

Ex-ante assessment of the “Building decarbonisation: Integrated renovation programmes and local heating and cooling plans” thematic area under the Urban Agenda for the European Union

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List of abbreviations

CEMR	European Council of Municipalities and Regions
CF	Cohesion Funds
CoR	Committee of the Regions
CP	Cohesion Policy
DGUM	Director Generals for Urban Matters
DSO	Distribution System Operator
EAA	Ex-Ante Assessment
EBPD	Energy Performance of Buildings Directive
EED	Energy Efficiency Directive
EIB	European Investment Bank
ELENA	European Local ENergy Assistance
EMA	Energy and Managing Authorities Network
ERDF	European Regional Development Fund
ESF+	European Social Fund Plus
EUI	European Urban Initiative
EV	Electric vehicle
FED	Future Electricity market Design
GCoM	Global Covenant of Mayors for Climate and Energy
JRC	Joint Research Centre
JTF	Just Transition Fund
MFF	Multiannual Financial Framework
MaWP	Multiannual Working Programme of the Urban Agenda for the EU
NEB	New European Bauhaus
NBRP	National Building Renovation Plan
NECP	National Energy and Climate Plan
OFC	Other Forms of Cooperation
PV	Photovoltaic
RED	Renewable Energy Directive
RRF	Recovery and Resilience Facility
SCF	Social Climate Fund
TIA	Territorial Impact Assessment
TP	Thematic Partnership
UAEU	Urban Agenda for the EU
UATPG	Urban Agenda Technical Preparatory Group
UDG	Urban Development Group
UTM	Urban Transitions Mission

Executive Summary

This report is an ex-ante assessment of a proposed Urban Agenda for the European Union (UAEU) partnership or other forms of cooperation for the theme *Building decarbonisation: Integrated renovation programmes and local heating and cooling plans*. The UAEU promotes multilevel cooperation in urban policy and practice between Member States, cities, the European Commission, and other stakeholders. During the Multiannual Financial Framework 2021-27, support to the UAEU is provided under the European Urban Initiative.

This ex-ante assessment (EAA) is an in-depth analysis of this theme to optimise its focus, timing and activities of multilevel cooperation and propose how partners will be selected by the European Urban Initiative (EUI) in an open call that will be launched in the second half of 2024. The UAEU set five criteria for analysis of any prospective theme: multilevel governance, policy environment, regulatory environment, existing identified gaps and recommendations, and trends and evidence about EU cities. The recommendations in this EEA would, if the findings of the assessment are endorsed by the Director Generals for Urban Matters (DGUM) set the selection criteria and scope of the theme in the open call from the EUI for partners. Assessment methods in this EEA include desktop research, interviews with relevant European Commission Directorates-Generals and linked organisations (e.g. Joint Research Centre), a focus group meeting with key stakeholders for decarbonisation of the built environment in Europe and consultation with Member States

Analysis

The European Union has set very ambitious energy and climate goals, including the decarbonisation of all of its building stock by 2050. Multilevel governance approaches are needed to coordinate actions by the European Union, Member States, and local and regional authorities to implement EU policies for building decarbonisation, integrated renovation programmes, and local heating and cooling plans. Evidence comes from commitments such as the New Leipzig Charter which states that urban challenges such as building decarbonisation are often more pronounced at the district and neighbourhood level, and local authorities as a formal link to the urban regeneration challenges of the wider city. Multilevel governance approaches are needed to meet the National Building Renovation Plan requirement for Member States to work with local and regional authorities to implement integrated renovation programmes of spatially related buildings. There are many sources of best practice in multilevel governance for building decarbonisation available, from the Global Covenant of Mayors for Climate and Energy to the Urban Transitions Mission.

European, international, and national **policies** play crucial roles in providing guidance, funding, knowledge, and capacity building for local authorities to accelerate decarbonisation and renovation of buildings. The Renovation Wave aimed to at least double the annual energy building renovation rate by 2030 compared to 2021 levels with the support of the EU Green Deal's redesign of the Union's climate, energy, transport and taxation policies. Cohesion Policy objectives for greening and

citizen engagement can drive investment in success of urban regeneration and energy renovation plans implemented at neighbourhood level.

This partnership, if approved, is likely to begin in 2025 as discussions on the EU budget for 2028-2034 get underway. Almost a third of the budget is dedicated to Cohesion Policy, aimed at regional development and reducing disparities. About €20 billion is for energy renovation and efficiency, which could reach €29 billion with co-financing. New cohesion funds, along with the Recovery and Resilience Facility, will provide over €66 billion for energy renovation across the EU till 2029. €11.5 billion of funding through InvestEU and LIFE is intended to leverage €120 billion of private sector finance to co-invest into integrated renovation programmes and local heating and cooling plans over 2021-27. Member States should expect the ambition of co-investment to grow in the next Multiannual Financial Framework.

Integrated renovation programmes and local heating and cooling plans interact with each other as new **regulations** come into force across Europe. Under the revised Energy Performance of Buildings Directive (EPBD), Member States shall show how their National Building Renovation Plans (NBRPs) promote work with and by local authorities to make use of integrated renovation programmes for spatially related buildings to meet EPBD targets for energy efficiency and renovation of buildings. The Energy Efficiency Directive (EED) sets standards for local authorities to create and implement local cooling and heating plans. The Renewable Energy Directive (RED) requires an increase of renewable energy to complete the process as heating and cooling building supply moves from national gas to electricity. The Union's future electricity market design (FED) will set incentives through the energy market to incentivise the distributed energy resources (e.g. heat pumps, solar panels, battery storage) that form part of decarbonisation through renovation.

This partnership will improve local authorities' capability to manage the interaction of multiple European regulations designed for:

- Implementation of local heating and cooling plans by local authorities as part of strategic planning of renovation and energy in cities (EED)
- Planning and implementation of integrated renovation programmes by local authorities as part of cities' urban regeneration and renovation plans (EPBD)
- Use of renewable energy communities and electricity market design for the planning and implementation of the EPBD and EED by the buildings and energy sectors in cities (RED, FED)

Trends and evidence about EU cities show that there is a need for local authorities to take action to speed up renovation and decarbonisation of buildings, and it benefits from multilevel governance approaches across the buildings and energy sectors. For building renovations alone, Member States in 2018 identified the need to collectively invest around €130 billion per year, €57 billion in social housing. An assessment of one-stop shops (OSS) for energy renovation of buildings found that the approach could support 5-6% of all renovations in 2030 set out by the Renovation Wave Strategy. Local authorities struggle to get data on how quickly distributed energy resources installed in renovation projects – from solar PVs to heat pumps at scale - get connected. These energy resources are the new flexibility in the electricity grid that will drive decarbonisation – the need for flexibility will increase in the EU by 133% between 2021 and 2030, and by another 250% by 2050.

Existing identified gaps and recommendations were found in previous thematic partnerships that need to be addressed in this partnership include:

- Interaction of local authorities' urban regeneration and energy renovation strategies with Member State climate, urban policy, and energy policy was limited
- One-stop-shop technical assistance lacks the capacity and knowledge to promote cost-effective district and neighbourhood solutions to residents and businesses

There are particular challenges faced by smaller and medium sized cities in accessing funding and technical support from entities such as the European Investment Bank and private investors, and the need for better communication and targeted messaging to encourage building owners' engagement and understanding of their role in integrated renovation programmes.

The identified gaps and opportunities confirmed the **opportunities** for the theme of building decarbonisation, integrated renovation programmes and local heating and cooling plans based on the proposal for topics by the UAEU governance structure:

- Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)
- Opportunity 2: Innovative funding mechanisms
- Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level
- Opportunity 4: Assessment, planning and implementation of local heating and cooling plans
- Opportunity 5: Integration of renewable energy in cities
- Opportunity 6: Integrated and neighbourhood approaches to decarbonisation of buildings
- Opportunity 7: Developing /exchange of practice on local energy communities and their interplay with municipal heating and cooling solutions
- Opportunity 8: Development of guidance to implement relevant directives

Recommendations

The **scope** of an UAEU partnership or other form of cooperation for *Building decarbonisation, integrated renovation programmes and local heating and cooling plans* should be clear and transparent, even if this sacrifices a degree of flexibility for partners. The field of building decarbonisation is wide. Focus will improve outcomes for Europe and its local authorities. After the analysis and feedback from stakeholders, this theme should focus on **the interaction of integrated renovation programmes and local heating and cooling plans that advance cities' social, economic, and environmental goals**. This means a focus on:

- District and neighbourhood approaches to renovation offer a variety of solutions at a larger scale
- Integrated renovation programmes of spatially related buildings, including public and non-residential buildings
 - Notwithstanding the above, most of the units across local authority partners' envisaged integrated renovation programmes should be residential as evidence of how participation will advance local social and economic goals
- Future energy system designs supported by decarbonisation of buildings through distributed energy resources installed in renovations



- Increasing the cost effectiveness of renovations, including blended public and private finance

For **multilevel cooperation**, a Thematic Partnership (TP), through flexible decision-making and targeted responses to this urgent urban challenges, would offer an appropriate avenue for the broad and holistic approach and multilevel collaboration that the theme requires. A TP structure will benefit the two areas for improvement identified by the UAEU: 1) strengthening Better Regulation actions 2) better serving the needs of small and medium-sized cities. Partners can consider an Other Forms of Cooperation (OFC) structure to supplement the recommended Better Funding actions to interact with the European Commission as they draft the next Multiannual Financial Framework (2028-2034).

The most successfully timed start of the TP would be as soon as possible to maximise its impact on multilevel cooperation in urban policy and practice in building decarbonisation. Actions under this TP will improve integrated renovation programmes (in NBRPs) and local heating and cooling plans (in NECPs) implementation guidance from Member States to regional and local authorities because:

- integrated renovation programmes of spatially related blocks in cities under the EBPD are being transposed by Member States into draft NBRPs due in December 2025
- local heating and cooling plans for local authorities under the EED are being transposed by Member States into revised NECPs now (June 2024)

The next MFF (2028-2034) will be drafted by the Commission during 2025 and 2026. Early forming of the partnership will more effectively allocate funds to meet the needs of local authorities, especially in southern and eastern regions of the EU where local authorities have less available capacity and capability compared to northern and western regions.

The TP **requires members with expertise**, including proven outstanding past contributions and experience in building decarbonisation. This could include policymaking, projects and programmes, research, activism, and/or active participation in international, EU and national networks or programmes in the renovation of buildings. This expertise should cover:

- renovation projects and/or plans, including investment, financing, and installation of heat pumps, solar, storage, and district heating and cooling systems
- district and neighbourhood approaches to renovation, including cost-effective technologies for spatially related buildings and collaborative financing of these approaches
- energy masterplanning, from local area energy planning to local heating and cooling plans

Institutions and stakeholders of interest include local and regional authorities, including agglomerations, Member States, Partner States, and European and national urban policy and practice organisations. Stakeholders of interest are at the European level (e.g. Covenant of Mayors – Europe, Carbon Neutral Cities Alliance, the Joint Research Centre DSO Observatory) and at the national level smart city networks (e.g. Spanish Network of Smart Cities / Red Española de Ciudades Inteligentes (RECI), associations of building owners, and trade associations for building renovation and energy networks. Special attention and efforts need to be made to involve appropriately small and medium-sized cities.

The European Urban Initiative (EUI) Secretariat offers daily **support** in planning, managing and monitoring for the Thematic Partnership as well as access to external experts that can provide specialised knowledge to assist in developing action plans. Financial support is available for small and medium-sized cities to participate in meetings and capacity-building activities. The EUI also connects partners with sources of funding to accelerate their work on building decarbonisation. Examples include national support for renovation programmes and local heating and cooling plans, URBACT Transfer Networks and Action Planning Networks, ICLEI's European City Facility, and Eurotowns mentorship of small and medium sized cities.

The **opportunity** for a thematic partnership tackling the needs of cities in this theme (see the **scope** above) across the UAEU points of emphasis and to influence the design of the EU single market. This opportunity meets the first UAEU emphasis to increase actions for Better Regulation. The interaction between the EPBD and the EED across the EU is central to this potential TP. The opportunity also meets the second UAEU emphasis to increase involvement of small and medium-sized cities in this TP. These cities can develop capacity to collaborate in local heating and cooling plans to increase investment into building decarbonisation. There is a final opportunity for the TP to set the agenda for the EU's future electricity market design as millions of buildings decarbonise through renovations that move their heating and cooling energy demand from natural gas to electricity.

Territorial Impact Assessments (TIA) as used by the European Committee of the Regions (CoR) can provide insights into the potential unbalanced territorial impacts of EU policies. A TIA of the impact of building decarbonisation, integrated renovation programmes and local heating and cooling plans is likely to mirror the TIA completed by ESPON¹ on the draft revised EPBD in January 2022. It found that there were strong positive impacts of the EBPD in Central and Northern Europe, and less so in Southern and Eastern Europe. It found that the benefits of the EBPD are more equitable in capital/primary cities, especially in Northern, Western, and Central Europe, and less equitable in secondary cities and Southern and Eastern Europe.

¹ <https://cor.europa.eu/en/our-work/Documents/Territorial-impact-assessment/4709%20TIArevisedEPBdirective2022.pdf>

Introduction

Urban Agenda for the EU

The Urban Agenda for the European Union (UAEU) was initiated within the framework of intergovernmental cooperation. The Pact of Amsterdam signed on 30 May 2016 at the informal meeting of EU Ministers responsible for Urban Matters, established the UAEU. The UAEU includes urban dimension in policies and its implementation to lead to better regulation, better funding and better knowledge for cities in Europe.

The UAEU is a multilevel and multistakeholder working method and institutional innovation promoting cooperation between Member States, cities, the European Commission and other stakeholders. It is implemented through Thematic Partnerships (TPs) and Other Forms of Cooperation (OFC) involving the European Commission (and other EU institutions), Member States, Partner States, cities and stakeholders in a multilevel governance format (TPs or OFCs) focused on themes.

The first phase of the UAEU created 14 Thematic Partnerships (TP). The Ljubljana Agreement (2021) and Gijon Agreement (2023) created new Thematic Partnerships that have been proposed until now (Table 1). Moreover, since 2020, the new Leipzig Charter provides guiding principles for integrated urban development.

Table 1: Thematic Partnerships of the UAEU

First phase partnerships		Ljubljana Agreement	Gijon Agreement
concluded	ongoing		planned
Security in Public Space	Culture and Cultural Heritage	Cities of Equality	Water sensitive city
Sustainable Land Use	Innovation and Responsible Public Procurement	Food	Building decarbonisation: Integrated renovation programmes and local heating and cooling plans
Energy Transition	Inclusion of Migrants and Refugees	Greening Cities	
Climate Adaptation		Sustainable Tourism	
Urban Mobility			
Digital Transition			
Circular Economy			
Jobs and Skills in the Local Economy			
Urban Poverty			
Housing			
Air Quality			



The thematic area: Building decarbonisation

The European Union has set very ambitious energy and climate goals, including the decarbonisation of all of its building stock by 2050.

Under the revised Energy Performance of Buildings Directive (EPBD), Member States must show how their National Building Renovation Plans (NBPRs) will use renovations to reduce their average residential building energy demand by 20-22% by 2035 and renovate the 26% worst-performing non-residential buildings by 2033. Member States must show how they will work with local authorities to make use of integrated renovation programmes for spatially related buildings to meet these targets.

The recently adopted Energy Efficiency Directive (EED) requires cities of minimum 45,000 inhabitants to develop local cooling and heating plans. Adding to this, the Renewable Energy Directive (RED) includes a mandatory percentage of renewable energy in these local heating and cooling plans.

To address these challenges, a district and neighbourhood approach to the decarbonisation of buildings is needed to make full use of the provisions in the revised EED, RED and EPBD. A multilevel governance approach to the decarbonisation of buildings is needed for integrated renovation programmes and local heating and cooling plans to be a success in cities across Europe. This approach is linked with flexibility of energy use, development of district heating and/or cooling, the development of energy communities and electricity market design reform. A thematic partnership under the UAEU is being considered to maximise the impact of integrated renovation programmes and local heating and cooling plans in cities in Member States and UAEU Partner States.

This ex-ante assessment serves as the technical foundation for a Thematic Partnership to determine its priorities and action plan under the Urban Agenda for the European Union.

Purpose of an ex-ante assessment

Ex-ante assessments (EAAs) were introduced by the Ljubljana Agreement in November 2021.² The aims of the EAA are defined by the Multiannual Working Programme (MaWP) for the UAEU. The MaWP states that an EAA should:

...enable the deployment of a pragmatic, effective and result-oriented approach aiming at increasing the impact of future UAEU deliverables. EAAs will look at the proposal to help optimise focus, timing and activities of the multilevel cooperation and safeguard suitable level of partners' thematic and procedural expertise. However, it should still allow the flexibility in the work and decision making of Partnerships according to the spirit of the UAEU.³

² Ljubljana Agreement: Informal Meeting of Ministers responsible for Urban Matters, 26 November 2021, Brdo pri Kranju, Slovenia (https://ec.europa.eu/regional_policy/sources/docgener/brochure/ljubljana_agreement_2021_en.pdf).

³ <https://futurium.ec.europa.eu/sites/default/files/2021-11/Multiannual%20Working%20Programme%20UAEU%202022-2026.pdf>

The purpose of the Ex-ante Assessment is to help:

- Establish the relevance of the focus on the theme chosen of Building decarbonisation: Integrated renovation programmes and local heating and cooling plans for future work in a multilevel governance context.
- Secure the suitable level of partner's expertise while accounting for a balanced composition of a Partnership / Other Form of Cooperation.
- Guide multilevel cooperation in preparing a future Orientation Paper (stocktaking and preparatory actions phases)

To reach these objectives, the present assessment is rooted in and adds to **the evaluation of the previous stages of the UAEU**. A recent stocktake of the UAEU stated that it "has been a qualified success" and that "since its formal launch in 2016, the UAEU has contributed to establishing a more effective integrated and coordinated approach to EU policies and legislation with a potential impact on urban areas".⁴

There are two emphases for improvement in for the UAEU:

Emphasis 1: Strengthening the Better Regulation pillar

Future partnerships should help strengthen the Better Regulation pillar. Thematic Partnerships will:

- Participate and contribute to ongoing policy processes and consultations on EU legislation that are relevant for the UAEU priority themes.
- Contribute to the ongoing and future priorities of EU policy.

Emphasis 2: Small and medium-sized cities and towns

Future partnerships should consider the challenges of small and medium-sized cities and towns. Selection criteria for partners should motivate and encourage small and medium-sized urban authorities to get involved in the UAEU multilevel cooperation. CoR, CEMR, Eurocities and Eurotowns can serve as mentor organisations to involve cities with less resources and expertise.

Implementation of the recommendations of the ex-ante assessment

This ex-ante assessment serves as the technical input for an open call for partners. It will:

- Deliver recommendations to help interpret and focus the thematic scope of the subject.
- Identify the most suitable form of multilevel cooperation.
- Recommend the timing for successful implementation.
- Identify the required type of expertise of the members.
- Identify institutions/stakeholders of interest to be involved in the multilevel cooperation set-up.
- Identify the type of support that will be required for the implementation.
- Provide an assessment on the opportunity to launch a partnership.
- Examining, the regulatory environment, whether a Territorial Impact Assessment has been prepared for a specific subject.

⁴ The latest monitoring of the actions of the UAEU is available at <https://futurium.ec.europa.eu/en/urban-agenda/monitoring-actions/monitoring-table/table-actions-update-september-2021?language=en>

Methodology

This ex-ante assessment was conducted with five assessment criteria set by the UAEU, and nine research questions set by the author.

Through a thorough desktop study, an exhaustive compilation of key publications, documents, websites, initiatives, and case studies pertinent to building decarbonisation, integrated renovation programmes, and local heating and cooling plans, was identified. Following this, a screening process was undertaken to select the most relevant sources at the European level for the core desk research across the assessment criteria and opportunities in the scope of work.

Five assessment criteria are used by ex-ante assessments for a prospective TP or OFC theme:

Table 2: UAEU Assessment Criteria

Assessment criteria	Description
1. Multilevel governance	<i>Power of multilevel governance approach // involvement of stakeholders // involvement of small and medium sized cities</i>
2. Policy environment	<i>Alignment to EU priorities // Alignment to sources of funding</i>
3. Regulatory Environment	<i>transposition in the national regulatory framework // possible bottlenecks at national and sub-national level</i>
4. Existing identified gaps and recommendations	<i>Opportunities identified from evidence lessons from previous partnerships and challenges not addressed</i>
5. Trends and evidence about EU cities	<i>Sources of evidence of the need for this theme</i>

Nine research questions were formulated based on the topic proposal, the pillars and objectives of the Urban Agenda, the opportunities in the scope of work, and the five assessment criteria. These questions informed ten interviews conducted with Commission services (DG REGIO, ENV, RTD, JRC, ENER) and other European organisations (EEA, JRC) between January and March 2024 (see Appendix 3) to explore their activities related to the topic within their scope of work and on their perspective on ways how cities and their enablers could progress.

Table 3: Research Questions

Research questions	Corresponding Assessment Criteria
What defines building decarbonisation, integrated renovation programmes, and local heating and cooling plans, and what is its thematic scope?	All

What role does multilevel governance play in incentivising these programmes and plans, and how should it be structured? What solutions and added value does it bring?	Multilevel governance
How does the policy environment at EU, regional, and local levels help make integrated renovation programmes and local heating and cooling plans happen?	Policy environment
What is the regulatory environment at EU, regional, and local levels, and how does it align with the needs and challenges of the theme? How can UAEU's work on this theme contribute to Better Regulations?	Regulatory environment
What funding options are currently or will soon be available? Does this confirm that there is a clear gap that integrated renovation programmes and local heating and cooling plans fill?	
What are the interconnections and opportunities for mutual support among actions developed or in progress with other Thematic Partnerships?	Existing identified gaps and recommendations
Based on identified gaps and the identified options to act within the multilevel governance context of current and evolving EU, national, regional and local policies, what recommendations can be made for this Thematic Partnership to support Better Regulation, Better Funding, and Better Knowledge?	
Why is there a necessity to manage the interaction of integrated renovation programmes and local heating and cooling plans, and what progress has been made so far?	Trends and evidence about EU cities
What are the requirements and challenges in planning and implementing integrated renovation programmes and local heating and cooling plans? Are there special needs of small and medium-sized cities?	

A stakeholder focus group with CEMR, Eurocities, CoR, URBACT, ICLEI, the Belgian Presidency and EC DG REGIO was held on 27 February 2024 to learn about their perception of challenges and opportunities for decarbonising Europe's built environment. Subsequent written feedback was received from these stakeholders. The insights garnered from both the interviews and stakeholder engagement sessions enriched the information obtained from desk research, offering additional perspectives and depth to the analysis.



A. The analysis

A.1 The concept: From district and neighbourhood approaches to energy efficiency to building decarbonisation, integrated renovation programmes and local heating and cooling plans

Research questions	Corresponding Assessment Criteria
What defines building decarbonisation, integrated renovation programmes, and local heating and cooling plans, and what is its thematic scope?	All

Housing Decarbonisation, local heating and cooling plans was proposed as a UAEU theme in the Gijon Agreement under the Spanish Presidency of the Council of the European Union in 2023. The topic was brought to the ministerial meeting after their consultation with the Urban Development Group (UDG). UDG members saw an opportunity to take new and innovative approaches to accelerate renovation of buildings from the Energy Performance of Buildings Directive (EPBD)⁵ and the Energy Efficiency Directive (EED) to the Renewable Energy Directive (RED). District and neighbourhood approaches to building renovation have been included for the first time in the EPBD. Local authorities must also draw up local heating and cooling plans. This is reframing the interaction between levels of governance, policy, regulation, and funding for the renovation of buildings across the EU.

As a result of the UDG consultation launched in May 2024 on the second draft ex-ante assessment it was agreed to change the proposed partnership title into *Building decarbonisation: integrated renovation programmes and local heating and cooling plans*. There was specific support from UDG members because 1) the title is more comprehensive and better related to the general objectives of the partnership and 2) for the partnership to take a real place-based approach, all buildings - public, non-residential, and housing - of an area need to be included.

The interaction of integrated renovation programmes with local heating and cooling plans will intensify as the EU and Member States implement the EPBD and EED. Member States must prepare and submit National Building Renovation Plans by 2026 (draft by December 2025). The New European Bauhaus promote beautiful, sustainable, inclusive urban environments. The New Leipzig Charter states "Climate-neutral energy supply, renewable resources, the implementation of energy efficiency measures, as well as climate-resilient and carbon-neutral buildings will contribute to significantly reducing greenhouse gas emissions and helping European cities adapt to the impacts of climate change."

⁵ https://www.europarl.europa.eu/doceo/document/TA-9-2024-0129_EN.html

The building sector must decarbonise by 2050 and reduce its emissions by 60% by 2030 to meet Europe's climate commitments. At the same time, the EU has committed to increase renewable energy consumption to 42.5%. Under the Paris agreement, the EU committed in 2015 to cutting greenhouse gas emissions in the EU by at least 40% below 1990 levels by 2030. In 2021, the target was changed to at least 55% reduction by 2030 and climate neutrality by 2050.

For integrated renovation programmes and local heating and cooling plans to be a success, district and neighbourhood approaches to renovation are essential. The preamble to the EPBD states: "integrated district or neighbourhood approaches help to increase the cost effectiveness of the renovations required for buildings that are spatially related [to access a] variety of solutions at a larger scale."⁶ Member States are increasingly exploring and adopting different urban sectoral strategies (including mobility, climate change adaptation, energy efficiency, social inclusion, etc) that could also include building renovation and cooling/heating aspects in an integrated approach.

This partnership will include all types of buildings within integrated renovation programmes, but with a focus on improving the housing stock through collaboration with spatially related non-residential and public buildings. This will speed up integrated renovation programmes of spatially related areas of social and economic importance to local authorities and the cost efficiencies in the renovation of spatially related buildings. In the EU, this co-existence of housing and non-residential buildings is widespread: more than 65% of inhabited areas are mixed.⁷ In cities, 72% of the EU population lived in a flat and 28% in a house.⁸ In small and medium sized cities, including mixed-use areas can increase the scale and viability of renovation plans. Local authorities' social and economic goals focus on upgrading the housing stock for its residents. At the same time, including spatially related buildings, including housing blocks, into integrated renovation programmes pull in non-residential and public buildings. This can take advantage of a higher rate of renovations of non-residential buildings and public buildings to crowd-in investment into a residential sector that is lagging behind. 1.0% of the stock is renovated overall, and residential deep renovation is lagging behind^{9,10}.

Integrated renovation programmes, paired with local heating and cooling plans, must shift to renewable energy at scale. This means shifting heating fuel from natural gas to electricity and moving electricity generation to renewable sources. The share of renewables provided only 24.8% of the final energy consumption in the heating and cooling sector in 2022, according to Eurostat.¹⁰ The process of replacing fossil fuels with renewables and other zero-carbon solutions in heating and cooling has so far been slower than in electricity generation. Natural gas is the most common fuel across heating and cooling - by gas boilers for heat in all buildings or chiller engines for cooling in

⁶ https://www.europarl.europa.eu/doceo/document/TA-9-2024-0129_EN.html

⁷ <https://cor.europa.eu/en/events/pages/consultation-revision-energy-performance-buildings-directive.aspx>

⁸ https://energy.ec.europa.eu/topics/energy-efficiency/heating-and-cooling_en

⁹ [https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20230203-1#:~:text=Energy%20for%20heating%20and%20cooling,of%20biomass%20and%20heat%20pumps\).](https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20230203-1#:~:text=Energy%20for%20heating%20and%20cooling,of%20biomass%20and%20heat%20pumps).)

¹⁰ <https://www.rics.org/news-insights/energy-efficiency-of-the-building-stock-in-the-eu>

large buildings and district systems.¹¹ A typical non-residential or public sector building can shift demand for grid-supplied electricity during the day, and a typical residential building in the morning and evening.

The challenge lies in cities - the largest proportion of the EU building stock is within urban centres (43%), with 33% in urban clusters and 24% in rural areas. 75% of space in the EU is residential, 25% is non-residential.¹² Within the EU, 42% of non-residential buildings and 38% of residential buildings were built pre-1970, before the oil crises prompted adoption of some energy conservation measures. As of 2020, approximately 12% of the EU residential built stock has been renovated to meet climate change targets, while 9% of the non-residential stock has been renovated.

The opportunity to set the direction of implementation of integrated renovation programmes and local heating and cooling plans in Member States. NBRPs will be in place from 2026. Currently, there are a limited number of Member States that have transposed the EED to require local authorities to start producing heating and cooling plans. In the Netherlands, the National Programme for Local Heat Transition is in place as a national support structure for the implementation of decarbonisation of heating.¹³ Germany, its new Planning Act requires them to be in place from 2028.¹⁴ It is through these plans that local authorities are being given the powers and obligations through implementation guidance from Member States to impose bans on gas boilers and other measures in their NBRPs.

Figure 1: Heat planning in EU Member States

A DIVERSE SET OF LEGAL FRAMEWORKS IN PLACE FOR HEAT PLANNING ACROSS EU MEMBER STATES

TYPOLOGY OF LEGAL FRAMEWORKS FOR LOCAL HEAT PLANNING					
No legal framework in place	Energy (and heat) supply plans obligatory but without clear links to spatial planning or climate plans	Obligatory heat planning linked to spatial planning but with limited alignment with climate planning	Obligatory heat plans. Integration with spatial planning and with climate planning and decarbonisation encouraged.	Heat planning partially addressed via climate and energy plans or developed on a voluntary basis	Obligatory heat planning integrated with climate plans and spatial development plans
Portugal; Spain; Malta; Cyprus, Bulgaria; Romania, Hungary; Greece; Latvia; Croatia	Poland; Slovakia; Slovenia; Italy	Estonia; Lithuania; Austria (in some Länder)	Denmark; Sweden	France; Ireland; Flanders (Belgium); Luxembourg; Finland	The Netherlands; Germany (Already in some Länder, likely federal obligation from 1.1.2024)

<https://energy-cities.eu/wp-content/uploads/2023/11/EU-analysis-Heating-and-Cooling-ENG.pdf>

¹¹ <https://energy-cities.eu/wp-content/uploads/2023/11/EU-analysis-Heating-and-Cooling-ENG.pdf>

¹² https://jpi-urbaneurope.eu/wp-content/uploads/2021/06/PED_Pilot_Cal_FinalReportGeneralPublic_PED-ID.pdf

¹³ <https://www.uia-initiative.eu/en/uia-cities>

¹⁴ <https://www.urban-initiative.eu/ia-cities>



Beyond the current transposing of the EBPD, EED, and RED by Member States and implementation by cities, revised regulation of the electricity market in the EU and Member States to supply the demand from renovation buildings is on the horizon. The move to renewable energy-supplied electricity for heating and cooling means that district heating and cooling solutions will soon become a mix of virtual (e.g. virtual power plants) and physical solutions (e.g. district heating systems). Electricity market design and incentives can pool flexibility through local electricity grids with the installation of millions of heat pumps for heating and cooling of individual premises. Waste heat from non-residential buildings is a resource.¹⁵ There is evidence that has been built up to promote district heating and cooling solutions – a recent report states that if the right support is given, European cities can move from 12% district heating to 50% by 2050.¹⁶

In summary, district and neighbourhood approaches to building renovation are needed by cities to meet the challenge of heating and cooling as the biggest source of energy demand in buildings and proving hardest to decarbonise through renovation building-by-building. This is a barrier for EU to meet its commitments to renovate buildings to decarbonise the sector. Funding needs cities to come forward with plans to take down barriers for public and private investment in the renovation wave. District and neighbourhood approaches to renovation are not the same as implementation of district heating and cooling systems - renewable energy encourages more renovation investment into resources that can provide automation and flexibility.

Out of the emerging scope of the interaction of district and neighbourhood approaches to renovation, local heating and cooling plans, and local energy systems to decarbonise the built environment at scale, the following opportunities were identified to frame the analysis:

- *Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)*
- *Opportunity 2: Innovative funding mechanisms*
- *Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level*
- *Opportunity 4: Assessment, planning and implementation of local heating and cooling plans*
- *Opportunity 5: Integration of renewable energy in cities*
- *Opportunity 6: Integrated and neighbourhood approaches to decarbonisation of buildings*
- *Opportunity 7: Developing /exchange of practice on local energy communities and their interplay with municipal heating and cooling solutions*
- *Opportunity 8: Development of guidance to implement relevant directives*

¹⁵ <https://www.renovate-europe.eu/2021-2027-cohesion-policy-support-for-energy-efficiency-and-building-renovation/>

¹⁶ <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52020DC0564>

A.2 Building decarbonisation, integrated renovation programmes and local heating and cooling plans in the EU policy context

EU strategic approaches

This partnership will improve local authorities' capability to manage the interaction of multiple European regulations designed for:

- Implementation of local heating and cooling plans by local authorities as part of strategic planning of renovation and energy in cities (EED)
- Planning and implementation of integrated renovation programmes by local authorities as part of cities' urban regeneration and renovation plans (EPBD)
- Use of renewable energy communities and future electricity market design for the planning and implementation of the EPBD and EED by the buildings and energy sectors in cities (RED, FED)

The interaction of integrated renovation programmes, local heating and cooling plans, and renewable energy in cities has been addressed across projects and programmes across the UIA/EUI, URBACT, Interreg, LIFE, and Horizon 2020/Europe/FP7 in the recent past:

Table 4: European-funded projects and programmes addressing building decarbonisation.

Within the UIA¹⁷ / EUI¹⁸ initiative

Acronym	Title	Location	Dates
Vilawatt	Innovative local public-private-citizen partnership for energy governance	Viladecans (ES)	2017-22
CoRDEES	Co-Responsibility in District Energy Efficiency & Sustainability	Paris	2017-19
FED	Fossil Free Energy Districts	Gothenburg	2017-19
E-Co-Housing	Co-creating a regenerative Housing Project together with the community	Budapest	2019-21
SOFTacademy	Demonstrating a model of collaborative pre-fabricated reinvention of modernist districts into cozy living environments	Tallinn	2024-27
NatUR-W	Nature-based Urban Regeneration through Water: Integrating the water cycle in urban renaturalization	Lorca (ES)	2024-27
Rock the Block	Integrated Participatory Roadmaps for Affordable Co-Living	Egaleo (GR)	2024-27
AHA Budapest	Affordable Housing for All	Budapest	2024-27

¹⁷ <https://www.gov.ie/en/publication/473d3-town-centre-first-policy/>

¹⁸ <https://cor.europa.eu/en/our-work/Documents/Territorial-impact-assessment/4709%20TIArevisedEPBdirective2022.pdf>



URBACT Networks

Project Title	Description	Lead city	Dates
Ecocore	Ecocore aims to build the capacity of small cities in addressing climate change by promoting a green economy agenda and assisting local stakeholders, particularly businesses, in transitioning to low-carbon energy sources for transportation, heating and electricity.	Balbriggan (IE)	2023-25
EU City Labs	The city labs on the energy transition are events focused on local learning communities' practices, the challenges to set up energy communities and how a multilevel governance approach can help to shape better cities.	Viladecans (ES)	2023-24
Cities for Sustainability Governance	Cities for Sustainability Governance (CSG) will use the SDGs as a vehicle for implementing strategic urban governance and deliver on the promise of transforming our world, as set out in the UN 2030 Agenda. It is a successor to the Global Goals for Cities network.	Espoo (FI)	2023-25
COPE: Coherent Place-based Climate Action	The COPE (Coherent Place-based Climate Action) network will unlock the green potentials of citizen action through a place-based approach, recognizing citizens and local action groups as fundamental stakeholders working to accelerate the green transition.	Copenhagen (DK)	2023-25

Horizon Europe / Horizon 2020 / FP7

Project Title	Description	Lead organisation	Dates
BUILD UPON 1 and 2	BUILD UPON 1 was a Regional Action Network as a living structural base to effectively help define and implement deep energy efficient building renovation at local, national and European level. BUILD UPON 2 linked renovation to policy and decision-making processes at Member State level.	GBC España (ES)	2015-17; 2019-21
Decarb City Pipes 2050	This project develops recommendations, especially on heating and cooling demands and supplies in 2050, on developing heating and cooling plans and on local policies in cities.	Urban Innovation Vienna (AT)	2020-23
oPEN Lab	oPEN Lab will identify commercially viable solutions to achieve positive energy urban	Vlaamse Instelling Voor Technologisch	2021-26

	environments, in line with the EU's aim to be climate-neutral by 2050	Onderzoek (BE)	
PLANHEAT	Integrated tool for empowering public authorities in the development of sustainable plans for low carbon heating and cooling	Rina Consulting (IT)	2016-20
DistrictEES	A building renovation model will be applied at district level to four different end user groups, namely private owners, housing associations, public buildings and commercial buildings.	Van Wijnen (NL)	2020-23
Hotmaps	Hotmaps is a GIS-based online software that supports authorities and energy planners to set up a strategic heating and cooling plan for their region.	TU Vienna (AT)	2016-20
THERMOS	THERMOS is a free, web-based energy planning software that provides accurate heat and cold network options analysis instantly within one web-based, user-friendly tool.	Centre for Sustainable Energy (UK)	2016-21
Act!onHeat	Act!onHeat identifies the success factors of strong and efficient existing heating and cooling plans and develop workflows based on existing open source tools.	Fraunhofer ISI (DE)	2021-24
CITYFIED	RepliCable and InnovaTive Future Efficient Districts and cities focuses on increasing the use of renewable energy sources by developing and implementing innovative technologies and methodologies for building renovation, smart grid and district heating networks.	Fundcacion Cartif (ES)	2014-19
REMOURBAN	REgeneration MOdel for accelerating the smart URBAN created a sustainable urban regeneration model that leverages the convergence area of the energy, mobility and ICT sectors in order to accelerate resource and energy efficiency.	Fundcacion Cartif (ES)	2015-20
Opengela	Opengela created neighbourhood offices which, as a kind of one-stop-shop, will provide advice and support to the community through the whole process of renovation of their apartment buildings.	Basque Country Region (ES)	2019-23



Interreg

Project Title	Description	Lead city	Dates
Towards low carbon city districts through the improvement of regional policies	Improve regional development policies and programmes in the areas of building renovation and construction of energy efficient buildings, creation and renovation of district heating and other urban renovation actions, in order to facilitate the transition to low-carbon districts and municipalities.	Navarra (ES)	2019-23
Efidistrict Fwd	Mobilising Local Energy Investments- Project Development Assistance- MLEI_PDA financed the regeneration of the Chantrea neighbourhood of Pamplona through the development of energy saving measures in buildings and the use of renewable energy in heating systems.	Pamplona (ES)	2013-15

LIFE

Project Title	Description	Lead organisation	Dates
LIFE BAUHAUSING EUROPE	Validation of the New European Bauhaus approach for the reimagination of public buildings as boosting projects for the transformation of their neighbourhoods.	Eurovértice (ES)	2023-27
STREET HP RENO	Developing street wide approach for housing for collective switch of energy systems to heat pumps packaged modules	Edera (IT)	2023-26
BENDER	Building interventions in vulnerable Districts against Energy poverty	Centre for Sustainable Development (HR)	2023-26
COHEAT2	Paving way for energy renovations and the transition from fossil fuels to green, local heat supply in the Region of Southern Denmark	Syddanmark Region (DK)	2022-25
D2HEAT	Croatian district heating sector support facility	North West Croatia Energy and Climate Agency (HR)	2022-26

Direct funding for building decarbonisation

Approximately a third of the EU's long-term budget - the Multiannual Financial Framework (MFF) - is dedicated to Cohesion Policy including the European Regional Development Fund (ERDF), the Cohesion Fund (CF), the Just Transition Fund (JTF) and the European Social Fund Plus (ESF+).



According to a study done by Renovate Europe, in 2013 there were 297 programmes across the 27 member states funded by the ERDF, CF and JTF. 175 of these programmes include investments in renovation and energy efficiency.¹⁹

This funding covers:

- Public sector building renovation €10.6billion (53%).
- Renovation of housing stock €6.4billion (32%).
- Support for businesses subject to energy efficiency requirements to renovate their buildings €2.9billion (14%).

A.3 Multilevel governance

Research questions	Corresponding Assessment Criteria
What role does multilevel governance play in incentivising these programmes and plans, and how should it be structured? What solutions and added value does it bring?	Multilevel governance

Multilevel governance [was defined](#) by the EU's Committee of the Regions (CoR) in 2009 and remains a core principle. CoR defined multilevel governance as "coordinated action by the European Union, the Member States and Local and Regional authorities, based on partnership [...] to create and implement EU policies. It leads to responsibility being shared between the different tiers of government". Multilevel governance should ensure there is the capacity to effectively and sustainably apply strategies and recommendations in local authorities, regions, and Member States through concrete action plans and measures.

New Leipzig Charter

The 2020 New Leipzig Charter is a policy framework document for sustainable urban development in Europe. It emphasises the need for multilevel governance for sustainable urban development, while the White Paper on European Governance advocates 5 principles of "good [multilevel] governance":

- Openness and transparency: communicate and make information easily accessible and understandable to all stakeholders and the general public
- Participation: ensure widespread participation of all stakeholders, each step of the way from the design to the implementation of the policy
- Accountability: clarify everyone's role and objectives
- Effectiveness: clearly identify objectives and expected results, and evaluate their impact
- Coherence: ensure that there is coherence between different actions (particularly other governance processes)

There is a link to *Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal*

¹⁹ https://www.europarl.europa.eu/doceo/document/TA-9-2024-0129_EN.html



level (*addressing the city as a whole*) because the charter states that urban challenges (such as building decarbonisation) are often more pronounced at the neighbourhood level, and local authorities as a formal link between small scale neighbourhoods and the wider city. The 'green city' states that the blueprint for a net-zero carbon cities is one with climate-neutral energy supply, renewable resources, the implementation of energy efficiency measures, as well as climate-resilient and carbon-neutral buildings.

There are links to *Opportunity 2: Innovative funding mechanisms* because Member States agreed to implement the Charter in their national or regional urban policies.

There are links to *Opportunity 8: Development of guidance to implement relevant directives* because TPs build on multilevel governance approach in the Charter, ensuring the involvement of regional, local, urban and other public authorities.

National Energy and Climate Plans (NECPs)

Each member state is required in a NECP to state how it intends to address the 5 dimensions of the energy union:

- decarbonisation
- energy efficiency
- energy security
- internal energy market
- research, innovation and competitiveness

The role of the EU in supporting NECPs is to close gaps and increase ambition at the national level. UAEU partnerships like building decarbonisation, integrated renovation programmes, and local heating and cooling plans appear to be ideal mechanisms for identifying common gaps in NECPs and increasing their ambition to integrate regeneration, energy renovation plans, grid reinforcement, renewable energy, energy communities, market design of incentives for flexible demand of heating and cooling, and the technologies needed for flexibility to protect comfort and keep energy bills low.

Funding under the EU's Recovery and Resilience Package can be used to support the investments and reforms identified in the national plans, in particular by investing in energy efficiency, renovating buildings, deploying renewable energies, sustainable mobility, modernising electricity grids and boosting innovation in technology and batteries.²⁰

Each member state submitted an updated draft NECP in 2023. Local authorities are involved in NECPs through the Governance of the Energy Union. They gather data for national governments, are consulted and take part in the development of national building renovation plans that form part of NECPs. Small and medium sized cities have less capacity to gather data to influence NECPs than larger cities. This TP needs to find ways of addressing this imbalance of data and influence.

²⁰ https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-directive_en

There is a link to *Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)* because local heating and cooling plans are an important strategy and delivery mechanisms for NECPs to prioritise the energy and climate actions prescribed for them by the EU²¹ in reforms and investments into the renovation of the building stock, renewable energy, and technologies and solutions for energy system integration.

There is a link to *Opportunity 2: Innovative funding mechanisms* as Member States will need to access funding through grants and loans: investments in renovation needs to crowd in private finance to maximise the impact of public finance.

National Building Renovation Plans (NBRPs)

The revised Energy Performance of Buildings Directive (EPBD) in 2024 will strengthen Member State long-term renovation strategies towards 'Building renovation plans'. These plans to set out the national strategy to decarbonise the building stock and how to address remaining barriers, such as financing, training and attracting more skilled workers. They also are required to emphasize improving the energy performance of worst-performing buildings.

Wider use of integrated, participative and district-related approaches must be promoted in building renovation plans, which allow for synergies and potential energy savings that would remain untapped if the focus were exclusively on individual buildings. Specifically for heating and cooling, Member States must state how they are phasing out natural gas and oil use for heating and cooling – and justify if they cannot put a ban in place for gas boilers by 2035. For renewable energy, renovation plans should require on-site solar energy as part of the renovation in all public and non-residential buildings from 2027 (exemptions can apply). District approaches should also integrate with mobility, as electric vehicles capable of bidirectional charging add to the capacity of buildings and the electricity system to balance power supply and demand, especially during peak hours and at lower cost. [Eurocities developed recommendations and guidance](#) on how member states' governance of building renovation plans should involve local authorities.

Renovation plans link to *Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)* because Member States need to draw up and submit national long-term renovation strategies, broken down to action at regional and local levels.

Renovation plans link to *Opportunity 4: Assessment, planning and implementation of local heating and cooling plans* because of the impact of data availability. It creates transparency between cities, owners, installers, and local authorities of the demand and completion inside an integrated renovation plan. It also creates transparency on the supply of renewable energy through Distribution System Operators on the embedded capacity registers, cost of studies, cost for reinforcements, and

²¹ https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-directive_en

time between applications from asset owners of renewable energy sources in urban areas (solar, batteries, heat pumps) and energisation or connection.

Renovation plans link to *Opportunity 5: Integration of renewable energy in cities* because the recast EPBD stated that Member States must include the involvement of renewable energy communities.

Renovation plans link to *Opportunity 6: Integrated and neighbourhood approach to decarbonisation of buildings* because the recast EPBD stated that Member States must include in the plans must have district and neighbourhood approaches and integrated renovation programmes to access multiple solutions at scale.

National building renovation plans link to *Opportunity 8: Development of guidance to implement relevant directives* as district and neighbourhood approaches encourage the use of multiple solutions and scaling up of building renovation, but it is only in its interaction with the mobility sector and EV batteries where flexibility, balancing power and demand, is mentioned as an investment priority. This could put a solution bias in play for investment into physical over virtual district systems. Local heating and cooling plans have multiple technologies and options for flexibility. Stakeholders from the energy sector, from Distribution System Operators (DSOs) to suppliers, are not named in the EPBD.

Energy and Managing Authorities Network

The Energy and Managing Authorities Network (EMA) network brings together Member States and this platform exchanges information and supports authorities in the implementation of energy-related programmes including on cities. DG REGIO leads an inter-service group called *Territorial Cohesion and Urban Development* that provides a forum for exchange of information between DGs including on energy and city-related matters.

The EMA links to *Opportunity 8: Development of guidance to implement relevant directives* because it can act as a place of crossover of policy and funding of district and neighbourhood approaches to renovation, integrated renovation programmes and local heating and cooling plans in cities.

Climate-Neutral and Smart Cities Mission

The Cities Mission will involve local authorities, citizens, businesses, investors as well as regional and national authorities to:

- Deliver 100 climate-neutral and smart cities by 2030
- Ensure that these cities act as experimentation and innovation hubs to enable all European cities to follow suit by 2050

112 cities were selected in 2022. They were invited to develop Climate City Contracts, which include an overall plan for climate neutrality across all sectors such as energy, buildings, waste management and transport, together with related investment plans. Horizon Europe is investing around €360 million in the Mission in the period 2021-23.

The Mission links to *Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level* because integrated renovation programmes and local heating and cooling plans can fill gaps in Climate City Contracts to help cities integrate investment into technologies for climate neutrality across building renovation and mobility. Funds such as Net Zero Cities are being used for innovations in funding and testing technologies for decarbonisation, including in heating and cooling.

Urban Transitions Mission

UTM is a global alliance of partners, and national governments to support cities to develop, pilot, and scale innovative solutions and approaches for urban transitions. The UTM is co-led by the European Commission, the Global Covenant of Mayors for Climate & Energy, and JPI Urban Europe. Europe is the biggest and longest-standing region under GCoM's 12,000 members. Cohorts of cities apply innovation, test, pilot and scale up solutions and access dedicated capacity building and R&I funding.

The Mission links to *Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level* because integrated renovation programmes and local heating and cooling plans are needed to accelerate investment in building renovations in different climates, especially as climate change increases the need for cooling.

Committee of the Regions

The Committee of the Regions (CoR) is an apolitical assembly which represents the interests of regional and local authorities in the European Union and addresses opinions on their behalf to the Council and the Commission.

The work of the CoR links to *Opportunity 4: Assessment, planning and implementation of local heating and cooling plans* because the Opinion [Smart, sustainable and affordable housing as a tool for local authorities to face multiple challenges](#) states, that 1.0% of the stock is renovated overall, and that residential deep renovation is lagging behind with rates lower than for non-residential deep renovation; calls for more incentives and financial support regarding residential deep renovation in the EU. These overcome problems of high ownership rates, low legal powers of local authorities, inadequate planning in terms of green and sustainable rehabilitation of buildings, and insufficient funding for place-based investments that address local needs and enhance local economic resilience, prosperity and sustainable development. Local authorities can showcase integrated renovation packages of heating, ventilation and cooling upgrades for buildings and to support the training of the renovation workforce within the programmes funded by the European Social Fund+ and under REPowerEU.

A.4 Policy environment

Research questions	Corresponding Assessment Criteria
How does the policy environment at EU, regional, and local levels help make integrated renovation programmes and local heating and cooling plans happen?	Policy environment

Through effective coordination and alignment across all levels of governance, a UAEU Thematic Partnership can empower local authorities to successfully address cross-cutting urban issues including sustainability and resilience in communities across the EU. There are tools such as Territorial Impact Assessments to assess the uneven impacts of regulation, funding, and available knowledge. Member States, in response to the Green Deal and the Renovation Wave, develop specific strategies and incentives tailored to local needs and resources, further supporting the implementation of heating and cooling plans. Local authorities learn through networks, from New European Bauhaus to the Global Covenant of Mayors, to turn regulation into actionable plans and projects. They work closely with stakeholders, including businesses, communities, and energy service providers, to identify local priorities, secure funding, and implement heating and cooling solutions that meet the needs of residents and businesses.

EU Cohesion Policy

It is expected that about one third of all 2021-2027 cohesion policy funding will go to financing sustainable 'green transition' projects. This means investments of more than €100billion of cohesion funding to support the green transition. An estimated €20billion is programmed in the Multiannual Financial Framework (MFF) to help Member States, regions and cities to directly invest in energy efficiency.

Policy Objective 2 Greener Europe:

- Specific Objective 2.1 links to *Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level* by promoting energy efficiency and reducing greenhouse gas emissions under which EUR 18.47 billion of ERDF investments have been programmed (Poland will invest a highest share in this area EUR 4.06 billion, followed by Spain and Germany) – this Specific Opportunity of cohesion policy can support projects aimed at decarbonisation of buildings including energy efficient heating and cooling in less developed regions.
- Specific Objective 2.2 links to *Opportunity 5: Integration of renewable energy in cities* by promoting renewable energy (EUR 8.7 billion from ERDF – Spain and Poland investing a highest share; relevant from the perspective of investing in heating & cooling based on renewable energy)
- Specific Objective 2.3 links to *Opportunity 7: Developing /exchange of practice on local energy communities and their interplay with municipal heating and cooling solutions* by developing

smart energy systems, grids, and storage outside the Trans-European Energy Network (TEN-E) (EUR 4.97 billion from ERDF – Poland investing a highest share).

Policy Objective 5 A Europe closer to its citizens: Specific Objective 5.1 links to Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level because it fosters the integrated and inclusive social, economic and environmental development, culture, natural heritage, sustainable tourism and security in urban areas (in total, €12.8 billion from ERDF allocated). Among the examples of such ERDF investments is the Irish ‘Town Centre First Policy’ to tackle vacancy, combat dereliction and breathe new life into Irish town centres including a focus on climate action and energy efficiency of buildings.²²

European Green Deal

The European Commission has adopted a set of proposals to make the EU's climate, energy, transport and taxation policies fit for reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. The European Green Deal was designed to transform the EU into a modern, resource-efficient and competitive economy and to ensure recovery from the Covid-19 pandemic. One third of the €1.8 trillion investments from the NextGenerationEU Recovery Plan for the EU's seven-year budget (2021-27) finances the European Green Deal.

The Green Deal links to *Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)* because it sets strategy and delivery mechanisms for NECPs and national building renovation plans to channel funding to integrated renovation strategies from the European Green Deal to prioritise the energy and climate actions prescribed for them by the EU in reforms and investments into the renovation of the building stock, renewable energy, and technologies and solutions for energy system integration.

Renovation Wave

The Renovation Wave aims to at least double the annual energy renovation rate by 2030 and in addition to reducing emissions and creating green jobs in the construction sector, which is dominated by local businesses, it will improve overall living standards for Europeans. The Renovation Wave Initiative will provide a political impetus to address cross-cutting challenges in the building sector. The initiative will build on three fundamental blocks: a solid regulatory framework, adequate financing and a strong governance framework based on long-term planning and stakeholder engagement.

The strategy identifies 3 focus areas:

- Tackling energy poverty and worst performing buildings
- Renovation of public buildings
- Decarbonisation of heating and cooling

²² https://energy.ec.europa.eu/topics/markets-and-consumers/market-legislation/electricity-market-design_en

The renovation wave links to *Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)* because district and neighbourhood approaches encourage the use of multiple solutions and scaling up of building renovation through local heating and cooling plans.

The focus on energy poverty links to *Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level*. There is a need to build on resources such as the European Energy Poverty Advisory Hub²³ that links local authorities and civil society organisations (city, municipal and regional governments, NGOs and other relevant organisations) across Europe to share best practice on energy poverty mitigation.

The Wave also links to *Opportunity 6: Integrated and neighbourhood approach to decarbonisation of buildings* because integrated renovation programmes can be improved by including housing, non-residential, and public buildings together. This takes advantage of the obligation of increasing the renovation of public buildings to 3% per year to accelerate integrated renovation programmes using blended finance. Integrated approaches to renovation prevent ‘stranded’ assets in the non-residential sector subject to regulations to improve the worst performing buildings – unless renovation takes place, these buildings will become unrentable, uninsurable, and unsellable, and hurt the economic activity of city and town centres, especially in small and medium-sized cities.

More green jobs in the electrification of heating of buildings in renovation are supported, but the range of skills needed for technologies and approaches at the district level, from renewable energy communities, energy system balancing with storage and EVs, and incentives for flexibility through market design, are also in need of support in the renovation wave.

The Affordable Housing Initiative

As a flagship of the [Renovation Wave](#) and the [New European Bauhaus](#), is a concrete action under the transition pathway of the Proximity and Social Economy industrial Ecosystem aiming to pilot ‘100 lighthouse renovation housing districts’ by 2030 to help renovate social and affordable housing in an integrated and smart approach, putting liveability, sustainability and access to local and social services at the forefront. The Affordable Housing Initiative is also embedded as key action to serve the principle 19 “Housing and assistance for the homeless” of the [European Pillar of Social Rights](#). This links to *Objective 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level* to measure and maximise social value of renovation of buildings.

Equal access to housing and services

Increasing effective equal access to adequate desegregated housing and essential services is one of the seven objectives of the EU Roma Strategic framework 2020-2030. This EU framework was complemented by and unanimously adopted Council Recommendation on Roma equality, inclusion, and participation. This links to *Objective 3: Key elements for the success of urban regeneration and*

²³ https://ec.europa.eu/info/sites/info/files/economy-finance/dp074_en.pdf

energy renovation plans implemented at neighbourhood level to include considerations of energy efficiency in all initiatives and measures from the Member States to invest in marginalised Roma communities.

New European Bauhaus

The New European Bauhaus is a creative and interdisciplinary initiative that connects the European Green Deal to people's living spaces and experiences. By creating bridges between different backgrounds, cutting across disciplines and community participation, the New European Bauhaus combines:

- sustainability, from climate goals to circularity, zero pollution, and biodiversity
- aesthetics, quality of experience and style beyond functionality
- inclusion, from valuing diversity to securing accessibility and affordability

Funding calls related to NEB such as the EUI call for Innovative Actions link to *Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level* - they state that the spirit of NEB is best fulfilled by actions such as:

- construction and renovation in a spirit of circularity and carbon neutrality
- adapting and transforming buildings for affordable housing solutions
- regenerating urban spaces

Global Covenant of Mayors for Climate and Energy (GCoM) / Covenant of Mayors – Europe

The Global Covenant of Mayors for Climate and Energy (GCoM) is the largest global alliance for city climate leadership, built upon the commitment of over 12,500 cities and local governments. The Europe region, Covenant of Mayors – Europe, forms the largest contingent of members. Cities and towns must aim at least as high as their country's commitment to the Paris Climate Agreement. Cities and towns form communities of practice, including renovations, heating, and cooling to share what is working to decarbonise buildings, including a partnership with the European Commission for the Urban Transitions Mission. Access to funding for a city to improve its decarbonisation strategies and projects from EU funds is often contingent on a city having a stated commitment for cutting emissions. GCoM membership is used to evidence this commitment.

GCoM's initiatives link to *Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)* because members commit to:

- Develop a greenhouse gas (GHG) emissions inventory
- Assess climate risks and vulnerabilities of the city
- Define climate mitigation, resilience and energy targets
- Create full climate action plans

A.5 Regulatory environment

Research questions	Corresponding Assessment Criteria
<p>What is the regulatory environment at EU, regional, and local levels, and how does it align with the needs and challenges of the theme? How can UAEU's work on this theme contribute to Better Regulations?</p>	Regulatory environment
<p>What funding options are currently or will soon be available? Does this confirm that there is a clear gap that integrated renovation programmes and local heating and cooling plans fill?</p>	

Many of the gaps and opportunities in the regulatory and funding instruments have been introduced in previous sections. Many of the same gaps and opportunities found in multilevel governance and policy initiatives will be reflected here, and vice versa as multilevel governance is inherent into the implementation of European Directives as they are transposed into national law and regulations. All of the Directives below link to *Opportunity 8: Development of guidance to implement relevant directives*.

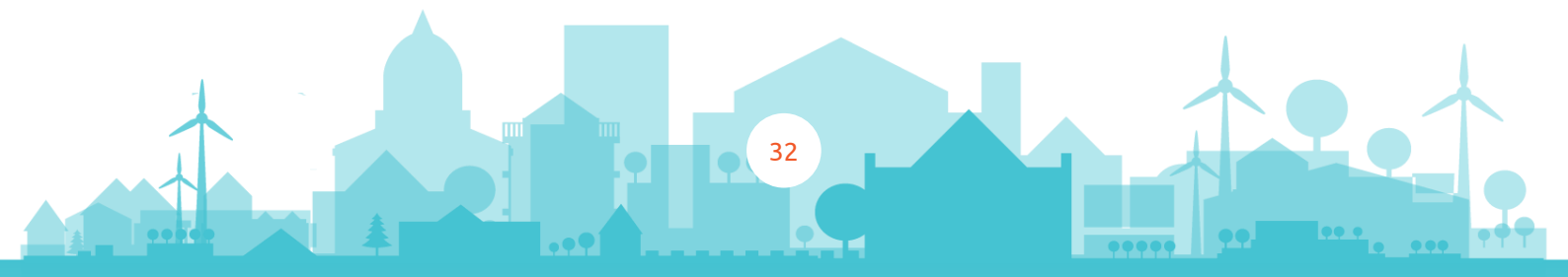
The Thematic Partnership is likely to begin in 2025-26 as discussions on the EU budget for 2028-2034 get underway. Almost a third of the budget is dedicated to Cohesion Policy, aimed at regional development and reducing disparities. About €20billion is for energy renovation and efficiency, which could reach €29billion with co-financing. New cohesion funds, along with the Recovery and Resilience Facility, will provide over €66billion for energy renovation across the EU till 2029. €11.5billion of funding through InvestEU and LIFE is intended to leverage €120billion of private sector finance to co-invest into integrated renovation programmes and local heating and cooling plans over 2021-27. Member States should expect the ambition of co-investment to grow in the next MFF.

Energy Performance of Buildings Directive

In the revised Energy Performance of Buildings Directive (EPBD)²⁴ local authorities can designate districts in accordance with local needs – and local heating and cooling plans are tools to prioritise funding, use regulation effectively, and get the data and information needed to scale renovations of buildings – and integrate renovations with energy systems and energy communities. The social, economic, and environmental needs of these districts are important pieces of data for local authorities as part of the consultation with national ministries responsible for Member State Building Renovation Plans for improving the energy efficiency and retrofitting of the building stock. Member states must aim to reduce average residential energy use by 20-22% by 2035, and to renovate the 26% worst-performing non-residential buildings by 2033.

The revised EPBD links to *Opportunity 6: Integrated and neighbourhood approach to decarbonisation of buildings* because it established the principle of district approaches to access multiple solutions at scale. Member States should take up neighbourhood and district approaches to building renovation

²⁴ <https://energy-cities.eu/member-states-must-get-ready-for-the-new-local-heat-and-cooling-planning-obligation/>



and renewable heating and cooling in their national building renovation plans and actively promote them.

It also links with *Opportunity 7: Developing /exchange of practice on local energy communities and their interplay with municipal heating and cooling solutions* because of the requirement of national building renovation plans to include opportunities for energy communities to meet the energy needs of renovated buildings.

Energy Efficiency Directive and Renewable Energy Directive

The recently adopted Energy Efficiency Directive (EED)²⁵ requires cities of minimum 45,000 inhabitants to develop local cooling and heating plans. The districts established by the EPBD signal where both needs and opportunities lie. Adding to this, the Renewable Energy Directive (RED)²⁶ includes a mandatory percentage of renewable energy in these local heating and cooling plans. They both link to *Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)* and *Opportunity 5: Integration of renewable energy in cities* because more than half of European countries a new legislative framework will be needed, along with the development of a whole new support system for cities of guidance and access to data, especially in the built environment and energy systems.

Future Electricity Market Design

Finally, the Union's future electricity market design²⁷ is being changed to use allow more use of purchase power agreements and contracts-for-difference. The links to *Opportunity 5: Integration of renewable energy in cities* because it will also help accelerate the deployment and integration of larger renewable energy sources in the energy system. Further reform is needed to support the integration of smaller renewable energy sources (typically less than 1MW) into districts designated by local authorities in local heating and cooling plans, from solar and storage to EV batteries.

Recovery and Resilience Facility and RePowerEU (2021-26)

The Recovery and Resilience Facility (RRF) is a temporary instrument (€357billion of grants and €291bn of loans). It is the centrepiece of NextGenerationEU -the EU's plan to emerge stronger and more resilient from the current crisis. It funds national RR plans with at least 37% of the budget to green measures and 20% to digital measures. Most of the relevant fund is given out in loans to leverage private finance into renovations as part of REPowerEU.

REPowerEU is a fund (€72bn in grants and €225bn in loans) to cut dependence on natural gas – and in the EU 'Save Energy' communication states that it can speed up the uptake of loans for renovation of buildings and district heating systems if EBPD and member state regulations provide

²⁵ <https://publications.jrc.ec.europa.eu/repository/handle/JRC132379>

²⁶ https://ec.europa.eu/commission/presscorner/detail/en/qanda_23_6045

²⁷ <https://www.creds.ac.uk/publications/summary-of-findings-from-heat-pump-flexibility-expert-workshop/>

the push factor. It will also encourage better electricity market design for pricing to promote further uptake of finance for the electrification of buildings.

The Smart Cities Marketplace links to *Opportunity 2: Innovative funding mechanisms* because it will last beyond REPowerEU with a complete catalogue of offers such as calls for free technical assistance, 1-to-1-consultancy services for city-led consortia close to the financing stage, financing masterclasses and a fine-tuned matchmaking for the financing of urban projects and intensified partnerships with other EU initiatives. It also collaborates very closely with the Covenant of Mayors - Europe²⁸ and a wide set of other urban initiatives for the purpose of fostering the uptake, replication and upscaling of urban solutions with blended public and private finance, facilitated via its Explore-Shape-Deal process.

European Regional Development Fund (ERDF)

ERDF funding, if used across all building sectors, links to *Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)* because it can play a large part of regenerating district and town centres by including non-residential buildings. Using urban regeneration and energy renovation plans together to take land use and re-use of buildings in the non-residential sector into account, and the re-use of spaces into account for development of local heating and cooling plans and integration of renewable energy.

Future funding under ERDF will link to *Opportunity 2: Innovative funding mechanisms* and *Opportunity 4: Assessment, planning and implementation of local heating and cooling plans* because integrated neighbourhood approaches to modernizations and energy-efficiency renovations can be adopted by moving away from the 'one building at a time' approach previously undertaken. A new knowledge base will be built up through new ERDF-funded projects supporting the new emphasis on district and neighbourhood approaches to renovation.

ERDF funding links into *Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level* because it can improve planning in terms of green and sustainable rehabilitation of buildings, funding for place-based investments that address local needs, and green skills training for the workforce needed for renovations of buildings. Local heating and cooling plans may need to adapt to direct investment into technologies and energy communities to balance energy systems.

ERDF funding links to *Opportunity 5: Integration of renewable energy in cities* because it can increase the district approaches, encourage the use of multiple solutions and scale up building renovations and interact with energy communities with flexibility, balancing power and demand. Considering the combination of green infrastructure with building renovation and new approaches to energy flexibility in urban regeneration and energy renovation strategies. Often energy generation and storage are excluded as out of scope of funding that promotes nature-based solutions – this limits integrated and neighbourhood approach to the decarbonisation of buildings.

²⁸ https://ec.europa.eu/commission/presscorner/detail/en/speech_23_2367

The ERDF-funded EUI Innovative Actions Fund links to *Opportunity 6: Integrated and neighbourhood approach to decarbonisation of buildings* because it awards grants of up to €5m for projects of a total EUI budget of €450m, many of which are in support of urban challenges that combine local strategies and plans with renovation of buildings. Examples in renovations of buildings include projects in Egaleo, Tallinn Lorca, and Budapest.

Just Transition Fund and Modernisation Fund

The Just Transition Fund (JTF) is a new fund within the CP Period 2021 – 2027 to support the territories most affected by the transition towards climate neutrality to avoid growing regional inequalities. This links to *Opportunity 1: Urban regeneration and energy renovation strategies at urban regeneration strategies* to replace carbon-intensive installations such as the worst-performing buildings, when these investments lead to substantial emission cuts and job protection.²⁹

The Modernisation Fund supports the modernisation of energy systems and the improvement of energy efficiency in 13 lower-income EU Member States. This links to *Opportunity 5: Integration of renewable energy in cities* because Member States can fund changes to energy systems to integrate new renewable energy into their national building renovation plans.

Social Climate Fund

The Social Climate Fund (SCF) was created alongside the [ETS2](#) for emissions from fuel combustion in buildings, road transport and additional sectors. Together with a mandatory 25% contribution of the Member States to their Social Climate Plans, the SCF should mobilise at least €86.7 billion over the 2026-2032 period. This links to *Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)* because Member States may use the SCF to support structural measures and investments in energy efficiency and renovation of buildings, clean heating and cooling and *Opportunity 5: Integration of renewable energy in cities* to support the integration of renewable energy. Member States will submit these plans to the European Commission by June 2025.

European Investment Bank

The European Investment Bank (EIB) links to *Opportunity 2: Innovative funding mechanisms* because it offers various forms of support for building renovation projects aimed at improving energy efficiency and sustainability. The EIB provides loans and other forms of financing to support building renovation projects. This funding can be used to cover the costs of energy-efficient upgrades, such as insulation, efficient heating and cooling systems, and renewable energy installations.

- [EIB energy lending policy](#): European Initiative for Building Renovation: The [EIB-R was established by the Renovation Wave](#) to support building renovation plans. It combines EIB financing experience and existing technical assistance facilities to reinforce support

²⁹ <https://www.urbanagenda.urban-initiative.eu/partnerships/energy-transition>

towards attracting investment through aggregation, tailored financial support and accessing new sources of finance.

- **EIB Funds for social and affordable housing:** Social and affordable housing loans are a major element of the EU bank's €150 billion in urban lending over the last seven years and of its support for EU urban policy. The EIB may also offer technical assistance to help building owners and developers identify cost-effective energy-saving measures and navigate the complexities of renovation projects. This can include conducting energy audits, providing feasibility studies, and offering advice on best practices.
- **ELENA – European Local Energy Assistance:** ELENA supports, with a minimum ticket size of €30m, the preparation of projects that improve energy efficiency and renewable energy use in buildings, and energy efficiency renovations and renewable energy projects for residential buildings.

LIFE

The LIFE **Clean Energy Transition** sub-programme has a budget of nearly €1 billion over the period of 2021-2027 and aims at facilitating the transition towards an energy-efficient, renewable energy-based, climate-neutral and resilient economy by funding coordination and support actions.

It links to Opportunity 4: Assessment, planning and implementation of local heating and cooling plans because assessments are needed of the link between climate vulnerability and increased need for cooling in local heating and cooling plans. The success of climate adaptation plans will depend on the integrated renovation programmes implemented at neighbourhood level.

It links to *Opportunity 5: Integration of renewable energy in cities* because data that combines both climate risk (e.g. urban heat islands) and climate opportunities (e.g. solar and wind potential) for use in a local heating and cooling plan to size investments across electrification of heating and cooling plant to on-site renewable generation.

Figure 2: EU funding for renovation. <https://www.renovate-europe.eu/funding-for-energy-renovation/>

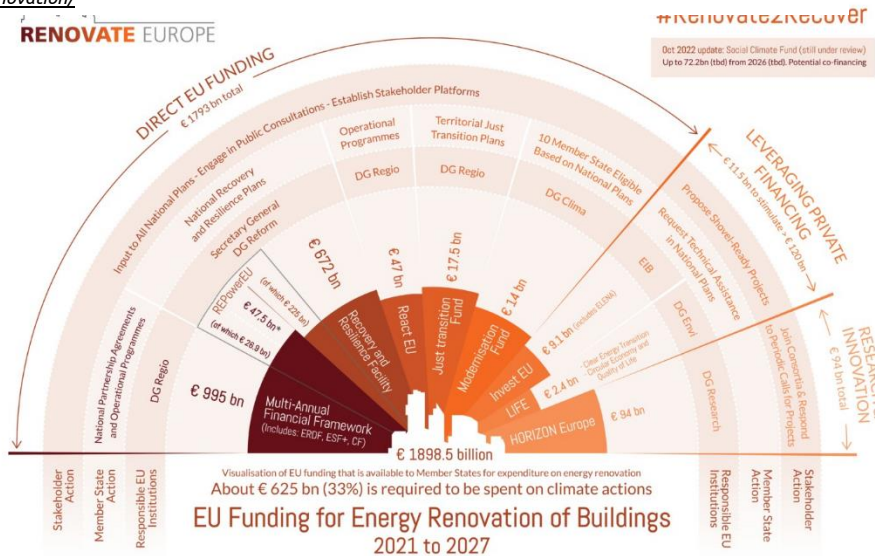
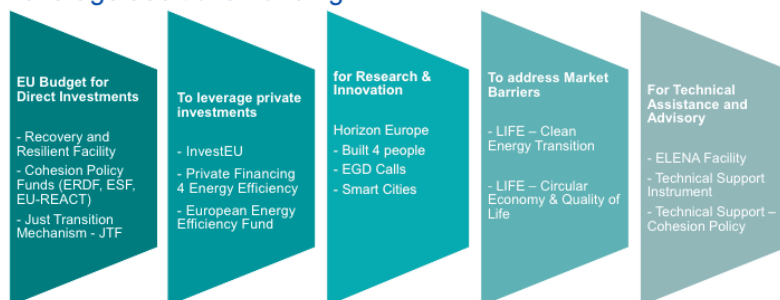


Figure 3: EU financial instruments for renovation. <https://www.fi-compass.eu/sites/default/files/publications/Financing%20the%20EU%20Renovation%20wave%20through%20FIs.pdf>

Financial instruments can use Cohesion policy resources alongside the Recovery and resilience facility and Invest EU to leverage additional funding



A.6 Trends and evidence about EU cities

Research questions	Corresponding Assessment Criteria
Why is there a necessity to manage the interaction of integrated renovation programmes and local heating and cooling plans, and what progress has been made so far?	Trends and evidence about EU cities
What are the requirements and challenges in planning and implementing integrated renovation programmes and local heating and cooling plans? Are there special needs of small and medium-sized cities?	

Speeding up renovation and decarbonisation of buildings requires much more collaboration, from a new neighbourhood and district approach to coordination between small and medium sized cities to get the work done. Getting good, ‘green’ loans to building owners needs a scale of investment of collections of many projects in an integrated renovation plan. The plans cannot wait for every premise in the local area to become vacant simultaneously – there needs to be innovative finance and intermediaries to accept financial risk and solve this paradox. For building renovations alone, Member States in 2018 identified the need to collectively invest around €130 billion per year, €57 billion in social housing.³⁰ Integrated renovation programmes and coordinated local heating and cooling plans across small and medium sized cities are effective ways to ‘crowd-in’ this funding. Public sector financing for the renovation wave is predominately in either loans – for example

³⁰ <https://www.urbanagenda.urban-initiative.eu/partnerships/climate-adaptation>

REPowerEU gives €72 billion in grants versus lends €225 billion in loans from 2021-27 – or technical assistance programmes that de-risks loans from the private sector – for example, finding ways to solve the ‘tenant-landlord incentive paradox’ where savings on energy bills accrue to the tenant as a benefit to capital expenditure by a landlord.

National Long Term Renovation Strategies Assessment Reports

The Joint Research Centre (JRC) maintains responsibility for assessing national renovation strategies since in Member States first produced building renovation strategies in 2014. The gaps in past approaches to renovation, and the evidence to support the revised EPBD mandating new district and neighbourhood approaches to renovation through more cost-effective approaches through integrated renovation programmes of spatially related blocks are clearly identified across these assessments across the last decade. These include:

- [Assessment of the first long-term renovation strategies under the Energy Performance of Building Directive \(Art. 2a\)](#) assesses the Long-term Renovation Strategies (LTRS) submitted by Member States between 2020 and 2022 (LTRS 2020) in compliance with Article 2a of the Energy Performance of Building Directive (EU 2018/844).
- [Assessment of second long-term renovation strategies under the Energy Efficiency Directive](#) assesses the Second Long-term Renovation Strategies (LTRS) submitted by Member States in 2017 (LTRS 2017) in compliance with Article 4 of the Energy Efficiency Directive (Directive 2012/27/EU).
- [Synthesis report on the assessment of Member States' building renovation strategies](#) assessed 31 national/regional building renovation strategies to meet Article 4 of the Energy Efficiency Directive that requires Member States "to establish a long-term strategy beyond 2020 for mobilising investment in the renovation of residential and commercial buildings with a view to improving the energy performance of the building stock."

A Europe-wide survey and assessment of one-stop shops (OSS) for energy renovation of buildings found that the approach has a potential to cover 5-6% of the renovation volume of 35 million buildings in 2030 set out by the Renovation Wave Strategy, at low social costs, integrating private investments with client-friendly methods. The current level of activity of the European OSS market is estimated to be around 100,000 projects per year.³¹

There is a big gap found in readiness for local heating and cooling plans in Member States as they integrate them into National Energy and Climate Plans and national building renovation plans.³² As of 2023, local heating and cooling planning was completely absent in half of EU member states, and a lot of work is needed in the ones that have heating and cooling plans to integrate these plans into spatial and urban planning. When transposing the Energy Efficiency Directive member states must change the existing legal framework for local authorities to coordinate with the coming national and local building renovation plans.

³¹ <https://www.rescoop.eu/uploads/rescoop/downloads/Guidelines-on-CHC.pdf>

³² <https://www.rescoop.eu/uploads/rescoop/downloads/Guidelines-on-CHC.pdf>

There is a need for renovation of buildings to support new energy communities and strengthen grids. Building fabric, or insulation, is important but does not equal decarbonisation. Investment into building fabric reduces the annual energy consumption of buildings – but soon, this will no longer be the main performance indicator of building decarbonisation. This is because buildings after the energy transition will be powered by abundant, renewable energy, intermittent and distributed in its production. After the energy transition, cities will be combining 1) getting the incentives right for residents and businesses to change heating and cooling patterns 2) on-site generation, increasingly within local energy communities 3) procuring off-site renewable energy and 4) storing renewable energy on-site.

Investment into grid reinforcement and flexibility in the energy system is a concern for the assessment, planning, and implementation of local heating and cooling plans. The role of Distribution System Operators (DSO) in local heating and cooling plans will facilitate the increase of renewable energy sources. The 2022 JRC DSO Observatory concluded that regulation should allow the best results from regulatory experimentations (regulatory sandboxes, citizen energy communities, etc.) to be replicated at a larger scale, while at the same time keeping the window open for new experimentations.³³

Local heating and cooling plans need to consider in their implementation how reinforcement contributions appear on the balance sheet of renovation projects. Industry estimates that around €375-425 billion of investment in distribution grids is necessary for the EU by 2030.³⁴ Without capacity for electrified heating and cooling in the local feeder and substation, large costs and delays set in. DSOs set rules and costs for electrification of buildings and on-site generation in energy communities – and local authorities struggle to get data on how quickly projects – from solar PVs to heat pumps at scale - get connected. In some cases, reinforcement of the low voltage network is the cheapest option rather than procuring flexibility; in other cases, the opposite may be true. A survey of energy networks found that they expect 50-90% of heat pumps to provide heating or cooling flexibility in some way – but this needs a high amount of automation to make this happen.³⁵

Plans need to take an integrated, neighbourhood approach to the rollout of flexibility, and the interaction with the mobility sector as EV charging demand increases. The EU's daily flexibility needs are expected to increase by 133% between 2021 and 2030 because of the switch to renewables, and by another 250% by 2050.³⁶ A wide range of technologies are needed to decouple heat and cooling provision from electricity production at peak hours. Flexibility does not require comfort for people in buildings to be unmet at peak hours. Examples of flexibility include heat pumps that can recharge hot water storage when power is cheapest, electric vehicles that store energy and recharge at night when power is cheapest, digitally-connected appliances in buildings that can be controlled remotely, and solar panels coupled with home batteries.

³³ <https://ses.jrc.ec.europa.eu/distribution-system-operators-observatory>

³⁴ [https://futurium.ec.europa.eu/sites/default/files/2021-](https://futurium.ec.europa.eu/sites/default/files/2021-11/Review%20of%20the%20UAEU%20contributions%20to%20the%20NUA%20-%20Final%20report.pdf)

[11/Review%20of%20the%20UAEU%20contributions%20to%20the%20NUA%20-%20Final%20report.pdf](https://futurium.ec.europa.eu/sites/default/files/2021-11/Review%20of%20the%20UAEU%20contributions%20to%20the%20NUA%20-%20Final%20report.pdf)

³⁵ https://ec.europa.eu/regional_policy/sources/brochure/urban_agenda_eu_en.pdf

³⁶ <https://futurium.ec.europa.eu/en/urban-agenda/news/review-contributions-urban-agenda-eu-new-urban-agenda>

A.7 Existing identified gaps and recommendations

Research questions	Corresponding Assessment Criteria
What are the interconnections and opportunities for mutual support among actions developed or in progress with other Thematic Partnerships?	Existing identified gaps and recommendations
Based on identified gaps and the identified options to act within the multilevel governance context of current and evolving EU, national, regional and local policies, what recommendations can be made for this Thematic Partnership to support Better Regulation, Better Funding, and Better Knowledge?	

This section summarises identified gaps and recommendations for UAEU by the eight working opportunities for support from the UAEU and the interconnections with previous and current UAEU Partnerships. The opportunities for this theme to improve the renovation of buildings through district and neighbourhood approaches and local heating and cooling plans. It presents a list of actions taken and gaps that could be addressed across the strategic objectives above of a thematic partnership in building decarbonisation, integrated renovation programmes, and local heating and cooling plans.

Table 5: UAEU partnerships.

First phase partnerships		Ljubljana Agreement	Gijon Agreement
Concluded (2016 – 2020)	Ongoing (2016 – present)	ongoing (2021-)	planned
Security in Public Space	Culture and Cultural Heritage	Cities of Equality	Water sensitive city.
Sustainable Land Use	Public Procurement	Food	Building decarbonisation:
Energy Transition	Inclusion of Migrants and Refugees	Greening Cities	Integrated renovation programmes and local heating and cooling plans
Climate Adaptation		Sustainable Tourism	
Urban Mobility			
Digital Transition			
Circular Economy			
Jobs and Skills in the Local Economy			
Urban Poverty			
Housing			
Air Quality			

Existing identified gaps and recommendations were found in previous thematic partnerships that need to be addressed in this partnership include:

- Interaction of local authorities' urban regeneration and energy renovation strategies with Member State climate, urban policy, and energy policy was limited
- One-stop-shop technical assistance lacks the capacity and knowledge to promote cost-effective district and neighbourhood solutions to residents and businesses

Some of the gaps from the Energy Transition Thematic Partnership were summarised in the [EUROCITIES policy paper on the Renovation Wave](#) - where in their view, a successful Renovation Wave:

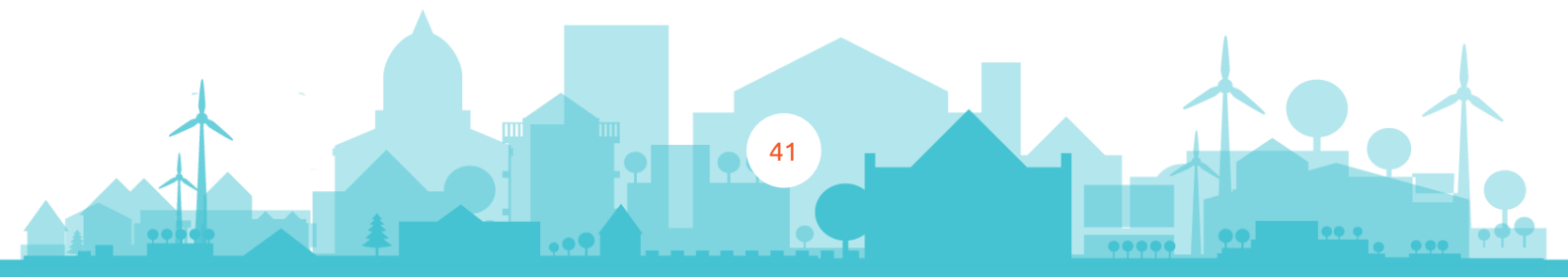
- increases the renovation rate from 1% today to at least 3% per year in 2050
- combines programmes tailored to each building segment and district level renovation approaches
- accompanied by appropriate funding and can leverage long-term investments
- increases technical assistance to set up and operate coordination services
- brings together climate and social cohesion goals

Table 6: Actions from previous UAEU partnerships.

Energy Transition Thematic Partnership (2016 –2020)³⁷

Action and lead	Links to the theme, and gaps this theme could fill
<p>Action 1: Creation of 'financing for district energy' task group</p> <p>Lead: Groningen, NL</p>	<p>Links: Bring district energy and financing experts together to share experiences, collaborating to identify potential funding mechanisms, and to identify the most appropriate sources of finance for district energy projects</p> <p>Gaps: There are challenges for local heating and cooling plans to be able to attract blended public and private finance for both distributed and centralised district energy projects.</p> <p><i>Opportunity 2: Innovative funding mechanisms</i></p>
<p>Action 2: Maximising use of waste heat in cities</p> <p>Lead: Euroheat and Power</p>	<p>Links: Develop a Position Paper (Euroheat and Power, 2020) that sets out a range of recommendations for how barriers could be addressed for the mutual benefit of the heat network operator, the waste heat producer, and the associated energy system.</p> <p>Gaps: Minimal.</p> <p><i>Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i></p>
<p>Action 3: Guidance on energy masterplanning for cities</p> <p>Lead: Germany</p>	<p>Links: Collection of good practice in energy masterplanning from city networks, the SCC01 Marketplace, and other European funded projects to put into the Reference Framework for Sustainable Cities to help improve the integrated approach of local development strategies and mainstream energy planning as part of urban development.</p> <p>Gaps: Local heating and cooling plans need to link energy masterplanning into local energy renovation plans and innovative funding mechanisms.</p>

³⁷ <https://futurium.ec.europa.eu/en/urban-agenda/news/review-contributions-urban-agenda-eu-new-urban-agenda>

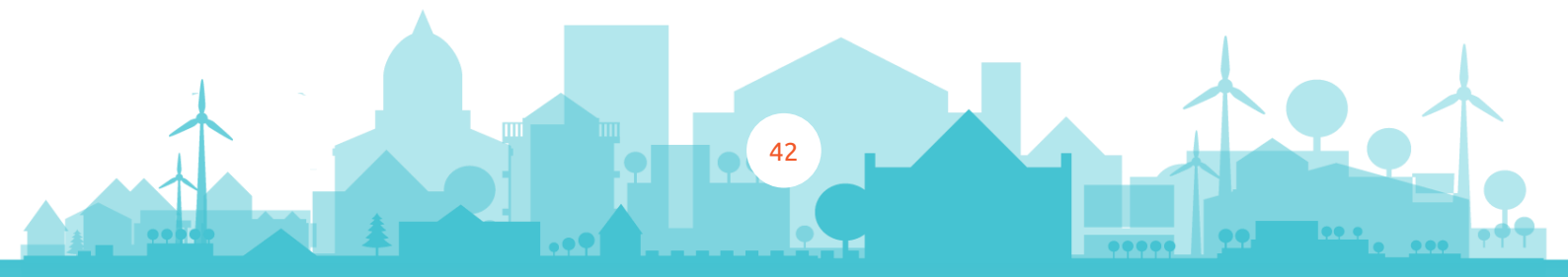


	<p><i>Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)</i></p>
<p>Action 4: 'Deployment desks' for city retrofitting</p> <p>Lead: Navarra Region, Spain</p>	<p>Links: Support establishment of Deployment Desks (often called One-Stop-Shops) in places with a city building renovation plans. These allocate financial resources to private residential owner-occupiers and establish management models that are delivered by the Deployment Desks and improve best practice platforms such as the S3 Partnership on Sustainable Buildings.</p> <p>Gaps: Such plans could initially focus on public buildings (dwellings) and also on districts with urgent regeneration needs. Later, they can also extend to private landlords and ownership collectives. These one-stop-shops can also build intelligence from local demand for local heating and cooling plans to build packages of renovation work that better link private investment funds linked to energy efficiency and retrofitting.</p> <p><i>Opportunity 2: Innovative funding mechanisms</i></p> <p><i>Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level</i></p>
<p>Action 5: Closer co-operation with EU bodies to promote energy transition funding</p> <p>Lead: Tilburg, NL</p>	<p>Link: Develop a concrete overview of State Aid exemptions that cities can use as guidance for implementing energy transition projects. The paper will function as an opening for negotiations with the EIB, to determine the extent to which it is possible to provide more flexible energy transition finance packages and a coNECPT work programme that includes dedicated energy transition funding for urban areas.</p> <p>Gaps: Using State Aid exemptions in renovation of buildings l effectively to 1) include non-residential and residential renovations at scale 2) scaling up renovation across multiple small and medium sized cities in a single package</p> <p><i>Opportunity 2: Innovative funding mechanisms</i></p>

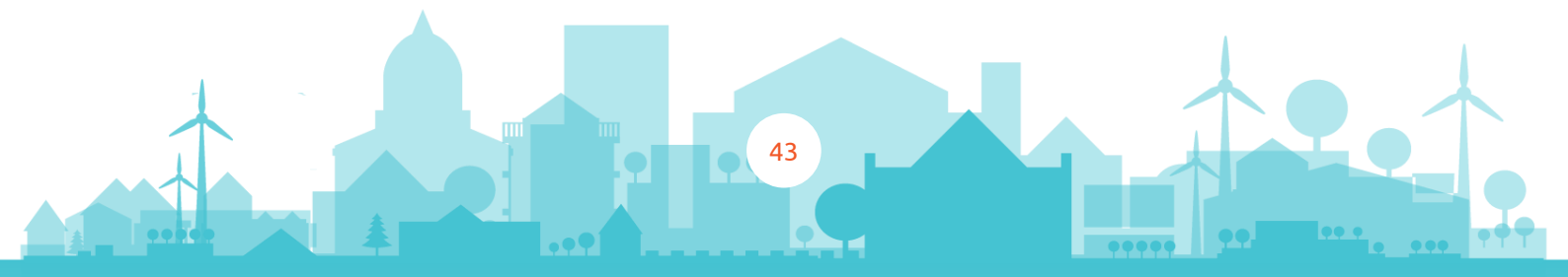
Climate Change Adaptation Thematic Partnership (2016-2020)³⁸

Action and lead	Links to the theme, and gaps this theme could fill
<p>Action 1: Analysis of national multilevel urban development and planning regulations with focus on climate adaptation</p> <p>Lead: Hungary</p>	<p>Link: Collected and analysed all available multilevel regulation tools on urban development and planning regulations in a context of multilevel climate adaptation strategies</p> <p>Gaps: Criteria for the success of climate adaptation plans in urban regeneration and energy renovation plans implemented at neighbourhood level.</p> <p><i>Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level</i></p>

³⁸ https://www.europarl.europa.eu/doceo/document/TA-9-2024-0129_EN.html

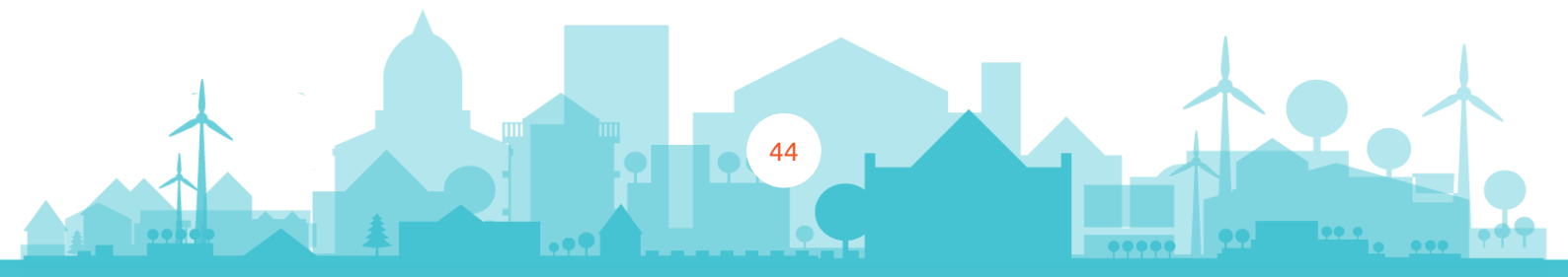


<p>Action 2: Guidelines and toolkit for the economic analysis of adaptation projects</p> <p>Lead: EIB</p>	<p>Link: EIB funded Urban Climate Risk and Vulnerability Assessments (Economic analysis included) of 10-12 cities for climate adaptation and develop these to infrastructure investments including green infrastructure in the urban context.</p> <p>Gaps: Assessments are needed of the link between climate vulnerability and increased need for cooling in local heating and cooling plans.</p> <p><i>Opportunity 2: Innovative funding mechanisms</i> <i>Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i></p>
<p>Action 3: Including recommendations for the Operating Programmes in the European Regional Development Fund in order to improve its accessibility for municipalities</p> <p>Lead: Barcelona Region</p>	<p>Link: Recommendations to the ERDF Operational Programmes (OPs) to improve access to these funds to small to medium sized local authorities when applying for an ERDF call and identify the solutions to overcome them</p> <p>Gaps: Access to funds for small and medium sized cities for their energy renovation strategies, including for energy communities alongside local authority-owned heating and cooling solutions.</p> <p><i>Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)</i> <i>Opportunity 2: Innovative funding mechanisms</i> <i>Opportunity 7: Developing /exchange of practice on local energy communities and their interplay with municipal heating and cooling solutions</i></p>
<p>Action 4: A new LIFE for urban adaptation projects</p> <p>Lead: EUROCIITIES</p>	<p>Link: advice for access by local authorities to access funding LIFE funding for urban adaptation projects.</p> <p>Gaps: Criteria for the success of climate adaptation plans in urban regeneration and energy renovation plans implemented at neighbourhood level.</p> <p><i>Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level</i></p>
<p>Action 5: Improving EU municipalities knowledge of the framework of the Copernicus Climate Change Service</p> <p>Lead: Joint Research Centre</p>	<p>Link: Developed effective tools for territorial analysis from the Copernicus Climate Change (C3S) Service CDS (Climate Data Store) to better plan climate adaptation strategies and inform local policy-makers.</p> <p>Gaps: Data availability that combines both climate risk (e.g. urban heat islands) and climate opportunities (e.g. solar and wind potential) for use in a local heating and cooling plan to size investments across electrification of heating and cooling plans to on-site renewable generation.</p> <p><i>Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i> <i>Opportunity 5: Integration of renewable energy in cities</i></p>



Other relevant thematic partnership actions

Partnership and Action	Links to the theme, and gaps this theme could fill
<p>Housing Thematic Partnership (2016-2020)</p> <p>Action 11: Recommendations on EU funding of affordable housing</p>	<p>Action: Programme for short- and long-term capacity building for the uptake of EU funds and EIB finance for retrofit of affordable housing</p> <p>Gaps: Integrated neighbourhood approaches to modernizations and energy-efficiency renovations can be adopted by moving away from the 'one building at a time' approach previously undertaken – but there is a lack of knowledge in cities of the combination of funds and understanding state aid rules.</p> <p><i>Opportunity 2: Innovative funding mechanisms</i></p>
<p>Greening Cities Thematic Partnership (2022 -) Action 1: Need for Green: Methodology for quantifying the demand for green infrastructure at local level</p>	<p>Link: A guidebook will support urban planning processes and the substantiation of green infrastructure projects, ensuring they meet climate adaptation and biodiversity goals. I</p> <p>Gaps: Considering the combination of green infrastructure to meet climate adaption goals with b integrated and neighbourhood approaches to the renovation of buildings.</p> <p><i>Opportunity 5: Integration of renewable energy in cities</i> <i>Opportunity 6: Integrated and neighbourhood approach to decarbonisation of buildings</i></p>
<p>Public Procurement Thematic Partnership Action 6: Cooperation Centres for innovative and responsible public procurement</p> <p>Lead: Haarlem, NL</p>	<p>Link: Guidance on a flexible concept for setting up a Local Cooperation Centre to provide opportunities for training and skills development, but also for networking, technical assistance provision and potentially joint purchases.</p> <p>Gaps: Opportunities for small and medium-sized cities to do more to jointly raise finance from the EIB and others (blended finance) as part of local heating and cooling plans.</p> <p><i>Opportunity 2: Innovative funding mechanisms</i></p>
<p>Circular Economy and Sustainable Land Use Thematic Partnerships (2016-20): Collaboration: Sustainable and Circular re-use of spaces and buildings</p> <p>Lead: Prato, IT</p>	<p>Link: Guide for cities on how to re-use abandoned and underused spaces and buildings to facilitate urban regeneration and the circular re-use of underutilised buildings and spaces</p> <p>Gaps: Using urban regeneration and energy renovation plans together to take land use and re-use of buildings in the non-residential sector into account, and the re-use of spaces into account for development of local heating and cooling plans and integration of renewable energy.</p> <p><i>Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level</i></p>



From the analysis above, the section below summarises the opportunities for this theme to improve the renovation of buildings through district and neighbourhood approaches and local heating and cooling plans. These opportunities include promoting integrated approaches to building decarbonisation efforts, developing local energy communities and their interplay with municipal heating and cooling solutions, and the development of guidance to implement relevant European directives. There are particular challenges faced by smaller and medium sized cities in accessing funding and technical support from entities such as the European Investment Bank and private investors, and the need for better communication and targeted messaging to encourage building owners' engagement and understanding of their role in integrated renovation programmes.

Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)

National Building Renovation Plans mandated by the recast EBPD will promote district and neighbourhood approaches to renovation and will change local authorities' approaches to urban regeneration through integrated renovation programmes and renewable energy communities. Local authorities when they put district and neighbourhood approaches to renovation in place, will make policies that address the city as a whole, and then use integrated renovation programmes to commit them in more detail through plans and projects in spatially related buildings at neighbourhood level. There are several examples underway in Member States. One example is the Natural Gas-Free Neighbourhood Programme in Netherlands.³⁹

The European Union grapples with a significant north-south and east-west divide among Member States,⁴⁰ in its local heating and cooling plans. At present, local heating initiatives are significantly more advanced than their cooling counterparts due to this geographical discrepancy. The necessity for local cooling plans is underscored by data on heating and cooling degree days alongside climate change projections. However, despite the urgency, many Member States lag in implementing such strategies, as evidenced by notable decarbonization projects primarily focusing on operational energy use and individual building renovations. These initiatives often overlook the potential of local heating and cooling solutions.

Despite these challenges, recent initiatives such as [CoRDEES Paris](#) funded by UIA and Horizon2020's [DecarbCityPipes](#) project provide hope for progress in addressing the complexities of local heating and cooling planning.

Opportunity 2: Innovative funding mechanisms

There is a need for more mechanisms for blending finance for building decarbonisation. This gap highlights a crucial need for collaborative efforts between various stakeholders to address the pressing issue of climate change.

³⁹ https://commission.europa.eu/energy-climate-change-environment/implementation-eu-countries/energy-and-climate-governance-and-reporting/national-energy-and-climate-plans_en

⁴⁰ https://ec.europa.eu/commission/presscorner/detail/en/ip_23_6602

Collaboration between spatially related buildings of different land uses and tenures are a challenge and an opportunity to use district and neighbourhood approaches to renovation at scale. Decision making and financial mechanisms for return on investment in renovation diverge between residential, non-residential, and public buildings. There are landlord and tenant incentive paradoxes that are widely documented. Within the same land use, these mechanisms diverge by tenure. Social housing decisions are done institutionally, and owner-occupied housing individually. Involving building owner and homeowner associations in these partnerships can tackle these opportunities.

Cooperation among small and medium-sized cities presents its own set of challenges, primarily due to the perception of leaders that pooling their demand with other cities will only happen if there is a 'perfect' alignment of goals and timescales. Achieving such alignment can prove to be a formidable task, hindering progress in collective efforts towards sustainability.

Another concern arises regarding liability within collaborative or innovative funding models. In scenarios where a party involved in a loan agreement fails to meet their repayment obligations, the implications and consequences remain uncertain, raising questions about accountability and risk management.

Despite these challenges, efforts to address them are underway, for example compilation of catalogues detailing various mechanisms aimed at addressing these issues. Platforms such as the Smart Cities Marketplace are repositories of such mechanisms, albeit with limited duplication, underscoring the need for further exploration and refinement of funding strategies in the pursuit of sustainable development.

Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level.

Repeatedly, engagement emerges as a critical factor for achieving success in these endeavours. Whether it's the involvement of local communities, businesses, or governmental bodies, active engagement and collaboration among stakeholders prove to be indispensable in driving positive outcomes and fostering sustainable energy practices within districts across Europe.

Supporting building owners in districts designated for integrated renovation programmes can build on the current and former network of one-stop-shops, including the Energy Transaction TP action in Navarra. There are new communities of practice for one-stop-shops emerging for the housing sector, for example EU Peers⁴¹ to connect a city's local one-stop shop for their home energy renovation projects" to one-stop-shops in other EU cities.

In the non-residential sector, numerous positive energy district projects (PEDs) across Europe, are beginning to emerge, as highlighted by the PED initiatives supported by JPI Europe.⁴² These projects

⁴¹ <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52020DC0564>

⁴² https://managenergy.ec.europa.eu/publications/2021-2027-cohesion-policy-support-energy-efficiency-and-building-renovation_en#:~:text=In%20the%20run%20up%20to,across%20the%20EU%20until%202029.

signify significant steps towards sustainable energy practices and urban development. The PED-ID consortium in Uppsala Business Park⁴³ found that district approaches appear to be more serendipitous than planned, often contingent upon the dedication and drive of the individuals and organisations involved in their development. It's the intrinsic motivation and commitment of these actors that seem to play a pivotal role in determining the outcome of such projects.

Opportunity 4: Assessment, planning and implementation of Local Heating and Cooling Plans

The integration of public and private finance, as previously mentioned, presents a substantial obstacle in advancing sustainable heating solutions. However, this barrier appears to dissipate when national strategies for local heating and cooling plans are firmly established. These strategies provide a framework that unlocks financial support for district heating projects, facilitating progress in sustainable energy infrastructure.

Despite this, knowledge and data within EU institutions regarding local heating and cooling plans remain limited, often focusing on individual building solutions rather than holistic city-scale approaches. This gap underscores the need for a more comprehensive understanding of the challenges and opportunities associated with district-level heating and cooling systems.

Moreover, the issue of split incentives, where occupants benefit from energy efficiency improvements while landlords or owners bear the investment costs, is widely recognized. Concerns persist regarding how and when occupants are expected to repay these investments through potentially higher rates. Addressing these concerns requires careful consideration of financial mechanisms and policy interventions to ensure equitable outcomes for all stakeholders involved.

Once again, the importance of engagement emerges as a central theme in driving progress in sustainable heating solutions. Community involvement and collaboration prove to be more impactful drivers of change than mere technical expertise. By prioritising engagement and fostering partnerships, communities can collectively navigate the complexities of transitioning to cleaner and more sustainable heating practices.

Opportunity 5: Integration of Renewable Energy in cities

RESCOop⁴⁴ found significant disparities in policies across Member States, indicating a wide spectrum of approaches to renewable energy integration and community empowerment. This diversity underscores the complexity of coordinating efforts towards a more sustainable energy future.

In many urban environments, the adoption of solar and battery technologies lags behind the emphasis on building fabric improvements. This 'fabric-first' approach prioritizes enhancing insulation and structural efficiency before implementing technological solutions, reflecting a cautious approach to sustainable urban development.

⁴³ <https://www.rescoop.eu/uploads/rescoop/downloads/Pres-Mfichter-cohesion-policy-Rescoop-webinar-080722-v1.pdf>

⁴⁴ https://smartspend.eu/wp-content/uploads/2021/08/Session-2-Cohesion-Policy-Funds-and-Just-Transition-Fund_Fichter.pdf

The concept of 'dynamic' pricing models, which enable energy prosumers to engage more actively in the market, is still in its early stages of development but shows promising signs of emergence. These models hold the potential to revolutionize how energy is consumed and distributed, although challenges remain in fully realizing their benefits, particularly in terms of risk pooling and ensuring equitable payback mechanisms within energy communities.

One pertinent question that arises is whether the preference for 'fabric-first' renovation policies over technology-centric approaches stems from evidence-based decision-making or inertia within policymaking circles. This question highlights the need for rigorous evaluation of the effectiveness and impact of different strategies to inform future policy directions.

Furthermore, while Member States are mandated to implement dynamic pricing by 2025, it raises the question of how this mandate will be leveraged to benefit energy communities in residential settings and facilitate flexibility contracts in non-residential contexts. Maximizing the potential of dynamic pricing requires proactive measures to ensure its integration into community-based energy initiatives and commercial energy agreements, promoting both sustainability and economic efficiency across diverse energy landscapes.

Opportunity 6: Integrated and neighbourhood approach to decarbonisation of buildings

The current approaches to tackling the decarbonisation challenge lack integration. Building renovation is much more efficient if is carried not unit by unit, or even building by building, but if it is carried at neighbourhood and district level. This helps the emergence of synergies between building renovations and infrastructure (mobility, urban realm) and what Net Zero Cities calls 'co-benefits' (education, employment) taking place in the same area.

Initiatives such as those outlined in the case study on residential energy efficiency financial instruments in Lithuania⁴⁵ highlight the emphasis on decarbonising apartment block buildings through collaboration with housing associations. While these efforts are commendable, they inadvertently sideline the potential for broader cooperation involving small and medium-sized cities, as well as public and private non-residential buildings and private housing.

This limited scope diminishes the capacity of smaller cities to attract finance by leveraging demand from a diverse range of sources. As a consequence, they may struggle to access larger funding opportunities from entities such as the European Investment Bank (EIB) and private investors.

However, there are opportunities to foster connections between initiatives like the UAEU Greening Cities Thematic Partnership and the European Urban Initiative's Innovative Actions second funding call including the topic of Greening Cities. By promoting integrated approaches combining green infrastructure projects with building decarbonisation efforts, it's possible to broaden the scope of decarbonisation efforts and enhance the sustainability of urban development initiatives across the EU.

⁴⁵ https://s3platform.jrc.ec.europa.eu/documents/20125/265185/2.FICHTER-DG%20REGIO_20200206_Smart%20Grids%20in%20the%20new%20MFF.pdf/df2a95a9-6709-024b-d953-b86e502fbf09?version=1.1&t=1619521010810

Opportunity 7: Developing exchange of practice on local energy communities and their interplay with municipal heating and cooling solutions

The analysis shows that EU institutions that address district and neighbourhood approaches to renovations and local heating and cooling plans have plans in place to improve involvement of energy communities. The partnerships can address regulatory barriers and unforeseen obstacles to involving energy communities into the local heating and cooling solutions implemented as part of integrated renovation programmes in cities.

Previous studies shed light on the prevalence local energy communities in rural communities, particularly in countries like Germany and Austria. These communities often have small energy networks that were established over a century ago. Interestingly, they have operated under exemptions from EU unbundling rules, allowing them to maintain local electricity distribution energy ownership structures.

The findings underscore the importance of understanding the historical context and regulatory nuances that shape the role of DSOs and utilities. There are intensified gaps by the JRC⁴⁶ in Member State policymaking and strategic planning efforts related to energy governance and decentralisation. Addressing this gap could facilitate more informed decision-making and better support for local energy ownership initiatives across the EU.

Opportunity 8: Development of guidance to implement relevant directives

Implementing the intentions in national building renovation plans for cities to use district and neighbourhood approaches to building renovation will be a challenge within the framework of the Revised Energy Performance of Buildings Directive (EPBD), the Energy Efficiency Directive (EED), the Renewable Energy Directive, and the Union's Future Electricity Market Design. Unlike its predecessor, the revised EPBD sets out requirements for national building renovation plans to promote integrated renovation programmes of spatially related blocks and energy communities. Local authorities still must put local heating and cooling plans in place through the EED, and an increase of district and neighbourhood approaches to renovation will impact the direction of local and heating plans.

Similar complexities and challenges arise with the interaction of renovation, heating and cooling demand, the RED, and a future Electricity Market Directive, especially concerning future implications. While specifics may vary, the Electricity Market Directive is anticipated to entail significant regulatory considerations for stakeholders, including energy service companies (ESCOs). Member States need to effectively communicate to building owners that there are better opportunities for improving energy efficiency and regulatory adherence to the EPBD through participation in local heating and cooling plans than going their own way. Clear and targeted messaging, coupled with incentives or support mechanisms, may be key to encouraging broader engagement and understanding among building owners involved in integrated renovation programmes put in place by cities.

⁴⁶ https://sustainableinnovation.se/app/uploads/2022/06/PED-ID_D4.3_Guidelines_V2_220630.pdf

A.8 Themes and local authorities in relevant EU programmes

This section consolidates the list of projects and networks in relevant EU programmes from relevant projects from the UAEU, UIA/EUI, URBACT, Horizon 2020, LIFE, and Horizon Europe across the themes of district and neighbourhood approaches to renovation of buildings and local heating and cooling plans:

Table 7: Cities in previous European-funded projects and programmes in building decarbonisation.

Programme	Cities
UAEU	Groningen (NL), Navarra (ES), Gothenburg (SE), Tilburg (NL), Roeselare (BE), Udine (IT), Vidzeme (LV), Vaasa (FI), Genoa (IT), Glasgow (UK), Loulé (PT), Potenza (IT), Province of Barcelona (ES), Sfantu Gheorghe (RO), Trondheim (NO), Haarlem, NL, Oslo (NO)
UIA / EUI	Viladecans (ES), Paris (FR), Gothenburg (SE), Budapest (HU), Tallinn (EE), Lorca (ES), Egaleo (GR)
URBACT	Balbriggan (IE), Dubrovnik (CO), Alba Iulia (RO), Kekava County (LV), Santo Tirso (PT), Pärnu (EE), Villena (ES), Tuusula (FI), Espoo (FI), Braga (PT), Gabrovo (BG), Košice (SK), Tallinn (EE), Valencia (ES), Jablonec nad Nisou (CZ), Agios Dimitrios (GR), Mannheim (DE), Copenhagen (DK), Kavala (GR), Pombal (PT), Bistrița (RO), Saint-Quentin (FR), Coruna (ES), Korydallos (GR), Vilnius (LT), Viladecans (ES)
Horizon 2020 / Horizon Europe / FP7	Bilbao (ES), Rotterdam (NL), Bratislava (SK), Munich (DE), Vienna (AT), Winterthur (CH), Halmsted (SE), Pamplona (ES), Tartu (EE), Genk (BE), Antwerp (BE), Velika Gorca (HR), Lecce (IT), Doetinchem (NL), Rheden (NL), Groningen (NL), Aradippou (CY), Augsburg (DE), Dunkerque (FR), Oeste (PT), Dortmund City (DE), Dresden City (DE), Strasbourg (FR), Frankfurt Region (DE), Grand Besançon (FR), Hannover Region (DE), Kharkiv City Council (UA), Leipzig City (DE), Mantova (IT), Mayo County (IE), Nottingham (UK), Granollers (ES), Cascais (PT), London (UK), Jelgava (LT), Alba Iulia (RO), Warsaw (PL), Berlin (DE), San Lucido (IT), Lunds (SE), Laguna-Valladolid (ES), Soma (TR), Valladolid (ES), Tepebasi/Eskisehir (TR), Seraing (BE), Miskolc (HU), Bilbao (ES), Eibar (ES)
Interreg	Navarra (ES), Marche Region - Pesaro, Urbino and Pioraco (IT), Karlovac (HR), Småland (SE), Zlín Region (CZ)
Mission Innovation	Aarhus (DK), Cascais (PT), Burgas (BL), Bodo (NO), Bergen (NO)
LIFE	Cartagena (ES), Blanca (ES), Adazi (LT), Varazdin (HR), Erzsebetvaros (HU), Tabanac (FR), Alba Iulia (RO), Tartu (EE), Middlefart (DK), Nyborg (DK)

B. Recommendations

B.1 To interpret and focus the thematic scope of the subject

The **scope** of an UAEU partnership or other form of cooperation for *Building decarbonisation, integrated renovation programmes and local heating and cooling plans* should be clear and transparent, even if this sacrifices a degree of flexibility for partners. The field of building decarbonisation is wide. Focus will improve outcomes for Europe and its local authorities. After the analysis and feedback from stakeholders, this theme should focus on **the interaction of integrated renovation programmes and local heating and cooling plans that advance cities' social, economic, and environmental goals**. This means a focus on:

- District and neighbourhood approaches to renovation offer a variety of solutions at a larger scale
- Integrated renovation programmes of spatially related buildings, including public and non-residential buildings
 - Notwithstanding the above, most of the units across local authority partners' envisaged integrated renovation programmes should be residential as evidence of how participation will advance local social and economic goals
- Future energy system designs supported by decarbonisation of buildings through distributed energy resources installed in renovations
- Increasing the cost effectiveness of renovations, including blended public and private finance

The table below outlines example envisaged actions of the partnership and which pillar they fall into. These are described in more detail in **Appendix 1: Towards an action plan**

Table 8: Envisaged actions of a thematic partnership

Focus area	Envisaged action	Pillar
District and neighbourhood approaches to renovation	Criteria for a local authority to designate a 'district' for integrated renovation programmes in local heating and cooling plans	Better Regulation
	How a local authority supports building owners in a 'district' designated for an integrated renovation plan	Better Regulation
Integrated renovation programmes of spatially related buildings	Integrated renovation programmes as city regeneration plans	Better Knowledge
	Integrated renovation programmes as part of city climate adaption plans	Better Knowledge

Future energy system design that supports decarbonisation of buildings	How district and neighbourhood approaches to renovations are part of energy communities and local energy system design	Better Knowledge
	How renovations fund infrastructure through grid reinforcement and/or energy flexibility services	Better Knowledge
Increasing the cost effectiveness of renovations	Blended finance challenge for implementing renovations using local heating and cooling plans	Better Funding
	Promoting economic benefits of district and neighbourhood approaches to renovation equally and fairly	Better Regulation

When partners develop an action plan for theme, they can shift towards more clarity and transparency by:

1. **Adopt a working problem statement** for the theme. It is for partners to decide, but early engagement with stakeholders have emphasised the increase of the cost effectiveness of renovation through new district and neighbourhood approaches for this theme. Many policy objectives, tools and actors can be included.
2. Design the actions to be balanced across the **'three pillars' of Better Regulation, Better Funding, and Better Knowledge**. Previous TPs have tended to gravitate to Better Knowledge. This theme must connect with action – renovation – on the ground in cities.
3. **Make the added value of the TP explicit. There has been success in the past in 'framing' the** current and prospective EU urban agenda and policymaking and legislative processes. Continue doing this by including requirements in the call for the proposed TP to explain the added value of the project by:
 - a. what advantages the TP will bring in its cities, for example, appeal to private investors, more partners, reduced risk or faster uptake of renovations
 - b. the likely impact of the TP on the organisations involved
 - c. what other means of support approached and why they were not suitable
 - d. how any existing or potential investment or support will be used in conjunction with the TP
 - e. what the partners would do without the TP
4. Finally, the call should require applicants to show they have taken account of relevant overlap with actions developed in previous TPs. They should **clearly state the nature of the expected advancement and/or expansion with respect to the previous work, based on an assessment of its results**. (This assessment may also be critical, arguing the need for revisiting, amending or updating those results.). Examples include:
 - a. Energy Transition Action 1: Creation of 'financing for district energy' task group

- b. Energy Transition Action 3: Guidance on energy masterplanning for cities
- c. Energy Transition Action 4: 'Deployment desks' for city retrofitting
- d. Circular Economy and Sustainable Land Use: Collaboration: Sustainable and Circular re-use of spaces and buildings
- e. Greening Cities Action 3: Integration of green and blue infrastructure into the built environment and energy

B.2 The most suitable form of multilevel cooperation (Partnership/OFC)

UAEU partnerships bring together the representatives of the EU institutions, member states, cities and other (Partnership theme relevant) stakeholders to bring about better regulation, funding and knowledge for each UAEU Partnership theme. Some Member States have applied similar approaches at the national and/or regional level⁴⁷, while the *Review of the contributions of the Urban Agenda for the EU to the New Urban Agenda*⁴⁸ recommended the UAEU multilevel cooperation method developed by first 14 UAEU partnerships (2016-2021) as one of the key transferable lessons in the context of the international development.

Partnership structure

From the analysis of this theme, the UAEU Partnership governance structure is the most appropriate form of multilevel cooperation for building decarbonisation, integrated renovation programmes, and local heating and cooling plans. This is because:

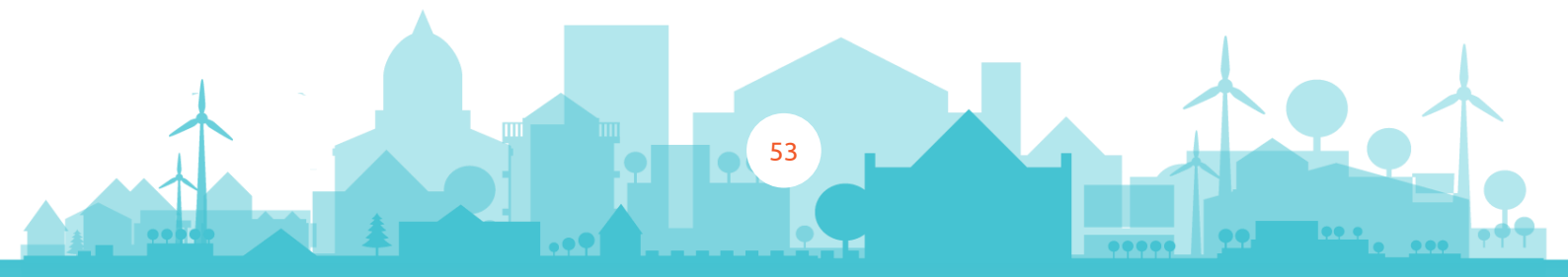
1. The timing of the partnership (see below)
2. Within the partnership governance structure, future partnership members will be able to advance the aims and objectives of the theme and experiment with better coordination in a neutral setting between:
 - a. public sector stakeholders across the EC, EIB, Member State, regional and local authorities
 - b. private sector stakeholders of building owners, tenants, investors, and lenders
 - c. energy sector stakeholders of [local and regional energy agencies](#), DSOs, utilities, and installers
3. The complexity and the level of innovation required from partnership members to take action does require the partnership structure to focus the partners' and coordinators' efforts on the theme and turning planning through district and neighbourhood approaches into action of renovations on the ground.

Other Form of Cooperation (OFC) structure – supplement Better Funding actions

Partners can consider an OFC structure to supplement the recommended Better Funding envisaged Partnership actions. Interaction with the European Commission as they draft the next Multiannual Financial Framework (2028-2034) may require a focused group of Member States and local

⁴⁷ https://ec.europa.eu/regional_policy/funding/just-transition-fund/just-transition-platform/opportunities_en

⁴⁸ https://energy-poverty.ec.europa.eu/about-us/vision-and-mission_en



authorities to gather data and evidence on renovation. Examples include data on the energy savings, emission reductions, and costs of different approaches to renovation, and monitoring of the promised benefits and co-benefits of current integrated renovation programmes.

Partnership structure – strengthening Better Regulation actions

To meet the emphasis of the MaWP to strengthen the Better Regulation pillar, the EUI should establish working sub-groups within the partnerships to tackle the interaction between regulations that support the district and neighbourhood approach to renovation and the drawing up of local heating and cooling plans. Not all partnership members will have the experience across the built environment, finance, or energy regulation vertically across EU, Member State, regional, and local levels. While the further scoping of this theme will certainly go through a further focus during the orientation phase, the theme is still expected to remain complex and wide in its coverage. A sub-group working approach can ease sharing of information and promote more actions for Better Regulation.

Partnership structure – strengthening needs of small and medium-sized cities

To meet the emphasis of the MaWP to consider the needs of small and medium-sized cities, the EUI should ask applicants to propose national support networks for participating small and medium-sized cities. There is an advantage for implementation: The EED states that local heating and cooling plans may be carried out jointly by a group of several neighbouring local authorities. There were three main challenges faced by these cities to participate in UAEU partnerships: limited unallocated time, travel, and language barriers.⁴⁹ In interviews with stakeholders, lack of scale of renovations in smaller cities is a barrier for action by the private and energy sectors. To overcome these challenges, the Partnership should consider in its action plan allocating a city network to support each small and medium sized city member with 3-5 smaller cities from their own country. These support networks would work alongside the official UAEU partnership city, participate in meetings, and provide the future scale of renovation to engage the private and energy sectors. This approach would enrich the overall work of the partnership and facilitate better communication among the members.

B.3 The timing for successful implementation

The most successfully timed start of the TP would be as soon as possible to maximise its impact on multilevel cooperation in urban policy and practice in building decarbonisation. The MaWP states that “to enhance the impact of the UAEU at the EU level, the UAEU should be better linked with EU agenda setting, policymaking and legislative processes at different levels”. It could be useful to synchronise the delivery of the actions’ results with the deadlines of the EU regulatory and policy processes.

Improving policy and regulations (current and near future):

⁴⁹ https://energy-poverty.ec.europa.eu/about-us/vision-and-mission_en

Actions under this TP will improve integrated renovation programme (in NBPRs) and local heating and cooling plan (in NECPs) implementation guidance from Member States to regional and local authorities. The TP actions will benefit from work on NBPRs and NECPs currently underway by Member State civil servants and legislatures underway for:

- local heating and cooling plans for local authorities under the EED are being transposed by Member States into revised NECPs now (June 2024)
- integrated renovation programmes of spatially related blocks in cities under the EBPD are being transposed by Member States into draft NBRPs due in December 2025.⁵⁰
- local heating and cooling plans for local authorities under the EED are being transposed by Member States into revised NECPs now (June 2024)⁵¹ Although local heating and cooling plans are voluntary for small local authorities, ERDF funding is available and used for their own heating and cooling plans.

Improving policy and regulations (future): Long-term incentives for renovation need to be put in place as part of the future electricity market design for the Union.

- On 14 March 2023, the European Parliament and Council reached a provisional agreement⁵² on reform of the electricity market design.
- New working groups in DG ENER covering the stability of the grid and flexibility are being formed with stakeholders from the energy, public, and private sector

Improving funding (future): Common with many partnerships, the current Multiannual Financial Framework (MFF) (2021-27) is ending and the Commission will be drafting the next MFF (2028-2034) during the 2025 and 2026. Early forming of the partnership will more effectively allocate funds for renovation of buildings where it is needed, especially in Southern and Eastern regions of the EU (see the results of the TIA above).

B.4 The suggested type of expertise of the members

This is broad theme that needs impact on action and implementation of renovation of buildings through the new EPBD lens of district and neighbourhood approaches. Future partners will have some choice and flexibility to identify relevant expertise and experience of the future Partners.

The focus should be on identifying the future members with expertise, including proven outstanding past contributions and experience in renovations (e.g. one-stop-shops), finance (blended investment), and energy grids and networks.

The call for applications should therefore show a clear relationship between the expertise The selection criteria can include:

1. Motivation to influence EU policy, regulation and knowledge relevant to the theme

⁵⁰ <https://www.oecd.org/cfe/decarbonising-homes-in-cities-in-the-netherlands-b94727de-en.htm#:~:text=in%20the%20Netherlands-,A%20neighbourhood%20approach,pilot%20programme%20in%2066%20neighbourhoods.>

⁵¹ <https://jpi-urbaneurope.eu/ped/>

⁵² <https://eu-mayors.ec.europa.eu/en/home>

2. Expertise including proven experience (and qualifications) of the applicant. The expertise and experience could be acquired through (national, regional, or local) policy making, projects (design, management and/or implementation), research, activism, and active participation in international, EU and national networks within EU or national programmes on renovation of buildings. This expertise should cover:
 - a. renovation projects and/or plans, including investment, financing, and installation of heat pumps, solar, storage, and district heating and cooling systems
 - b. district and neighbourhood approaches to renovation, including cost-effective technologies for spatially related buildings and collaborative financing of these approaches
 - c. energy masterplanning, from local area energy planning to local heating and cooling plans
3. Willingness to work across the built environment, finance, energy, and public sectors

The applicants considered for the coordination role may be given additional requirements such as:

1. Experience and expertise in managing multilevel, international partnerships (and adequate commitment of human and financial resources).
2. Proven commitment to multisectoral, interdisciplinary approach
3. Outreach to relevant stakeholders and membership (or at least participation) in EU and/or international networks working on the issue of renovation of buildings

B.5 Potential institutions and stakeholders of interest, relevant and related to the thematic issue, to be involved in the multilevel cooperation set-up

The composition of the partnership is essential in defining the theme as the background of each partner will play a critical role in this process. In line with the recommendation on the most suitable form of multilevel cooperation, the partnership approach is recommended for multilevel cooperation. This approach include local and regional authorities, including agglomerations, Member States, Partner States, and European and national urban policy and practice organisations. Stakeholders of interest are at the European level (e.g. Covenant of Mayors – Europe, Carbon Neutral Cities Alliance, the Joint Research Centre DSO Observatory) and at the national level smart city networks (e.g. Spanish Network of Smart Cities / Red Española de Ciudades Inteligentes (RECI), associations of building owners, and trade associations for building renovation and energy networks. Special attention and efforts need to be made to involve appropriately small and medium-sized cities.

Potential partners include:

- Cities of all sizes (including local authorities, functional urban areas and agglomerations)
 - small (less than 50.000 inhabitants)
 - medium (between 50.000 and 250.000 inhabitants)
 - large (more than 250.000 inhabitants)
- Regions and Regional Development Agencies
- Member States (through relevant national level ministries and agencies)
- Partner States (Norway and Switzerland)
- European and national city umbrella organizations. Examples include:

- European umbrella organisations
 - Member State associations that address this intersection
 - Urban planning institutions / associations
 - Associations of building owners
 - Trade associations for renovation and the energy transition
- Research organisations and/or experts specialising in applied research relevant to renovation of buildings, urban planning, and energy grids

B.6 Type of support that will be required for the implementation

The type of support that is required for the implementation of the partnership will be met by a secretariat being formed by the European Urban Initiative. The EUI support will cover the needs of the partnership during:

- The launch of the partnership
- The work of the partnership, including defining the actions, ways of working and delivery of the action plan
- The implementation of the defined actions from the completed action plan

Overall support for all three phases:

- Connections to funding and technical support available to partners – the UAEU does not award funding to partners. Examples include national support for renovation programmes and local heating and cooling plans, URBACT Transfer Networks and Action Planning Networks, ICLEI’s European City Facility, Eurotowns mentorship of small and medium sized cities, and academic networks such as the Architectural Research European Network Association (ARENA).
- EUI Thematic Partnership Officer: The Thematic Partnership Officer will provide to every UAEU Thematic Partnership advice and guidance about partnership planning, management and monitoring. This will cover:
 - Specific day-to-day guidance and advice (planning, managing and monitoring) and support regarding data, tools and processes.
 - Facilitation and organisation of meetings & workshops with the Thematic Partnership coordinators
 - Specific support and advice regarding communication and dissemination services, as well as reporting.
 - Guidance and advice about the: UAEU, Thematic Partnership process, urban policy knowledge, urban-related organisations, and stakeholders

The launch of the Thematic Partnership

The EUI Secretariat provides during the initiation phase to every UAEU Thematic Partnership initiation meetings and provision of support materials about:

- The UAEU governance structure and involved key actors
- Multilevel governance processes to which the UAEU milestones/ outputs are linked

- The principles for managing the UAEU Thematic Partnership
- The foreseen timeline and the key steps necessary for developing and implementing an UAEU Action Plan
- The deliverables for each UAEU Thematic Partnership
- The support services offered by the EUI Secretariat
- The lessons learnt from the previous UAEU Thematic Partnerships.

The initiation meetings are foreseen to take place in the first three months of the UAEU Thematic Partnership.

The Implementation Phase of the Thematic Partnership

The implementation phase of the Thematic Partnership focusses on the key elements of defining, implementing, dissemination and monitoring of actions.

Each Thematic Partnership can benefit from several expert days per year for the 3 years of the UAEU Partnerships depending on needs. External experts will be contracted by the EUI Secretariat to provide specific knowledge, know-how and expertise or to produce specific outputs for the development and implementation of the Thematic Partnership's Action Plans, their specific actions and the UAEU.

The expertise can be contracted when knowledge, know-how and expertise are not already available inside the Thematic Partnership or when there is not sufficient capacity to achieve a certain goal. Such expertise can be used e.g., for research, analyses, ICT expertise but cannot be used for writing the Action Plan itself since this is at the core of the work of the Partnership. Requests for provision of expertise, after the initial 3 years will be considered case by case depending on the available budget.

Reimbursement of Travel and Accommodation (in particular for small and medium sized cities), There is financial support is offered to urban authorities and associations or groupings of urban authorities:

- to actively participate in their UAEU Thematic Partnership in-person meetings to compensate for their limited resources and
- To actively participate in the Coordinators and Action leaders' in-person Meetings (CALM) –
- This service is dedicated in particular to small and medium sized cities and is limited for cities up to 500.000 inhabitants.

Creation of Synergies with other Thematic Partnerships

Overall, the EUI Secretariat support synergies between the UAEU Thematic Partnerships and other EUI work streams. Furthermore, it organises Coordinators and Action Leaders' Meetings (CALM) to offer a structured moment where the UAEU Thematic Partnership coordinators and action leaders of all ongoing Thematic Partnerships can exchange directly about the status of implementation of the Thematic Partnership, Action Plan and related events.

Synergies with Innovative Actions Calls – Energy transition and tech in cities / New European Bauhaus / Greening Cities. The EUI Secretariat will, together with the UAEU Thematic Partnerships, monitor the status the UAEU development and implementation. It will integrate the monitoring and reporting of all actions of each previous UAEU Thematic Partnership with new information received from ongoing Thematic Partnerships and UAEU Thematic Partnerships launched after 2021.

City to city exchange offered by the EUI Programme. The EUI provides under the capacity building activities the support of city-to-city exchanges. The call is permanently open and eligible for all cities participating in the UAEU partnerships. The city-to-city exchange offer short-term opportunities for peer learning. There can be as simple as one visit between two cities. An applicant may define up to three visits within 5 months, if a service of events is most suited to tackling the identified challenge. The applying city selects the most appropriate format for each visit according to their needs – an outgoing visit where the applicant travels to a peer city, or an incoming visit where the peer visits the applicant city.

Dissemination of Results

Overall, the EUI Secretariat will create synergies between the UAEU Thematic Partnerships and other EUI work streams. Furthermore, it will organise Coordinators and Action Leaders' Meetings (CALM) to offer a structured moment where the UAEU Thematic Partnership coordinators and action leaders of all ongoing Thematic Partnerships can exchange directly about the status of implementation of the Thematic Partnership, Action Plan and related events. The EUI Secretariat will, together with the UAEU Thematic Partnerships, monitor the status the UAEU development and implementation. It will integrate the monitoring and reporting of all actions of each previous UAEU Thematic Partnership with new information received from ongoing Thematic Partnerships and UAEU Thematic Partnerships launched after 2021.

Urban Contact Points for the EUI

The Network of Urban Contact Points (UCP) is a single network of contact points in the Member States, operating in the national language(s), established by the European Urban Initiative with the following Opportunity to increase the number of urban policy makers and practitioners at local, regional and national level participating in the activities of the EUI and the UAEU and to strengthen the links between the EU, national, regional and local levels. UCP will not be directly involved as partners in the Thematic Partnerships, however the UCP support the communication work of the UAEU TP and promote and disseminate the results achieved.

B.7 Assessment on the opportunity for a Partnership/OFC

The **scope** of an UAEU partnership or other form of cooperation for *Building decarbonisation, integrated renovation programmes and local heating and cooling plans* should be clear and transparent, even if this sacrifices a degree of flexibility for partners. The field of building decarbonisation is wide. Focus will improve outcomes for Europe and its local authorities. After the

analysis and feedback from stakeholders, this theme should focus on **the interaction of integrated renovation programmes and local heating and cooling plans that advance cities' social, economic, and environmental goals**. This means a focus on:

- District and neighbourhood approaches to renovation offer a variety of solutions at a larger scale
- Integrated renovation programmes of spatially related buildings, including public and non-residential buildings
- Future energy system designs supported by decarbonisation of buildings through distributed energy resources installed in renovations
- Increasing the cost effectiveness of renovations, including blended public and private finance

This opportunity meets the first UAEU emphasis to increase actions for Better Regulation. The interaction between the EPBD and the EED across the EU is central to this potential TP. Local authorities are obligated to create local heating and cooling plans to decarbonise and increase renovations of buildings. The EPBD includes requirements for district and neighbourhood approaches to renovation of spatially related blocks, integrated renovation programmes, and involvement of energy communities in Member States' national building renovation plans. The Future Electricity Market Design of the EU will ingrain incentives, from speed of access of electrified heating to the grid to consumer pricing, for decarbonisation of buildings. Local authorities in this TP will develop new ways of collaborating with building owners, DSOs, and Member States to increase the use of district and neighbourhood approaches to renovation of spatially related blocks.

The opportunity also meets the second UAEU emphasis to increase involvement of small and medium-sized cities in this TP. The EED states that local authorities may collaborate together to write and implement local heating and cooling plans. Financial and technical assistance from the EIB needs scale to engage. Small and medium-sized cities in this TP can develop new ways of collaborating with nearby cities, other cities in their State, and across the EU to increase renovation of buildings through use of the EED and EIB.

The opportunity will be maximised by including housing, non-residential, and public buildings in the national building renovation plans, local integrated renovation programmes, local energy communities, and local heating and cooling plans addressed by this TP. Small and medium-sized cities need to maximise the volume of buildings in their integrated renovation programmes – including the 3% annual renovation target for public buildings in the EED and the target to renovate the 16% worst-performing non-residential buildings by 2030 in EPBD – to create the scale needed for success in financing and implementation.

Across all local authorities, spatially related areas that are the subject of district and neighbourhood approaches in EU cities are mixed-use. This TP should include all areas of cities data in need of district and neighbourhood approaches to renovation, as any local authority would include all



buildings in their local heating and cooling plan, integrated renovation plan, or local energy community. Moreover, inclusion of all buildings will make the TP more coherent when addressing the Future Electricity Market and grid stability as millions of buildings move their heating and cooling fuel from natural gas to electricity. Notwithstanding the above, most of the units across local authority partners' envisaged integrated renovation programmes should be residential as evidence of how participation will advance local social and economic goals.

Therefore, based on the above answers to the UAEU points of emphasis and a recommended change to include non-residential and public buildings, this EEA confirms that this theme will accelerate city's district and neighbourhood approaches to the renovation of buildings and their local heating and cooling plans.

B.8 Territorial Impact Assessment (TIA)

TIA's are conducted to support policymakers and practitioners with identifying, ex-ante, potential territorial impacts of new EU Legislations, Policies and Directives (LPDs). LPDs have effects on territories depending on their history, culture and socio-economic, demographic, geographic and environmental characteristics. There are a number of methodologies in use⁵³, but the most appropriate is the ESPON TIA Quick Check tool. It is an ex-ante territorial impact assessment method that combines qualitative judgements on the effects caused by a policy ("exposure") with quantitative data on the susceptibility of each region to those effects ("sensitivity") to calculate territorial impact patterns in the fields of economy, environment, society and governance.

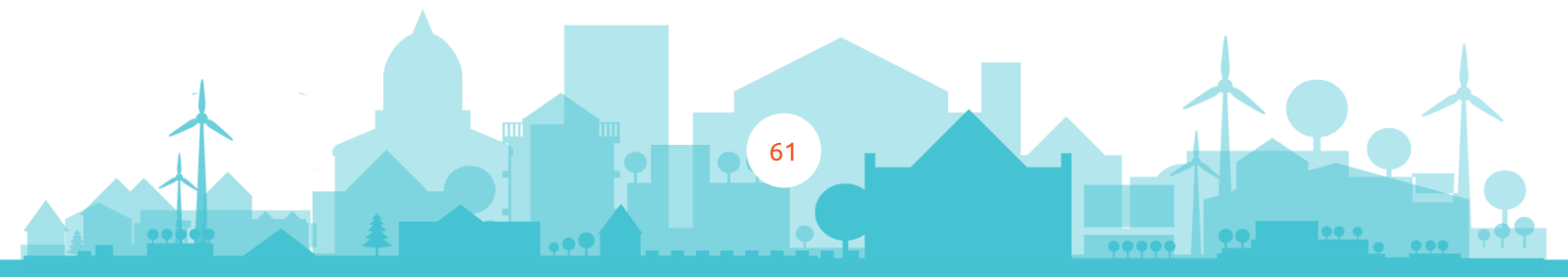
A TIA of the impact of local heating and cooling plans is likely to mirror much of the TIA completed by ESPON⁵⁴ on the draft revised EPBD. The TIA covered the environmental effect of the EPBD on emissions, renewable energy consumption, and total energy consumption in residential and non-residential buildings, but was missing assessments of energy system balancing and interaction with the mobility sector. It assessed the economic performance of a renovation wave across the overall economic development of a city and its region but ignored how evenly benefits fall. It assessed the societal effects of reducing poverty and public health effects of inadequate heating but was missing the growing effect of inadequate cooling.

Table 9: ESPON TIA on the revised EPBD (2022)

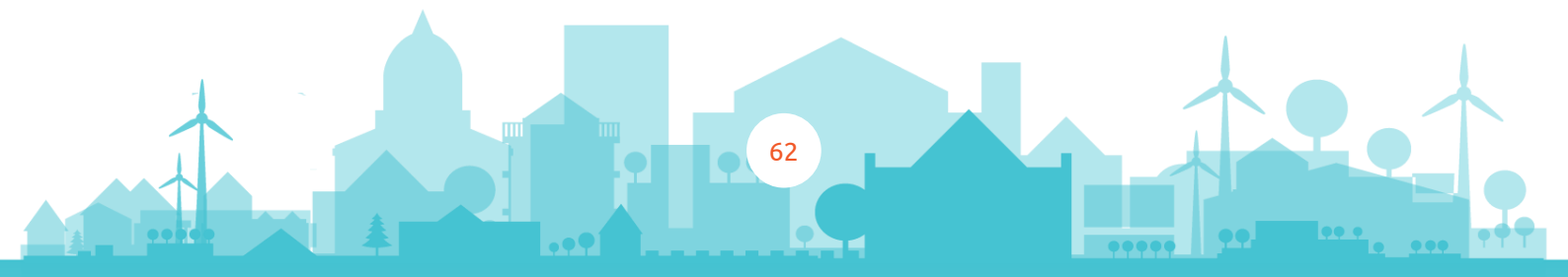
Effect	Covered in EPBD TIA (Yes / No)	Assessment in EPBD / Potential assessment in a future TIA
Environmental - Increasing the share of renewable energy consumption	Yes	Potentially more positive in Ireland, and along the coastlines of countries such as Spain, France, Italy, Croatia and Greece, fewer in Central Europe, and even fewer positive impacts in Northern

⁵³ <https://www.cor.europa.eu/en/engage/studies/Documents/TIA-State-of-Play.pdf>

⁵⁴ <https://cor.europa.eu/en/our-work/Documents/Territorial-impact-assessment/4709%20TIArevisedEPBdirective2022.pdf>

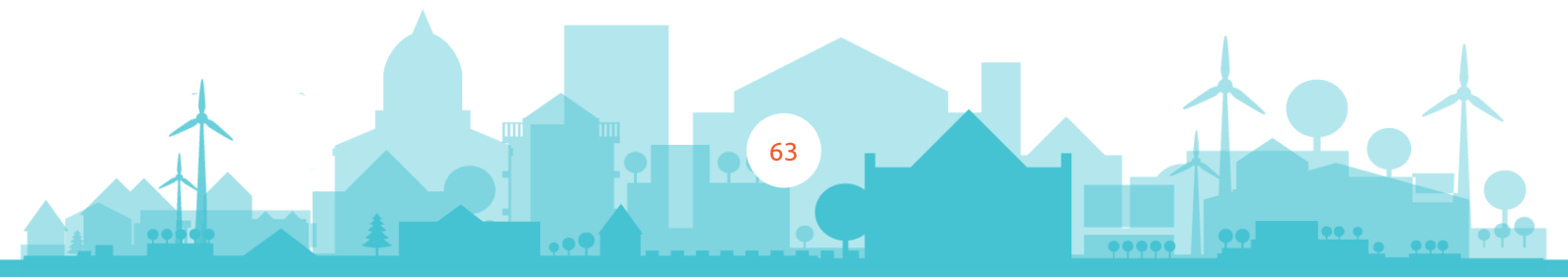


Environmental - Decreasing annual energy consumption	Yes	Europe, Romania and Bulgaria. Strong positive impacts in Central and Northern Europe, and less so in Southern and Eastern Europe with the exception of Italy and Greece.
Environmental - System balancing capacity (buildings and mobility)	No	Potential strong positive impacts shared with territories with a strong impact from the increase in the share of renewables.
Environmental - Emissions	Yes	Positive impact of environmentally positive impact in Poland and the Mediterranean area, and weaker in areas of Northern and Central Europe.
Economic – Economic performance at regional level	Yes	Positive economic growth for eastern and southern regions as well as many rural regions in France.
Economic – Equality of economic benefits	No	More positive development in GDP per person for secondary cities, in relative terms, than capital regions. However, from the findings below, positive impacts on GDP per person are likely shared more equally in capital/primary cities, especially in Northern, Western, and Central Europe, and allocated more unequally in secondary cities.
Societal – poverty and social exclusion	Yes	More benefits for people with higher incomes in Eastern and Southern Europe; the southern regions of Spain suffer a negative impact – increasing risk of poverty and social exclusion.
Societal – lack of heating	Yes	Southern Europe and a small part of Northern Europe would be impacted positively in terms of adequate heating.
Societal – lack of cooling	No	Southern Europe and a small part of Northern Europe would be impacted positively in terms of adequate cooling.



Appendix 1 – Towards an action plan

Better Regulation	Reasoning / Relevant regulations
<p>District and neighbourhood approaches to integrated renovation programmes:</p> <p>Criteria for a local authority to identify integrated renovation programmes to support in their local heating and cooling plans</p>	<p>Local authorities will be designating integrated renovation programmes involving spatially related buildings to support using the Energy Performance of Buildings Directive (EPBD) - but clarity on regulation, European and member state funding, and knowledge is needed to local heating and cooling plans mandated by the Energy Efficiency Directive (EED) to local authorities, or groups of them.</p> <p>Incorporating integrated renovation programmes into local heating and cooling plans enables new technologies and approaches for spatially related buildings. Additionally, integrating renewable energy into these plans is crucial for promoting sustainability.</p> <p>Integrated renovation programmes in cities will be delivery mechanisms for Member States to implement national building renovation plans mandated by the EPBD. This includes reforms and investments in renovating building stock, deploying renewable energy, and implementing technologies for energy system integration.</p> <p>Finally, there is an opportunity to combine green infrastructure in districts with an integrated renovation programme with local heating and cooling plans. However, there is often a limitation in funding that promotes nature-based solutions, leading to the exclusion of energy generation and storage. This hampers an integrated approach to decarbonizing buildings at the neighbourhood level.</p>
<p>District and neighbourhood approaches to integrated renovation programmes:</p> <p>Supporting building owners in districts designated for integrated renovation programmes</p>	<p>Local authorities play a crucial role in supporting building owners within integrated renovation programmes introduced by the Energy Performance of Buildings Directive (EPBD).</p> <p>Initially, local authorities may need to focus on with districts where they can leverage public sector ownership. Later, they can extend their support to include private landlords and ownership collectives.</p> <p>One-stop-shops can be established to streamline the process, providing a centralized resource for building owners seeking assistance. These one-stop-shops not only</p>



	<p>offer guidance and support but also gather intelligence from local demand for heating and cooling plans. This information can be used to develop packages of renovation work that align with private investment funds, particularly those linked to energy efficiency and retrofitting initiatives.</p>
<p>Future electricity market design that supports decarbonisation of buildings:</p> <p>Integrated renovation programmes and local heating and cooling plans and renewable energy communities and local energy system design</p>	<p>Integrated renovation programmes under the EPBD and local heating and cooling plans under the EED when they implement the renewable energy commitments in the RED will play a crucial role informing future electricity market design directive (FMD) balancing energy systems, showcasing new technologies in spatially related blocks while providing incentives for energy customers through suppliers and Distribution System Operators (DSOs). As more heat pumps, solar, storage, and other methods of decarbonising heat by moving from natural gas to electricity as the end-use energy for heating and cooling, renovation will become the new front line of the energy transition.</p> <p>The role of a local authority to increase transparency between building owners investing in renovation and Distribution System Operators (DSOs) is essential for effective integration of renewable energy in areas being decarbonised under local heating and cooling plans. This includes sharing data on embedded capacity registers, study costs, reinforcement expenses, and the time required between applications from building owners of renewable energy sources, such as solar panels, batteries, and heat pumps, and the energisation or connection process. Enhanced transparency facilitates smoother collaboration and decision-making processes by building owners and investors.</p>

Better Funding	Reasoning / Relevant funding sources
<p>Future electricity market design that supports decarbonisation of buildings:</p> <p>How local heating and cooling plans fund infrastructure through grid reinforcement and/or energy flexibility services</p>	<p>Determining the funding mechanisms for infrastructure projects within a local heating or cooling plan can be complex, especially when spanning multiple jurisdictions, macro-urban areas, or cross-border regions. One challenge lies in ensuring access to funds for small and medium-sized cities to implement their energy renovation strategies.</p> <p>Local heating and cooling plans can cover multiple local authorities. Smaller cities that do this will unblock access to collaborative funding and technical assistance from the EIB</p>



	<p>and InvestEU, and attracting co-financing through the private sector, can be blocked by smaller sizes of investment. One example is the £30m minimum project size for technical assistance for EIB-ELENA.</p> <p>Cohesion policy plays a crucial role in supporting the added value of cross-border and interregional approaches within local heating and cooling plans. Funding sources for wider investment across small and medium sized cities include the Social Climate Fund to support structural measures and investments in energy efficiency and renovation of buildings, clean heating and cooling.</p> <p>Finally, local heating and cooling plans should integrate energy master planning into their strategies, alongside innovative funding mechanisms. This integration is vital to streamline processes and ensure effective utilisation of resources.</p>
<p>Cost effectiveness of renovations of spatially related buildings:</p> <p>Blended finance challenge for implementing integrated renovation programmes blend</p>	<p>Key funding gaps must be addressed to enable local heating and cooling plans to effectively attract blended public and private finance for decarbonisation projects included in local heating and cooling plans. To reduce reliance on grants, cities must strive to attract and leverage private finance while strategically allocating grants where necessary, such as in the case of social housing initiatives.</p> <p>Identifying integrated renovation programmes in local heating and cooling plans will bridge gaps in the Climate City Contracts promoted by the Mission for Climate-Neutral and Smart Cities, enabling cities to integrate investments in climate-neutral technologies across building renovations and mobility sectors.</p> <p>This action should explore regulatory innovations in leveraging State Aid exemptions within local heating and cooling plans. These innovations should include two crucial aspects: firstly, the inclusion of non-residential and residential renovations on a large scale, and secondly, the incorporation of comprehensive packages tailored to be allocated across small and medium-sized cities.</p> <p>The EED obligation to increase the renovation rate of public buildings to 3% annually, encompassing all public sector buildings, can serve as a catalyst to accelerate local heating and cooling plans through blended finance strategies. This approach uses public procurement requirements under the</p>

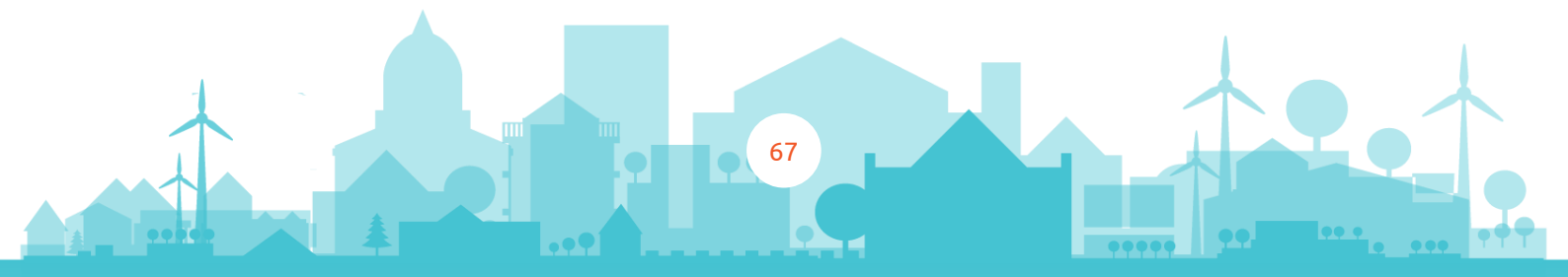


	<p>Energy Efficiency First Principle under the EED and fosters sustainable urban development by optimising financial resources and promoting collaboration between public and private sectors.</p>
<p>Cost effectiveness of renovations of spatially related buildings:</p> <p>Promoting economic benefits of integrated renovation programmes equally and fairly</p>	<p>Ensuring equal and fair promotion of economic benefits requires comprehensive support across various sectors, including the development of green jobs and the enhancement of skills in renewable energy technologies. It is accepted that green jobs are created and retained through the electrification of heating in building renovations, there remains a need to expand this support to encompass a broader range of skills required at the district level. This includes expertise in renewable energy communities, energy system balancing utilising storage solutions and electric vehicles, and incentivising flexibility through market design</p> <p>Challenges arise due to inadequate planning for the green and sustainable rehabilitation of buildings, insufficient funding for localised investments that address specific community needs, and a lack of training opportunities for the workforce involved in building renovations. To address these gaps, local heating and cooling plans may need to adapt by directing investment into technologies and energy communities. By balancing energy systems and addressing skills shortages, these plans can play a crucial role in ensuring economic benefits are distributed equitably and sustainably across communities.</p>

Better Knowledge	Reasoning / Relevant information sources
<p>Impact of local heating and cooling plans:</p> <p>Impact of local heating and cooling plans on urban regeneration</p>	<p>Local heating and cooling plans have the potential to serve as powerful regeneration initiatives, particularly if they are expanded to encompass all building sectors, including non-residential buildings. This expansion presents a significant opportunity for cohesion policy to play a central role in revitalising districts and high streets.</p> <p>By incorporating non-residential buildings into these plans, impact can be extended to businesses, ensuring they meet minimum energy efficiency requirements. This not only benefits businesses but also contributes to overall energy conservation efforts.</p>



	<p>There are notable gaps in ensuring the inclusion of all socioeconomic groups in the benefits of implementation of local heating and cooling plans. From dynamic rates to the utilisation of smart technology and storage solutions, these initiatives have the potential to save consumers money and increase the use of renewable energy sources. Ensuring equitable access to these benefits is essential to prevent widening disparities.</p> <p>There needs to be an approach to 'stranded assets' and their impact on regeneration and community cohesion. Without renovation, both non-residential and residential buildings risk becoming unrentable, uninsurable, and unsellable. Simultaneously, there is a concern that local heating and cooling plans may encounter obstacles if funding is perceived as being directed toward assets at risk of becoming stranded. Balancing these considerations is crucial to ensuring the success and sustainability of local heating and cooling initiatives as regeneration plans.</p>
<p>Impact of local heating and cooling plans:</p> <p>Impact of local heating and cooling plans on city climate adaption plans</p>	<p>Local heating and cooling plans can have a major impact on climate adaption of cities. To effectively integrate integrated renovation plans into climate adaptation efforts, assessments are required to understand the correlation between climate vulnerability and the increased demand for cooling. This understanding will inform the development of comprehensive local heating and cooling plans that address both heating and cooling needs while considering climate risks and vulnerabilities.</p> <p>Success criteria for climate adaptation plans and funds such as LIFE should be put in the context of urban regeneration and energy renovation initiatives at the neighbourhood level. These criteria should connect resilience to extreme weather events with heating and cooling demand, energy efficiency improvements, and the integration of renewable energy sources.</p> <p>Data availability plays a crucial role in informing decision-making processes within local heating and cooling plans. Comprehensive data sets that combine climate risk assessments, such as urban heat island mapping, with climate opportunities, such as solar and wind potential, are essential. This data informs investment decisions, facilitating the sizing of investments across electrification of heating and cooling systems and on-site renewable energy generation.</p>

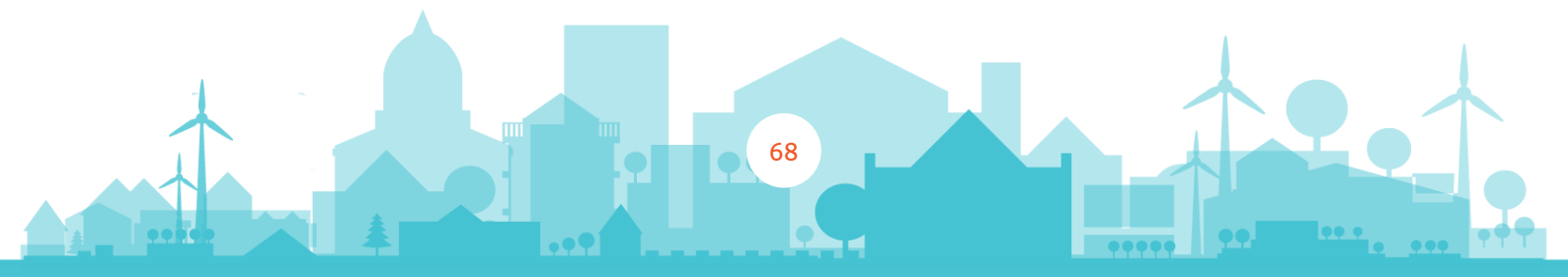


Summary of actions by Opportunity

Focus area	Envisaged action	Opportunity							
		1	2	3	4	5	6	7	8
District and neighbourhood approaches to renovation	Criteria for a local authority to designate a 'district' for integrated renovation programmes in local heating and cooling plans	1		3	4				8
	How a local authority supports building owners in a 'district' designated for an integrated renovation plan		2		4		6		8
Integrated renovation programmes of spatially related buildings	Integrated renovation programmes as city regeneration plans	1	2	3			6		
	Integrated renovation programmes as part of city climate adaptation plans	1	2	3					
Future energy system design that supports decarbonisation of buildings	How district and neighbourhood approaches to renovations are part of energy communities and local energy system design		2			5	6	7	
	How renovations fund infrastructure through grid reinforcement and/or energy flexibility services		2			5		7	
Increasing the cost effectiveness of renovations	Blended finance challenge for implementing renovations using local heating and cooling plans	1	2		4				
	Promoting economic benefits of district and neighbourhood approaches to renovation equally and fairly	1	2	3	4				

Opportunity:

- Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)
- Opportunity 2: Innovative funding mechanisms
- Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level
- Opportunity 4: Assessment, planning and implementation of local heating and cooling plans
- Opportunity 5: Integration of renewable energy in cities
- Opportunity 6: Integrated and neighbourhood approach to decarbonisation of buildings
- Opportunity 7: Developing /exchange of practice on local energy communities and their interplay with municipal heating and cooling solutions
- Opportunity 8: Development of guidance to implement relevant directives



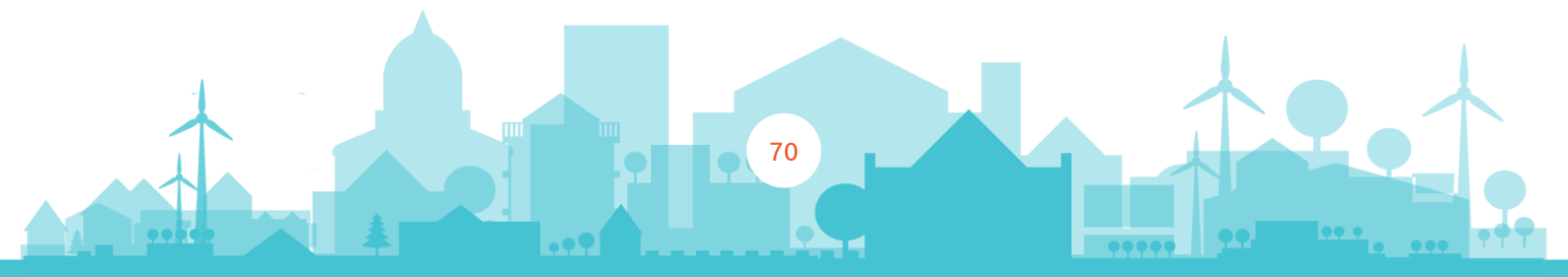
Appendix 2 – Analysis in detail

Multilevel governance cooperation	Link to other governance levels	Link to building decarbonisation, integrated renovation programmes, and local heating and cooling plans, and gaps identified
<p>New Leipzig Charter</p>	<p>Member States agreed to implement the Charter in their national or regional urban policies.</p> <p>The Urban Agenda for the EU increases coherence in the EU regulatory framework on urban topics, improving EU policy development with an urban dimension, and refining funding instruments. Partnerships builds on the multilevel governance approach ensuring the involvement of regional, local, urban and other public authorities.</p> <p><i>Opportunity 2: Innovative funding mechanisms</i></p> <p><i>Opportunity 8: Development of guidance to implement relevant directives</i></p>	<p>Links: The charter states that urban challenges (such as building decarbonisation) are often more pronounced at the neighbourhood level, and local authorities as a formal link between small scale neighbourhoods and the wider city. The 'green city' states that the blueprint for a net-zero carbon cities is one with climate-neutral energy supply, renewable resources, the implementation of energy efficiency measures, as well as climate-resilient and carbon-neutral buildings.</p> <p>Gaps: Minimal. The Charter is a scene-setting document.</p> <p><i>Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)</i></p>
<p>National Energy and Climate Plans (NECPs)</p>	<p>There is broad coverage in all NECPs written by Member States of supportive measures to building renovation.</p> <p>The NECPs should address funding. Only using European Energy Efficiency Fund grants and loans is not enough: investments in buildings and energy also need to crowd in private financing and scale up public financing.</p> <p><i>Opportunity 2: Innovative funding mechanisms</i></p>	<p>Link: Many Member States are coming forward with penalties and procurement rules to speed up building decarbonisation. Examples include banning rentals of buildings with the poorest energy efficiency ratings and limits and bans on use of natural gas and oil for heating and cooling.</p> <p>Gaps: Local heating and cooling plans are important strategy and delivery mechanisms for NECPs to prioritise the energy and climate actions prescribed for them by the EU⁵⁵ in reforms and investments into the renovation of the building stock, renewable energy, and technologies and solutions for energy system integration.</p>

⁵⁵ <https://ec.europa.eu/eurostat/web/interactive-publications/housing->

2023#:~:text=In%20the%20EU%20in%202022%2C%2052%25%20of%20the%20population%20lived,thirds%20of%20the%20Member%20States

		<i>Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)</i>
National Building Renovation Plans (NBRPs)	<p>National building renovation plans should allow 'districts' to be established by local authorities, in accordance with local needs.</p> <p>Member States need to draw up and submit national long-term renovation strategies, broken down to action at regional and local levels.</p> <p><i>Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)</i></p>	<p>Links: The revised EPBD established district approaches to access multiple solutions at scale. Member States should take up neighbourhood and district approaches to building renovation and renewable heating and cooling in their national building renovation plans and actively promote them.</p> <p>Gaps: District approaches encourage the use of multiple solutions and scaling up of building renovation, but it is only in its interaction with the mobility sector and EV batteries where flexibility, balancing power and demand, is mentioned as an investment priority. This could put a solution bias in play for investment into physical over virtual district systems. Local heating and cooling plans have multiple technologies and options for flexibility. Stakeholders from the energy sector, from Distribution System Operators (DSOs) to suppliers, are not named in the EPBD.</p> <p><i>Opportunity 6: Integrated and neighbourhood approach to decarbonisation of buildings</i></p> <p><i>Opportunity 8: Development of guidance to implement relevant directives</i></p> <p>Data availability that creates transparency between local authorities and Distribution System Operators on the embedded capacity registers, cost of studies, cost for reinforcements, and time between applications from asset owners of renewable energy sources in urban areas (solar, batteries, heat pumps) and energisation or connection.</p> <p><i>Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i></p> <p><i>Opportunity 5: Integration of renewable energy in cities</i></p>
Multilevel governance cooperation	Link to other governance levels	Link to building decarbonisation, integrated renovation programmes, and local heating and cooling plans, and gaps identified

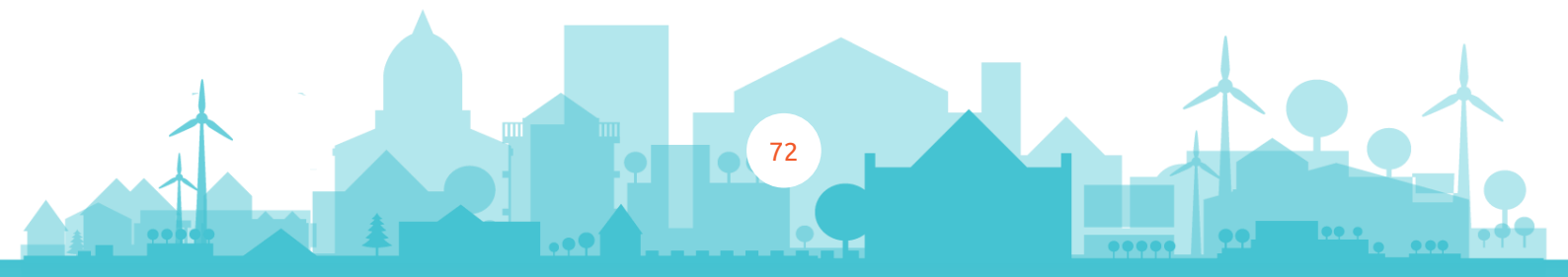


<p>Energy and Managing Authorities Network (EMAN)</p>	<p>Acts as a network between DGs and Member State officials.</p>	<p>Link: The EMAN allows exchange of information and ideas on energy and cities between DGs.</p> <p>Gaps: The EMA can act as a place where crossovers of policy and funding between district and neighbourhood approaches in integrated renovation programmes and local heating and cooling plans in cities.</p> <p><i>Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)</i></p>
<p>Climate-Neutral and Smart Cities Mission</p>	<p>Directs technical assistance and funding from the EU to cities to be experimentation and innovation hubs for the EU.</p>	<p>Link: Climate City Contracts are promoting integrated neighbourhood solutions across regeneration and energy planning. Funds such as Net Zero Cities are being used for innovations in funding and testing technologies for decarbonisation, including in heating and cooling.</p> <p>Gaps: Local heating and cooling plans can fill gaps in Climate City Contracts to help cities integrate investment into technologies for climate neutrality across building renovation and mobility.</p> <p><i>Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level</i></p> <p><i>Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i></p>
<p>Urban Transitions Mission</p>	<p>Directs technical assistance and funding from the EU to cities to be experimentation and innovation hubs across the world.</p>	<p>Link: Cities are being used for innovations in funding and testing technologies for decarbonisation, including in heating and cooling. Cooling approaches outside of Europe will be included.</p> <p>Gaps: Local heating and cooling plans are needed to accelerate investment in building renovations in different climates, especially as climate change increases the need for cooling.</p> <p><i>Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level</i></p> <p><i>Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i></p>



Committee of the Regions	<p>Gives representations of local authorities direct access to EU policymakers.</p>	<p>Gaps: CoR identified inadequate planning in terms of green and sustainable rehabilitation of buildings, insufficient funding for place-based investments that address local needs, and lack of green skills training for the workforce needed for renovations of buildings. Local heating and cooling plans may need to adapt to direct investment into technologies and energy communities to balance energy systems to make up for the gaps identified by the CoR above.</p> <p><i>Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i></p> <p><i>Opportunity 7: Developing /exchange of practice on local energy communities and their interplay with municipal heating and cooling solutions</i></p>
Policy initiative	Link to building decarbonisation, integrated renovation programmes, and local heating and cooling plans	Gaps and Opportunities
Cohesion Policy Specific Opportunity 2.1 - promoting energy efficiency and reducing greenhouse gas emissions	<p>An estimated €20billion of cohesion funds are programmed for energy renovation and energy efficiency as delivery support to the renovation wave: €10.6billion for public buildings, €6.4billion for housing, and €2.9billion for non-residential buildings</p> <p>Implement 'Energy Efficiency first' principle to reduce energy supply first.</p> <p><i>Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)</i></p>	<p>Gaps identified in the use of cohesion funds for energy efficiency⁵⁶ that local heating and cooling plans are well-placed to resolve:</p> <ul style="list-style-type: none"> • Reduce dependence on grants for cities to act. Attract and leverage private finance while targeting grants where needed (e.g. social housing) • Support for businesses subject to minimum energy efficiency requirements • Coordination with other (EU) public funds • Monitor programme implementation and address delivery bottlenecks <p><i>Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level</i></p>

⁵⁶ <https://energy-cities.eu/coming-soon-a-european-community-of-local-one-stop-shops-for-home-energy-renovation/>

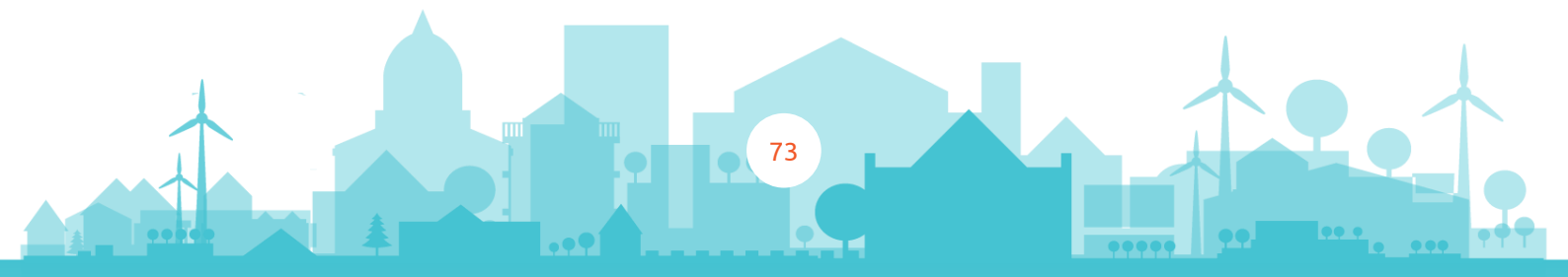


<p>Cohesion Policy Specific Opportunity 2.2: promoting renewable energy</p>	<p>Research, development, and innovation support for renewables and energy communities</p>	<p>Gaps in mainstreaming funding as part of local heating and cooling plans to promote local ownership and collaboration of energy communities (see example from Just Transition Funding)</p> <p>Opportunities to support energy communities integrating with municipal heating and cooling systems:⁵⁷</p> <ul style="list-style-type: none"> • Interreg for cross-border communities (for example virtual power plant from NW Europe) • Integrated Territorial Investments (examples) • Community Led Local Development <p><i>Opportunity 5: Integration of renewable energy in cities</i></p> <p><i>Opportunity 7: Developing /exchange of practice on local energy communities and their interplay with municipal heating and cooling solutions</i></p>
<p>Cohesion Policy Specific Cohesion Policy Opportunity 2.3: developing smart energy systems, grids, and storage</p>	<p>Support to integration of energy efficiency, renewable energy, and energy systems</p>	<p>Gaps:</p> <ul style="list-style-type: none"> • Examples from UIA funding show that governance, monitoring, and testing in the field advance better technology for smart energy grids and storage⁵⁸ • With local heating and cooling plans, cohesion policy supports the added value of cross-border and interregional and macroregional approaches.⁵⁹ <p>Opportunities for local heating and cooling plans to demonstrate new technologies coupled with incentives for energy customers through suppliers and DSOs.</p> <p><i>Opportunity 6: Integrated and neighbourhood approach to decarbonisation of buildings</i></p> <p><i>Opportunity 7: Developing /exchange of practice on local energy communities</i></p>

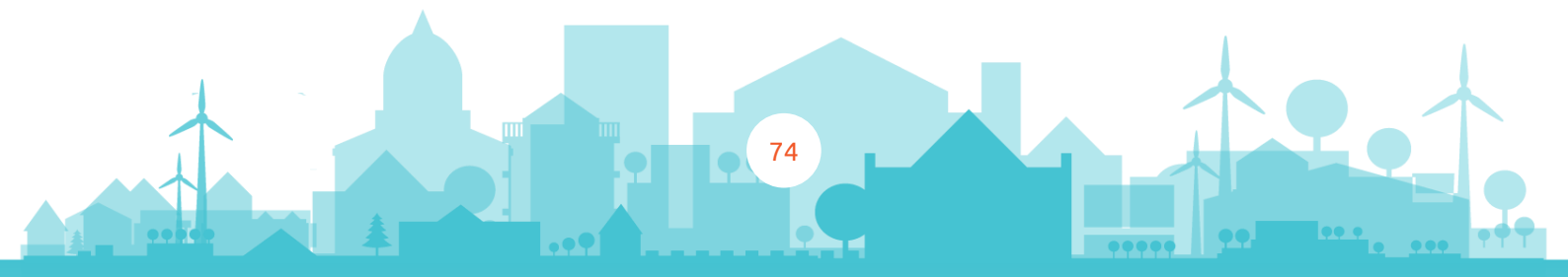
⁵⁷ <https://nplw.nl/default.aspx>

⁵⁸ <https://journals.sagepub.com/doi/10.1177/2399808320987849>

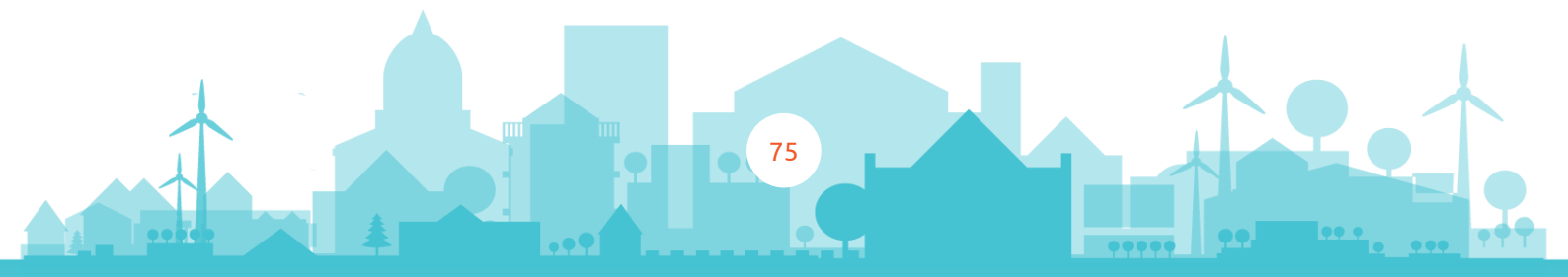
⁵⁹ <https://energy-cities.eu/introducing-the-obligation-for-heating-and-cooling-planning-with-appropriate-support-for-municipalities/>



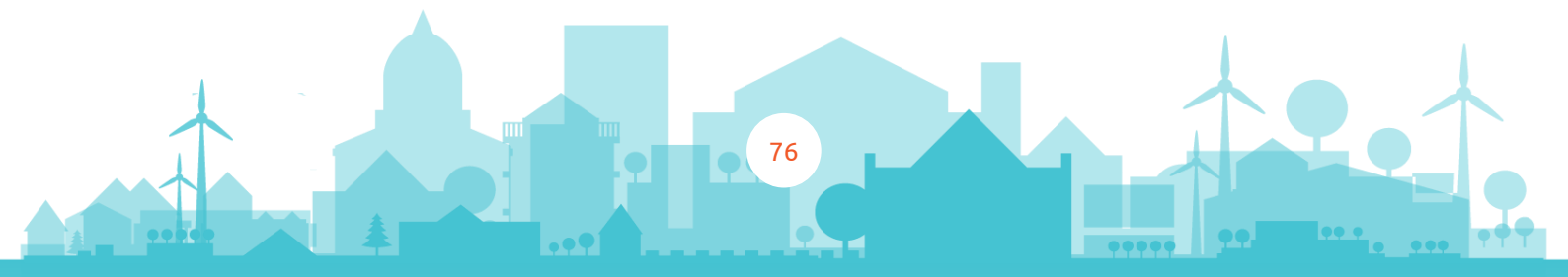
		<p><i>and their interplay with municipal heating and cooling solutions</i></p> <p>Data availability that creates transparency between local authorities and Distribution System Operators on the embedded capacity registers, cost of studies, cost for reinforcements, and time between applications from asset owners of renewable energy sources in urban areas (solar, batteries, heat pumps) and energisation or connection.</p> <p><i>Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i></p> <p><i>Opportunity 5: Integration of renewable energy in cities</i></p>
<p>Cohesion Policy Specific Objective 5.1: integrated and inclusive social, economic and environmental development... in urban areas</p>	<p>Cohesion policy commits 6% of funding (ERDF/CF) to urban development. Energy efficiency investments can be an important part of urban regeneration strategies at the city and the district level.</p>	<p>Opportunity for cohesion policy if used across all building sectors to play a large part of regenerating district and town centres by including non-residential buildings.</p> <p>Gaps of inclusion across all socioeconomic groups in the use of flexibility, from dynamic rates to the use of smart technology and storage to save consumers money and increase the amount of renewable energy being supplied.</p> <p><i>Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)</i></p> <p><i>Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level</i></p>
<p>Policy initiative</p>	<p>Link to building decarbonisation, integrated renovation programmes, and local heating and cooling plans</p>	<p>Gaps and Opportunities</p>



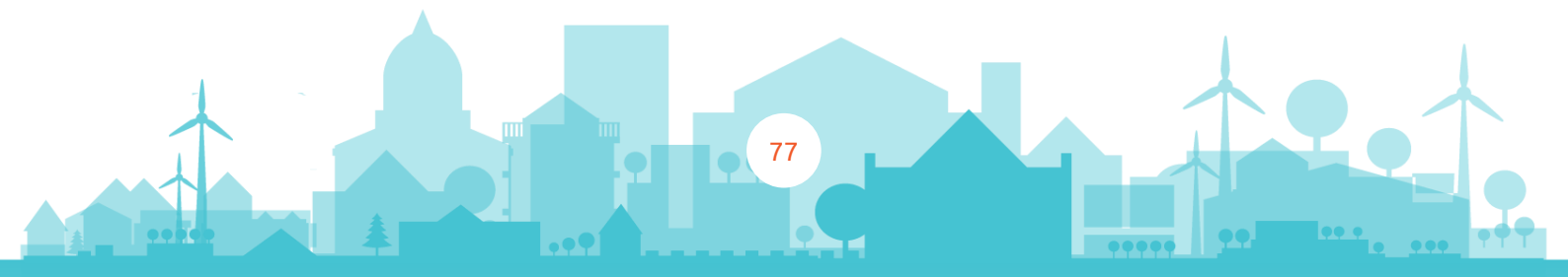
<p>European Green Deal</p>	<p>The building sector will need to completely decarbonise by 2050 and reduce its emissions by 60% by 2030 to meet Europe's climate commitments.</p>	<p>Gaps: Local heating and cooling plans are important strategy and delivery mechanisms for NECPs to channel funding from the European Green Deal to prioritise the energy and climate actions prescribed for them by the EU in reforms and investments into the renovation of the building stock, renewable energy, and technologies and solutions for energy system integration.</p> <p><i>Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)</i></p>
<p>Renovation Wave</p>	<p>The renovation wave pulls together the revised EPBD, member state NECPs, and member state building renovation plans. One of the focus areas of the wave is heating and cooling, the second is renovation of public buildings, and the third is energy poverty.</p>	<p>Gaps: Local heating and cooling plans are important strategy and delivery mechanisms for NECPs to prioritise the energy and climate actions prescribed for them by the EU in reforms and investments into the renovation of the building stock, renewable energy, and technologies and solutions for energy system integration.</p> <p><i>Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)</i></p> <p>Gaps: District approaches encourage the use of multiple solutions and scaling up of building renovation, but it is only in its interaction with the mobility sector and EV batteries where flexibility, balancing power and demand, is mentioned as an investment priority. This could put a solution bias in play for investment into physical over virtual district systems. Local heating and cooling plans have multiple technologies and options for flexibility. Stakeholders from the energy sector, from DSOs to suppliers, are not named in the EPBD.</p> <p><i>Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level. There is a need to build on resources such as the European Energy Poverty Advisory Hub that links local authorities and</i></p>



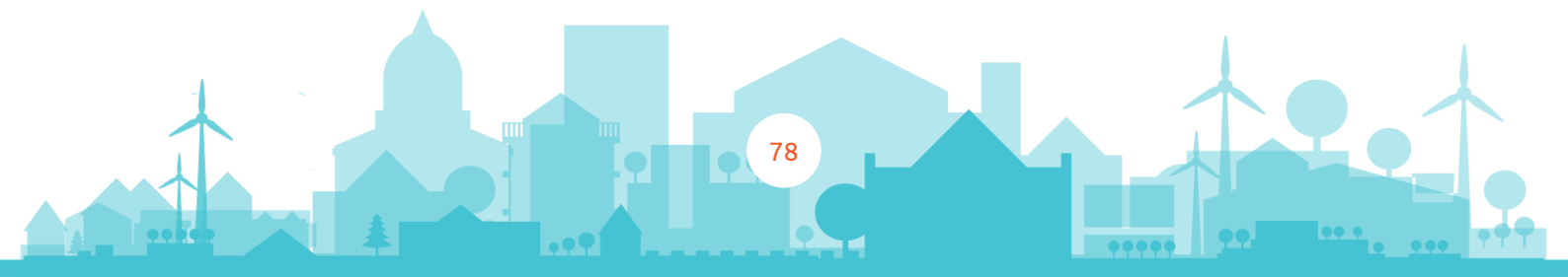
		<p>civil society organisations (city, municipal and regional governments, NGOs and other relevant organisations) across Europe to share best practice on energy poverty mitigation.</p> <p><i>Opportunity 6: Integrated and neighbourhood approach to decarbonisation of buildings</i></p> <p><i>Opportunity 8: Development of guidance to implement relevant directives</i></p> <p>Additional gaps to be addressed with the renovation wave: Investigate the general principle to not invest in stranded assets – unless renovation takes place, both non-residential and residential buildings will become unrentable, uninsurable, and unsellable. At the same time, local heating and cooling plans may stall if fears develop that funding is being directed in part to stranded assets.</p> <p>More green jobs in the electrification of heating of buildings in renovation are supported, but the range of skills needed for technologies and approaches at the district level, from renewable energy communities, energy system balancing with storage and EVs, and incentives for flexibility through market design, are also in need of support in the renovation wave.</p> <p>Using the obligation of increasing the renovation of public buildings to 3% per year, and including all public sector buildings, to accelerate local heating and cooling plans using blended finance.</p>
Policy initiative	Link to building decarbonisation, integrated renovation programmes, and local heating and cooling plans	Gaps and Opportunities
Affordable Housing Initiative	Aims to enhance the renovation capacity in social and affordable housing by mobilising cross-sectoral partnerships to pilot 100 renovation districts and by promoting qualitative, liveable, accessible, affordable homes.	<p>Link: The initiative provides access to technical and innovation capacity and offers ad-hoc project support, including financial planning and design. The projects developed serve as models for long term affordability for residents and replication potential. The European Energy Poverty Advisory Hub (EPAH) acts as a depository of best practice of these projects.</p> <p><i>Objective 2: Innovative funding mechanisms</i></p>



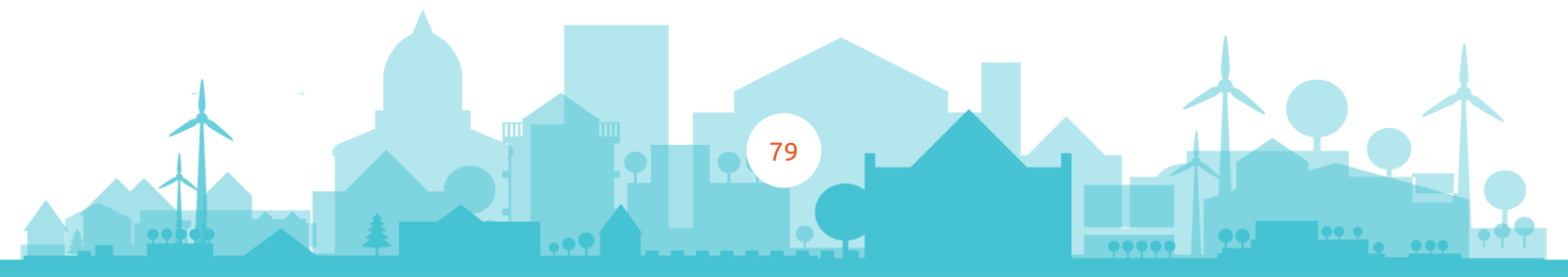
		<p><i>Objective 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level</i></p> <p>Gaps: Local heating and cooling plans are needed to accelerate investment in building renovations</p>
New European Bauhaus	<p>EU funding calls related to NEB such as the EUJ call for Innovative Actions state that the spirit of NEB is best fulfilled by actions such as:</p> <ul style="list-style-type: none"> • Construction and renovation in a spirit of circularity and carbon neutrality • Adapting and transforming buildings for affordable housing solutions • Regenerating urban spaces 	<p>Link: Climate City Contracts are promoting integrated neighbourhood solutions across regeneration and energy planning. Funds such as Net Zero Cities are being used for innovations in funding and testing technologies for decarbonisation, including in heating and cooling.</p> <p>Gaps: Local heating and cooling plans can fill gaps in Climate City Contracts to help cities integrate investment into technologies for climate neutrality across building renovation and mobility.</p> <p><i>Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level</i></p>
Global Covenant of Mayors for Climate and Energy (GCoM)	<p>Knowledge sharing across a network of 12,000 cities worldwide and in Europe</p>	<p>Link: Cities across Europe have committed to lowering their emissions and are implementing and testing technologies for integrated renovation programmes and local heating and cooling plans. Cooling approaches outside of Europe will be included.</p> <p>Gaps: Local heating and cooling plans are needed to accelerate investment in building renovations in different climates, especially as climate change increases the need for cooling.</p> <p><i>Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level</i></p> <p><i>Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i></p>
Regulation	Link to decarbonisation of buildings, local heating and cooling plans	Gaps and Opportunities



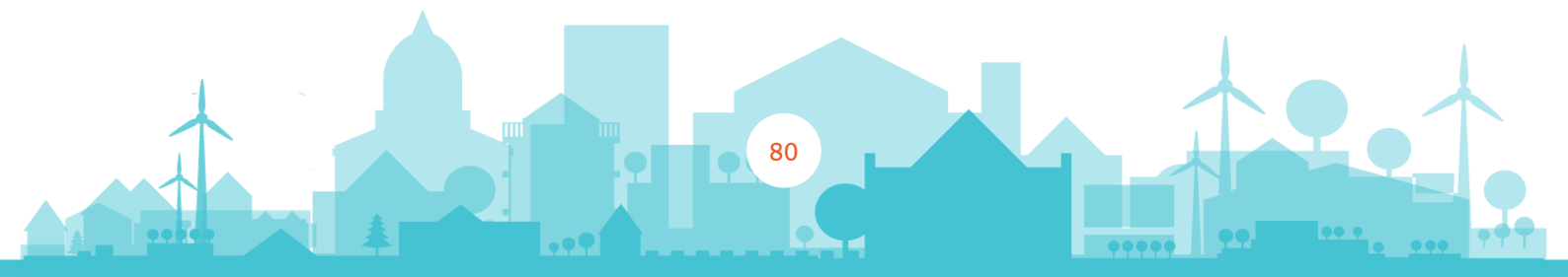
<p><u>Revised Energy Performance of Buildings Directive (2024)</u></p>	<p>The revised directive, when adopted by the European Council, will increase the rate of renovation, particularly for the worst-performing buildings in each country. Member States must make a 20% to 22% reduction in residential buildings' energy use by 2035. 55% of the gains must come from the bottom 43% of worst-performing buildings. By 2030, the bottom 16% of worst-performing non-residential buildings like offices and schools must be renovated, by 2033 the bottom 26%.</p> <p>The revised EPBD established district approaches to access multiple solutions at scale. Member States should take up neighbourhood and district approaches to building renovation and renewable heating and cooling in their national building renovation plans and actively promote them.</p>	<p>Opportunities: Local heating and cooling plans have the opportunity to support plans Member States have for penalties and procurement rules to speed up integrated renovation. Examples include banning rentals of buildings with the poorest energy efficiency ratings and limits and bans on use of natural gas and oil for heating and cooling.</p> <p>Gaps: Local heating and cooling plans are important strategy and delivery mechanisms for NECPs to prioritise the energy and climate actions prescribed for them by the EU in reforms and investments into the renovation of the building stock, renewable energy, and technologies and solutions for energy system integration.</p> <p><i>Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)</i></p> <p>Local heating and cooling plans need to fill in a gap to bridge the silos of the energy sector and the built environment sector, from energy masterplanning to local energy renovation plans and access innovative funding mechanisms.</p> <p><i>Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level</i></p> <p>Gaps: District approaches encourage the use of multiple solutions and scaling up of building renovation, but it is only in its interaction with the mobility sector and EV batteries where flexibility, balancing power and demand, is mentioned as an investment priority. This could put a solution bias in play for investment into physical over virtual district systems. Local heating and cooling plans have multiple technologies and options for flexibility. Stakeholders from the energy sector, from DSOs to suppliers, are not named in the EPBD.</p> <p><i>Opportunity 6: Integrated and neighbourhood approach to decarbonisation of buildings</i></p> <p><i>Opportunity 8: Development of guidance to implement relevant directives</i></p>
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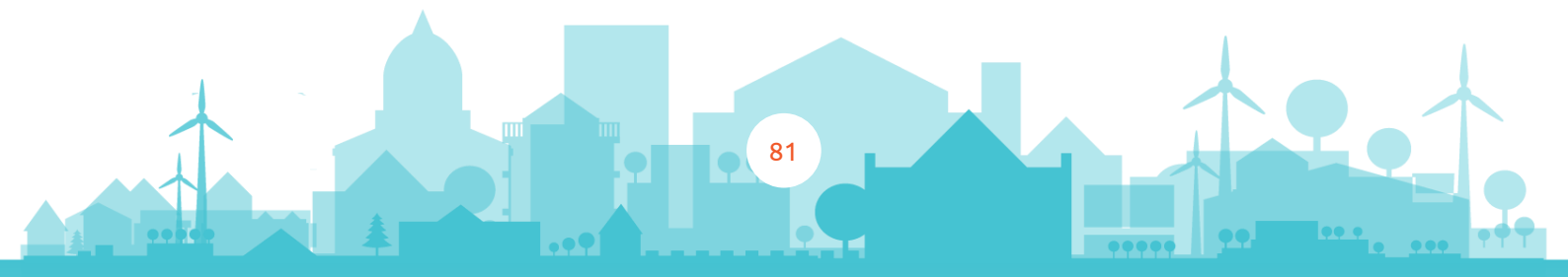
<p><u>Energy Efficiency Directive (2023/1791)</u></p>	<p>The recently adopted Energy Efficiency Directive (EED) requires cities with a minimum of 45,000 inhabitants to develop local cooling and heating plans. The EED extended the obligation to renovate 3% from central government to all public sector buildings greater than 250 square metres.</p>	<p>Gap: In more than half of European countries a new legislative framework will be needed, along with the development of a whole new support system for cities of guidance and access to data, especially in the built environment and energy systems.</p> <p><i>Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)</i></p> <p>Gap: Using the obligation of increasing the renovation of public buildings to 3% per year, and including all public sector buildings, to accelerate local heating and cooling plans using blended finance.</p> <p><i>Opportunity 2: Innovative funding mechanisms</i></p>
<p><u>Revised Renewable Energy Directive (2023/2413)</u></p>	<p>The Renewable Energy Directive sets an overall renewable energy target of at least 42.5% binding at EU level by 2030 - but aiming for 45%. It requires the use of renewable energy in heating and cooling plans.</p>	<p>District approaches in the EBPD encourage the use of multiple solutions and scaling up of building renovation, but it is only in its interaction with the mobility sector and EV batteries to maximise use of renewable energy procurement to meet the RED targets through flexibility, balancing power and demand, is mentioned as an investment priority.</p> <p><i>Opportunity 5: Integration of renewable energy in cities</i></p> <p><i>Opportunity 6: Integrated and neighbourhood approach to decarbonisation of buildings</i></p> <p>Access to funds for small and medium sized cities for their energy renovation strategies, including for energy communities to supply renewable energy in buildings alongside local authority-owned heating and cooling solutions.</p> <p><i>Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)</i></p> <p><i>Opportunity 2: Innovative funding mechanisms</i></p>



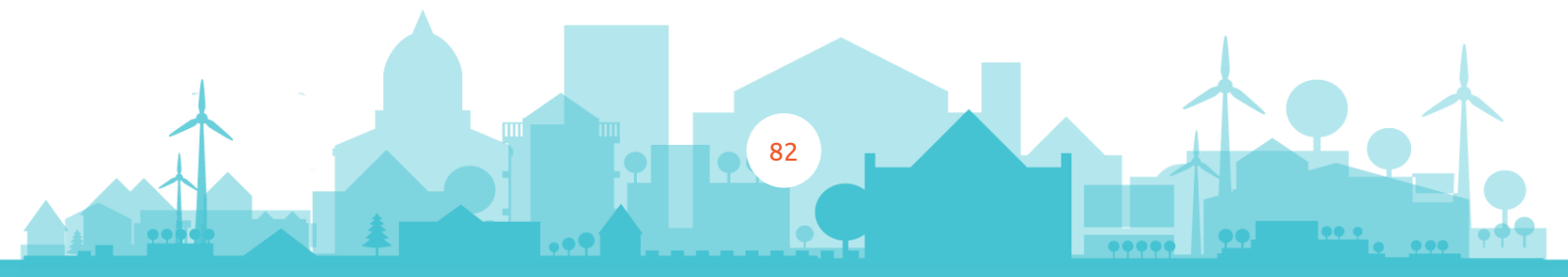
<p>Commission Recommendation (EU) 2023/2407 of 20 October 2023 on energy poverty</p>	<p>The recommendation guided Member States to use financial resources in Fit for 55 and other measures to tackle energy poverty through affordability and other means for the renovation of buildings.</p>	<p>Gaps of inclusion across all socioeconomic groups in the use of flexibility, from dynamic rates to the use of smart technology and storage to save consumers money and increase the amount of renewable energy being supplied.</p> <p><i>Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)</i></p> <p>State Aid exemptions in local heating and cooling plans effectively to 1) include non-residential and residential renovations at scale 2) include packages across small and medium sized cities</p> <p><i>Opportunity 2: Innovative funding mechanisms</i></p> <p>Opportunity to reduce energy poverty through membership of communities of practice on how energy communities address energy poverty (European Energy Poverty Advisory Hub (EPAH) and Covenant of Mayors – Europe) and of renewable energy communities (for example, VILAWATT funded by the UIA now EUI)</p> <p><i>Opportunity 7: Developing /exchange of practice on local energy communities and their interplay with municipal heating and cooling solutions</i></p>
<p><u>Fit for 55</u></p>	<p>Fit for 55 is a set of policy proposals to reduce the European Union's carbon emissions by 55% by 2030. This included the doubling of the renovation rates of buildings by 2030.</p>	<p>See Renovation Wave and EPBD gaps and opportunities.</p>
<p><u>Reform of the electricity market design</u></p>	<p>Make the energy bills more independent from the short-term market price of electricity through using more long-term contracts, such as power purchase agreements, and investment support for distributed energy resources as part of local heating and cooling plans with two-way contracts for difference.</p>	<p>Data availability that creates transparency between local authorities and Distribution System Operators on the embedded capacity registers, cost of studies, cost for reinforcements, and time between applications from asset owners of renewable energy sources in urban areas (solar, batteries, heat pumps) and energisation or connection.</p> <p><i>Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i></p>



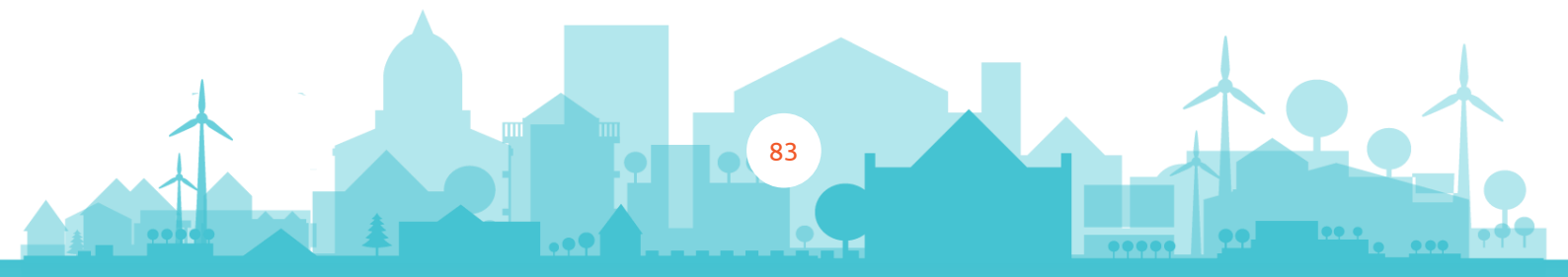
<p><u>Future electricity market directive (storage / flexibility)</u></p>	<p>Future policy on energy storage will set the rules for flexibility services in the electricity grids, use of bidirectional electric vehicle charging vehicle to grid services and other ways where district heating and cooling plans will depend on storage of electricity rather than traditional water based district systems.</p>	<p><i>Opportunity 5: Integration of renewable energy in cities</i></p> <p>How a local heating and cooling plan balances energy systems (including interaction with the mobility sector) using smaller renewable energy sources, from solar PV and storage to EV batteries and heat pumps at scale.</p> <p><i>Opportunity 5: Integration of renewable energy in cities</i></p> <p>Opportunities for local heating and cooling plans to demonstrate use of digital technologies to manage heating and cooling appliances coupled with incentives for energy customers through suppliers and DSOs.</p> <p><i>Opportunity 7: Developing /exchange of practice on local energy communities and their interplay with municipal heating and cooling solutions</i></p> <p>District approaches encourage the use of multiple solutions and scaling up of building renovation, but it is only in its interaction with the mobility sector and EV batteries where flexibility, balancing power and demand, is mentioned as an investment priority. This could put a solution bias in play for investment into physical over virtual district systems. Local heating and cooling plans have multiple technologies and options for flexibility. Stakeholders from the energy sector, from DSOs to suppliers, are not named in the EPBD.</p> <p><i>Opportunity 5: Integration of renewable energy in cities</i> <i>Opportunity 6: Integrated and neighbourhood approach to decarbonisation of buildings</i></p> <p>Identified in inadequate planning in terms of green and sustainable rehabilitation of buildings, insufficient funding for placed-based investments that address local needs, and lack of green skills training for the workforce needed for renovations of buildings. Local heating and cooling plans may need to adapt to direct investment into technologies and energy communities to balance energy systems.</p>
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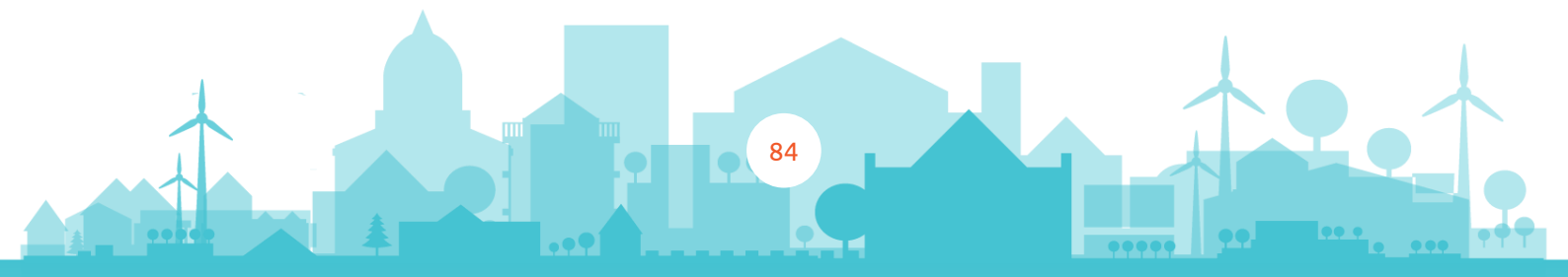
		<p><i>Opportunity 6: Integrated and neighbourhood approach to decarbonisation of buildings</i></p> <p><i>Opportunity 7: Developing /exchange of practice on local energy communities and their interplay with municipal heating and cooling solutions</i></p>
Funding Source	Link to decarbonisation of buildings, local heating and cooling plans	Gaps and Opportunities
Recovery and Resilience Facility (2021-26)	The Recovery and Resilience Facility (RRF) is a temporary instrument (€357billion of grants and €291billion of loans). It is the centrepiece of NextGenerationEU - the EU's plan to emerge stronger and more resilient from the current crisis. It funds national RR plans with at least 37% of the budget to green measures and 20% to digital measures. Most of the relevant fund is given out in loans as part of REPowerEU (below).	<p>Address challenges for local heating and cooling plans to be able to attract blended public and private finance for both distributed and centralised district energy projects.</p> <p>State Aid exemptions in local heating and cooling plans effectively to 1) include non-residential and residential renovations at scale 2) include packages across small and medium sized cities</p> <p>Local heating and cooling plans need to link energy masterplanning into local energy renovation plans and innovative funding mechanisms.</p>
REPowerEU (2022-26)	REPowerEU is a fund (€72billion in grants and €225billion in loans) to cut dependence on natural gas – and in the EU 'Save Energy' communication states that it can speed up uptake of loans for renovation of buildings and district heating systems if EBPD and member state regulations provide the push factor. It will also encourage better electricity market design for pricing to promote further uptake of finance for the electrification of buildings. Most of this funding is from the Recovery and Resilience Facility.	<p>Reduce dependence on grants for cities to act. Attract and leverage private finance while targeting grants where needed (e.g. social housing)</p> <p>Using the obligation of increasing the renovation of public buildings to 3% per year, and including all public sector buildings, to accelerate local heating and cooling plans using blended finance.</p> <p><i>Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)</i></p> <p><i>Opportunity 2: Innovative funding mechanisms</i></p>
REPowerEU – Smart Cities Marketplace	The Smart Cities Marketplace complements current EU efforts such as REPowerEU with a complete catalogue of offers such as calls for free technical assistance, 1-to-1-consultancy services for city-led consortia close to the financing stage, financing masterclasses and a fine-tuned matchmaking for the financing of urban projects and intensified partnerships with other EU initiatives.	<p>Data availability that creates transparency between local authorities and Distribution System Operators on the embedded capacity registers, cost of studies, cost for reinforcements, and time between applications from asset owners of renewable energy sources in urban areas (solar, batteries, heat pumps) and energisation or connection.</p>



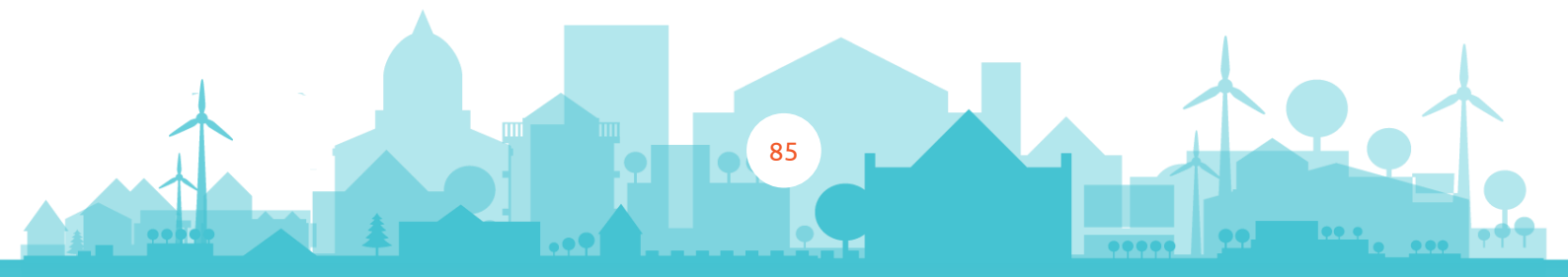
	<p>The Marketplace links the community of practice across the Covenant of Mayors – Europe with the two Missions of 1) Climate-Neutral and Smart Cities and 2) Adaptation to Climate Change</p>	<p><i>Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i> <i>Opportunity 5: Integration of renewable energy in cities</i></p>
<p>Multiannual Financial Framework (2021-27)</p>	<p>The €1 trillion MFF comprises the European Regional Development Fund (ERDF), Cohesion Funds (CF) and the European Social Fund Plus (ESF+) that all can fund grants for renovation of buildings. An estimated €20billion of Cohesion Funds are programmed for energy renovation and energy efficiency in line with national renovation strategies. ESF+ funds training for the much-needed supply chain of installers of heat pumps, solar panels, and district systems.</p>	<p>Support for businesses subject to minimum energy efficiency requirements Opportunity for cohesion policy if used across all building sectors to play a large part of regenerating district and town centres by including non-residential buildings.</p> <p>Gaps of inclusion across all socioeconomic groups in the use of flexibility, from dynamic rates to the use of smart technology and storage to save consumers money and increase the amount of renewable energy being supplied.</p> <p>Investigate the general principle to not invest in stranded assets – unless renovation takes place, both non-residential and residential buildings will become unlettable, uninsurable, and unsellable. At the same time, local heating and cooling plans may stall if fears develop that funding is being directed in part to stranded assets.</p> <p><i>Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)</i></p> <p>Inadequate planning in terms of green and sustainable rehabilitation of buildings, insufficient funding for place-based investments that address local needs, and lack of green skills training for the workforce needed for renovations of buildings. Local heating and cooling plans may need to adapt to direct investment into technologies and energy communities to balance energy systems.</p> <p><i>Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level</i></p> <p>More green jobs in the electrification of heating of buildings in renovation are supported, but the range of skills needed for technologies and</p>



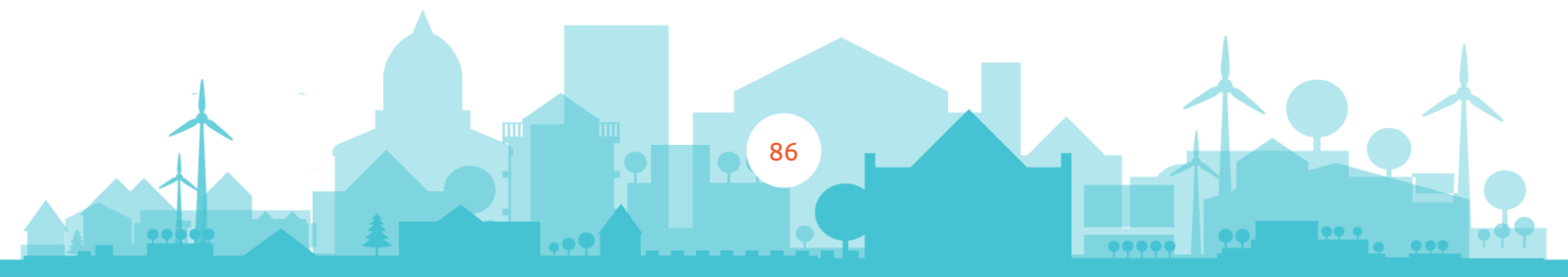
		<p>approaches at the district level, from renewable energy communities, energy system balancing with storage and EVs, and incentives for flexibility through market design, are also in need of support in the renovation wave.</p> <p><i>Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)</i></p>
<p><u>ERDF – European Urban Initiative – Innovative Actions</u></p>	<p>The Innovative Actions funds up to €5m for projects of a total EUI budget of €450m, many of which are in support of urban challenges that combine local strategies and plans with renovation of buildings. Examples in renovations of buildings include projects in Egaleo, Tallinn Lorca Budapest.</p>	<p>Integrated neighbourhood approaches to modernizations and energy-efficiency renovations can be adopted by moving away from the ‘one building at a time’ approach previously undertaken. A new knowledge base will be built up through new ERDF-funded projects on the new emphasis on district and neighbourhood approaches to renovation.</p> <p><i>Opportunity 2: Innovative funding mechanisms</i></p> <p><i>Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i></p> <p>District approaches encourage the use of multiple solutions and scaling up of building renovation, but it is only in its interaction with the mobility sector and EV batteries where flexibility, balancing power and demand, is mentioned as an investment priority. This could put a solution bias in play for investment into physical over virtual district systems. Local heating and cooling plans have multiple technologies and options for flexibility. Stakeholders from the energy sector, from DSOs to suppliers, are not named in the EPBD.</p> <p><i>Opportunity 5: Integration of renewable energy in cities</i></p> <p><i>Opportunity 6: Integrated and neighbourhood approach to decarbonisation of buildings</i></p> <p>Using urban regeneration and energy renovation plans together to take land use and re-use of buildings in the non-residential sector into account, and the re-use of spaces into account for development of local heating and cooling plans and integration of renewable energy.</p>



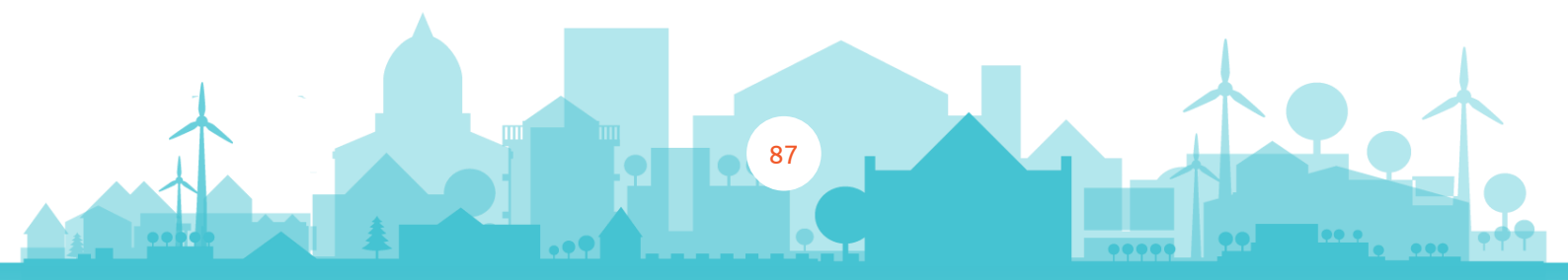
		<p><i>Opportunity 3: Key elements for the success of urban regeneration and energy renovation plans implemented at neighbourhood level</i></p> <p><i>Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i></p> <p>Considering the combination of green infrastructure with building renovation and new approaches to energy flexibility in urban regeneration and energy renovation strategies. Often energy generation and storage are excluded as out of scope of funding that promotes nature-based solutions – this limits integrated and neighbourhood approach to the decarbonisation of buildings.</p> <p><i>Opportunity 6: Integrated and neighbourhood approach to decarbonisation of buildings</i></p> <p><i>Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i></p>
CF - Just Transition Fund	The Just Transition Fund (JTF) is a new fund within the CP Period 2021 – 2027 to support the territories most affected by the transition towards climate neutrality to avoid regional inequalities growing	<p>Access to funds for small and medium sized cities for their energy renovation strategies, including for energy communities alongside local authority-owned heating and cooling solutions.</p> <p>Opportunities to support energy communities integrating with municipal heating and cooling systems:</p> <ul style="list-style-type: none"> • Interreg for cross-border communities (for example virtual power plant from NW Europe) • Integrated Territorial Investments (examples) • Community Led Local Development <p>With local heating and cooling plans, cohesion policy supports the added value of cross-border and interregional and macroregional approaches.</p> <p><i>Opportunity 2: Innovative funding mechanisms</i> <i>Opportunity 7: Developing /exchange of practice on local energy communities and their interplay with municipal heating and cooling solutions</i></p>
Social Climate Fund	The Social Climate Fund (SCF) was created alongside the ETS2 for emissions from fuel	Member States may use the SCF to support structural measures and investments in energy efficiency and



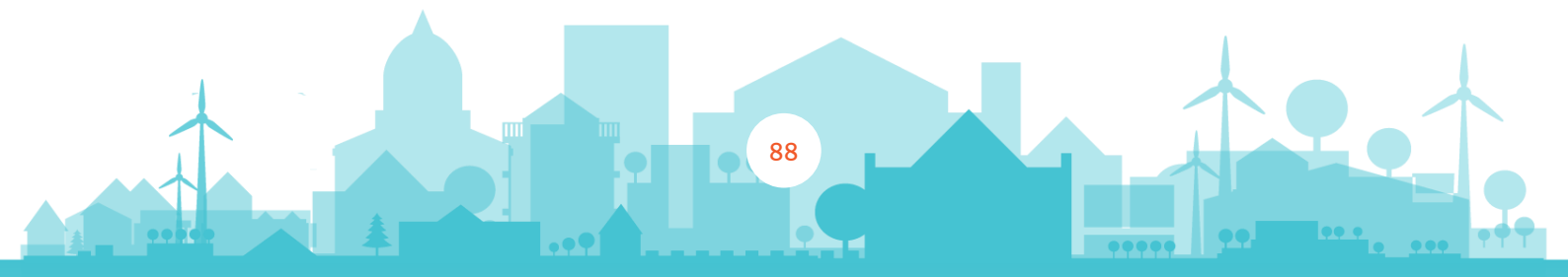
	<p>combustion in buildings, road transport and additional sectors. Together with a mandatory 25% contribution of the Member States to their Social Climate Plans, the SCF should mobilise at least €86.7 billion over the 2026-2032 period.</p>	<p>renovation of buildings, clean heating and cooling</p> <p><i>Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)</i></p> <p>Supporting the integration of renewable energy.</p> <p><i>Opportunity 5: Integration of renewable energy in cities</i></p>
<u>Modernisation Fund</u>	<p>The Modernisation Fund supports the modernisation of energy systems and the improvement of energy efficiency in 13 lower-income EU Member States.</p>	<p>Opportunities for local heating and cooling plans to demonstrate new technologies coupled with incentives for energy customers through suppliers and DSOs.</p> <p><i>Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i></p> <p>Data availability that creates transparency between local authorities and Distribution System Operators on the embedded capacity registers, cost of studies, cost for reinforcements, and time between applications from asset owners of renewable energy sources in urban areas (solar, batteries, heat pumps) and energisation or connection.</p> <p><i>Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i></p> <p><i>Opportunity 5: Integration of renewable energy in cities</i></p>
<u>EIB energy lending policy: European Initiative for Building Renovation</u>	<p>The EIB-R was established by the Renovation Wave to support building renovation plans. It combines EIB financing experience and existing technical assistance facilities to reinforce support towards attracting investment through aggregation, tailored financial support and accessing new sources of finance.</p>	<p>Data availability that creates transparency between local authorities and Distribution System Operators on the embedded capacity registers, cost of studies, cost for reinforcements, and time between applications from asset owners of renewable energy sources in urban areas (solar, batteries, heat pumps) and energisation or connection.</p> <p><i>Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i></p>
<u>EIB - ELENA - European Local ENergy Assistance</u>	<p>ELENA supports, with a minimum ticket size of €30m, the preparation of projects that</p>	<p><i>Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i></p>



	improve energy efficiency and renewable energy use in buildings, and energy efficiency renovations and renewable energy projects for residential buildings.	<i>Opportunity 5: Integration of renewable energy in cities</i> Assessments are needed of the link between climate vulnerability and increased need for cooling in local heating and cooling plans.
<u>EIB Funds for social and affordable housing</u>	Social and affordable housing loans are a major element of the EU bank's €150 billion in urban lending over the last seven years and of its support for EU urban policy.	Criteria for the success of climate adaptation plans in urban regeneration and energy renovation plans implemented at neighbourhood level.
<u>InvestEU</u>	The InvestEU Programme aims to guarantee €372 billion in investments using an EU budget guarantee. More specific financial instruments to support building renovations will also be developed between 2021 and 2027. These will be connected to REPowerEU, Green Deal and Digital Investment	Data availability that combines both climate risk (e.g. urban heat islands) and climate opportunities (e.g. solar and wind potential) for use in a local heating and cooling plan to size investments across electrification of heating and cooling plant to on-site renewable generation. <i>Opportunity 2: Innovative funding mechanisms Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i> How local authorities can support focus on public buildings (dwellings) and districts with urgent regeneration needs. Later, they can also extend to private landlords and ownership collectives. These one-stop-shops can also build intelligence from local demand for local heating and cooling plans to build packages of renovation work that better link private investment funds linked to energy efficiency and retrofitting. <i>Opportunity 2: Innovative funding mechanisms Opportunity 4: Assessment, planning and implementation of local heating and cooling plans Opportunity 6: Integrated and neighbourhood approach to decarbonisation of buildings</i>
<u>LIFE – Clean Energy Transition</u>	The LIFE Clean Energy Transition sub-programme has a budget of nearly €1 billion over the period of 2021-2027 and aims at facilitating the transition towards an energy-efficient, renewable energy-based, climate-neutral and -resilient economy by funding coordination and support actions	Assessments are needed of the link between climate vulnerability and increased need for cooling in local heating and cooling plans. Criteria for the success of climate adaptation plans in urban regeneration and energy renovation plans implemented at neighbourhood level.



		<p>Data availability that combines both climate risk (e.g. urban heat islands) and climate opportunities (e.g. solar and wind potential) for use in a local heating and cooling plan to size investments across electrification of heating and cooling plant to on-site renewable generation.</p> <p><i>Opportunity 2: Innovative funding mechanisms Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i></p>
<p>Horizon Europe – Climate-Neutral and Smart Cities Mission</p>	<p>Horizon Europe is investing around €360 million in the Mission in the period 2021-23. 112 cities were selected in 2022. They were invited to develop Climate City Contracts, which include an overall plan for climate neutrality across all sectors such as energy, buildings, waste management and transport, together with related investment plans for renovation of buildings for the EIB and investors.</p>	<p>Local heating and cooling plans can fill gaps in Climate City Contracts to help cities integrate investment into technologies for climate neutrality across building renovation and mobility.</p> <p><i>Opportunity 2: Innovative funding mechanisms Opportunity 1: Urban regeneration and energy renovation strategies at local/municipal level (addressing the city as a whole)</i></p> <p>Data availability that creates transparency between local authorities and Distribution System Operators on the embedded capacity registers, cost of studies, cost for reinforcements, and time between applications from asset owners of renewable energy sources in urban areas (solar, batteries, heat pumps) and energisation or connection.</p> <p><i>Opportunity 4: Assessment, planning and implementation of local heating and cooling plans Opportunity 5: Integration of renewable energy in cities</i></p> <p>Data availability that combines both climate risk (e.g. urban heat islands) and climate opportunities (e.g. solar and wind potential) for use in a local heating and cooling plan to size investments across electrification of heating and cooling plant to on-site renewable generation.</p> <p><i>Opportunity 2: Innovative funding mechanisms Opportunity 4: Assessment, planning and implementation of local heating and cooling plans</i></p>



Appendix 3 – Literature review, interviews, and meetings

Literature review across energy performance of buildings, energy efficiency, the renovation wave, renewable energy, urban regeneration, urban greening, digitalisation, and the electricity market:

- European Policy (Cohesion Policy, EBPD, Green Deal, Renovation Wave, Energy Efficiency Directive, Renewable Energy Directive, Future electricity market design)
- 'Charters' (New European Bauhaus / New Leipzig Charter / New Urban Agenda)
- Mission on Climate-Neutral and Smart Cities / Covenant of Mayors
- 2024 European Commission Work programme
- Results and deliverables from previous Thematic Partnerships (Scoping Paper, Action Plans and Ex-Ante Assessment)
 - Concluded (for example, Energy Transition, Housing, Digital Transition)
 - Ongoing (for example, Greening Cities, Public Procurement)
- National Long Term Renovation Strategies Assessment Reports carried by the Joint Research Centre (JRC)
- Buildings Performance Institute Europe reports on renovation and the neighbourhood approach
- Available evidence and scientific expertise coming notably from 'Future of cities' related data and research findings, the Urban Data Platform + and recent evidence on urban development in the EU
- Urban Data Platform
- Fit for Future Platform
- National regulatory frameworks regarding the concerned theme
- Relevant funding opportunities for the concerned theme

Ten interviews with officers across Commission DGs have been conducted. Questions for the interviews were developed from desktop research. The results of the interviews provided additional information and perspectives in advance of a workshop with stakeholders. This workshop with stakeholders was held on 27 February 2024, and written feedback was taken from stakeholders that informed this report and the assessment of partners available in the future final ex-ante assessment.

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