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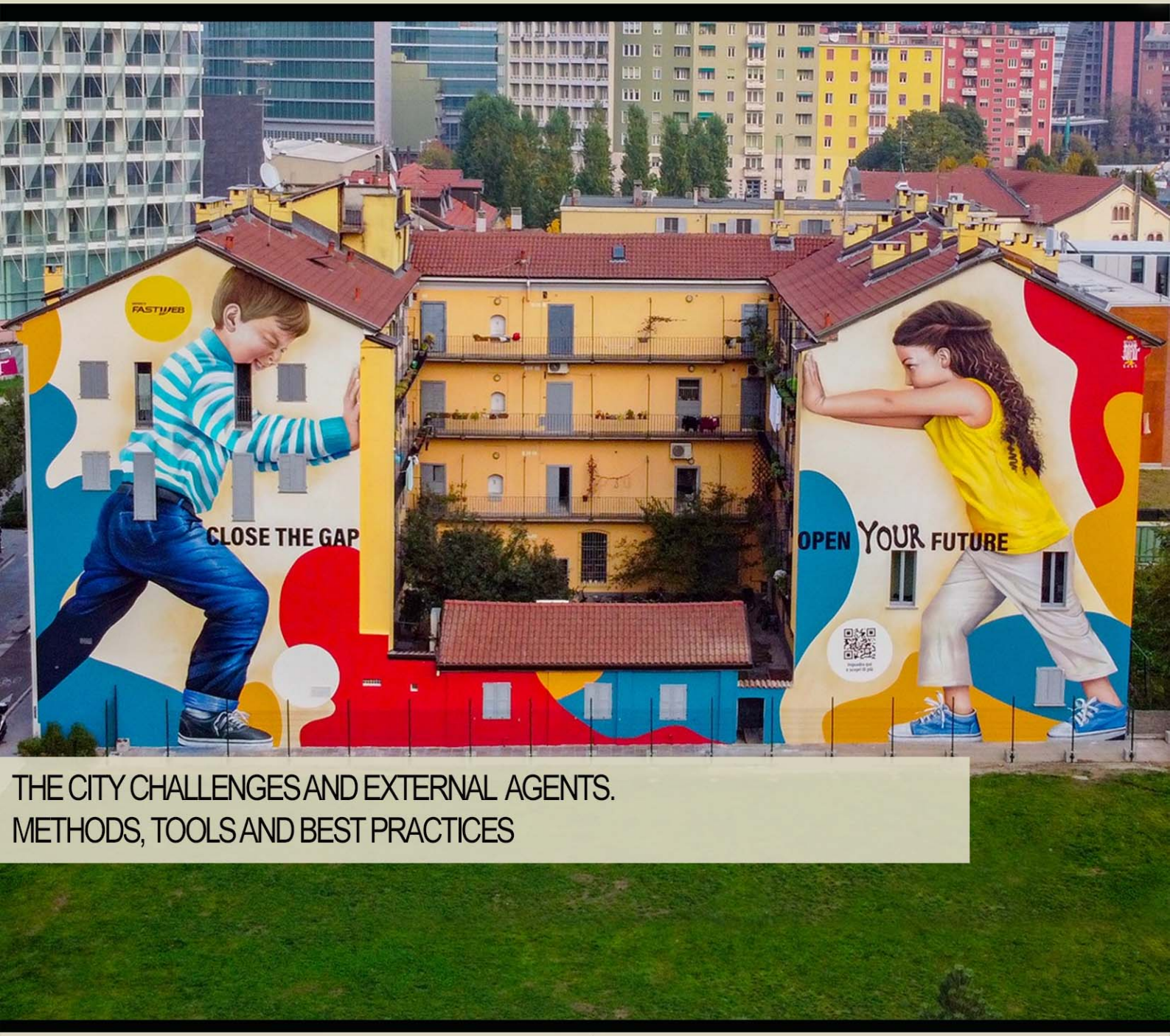

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The cover image shows redeveloped building in the Garibaldi neighbourhood in the city of Milano (Picture by Fastweb, retrieved from: https://www.facebook.com/Fastweb/photos/10158794132149472).

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REVIEW NOTES – Town Planning International Rules and Legislation

Accelerating sustainable urban transition: European climate action

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Abstract
Starting from the relationship between urban planning and mobility management, TeMA has gradually expanded the view of the covered topics, always following a rigorous scientific in-depth analysis. This section of the Journal, Review Notes, is a continuous update about emerging topics concerning relationships among urban planning, mobility, and environment, thanks to a collection of short scientific papers written by young researchers. The Review Notes are made up of five parts. Each section examines a specific aspect of the broader information storage within the main interests of the TeMA Journal. In particular: the Town Planning International Rules and Legislation. Section aims at presenting the latest updates in the territorial and urban legislative sphere. Accelerating the sustainable urban transition requires functional and structural changes in urban systems through which challenges such as the climate crisis are addressed. Researchers, professionals, policy makers in their various roles are trying to provide concrete proposals and actions to the challenge of climate change in cities from a sustainability perspective. The European Commission has also played a crucial role in providing forms of funding on the issue. In this direction, the paper examines precisely the European regulatory excursus starting from the climate law up to the EU Adaptation Strategy to increase the resilience of cities.

Keywords
Urban sustainability transitions; Climate change; European climate policy; Urban climate action.

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1. Sustainable urban transition

The latest reports issued by the UN show that 70% of people globally will live in cities by 2050. This will mean that the global urban population will be far much higher than the rural population (Seto et al., 2010). The consequence of this is an increased demand in and around cities for energy, food, water, buildings, waste management, health care, education and other basic services. The growing demand, in turn, involves the creation of socio-technological systems necessary to "manage cities" with a view to sustainability. Unfortunately, cities are the terrains where most of the (in) sustainability problems originate. This is confirmed by the latest reports issued by the IPCC which show that cities are responsible for almost 75% of total resource consumption (Madlener and Sunak 2011) and the primary source of greenhouse gas (GHG) emissions (Hurlimann et al., 2021). Conversely, cities are also the terrains concentrated efforts towards actions aimed at innovation, sustainability and social progress (Thornbush & Golubchikov, 2021). The different territorial realities are called to play a dual role, first as actors "for the (re) development of socio-technological systems and as facilitators of" places "for sustainable innovations (Geels et al. 2011). This intuition according to which cities are "actors and places" of the transition to sustainability is not a completely new concept. Many ambitious sustainability initiatives have already emerged at the level of cities and metropolitan regions, such as the Covenant of Mayors and the C40 climate coalition. There are the policy gaps in defining a sustainable city model is in the lack of "development" policies that so far seem insufficient to guide and accelerate a deeper systemic change. The transition to urban sustainability is an ever-changing political process, permeated by conflicts and contradictions. Surely the concept of sustainability entered the world scene with the introduction of the notion of sustainable development by the so-called Brundtland commission in the 1980s; they defined it as "meeting the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987). After almost three decades, there is still an extreme difficulty in making operational and implementing sustainable development in the scientific and political debate. Unfortunately, urban policies and related governance systems still focus on “direct” economic development and standard technological solutions, instead of aiming for adaptive and transformative sustainability strategies. Sustainability is too often seen as an element of secondary policy interest, mainly because it is dominantly perceived in the short-term economic balance sheet. Since its advancement is perceived as costly and often uncertain. Clearly, in order to (re) structure cities, large investments are required which often require large initial investments, the benefits of which can occur in the period (Fuenfschilling et al., 2019). The primacy of short-term economic concerns in the decision-making process is short-sighted in the face of the current realities of different territorial contexts and their relative functioning of economic systems that depend on the sustainable functioning of socio-technological systems and their social and environmental context. At the same time, user needs vary and depend among other things on historical, political, economic and social events (Raven et al., 2019). The many forms of unsustainability are visible in the form of what we call persistent problems. Just think about our current energy systems and how it affects urban life. In most modern cities that once had their energy supply now their energy infrastructures depend on nationwide grids and power plants running fossil fuels in a liberalized market. The interests, investments, and stakes in the current fossil-based regime are high and would require structural change. Many cities today are concentrating their efforts on developing new urban energy solutions, which range from stimulating energy efficiency, to the spread of renewable technologies on the one hand to improve the energy efficiency of urban areas and on the other to counter the climate crisis (Frantzeskaki et al., 2018) thanks also to the issue of documents in the framework of the United Nations conventions. Cities have opened up the possibility of providing space for radical alternatives to the dominant centralized and fossil fuel-based energy system, thus becoming important agents of change in transitions. However, there is still a lack of coordination in which cities explore different strategies, solutions and technologies, depending on the context and the potential and characteristics of the different local contexts. Faced with this scenario, the need to focus on and accelerate the sustainable urban transition emerges today.

While the potential does indeed exist to accelerate sustainability, cities are not automatically able to proactively anticipate and adapt to such possibilities.
A transition consists of a number of system changes, which are innovations that fundamentally alter the relationships between organizations, institutions and individuals in a given field or domain (a subsystem). To orient the transition towards sustainability, new governance methods are needed that take into account the long time horizon, the uncertainties and complexities, and the multitude of people and interests involved (Raven et al., 2019). Transition studies in science in recent years have been developed on the basis of different perspectives useful for analysing the transition of sustainability in the urban area. A first approach aimed at innovations on different urban scales useful to be able to radically change the urban fabric and social practices towards sustainability even if these changes involve high costs. A second approach, instead multiphase, which aims at a holistic and dynamic knowledge of the multiple phases (pre-development, take-off and lock-in) and the associated dynamics that a transition process involves. A third approach based on the definition of conceptual tools to understand the evolutionary interactions between environment and social transformations that occur in a long and short period. A fourth perspective based on the analysis of the different models of processes in which transitions can proceed when considering policies, institutions, technology (Gells, 2002). The different perspectives provide concepts for innovation, but also the "stepping stones" to overcome theoretical gaps for proactive management of the transition of specific sustainability problems in a given urban area. Surely today the scientific debate on how to accelerate the sustainable urban transition by filling its hitherto existing gaps and management difficulties remains open. What are the steps that have so far been made by science, technicians of the territory and local communities in countering the climate crisis by indirectly promoting sustainable urban transition also by reason of the European directives?

2. The role of science and policy in accelerating climate action

In recent years, the community made up of researchers, professionals, policymakers have tried to give answers to the challenge of climate change in cities. Urban systems are globally recognized as sites of climate vulnerability. The fight to combat the phenomena of climate change has been conducted according to two strategies: mitigation, which focuses on the drivers of climate change, and adaptation, which focuses on the impacts of climate change (Sharif, 2021). Today there is an urgent need to fully mobilize climate action at different urban scales where cities play a central role as stated in the United Nations Framework Convention on Climate Change (UNFCCC). A first moment of confrontation between the scientific, political and practical communities on the issue of science and cities on climate change took place at the science conference held in 2018. This conference, for the first time, constituted a meeting focused on the projection of impacts between the scientific community and institutions. Furthermore, it recognized the importance that if a partnership between science, politics and practice is not established, only in this way will we be able to enhance climate action and aim for sustainable development. Within the same conference, a solid program of tailor-made research and action was also defined that are sensitive to the level of resources available in the different cities (for example, large, medium and small; high, medium and low income; cities in shrinking and expanding, etc.). The high level of knowledge developed today by scientists, the European directives issued on the climate must not remain closed and are within decisive consensus, but must constitute the starting point for actively involving local inhabitants to better respond to specificities, local needs and priorities. The scientific community lately feels more and more the need for a cutting-edge analysis of the climate, vulnerability, impact, adaptation and mitigation, identifying critical areas linked to the priorities of the operators and associated methodologies to investigate them (Giri et al., 2021; Khan et al., 2021). Scientific research on the topic of climate change and sustainability is moving through the creation of multidisciplinary, interdisciplinary frameworks that allow investigation in new ways that identify innovative approaches to the analysis of the urban climate with the aim of increasing the resilience of the city and to promote environmental sustainability (de Falco et al., 2018; Tira

et al., 2020). On the contrary, the technicians of the territory require a practicable science, centered on consensus and based on the concreteness of being able to implement mitigation and adaptation actions, with a careful evaluation of the synergies and compromises of particular actions on the basis of the knowledge of the " worst case "that their city is facing, as developed for the Climate Ready Boston report. Instead, city policymakers demand concrete examples of what other cities are doing and how they have been and have not been effective. They need context and guidance to define the general guidelines that their cities must follow, not only in the context of climate change, but also with its likely interactions with the different components of an urban system (Yeganeh et al., 2020; Bastin et al., 2019). Valid examples developed so far are action networks such as C40 and the Coalition for Urban Transitions which play an important role in providing guidance to cities, for both professionals and policy makers. An additional professional network of climate specialists on an international, national, regional and urban scale is UN-HABITAT Planners for Climate Action (www.plannersclimate.org) which seeks to support the role of climate action and sustainability in practices. Urban and regional planning, capacity building and research. The knowledge demands of the scientific, political and practitioner communities may differ, but it is important to recognize that their knowledge needs overlap and diverge. Issues related to climate and sustainability have received a major boost and acceleration as these issues have been included in post-Covid-19 recovery and resilience plans (Gaglione & Ayiine-Etigo 2021). Investment choices will define the future of the climate-environmental agenda in the post-Covid-19 era and for a sustainable, low-carbon economic recovery that is supported by renewed democratic governance mechanisms and social participation frameworks (Hepburn et al., 2020). Cities, as nodes of multifaceted interdependencies, can therefore benefit from development that starts at the local level to reach the subnational and national level and finally to reach the regional and international one (UCLG, 2020). The European Commission has played a crucial role not only in promoting ambitious climate goals that enhance the credibility of EU leadership efforts internationally, but at the same time in more strategic behaviour that reflects the preferences of Member States and in offering substantial forms of financing useful for combining different interests based on a single objective. In light of these considerations, the following is the European regulatory excursus starting from the climate law up to the EU Adaptation Strategy with the aim of examining the actions defined so far and how they can positively influence in favouring urban sustainability and the climate crisis.

EU Climate Law

The climate law enacted on 30 June 2021 continues with the objectives set by the European Green Deal. The law sets a legally binding target to achieve zero net greenhouse gas (GHG) emissions by 2050. Climate action will provide an opportunity for all sectors of the economy in the Union to contribute to ensure industrial leadership in the field of global innovation. The law is articulated in its 17 articles. The highly ambitious objective governed by Article 1 also aims to increase the competitiveness of European industry and ensure a just transition for the regions and workers concerned. The additional objectives governed within the document are aimed on the one hand at integrating the policy framework by defining short and long-term projections, providing predictability for investors and businesses and ensuring transparency and accountability. In the document, precisely in article 3, an intermediate goal is set that in 2030 it will be necessary to reduce greenhouse gas emissions by at least 55% compared to 1990 levels. Account of an indicative greenhouse gas balance for the period 2030-2050 to be published by the Commission. In detail, the Union's climate target for 2040 will have to take into account some key elements: (i) the best and most recent scientific evidence available, including the latest IPCC reports; (ii) the social, economic and environmental impact, including the costs of inaction; (iii) the need to ensure a just and socially equitable transition for all; (iv) cost efficiency and economic efficiency; (v) the competitiveness of the Union economy, in particular of small and medium-sized enterprises and sectors most exposed to carbon leakage; (vi) the best cost-efficient, safe and modular techniques available; (vii) energy efficiency and the principle of energy efficiency in the first place, affordability of energy and security of energy supply; (vii) the need to ensure environmental effectiveness and progression over time; (viii) the need to maintain, manage and enhance natural wells over the long term and to protect and restore biodiversity; (ix) investment

needs and opportunities; (x) international developments and efforts undertaken to achieve the long-term objectives of the Paris Agreement and the ultimate goal of the UNFCCC Framework Convention.
Furthermore, the law places its emphasis on tackling the fight against climate change according to an adaptation strategy as regulated in article 5, highlighting that constant progress is necessary in improving the adaptability of urban systems which in turn involves strengthening resilience and reducing vulnerability to climate change. In addition, Member States will have to implement national adaptation strategies and plans, taking into account the European Union strategy on adaptation to climate change based on rigorous analyzes on climate change and vulnerability, on assessments of progress made on the basis of indicators able to define the concept of vulnerability and based on the best and most recent scientific evidence available. In Articles 6 and 7 it takes into account both the evaluation of the progress made and the Union measures and the evaluation of national measures. In assessing the progress made and the Union's measures, the collective progress of all Member States in achieving the goal of climate neutrality is measured and in turn the collective progress made by all Member States in adaptation actions. By 30 September 2023, and every five years thereafter, the Commission will review the consistency of the Union's measures with respect to the goal of climate neutrality and progress on adaptation. On the other hand, in the assessment of national measures the significant aspects are in the assessment of the coherence of the national measures considered, on the basis of the integrated national energy and climate plans, of the national long-term strategies and of the biennial interim reports submitted under the regulation. (EU) 2018/1999, relevant for the achievement of the climate neutrality objective referred to in Article 2 (1) of this Regulation. Then, in the consistency of the relevant national measures in ensuring progress on the adaptation referred to in the article. Finally, the law highlights a further determined aspect, namely participation in involving different communities. Citizens and communities play a decisive role in advancing the transition to climate neutrality, therefore strong public and social commitment to climate action at all levels, including national, regional and local, should be encouraged and facilitated in an inclusive and accessible process. The European Union aims to create a network capable of involving all the components of society, including interested parties representing the various sectors of the economy, to offer them the possibility and invest them with the responsibility to commit themselves to a society. Climate neutral and climate resilient, including through the European Climate Pact. An increasing number of countries have adopted climate laws with a long-term perspective others in the process of being adopted. The UK was one of the first countries to adopt the Climate Change Act. By February 2020, ten EU Member States had adopted climate laws, seven of them aiming for a long-term transition. Seven other Member States are preparing or considering adopting a climate law. A study carried out by Duwe et al., 2020 called "Climate Laws in Europe: Good Practices in Net-Zero" carried out an analysis of the legal text of climate laws and how there are differences in the way and forms in which climate policy elaborations are expressed in each country. While no equal climate laws exist, it emerges that most of them are based on a number of common design elements: (i) clear quantitative and long-term goals; (ii) mandatory climate planning to align short-term policies with long-term planning; (iii) periodic (annual) reports and progress checks to implement corrective actions, if necessary; (iv) attribution of responsibilities to the competent institutions (ministries and parliaments); (v) an independent scientific advisory body; (vi) public participation, for example city assemblies.

European Climate Pact

To give greater impetus so that the laws and policies put in place by the European Union so far can bear fruit, the European climate pact was issued. The main objective of this pact is to invite people, communities and organizations to participate in climate action and build a greener Europe. In turn, the pact aims to invite on the one hand to connect and share knowledge on climate change and on the other to develop, implement and scale solutions. The Pact will have the possibility to evolve through creativity, to the needs and ideas of those who will be part of it. In the initial phase, the Pact will give priority to actions focused on four areas that offer immediate benefits not only for the climate, but also for the environment. The four areas of interest are: (i) green areas; (ii) green transport; (iii) Green buildings; (iv) Green skills. For each of these four areas. As regards green areas, the Pact has the task on the one hand of offering local authorities solutions to restore, protect and expand green urban areas and on the other hand of supporting new initiatives for planting and caring for trees, for example through information and visibility. The benefit of creating green areas is both to absorb greenhouse gas emissions and to reduce excessive temperature rise. Several European initiatives have been developed in this area. A prime example is the European Green Capital Award. The (European) Green Capital Award values the efforts of local authorities to improve the environment, and thus the economy and the quality of life in cities. The prize is awarded annually to a city that is at the forefront of environmentally friendly urban life. The award encourages cities to commit to ambitious goals for further environmental improvement. A second example is Green City tool. Cities can use the tool anonymously or, if they wish, officially register and enter the Green City map. The tool is based on a yes / no assessment of your city in sustainable urban planning governed by criteria. It covers 12 key environmental thematic areas such as mobility; power; adaptation and mitigation to climate change. Finally, the tool also provides guidelines of the best practices so far implemented on the various issues. A third example The Green City Accord is a movement of European mayors committed to making cities cleaner and healthier. It aims to improve the quality of life for all Europeans and to speed up the implementation of relevant EU environmental laws. By signing the Agreement, cities are committed to addressing five areas of environmental management: air, water, nature and biodiversity, circular economy and waste

and noise. Regarding green transport, the pact aims to support numerous initiatives how to move efficiently and in healthier and less polluting ways. Many European cities are implementing simpler, safer, healthier and cheaper solutions for fossil combustion vehicles, such as sharing electric vehicles, bicycles and e-bikes, eco-friendly buses and trains while also favouring ways of moving from rural areas to cities. . Two significant European initiatives developed in this area are illustrated below. A first initiative is the CIVITAS (sustainable and smart mobility for all) project. The CIVITAS initiative works to make sustainable and smart urban mobility a reality for everyone in Europe and beyond. The thematic areas in which the whole project moves goes on how to favour moving mode based on a type of soft mode to favour a type of collective transport such as local public transport in order to create a multimodal city in which people can complete your travels in a comfortable and sustainable way, without the need for your own car. In addition, the project aims to improve the demand for urban space management through an integrated planning between the built environment and the sustainable displacement modality in order to have an integrated and inclusive planning. A second initiative is the European Platform on Sustainable Urban Mobility Plans. The European SIA platform supports the development of the Sustainable Urban Mobility Plan (SUMP) concept and the tools necessary for its successful application by local planning authorities and facilitates coordination and cooperation between the different actions. The Mobility Plans portal provides a wealth of information on how to develop and implement a SUMP, including information on the elements of a SUMP, guidelines on the process of developing and implementing a SUMP and selected tools, guides, manuals and reports to support health professionals. Urban mobility in their work. As for green buildings, the goal is to make our buildings more climate-friendly by building better structures and at the same time renovating existing ones. The pact aims both to share information and raise awareness on the multiple benefits of building renovation and to share guidelines and technical assistance for local authorities and citizens. A significant example of urban evaluation of our building stock is the European initiative EU Building Stock Observatory (BSO). BSO was established aiming to provide a better understanding of energy performance in the construction sector through reliable, consistent and comparable data. The BSO contains a database divided into 250 indicators. The indicators are organized into thematic areas ranging from the characteristics of the building stock, building renovations, energy consumption, and certification. Each dataset can be viewed by subject, year and country or for the EU as a whole. Once the indicators have been selected, the data is presented in summary tables and graphs, with references to each data source. The results obtained can also be mapped and allows users to compare information between EU countries. To promote and publish the database results, the BSO produces thematic and country-specific factsheets that address the most relevant issues. Finally, as regards green skills, climate action is already providing the jobs and opportunities of the future. The transition to a climate-neutral economy will trigger a fundamental transformation in a wide range of sectors. New jobs will be created, while some will be replaced and others redefined. The pact aims to: (i) encourage companies and organizations to participate in the Skills Pact to help workers qualify and retrain; (ii) disseminating good practices and success stories collected in European programs; (iii) help navigate the European Social Fund, which will train five million people in green jobs and green recovery; (iv) building links with Erasmus + in support of education and training and other programs that offer opportunities to develop forward-looking skills and partnership projects; (v) Encourage stakeholders, local authorities and communities to use the Just Transition Mechanism to promote the retraining and active inclusion of workers and job seekers and help create new local jobs in regions concerned; (vi) support programs for higher education institutions seeking to develop and teach courses on environmental and climate impacts.

EU Adaptation Strategy

In February 2021 the new strategy for adaptation to changes was issued by the European Union. The new strategy establishes how the European Union can adapt to the inevitable impacts of climate change and become climate resilient by 2050. The cornerstones on which this strategy is based make adaptation (i) smarter; (ii) faster; (iii) more systematic and finally intensify international action on adaptation to climate change.

The strategy primarily aims to foster smarter adaptation aimed at improving knowledge and managing uncertainty. Climate change manifests itself in many threats, with impacts in almost all sectors. Therefore, the knowledge base required to inform effective action is broad. It includes uncertainty about how it will change and affect natural and human systems and the effectiveness of policies and measures put in place. This involves feeling the need to push the frontiers of adaptation knowledge and acquire more and better data relating to the climate. Faced with these knowledge gaps, in the document, the European Commission proposes to strengthen knowledge on climate impact and resilience through support tools such as Horizon Europe, Digital Europe, Copernicus and EMODnet. Also, to improve the state of the art on adaptation modelling, risk assessment and management tools - towards "activity level modelling". However, decision support tools such as the Climate-ADAPT platform are already well established, which in turn is gradually being expanded, for example with access to Copernicus data. The European Union aims to update and expand Climate-ADAPT as a source of knowledge on climate impacts and adaptation, also by federating various sources of information, and as a monitoring and reporting mechanism. In recent years the effects of climate change have manifested so frequently causing impacts so pervasive that our response to them must be systemic. Therefore, on the one hand, adaptation must aim at improving adaptation

strategies and plans at all levels must be effective and based on the latest science. Improvement can take place both by stimulating cooperation at regional and cross-border level and by improving guidance on national adaptation strategies in cooperation with Member States by updating monitoring, reporting and assessment of adaptation using a harmonized framework of standards and indicators. In turn, the document aims to promote local, individual and just resilience, step up support for planning and implementation of local adaptation and launch an adaptation support structure under the EU Covenant of Mayors. Finally, promote nature-based adaptation solutions to propose nature-based solutions for carbon removal, including accounting and certification in upcoming carbon cultivation initiatives. Progress in adaptation planning remains slow and implementation and monitoring even slower. Current measures mainly focus on awareness raising, institutional organization or policy development, but in reality the implementation of physical solutions, such as creating more green spaces to reduce the impact of heatwaves or adapting sewer systems to better cope with storms, is overdue. The goal of this strategy is therefore to shift the focus on the development and implementation of solutions, to help reduce climate risk, increase climate protection. To do this, the European Union places as strategies: (i) supporting the development of further adaptation solutions, including tools to support rapid response decisions to enrich the toolbox for adaptation professionals; (ii) develop an EU-wide climate risk assessment and strengthen climate considerations in EU disaster risk prevention and management; (iii) increase cooperation with standardization organizations for climate-proof standards and to develop new ones for climate adaptation solutions. Finally, to strengthen international action for climate resilience, the EU will increase support for resilience and international climate preparedness through the provision of resources, prioritizing action and increasing effectiveness, through increasing of international finance and through greater engagement and global exchanges on adaptation.

Conclusions

The concept of sustainability has burst into the scientific and political landscape. Today there is a strong need to encourage and accelerate the sustainable urban transition thanks to the multitude of funding established by the European Union, but also in the recovery and resilience plans. Although there are still strong theoretical and managerial gaps in favouring it as described in the first paragraph of this work. Fostering sustainable urban transition indirectly means addressing some challenges that cities are called upon to respond to such as climate change given the multitude of effects that occur in urban areas. Today the community made up of researchers, technicians of the territory and local administrations are asking for different answers in addressing the climate crisis. Their joint work could give satisfactory results if there was coordination and sharing of needs and knowledge in order to improve the quality of urban systems.

Europe is playing a frontline role on the issue as can be seen from the fact data-sheet of this work. First, it is setting legally binding targets such as zeroing emissions by 2050 for member states to focus their efforts on favouring climate-neutral cities, trying not to make it become a utopia. Secondly, the climate pact aims to promote initiatives at different national, regional and local scales to reduce organizational difficulties. Thirdly, Europe is pushing to fight the climate crisis according to adaptation strategies and measures at the local scale and the implementation of national plans for adaptation to change through knowledge of the risk and vulnerability of urban systems to the effects of climate change. It is necessary to accept that the territorial dynamics are in continuous evolution as their changes and therefore it is necessary to accelerate the ways in which to govern them.

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