



European
Commission



The Green City Dimension

Striving towards a greener Europe

Climate adaptation and energy transition driving change in urban areas

*Regional and
Urban Policy*

This article is part of a series of articles based on the 14 Partnerships of the Urban Agenda for the EU. Structured around the three city dimensions of the New Leipzig Charter (the Productive, the Green and the Just City), the articles link Partnerships' actions and activities with other relevant EU projects and initiatives supported by Cohesion Policy (including Urban Innovative Actions, URBACT or Article 7 cities benefitting from ERDF). The articles demonstrate the key role of cities in the Urban Agenda for the EU and focus on specific actions they have led and implemented. Overall, the articles aim at showcasing practices and experiences on how different tools and funding support can help cities face their challenges in a strategic way towards sustainable urban development.

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Striving towards a greener Europe

Climate adaptation and energy transition driving change in urban areas

In 2021, COP26 will take place in Glasgow with the aim to accelerate actions towards the goals of the Paris Agreement and the UN Framework Convention on Climate Change. The urgency to foster energy transition and climate adaptation is not new and EU institutions, Member States, regions and cities have long called for action, particularly at city level. Embedded in this context are **two Urban Agenda for the EU Partnerships** on **Energy Transition** and **Climate Adaptation**, which have sought to help urban practitioners develop better climate adaptation measures focusing on energy efficiency and energy transition initiatives in urban areas.

This article presents some of the key flagship initiatives of these Partnerships as well as examples supported by the URBACT programme, Urban Innovative Actions projects (UIA) and integrated urban strategies supported by the European Regional Development Fund (ERDF) together with concrete tools and methodologies, which can be applied further by interested cities.

Climate adaptation and energy transition as key challenges for European cities

Today, the negative impacts of climate change on the world, especially on urban areas, are **well known**: while increasing temperatures result in the 'urban heat island effect', increasing precipitation, and extreme precipitation events lead to pluvial and fluvial flooding. Moreover, water scarcity, as well as increased storm damage and the threat of nearby forest fires, occur more frequently. On top of that, the direct impacts cascade through urban systems leading to a wide range of secondary impacts on the economy, human health, social wellbeing, and overall quality of life and functioning of cities.

Currently, **75% of EU citizens** live in urban areas, and **66% of the world's population** is expected to live in cities by 2050. Alongside this, cities' global carbon footprint will **triple** by 2030. A significant part of this footprint is subject to the high energy demand of cities, which is a major contributor to climate change: about **two thirds of global greenhouse gas emissions** are caused by the generation of electricity and heat.

It is also at city level that 60–80% of natural resources are consumed, 50% of global waste and 75% of greenhouse gas emissions are produced. As such, the call for 'greener' cities has been echoed by many institutional and non-institutional stakeholders (e.g. [Transition Towns](#), [Extinction Rebellion](#), [Youth Strikes](#)), as well as recent democratic experiments ([Convention citoyenne](#) in France, [Climate assemblies](#) in the UK). Developing climate adaptation strategies, using carbon budgeting, and implementing smarter integrated energy systems are just a few of the possible solutions.

The framework for greener cities

Even though sustainability is not a new concept, there has been an increase in strategic and enabling frameworks for actions towards climate change mitigation and energy transition, at international, European and city level.

At European level, the [Green Deal](#) is a key strategic framework to make the EU's economy more sustainable. The framework seeks to achieve climate neutrality by 2050: boosting the efficient use of resources by moving to a clean, circular economy and restoring biodiversity are at its core. The new [EU strategy on adaptation to climate change](#) confirms that the EU should adapt to the unavoidable impacts of climate change and become climate resilient by 2050, following four principle objectives: to make adaptation (i) smarter, (ii) swifter and (iii) more systemic, and (iv) to step up international action on adaptation to climate change. This is supported by dedicated funding accounted for under the [new Cohesion Policy for 2021-2027](#). The vision is for a smarter Europe (through innovation, digitalisation, economic transformation, and support to small and medium-sized businesses) and a greener, carbon free Europe (investing in energy transition, renewables, and the fight against climate change). These priorities account for 65% to 85% of the European Regional Development Fund (ERDF) and Cohesion Fund resources.

At city level, the renewed [Leipzig Charter](#) supports the vision of a 'green city', contributing to combatting global warming and developing high-quality urban environments for all (through climate-neutral energy supply, renewable resources and carbon-neutral buildings, investments in innovative and efficient technologies, and fundamental change in the modes of production and consumption). It addresses the need to regenerate endangered ecosystems and to use nature-based solutions, notably green and blue infrastructures. Finally, it focuses on urban transport and mobility systems, which should be efficient, carbon-neutral, and multi-modal. The [Covenant of Mayors](#) and [Climate Chance](#) also provide an opportunity for cities to commit to increasing energy efficiency and the use of renewable energy sources.

Aligned with the move towards more integration and multi-level governance, and based on the [Pact of Amsterdam](#), since 2017, the Urban Agenda for the EU Partnerships on [Energy Transition](#) (led by Gdańsk, Poland; London, UK; and Roeselare, Belgium) and [Climate Adaptation](#) (led by

the city of Genova, Italy) have gathered European, national, regional and city stakeholders to address the key issues including:

- developing a common level of awareness of the urgency of climate change and building city capacities to address and adapt to the impacts of such change;
- identifying solutions for energy supply, generation and storage, management and planning, and energy consumption.

The rest of this article presents key insights and initiatives that have sought to address these issues.

Gaining access to high-quality data on climate change for local policy design

Gaining access to adequate information for cities to design and implement local climate strategies can be difficult. Using this data correctly is another challenge.

Making it possible to access information has been the focus of one of the actions of the Partnership on climate adaptation. Led by the European Commission's Joint Research Centre (JRC) with the support of the City of Genova (Italy), this action has sought to build on the knowledge and experience of the European Commission-led [Copernicus Climate Change Service \(C3S\)](#), to inform and build the capacity of local policymakers. Indeed, the C3S provides territorial analysis, including on temperatures and climate variables useful for climate adaptation.

After identifying both the potential and need to further promote the platform, a first webinar was organised to explain the platform's benefits. Two more webinars are planned to take place in 2021 to provide training on the use of the data by the service provider (ECMWF) as well as other useful climate data from the [PESETA IV](#) project, by the JRC.

The immediate impact of this action took place at three levels: EU, local and research. Via the collaboration with DG CLIMA, the action directly contributed to the new [EU strategy on adaptation to climate change](#), which promotes the use of existing data, especially from C3S. In addition, thanks to the methodology and framework from the partnership, the city of Genova developed its very first holistic resilience strategy, '[Lighthouse](#)', which also stresses the importance of sharing and reallocating the efforts for implementing climate adaptation solutions, with the same methodological and governance principles as those of the Urban Agenda (i.e. multi-level governance and participation). This strategy also benefitted from JRC support in translating research into useful and manageable data for policy and decision-

makers. When it comes to the lessons learnt in terms of strategic thinking, Stefania Manca, Coordinator of the Climate Adaptation Partnership from Genova, noted:

“All levels of governance need to move away from silos, improving dialogues and thinking towards more systematic approaches.”

In addition, she added that *“climate adaptation is not climate mitigation”*. As such, data needs to be used in a preventive way and city practitioners need to be empowered to use them. Finally, Genova has also provided the JRC with local data which, in turn, benefits research on a European scale. The city is now designing a collaboration programme with the JRC to ensure the best possible use of available data for critical infrastructure, agrological risks, and cultural heritage monitoring. Paulo Barbosa, Leader of the action on ‘improving EU municipalities’ knowledge in the framework of Copernicus Climate Change Service’ from the JRC, stated:

“Multi and interdisciplinary governance and exchanges are key to ensure development of city resilience policies.”

Only through ongoing and iterative learning and exchanges can local policies be made more meaningful and efficient.



Lighthouse, the resilience strategy of Genova © BY-SA @Comune di Genova

Developing a local ecosystem to adapt to climate change

In Manchester, a strong political commitment to the fight against climate change has been a key policy goal for a number of years and in 2019 the latest plan, the [Manchester Climate Change Framework](#), was approved, introducing the goal of carbon neutrality by 2038.

The implementation of this approach has been three-fold. It began by setting up a [climate change agency](#) in the form of an NGO to design and implement climate policies: the independent structure of the NGO ensures that the activities are carried out outside of the internal municipality politics and with dedicated focus on the best possible implementation. In parallel, it developed the [Manchester Climate Change Partnership](#), a strategic group gathering local public authorities, research organisations, and key local stakeholders as well as media, communities, and [arts and culture organisations](#). The third and final step was to set up science-based targets to ensure it could reach its objective of 15 million tons carbon budgeting.

As part of the [URBACT ZCC-Net network](#), Manchester, acting as a lead partner, seeks to develop the resources to further implement its Climate Change Framework, to deepen the existing framework by making it more concrete (e.g. via retrofitting budgeting, energy supply) and extending it (e.g. via consumption-based emissions). So far, the implementation of some of these activities has been possible via [Horizon 2020](#) grants, such as the development of the 'sponge park' (including nature-based solution elements) of West Gorton in the [Grow Green project](#). Last but not least, URBACT has enabled the city to go one step further in its Climate Change Framework, as Adrian Sachter, project coordinator of the network expressed:

"The URBACT support and methodology has provided Manchester with the possibility for cross international learning and sharing of experience, which cannot be done purely at a city nor national level but really altogether. Even with Brexit, we have the same ambitions as the other Member States and our network enables us to seek joint thinking and actions to fight climate change."

Future plans include addressing the funding challenge in the form of innovative financing opportunities.



West Gorton Community Park © City of Manchester

Developing a local ecosystem to adapt to climate change

A tremendous amount of heat is wasted within the EU. It produces **more waste heat than the demand** of its entire building stock. In addition, it does not take advantage of heat recovery potential from unconventional waste heat sources, i.e. data centres, metro stations, service sector buildings and waste-water treatment plants – which could cover **10 % of the EU's total energy demand** for heat and hot water.

The potential benefits of reusing waste heat have been tested and implemented in **Odense**, Denmark, in the Funnen District Heating where a major Facebook Technology data centre is operated by Fjernvarme Fyn. The city was able to reduce its coal consumption by a factor of 3 in 10 years and aims to phase out the remaining 30% of coal consumption in heat production by 2025. Addressing barriers such as continuous competitiveness on the market, unsupportive taxation schemes, lack of subsidies, or adaptation to local production and consumption realities, has made this goal possible.

One action of the Partnership on Energy Transition sought to address these barriers to take advantage of heat recovery potential from unconventional waste heat sources and to deploy renewables and waste heat used in district heating (DH) networks. It has therefore sought to contribute to the implementation of the **Clean Energy Package**. This action, led by Euroheat & Power, with support from Tilburg (NL), Roeselare (BE), Udine (IT), Groningen (NL) and Gothenburg (SE), produced a detailed policy paper with immediately applicable recommendations for policymakers. Pauline Lucas from Euroheat & Power noted:

“The Urban Agenda Partnership provided an opportunity to get support from external experts to carry out an in-depth review of challenges and opportunities from waste heat recovery.”

Thanks to this and to the participation of the European Commission Joint Research Centre (JRC) and DG Energy in this action, the paper has supported the EU policy process by contributing to the [revision of the Energy Efficiency and Renewable Energy Directives](#), to JRC’s recent work on waste heat, and to reports of the European Parliament.

Euroheat & Power will also continue to use outcomes of this work to support and engage with cities and other stakeholders (e.g. in the [CELSIUS](#) project). Pauline Lucas concluded:

“The Urban Agenda has been key to promoting a key priority for the transition to sustainable societies, the decarbonisation of cities. It has made cooperation and feedback from cities easier and helped establish a dialogue that still goes on. It should definitely continue.”



Odense Data Centre ©Facebook

“[In] Odense, Denmark, the city was able to reduce its coal consumption by a factor of 3 in 10 years and aims to phase out the remaining 30% of coal consumption in heat production by 2025”.

Overcoming local barriers to solar energy self-production

Producing renewable energy while addressing economic, legislative, cultural and policy challenges has been at the core of the [UIA Antwerp Circular South project](#). As one of the two [Article 7 cities](#) of Belgium's Flanders region (together with Ghent), Antwerp has sought to develop an integrated urban strategy to improve the economic, environmental, climatic, social and demographic conditions and has reflected this in its [framework supporting circular economy](#) and the recently approved [Climate Plan 2030](#).

In particular, in the newly built Nieuw Zuid district, the UIA Antwerp Circular South project has aimed to change local energy consumption habits by producing solar energy via (building-integrated) photovoltaic panels ((BI)PVs), monitoring the production via smart meters and a specific application. An energy community was created to link production and consumption, and experiments about consumption and its benefits were carried out.

The [challenges](#) addressed throughout the project notably related to the technicalities of installing all (BI)PVs on newly built sites, and the economic reality of a market still lagging behind in terms of available devices, as well as the legislative constraints of using self-produced energy. The project developed alternatives such as using a virtual model for PV production, reiterating tenders and market analysis for smart meters and PVs, and working with the options offered by an energy community to best use the energy surplus. As Joren Hofman from Antwerp put it:

"Our project was highly innovative, maybe too much in advance of its time. The UIA funding enabled us not only to go on a bold experiment – extremely strong because it combined both offline and online components – but also to reflect upon the process and share our learnings with other interested cities."

The project now possesses a repository of solutions to such challenges.

One of the project's key lessons has been that this type of project takes part in an interlacing of contexts, which requires an integrated approach and strong commitment from partners to co-create. This has also provided an opportunity to try and influence changes in a specific local context: providing evidence for economic added value, designing a convincing narrative, etc. This might in turn support the transposition of the Directive on common rules for the internal market for electricity ((EU) 2019/944) at regional level. For now, stakeholders conclude that the market is not ready for solar energy in apartment buildings. According to Joren Hofman, the success of the project can be used to guide other projects:

"The Nieuw Zuid district and Circular South project can serve as a template for further new and re-valued city projects."

deployment desks for city retrofitting’, which includes public master plans for building renovation, governance models, skills and training needs for the deployment of desk teams.

There have been many key lessons for setting-up functioning networks of deployment desks. Some baseline requirements were highlighted, such as a concerted action of the different levels of the administration (municipality, region, state and EU), leadership from the local administration, structuring of local communities and commitment of residents to change their behaviour, a tailored governance model, and the creation of renovation deployment desks. The latter are located in the areas to be renovated and composed of mixed entities with technical and multidisciplinary management profiles.

As Beatriz Irala Aliaga, Leader of the action ‘Deployment desks’ for city retrofitting’ from the Government of Navarra, said:

“This action is based on our work in Navarra, yet we have had to get to know other regions, so that we have enriched each other and got inspired by each other.”

Carlos Chocarro San Martín from Nasuvinsa stated:

“It has been crucial not only to compare the different realities in our Member States and cities, but also to work with different profiles and expertise, from energy to waste via urban planning.”



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The future of climate change and energy strategies must be integrated

In light of the [Green Deal](#) and the overall policy framework cited in the introduction, cities will need to continue developing and implementing climate adaptation and energy transition strategies. The examples mentioned above have shown the need for developing new solutions and their added value for committed cities. These pave the way for other interested cities. Continuing to combine soft and hard investments, ensuring integrated approaches and multi-level governance, will play a key role in the success of these solutions. Cities can go further in join the [Green City Accord](#), a European initiative supporting cities to commit to improve their environmental objectives.

Cohesion Policy sets out ambitions and funding instruments to support these objectives. A reinforced support to sustainable urban development will be activated with a minimum 8% of the European Regional Development Fund to be dedicated entirely to this goal. In addition, programmes can choose to have a priority focused entirely on integrated territorial development to go beyond the thematic approach (Policy Objective 5 'a Europe closer to citizens'). New tools and activities will also be provided to cities through the European Urban Initiative, in cooperation with Urbact, to support innovative projects, capacity building, capitalisation and knowledge. Other EU initiatives, such as the [Renovation Wave](#) and the [New European Bauhaus](#) will also be key for further renovation and retrofitting to support energy transition.