importance of the neighbourhood level perspective, where contemporary challenges of cities take form, are perceived, and directly impact daily life of city dwellers. The Urban Agenda of the EU focuses more specifically on cooperation and coordination between EU-level and needs of cities. Out of its 12 thematic partnerships, specifically the Partnership for Urban Mobility and Accessibility and the Partnership for Sustainable use of land and nature-based solutions are most relevant for the 15mC TP.

Owing to the JPI Urban Europe's bottom-up dynamic already at place when establishing the partnership, the 15-mC TP is designed to contribute to the high-level strategies mentioned above and especially contribute to achieving the Mission "100 Climate Neutral and Smart Cities by 2030", driven by the European Commission. We aim at establishing and promoting a robust network of institutions, projects, and knowledge throughout the duration of the partnership, where innovative approaches to urban mobility and logistics can be experimented with and tested in real life. Similarly, we will contribute to the development and activities of the Urban Transition Mission within Mission Innovation adding to global perspectives on the topics.

Additionally, the 15mC TP connects to, references its activities with and builds on results of other similar EU-partnerships, especially with the partnerships on

- Zero-emission Road Transport (2Zero), which helps gaining insights into the "improve" approach by focusing on electrification of mobility. Technological innovation, required infrastructure, and services can then be taken up in the 15mC TP and test and validate their potential.
- Connected, Cooperative and Automated Mobility (CCAM), who's findings can be used in the 15mC TP to investigate applications and impacts of intelligent infrastructures and automated vehicles.
- People-centric Sustainable Built Environment (Built4People), which can support the understanding of the reciprocal relationship of construction and mobility and regulatory innovation in the building sector.
- EIT Urban Mobility with a similar aim and understanding as in DUT, EIT UM has a stronger emphasis on entrepreneurship, start-ups and business models, which offers fruitful synergies.

The 15mC TP works on connecting to European and global initiatives and networks, as we can harness extensive synergies, from building on expertise and networks, to exploring the status-quo and driving forward the strategic development of the 15-minute City concept, to mobilising stakeholders for call promotion and dissemination activities. Here, especially C40 and Global Covenant of Mayors, POLIS network, CIVITAS, ICLEI and the ENTRANCE platform are to be named.

Finally and most importantly, cities and urban areas are our key stakeholders, being often problem-owners, central carriers of localised knowledge and level of implementation of FTI-projects and their approaches to climate-neutral mobility. Their needs and expertise are critical for the development of the 15mC TP's activities, its calls and impact. Therefore, we establish a City Panel that will accompany our activities as reflective body that enriches and grounds the transnational co-creation in DUT with local perspectives. Furthermore, we want to build on the diverse strategic and practical approaches to neighbourhood-oriented, people-centred urban mobility and logistics, as in Paris' "Ville de ¼ Heure", Portland's "Complete Neighbourhoods", Melbourne's "20-Minute Neighbourhoods", the "45-min City" in Singapore, Barcelona's "Superblocks" („Superillas") or Bogotá's "Barrios Vitales" and many more.

### 3.4 Key areas of action

DUT is a co-created and co-developed partnership that builds on exchange with national partners and agencies funding JPI Urban Europe, researchers and practitioners of city administrations and enterprises. Especially inputs from cities were central for elaborating Key Areas of action for the 15mC TP. In three focus group meetings in the second half of 2020, needs and challenges in current activities and visions for a sustainable future were collected, discussed, and reflected further in stakeholder events, such as the AGORA Dialogues, JPI Urban Europe Policy Conference or national consultations until end of 2021. Doing so, we want to make sure to consistently focus on and direct our attention to “real-world” problems that define and shape the needed transformation towards climate neutral, liveable and inclusive cities. The extensive number of inputs, suggestions and feedback for urban mobility transitions was compiled in the 15mC TP, thus providing the content-related underbelly of our activities and the base for the elaboration of calls.

Stemming from this challenge- and needs-based co-creative process, the Key Areas (KA) are tackled in four areas, being personal mobility, urban planning and public space, urban logistics, and innovative governance. Each KAs contain three to four themes (TH), which structure, guide and describe our strategic and content-related direction further (see figure 18).

A third layer of transition topics was developed for the Key Areas, but – due to its level of detail and extent – will not be part of this roadmap, while naturally being key for strategic and call-related activities in the 15mC TP. When reading the following section, it is important to consider that all inputs were created together closely with stakeholders from national and local urban policy. In line with principles of mission-oriented innovation policy, we decided to keep this policy-related formulation to indicate a greater intention and directionality towards mobility transition. The following sections present priorities and the narrative for action in the 15mC TP of DUT.

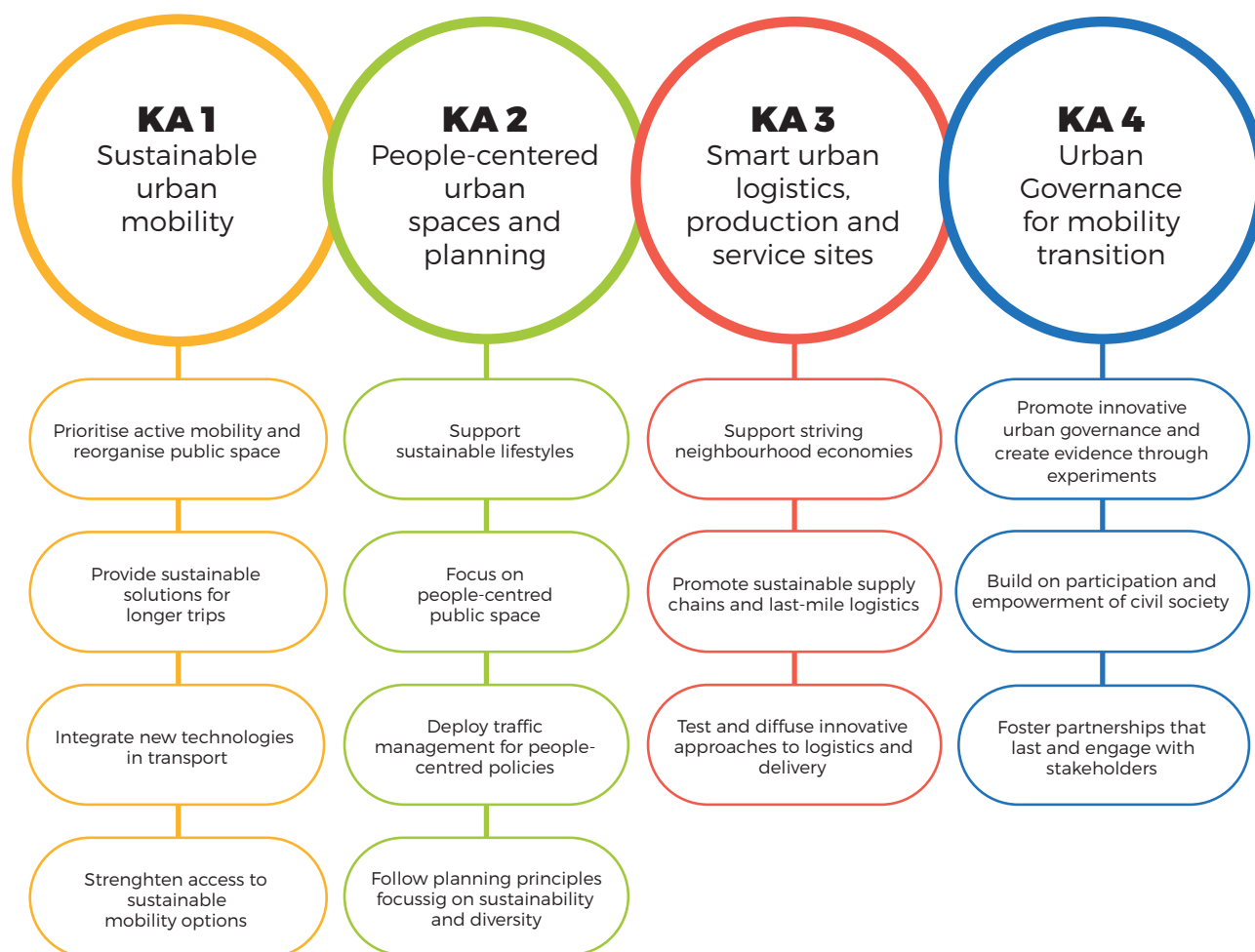


Figure 18: Four key areas and underlined topics in the 15mC TP

### 3.4.1 KA 1 – Sustainable urban mobility

With the 15-minute City concept, DUT proposes a vision for urban mobility transformation, where traffic planning is integrated into comprehensive and strategic urban planning and considers different mobility needs, supply and opportunities from a neighbourhood up to the metropolitan scale, also comprising inter-city mobility. However, at the core it advocates that people must have the possibility to fulfil their daily needs through active mobility within their neighbourhoods, added up by sustainable multi-modal transportation for longer distances, thus reducing the need for private car-based mobility to a minimum.

Therefore, the 15-minute City is essentially based and built up on the walkability (and bike-ability) of neighbourhoods, where the quality of experience for pedestrians, cyclists and public transport users defines a big part of the 15-minute City concept. This requires a fair distribution of public space, prioritising active mobility modes. Driving still fulfils an important function, but should neither be the first, nor the default choice. Here, needs-oriented and interoperable digital services, like Mobility as a Service (MaaS), come into play and bring different individual, shared and collective mobility options together, which has the potential to widen mobility choices and accessibility.

Digitalisation is a main driver of this mobility transition because digital communication technology helps us to rethink the organisation of daily activities, also by providing virtual mobility and new instruments for economic, institutional and social innovation. Nevertheless, the 15-minute City is not a technological exercise, but focusses on how we want and need to shape our urban environments sustainably. One key challenge for urban mobility lies in low-density neighbourhoods, as in the urban fringes and suburban areas, where it will be specifically hard to bring zero-emission mobility and urbanism into practice.

- TH 1.1.: Prioritise active mobility and reorganise public space
- TH 1.2.: Strengthen access to sustainable mobility options
- TH 1.3.: Provide sustainable solutions for longer trips
- TH 1.4.: Integrate new technologies in transport

### 3.4.2 KA 2 – People-centred urban spaces and planning

The built environment fundamentally predetermines mobility options: all urban movement takes place within the streetscape, which in turn is shaped and defined by buildings and the urban morphology as a whole. Therefore, urban planning and design are focal points for rethinking mobility and logistics in cities. The 15-minute City concept puts forward a new interpretation of the concepts of the polycentric city and the city of short distances and emphasises the need for combining accessibility with high quality public spaces in and around lively and functionally mixed neighbourhoods. Urban density and diversity of lifestyles are essential factors, as they lay the foundation for offering urban services and mobility options. These topics are fundamental parts of public policy, urban governance and management practices.

People-centred squares and streets are essential for well-being, health and the social life in a neighbourhood and serve as a second living room – all of which has become even more essential and visible in times of the global pandemic. (Non-commercial) urban space is scarce. Nevertheless, we dedicate the biggest share to moving and parking unsustainable and spatially inefficient vehicles. Parallel to how political goals and social behaviour will need to change towards climate neutrality within the next years, so must the distribution of public space, as its layout and design enforces the way in which we live and move. The 15-minute City concept further promotes flexible and multifunctional use of public space: Squares and streets should be adaptive enough to accommodate different functions or urban services, possibly even depending on the time of the day. Public space should be safe open and attractive for all age groups as well as for shared and centred on the modes of active mobility.

All of these elements have to come together within the institutional and regulatory framework in urban planning. There, holistic, evidence-based and people-centred strategies (sustainable urban mobility plans – SUMP) and tools for traffic management, are needed. These activities and contemporary challenges in urban mobility call for better coordination and cooperation across administrative boundaries in functional urban areas.

- TH 2.1.: Follow planning principles focusing on sustainability and diversity
- TH 2.2.: Focus on people-centred public space
- TH 2.3.: Support sustainable lifestyles
- TH 2.4.: Deploy traffic management for people-centred policies

### 3.4.3 KA 3 – Smart urban logistics, production and service sites

For making climate neutral cities a reality, there will be a massive coordinated effort necessary to reorganise city logistics and delivery to form a sustainable urban metabolism. Urban freight transport is key to a smooth supply with products of a city and encompasses transport of all goods, from delivery of parcels, to building materials and waste disposal. The underlying goal of sustainable urban logistics is to find ways to increase its economic and ecologic efficiency, while at the same time lowering the burden on urban infrastructures and raising quality of life for city dwellers. To address these challenges, new solutions, procedural innovation and cooperation are needed that help reducing the number of trips through better integration, coordination and sharing of infrastructure among shippers. As most products consumed in a city are brought in from beyond the administrative city boundaries, the scope has to be widened to at least the functional urban area, but preferably to a (supra-)regional level, when thinking about sustainable supply chains.

In the last years, e-commerce has increasingly taken over business of traditional street stores. Thus, transporting goods to households grows dynamically as a service expected by the customer, which changes the scale of last-mile logistics drastically. Therefore, solutions for green logistics are needed that go together with the decentralised approach of the 15-minute City, which are efficient in their use of public space and focus on sustainable transport modes for last mile logistics.

Dense, mixed-use neighbourhoods that accommodate many different functions makes it possible to satisfy local needs within a close perimeter and offer vibrant street life and a wider diversity of local lifestyles. Adding up to traditional urban office spaces, co-working infrastructures for creative professionals and teleworking, (small) manufacturing and production companies in the city essentially contribute to the aim of promoting a mix of functions, as they often synergise with commerce, services or educational institutions and training opportunities. A broad urban mix keeps the distances between home, work place and local suppliers minimal, rendering modes of active mobility the first choice.

As not all productive activities are destined to be combined with residential functions, but are necessary for thriving urban economies, it is central to preserve industrial zones as working hubs within the city boundaries as well as to integrate logistic and industrial areas into early stages of urban planning.

- TH 3.1.: Support striving neighbourhood economies
- TH 3.2.: Promote sustainable supply chains and last-mile logistics
- TH 3.3.: Test and diffuse innovative approaches to logistics and delivery

### 3.4.4 KA 4 - Urban governance for mobility transition

The ambition of the local political and administrative system largely affects and influences the depth of the urban mobility transformation. Therefore, this Key Area addresses overarching process-related principles and activities for realising 15-minute City concepts, and considers ways of how a city administration can demonstrate lived openness to mission-orientation and institutional innovation to pursue change, from within its strategic operations to everyday tasks.

In highly complex and rapidly changing urban environments, it is key to promote innovative urban governance, resting upon regulatory frameworks and mind-sets fostering evidence through experiments. Considering the time constraints for mobility transition, quick rounds of testing and experimenting of measures in real-world settings are indispensable. This requires a holistic approach to urban policymaking, building on long-term partnerships with stakeholders as well as participation and empowerment of civil society, to mobilise private investment and distribute ownership for the transition.

These activities require rethinking internal processes within a city administration ambitiously and encompass elements from municipal visioning of the transition, to building up capacities for change processes, offering a framework to allow for testing and experimentation of approaches – such as in temporary uses or demonstration of pilots in urban space – to institutional learning as well as monitoring and impact evaluation.

- TH 4.1.: Promote innovative urban governance and create evidence through experiments
- TH 4.2.: Foster partnerships that last and engage with stakeholders
- TH 4.3.: Build on participation and empowerment of civil society

## 3.5 A perspective on systemic innovation - the 15mC Innovation Graph

In order to support the transformation of an urban mobility system, the 15-minute City framing has to recognise and think innovation in a systematic way. In the last decades, the dominant focus on technological innovation led to improvements (e.g. on low-carbon technology), but has proven insufficient to drive an encompassing green transformation of urban economies or to achieve impact at system level. Building on UCL methodology for mission-oriented roadmaps, we define system innovation as “portfolio of interdependent and mutually reinforcing innovations which together have a potential to transform systems delivering key services to societies”<sup>47</sup>. This understanding emphasises the importance of aligning innovations across actors and sectors by building a directional framework.

Therefore, within the 15mC TP we mapped our Key Areas and themes in an innovation graph (see Figure 19), differentiating between the degree of change, inquiring if an innovation can be realised within the current development path or it requires a reorientation of the direction where we are heading first (evolutionary vs. revolutionary innovation) on the one hand. On the other hand, we ask which dimension of change is most relevant for implementing the topics. By doing so, we want to highlight on which levels we have to take action, where our focus areas – as well as possible blind spots – lie and how the topics can be brought together in order to drive urban mobility transitions.

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<sup>47</sup> Miedzinski, M., Mazzucato, M., Ekins, P. (2019), A framework for mission-oriented innovation policy roadmapping for the SDGs: The case of plastic-free oceans; UCL Institute for Innovation and Public Purpose, Working Paper 2019-03, London: [https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/a\\_framework\\_for\\_mission-oriented\\_policy\\_roadmapping\\_for\\_the\\_sdgs\\_final.pdf](https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/a_framework_for_mission-oriented_policy_roadmapping_for_the_sdgs_final.pdf)





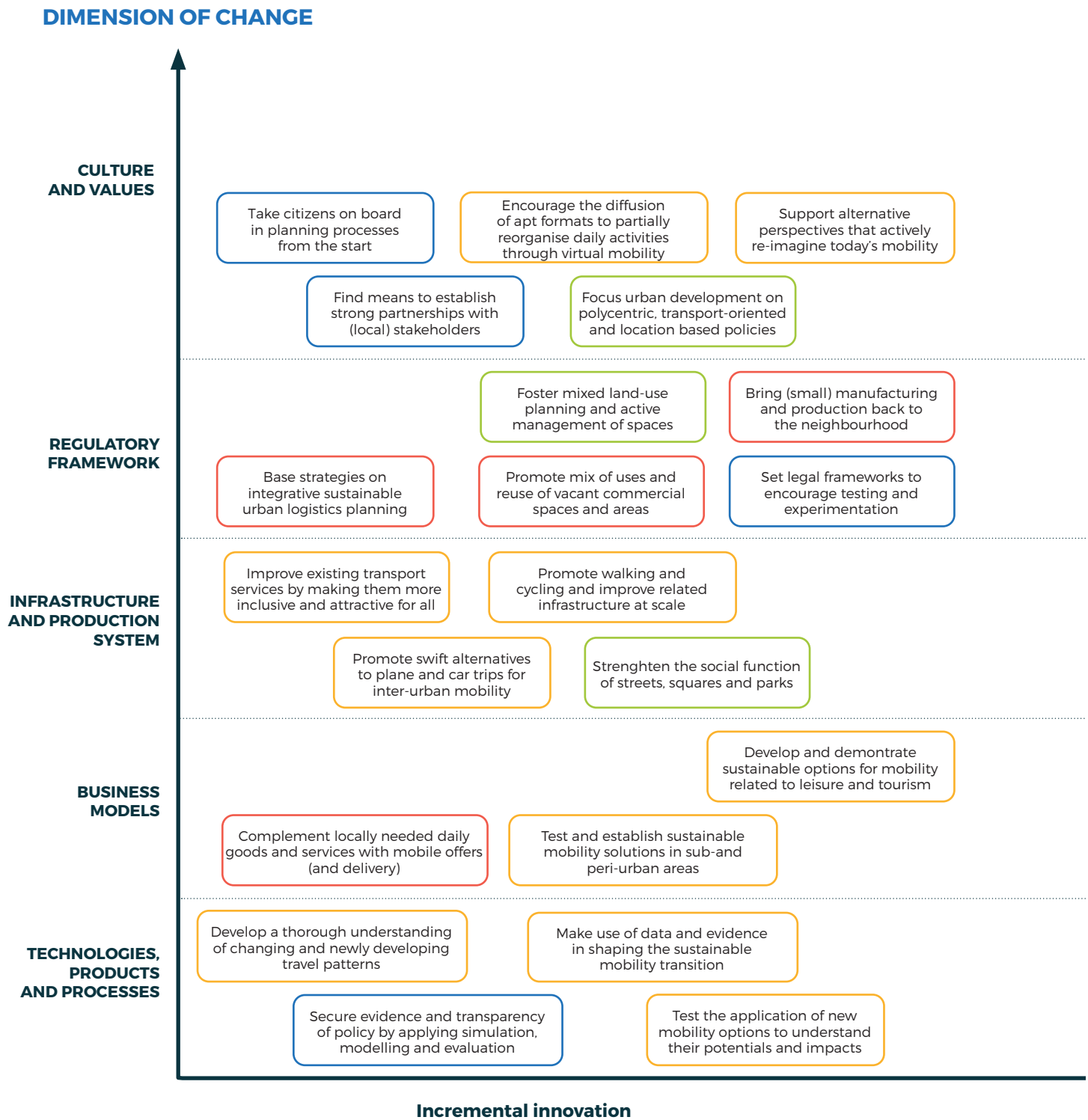
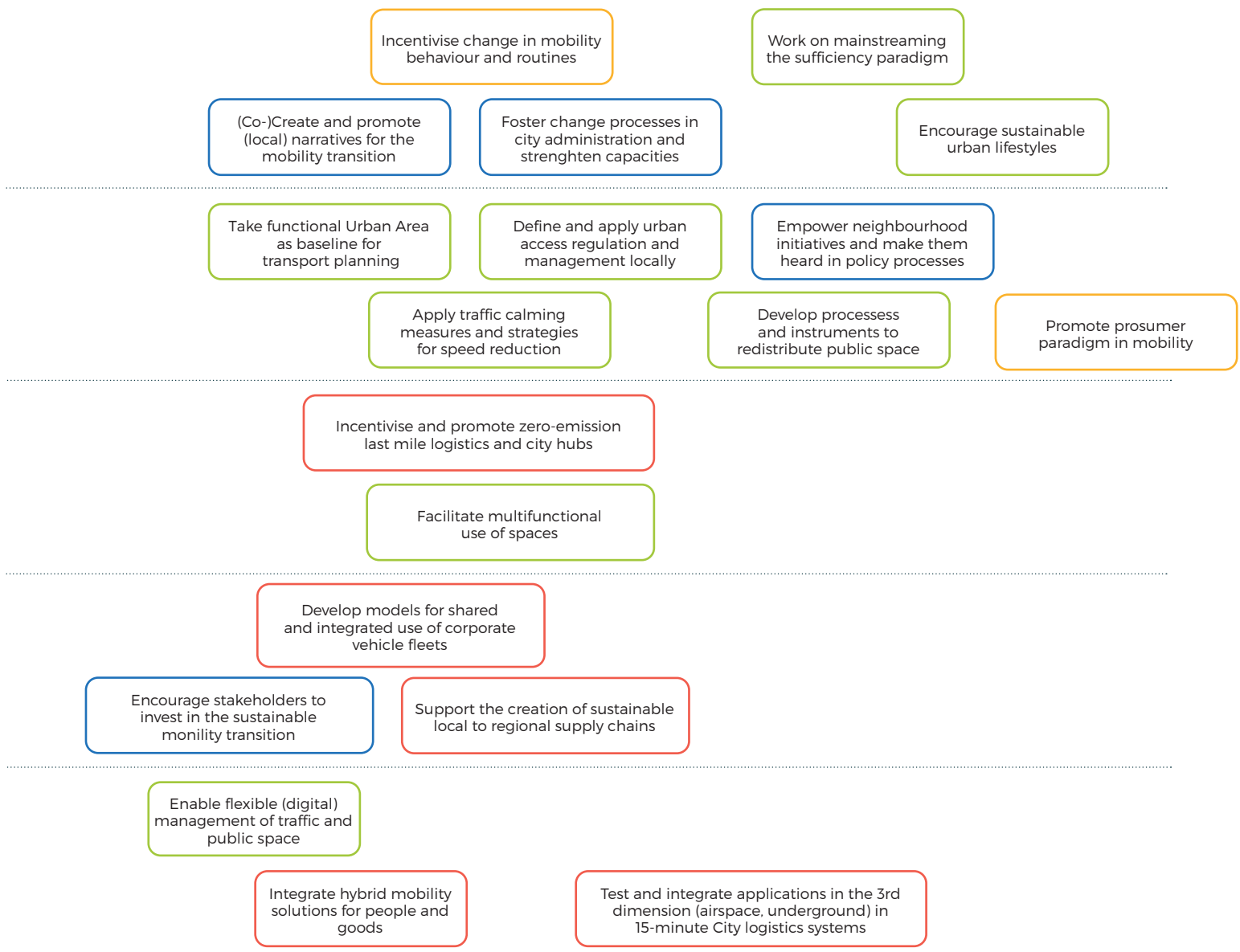


Figure 19: Innovation graph – identified emerging topics in the 15mC TP

### INNOVATION GRAPH 15mC



Disruptive innovation

DEGREE OF CHANGE

**Key Area 1**  
Multi-Model and Sustainable urban Mobility

**Key Area 2**  
Human-centered Urban Spaces and Morphology

**Key Area 3**  
Smart Urban Production, Logistics and Services

**Key Area 4 (+1)**  
Urban Government and Governance for Transition



# 4. Roadmap for Circular Urban Economies for a regenerative urbanism Transition Pathway

## 4.1 Circular interventions for a regenerative urbanism

The challenge at hand is threefold:

First, 70-75% of the global use of natural resources occurs in cities and urban areas (UNEP, 2017). Since cities cannot provide all these resources themselves, they increase the environmental pressure on other domains of planetary life such as access to fertile land, nutrients, clean water and air (EMF, 2012). Furthermore, cities are intrinsically inefficient due to their density of people and materials, (Jacobs, 1969) and they generate large volumes of urban waste in the linear economy.

Second, cities are the primary catalysts of economic development and prosperity, but the created wealth in urban economies is not equally accessible for all. Capital accumulation from real estate and finance speculation share the urban space with sectors characterised by insecure jobs and low wages, resulting in a lack of social cohesion. Socio-economic inequality is an increasingly stressing urban challenge across the world.

Third, and although European urban areas nourish a relatively high degree of biodiversity, they are still fragile and not nearly as circular, permeable, and biodiverse as needed to support human and planetary wellbeing, including climate action.

The urban density of people and materials also provides an opportunity: people living close to one another can use resources more efficiently, and cities offer scales and sizes that are necessary to close material loops. To benefit from this opportunity, cities should preferably be reimagined as complex ecosystems, inputs and outputs need to be linked, and urban areas must be designed as life-giving places. Cities characterised by a

regenerative urbanism can repair the degraded natural cycles of the planet while supporting a high quality of life for all their inhabitants. This is the core of the Circular Urban Economies for a regenerative urbanism (CUE) Transition Pathway.

The reimagination and redesign of cities is not only about striving for sustainability, but about providing more with less, and implementing self-enforcing circular measures that not only close material loops but provide socio-economic benefits in their surrounding urban communities as well. The CUE transition pathway represents a transformative drive to facilitate sustainable, healthy, inclusive, and attractive urban places. This is a move beyond merely making business per se towards ensuring that economic activities in the urban realm serve the community, satisfy societal needs, and respect ecological limits. It deals with properly valuing the long-term impact of business activities on the planet and human societal wellbeing. It also aims at encouraging regenerative mindsets and practices, instead of prioritising the short-term financial returns which characterise the currently dominating economic regime.

The resource intense ways of urban life have made cities large, rich, and diverse deposits of raw materials, continuously reliant on flows of goods and services to sustain their ways of working. Green and just urban spaces can only emerge if initiatives are implemented that simultaneously address urban areas as sites of unsustainable consumption and socio-economic inequality. This is the reason why urban communities characterised by regenerative design and development are desirable (Reed, 2007); they strive towards increased urban livability, while at the same time reducing cities' environmental footprints by closing material loops (Girardet, 2015). Increasingly circular urban economies are the means, and regenerative urbanism is the goal. To achieve this transformative change, the combined efforts of researchers, innovators and stakeholders is badly needed.

## 4.2 The Circular Urban Economies mission

The CUE transition pathway aims to foster the urban planning and design of places characterised by regenerative urbanism, i.e., liveable, inclusive, and green communities and neighbourhoods that are sustained by circular urban economies and resource flows. Thus, it encourages a multitude of tools and approaches that together and from a holistic, people-oriented, and challenge-driven perspective, increased urban resource efficiency and livability. By collecting examples and clustering them according to topic and context, the CUE TP will provide a portfolio of 50+ solutions that can contribute to the circular transformation of urban areas until the end of the partnership.

### 4.2.1 Where are we?

Although many solutions to increase circularity and increase resource efficiency already exist, these solutions are not always connected, neither to matters of equity, justice, and social cohesion, nor urban greening approaches. Additionally, the institutional and regulatory surrounding is often lagging or simply not in place yet, thus blocking an encompassing shift towards sustainable behaviour at the individual as well as structural level.

Therefore, the CUE transition pathway supports stakeholder and public engagement in co-design processes and transformative activities that create socially cohesive and green urban neighbourhoods. It focuses on delivering evidence for transformative mechanisms, tools, and solutions, and the development and testing of tailored concepts that ensure mutual learning processes for best practice exchange and transfer.

While putting matters of social cohesion and urban greening approaches at the centre of attention, the pathway also gives direction and provides space for critique that shape challenges and raise questions. As such, it considers and involves approaches and concepts that push transformation towards regenerative urbanism, as well as academic scrutiny of practice-as-usual as well as transformative initiatives.

## 4.2.2 What do we want to achieve?

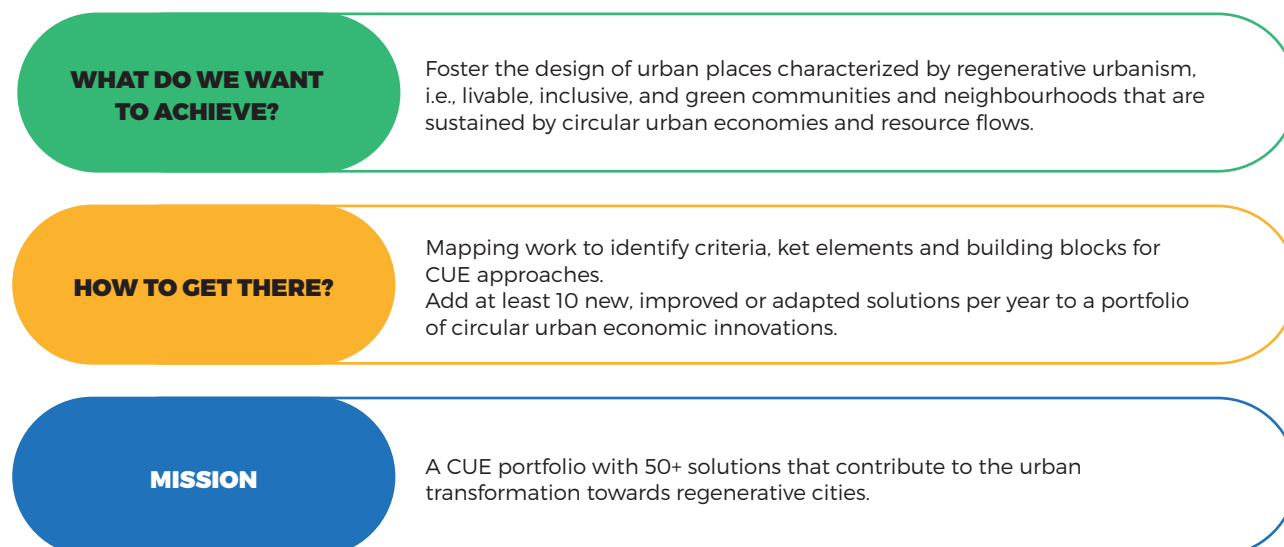


Figure 20: The CUE Mission

The circular economy, as characterised by the Ellen MacArthur Foundation (2021), is a framework for an economy that is regenerative by design. The long-term objective and target for the CUE transition pathway is to encourage cities to scrutinise, translate and implement circular ways of thinking into the urban realm, and to strive towards the following goals<sup>48</sup>:

- The creation of equal, diverse, accessible, and liveable urban environments, characterised by the ambitions of the New European Bauhaus. These should display cultural, social, and aesthetic needs and values while safeguarding the natural and cultural heritage.
- The construction of a robust urban infrastructure that renders all urban inhabitants equal chances to live a healthy life, regardless of socioeconomic status, and background. This infrastructure can for example be based on grey-to-green design, multifunctional urban greening approaches and ecosystem restoration/regeneration, as well as innovative ways to integrate energy, water, and waste systems.
- The establishment of zero waste communities that display self-sufficiency at different scales by combining resource recovery and matters of landscape democracy (aspects such as exposure to landfill sites, pollution, hazardous materials etc.), including the water cycle.
- The creation of blue/green multifunctional designs that reintroduce, reintegrate, and restore urban ecosystems, mitigate emissions, regenerate urban soils, and reduce energy demands. These designs should increase the attractiveness of urban areas as well as encourage coalescence of social groups, especially ensuring access for marginalised and vulnerable communities.
- Foster capacity building for urban and regional leadership, and governance models based on co-designed and the involvement of various actors and social groups in democratic community building.
- Nourish the evolution of digitally enhanced urban spaces and open, transparent, and understandable communication and interactions between citizens and city officials.
- Encourage the planning of accessible, safe, and inclusive communities where risk is mitigated by principles promoting climate resilience, weatherproofing, healthiness, and attractiveness.
- Establishing thriving and inclusive urban economies that provide attractive commercial facilities and business opportunities while assuring financial security for those who cannot provide for their own livelihoods. Value creation models that account for and integrate social and environmental return on investment are encouraged.

<sup>48</sup> These goals are aligned with the section on "Enabling systems" describing the policy landscape relevant to the pathway as well as the Key Areas of the pathway.

### 4.2.3 How are we going to get there?

To accomplish its mission, the CUE transition pathway will incentivise co-created research and innovation efforts that shall strive towards transformative change and a circular economy at different urban scales. It will consider this transformation from an integrated point of view and address resources and material flows in the context of buildings, districts, neighbourhoods, suburban and peri-urban areas as well as regionally functional urban areas across the urban-rural continuum. The CUE transition pathway also encourages community support and the development of urban sharing economies. Matters of landscape democracy, equity and social inclusion will be supported, as well as innovative redesigns of governance, funding, and business models, as well as innovative ways to perform impact assessments to ensure that implemented interventions achieve their goals.

At the core, the CUE transition supports the challenge-driven conceptual development of circular resource flows and regenerative urbanism. Priorities here are dialogues and co-design with state-of-the-art researchers as well as multi-actor problem-owners from local settings. Specific mobilisation of and co-creation with transnational stakeholders will be carried out. A city panel of urban planners, public servants, and city representatives will be established and activities to mobilise and support urban research and innovation actors and urban governance will be initiated. Dialogues and co-creation will result in position papers and policy briefs that can provide guidance for stakeholders that work with social and technical infrastructure, transition management processes, and circular urban economy issues in their local environment.

Mapping and synthesis of project results and state of the art research and innovation knowledge production will be carried out. This entails mapping exercises and analysis across transnational and international projects on aspects relevant to circular economy development. Suggested topics include multifunctional urban greening approaches, urban doughnut economy development, analysis of urban climate change mitigation practices and adaptation frontiers, as well as transformative capacities in local urban innovation ecosystems. In addition, alignment, and coordination tasks with/between the other two DUT transition pathways (PED and 15mC) as well as with transnational networks and relevant partnerships, is foreseen.

Finally, actions to support the preparation of joint call topics and other instruments will be undertaken, processing inputs from DUT Synergies Forum and AGORA events, the European Commission, and transnational networks.

Crucial to achieve the transition pathway ambitions is the development and improvement of the following means and methods:

- Urban green design methods that increase the circulation of organic and inorganic materials, at various spatial scales and coherent to local climate and dynamics.
- Cutting-edge approaches to clean technology, entrepreneurial creativity, and social innovation.
- Capacity building for urban administrations to address the challenge of keeping the resource use of urban areas within planetary limits. This entails fostering innovation in urban public administrations in their role as process enablers, with a special focus on waste prevention solutions.
- Capacity building for authorities and urban communities to foster operative and locally integrated governance and innovative business models. Achieving such capacity building requires knowledge-based and community-centered approaches as well as thorough policy translations between different urban planning and design contexts.
- Incentivise resource sharing and reuse, through social and entrepreneurial innovation.

#### 1st phase (2022-2025)

In the short-term, it will be key to ensure quick implementation and start learning circles. This should be done in collaboration with relevant stakeholders and be connected to relevant networks and collaborative platforms to pave the way for regenerative urbanism as a topic of discussion and reflection. Therefore, during 2022, a CUE City Panel will be formed to provide input to the pathway of the challenges for cities and municipalities in implementing circular economies for regenerative urbanism.

Second, mapping and synthesis work will be engaged in to identify key elements and building blocks for circular urban economy approaches, focusing on quick results. This work could for example be initiated in experimental settings, living labs or through the means of other co-creative methods that involve multi-actor partnerships and locally connected stakeholder groups. Here, the emphasis is also on application, implementation and validation of existing knowledge, concepts, and solutions for specific challenges of circular urban economies in practice, to generate scalable learnings on what regenerative urbanism entails.



Last, the first year of activities will also include the development of criteria to monitor the pathway's progress in terms of funded projects during the entire program period. These will be revisited and calibrated during the medium- and long-term periods of the program, in accordance with the knowledge produced.

### **2nd phase (2026-2028)**

In the mid-term, the first project results will be available making it possible for other cities to build upon the learnings from first movers. These knowledge items should preferably include business models and social innovations that enable transformative change based on urban greening approaches for urban regeneration, climate adaptation and a healthy urban environment. Examples of implemented urban mining strategies for increased circulation of inorganic materials are also sought after.

The next step involves the development of holistic and radical concepts and solutions that prepare systems, models, and processes for regenerative urbanism. This will be achieved through broadening (to other sectors, companies, institutions), deepening (more thorough understanding, better tools, proven results) and spreading (mainstreaming existing knowledge and tools) processes, so that solutions can be replicated from one to numerous neighbourhoods within a city, at the inter-city learning level, as well as adapted and translated to larger city sizes and contexts.

To the initiated portfolio of circular urban economic interventions established during the 1<sup>st</sup> phase, we will add at least 10 new, improved, or adapted solutions per year, starting in 2024.

### **3rd phase (2029-2032)**

In the long-term, the achieved learnings will be strategically disseminated to benefit larger numbers of people and impact norms, practices, and expectations as well as policy and regulatory frameworks. Elaborated next-generation models that address resource saving, sharing, recycling, and reuse as well as matters of inclusiveness, accessibility, equality, and justice as key principles in urban development, will be tested, replicated, and scaled in different ways. At the core, this stage is about identifying and generalising what has worked and what should be followed-up on, as well as translate the CUE transition pathway's achievements to the PED and 15-Minute City transition pathways as well as vice versa. By collecting examples and clustering them according to topic and context, the portfolio of circular urban economic solutions will contain 50+ solutions that can contribute to the transnational learning process for the urban transformation towards regenerative cities.



## 4.3 Enabling systems: the Circular Urban Economies European innovation ecosystem landscape

On top of driving urban transformation and facilitating regenerative urbanism at different spatial scales, the CUE transition pathway will also connect to the relevant policy landscape and networks (such as ICLEI, EUKN, ERRIN and Eurocities).

There are several goals, policies and initiatives in the global, European, and urban arena that are highly relevant to the CUE transition pathway. Several of the targets in the United Nations 2030 Agenda Sustainable Development Goal 11 are addressed by and support the transition pathway's priorities (11.3 – 11.7 as well as 11.a and 11.b).

The UN Paris Agreement on climate change implementation is aligned to the CUE transition pathway in its encouraging of the development of circular urban economies to support more efficient resource use and sharing approaches to decrease the over-consumption of e.g., food, water, and energy.

The UN-Habitat New Urban Agenda is also highly relevant to the CUE transition pathway. Its interlinked principles of leaving no one behind poverty wise, ensuring sustainable and inclusive economies by well-planned urbanisation, and ensuring environmental sustainability by promoting for instance sustainable use of land and resources and protecting ecosystems and biodiversity, are echoed in the pathway.

Likewise, the three dimensions of the New Leipzig Charter stating that cities should be just, green and productive are of high relevance to CUE transition pathway, as well as the key principles of good urban governance and the ambitions to strengthen capacity building in cities.

The New European Bauhaus (NEB) supports public participation processes and high-quality built environment which are also central to the CUE transition pathway. The NEB policy aims at fostering a co-designed systemic approach to 'quality climate urban transformation', and the possibility to create urban spaces, where citizens' social, emotional, cultural, and aesthetic needs and values are met by new technologies. Such a transformation is based on a deep digital transformation and a profound change in political, economic, social, and industrial systems in European local administrations, which resonate to the CUE pathway's ambitions.

The European Green Deal is also a valuable document for the CUE transition pathway, especially its focus on climate neutrality, a clean and circular economy, energy and resource efficiency in construction and renovation, preserving and restoring ecosystems as well as healthy and environmentally friendly food systems.

Similarly, the EU Mission on Climate-Neutral and Smart Cities has important connections to the CUE transition pathway as well as to the whole DUT partnership programme. For example, the mission aims to contribute to energy and resource efficient renovations of buildings and urban areas that combines sustainability, inclusion, and aesthetics in a human-centred way.

Last, the Urban Agenda for the EU contains 14 prioritised themes which are all relevant to the CUE transition pathway, those focusing on circular economy and sustainable use of land and nature-based solutions are key the CUE transition pathway's mission.

## 4.4 Key areas of action

Three identified key areas will guide the work with the CUE transition pathway going forward. Key Area 1 focuses on how planning and urban design, by means of urban greening approaches, can improve the circularity of urban material flows to achieve resource efficiency by avoiding or using fewer and less raw materials. Key Area 2 evolves around leadership, vision, governance, and how circular interventions can foster social cohesion in cities and mobilise people for transformative change. Key Area 3 is aimed at the mobilisation of actors and tools to achieve increased urban circularity, and the innovation ecosystem in which circular urban economies are embedded.

While some aspects and issues found in these key areas are suitable for conventional joint calls for research and innovation projects, others may be more suitable for other types of program activities. These may come in the form of strategic synthesis work enabled by knowledge hubs; they might be related to AGORA events and for instance focus on capacity building and impact creation. They might also be the focus of European and international cooperation.

The way urban research and innovation is conducted is a continuously important aspect to consider in the Key Areas, that is, the 'how?' in approaches and methodologies. Crucial to achieving the mission is the support of co-creative and multi-actor participatory ways to work with urban systems, local communities, etc. It is important that all activities in the CUE transition pathway are designed to address aspects highlighted in the key areas, themes, and topics. These items are mainly drawn from focus groups and stakeholder dialogues and exchanges, elaborated upon by JPI Urban Europe funding agencies, and are described in greater detail below.

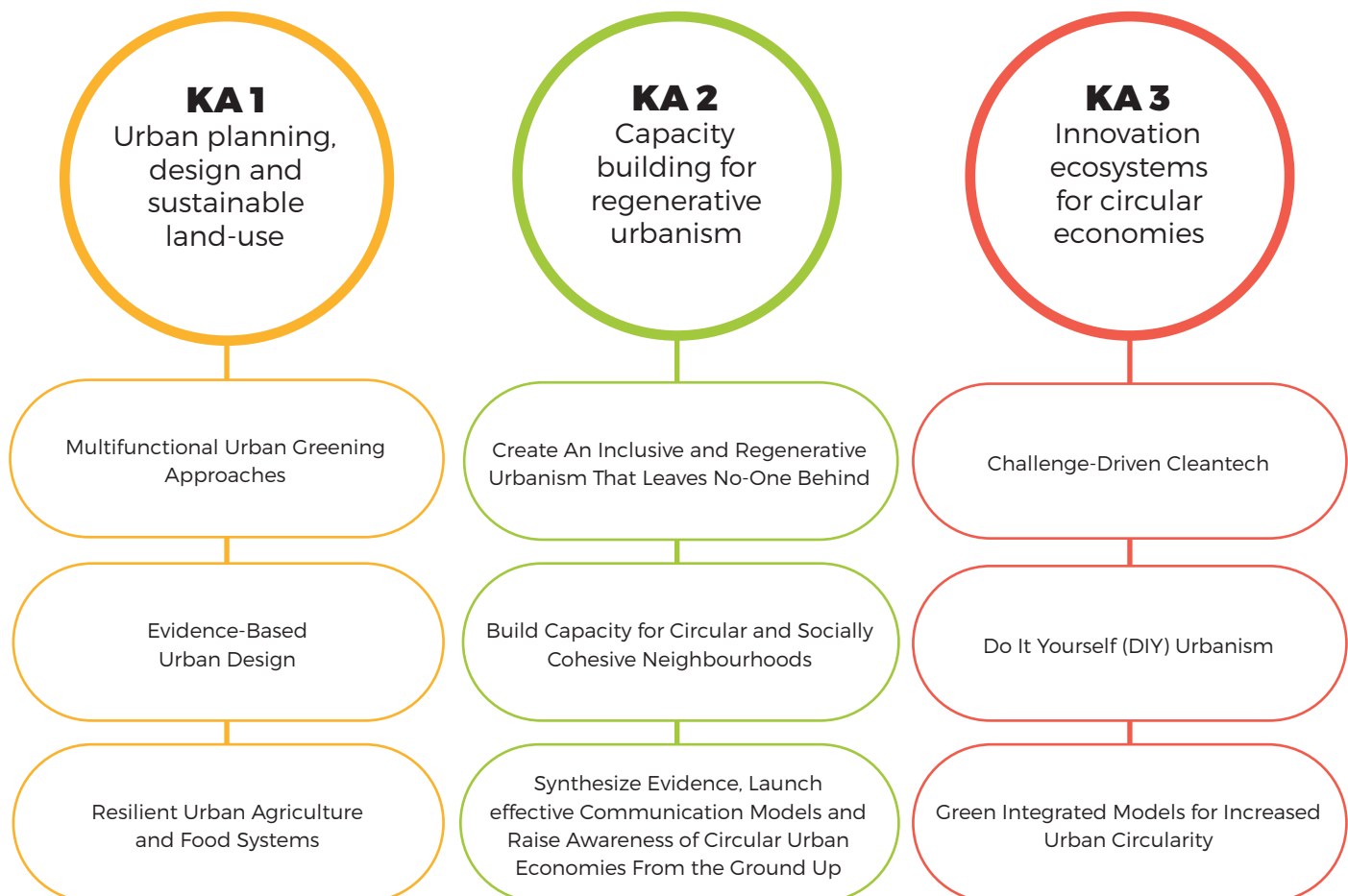


Figure 21: Three key areas and underlined topics in the CUE TP

#### 4.4.1 KA 1 – Urban planning, design, and sustainable land-use

Key Area 1 (KA1) focuses on how the flows of organic as well as inorganic materials can be better circulated in urban and metropolitan regions (including peri-urban areas and the urban-rural continuum). Critical scrutiny of current planning processes and urban design methods are encouraged to address how urban land and resource use could be planned differently to increase resource efficiency to avoid or use less raw materials.

Concerning urban flows of renewable resources, KA1 includes different multifunctional urban greening approaches across urban scales and neighborhoods. These approaches for example address ecosystem services, blue-green infrastructure, ecosystem restoration and issues related to greywater and runoff collection, treatment, and reuse. Through the means of, for example, nature-based solutions, these approaches can mitigate emissions, regenerate urban soil, and reduce energy demands in ways that also increase the attractiveness and quality of life in urban communities. Urban agricultural approaches to facilitate locally produced food and increase nutrient collection and reuse in urban contexts are encouraged.

KA1 also includes urban mining approaches that strive towards increased circulation of inorganic materials from the built environment, like solid waste such as metals, glass, and concrete structures. These approaches acknowledge how the handling and planning of urban waste is connected to landscape democracy issues, for example concerning exposure to landfill sites, sound pollution, hazardous materials, toxic aerosols, and smells.

To achieve the transformative changes sought for in this key area, transdisciplinary and multisectoral efforts and approaches are sought after to generate a mix of practices and perspectives from art, design, planning, architecture, science, and technology, etc.

- Theme 1:1 Alter urban land and resource use through the design and planning of multifunctional urban greening approaches.
- Theme 1:2 Apply evidence based urban design methods to increase the circulation of organic and inorganic materials.
- Theme 1:3 Create resilient urban agriculture and food systems that increase urban self-sufficiency on different food items as well as increase nutrient collection and reuse.

#### 4.4.2 KA 2 – Capacity building for regenerative urbanism

Key Area 2 revolves around leadership, vision, governance, and how circular interventions can foster social cohesion in cities and mobilise people for transformative change. It focuses on new methodologies and transdisciplinary approaches that can address wicked issues and encourage development towards regenerative urbanism and acknowledge how urban transformations often start in local communities and neighborhoods.

To achieve regenerative urbanism, urban leadership, governance, and regulatory frameworks must consider matters like diversity, equity, and democracy when they address exclusionary urbanisation processes such as gentrification and segregation, regardless of whether these are based on ethnicity, religion, or other factors. Urban livability and social sustainability can only be guaranteed by socially cohesive planning efforts that leaves no group of citizens behind. Initiatives that ensure access to ecosystem services for marginalised and vulnerable communities that live in disproportionately less safe, resilient, and green neighborhoods are, for example, encouraged.

Instead of reinforcing existing patterns of inequality or exclusion, policymakers and planners should strive for locally rooted participation and co-creative processes at all stages of the policy cycle. Such processes should be grounded in multi-actor collaboration among urban officials, experts, business (e.g., the real estate community), and civil society. The creation of urban economic models that question the primacy of GDP growth and embrace concepts such as regeneration, cooperation, care, solidarity, wellbeing, prosperity, and wealth creation within urban communities, are needed. Any immediate positive effects and benefits of applying new economic models and practices locally should be showcased to decision makers and provide trans-local learning possibilities. Vibrant neighborhoods that are circular, cohesive, and green, should become role models for other communities and cities.

- Theme 2:1 Create urban leadership and governance processes that acknowledge matters of diversity, equity and democracy, to create an inclusive and regenerative urbanism that leaves no one behind.
- Theme 2:2 Build capacity for circular, socially cohesive, and green neighborhoods through locally rooted participation and co-creative processes at all stages of the policy cycle.
- Theme 2:3 Synthesise evidence, launch effective communication models, and raise the awareness of circular urban economies from the ground up.

### 4.4.3 KA 3 - Innovation ecosystems for circular economies

Key Area 3 is aimed at the mobilisation of actors and tools to achieve increased urban circularity, and the innovation ecosystem in which urban circular economies are embedded. This includes, but is not limited to, business activities, investment schemes and incentive-based funding mechanisms. It emphasises the role of community building, social innovation, and various sociocultural changes to bring about substantial reduction of urban resource use through reuse, restoration, regeneration, and redistribution of goods and materials.

Increased urban circularity is dependent on ground up approaches, building a critical mass of small-scale leverage points for intervention to achieve large scale transformations. Industrial alignment is key for this achievement, together with updated public procurement practices and revised business models. Entrepreneurial and social creativity must be fostered and picked up from proof-of-concept and public funded innovation, to translate local, cultural, and industrial traditions into new circular economic models, circular product design methods and altered production practices. In summary, the innovation ecosystems required to facilitate circular economies rely on the participation of a broad set of actors and should preferably make use of inhabitant engagement and public participatory approaches to achieve its goals (Key Area 2).

The tools needed for this transition range from easy to apply low tech interventions to hi-tech solutions requiring sustainable (in terms of energy and resource consumption) data infrastructure and transparent information exchanges regarding supply and demand. Digital marketplaces and blockchain technologies for trading and tracing goods and products are encouraged, as well as new climate-adaptive and flexible services to facilitate the circular flows of materials. Other digital interventions include operative local modelling tools to increase the livability of urban communities, e.g., building information modelling (BIM), city information modelling (CIM), landscape information modelling (LIM), and public participatory geographic information systems (PPGIS).

In sum, regenerative urban manufacturing measures and a well-designed innovation system for increased circularity, can enhance the value of local production, increase the self-sufficiency of urban areas, facilitate regional resource and product flows and stimulate green job creation.

- Theme 3:1 Create innovation ecosystems that include broad actor coalitions for challenge-driven clean tech solutions and social innovation.
- Theme 3:2: Facilitate and provide the DIY circular urbanism to facilitate social and economic change from the ground up.
- Theme 3:3: Apply green integrated models and tools to aid the implementation of urban circular economies.

## 4.5 A perspective on systemic innovation - the CUE Innovation Graph

To enable and recognise innovation in a systemic way, the CUE TP has been influenced by the UCL methodology for mission-oriented roadmaps, which emphasise the importance of aligning innovations across both actors and sectors (Miedzinski et al. (2019)). Acknowledging that systemic change requires a holistic understanding of innovation and considers the interdependence between different dimensions of change, the CUE TP mapped central concepts and themes in an innovation graph (see Figure 22).

The graph displays one axis highlighting five different dimensions of change (technologies, products and processes, business models, infrastructure and production systems, regulatory frameworks and culture and values) that encapsulate the sociotechnical nature of innovation ecosystems, and one axis for the degree of change from incremental to disruptive innovation. In sum, the graph presents a way to define system innovation for the CUE TP by displaying a set of interdependent and mutually reinforcing innovations which together could transform CUE-related systems and deliver key services to societies (see Miedzinski et al. (2019)). To the extent that it indicates the thematic priorities for the TP, the graph is also a building block for the development of the multi-annual call agenda for CUE (CUE MCA; chapter 7.5).

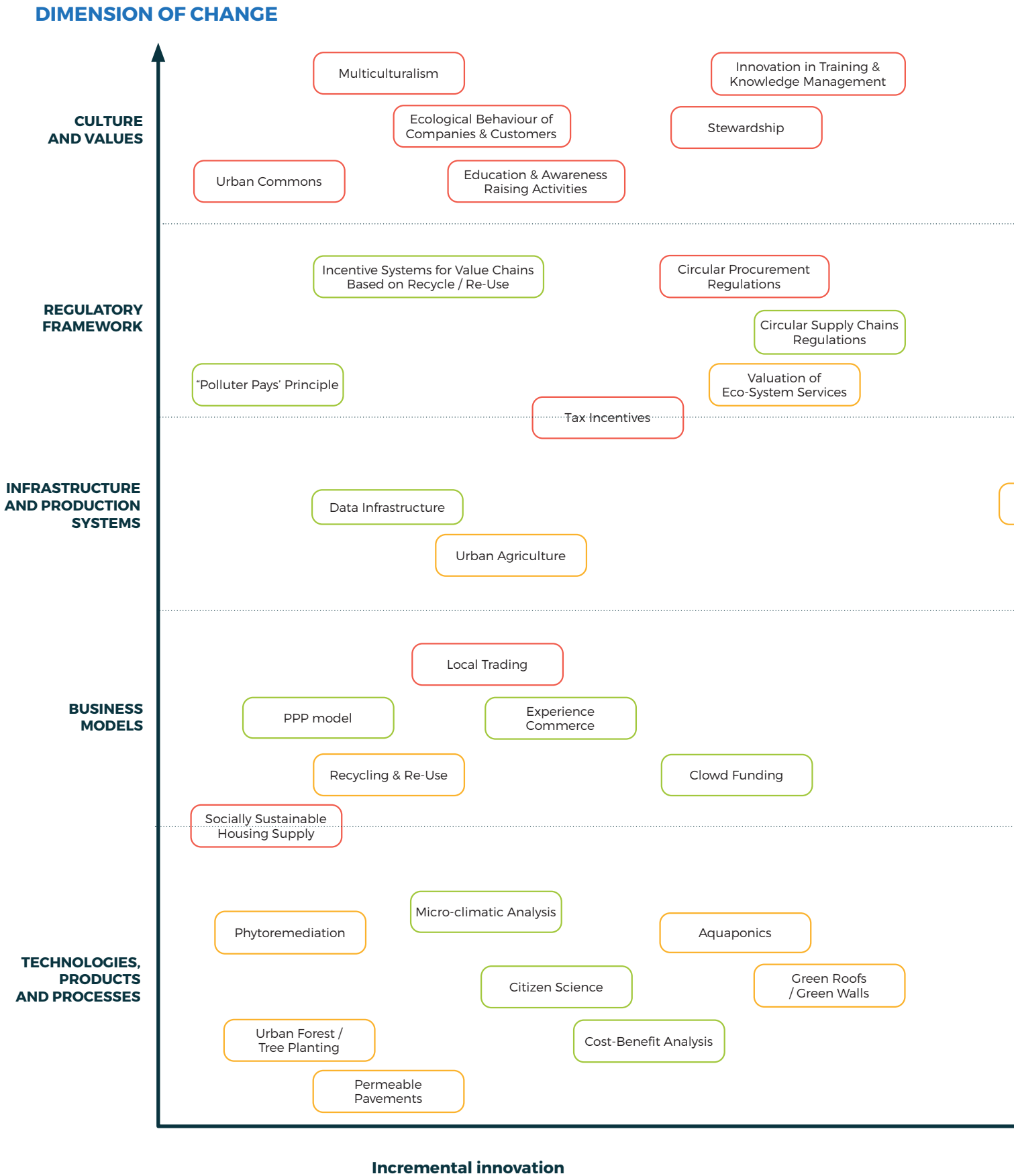
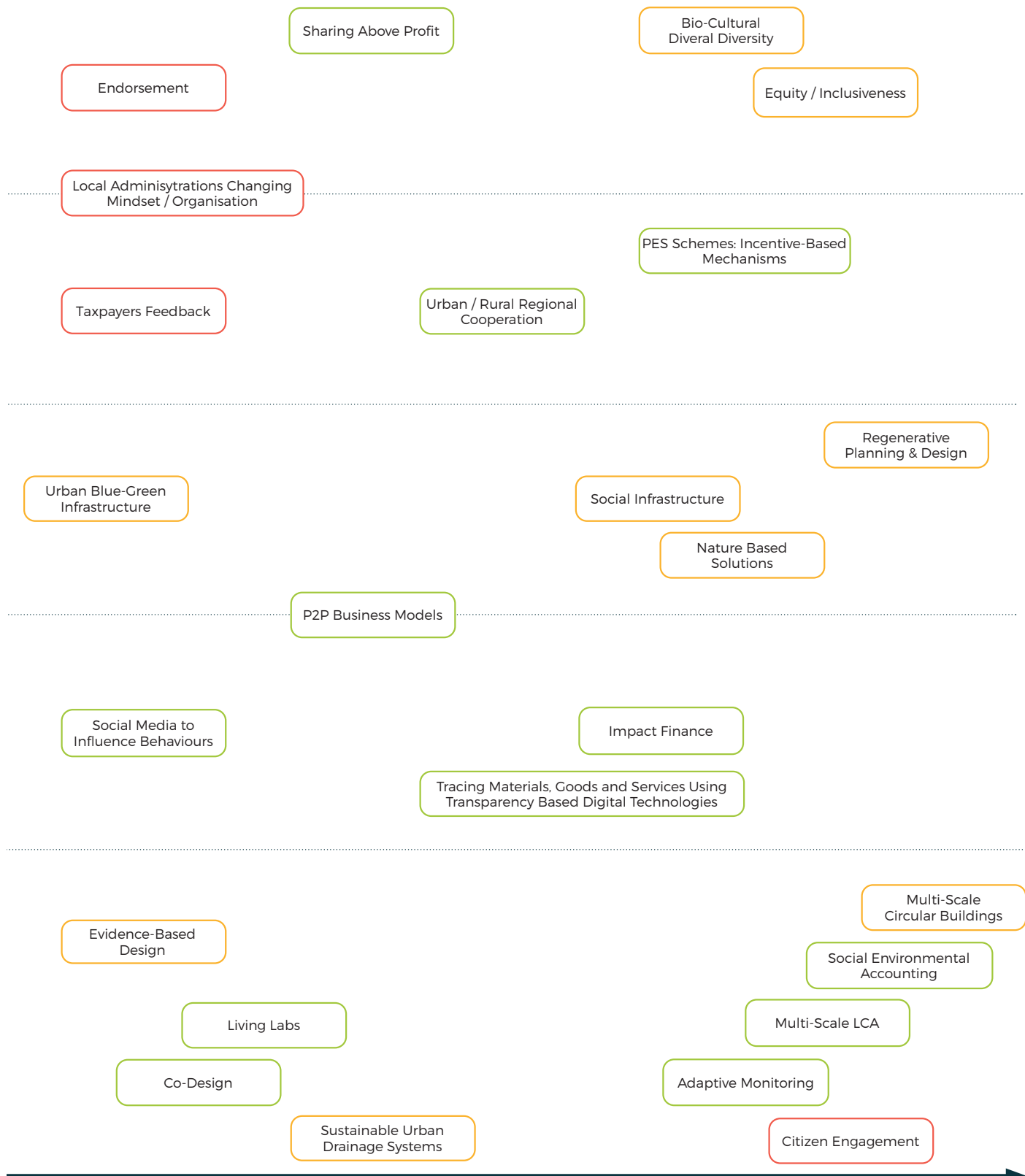


Figure 22: CUE Innovation Graph - identified emerging topics of innovations for the CUE Transition Pathway

### INNOVATION GRAPH CUE



Disruptive innovation

DEGREE OF CHANGE

**Key Area 1**  
Multi-Model and Sustainable urban Mobility

**Key Area 2**  
Human-centered Urban Spaces and Morphology

**Key Area 3**  
Smart Urban Production, Logistics and Services

**Key Area 4 (+1)**  
Urban Government and Governance for Transition





## **5. A Multi-annual Call Agenda to guide the implementation of joint calls and strategic measures**

The DUT Strategic Roadmap summarises the strategic and thematic priorities of DUT and provides the framework for the implementation of DUT and its calls. For each of the DUT Transition Pathways a mission has been developed that represents the main ambition of the that transition pathway until 2030. Subsequently, key areas and topics that are in need to be addressed to achieve these missions, have been derived, elaborated and refined from a collaborative process including the Focus Groups, national consultations and AGORA Dialogues.

In order to allow for longer-term planning, these thematic priorities are aligned in the multi-annual call agenda (MCA), which should help funders and the community to prepare for future calls. The call agenda also allows to strengthen the links between the calls, build future calls on outcomes from previous ones, utilise synergies across the Transition Pathways and ensure that the key areas are addressed in a coherent way. However, the call agenda does not lay out the call topics in detail, it just indicates the relationship between the identified issues in each of the three transition pathways' key areas. The call agenda should be considered as a guideline and as providing an overview and indication of the periodicity for upcoming calls. It puts the discussed topics within the DUT process in an order, it does not cover all possible actions and activities on all the addressed issues within DUT. It is to be considered a flexible tool to be used for continuous revisions in a agile and co-created process over the upcoming years.

## 5.1 Overarching Principles of the DUT MCA

The multi-annual call agenda of DUT is organised according to four predominant principles to ensure the fulfilment of the DUT mission, and to facilitate the continuous chiseling out of thematic scopes for calls and other activities:

- 1.** The Mission-oriented principle
- 2.** The Co-creation principle
- 3.** The Internal Portfolio principle
- 4.** The External Portfolio principle

These principles provide strategic guidance in ways that are described below. In sum, the Mission-oriented principle is the superior and prioritised one of the four. The co-creation and two portfolio-principles are the tools and methods that the DUT program makes use of to continuously update and ensure that the pathway-specific as well as over-arching DUT mission are fulfilled by the end of the program's lifetime. These four principles shall ensure both (1) the achievement of concrete results in terms of guidelines, solutions, approaches right from the first calls and (2) support radical systems change for each Transition Pathway. In a process involving all DUT partners through the Steering Group meetings, and stakeholders and problem owners in the City Panels, the specific call topics of each DUT call will be continuously elaborated and decided upon.

### **The Mission-oriented principle**

The call agenda is oriented towards the Transition Pathways' missions and the pathway-specific key areas that should be addressed to achieve their respective missions. In the Multi-annual Call Agenda, items from the pathways' key areas are ordered in a timeline that gives an indication of in which sequence they will be covered over the next years, and in a way that considers the trajectories and potential developments of each key area. Here, a broad focus should both enable a focus on issues that need quick results from the get-go, while also support work on the biggest challenges. The call agenda is a living document that will be updated as the DUT unfolds, and the key areas and their items enact a baseline of what the DUT process has arrived at thus far, and provide an orientation of what is expected for the upcoming calls.

### **The Co-creation principle**

To ensure that the DUT partners' agendas, priorities, and prerequisites are included, all DUT calls and other initiatives are elaborated in co-creative processes. In the three pathways, co-creativity is facilitated through the format and activities of the Steering Groups, in which the DUT partners participate. Similarly, the three City Panels ensure that pressing issues of stakeholders and problem owners influence DUT, its calls, and its other initiatives. Together, these actors continuously feed-in and inform the development of the program, as well as the Multi-annual Call Agenda.

### **The Internal Portfolio principle**

The Multi-annual Call Agenda applies a project portfolio principle to ensure that certain topics and cross-cutting themes are not over- or under-covered. This relies on data collection of topics, themes and approaches used in the submitted applications and funded DUT projects and comparing these to the desired output in terms of Mission-fulfilment. The principle does not only concern the chiseling out of future call topics but suggestions of new cross-cutting themes and strategic priorities might also be derived from work done according to this principle.

### **The External Portfolio principle**

The external portfolio principle ensures that activities in the DUT are related but not superfluous to other calls, partnership program initiatives, and activities within Horizon Europe. It also considers and builds upon the legacy of JPI UE ERA-NETs. The portfolio principle is used to design calls and initiatives are aligned and overlap to initiatives made in other EU contexts, but ensures that the timing, thematic orientation, call specifics etc. are not too much alike to avoid one initiative over-shadowing another. To achieve these overlaps, participation and overhearing is continuously sought after and encouraged.

## 5.2 Links between the Transition Pathways

The three DUT TPs are thematic foci supporting comprehensive urban transition processes. While priorities and topics for the upcoming DUT Calls are referring to the individual TPs, the calls will address cross-cutting topics and links between the PED TP, the 15mC TP and the CUE TP. Creating and supporting these links will be highly encouraged in the DUT Calls. Figure 23 shows a generic compilation of these links.

Clearly, there are overarching issues like governance, holistic planning, data management, etc. that are crucial for all three TPs. The linking topics between two TPs outline areas for focused cross-cutting thinking between the thematic priorities of the TPs. Links between the CUE TP and the 15mC TP include spatial and infrastructural synergies between the mobility transition and a future focus on circularity in the urban context, specifically addressing logistics, the use of resources and re-use of existing structures. Between the CUE TP and the PED TP, links address the use of waste for energy generation, nature-based solutions for improving energy efficiency, the support of regional energy circles, and economic impact/synergies regarding job creation. The 15mC TP and the PED TP have clear overlaps regarding improving energy efficiency in the mobility sector as part of PED strategies (and vice versa). Also, the urban structure in terms of density and function as crucial for both energy-related challenges (efficiency, generation) and short distances for transport and mobility. On a societal level, bottom-up initiatives like energy communities and mobility communities can be linked to have a wider impact on sustainable development.

These links between the three TPs are integrated in the key areas of each TP and will be further elaborated in the focused process towards call topic generation in each individual DUT Call.

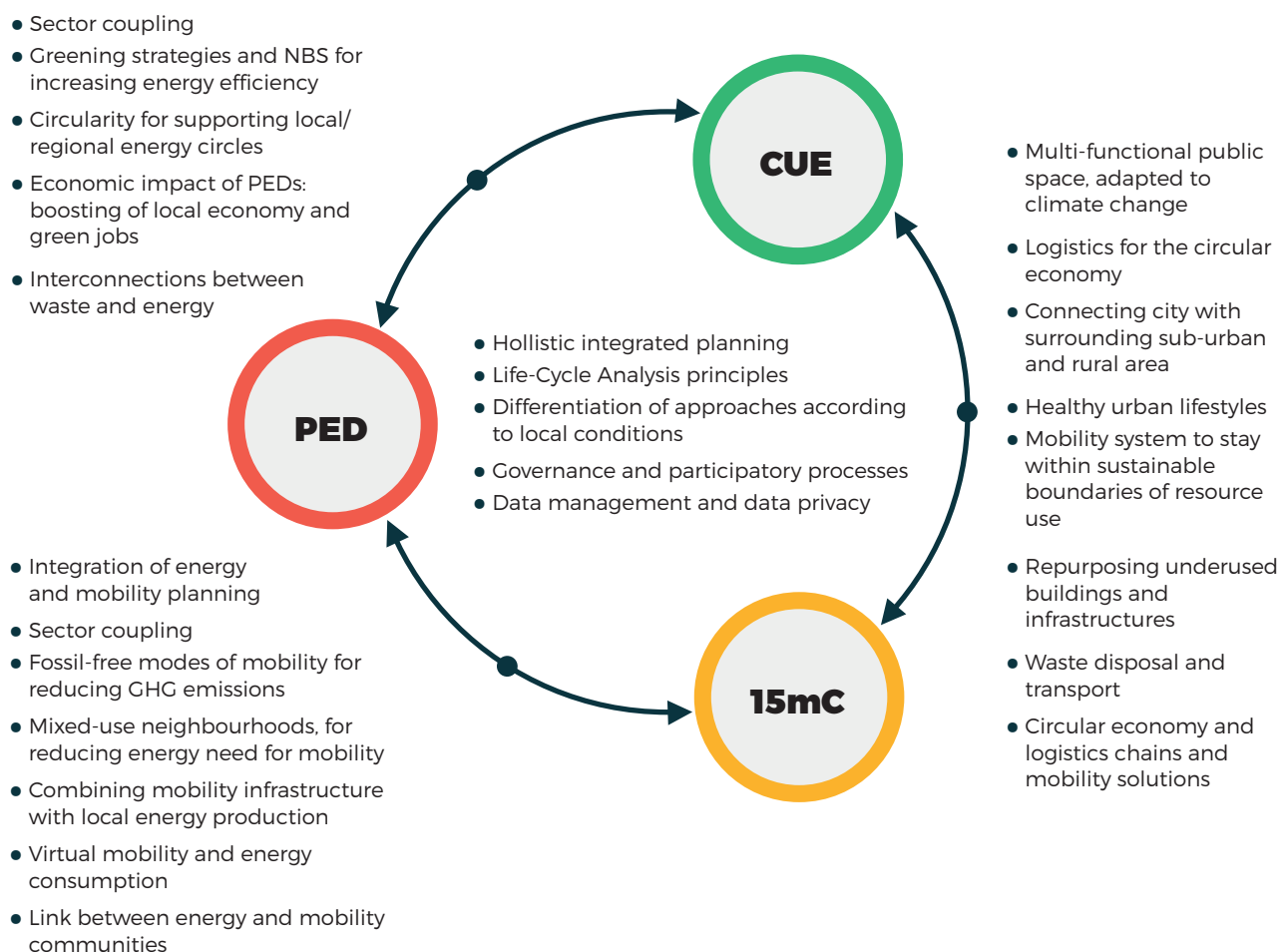
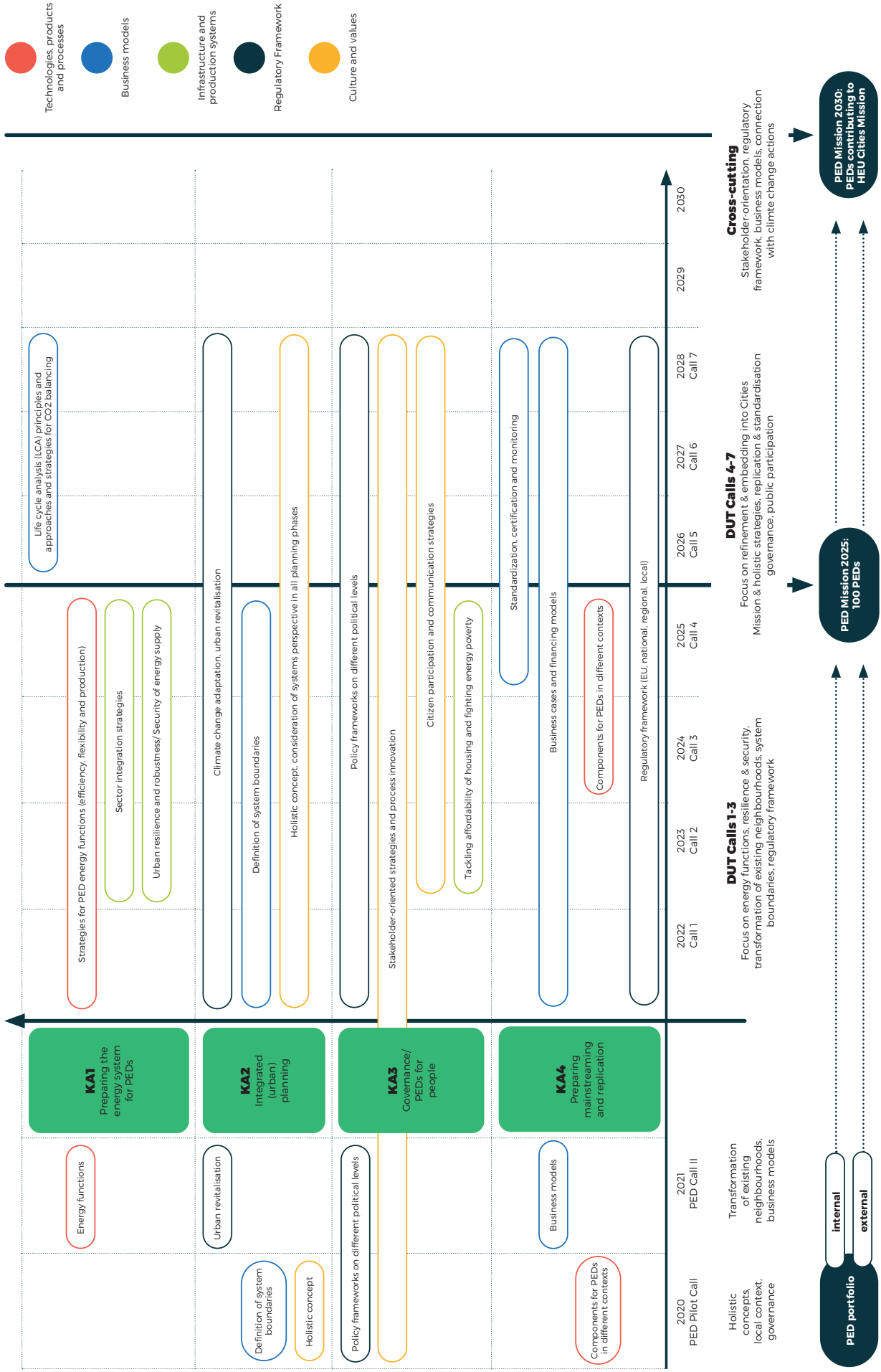


Figure 23: Thematic links between the DUT Transition Pathways

Figure 24: Key areas of action in the PED Multi-annual Call Agenda



## 5.3 Multi-annual Call Agenda for the PED Transition Pathway

The PED MACA is building on history, learnings and achievements over the PED Program running time since 2018 and has been developed according to the principles for the development of the Multi-annual Call Agenda (see above).

Regarding the mission-oriented principle, the PED MCA is linking the content of the Key Areas of Action (chapter 3.4) with activities in the three phases towards the PED Mission laid out in chapter 3.2.3. In terms of co-creation, the PED MACA builds on extensive consulting and co-creation with key stakeholders since 2018, specifically in the PED City Panel, the PED Stakeholder Group, AGORA Dialogues, and cooperation with other PED-related European networks and initiatives. The PED MACA builds on the development of an internal portfolio (including previous PED Calls in 2020 and 2021, respectively) by contributing PED-specific topics to the annual DUT Calls, addressing needs and requirements of the key stakeholders to achieve the PED Mission 2025/2030. The external portfolio refers to PED-related activities and calls supporting the SET Plan Action 3.2 and contributing to the PED Mission. This includes calls under Horizon Europe<sup>49</sup>. Also, projects from JPI Urban Europe ERA-NETs (specifically ENSCC, ENUTC) are contributing to the external portfolio.

The PED MCA brings the elements of the Key Areas of Action (chapter 3.4) in a chronological order over the DUT running period including seven calls and with that offers a prioritisation of content-related foci for PED development and a stepped approach towards the achievement of the PED Mission (Chapter 3.2). The PED MCA does not define specific topics for the individual calls and will be subject to evaluation loops and potential adjustments and new additions. Figure 24 shows a generalised visualisation, the Annex provides a more detailed version.

The two PED Calls<sup>50</sup> of 2020 and 2021, respectively, were focusing developing basic approaches towards PED development (integration of PED strategies into urban planning, holistic perspective, stakeholder engagement, governance, business models). PED Call II also had a specific focus on integrating PED strategies in existing urban environments.

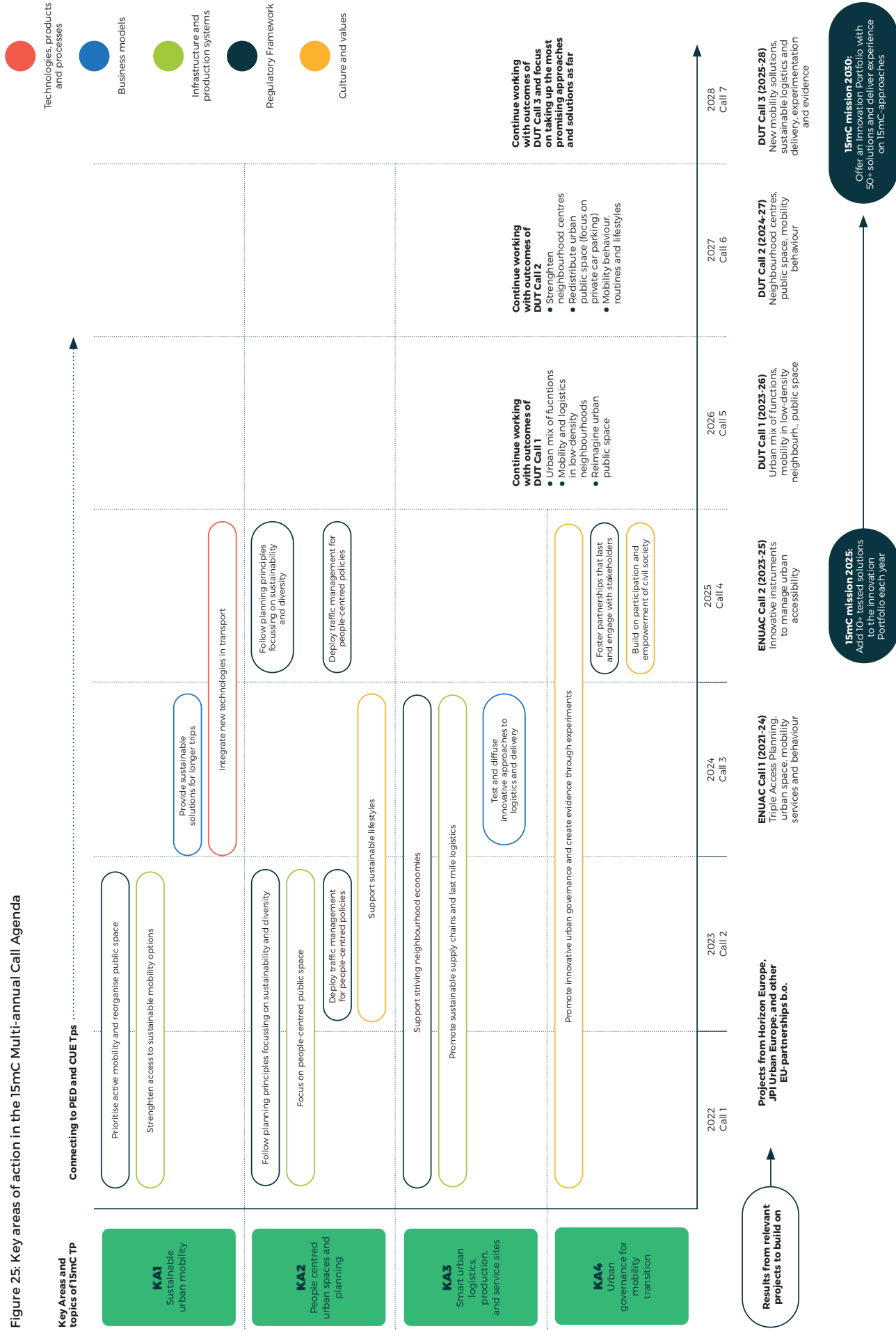
For the seven planned DUT Calls 2022 – 2028, there are obvious thematic areas that will be considered in all calls: stakeholder engagement, regulatory framework, business models, link to climate change actions. However, there might be a specific thematic focus on either of these in selected calls.

- The first phase of the strategic development of the PED TP until 2025 will include four DUT Calls. Strategies for the energy functions (local generation, efficiency, flexibility) and sector integration strategies are important themes to be further developed in these calls. Exploration of energy flexibility strategies and the integration of local PEDs into the regional energy system will contribute to both the PED Framework Definition and the definition of system boundaries for PEDs. Providing energy security will be crucial for the energy transition in general and it is key for the success of the PED concepts. PEDs connected with urban revitalisation (already a topic in PED Call II) and linking PED development with urban mobility, both as parts of climate change action, will be key areas for further exploring and elaborating the PED concept. There will be focus on local and national governance levels in the first four calls, thus connecting the policy frameworks with local/regional/national energy strategies. Similarly, stakeholder engagement strategies will specifically be explored in local contexts, adding supra local levels of stakeholder ecosystems in calls 2 to 4 by elaborating on the specific cooperation with the real estate sector and utilities. Citizen participation and communication strategies will be increasingly dedicated aspects of the PED topics from DUT Call II, exploring both concepts for involvement/co-creation and behavioural aspects for driving the PED concept and the energy transition. Connected with this and with the aspect of energy security, social aspects such as energy and housing affordability and energy poverty will be another focus in the first phase. With these thematic areas, and adding 10 to 15 projects per DUT Call, a broad portfolio of 100 PEDs will be developed by 2025. The portfolio also includes projects from HEU Calls and calls from other initiatives.

<sup>49</sup> Most recent call: HORIZON-MISS-2021-CIT-02-04 Positive Clean Energy Districts

<sup>50</sup> PED Pilot Call: <https://jpi-urbaneurope.eu/calls/ped-pilot-call/>; PED Call II: <https://jpi-urbaneurope.eu/calls/ped-call/>

Figure 25: Key areas of action in the 15mC Multi-annual Call Agenda



- The **second phase of the strategic development of the PED TP from 2025** will include three DUT Calls. It will focus on the standardisation and replication of PED concepts, mainstreaming PED concepts in urban planning processes, adapting the regulatory framework on different levels, the development of feasible business models including LCA strategies and linking to urban circularity strategies. With this, the PED portfolio with 10 to 15 projects per DUT Call will build towards an integration of PED strategies and PED elements into the HEU Cities Mission and support the achievement of mission through the provision of holistic solutions based on the PED concept towards climate-neutral European cities.

## 5.4 Multi-annual Call Agenda for the 15mC Transition Pathway

The long-term Call Agenda for the 15mC TP builds, on the one hand, on all results and synthesis of materials collected and prepared in the stakeholder engagement activities between 2020 and 2022 within the TP. On the other hand, it is informed by projects finished and running in Horizon Europe and JPI Urban Europe as well as by strategic directions and calls in other European partnerships. As such, the indicative direction for the calls until 2028 is based on the 15mC Key Areas, topics, and Innovation Graph.

The Call Agenda intends to provide a coherent overview on the thematic orientation of the TP for future calls, needed to fulfil the 15mC TP's mission. Nevertheless, it will also be essential to maintain flexibility to be able to react to contemporary developments, to build on relevant inputs and requirements from other initiatives (e.g. City Mission cities) and on results stemming from proceeded calls in DUT. Thus, it proposes targeting the big challenges, issues and "hard nuts" first, which have a high expected impact on the urban mobility system and will take time to tackle, identified in our stakeholder processes (such as national consultations, AGORA events and city focus groups).

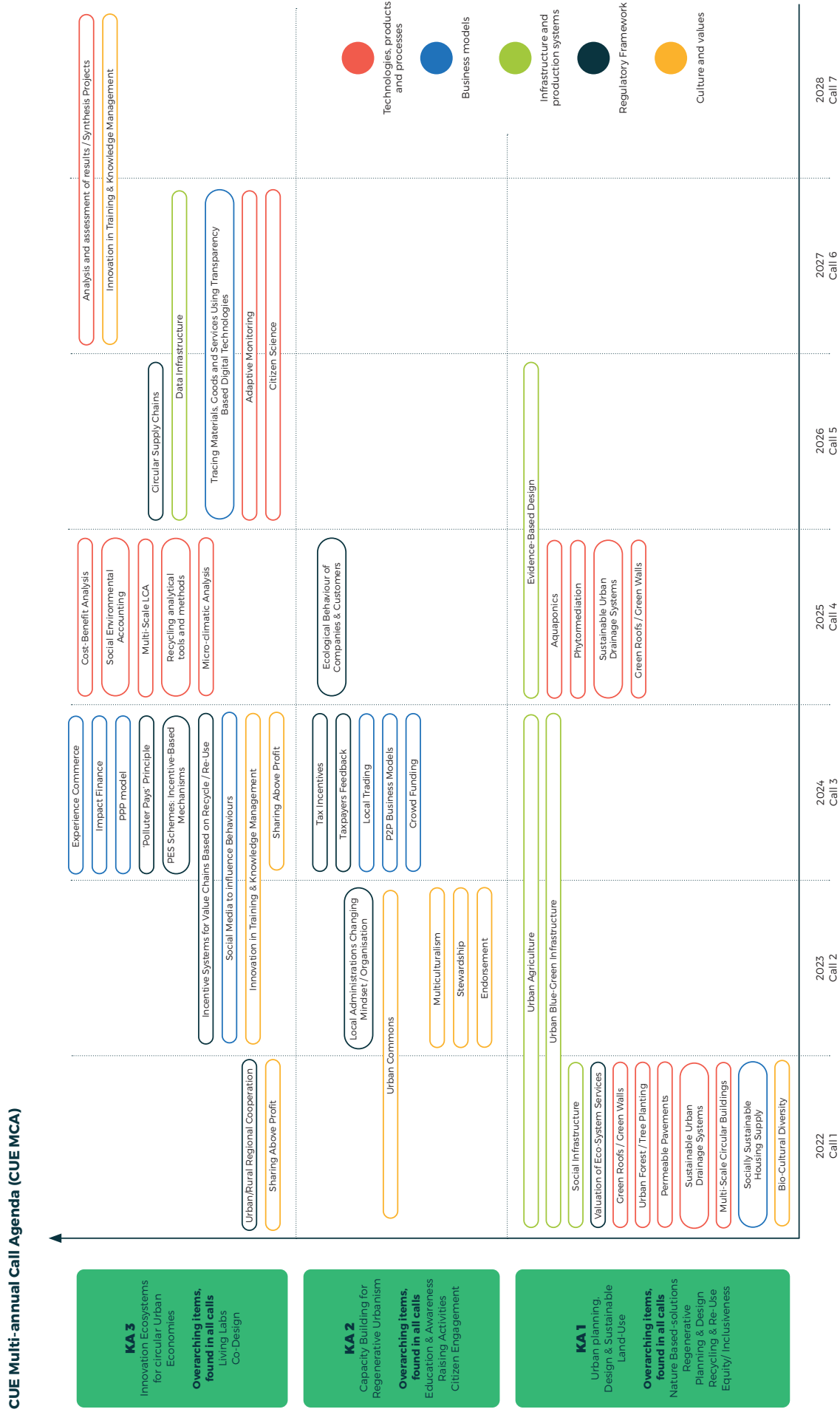
The first two calls focus on understanding, tackling and piloting action to face specific dilemmas in identified critical topics. These cover the share and distribution of urban public space, mixed-use neighbourhoods, sustainable transport in low-density areas and mobility behaviour and routines for climate-neutral cities. DUT call 3 and 4 focus further on how 15-minute City measures for mobility transition can be implemented through new governance, procedures, experimentation, testing and application of technology and instruments. By then (at least elaborated interim) results are expected from ENUAC call 1 and 2, which will further inform the development of call topics in the 15mC TP, additionally to input from the further external portfolio.

Latest by 2026, learnings and experiences from the first two DUT calls on the big issues can be taken up and developed in DUT calls 5 and 6, aiming at an extensive implementation in urban practice. Certainly, this relies on many factors and is quite far into the future, which renders the perspective blurrier and demands more openness and flexibility. In the final DUT call 7, the most promising results and projects will be taken up and developed further into call topics, while also focusing on balancing the contents of the 15mC Innovation Portfolio.

This overview summarises the draft direction for the upcoming calls (see also figure 25):

- **Call 1 - 2022:** Big challenges and hard nuts identified in stakeholder engagement (WHAT?) (1)
  - Urban mix of functions
  - Mobility and logistics in low-density neighbourhoods
  - Reimagine urban public space
- **Call 2 - 2023:** Big challenges and hard nuts identified in stakeholder engagement (WHAT?) (2)
  - Strengthen neighbourhood centres
  - Redistribute urban public space (focus on private car parking)
  - Mobility behaviour, routines and lifestyles
- **Call 3 - 2024:** Governance, procedures and instruments (HOW?) (1) + build on ENUAC Call 1 (2021-24, with projects on Triple Access Planning, urban public space, mobility services and behaviour)
  - Test the application of new mobility solutions
  - Sustainable urban logistics and delivery
  - Expand the framework for experimentation and evidence based policy making

Figure 26: Key areas of action in the CUE Multi-annual Call Agenda





- **Call 4 - 2025:** Governance, procedures and instruments (HOW?) (2) + build on ENUAC Call 2 (2023-25, with projects on instruments for urban accessibility management)
  - Regional and cross-sectoral cooperation
  - From participation to empowerment in mobility policy
  - Application of urban access regulation frameworks
- **Call 5 - 2026:** Build on DUT Call 1 (2023-26) (+ flexibility)
- **Call 6 - 2027:** Build on DUT Call 2 (2024-27) (+ flexibility)
- **Call 7 - 2028:** Build on DUT Call 3 (2025-28) and balance the contents of the 15mC Innovation Portfolio

## 5.5 Multi-annual Call Agenda for the CUE Transition Pathway

This section describes the ways of thinking behind the early prioritisations made for the CUE transition pathway. It covers the thematic orientation of the first two calls and how they are thought to build thematically upon one another. It also presents how the priorities within CUE relate to initiatives and priorities of other thematically linked EU initiatives such as the ENUTC and Biodiversa+.

At the time of writing, the thematic scope for the CUE transition pathway in the first DUT Call casts a wide thematic net that includes the intersection of sharing and circular economy principles (Theme 1 in Key Area 1), nature-based solutions (Theme 2 in Key Area 1), and urban food systems (Theme 3 in Key Area 1). It is thus so that the suggested thematic scope of CUE call topics for Call 1 to a great extent coincides and overlaps with Key Area 1. While this is first and foremost the result of a co-created process of the CUE taskforce, AGORA-events, the feedback from the DUT partners and so on, it is also a reflection of the relatively big size of the call, at the time of writing estimated at 60-80M Euro. Even if a mere third of this sum in the end will go towards funding CUE-projects, the size still merits a wide thematic focus to avoid the risk of putting too many eggs in too few baskets.

Starting the CUE pathway off with a focus on urban plans and designs (KA1), presents a way to tackle the “what needs to be done?”-question. This thematic focus encourages projects that suggest as well as scrutinise planning processes and urban design methods for increased circularity of urban resource flows and multi-functional urban greening approaches. The priority concerns testing and trying such solutions out, and evaluating their merit, effectiveness, societal value etc. Also, this broad thematic emphasis implies a kind of litmus test of the themes in Key Area 1 of the CUE TP, are they equally relevant and urgent? Do they differ in these senses, and if so: why?

For the second call, increased weight will be given to matters of governance, actors and tools (KA 2 and 3), and a greater emphasis on how the things that need to be done should be done as well as by and for the benefit of whom. Tentatively, this means a shift towards further addressing how urban governance matters can be altered to tackle urban issues of circularity and greening more effectively. How can political decision-making processes be shifted to let bottom-up practices and initiatives complement top-down steering and management? It also becomes relevant to address which groups of actors that have the capacity and know-how to steer and manage the urban circular and greening transformation, and critically scrutinise the incentive structures in terms of who reaps the benefits of suggested solutions and interventions. Mobilisation of new and old actor groups is tentatively needed to ensure the longevity and efficiency for circular and green interventions to be prosperous, and issues related to economics, business models, and societal benefits must thus be tackled. Last, an increased focus on how (digital) tools for planning, monitoring, decision-making, etc. can be used to aid the implementation of circular and greening interventions is implied.

In sum then, the themes of Key Area 1 suggested as the thematic CUE-priorities for DUT call 1, will thus tentatively be followed by the themes of Key Areas 2 and 3 in DUT call 2 (see figure 26).

### **Alignment and overlaps**

The three thematic CUE-priorities for the first DUT call, implies some apparent connections to other EU Partnership Programs:

The thematic priority on the intersection of sharing and circular economy principles can be seen as a continuation and further development of the “Circular Urban Economy”-topic in the ENUTC Call of 2021. Moreover, the ENUTC Additional Call planned to launch during the fall 2022, can tentatively fund projects that can serve as a resource base for activities and CUE-projects during the years ahead. Moreover, it will be important to observe and possibly relate and connect to the three projects that will likely be financed in the innovation action Horizon-CL6-2023-CIRCUBIO: One hundred circular model households: making European households sustainable through inclusive circular practices.

The CUE-theme on nature-based solutions presents a clear overlap with one of the so-called flagship programs in Biodiversa+ that has a similar focus. While the CUE transition pathway relies on a broad and inclusive definition of NBSs which is similar to the Biodiversa+-understanding of the NBS-concept, the CUE transition pathway's urban delineation serves to prevent a too-close overlap between the two partnerships. Joint efforts to develop this overlap conceptually are planned in a joint strategic workshop, which for example creates the synergistic possibility to orchestrate upcoming calls on nature-based solutions in Biodiversa+ during the next year and onwards.

Concerning the third thematic CUE-priority for call 1, the research and innovation action HORIZON-CL6-2023-COMMUNITIES: Assessing urban farming impacts should be on the CUE transition pathway's radar (one 5M Euro-project is expected), as well as the two projects estimated to be financed in the innovation action HORIZON-CL6-2023-COMMUNITIES: Unlock potential of the New European Bauhaus in urban food system transformation (6MEuro). Last, it will be important to follow and observe the development of the food-related partnership programs in Horizon Europe which are currently under development.

# **Annex: Detailed MCAs**

### PED Multi-annual Call Agenda (PED MCA)

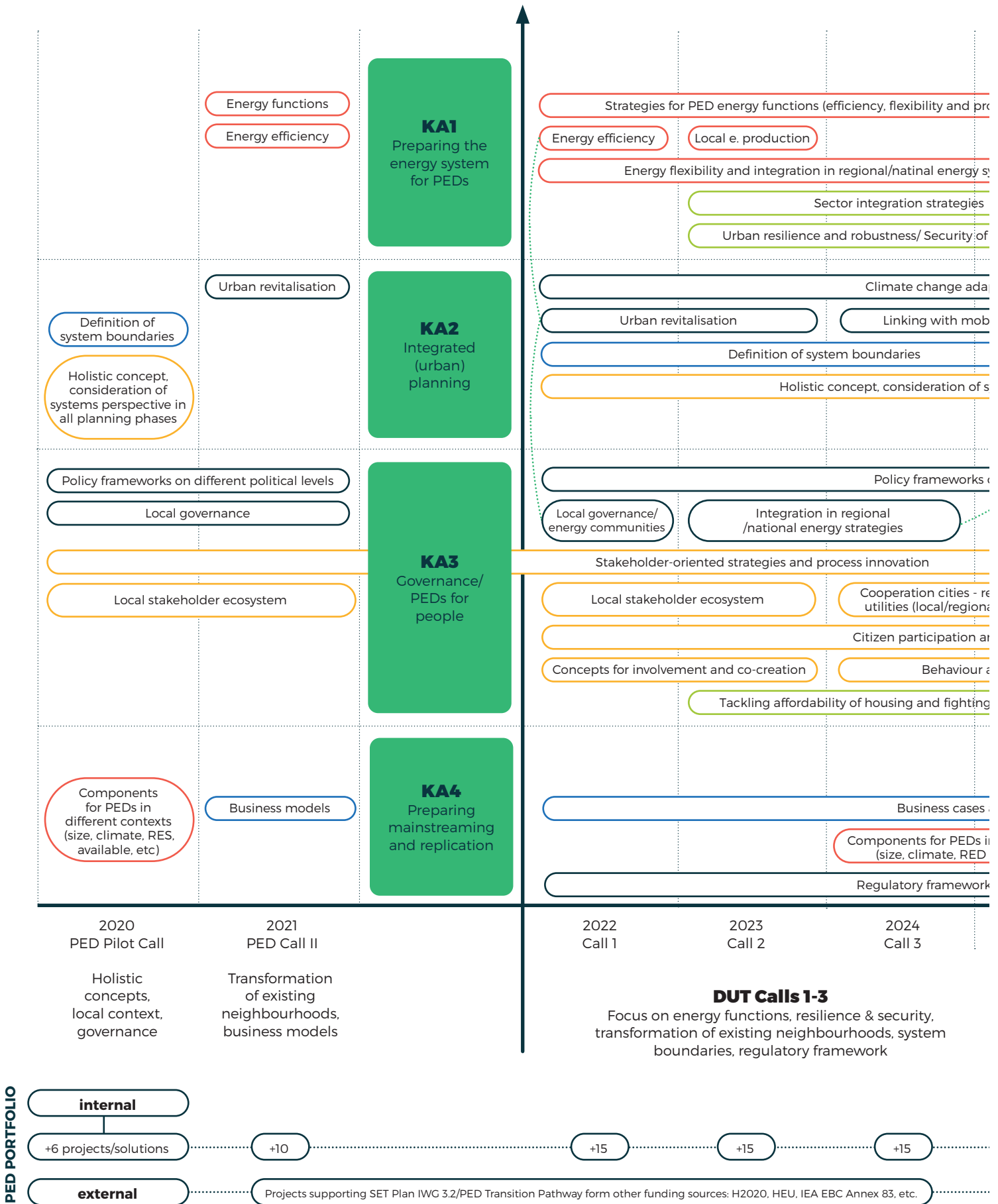
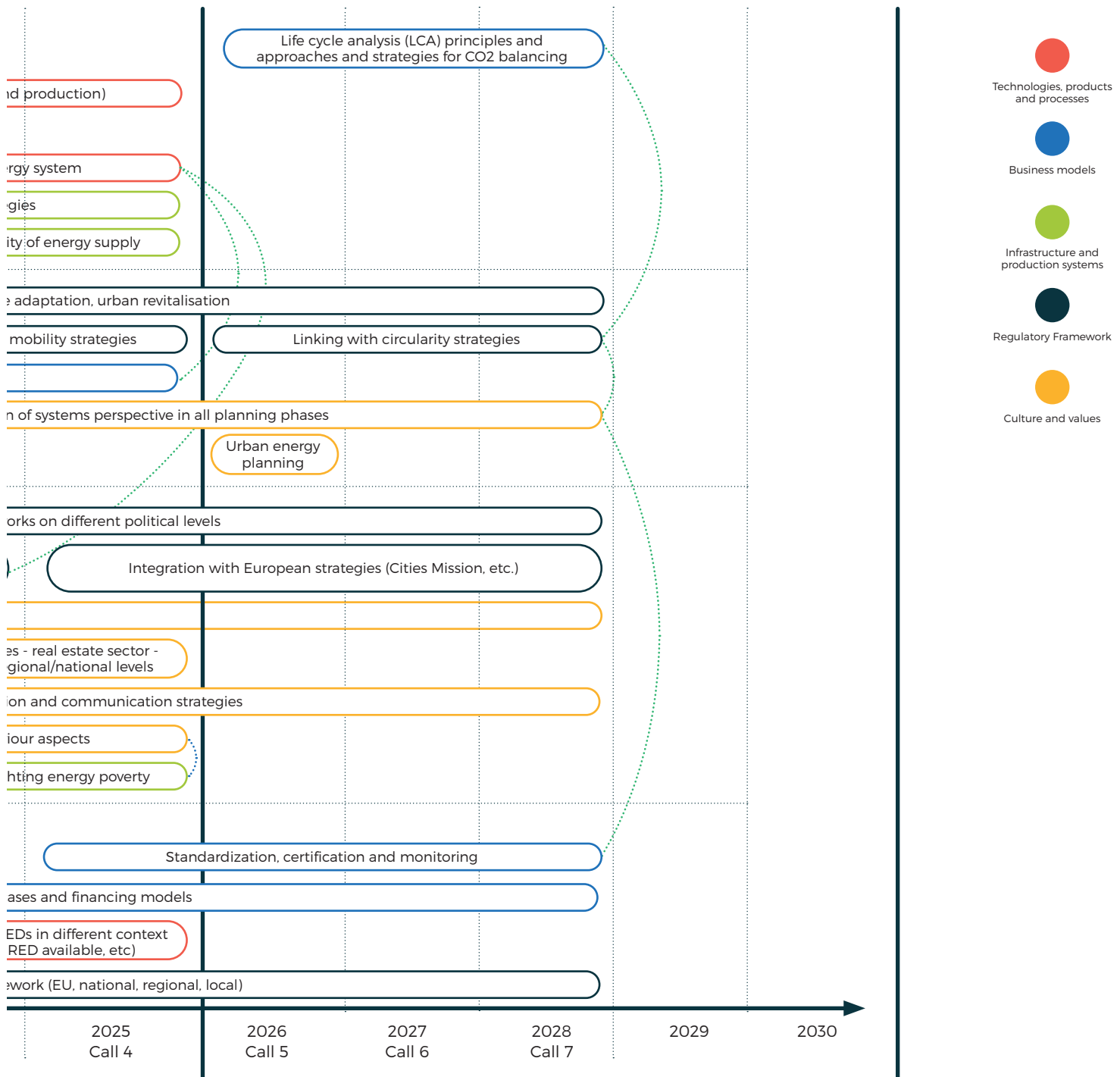


Figure 27: Key areas of action in the PED Multi-annual Call Agenda – details

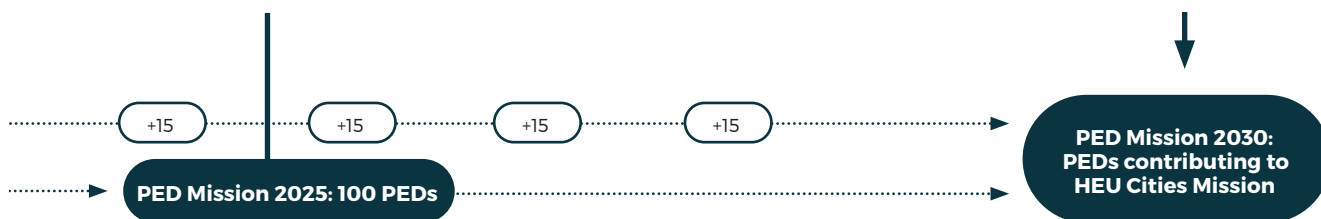


**DUT Calls 4-7**

Focus on refinement & embedding into Cities Mission & holistic strategies, replication & standardisation governance, public participation

**Cross-cutting**

Stakeholder-orientation, regulatory framework, business models, connection with climate change actions



**Key Areas and topics of 15mC TP**



Results from relevant projects to build on

Projects from Horizon Europe, JPI Urban Europe, and other EU-partnerships b.o.

**ENUAC Call 1 (2021-24)**  
Triple Access Planning, urban space, mobility services and behaviour

Figure 28: Key areas of action in the 15mC Multi-annual Call Agenda - details



**ENUAC Call 2 (2023-25)**  
Innovative instruments to manage urban accessibility

**DUT Call 1 (2023-26)**  
Urban mix of functions, mobility in low-density neighbourhood, public space

**DUT Call 2 (2024-27)**  
Neighbourhood centres, public space, mobility behaviour

**DUT Call 3 (2025-28)**  
New mobility solutions, sustainable logistics and delivery, experimentation and evidence

**15mC mission 2025:**  
Add 10+ tested solutions to the innovation Portfolio each year

**15mC mission 2030:**  
Offer an Innovation Portfolio with 50+ solutions and deliver experience on 15mC-approaches

### CUE Multi-annual Call Agenda (CUE MCA)

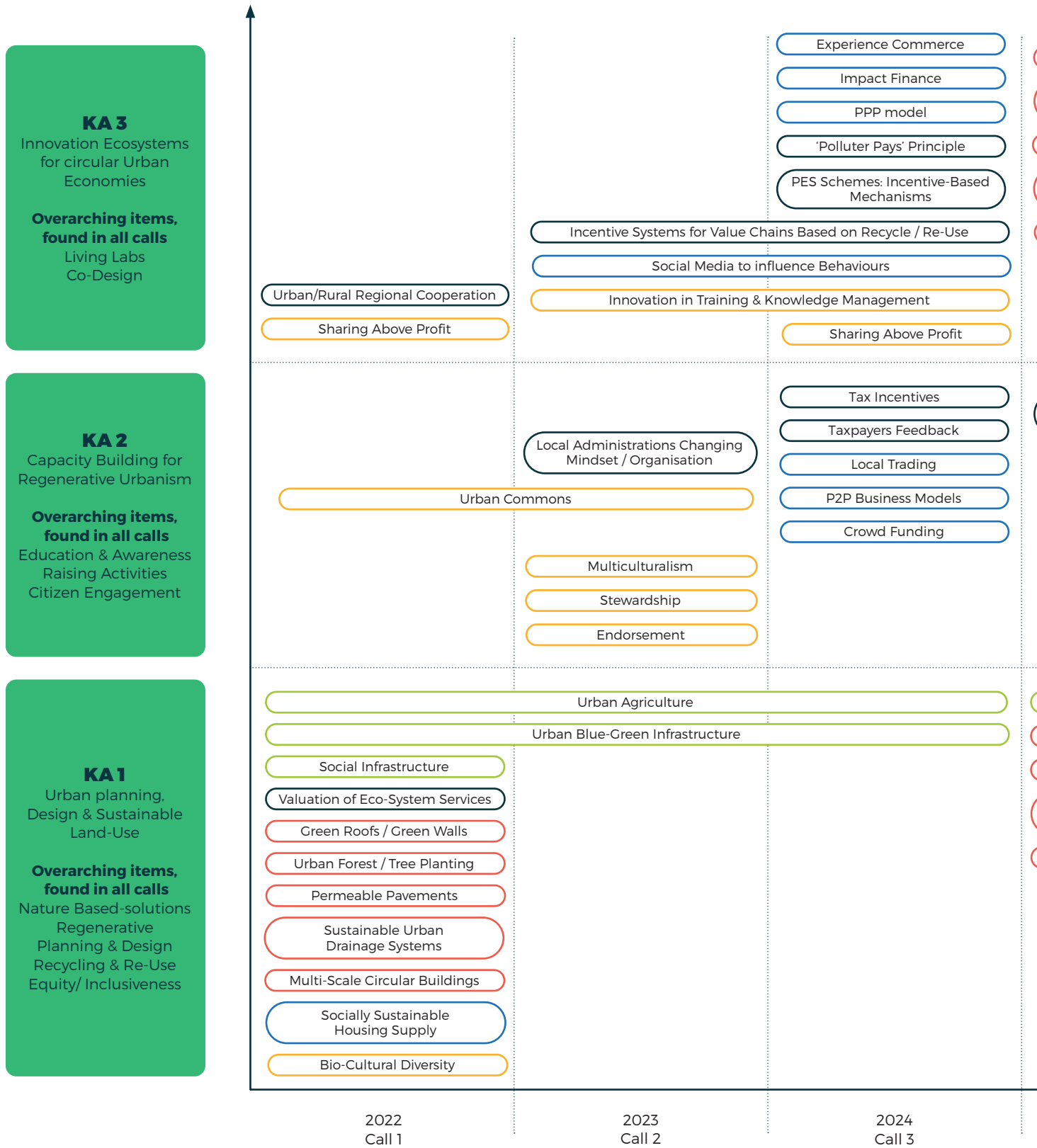
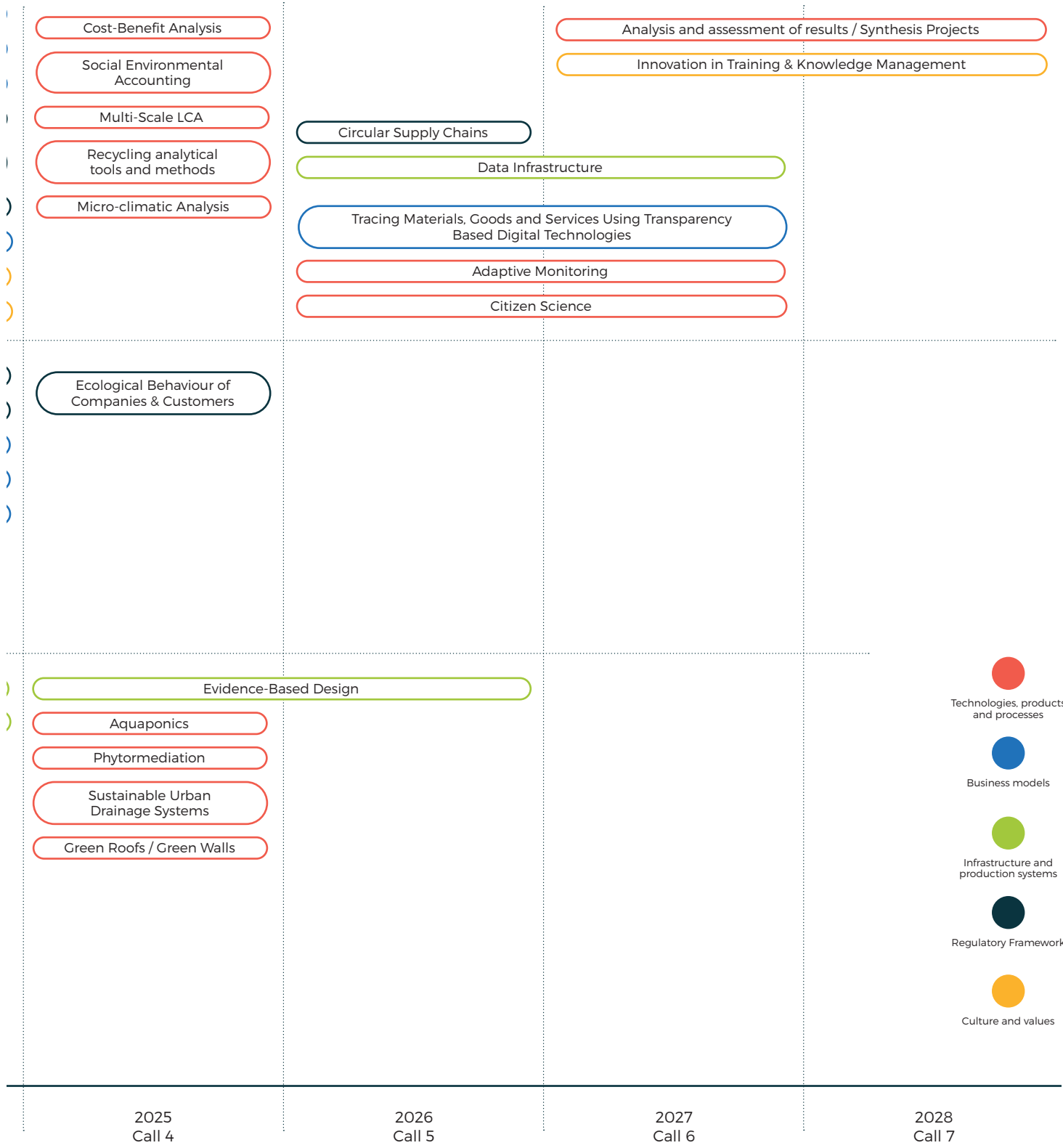


Figure 29: Key areas of action in the CUE Multi-annual Call Agenda - details





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