TeMA

Journal of Land Use, Mobility and Environment

Cities need to modify and/or adapt their urban form, the distribution and location of services and learn how to handle the increasing complexity to face the most pressing challenges of this century. The scientific community is working in order to minimise negative effects on the environment, social and economic issues and people's health. The three issues of the 14th volume will collect articles concerning the topics addressed in 2020 and also the effects on the urban areas related to the spread Covid-19 pandemic.

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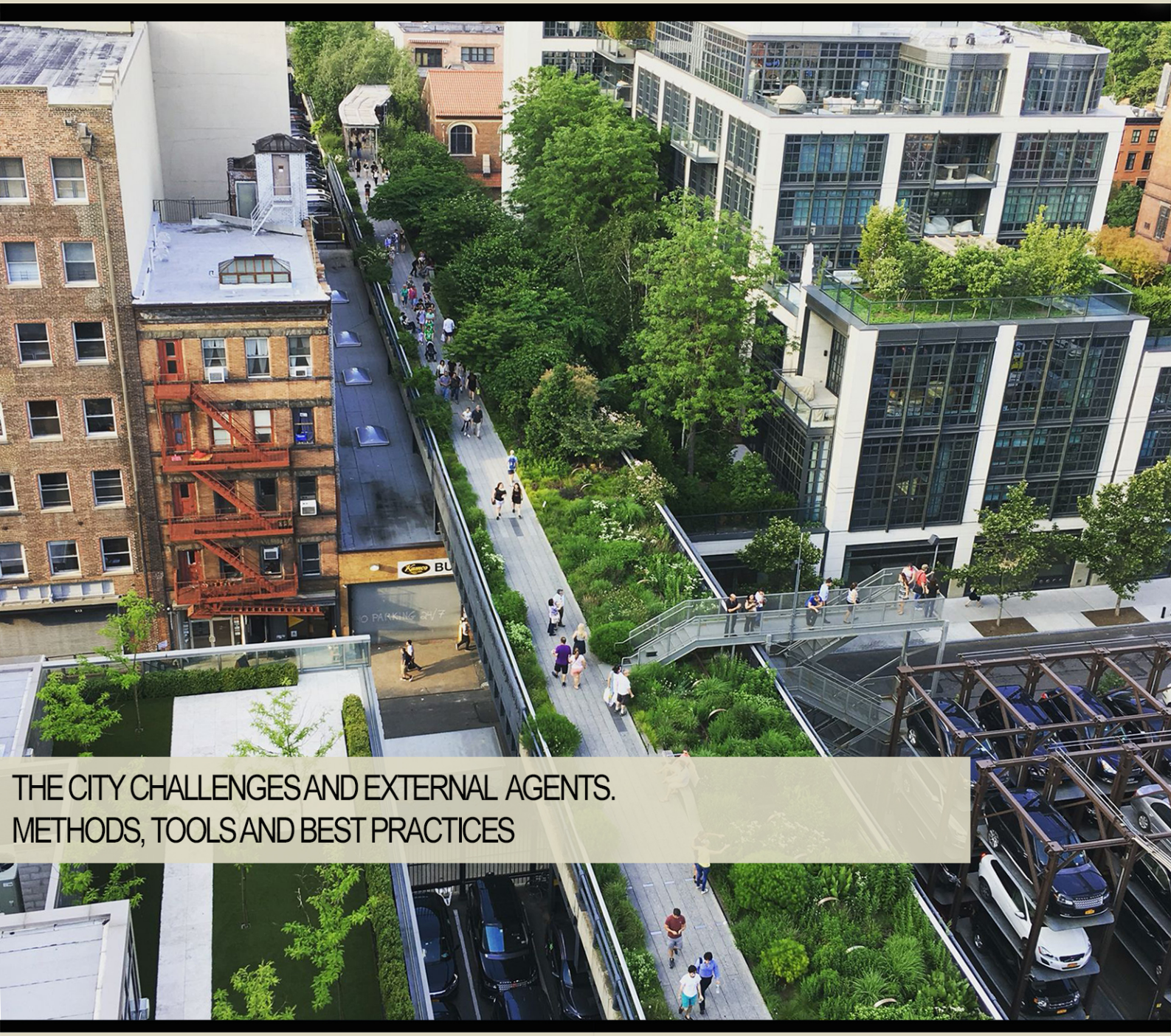

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REVIEW NOTE – Town Planning International Rules and Legislation

Strategies and guidelines for urban sustainability: The impacts of the Covid-19 on energy systems

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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 Overview section aims at presenting the latest updates in the territorial and urban legislative sphere.
The Covid-19 pandemic is causing a major impact on energy systems. Improving the energy efficiency of urban areas is now the cornerstone of scientific community and the European Commission discussions. Thus, the content of this review note aims at carrying out an analysis of the latest documents of the European Commission before and during the slow recovery from Covid-19 with the aim of identifying the priorities and areas on which to intervene to reduce energy consumption in different territorial contexts.

Keywords
Urban sustainability; Energy Consumption; CO_2 Emissions; Covid-19.

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1. Introduction

The Covid-19 pandemic, which has involved the entire world, has had a great impact on energy systems, holding back investment and threatening to slow the expansion of essential clean energy technologies. The major travel, trade, and economic activity disruptions caused by Covid-19 will lead to a significant decrease in carbon emissions. Emission reduction arises simultaneously to the wake of an international health crisis and widespread economic trauma. This situation will inspire governments to pursue structural reductions in emissions by organizing smart, sustained and ambitious policies to accelerate the development and deployment of a full range of clean energy solutions for different urban systems. Bearing this in mind, the International Energy Agency (IEA) has made it clear that tackling the global climate challenge and accelerating transitions to clean energy requires a grand coalition. This coalition requires the coordination of governments, industries, investors, and civil societies by sharing innovative ideas and best practices to increase the energy efficiency of cities. The IEA's annual Tracking Clean Energy Progress report shows that only 6 out of 46 technologies and sectors were "on track" to meet sustainability goals even before the pandemic. The pandemic has imposed unprecedented constraints, having extensive impacts on all components of the urban system (Gargiulo et al., 2020). For example, the urban mobility system is influencing the use of energy in a severe way. Perhaps, transportation is the only sector where the demand for energy and the effects of the Covid-19 response are more evident. The road use and rail transport along with the number of passengers have decreased, with consumptions reduced from 50-90%. The restrictive measures imposed by governments have completely changed the daily demand for mobility. The need to reach services in the proximity of their homes has indirectly encouraged forms of "soft" mobility, such as the use of bicycles. According to this trend, many cities, such as Milan, Paris, Rome, Brussels, Berlin, Budapest, have developed interventions intended at improving roads, public spaces and the circulation of pedestrians and cyclists. These changes may have long-term impacts on the transition towards clean energy in urban areas if the positive aspects associated with user behavior can be sustained after the end of the pandemic crisis. In cities, particularly in Europe, some policies have shown that they can help encourage the transition to more sustainable transport modes and technologies. These policies include direct investments in cycling and public transport infrastructure and traffic regulation changes to increase the user safety and usability in reaching their activities. On the other hand, the pandemic has favored the possibility of working from home, leading to an increase in domestic energy consumption. For example, residential energy consumption in the United States has increased approximately 6-8% over the last year (IEA, 2020). Responding to the users' new needs and requirements will lead to a rethinking of how to remodel the built environment. It will be necessary to implement policies and practices aimed at the redevelopment of buildings by improving their energy retrofit and limiting the consumption of energy from domestic heating and cooling. The policies needed after the pandemic crisis will have to stimulate demand for highly efficient and low-carbon products at the same time, which could help keep urban areas on track to meet climate goals while reducing energy consumption. The installations of renewable energy sources on-site such as solar thermal, solar photovoltaic, geothermal energy are opportunities that could also be supported by economic recovery plans. For example, through Eco-bonus, Italy provides tax deductions of 110% for energy efficiency and seismic safety renovations. The current pandemic crisis raised new research questions for scholars, in particular research about energy. The scientific community had been questioning for years all the different types of energy consumption (e.g. total energy, transport, or residential), overlooking urban characteristics such as population density, family size, income, etc. The studies have examined the urban features affecting urban energy consumption at two different micro and macro scales. Studies by Martin et al. (2017), Mazzeo (2013), Gobakis and Kolokotsa (2017), Gargiulo and Russo (2017), Pincetl et al. (2020) highlighted how the design of the built environment, the relationship between buildings and open spaces, the materials used for the external surfaces, the socio-economic context, population characteristics combined with climatic and microclimatic conditions affect energy consumption in urban areas. Since the relationship between

urban fabric and buildings influences energy performance, it is possible to obtain a lower energy requirement by improving the built environment. For example, building shape and height can influence their solar exposure with consequences on solar heat gains and the energy produced by photovoltaics integrated into the building envelope and by solar collectors. In particular, the characteristics of the built environment depend on three parameters relating to energy: the "surface-volume" ratio (S / V) of the buildings, the "height-width" ratio (H / W) of the canyon, and the main road orientation (Leconte et al., 2015; Memon et al., 2010). These variables are helpful to describe the compactness of the built environment and the surrounding open space characteristics. Compact urban configurations lead to the reduction of heat exchange between buildings and the external environment but also the decrease of solar heat gains. These parameters express the compactness of the built environment and the typology of the surrounding open spaces (Xu et al., 2019). Compact urban configurations reduce heat exchanges between buildings and the external environment but also reduce solar heat gains. Other studies have focused on the functional mix of urban areas combined with the percentage of jobs and how these variables affect the energy consumption of transport. Other Studies such as Enter Zhang and Zhou (2020) and Hong et al. (2016) have placed more attention on the use of methods, tools and techniques to measure energy performance, aiming to provide maps of the different territorial contexts to identify the prioritized areas. All these studies aim to provide simultaneously a panel of strategies, actions and interventions with a view to adaptation and mitigation. Some research pieces have highlighted the importance of the incorporation of energy efficiency measures in current projects to minimize the future effects of climate change, which constitutes one of the main threats that cities must face today. Whereas, other studies have focused on the efficient use of energy by contributing to lower energy consumption and the reduction of greenhouse gases released in nature, thus improving environmental sustainability. Therefore, the energy issue and the sudden improvements in energy efficiency in urban areas is a topic that has become the focus of discussions of the scientific community and the European Commission even in this pandemic scenario that cities are facing. Especially in recent years, the European Commission has been setting highly ambitious national targets. In this direction, the present review aims to carry out an excursus of the latest European Commission documents regarding the improvement and reduction of energy consumption before and after the Covid-19 crisis to identify the priorities in terms of energy efficiency issued by the European Commission and which can be applicable in different territorial contexts and which at the same time can counteract the occurrence of climate change.

Strategic vision with zero climate impact, COM/2018/773

In recent years, the European Commission has been placing a strong interest in the energy issue beginning from the need to tackle one of the phenomena that has been threatening cities that is climate change. The European Commission in 2018 adopted a long-term strategic vision for a prosperous, modern, competitive and climate-neutral economy by 2050 - A clean planet for all". The Commission's vision aims for a climate-neutral future reachable by covering nearly all EU policies. It is in line with the Paris Agreement goal of keeping the temperature rise well below 2° C, also pursuing efforts to maintain this value at 1.5° C. this goal must be achieved by 2050 so that the EU can maintain a leading role in terms of zero climate impact. Furthermore, the strategy highlights how Europe can play a leading role in achieving zero climate impact, by investing in realistic technological solutions, involving citizens, and harmonizing interventions in pivotal sectors like industrial policy, finance, or research - guaranteeing at the same time social equity for a fair transition. The strategy explains how to achieve this by considering all key economic sectors energy, transport, industry, and agriculture. In the vision of the European Union there are seven strategic elements: (i) optimizing the benefits of energy efficiency; (ii) optimizing the use of renewable energy and the use of electricity; (iii) adopting clean, safe and connected mobility; (iv) recognizing the competitiveness of European industry (v) developing adequate and smart grid infrastructure and interconnections (vi) harnessing the benefits of the bioeconomy and create carbon sinks (vii) tackling the rest of CO_2 emissions through the carbon capture and storage process. In particular, the strategies of the first three points and the fifth listed above are examined, which are the components that directly affect urban systems. As far as the building efficiency is concerned, the outlined scenario shows

that the energy efficiency of European countries depends on energy demand in both the residential and service sectors whose current energy consumption amounts to 40%.
In order to decrease energy consumption, the strategy is to increase the renovation rate, change heating fuel so that the vast majority of homes get heat by plants powered by renewable sources (electricity, district heating, renewable gas, or solar thermal), disseminate the most efficient products and equipment, use intelligent building and equipment management systems and improve insulation materials. Europe also stresses that the modernization of the built environment and the mobilization of all actors will require an integrated and coherent approach in all relevant policies; the participation of consumers will be decisive in this process, including their associations. The second strategy concerning the diffusion of electricity from renewable sources aims at the diffusion, at more competitive conditions, of electricity from renewable sources, offering opportunities for the decarbonization of other sectors, such as heating, transport, and industry, through its direct use. The use of Power-to-X technologies, which can transform electricity into synthetic gases and synthetic liquids, and their ability to store synthetic fuels and use them in various ways in economic sectors that are difficult to decarbonize (for example, industry and transport). The third deals with clean, safe and connected mobility by encouraging all modes of transports of low-emission vehicles by equipping them with alternative systems and at the same time with other energy efficiencies. Secondly, to aim for clean mobility that allows for intelligent traffic management and ever greater automation of all mobility modes, reducing congestion and reducing vehicular pressure in cities. At this point, Europe highlights the significant and decisive role of spatial planning in the field of regional infrastructures to fully exploit the advantages offered by the greater use of public transport. Furthermore, the European Commission underlines that urban areas and smart cities will be the first nuclei of innovation so that short journeys predominate through the creation and construction of safe cycling and pedestrian paths as well as clean local public transport. The second part of the document aims to define the role of the various institutions. In particular, it outlines that the Union policies with those of the Member States and regional and local administrations facilitate a just and well-managed transition that leaves no region, community, worker, or citizen behind. Aligned policies are important for growth and what supports growth, such as competition, labor market, taxation, climate action and energy policy. Besides, accelerate research, innovation and short-term entrepreneurship for a wide range of zero-carbon solutions. Finally, recognizing and strengthening the central role of citizens and consumers in the energy transition, encourage and support consumer choices to improve the quality of life and of their cities.

European Green Deal

The long-term strategic vision for a prosperous, modern, competitive and climate-neutral economy by 2050 - A clean planet for all "enacted in 2018 was the prelude to the excitement of the European Green Deal. The European Green Deal constitutes a set of political initiatives, proposed by the European Commission, with the main objective of achieving climate neutrality in Europe by 2050. Ursula von der Leyen defines that the Green Deal will be like "the landing of man on the moon". It is a difficult mission with the aim to improve the environment and citizens' state of health by making their Member States climate-neutral or by reducing emissions and sources of pollution and, at the same time, developing a new economy capable of generating new jobs. The actions on which the green deal is based on consist of five areas. The first is addressed to the climate. In particular, the European Union aims to become climate-neutral, i.e. zero emissions, by 2050, through a climate community law that will not only translate the vision into obligations and prescriptions but will point the way to new investments for institutions and businesses; the second on energy. Today, the production and use of energy cover more than 75% of greenhouse gas emissions: liberation from oil and other fossil sources is the essential prerequisite to fight climate change. In this context, the goal is the total decarbonization of the European energy system by encouraging member states to present their national energy and climate plans following the regulation on governance of the energy union and action to the climate. The third is directed to buildings since 40% of energy consumption is in the building sector.
Renovating buildings with the most advanced technologies will allow citizens to drastically reduce energy consumption and, at the same time, improve the energy performance of urban areas. The Commission will rigorously apply the legislation on energy performance in the building sector, starting with an assessment of national strategies.
Long-term restructuring of the Member States which will be carried out in 2020. The Commission proposes to work with stakeholders on a new restructuring initiative in 2020 and to envisage innovative financing schemes under InvestEU. The fourth area regards the industry sector. Only 12% of European industrial activities use recycled materials in their production processes. For this reason, the European Green Deal will have to encourage innovations in all industrial sectors to carry out concrete circular economy projects; The fifth on mobility. Transport is the source of 25% of greenhouse gas emissions. A greener Europe cannot ignore more sustainable forms of public and private mobility. The areas considered by the Green Deal involve industrial sectors, civilians, research institutions. It underlines the need to adopt a holistic approach, ensuring that all EU actions and policies contribute to different objectives, improving urban quality and users' level of wellbeing. The areas which this document deepen were already partially defined in the strategic vision issued by the European Commission, providing us with more practical solutions and interventions to improve the energy efficiency of cities. The Green Deal, on the other hand, also outlines the financing plan. In detail, the financing plan envisages: (i)

allocating at least 1,000 billion euros to be disbursed over the next 10 years as loans to support sustainable investments; (ii) creating the conditions for both private individuals and the public sector to invest in sustainable initiatives such as to intercept these incentives; (iii) supporting public administrations and project promoters to identify, structure and implement these sustainable projects. In turn, two instruments implement the directives of this document: the sustainable investment plan and the Just Transition Mechanism. The investment plan is divided between funds from the European budget, estimated at at least 25% of the total or a figure that amounts to 485 billion euros up to 2030, private co-financing and loans from the European Investment Bank (EIB), which has already announced that 50% of investments by 2025 will be dedicated to green projects. The "Just Transition Mechanism" aims to support the most economically and socially disadvantaged areas during the transition period. Considering Poland, for example, whose energy systems are still too tied to the coal and lignite supply chain to be able to reach the target within the deadlines set by Europe: Warsaw has, in fact, already expressed its perplexities on the Green Deal.
The Fund aims to incentivize new technologies while preserving jobs, thus reducing the inevitable social impact of the transition as much as possible: 7.5 billion euros are expected to be disbursed through the InvestEU platform, to trigger further loans from the EIB and move private funds around 45 billion euros allocated to sustainable projects.

'Green Transition' in pandemic recovery plan

A year after the issuance of the Green Deal, attention has focused on the urgent health aspects of the Covid-19 epidemic, almost completely obscuring the objectives set by the Green Deal. In April 2020, the European Parliament called for the European Green Deal to be included in the Covid-19 pandemic recovery program. Ten countries have urged the European Union to launch a Green Recovery Plan to avert the weakening of climate change action due to the Covid-19 pandemic. In a pandemic scenario, in September 2020, the European Commission issued the plan, entitled "A more ambitious 2030 climate goal for Europe: investing in a climate-neutral future in the interest of citizens", is accompanied by an impact assessment confirming that this reduction is a realistic and feasible strategy. The new climate target set more in the short term i.e., by 2030 will help to set the direction for the post-pandemic EU economic recovery by stimulating investment in a resource-efficient economy, promoting innovation in clean technologies, strengthening competitiveness. Besides, the Member States can draw on the 750-billion-euro from Next Generation EU, Recovery Fund and the EU's next long-term budget for these investments towards the green transition, as well as the new renewable energy financing mechanism of the EU. And the EU facilitates collaboration between the Member States to finance and implement projects in this field.
Also, the European Commission has adopted the assessment of the Member States' national energy and climate plans for the period 2021-2030. The individual assessments of the 27 National Energy and Climate Plans (NECPs) analyze the progress and the ambitions of the Member States in achieving the 2030 climate and energy targets.
The report examines the five different dimensions of the Energy Union: decarbonization, including renewable energies, energy efficiency, energy security, the internal energy market, as well as research, innovation and competitiveness. However, there is soaring progress in the renewable energy field, but we need to improve performance in terms of energy efficiency. It will be necessary to give a positive boost to the restructuring plan and the revision of the energy efficiency directives. The communication provides for a series of actions that are necessary for all economic sectors to achieve this ambitious decarbonization process and defines which legislative acts will be subject to review, such as the Energy Efficiency Directive, the Renewable Energy Directive, a system for the trading of share emissions. Recently, Energy Commissioner Kadri Simson said: "National energy and climate plans are an essential tool of our collaboration with the Member States to plan policies and investments for a green and just transition. The time has come to implement these plans and use them to overcome the crisis caused by the Covid-19 pandemic with new jobs and a more competitive Energy Union".
The examination of these documents shows that in recent years the European Commission has been playing a leading role in combating the fight against climate change through the improvement and energy efficiency of cities. The funding allocated by the Green Deal must be the starting point for promoting material projects that aim to provide strategies, actions and interventions on the different territorial contexts through the coexistence of a multitude of actors such as industries, research bodies, universities, civil societies. Efforts should aim more at adapting our cities so that results are obtained more in the short term than mitigation actions whose effects on cities require longer waiting times. Finally, the practical fulfillment of the national energy and climate plans (PNEC) must constitute the essential tool both for the achievement of the climate and energy objectives by 2030 and for the monitoring to improve the energy performance of the different territorial contexts and to overcome the crisis caused by the Covid-19 pandemic. The virulence with which this virus, invisible but so omnipresent, manifests itself is changing our social behavior and, with it, many relationships that structure the urban and territorial system. From this pandemic scenario, as the documents examined also affirm, we must start to rethink the organizational form of our cities. A city that must change its face by favoring policies and practices increasingly with a view to sustainability and energy efficiency.

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