IN-PLAN

The IN-PLAN Practice

Handbook for integrated energy, climate and spatial planning

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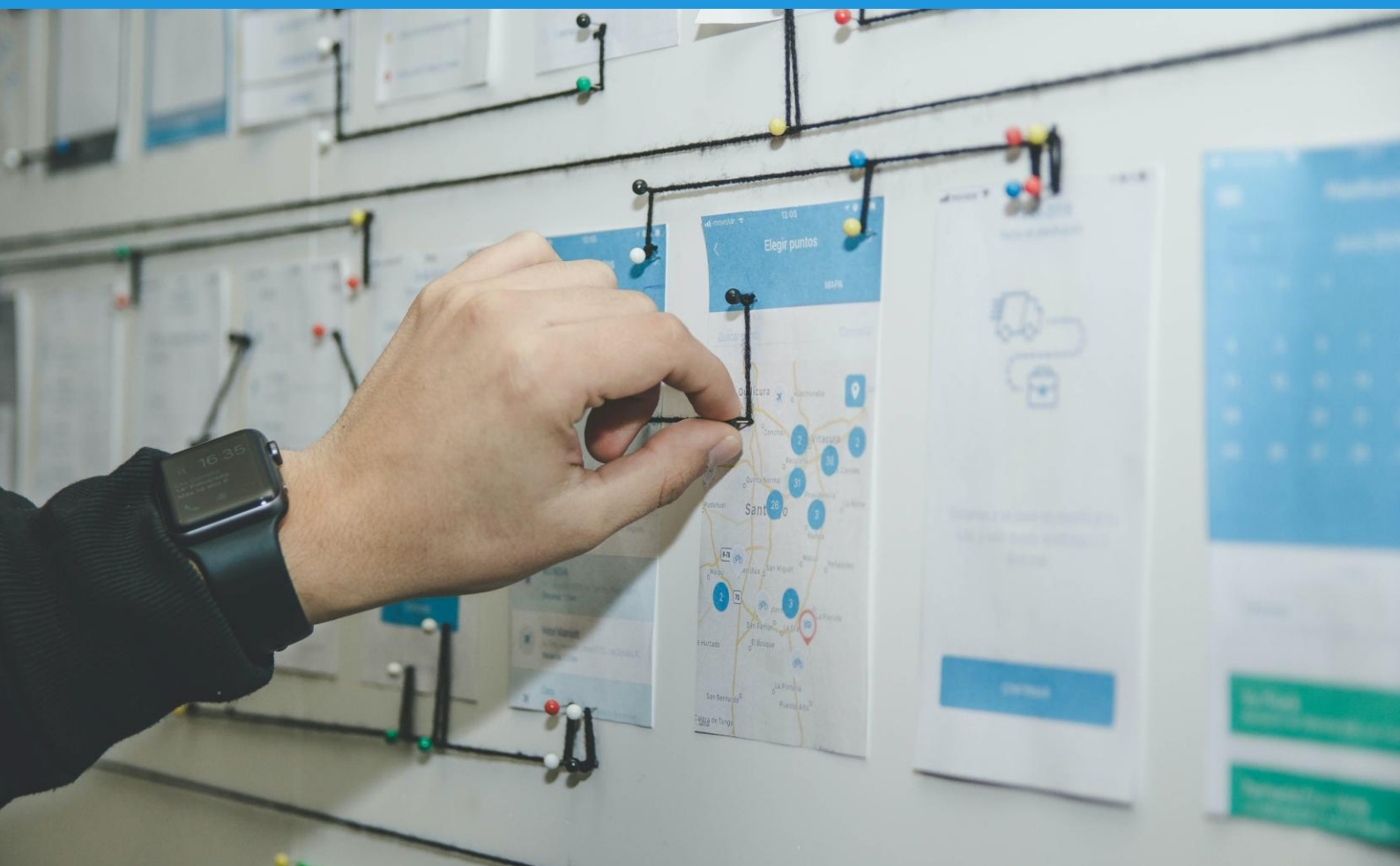

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About IN-PLAN

The overarching objective of IN-PLAN (Integrated Energy, Climate and Spatial planning) is to **develop**, **test** and **roll out** the IN-PLAN practice – a long-lasting support structure enabling local and regional authorities to effectively implement their sustainable energy, climate, and spatial plans. They aim to do so by:

- Integrating energy and climate planning with spatial planning (and other types of planning tools, such as mobility, infrastructure, etc.);
- Ensuring commitment at all political levels (through vertical integration); and
- Matching the included measures with specific dedicated local and regional budget lines.

On top of delivering this innovative and effective approach, IN-PLAN intends to empower local and regional governments and their agencies through a *two-step capacity-building programme*. From the start, the IN-PLAN consortium will engage 15 local and regional governments – the **Lighthouses** – in order to co-create, implement and refine the IN-PLAN practice, its operational guidelines and the capacity-building programme. 30 more local and regional governments – the **Pilots** – will also benefit, in part, from the IN-PLAN practice.

Once developed, the two-step capacity building will start. Phase one will aim at **training the trainers**: empowering energy, climate and/or development agencies from across Europe to become IN-PLAN **Multipliers**. Phase two will aim at passing on the knowledge to local and regional governments, the **Replicators**. They will be tutored either by the five national project partners or by the trained multipliers.

IN-PLAN's ultimate goal is to empower local and regional authorities in developing and implementing integrated energy, climate, and spatial planning in their territories.

TABLE OF CONTENTS

1. Introduction to the IN-PLAN Practice

In recent years, many local and regional authorities have set ambitious climate neutrality targets and are actively implementing the necessary transformations in energy and mobility to achieve these goals. Despite operating within various overarching framework conditions, these authorities play a crucial role in translating national and European climate targets into practical actions. They have control over spatial developments within their jurisdictions and often hold the legal mandate to develop and enforce spatial development plans. These plans outline future settlement and economic development while setting restrictions on land use. Given the strong correlation between spatial structures, energy demand and supply, and mobility patterns, spatial planning serves as a valuable tool for municipalities to drive crucial initiatives for addressing climate change and achieving net-zero targets.

The LIFE project IN-PLAN specifically focuses on spatial planning, addressing how to further integrate climate and energy aspects to accelerate local decarbonisation efforts. The IN-PLAN Practice serves as a guideline for implementing integrated spatial planning aimed at achieving climate neutrality. It introduces the concept of integrated spatial planning and explains how different planning systems across Europe offer varying possibilities for action.

Chapter Two presents the most important topics for climate action to be integrated into spatial plans, along with an overview of possible interventions and good practice examples. These focus areas include Climate Adaptation, Sustainable Mobility, and Renewable Energy. The chapter concludes with the IN-PLAN Checklist, which can be applied to each spatial plan to ensure comprehensive steps towards climate neutrality are taken.

Chapter Three provides a comprehensive overview of a generic integrated planning process, addressing key questions such as: What steps need to be taken? Which stakeholders need to be included? Each step of the process is illustrated with good practice projects and helpful tools that can be applied. A more extensive collection of examples and tools can be found in the Annex of the document.

In the online version of the IN-PLAN Practice, the chapters are presented in an interactive format and provide additional information.

1.1. Integrated Spatial Planning

According to the Torremolinos Charter (CEMAT 1983), **spatial planning** gives geographical expression to the economic, social, cultural, and ecological policies of society. It is a scientific discipline, an administrative technique, and a policy that promotes balanced regional development and the physical organisation of space through an interdisciplinary approach. Spatial plans are powerful tools used to define the spatial development of a territory, including land use categories, infrastructure placement, and specific construction and development requirements. They aim to create a rational territorial organisation of land uses, balancing development demands with environmental protection and achieving socio-economic objectives. Spatial planning coordinates the spatial impacts of sectoral policies, balances economic development between regions, and regulates land and property use conversions.

In essence, spatial planning manages the arrangement and development of living, working, and environmental conditions across various spatial levels—from residential quarters and urban districts to entire cities, regions, states, and even international levels. It is an expression of sovereign power and a public responsibility at the state, provincial, and municipal levels, based on legal regulations. Spatial planning laws provide for various forms of plans, which take legal effect as ordinances and have long-term impacts.

Therefore, spatial planning encompasses a wide range of instruments, from strategic frameworks and land-use planning to urban development agreements. These could include, for example, provincial development strategies, regional and sectoral programmes, local development strategies, land use plans and building schemes, but also municipal heating plans, spatial energy plans, etc. Local and regional governments utilise these tools to outline development pathways, setting restrictions and guidelines for land use and growth.

Integrated spatial planning is a comprehensive approach to managing spatial development that encompasses three critical dimensions: vertical integration, horizontal integration, and territorial integration. Vertical integration involves collaboration between different levels of governance, such as local, regional, national, and international authorities. This coordination ensures that policies and plans are aligned effectively, avoiding conflicts and redundancies and creating coherent development strategies.

Horizontal integration emphasises cooperation across different policy areas and departments within a municipality. This approach involves addressing issues holistically rather than in isolation. For achieving climate neutrality, this means integrating climate adaptation, sustainable mobility, and renewable energy into spatial planning. Additionally, by considering social and economic aspects, spatial planning aims to achieve sustainable development that balances growth with environmental protection and social equity, ensuring that projects have positive, multifaceted impacts.

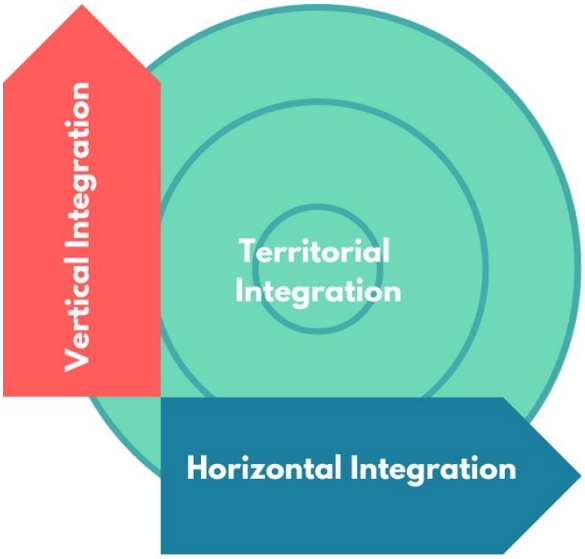


Figure 1: Diagram of integrated planning.

Territorial integration entails regional cooperation between municipalities. By working together, municipalities can address shared challenges, optimise resource use, and implement regional development strategies that transcend individual boundaries. This cooperation enhances the effectiveness and efficiency of spatial planning efforts, leading to more cohesive and comprehensive regional development.

The European Commission advocates for **sustainable and integrated spatial development** with additional key features. It promotes a strategic vision for territorial development, guiding long-term planning efforts to align with broader sustainability and growth objectives. The Commission's approach also emphasises multi-level governance and multi-stakeholder coordination, involving various actors according to their roles, skills, and scales of intervention, and ensuring active citizen engagement.

Furthermore, the Commission supports the integration of multiple funding sources to support spatial development projects, maximising resource availability and enabling the implementation of large-scale, impactful projects. It also promotes a result-oriented approach, establishing frameworks for monitoring and evaluation to ensure continuous improvement and accountability. By emphasising these elements, the European Commission aims to promote a more sustainable, cohesive, and effective approach to spatial development across Europe.

Completing these EU-level policy initiatives, there is a growing trend to incorporate renewable energy and climate protection into spatial planning laws. Many countries and regions recognise that sustainable and integrated spatial planning is essential for addressing climate change and facilitating the energy transition, making it a vital component in the global effort to achieve climate neutrality.

1.2. Planning Systems in Europe

The EU itself does not have general competence in the field of spatial planning, but it often makes efforts to coordinate spatial planning policies among member states. Despite this, the EU exerts significant influence on spatial planning through its sectoral competencies and activities, shaping the framework within which spatial plans are developed. Within the EU, there is a variety of spatial planning practices and instruments, each linked to the respective planning customs and traditions of member states. These systems differ in their objectives, organisational structures, and instruments. In general, spatial planning corresponds to a specific set of nationally legally binding rules and regulations.

Most EU member states have a planning system involving three levels of government. However, some countries operate with only two levels, while others have four or even five levels of planning responsibility. Generally, most EU member states have some form of planning competence at the national level. Law-making and policy-making competences are typically assigned to higher administrative levels, while plan- and decision-making competences are shared across all levels of government. Broadly speaking, four different planning systems can be identified in Europe:

Centralised systems

Some European countries, such as France, have strong centralised spatial planning. Decisions and planning are typically made by a central governmental organisation with extensive control and enforcement powers. This allows for a unified approach to land use planning but can also lead to bureaucracy and a lack of local flexibility.

Decentralised systems

Many European countries, such as Germany, Italy, and Austria, have decentralised spatial planning systems where responsibility and authority are distributed among different levels of government. In Austria, for example, spatial planning laws are made at the federal state level, while municipalities are in charge of drawing up and implementing spatial plans. This allows for greater flexibility and consideration of local needs but can result in varying approaches and standards across different regions.

Cooperative systems

Some European countries, like the Netherlands, have cooperative spatial planning systems where various stakeholders—including government, municipalities, businesses, and citizens—work together to make spatial planning decisions. This approach encourages broad participation and consensus-building, ensuring that diverse interests are taken into account.

Integrative systems

In Scandinavia, particularly in Sweden and Norway, integrative spatial planning systems are used. These systems closely link different policy areas such as environment, transport, housing, and economy to enable holistic and sustainable spatial planning. This approach emphasises balancing different interests and promoting synergies between various sectors.

Of course, these systems can vary, and many countries use a mix of approaches. Additionally, spatial planning systems are constantly evolving to meet changing challenges and requirements. For the IN-PLAN practice, serving as a guiding document for regions and municipalities across Europe, this diversity means it cannot address the specific situation of each individual country. Instead, it must remain as general as necessary while being as precise as possible in its suggestions for successful integrated spatial planning.

1.3. Aim of the IN-PLAN Practice

The IN-PLAN Practice aims to provide municipalities, regions, and other public authorities with a comprehensive guidebook for integrating climate adaptation, mobility, and energy planning into spatial planning processes. It fosters institutionalised collaboration across different departments and stakeholders at all levels.

As such, the practice is meant to:

- give guidance on how to utilise and integrate spatial plans to streamline sectoral planning instruments, documents, and plans;
- outline key aspects and milestones to consider during the spatial planning process;
- recommend practical tools, software, and methods conducting basic research, communication, and other essential planning tasks;
- identify which stakeholders should be involved both organisationally and content-wise;
- provide useful good practice examples.

The IN-PLAN Practice is designed to empower local and regional governments to develop, implement, and monitor ambitious integrated spatial plans with climate neutrality targets. It provides guidance on involving key actors from the local and regional levels throughout the planning process, from inception to implementation and monitoring, fostering stakeholder engagement and participatory governance concepts.

Structured alongside the outline of a general spatial planning process, the IN-PLAN Practice and its recommendations on climate change adaptation, sustainable mobility, and renewable energy are easily applicable at any stage of an ongoing spatial planning process. The practice offers step-by-step recommendations and guidance for each phase, detailing specific actions and timelines. Additionally, it lists practical best practices from across Europe and offers a toolbox of technical and soft skill tools, instruments, and methods. Rather than developing new tools, the Practice contextualises existing ones within the planning process.

Overall, the IN-PLAN Practice aims to depict an ideal integrated spatial planning process, acknowledging that such processes are often iterative rather than linear, incorporating feedback loops. The practice is particularly valuable during both complete and partial overhauls of spatial plans, strategies, or other planning documents, offering practical insights and guidance to ensure successful integration of key aspects.

2. Focus Topics for Climate Action

Spatial planning plays a crucial role in addressing climate change, for example by **minimising land consumption** through long-established concepts such as promoting compact settlement structures. Compact settlements are essential for protecting agricultural production areas, preserving green spaces, and maintaining unsealed soils and forests as CO2 sinks. They also support adaptation to climate change, sustainable mobility patterns, and the transition to renewable energy sources. **Compact settlements** and dense building structures increase the efficiency of grid-connected energy systems, reduce travel distances, and improve the viability of public transport. However, compact does not mean overcrowded, cluttered or impervious, but rather rich, with a high density and variety of functions and services in a small area. **Mixed-use developments** that combine living and working spaces also help to balance peak and base loads in the electricity grid, leading to greater energy and resource efficiency.

In short, spatial planning and its underlying concepts have gained importance due to the escalating challenges municipalities and their citizens face from climate change.

Thematic areas such as **climate adaptation**, **sustainable mobility**, and **renewable energy** are deeply interlinked with spatial planning and can be described as focus topics for climate action. For example, spatial planning can identify optimal sites for renewable energy generation (solar, wind, and biomass) and secure areas for grid expansion and storage. At the same time, planners must balance various land uses to minimise conflicts and ensure harmonious development.

This chapter, structured around the focus topics of climate adaptation, sustainable mobility, and renewable energy, provides guidance and examples for integrated planning and relevant measures. At the end of the chapter, the IN-PLAN Checklist is included to screen integrated planning efforts.

2.1. Renewable Energy

Why is spatial planning relevant for energy planning?

Spatial planning is crucial for energy planning due to the spatial dimension of both energy demand and energy availability. On the **energy demand** side, cities, industrial centres, and densely populated areas have a much higher energy demand density compared to small settlements. Further, even within settlements, energy demand can vary significantly between districts and neighbourhoods, influenced by factors such as the composition of the building stock (building density, refurbishment rate, etc.) and specific use cases (residential areas, recreational activities, services, industrial processes).

On the **supply side**, the availability of energy is also spatially differentiated. Renewable energy potentials (such as photovoltaic (PV), solar thermal, wind, hydropower, biomass, geothermal, and waste heat) vary significantly in the surface area required for energy generation and the locations where they are available. For example, PV and wind energy require substantial surface areas, while waste heat from industrial processes and hydropower are location-specific.

While local and regional authorities and municipalities may only be able to establish spatial (energy) plans and set measures for their own territory, it is advised to cooperate with surrounding regions and municipalities to streamline secure energy supply on a broader scale.

How to integrate energy planning in spatial planning?

Integrated energy planning should strive to **match energy potentials with energy demand** by accounting for their spatiality, in order to provide energy efficiently and reduce costs. This can present a particular challenge for dense urban areas with limited available surfaces and high energy demand density. It may be necessary to mobilise energy potentials beyond the boundaries of the settlement to satisfy energy demand.

In addition, the **necessary energy infrastructure should be assessed in the planning phase**. Grid infrastructure (heat networks, gas pipelines, electricity grids, etc.) may need to be extended or re-dimensioned to accommodate future peak loads. Similarly, the phasing out of fossil fuels will lead to the decommissioning or repurposing of fossil fuel infrastructure. The increased volatility of renewable energy sources also requires that the needs for energy storage facilities are anticipated, both for short-term and seasonal storage. Ideally, when planning new buildings or settlements, the energy demand should be calculated beforehand, and nearby energy potentials and the necessary energy supply infrastructure should be included in the planning.

The transition to renewable energy may require the **temporary use of public and/or private spaces**, such as road works to maintain or adapt network infrastructure, or construction works to convert buildings from fossil fuel to renewable heat. Ideally, these interventions are synchronised to reduce costs, save time, and minimise disruption to residents and mobility. This could mean combining building refurbishment with a switch to renewable heating, or greening public spaces with grid maintenance, and allows synergising with other measures related to climate adaptation and mobility.

What types of energy related measures to consider?

Managing energy demand

On the energy demand side, a number of measures can support the uptake of renewable energy and promote energy efficiency:

Stipulating and incentivising the use of renewable energy: Both in new settlements and in the existing building stock, areas can be defined where either the use of fossil fuels, or the use of fossil-fuelled heating systems, can be prohibited, or where the use of renewable energy is mandated.

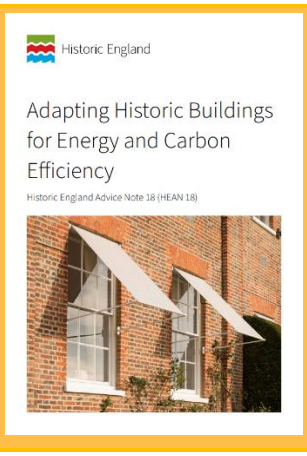
Similarly, **energy performance requirements for buildings** could be established. It is fundamental to investigate the feasibility of such a measure before implementation. Some measures may be hard to implement due to specific configurations of the building stock. For example, the protection of historic buildings can limit the options for refurbishment measures or for PV installations. Further, it is important to make sure that the market has sufficient capacities to accommodate the subsequent demand increase in terms of workforce and know-how, and of material supply. Also, the costs incurred need to be estimated and it should be anticipated by whom they are to be borne. Finally, the measure needs a clear time horizon, e.g. until when and under which conditions a heating system needs to be switched, to ensure smooth operation.

Matching local energy demand and supply through energy communities: energy communities allow citizens to both produce and consume (renewable) energy. For electricity, this can reduce strain on the power grid, for example if it is consumed and stored locally rather than transported across long distances.

Good Practice: Adapting Historic Buildings

In order to provide a clear guideline for the retrofit of historic buildings in the UK, Historic England has produced an Advice Note with detailed information on suitable measures to reduce carbon emissions and improve the energy efficiency whilst conserving the significance and aesthetics of the British architectural heritage.

For further information see Energy Efficiency and Retrofit in Historic Buildings | Historic England.



Harnessing energy potentials and ensuring efficient supply

Identification and quantification of energy potentials: to ensure secure supply of energy, in particular with regards to the clean energy transition, the available renewable energy potentials must be identified and quantified. In particular for dense settlements and cities, relevant potentials (e.g. geothermal heat potentials or open surfaces for PV) may be situated outside of the respective territorial

authority and therefore require cooperation with other local, regional or national authorities, and energy providers and grid operators.

Reserving energy generation areas and surfaces: In densely populated settlements, a multitude of surfaces can be mobilised for PV (or solar thermal energy). These primarily include:

- buildings (roof and facade surfaces),
- sealed open areas (traffic areas, parking lots, …),
- special areas (power plant areas, landfills, …),
- residual areas of infrastructure facilities (highway, railroad, …),
- open spaces with dual use (agricultural surfaces, priority for publicly inaccessible areas).

As a general rule, built-up areas, dual-use surfaces, or lower-grade surfaces such as brownfields should be prioritised for PV before expanding into open and natural spaces. Estimation of PV potential in a settlement or urban area could be carried out via a systematic analysis of surface suitability (i.e. using GIS data) and made available to planners as a potentials map.

In less densely populated areas, similar conflicts for space can arise. Wind turbines may require minimum distances to the nearest settlements. The usage of biomass (wood, crops) for electricity production or heating may compete with growing food or biodiversity. Synergies between multiple usages should be exploited, trade-offs should be minimised and carefully considered.

To support the mobilisation of surfaces beyond legal obligations (see above), a system of subsidies and other financial incentives as well as counselling services (such as One Stop Shops often run by the municipalities themselves) could be employed.

Heating and Cooling Planning

Heating and cooling infrastructure is strongly dependent on the characteristics of the built environment, such as building density, heat demand density, refurbishment state, and usage.

Therefore, matching heat demand and supply is best done through a dedicated **heating and cooling (H/C) plan**. Its purpose is to indicate, which heating solutions should be employed in which parts of a settlement (and possibly in which timeframe). This requires knowledge about the existing heating infrastructure, the current and future heat demand density (in accordance with expected settlement development) and available (renewable) heating and cooling sources. As far as data is available, further aspects may be integrated in the H/C plan according to local needs.

Beyond naturally available heat potentials, waste heat from industrial processes, geothermal heat, or ambient heat should be evaluated. These heat potentials should be characterised based on their temperature levels and the extent to which they can be upgraded using heat pumps. If additional power plants or the expansion of existing ones are necessary (such as combined heat and power or biomass plants), they should also be included in the planning process. Seasonal underground heat storage systems such as Borehole Thermal Energy Storage (BTES) under urban areas (inner courtyards of buildings, gardens, parks, parking areas) might be necessary as well.

On the consumption side, heat demand can vary considerably between and inside neighbourhoods. Residential buildings are generally easier to switch to renewable energy solutions: a spatially

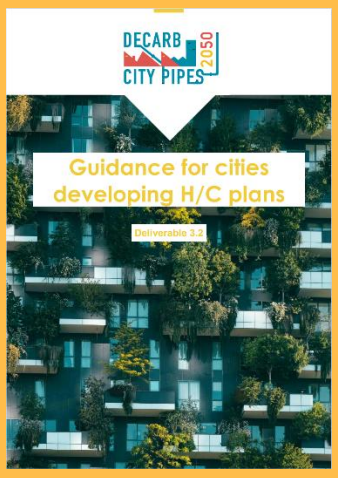
differentiated H/C plan can help identifying whether large-scale, grid-based systems like district heating are suitable, or if individual heating solutions such as air heat pumps, biomass boilers, or small, low-temperature heating networks are to be preferred. Besides technological feasibility, socio-economic factors such as financial costs, risks, and social acceptance of proposed solutions should be considered in the decision-making process.

Particular consideration should also be given to service- or production-oriented businesses as well as larger industrial sites, which may be dependent on very specific machinery or high temperature levels where renewable solutions may not be technologically or economically feasible (yet). In particular, it should be evaluated which areas may need renewable gaseous fuels (green gas, hydrogen) in the future, and which infrastructural needs this entails.

Good Tool: Guidance for Cities Developing H/C Plans

The guide for developing a Heating and Cooling (H/C) plan was elaborated in the EU Horizon 2020 project Decarb City Pipes 2050. It details creating an H/C map using the method of the city of Winterthur, Switzerland. It includes making infrastructure, heat demand, and potential maps to assess heat supply feasibility. It also addresses economic considerations, data quality, and integrating heating and cooling with the power grid amidst increasing electrification.

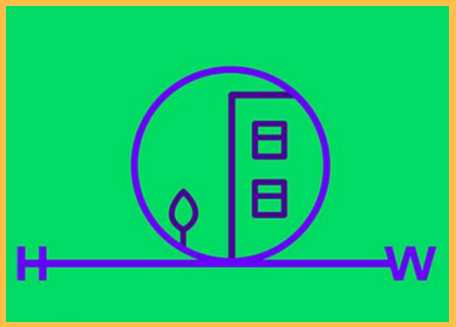
For further information see Guidance for cities developing Heating and Cooling plans – Decarb City Pipes 2050 .



Good Practice: Tallaght District Heating Scheme

The Tallaght District Heating Scheme is a newly built system in Tallaght, a suburban satellite town of Dublin, Ireland. It utilises heat from a recently completed data centre to supply both heating and hot water to County Hall and other public buildings. This innovative scheme effectively matches local heat potentials with local energy demand, promoting efficient energy use and sustainability.

For further information see Heatworks – Ireland's first not-for-profit energy utility.



Good Practice: Vienna Heating Plan 2040

The Vienna Heating Plan 2040 indicates the most suitable heating solutions for buildings that are currently heated with oil or gas until 2040. It is based on the current and expected heating demand, renewable energy potentials, and existing infrastructure.

For further information see Vienna Heating Plan 2040.

2.2. Climate Adaptation

Why is spatial planning relevant for climate adaptation?

Ongoing **climate change is causing a global increase in extreme weather events and higher temperatures**. Even if these effects can take different forms locally, the general trend affects all of Europe. Natural disasters such as heavy rainfalls, flooding and prolonged droughts are increasing; sea levels are rising; coasts and slopes are increasingly at risk from erosion and landslides; summer overheating is particularly noticeable in cities, where so-called "heat island" effects are occurring; and biodiversity is declining rapidly due to the changing climatic conditions.

The Paris Agreement of 2015 established a goal for adaptation, focusing on enhancing adaptive capacity, strengthening resilience, and reducing vulnerability to climate change. While climate protection measures aim to mitigate climate change, **adaptation measures are designed to prepare for and minimise its adverse effects on natural and human systems**, including ecosystems, built environments, public health, and others.

Many climate change adaptation measures have a direct spatial impact: on a large scale in the natural environment or on a smaller scale in the public spaces of (urban) settlement areas. Due to their anticipatory and preventive nature, climate adaptation measures are often intertwined with disaster risk reduction management, which itself is strongly connected to spatial planning as well. Therefore, it is **essential to integrate climate change adaptation measures into spatial planning** to ensure comprehensive and effective strategies for addressing climate change.

How to integrate climate adaptation in spatial planning?

Adaptation measures range from actions that build adaptive capacity or establish management systems and supportive mechanisms to adaptation actions implemented on the ground. They can be applied in policies, practices and projects which can reduce risks or realise opportunities associated with climate change.

Good Tool: Climate-ADAPT

Climate-ADAPT is a platform that aims to facilitate Europe's adaptation to climate change by providing accessible data and information on expected climate impacts, vulnerability assessments, adaptation strategies, case studies, and tools for planning. It organises information into categories such as EU policy sectors, countries and cities, and various knowledge topics, complementing the EU's efforts towards achieving its 2030 climate and energy targets. Of particular interest are the Climate-ADAPT Adaptation Support Tool and the Climate-ADAPT Case Studies.

For further information see key services, thematic features and tools of Climate-ADAPT.

Spatial planning plays a critical role in climate adaptation by integrating strategies that reduce vulnerability and enhance resilience to climate impacts in the spatial development of a territory. This involves incorporating green infrastructure, such as parks and green roofs, to mitigate urban heat island effects; designing flood management systems, such as sustainable urban drainage systems and retention basins; and protecting natural habitats to preserve biodiversity. By considering climate adaptation in spatial planning, we can create more resilient communities that are better equipped to handle the challenges posed by climate change.

What types of climate adaptation measures to consider?

Addressing (urban) heat

Protect and enhance fresh and cold air corridors: Urban fresh and cold air corridors facilitate the flow of cooler, fresher air from rural or green areas into cities, helping to mitigate the urban heat island effect. These airflows typically follow large linear green spaces, water bodies, and valleys. Urban climatological studies can identify existing fresh and cold air corridors and provide guidance on where new corridors could be designed or existing ones enhanced.

Mapping urban heat islands: Urban areas often experience higher temperatures than rural areas due to their structural characteristics. Key factors contributing to this include extensive impermeable surfaces that cause rapid rainwater runoff, limited shading and evaporation from vegetation, dense construction using heat-absorbing materials, and urban geometries that hinder air circulation. Isotherm maps of urban areas are crucial for identifying urban heat islands, highlighting areas that are particularly affected and in need of targeted interventions.

Accessible climate-resilient public spaces: In a just urban environment, high-quality public spaces should be accessible to everyone in the immediate vicinity of their homes. Amid the climate crisis, high quality encompasses public spaces that remain attractive and functional during hot summer days. Climate-resilient public spaces feature extensive vegetation and other shading elements, water features for refreshment, and a high proportion of permeable surfaces that facilitate cooling through evaporation. The 'sponge city' principle has introduced various technologies for designing public spaces to store rainwater in the ground, enabling its use on-site to nourish vegetation and aid in evaporation.

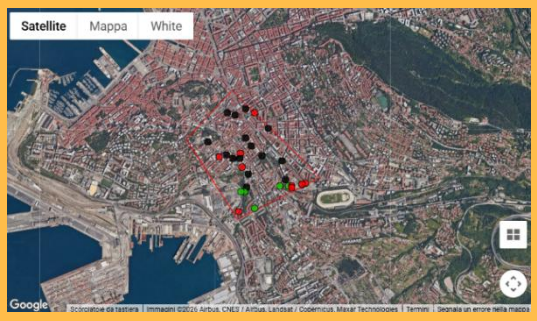
Good Tool: i-tree canopy

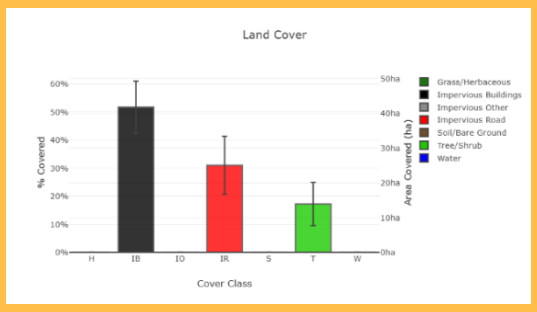
i-Tree Canopy is a free online tool that helps **estimate how much of an area is covered by trees** and other types of land use (like buildings, roads, or grass).

You can either draw the area on the map or upload a file (e.g. a shapefile) to define it. The tool then shows random points within the area, and you choose what type of land cover each point has (for example, tree, pavement, or water). Based on your input, the system estimates the overall land cover distribution. For reliable results, it is recommended to classify between 500 and 1000 points.

The tool can also help estimate the economic value of the benefits provided by trees (like cooling or air cleaning). But outside the U.S., U.K., Ukraine, Sweden, New Zealand, and South Korea, you need to enter your own values to do this calculation.

For further information see i-Tree Canopy





Regulations for climate-resilient buildings: Microclimatic studies must become mandatory elements of the planning process for large building structures and new urban quarters. These studies provide crucial insights into the microclimatic effects of new urban structures and offer strategies for mitigation through repositioning, shading, ventilation, or the greening of roofs and facades. Measures recommended by such studies should be legally enforced and implemented accordingly. Additionally, new buildings need to incorporate sustainable cooling measures. During the design process, passive cooling options such as shading (e.g. external blinds), greening, and natural ventilation must be explored and implemented where feasible. Additionally, the use of more sustainable cooling methods such as free cooling or district cooling should be explored. To enforce these measures, designated zones can be established where waste heat disposal into public spaces is prohibited, effectively discouraging the use of conventional air conditioning systems.

Disaster risk management

Preparing urban spaces for heavy rainfalls: Using green infrastructure for circular rainwater management is the most sustainable and effective way to reduce the risk of flooding from heavy rainfall in cities. Protecting large natural landscapes within urban areas as flood retention and drainage zones creates effective green-blue corridors that manage stormwater by increasing infiltration and reducing runoff. Morphological analysis can help to identify low-lying areas that are suitable for controlled flooding during storm events. On a smaller scale, urban public spaces should be redesigned according to the principles of the 'sponge city', incorporating permeable surfaces, bioswales, and other nature-based

solutions to efficiently absorb and manage stormwater. An important basis for these efforts is to assess the degree of soil sealing in urban areas, with targeted reductions based on specific indices and targets for pavement removal and permeability.

Climate resilient coastal areas: Coastal areas require robust planning to withstand climate impacts. Shoreline management plans are essential tools for managing waterfront spaces, establishing flood protection or buffer zones, and enforcing building restrictions in danger areas. A variety of protective measures can be applied, including natural or green interventions such as shoreface nourishment, dune strengthening, and restoration of coastal wetlands. Additionally, grey interventions, such as storm surge gates, flood barriers, groynes, breakwaters, artificial reefs, seawalls, and jetties, provide engineered solutions to protect against sea-level rise and storm surges.

Managing risks in mountains and valleys: In mountainous inland areas, flood protection measures along rivers can be complemented by strategies for slope protection and avalanche zone planning. Forward-looking zoning regulations and building restrictions are crucial in these regions, as are large-scale retention areas along rivers and protective forests on mountain slopes. It's essential to consider climate change scenarios when assessing and managing these threats effectively.

Supporting biodiversity

Protecting and providing diverse habitats: The key measure to support diverse ecosystems is to safeguard and maintain heterogeneous natural areas where biodiversity can flourish. This involves not only protecting but also restoring natural landscapes, such as river restoration projects where urban or rural water bodies are redesigned to return to a more natural state, thereby re-establishing habitats for diverse plants and animals. This is also foreseen by the EU Nature Restoration Law.

Connecting natural habitats: Various animal and plant species have distinct habitat size requirements. To accommodate species that need ample space and facilitate genetic exchange between habitats, it is crucial to maximise connectivity among open spaces and avoid fragmentation of existing habitats. Ecological corridors can be established in various forms, ranging from tree-lined pathways and street-side greenery connecting urban parks, to wildlife bridges spanning highways in rural areas. These corridors enhance biodiversity by facilitating movement and interaction across landscapes.

Adapting ecosystems to changing climate conditions: As climate conditions shift towards hotter and drier summers, some ecosystems face challenges in sustaining their current forms. Municipal gardening companies are adopting new planting concepts for public parks and gardens, while urban areas are transitioning to tree species better suited to withstand heat and drought. In rural settings, farmers are adjusting their crop selections, and large recreational areas are increasingly replacing traditional lawns with more resilient alternatives.

Good Practice: Climate Analysis and Planning Information Maps

Zurich's climate analysis and planning information maps provide detailed information on air temperatures, cold air currents, and bioclimatic conditions during summer days and nights. They identify heat islands, compensation areas, and ventilation routes, aiding municipalities and planners in addressing urban heat issues. Differentiated for day and night, these maps assess climatic stress and relief functions, supporting regional planning and informing public participation.

For further information see Klimakarten und -daten | Kanton Zürich.

Good Practice: Climate-resilient Public Spaces in Paris

Paris has transformed its public spaces to enhance climate resilience, guided by strategic documents like the Paris Resilience Strategy and the Bioclimatic PLU. The city aims to create recreational areas during summer heat and facilitate active mobility. Natural solutions such as rainwater management, shade structures, and natural ventilation are used. Additionally, road spaces are reallocated for walking and cycling, increasing green spaces and promoting social well-being and biodiversity.

For further information see Paris Resilience Strategy.

2.3. Sustainable Mobility

Why is spatial planning relevant for mobility planning?

Spatial planning is crucial for mobility planning because it helps create public spaces and streets that accommodate the **evolving mobility patterns** of citizens and increasing demands on public spaces and streets. As individuals become increasingly flexible and multimodal in their travel patterns, spatial planning ensures that infrastructure supports a shift towards eco-friendly modes of transportation such as walking, biking and public transport. In addition to that, societal and **demographic changes**, such as an aging population, warrant changes in the way streets and public spaces are designed. Streets are no longer intended primarily for traffic. By integrating various needs into the design of public spaces, such as socialising, provisioning, and greening, spatial planning can **create streetscapes that are multifunctional and climate-resilient**, addressing both current and future challenges.

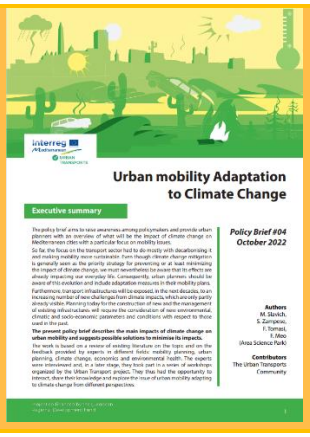
Moreover, the transportation sector significantly impacts the environment through **extensive land use for roads and parking and energy consumption from fossil fuels**, contributing to greenhouse gas emissions and pollution. Spatial planning can help mitigate these effects by promoting climate-friendly

mobility options. However, planners must not only consider passenger transport, but also freight transport, and the diverse needs of residents, local shops and visitors. By incorporating infrastructure for public transport, active mobility (biking, walking), micro-mobility (scooters), non-fossil fuel-powered (shared) vehicles and logistics, spatial planning can support the development of a more sustainable and efficient transportation system.

Good Tool: Policy Brief for Urban Mobility

The policy brief Urban Mobility Adaptation to Climate Change informs policymakers and urban planners about the impact of climate change on Mediterranean cities' mobility. It emphasises the need to incorporate adaptation measures in addition to decarbonising transport, as climate change is already affecting daily life. The brief highlights future challenges for transport infrastructures and suggests solutions to mitigate these impacts.

For further information see Policy Brief: Urban mobility Adaptation.



How to integrate mobility planning in spatial planning?

An orientation for climate-resilient mobility and spatial planning is provided by the Avoid–Shift–Improve (A-S-I) approach, which can serve as an inspirational framework when drafting plans and measures. The A-S-I Approach is comprised of the three hierarchically pillars of **avoiding, shifting and improving mobility**:

- **How to avoid traffic in your municipality?** Measures include planning for compact settlement structures and redesigning neighbourhoods to intermixed residential, work, and leisure districts to shorten travel distances and avoid trips. Concepts like the 15-Minute City or Transit Oriented Development (TOD) provide planning orientation in this regard.
- **How to shift modes away from energy intensive and fossil fuel dependent modes towards more environmentally friendly modes of transport?** Spatial and mobility plans should support increasing the share of walking, biking, public transport, or car-pooling and -sharing. The number of trips remains unchanged, but the aim is to create mobility options with minimal energy consumption per passenger-km, emissions, and land and resource use.
- **How to improve vehicle technology and systems to increase energy efficiency? The** third pillar aims to enhance energy efficiency for the remaining number of trips that cannot be avoided or shifted. This includes the change from fossil fuel-based vehicles to electric vehicles as well as the utilisation of digital technology.

What types of mobility measures to consider?

Reorganisation of streets

Road network categorisation as a future-oriented planning tool for combining roads into a coherent network. Different road types can be categorised, and climate-relevant planning and design guidelines can be defined for each type. This makes it possible to transparently assign functions and features to specific road types.

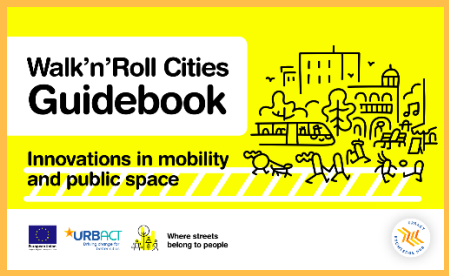
Parking and curbside management: The availability of parking spaces in central public areas takes up a lot of space and encourages car traffic. There are various instruments and restrictions such as parking fees and short-term parking zones that can be utilised as well as reducing the overall availability of parking spaces. Additionally, parking garages can be utilised instead of on-street parking. To increase acceptance for such measures consider using the revenue from parking fees to directly finance other mobility measures such as public transport. Space that was previously occupied by parking can be repurposed in a multifunctional and climate friendly way (e.g. park benches, urban gardening, greening, mobility points for sharing-vehicles).

Traffic calming zones: The introduction of traffic calming zones not only leads to a regulatory and ideally structurally induced speed reduction but also creates space for other functions like greening and encourages active mobility. It is crucial to consider freight transport in the planning phase. The redesign of roads can also be used as an opportunity to re-route or install infrastructure for energy or broadband. Well-known and relevant concepts to consider are superblocks, pedestrian zones or shared spaces.

Good Tool: Walk'n'Roll Cities Guidebook

The "Walk 'n' Roll Cities Guidebook" aims to familiarise public authorities, decision makers, urban planners as well as citizens with innovative concepts for mobility and public space. In three booklets, the challenges of sustainable mobility and public space, high-level visions as well as possible measures and steps to implement the transformation are presented step by step.

For further information see Walk'n'Roll Cities Guidebook.



Strengthen sustainable transport offers

Infrastructure for active mobility: The design and routing of active mobility pathways (walking, cycling) must be adapted to be climate-resilient in light of climate change. In increasingly hot cities, pathways need to be equipped with shading and cooling measures and resting areas (benches, drinking water). The networks for active mobility should be planned as densely and directly as possible with consideration of the human scale. Larger residential projects should also include semi-public footpaths to enable continuous paths for pedestrians. Additional infrastructure such as bike paths should be created on already paved surfaces and roads to avoid further sealing of soil.

Transport infrastructure as a priority in development projects: New places to live and work offer significant opportunities to encourage new mobility behaviours. Alternative and sustainable mobility solutions must therefore be considered and implemented from the outset of urban development projects. Public transport options should be available for use by the first residents of a development project. The public transport network should be extensive, with stops within walking distance (300 to 500 metres).

New mobility offers and mobility hubs support the transition from private cars to sustainable transport modes. Station-based car sharing or bike sharing systems, as well as infrastructure for carpooling, ride hailing and on-demand buses, provide comprehensive mobility solutions for all needs and offer an optimal combination with public transportation. Mobility hubs are strategically located at traffic intersections and central places and serve as central points for intermodal transportation connections. They offer a wide range of public transportation, sharing services and bike racks. Additionally, they can provide seating areas with shelters, solar panels and information points and amenities like self-service offers or water dispensers.

Promotion of eco-friendly propulsion technologies

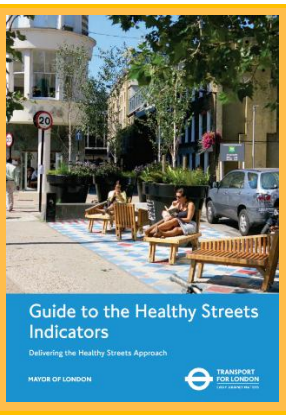
Zero and Low Emission Zones are spatially defined areas where the entry of all or certain fossil-fuel powered vehicles is limited or prohibited. This can be implemented for a specified period or the whole day. These zones function effectively with vehicle-use monitoring and enforcement as well as additional infrastructure offerings such as e-charging infrastructure or alternative mobility options (sharing e-cargo bikes, public transport improvements).

A robust **charging infrastructure** is essential for the widespread adoption of electric vehicles. The deployment of charging stations in both public and private spaces must be closely integrated with energy spatial planning. Charging stations can only be installed where the grid and energy capacity can support them, making it critical to plan the number, location, and type (slow, fast, or rapid) of chargers by assessing energy demand and availability. Strategic decisions must be made to ensure the placement of charging infrastructure in key locations, catering to public transport, freight logistics, shared mobility services, and private or commercial vehicles.

Good Tool: The Healthy Streets Approach

The Healthy Streets Approach is a framework for designing public streets that promote health and prioritise people in the planning process. Central to this concept are ten Healthy Streets Indicators. London has adopted the Healthy Street Approach and published the strategy *Healthy Streets for London* and the *Guide to the Healthy Streets Indicators*.

For further information see Healthy Streets for London & Guide to the Healthy Streets Indicators.



Good Practice: The Superblock Model

Superblocks are a mobility and urban planning concept that aims to calm traffic in residential areas and enhance the quality of public space. Several blocks of buildings are grouped together to form superblocks. Within these superblocks, motorised traffic is largely restricted to the surrounding streets. The interior of the superblocks is traffic-calmed, reclaiming the streets as public spaces with high-quality facilities away from car traffic. Barcelona is considered the pioneer city of this concept, others like Berlin with the SuperKiez or Vienna with the SuperGrätzel have followed suit.

For further information see Welcome to Superilles Barcelona.

2.4. Conflicts and Synergies

Why integrated planning matters

Spatial planning is inherently complex. It deals with long-term decisions under conditions of uncertainty, competing interests and limited resources. This complexity becomes tangible, when multiple sectoral demands materialise in the same physical space. Energy infrastructure, mobility systems, climate adaptation measures, housing, economic activities and public space - all compete for **limited land and resources**. If these interactions are not anticipated and addressed proactively, conflicts of use, inefficiencies and lock-in effects are likely to occur.

At the same time, space also offers opportunities for synergy. When interventions are coordinated across sectors and over time, the same space can fulfil multiple functions and generate added value. Integrated planning therefore does not eliminate complexity, but provides a framework to make conflicts visible, to negotiate trade-offs transparently and to deliberately **leverage synergies**.

While the previous sections of this chapter addressed renewable energy, climate adaptation and sustainable mobility separately, experience from practice clearly shows that sectoral planning alone is insufficient. Only an integrated approach allows municipalities and regions to navigate competing demands, avoid contradictory measures and achieve coherent spatial outcomes.

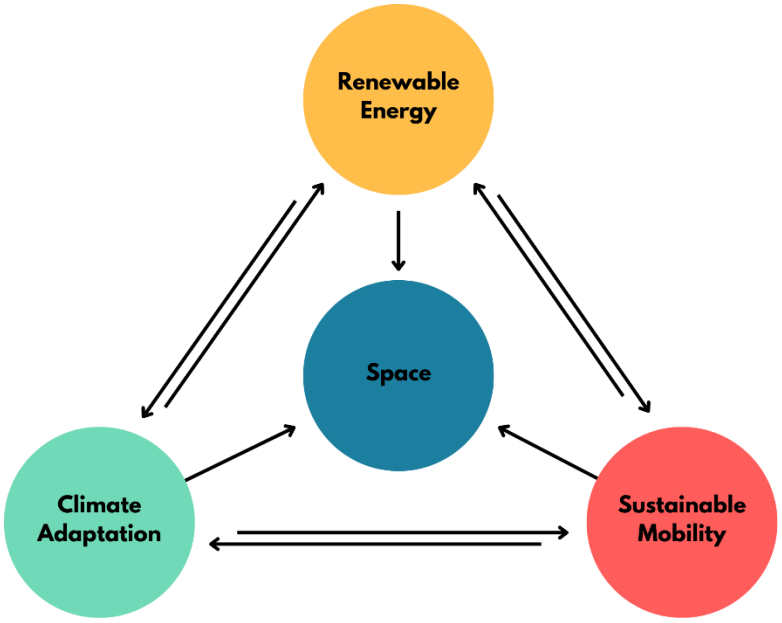
Space as the connecting dimension

Space is the practical interface where energy, mobility and climate adaptation intersect and where integration – or the lack of it – becomes visible.

Energy systems, mobility patterns and climate adaptation measures all have a strong spatial dimension:

- **Energy** generation, distribution and storage require specific locations, surfaces and networks.
- **Mobility** infrastructure structures streets, public spaces and settlement patterns.
- **Climate adaptation** relies on spatial elements such as green and blue infrastructure, ventilation corridors, retention areas or unsealed surfaces.

Recognising space as the connecting dimension helps planners to identify both potential conflicts and possible synergies early on. Integrated spatial planning provides the framework to systematically address these interactions, rather than responding to them in an ad hoc manner at later stages of implementation.



Spatial requirements of renewable energy, climate adaptation and sustainable mobility result in both competing demands and potential synergies.

Climate protection as a common strategic orientation

A shared, overarching objective that provides orientation across sectors is key to integrated planning. The EU-target of reaching **climate neutrality by 2050** provides a widely acknowledged guiding objective for local and regional authorities.

Achieving climate neutrality cannot only be delegated to individual sectoral plans or departments. Instead, climate protection targets need to function as a **common reference point** for all municipal strategies, projects and investments – including spatial planning, mobility, energy, housing and the design of public space.

From this perspective, climate protection is a cross-cutting mandate. It creates a shared direction that encourages actors to look beyond their sectoral responsibilities, to actively cooperate with other departments and to coordinate interventions in space and time. Without such an overarching orientation, sectoral strategies risk optimising their own objectives while collectively falling short of climate targets.

Integrated spatial planning provides the institutional and spatial framework to translate this common objective into concrete, place-based decisions. It enables municipalities to align sectoral measures, to manage trade-offs transparently and to ensure that individual projects contribute to the broader climate protection goals of the city or region.

Key strategic insights for leveraging synergies

Experience from municipalities across Europe highlights several recurring patterns:

- **Dense, mixed-use urban areas** provide favourable conditions for climate-friendly mobility behaviour and efficient energy systems due to concentrated populations and well-developed infrastructure. At the same time, they are often particularly affected by climate change impacts such as heat stress, flooding or reduced biodiversity, as they typically exhibit high levels of sealed surfaces and limited vegetation. This requires targeted adaptation measures that are closely coordinated with mobility and energy planning.
- **Sectoral objectives** are strongly interdependent. Measures that are effective from a single-sector perspective can create unintended conflicts if spatial interactions are not considered.
- **Coordination and timing** are crucial factors. Aligning planning processes, investments and implementation schedules across departments can significantly reduce costs, minimise disruption for residents and increase overall effectiveness.

Integrated planning does not aim to avoid all conflicts. Rather, it makes them explicit and manageable and supports the identification of solutions that generate co-benefits across multiple policy areas.

Synergies in practice: two typical planning contexts

Rather than providing an exhaustive catalogue, the following two planning contexts illustrate how integrated approaches can unlock synergies between climate protection, mobility and climate adaptation.

New Urban Developments

New development areas offer a unique opportunity to embed integrated solutions from the outset.

Typical synergies include:

- Compact, mixed-use layouts that reduce travel demand and enable high-quality public transport and active mobility.
- Green corridors that simultaneously function as biodiversity networks, climate adaptation measures and active mobility routes.
- Integrated energy concepts combining local renewable generation, waste heat utilisation, energy storage and low-temperature heating networks profit from a dense building structure and an early consideration in the planning process.
- Transit-oriented development, mobility hubs and car-reduced neighbourhoods that minimise land consumption and infrastructure needs.

Because spatial structures are still flexible, integrated solutions can be embedded structurally rather than retrofitted later at higher cost.

Urban Renewal and Transformation of Existing Areas

In existing neighbourhoods, integration is particularly important to manage constraints and avoid disruption.

Typical synergies include:

- Coordinating climate-proof redesign of streets and urban spaces with the renewal of underground infrastructure such as energy grids or district heating networks.
- Combining traffic calming and reallocation of street space with greening and nature-based solutions.
- Aligning heating and cooling plans with major infrastructure projects or broader urban renewal programmes.

Well-timed coordination across sectors can turn necessary infrastructure works into visible improvements for residents and users of public space.

Good Practice: Äußere Mariahilfer Straße, Vienna

The redesign of the Äußere Mariahilfer Straße illustrates integrated spatial planning in practice. The project combines the installation of district heating and cooling networks and the renewal of water infrastructure with climate adaptation measures such as new trees, greening, cooling elements and permeable surfaces to support rainwater infiltration. One car lane was removed by introducing one-way traffic, creating space for a high-quality, bi-directional cycle track, wider pavements and improved public space. Tram lines retain a dedicated track, ensuring efficient public transport while enhancing overall liveability.

For further information see Transformation of Äußere Mariahilfer Straße

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From integrated thinking to integrated action

The examples above demonstrate that conflicts and synergies are not exceptions, but the norm in spatial planning for climate action. Integrated planning does not aim to optimise individual sectors in isolation. Instead, it seeks spatially coherent solutions that contribute to climate protection while addressing mobility needs, climate adaptation requirements and quality of life.

2.5.IN-PLAN Checklist

The IN-PLAN Checklist is designed as a **quick screening tool** to support municipalities and regions in reviewing integrated plans and projects. It brings together key planning aspects presented in the previous sections and helps to assess whether important strategic and operational topics have been addressed. The checklist is **not intended to be exhaustive**. It serves as a structured reminder to inspire reflection, support internal discussion, and help identify potential blind spots or areas for improvement.

The checklist can be **ideally used at two key moments**: **At the beginning of an integrated planning process**, to help structure goals, align expectations across departments and stakeholders, and build a shared vision of integrated planning and **during the planning process**, to track whether the process and its outcomes are still aligned with integrated planning principles and objectives.

For each integrated planning aspect, users can indicate:

- **Relevance**: how relevant the aspect is for their local or regional planning context, and
- **Status of implementation**: the current stage of implementation (e.g. implemented, planned, etc).

A **more detailed version of the checklist** is available in the online version of the IN-PLAN Practice, which also includes examples of concrete measures. In addition, a **downloadable spreadsheet** of the checklist is provided. The spreadsheet can be customised by users. It also includes a **dashboard with visualisations** that provide a quick overview of:

- the local relevance of different planning sectors, and
- the level of implementation of sectoral measures in relation to their relevance.

Integrated planning aspects	Spatial planning	Climate Adaptation & Biodiversity	Sustainable Mobility	Renewable Energy	Relevance	Status of implementation
Spatial planning						
Prioritization of inner over outer settlement development						
Densification in existing settlement areas to optimise land use						
Control of the density of settlement structures						
Promotion of diversity of uses and mixed land uses						

	Spatial planning	Climate Adaptation & Biodiversity	Sustainable Mobility	Renewable Energy	Relevance	Status of implementation
Climate Adaptation & Biodiversity						
Climate-resilient transformation of existing public space						
Climate-resilient design of newly built public space						
Surface permeability and stormwater management in urban design						
Consideration of surface materials in urban planning regulations						
Integration of socio-economic aspects and climate adaption in analysis and planning						
Nature-based cooling and greening standards for buildings and plots						
Requirements for climate-responsive architecture and site planning						
Climate risk management and emergency preparedness						
Climate resilient design of public infrastructure						
Monitoring and safeguarding urban biodiversity						
Ecosystem protection and climate-resilient habitat design						
Sustainable Mobility						
Transport-oriented development: Alignment of building density with existing or future transport infrastructure						

	Spatial planning	Climate Adaptation & Biodiversity	Sustainable Mobility	Renewable Energy	Relevance	Status of implementation
Prioritization of traffic avoidance measures first, followed by mobility shift, and lastly technological improvements (according to the Avoid–Shift–Improve principle)						
Consideration of various trip purposes (such as commuting, leisure and tourism, business travel, or daily errands) in mobility planning						
Alignment with the 15-minute city principles						
Prioritization and integration of pedestrian and cycling needs in urban mobility planning						
Consideration of the needs of different socio-demographic user groups (gender, older people, children, etc.) in the design of mobility infrastructure						
Consideration of relevant mobility measures in the early stage of new development areas to foster new mobility behaviours						
Efficient and well-connected public transport routing						
Design of public transport stations to be accessible, safe, climate-resilient, multimodal, attractive, and centrally located						
Mobility solutions for low-density areas without access to conventional public transport						
Consideration of energy generation options when constructing new mobility infrastructure (stations, routes, garages, etc.)						
Traffic concentration on selected major roads with simultaneous traffic calming measures in neighbourhoods						

	Spatial planning	Climate Adaptation & Biodiversity	Sustainable Mobility	Renewable Energy	Relevance	Status of implementation
Regulations or measures to reduce fossil-fuel-based vehicle usage						
Traffic planning aimed at reducing motorized individual transport						
Flexible streetscape use depending on time of day						
Plan and regulate the location of loading zones, microhubs, and logistics yards to optimize urban logistics and reduce negative impacts on traffic and neighborhoods						
Use of waterways for freight transport (e.g. rivers, canals, lakes, sea)						
Access management for freight transport						
Promotion of low-emission and alternative drive systems in urban logistics						
(Re)Design of streetscapes and public spaces to enable multifunctional use and increase resilience to climate impacts						
Integration of vehicle sharing in urban planning						
Integration of multimodal mobility in urban planning						
Digital and analog infrastructure improvements to enable multimodal mobility						
Renewable Energy						
Assessment and anticipation of future energy demand trends across sectors and geographies						
Assessment of electricity and heat grid infrastructure to meet future energy demand						

	Spatial planning	Climate Adaptation & Biodiversity	Sustainable Mobility	Renewable Energy	Relevance	Status of implementation
Spatially differentiated strategies for building renovation and energy efficiency improvements						
Integration of energy-related needs and behaviours of different user groups into planning processes						
Assessment of energy supply solutions depending on building density						
Integration of efficient energy grid infrastructure in relation to the settlement structure and zoning						
Coordination of spatial planning with grid operators and energy suppliers (e.g. coordination of renewable energy infrastructure expansion with gas network decommissioning)						
Coordination of energy infrastructure construction with the transformation of public space						
Consideration of new uses for plots of decommissioned (fossil) power plants						
Consideration of spatial implications of energy storage infrastructure						
Planning of resilient energy infrastructure in climate risk areas						
Designation of priority areas for renewable energy generation in line with RED III (Renewable Energy Directive)						
Support local and decentralized production of renewable energy						
Consideration of spatial requirements for large-scale production facilities						
Integration of energy production with biodiversity measures						

3. The Integrated Planning Process

This chapter outlines a typical planning process for the development of an integrated spatial plan of undefined dimension and scale. It goes into detail on some of the important steps that need to be taken in preparation, development and implementation (monitoring). The process is illustrated with examples of tools and good practice projects to make the individual steps more comprehensible.

Phase 1: Set Up Integrated Planning Process

The development or revision of any (new) planning instrument needs to be well prepared. To set up an integrated planning process it is crucial to get a clear picture of the goals, timeline and the stakeholders to be involved. Integrated planning requires including the perspectives of experts from various sectors and cross-departmental collaboration will be mandatory in most cases. The development of reliable and feasible planning documents also requires the participation and support of the people who will be ultimately affected by these plans. The forward-looking coordination of various stakeholder groups according to their respective roles is therefore a core element in setting up an integrated planning process.

Questions to be addressed in this phase:

- ? How can we establish political commitment to the plan?
- ? Who is leading the planning process and are other partners needed to set it up?
- ? What is the timeline for the planning process incl. work packages, milestones and final delivery of the product?
- ? Which stakeholders should be involved in the integrated process, at what point and in which formats?
- ? Are there any risks to timely implementation of the process? How is the progress monitored and controlled?

Outcomes of Phase 1

- Established political commitment
- Clear roles and responsibilities in process management
- Clear process design and timeline
- Comprehensive vertical and horizontal stakeholder engagement plan
- Risk assessment

Establish political commitment

Leadership and formal commitment of political decision makers is a crucial precondition for the successful development and implementation of any (spatial) plan. Before you address the key decision makers you need to determine the right timing for the planning process. Even if the technical situation requires immediate action, current political processes may impede rapid realisation. Upcoming elections could slow down or accelerate political decision making. Current media presence of climate change issues could create a window of opportunity. Harmonisation with the development of other related activities could create leverage for advocating the plan on the political level.

When the timing is right, make sure to provide the key political leaders with a short informative briefing on the benefits of the plan and the resources needed. Inform politicians about the relevance of connecting energy, climate, mobility and spatial planning. Key arguments for a political audience may include:

- Connection of the plan to EU regulations and higher-level laws that require action.
- Opportunity for international recognition and visibility.
- Reference to main political narratives and overarching climate goals by the municipality.
- Focus on positive aspects and synergies, e.g. energy transition as a window of opportunity for the transformation of public space.
- Intended practical effects of the plan on the local level.

The decision in favour of the planning process should be recorded in writing and, in addition to the political will, should also include the allocation of sufficient resources (personnel, budget, time), as well as the further involvement of the political decision-makers until the final decision on the plan and the financial support for its implementation. Political authorities can further contribute to the implementation of effective climate measures by ensuring the integration of the plan's overall vision with other actions and initiatives (horizontal and vertical integration).

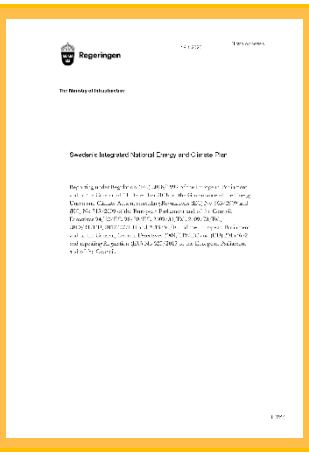
How to proceed:

- ✓ Make sure that the timing is right (e.g. upcoming elections, harmonisation with other activities).
- ✓ Collect good (political) arguments for the creation and implementation of the plan.
- ✓ Along with the formal political backing, ensure the allocation of adequate human and financial resources.
- ✓ Involve political decision-makers in critical moments throughout the planning process.

Good Practice: National Energy and Climate Plans (NECPs)

All European countries are obliged to draw up National Energy and Climate Plans (NECPs) in order to achieve the EU's common climate targets. These plans are based on political commitment and cover measures for decarbonisation, energy efficiency, energy security and the promotion of renewable energies. A good and valid NECP can serve as a basis for argumentation for the integration of climate measures into spatial planning.

For further information see Sweden's Integrated National Energy and Climate Plan.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Swedens Integrated National Energy and Climate Plan

Definition of clear roles and responsibilities in process management

In parallel to securing political commitment for the plan, it is important to establish clarity on who is responsible for the planning process, who will be the addressees in terms of implementation of the plan, and how the authorities can be included in the process to ensure their backing all the way up to implementation. Even when the process lead is clearly defined, e.g., by the legislative framework that regulates the development of a specific plan, it will be valuable to consider the role of other partners in the planning process. In terms of vertical integration, it could be vital to include different administrative levels, e.g., the national, regional or neighbourhood levels, in strategic decisions on the planning process. In terms of horizontal integration, it could be practical to establish inter-departmental cooperation

depending on the municipal structures and the topics to be addressed in the plan. The support of other administrative levels or departments could also be needed to initiate or set up the planning process. All these stakeholders should be taken into consideration when setting up the project management unit that could be interdisciplinary, inter-departmental and/or include different administrative levels.

At the same time, a steering committee with all relevant decision makers should be established. The composition of the committee also takes into account the relevant administrative levels and sectors. The steering committee will be regularly informed about the planning process and involved in key moments, where ground-breaking decisions are made. The continuous involvement of the political decision makers ensures their support of the process, their final agreement with the plan and their further commitment to implementation.

One of the first tasks of the management unit is to determine if external assistance will be needed for the planning process. A first estimate of human resources and know-how required for the task is compared to the human resources and expertise that is available within the involved administrative departments. If a gap is identified, external consultants could be hired to support the process or individual tasks.

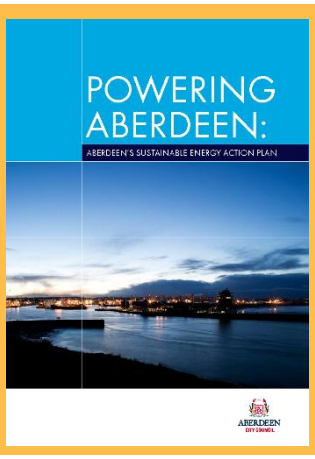
Many municipalities fully rely on external spatial planning offices for developing and writing up new or updated spatial plans, others seek external support for special tasks like data collection or facilitation of participatory processes. For the development of a spatial plan that includes aspects of energy, climate and mobility planning, the tender should clearly address consultants with adequate experience, e.g. in climate mitigation and adaptation planning, mobility planning and energy planning. The tender could also address a consortium of consultants that would cover all these requirements. The tasks for the consultant should be clearly defined along with the expected results and the timeline. Note that the involvement of external consultants can also be used to build capacity within the municipality.

How to proceed:

- ✓ Identify administrative stakeholders that are needed as partners to initiate the process.
- ✓ Ensure the involvement of political key stakeholders in the decision-making process.
- ✓ Determine if external assistance is needed and prepare adequate tender.

Good Practice: Aberdeen's Sustainable Energy Action Plan

The "Powering Aberdeen: Aberdeen's Sustainable Energy Action Plan" seeks to improve energy sustainability and reduce CO2 emissions through renewable energy, efficiency, and urban sustainability. Effective leadership and strong governance, led by the Aberdeen city council with stakeholder participation, are crucial. A steering group and sub-groups will oversee the plan. This plan serves as a strategy and framework for creating an energy-efficient, eco-friendly city. For further information see Powering Aberdeen.



Elaborate a clear process design and timeline

Based on the given framework of available time and financial resources, the project management unit sets up a detailed work plan and process design. The IN-PLAN Practice provides an overview of how a generic planning process could look like, encompassing setting up the process, conducting the initial baseline assessment, defining a common vision and goals, drafting the actual plan, and ultimately implementing and monitoring it. Each of these planning steps could be a work package in the process design (among others if needed). Each work package will have several specific tasks to be conducted until a defined deadline. Each work package and task should also have a designated stakeholder who will be responsible for its completion. These could be stakeholders from the management unit but also external consultants who have been contracted to support the planning process with their expertise.

There might be interim results to be presented to the steering committee to monitor the planning process and to give guidance for the next steps. Dates for meetings with the steering committee should be fixed as early as possible since political decision-makers are normally very busy. There might be other key meetings that could be scheduled already, like inter-departmental workshops or events for public participation. A regular meeting schedule for the management unit could be established. Beside these key events, certain deliverables or milestones could be determined to further structure the process and give some indicators for process monitoring.

For an integrated planning process, the coordination with other departments and sectoral experts will be crucial. Sufficient time should be allocated for joint workshops, exchange and mutual revision of interim results. Before the plan is submitted for adoption by the municipal council, ample time should be allocated for political coordination to ensure consensus on the final product.

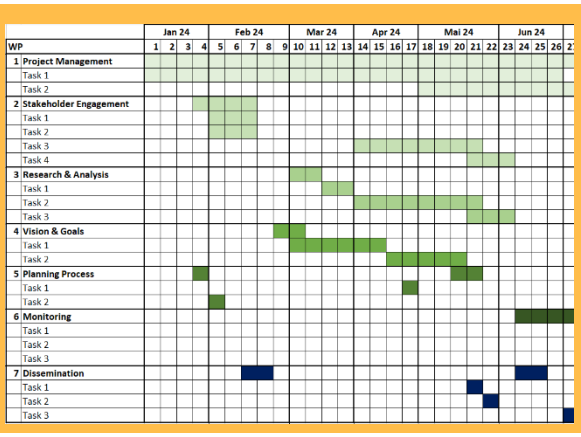
How to proceed:

- ✓ Establish work packages with clear responsibilities.
- ✓ Set dates for steering committee meetings, milestones and key events.
- ✓ Allocate enough time for sectoral and political coordination.

Good Tool: GANTT Chart

A GANTT chart visually maps out the sequence of activities within a project schedule using horizontal bars. The charts illustrate the beginning and end dates of project components, while also showcasing how tasks are linked together. Gantt charts can be used for planning complex processes but also to keep track of progress.

For further information see What is a Gantt Chart?.



Develop a comprehensive stakeholder engagement plan

The sustainable transformation of living environments necessitates the active contribution of all societal members. Broad stakeholder engagement is therefore essential for the successful creation and implementation of an integrated spatial plan encompassing climate, energy, and mobility planning.

There are several benefits of stakeholder participation in all stages of a planning process:

1. The analysis of different perspectives enriches the assessment phase and raises awareness for issues that would otherwise go unnoticed;
2. Diverse stakeholders come up with different approaches to solving various problems;
3. Stakeholders who are engaged in the planning process are more likely to accept the results and support the implementation.

To ensure effective stakeholder involvement, start with comprehensive stakeholder mapping. Convene with your team to identify relevant stakeholder groups for the plan's development and implementation. Discuss each group's specific role, how they relate to the endeavour, and the best methods to include them in the process. Consider stakeholders from various spatial layers and sectors, including the private sector, academia, civil society (such as NGOs, associations, and residents), the public sector, and other institutions. Determine if stakeholders active on regional, national, or international levels need to be included.

Next, assess how each group is affected by the plan and how they can influence its implementation. Identify the resources and expertise each stakeholder possesses that could be beneficial and evaluate the influence and potential conflicting interests among stakeholder groups.

Once you have a thorough understanding of the stakeholders and their roles, define how to include them in the process. Determine the appropriate level of involvement for each stakeholder, ranging from mere information sharing to empowering them to take an active role in the transformation process. Recognise that stakeholders will have varying resources and capacities for participation and may require different tools and formats for effective involvement. If you have little experience with participatory formats, consider seeking external assistance to set up and implement the stakeholder engagement plan.

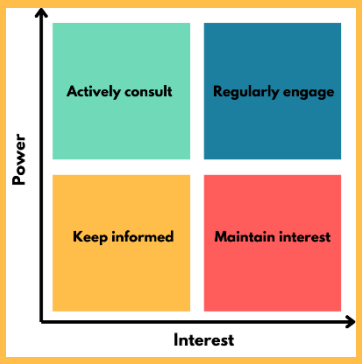
How to proceed:

- ✓ Identify the stakeholders that need to be involved in the planning process.
- ✓ Define the specific role of each stakeholder group in the planning (and implementation) process.
- ✓ Include timeslots and adequate formats for stakeholder participation in the process design.

Good Tool: Power-Interest Matrix

The Power-Interest Matrix is a tool used in project management to classify stakeholders according to their level of influence over the project and their level of interest in it. This matrix assists in developing targeted communication and engagement strategies tailored to the specific needs and expectations of stakeholders.

For further information see Enhancing Stakeholder Engagement through the Power/Interest Matrix.



Conduct overall risk assessment

A risk assessment identifies and analyses potential risks that could affect the success of a project or a process, focusing on the probability of occurrence and the impact if they do happen. While risks cannot be entirely avoided, risk management methods used in project management, such as the project risk assessment matrix, help evaluate potential damages and enhance the likelihood of successful project and process completion. The assessment process involves systematically identifying, assessing, and controlling hazards, determining both quantitative and qualitative values of risks, and measuring the probability of these risks becoming reality.

Various types of risks can arise, varying depending on the nature of the project. Your experience from previous projects will provide valuable insights into potential risks. These risks can be categorised as internal or external. Common risks include financial risks, schedule delays, unsatisfactory performance or implementation, poor management decisions, legal liabilities, and environmental changes. Some risk assessment approaches also consider "positive risks" or opportunities. It is important to remember that risks are often interdependent and can influence each other.

Risk assessment should be conducted at the beginning of a project. Start with a risk identification session involving the entire project team, following every step along the project timeline. Reviewing similar past projects can help ensure that no potential risks are missed. Clearly state each risk with its cause, nature, and potential impact to understand its scope.

Once all potential risks are identified, analyse their relevance to your project. Determine each risk's time frame, probability, factors, and impact: how likely is the risk to occur, and what would be the scale of its impact? The more likely and impactful the risk, the more seriously it must be taken. Develop a risk management strategy outlining the activities you will undertake to address each risk. Preventive measures may include avoidance, mitigation, transfer, or acceptance. The choice of strategy depends on the risk's nature and the project's capacity to manage it.

As your project progresses, schedule periodic meetings to monitor risks, take action, or adapt the management strategies as necessary. This ensures the risk management process remains dynamic and effective over time.

How to proceed:

- ✓ Identify potential risks to (timely) implementation of the process.
- ✓ Evaluate the risks and develop measures for mitigation.
- ✓ Monitor the risks along the working process.

Good Tool: Risk Matrix

A risk matrix is used to define the level of risk by considering the category of likelihood against the category of consequence severity. This is a simple mechanism to increase visibility of risks and assist management decision making.

For further information see Risk matrix.

Likelihood	Harm severity			
	Minor	Marginal	Critical	Catastrophic
Certain	High	High	Very high	Very high
Likely	Medium	High	High	Very high
Possible	Low	Medium	High	Very high
Unlikely	Low	Medium	Medium	High
Rare	Low	Low	Medium	Medium

Phase 2: Baseline Assessment

In the initial phase of spatial planning, it is essential to thoroughly understand existing policies, planning documents, and the legal framework. This includes identifying which documents are required and available, and which existing legal instruments can be utilised. Additionally, reviewing international, national and regional good practice examples can guide and inspire the work. It is crucial to evaluate what spatial data is available, what additional data is needed, and how to access and manage this data. This foundational stage should also encompass an analysis of the relevant information the data provides about the current status and future development of the area. These steps are vital for refining the decision-making process in formulating visions and objectives for land use planning in the subsequent phase.

Questions to be addressed in this phase:

- ? Which existing planning documents and legal frameworks need to be taken into account?
- ? Which (international) good practice examples can guide and inspire our work?
- ? What (spatial) data is available, what other data do I need, how can I access and manage this data?
- ? What relevant information can the data give about the current status of the place and how it will develop in the future?

Outcomes of Phase 2

1. Review of existing planning documents, strategic plans, current measures, planning guidelines and legal instruments.
2. Understanding of contemporary standards and good practice examples in the field.
3. Data acquisition and data management plan.
4. Status quo analysis and forecast.

Review of existing planning documents and legal frameworks

Many municipalities and administrative regions have access to detailed national, regional, and local strategic documents addressing sustainable development, climate change mitigation, and adaptation, such as energy plans, SECAPs, and SUMPs. Despite their availability, the objectives and actions outlined in these documents often remain disconnected from spatial planning initiatives.

While sustainable development is frequently mentioned as a goal in land use planning, it is often not specifically reflected in existing legislation. Additionally, municipalities typically do not control aspects like energy generation within their communities. A complex legal hierarchy defines the possibilities, mandates, and objectives for spatial planning, yet these legal instruments are often underutilised due to limited knowledge or ambition. Some important aspects, such as addressing building stock, are excluded from spatial plans because municipalities lack the legal authority to include them. A more robust legal framework could significantly enhance municipalities' ability to make effective and spatially nuanced decisions.

How to proceed:

- ✓ Screen planning documents, planning guidelines or other sectoral plans for measures and actions that might be addressed in spatial plans.
- ✓ Get a clear understanding on aspects your municipality has the legal mandate to address in spatial plans.
- ✓ Check what other instruments (other plans, building permits, contracts etc.) can be utilised to achieve a specific goal, if not spatial plans, to deal with specific issues.

Good Practice: Let's Fill Streets with Life

The Let's Fill Streets with Life programme in Barcelona is based on various municipal plans (Barcelona Climate Commitment, Urban Mobility Plan, Green and Biodiversity Plan, etc.), as well as the previous Superblock Program for 2011-2015. It creates synergies, coordinates these plans in a cross-cutting manner, and provides a vision for comprehensive change to develop the strategic lines set out in this legislation.

For further information see Let's Fill Streets with Life.

Understanding of contemporary standards and good practice examples

Researching good practices is essential for effective spatial planning, as it provides valuable insights and inspiration for implementing innovative solutions in your city. To achieve the best possible outcomes, it is crucial to understand the available options and what contemporary standards entail.

Start by examining the specific standards relevant to your country, region, and municipality. This ensures that new strategies align with local regulations and expectations. For instance, reviewing ambitious spatial planning initiatives within your own region can highlight successful approaches that are contextually appropriate.

Next, look at comparable municipalities with established good practices. Cities like Copenhagen and Amsterdam offer exemplary models in integrating sustainable transportation and green infrastructure. Analysing these cases can reveal practical solutions and innovative approaches that might be adapted to fit your local context.

International comparisons with best practice examples are particularly valuable for understanding what is achievable in implementation. They help you see beyond local constraints and explore cutting-edge solutions that could enhance spatial planning in your municipality. By drawing on both local and international examples, you can develop more effective and forward-thinking strategies that contribute to creating resilient and liveable urban environments.

How to proceed:

- ✓ Examine contemporary standards specific to your own country, region and municipality.
- ✓ Search for good practices within your country/region regarding ambitious spatial planning.
- ✓ Look at comparable municipalities with good practice examples.

Good Practice: Dutch Cycling Embassy

The Dutch Cycling Embassy is a public-private network promoting sustainable bicycle mobility. They offer good practice examples, a knowledge base with over 600 blog posts, and regular updates on cycling improvements in the Netherlands and globally. Thematic platforms like this are valuable for researching good practices for your municipality. European research projects also collect good practices, aiding the development of your own strategies and plans.

For further information see Dutch Cycling Embassy.

Data Acquisition and Data Management

Effective data acquisition and management are fundamental to successful spatial planning projects. The first step is to determine the specific types of data needed for your project. This involves considering all relevant factors such as geographic information, infrastructural details, environmental data, and socio-economic statistics. Keep in mind that qualitative data from interviews or observations can also be an important source for analysis. Understanding these requirements upfront helps to focus your efforts on gathering the most pertinent information. For instance, if your project involves urban development, you might need data on population density, traffic volumes, green spaces, and existing infrastructure.

Next, compile a comprehensive inventory of existing data from various sources, including open data platforms, public databases, and private sector resources. Open data is often freely available online but must be checked for source reliability. Public data is owned by national or regional authorities, while private data can come from utility companies, such as infrastructure details and mobile phone usage data. Assess the availability and quality of these data sets to understand what you already have. This step helps identify what data is readily accessible and what might require further effort to obtain.

With your inventory in hand, analyse the existing data to identify any gaps. Determine what crucial information is missing that you need to collect or acquire to complete your data set. For example, many municipalities may lack reliable data on emissions, actual energy consumption, renovation activities, and mobility patterns. When baseline data is unavailable, consider using tools like hectare grids (e.g., Heatmap, PETA for energy data) to estimate missing information. Conducting surveys can also be essential to fill these data gaps effectively.

Design a clear process for acquiring the required data. Identify potential data providers and determine how you can collect the data. This might involve establishing agreements with private entities to access their data or conducting field surveys and utilising advanced methods such as sensors, drones, and satellite imagery. It is advisable to sign non-disclosure agreements for data procurement if no legal basis exists, especially for sensitive information like building-specific consumption data from energy providers. Familiarise yourself with data protection laws and guidelines, such as the EU's General Data Protection Regulation (GDPR), to ensure compliance.

Implement a robust data management system to ensure coherent storage, processing, and usage of data. A well-designed data management plan should outline procedures for data generation or acquisition, processing, conservation, and sharing. It needs to be shared with, understood, and applied by all employees. This plan should indicate what data should be collected, how it will be managed, the methodologies and standards to be applied, sharing channels, and processing and storage methods.

Handling metadata, which includes additional information accompanying tables or databases, is also crucial. Privacy protection is paramount when collecting, storing, and sharing data, especially personal data. Sometimes data may need to be generalised, aggregated, or anonymised to avoid breaches. Centralise data retention, define clear procedures, provide complete documentation, and organise data consistently. Adopt a versioning system, make regular backups, use real-time collaboration tools,

monitor data access and review, and provide adequate technical assistance to ensure correct management and use of data.

While there is an initial investment in training, cleaning data, and setting standards, the return on investment is quick. It saves time and ensures consistent results over time, contributing to future resilience. As the environment changes, keeping data up to date is crucial to ensure its accuracy and reliability. Information needs to be recorded at regular intervals, especially for dynamic data like energy and mobility.

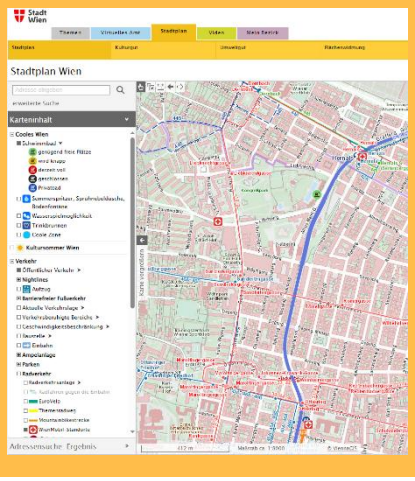
How to proceed:

- ✓ Determine the specific types of data needed for your project.
- ✓ Compile a comprehensive inventory of existing data from open, public, and private sources. Assess the availability and quality of data to understand what you already have.
- ✓ Analyse the existing data to identify any gaps.
- ✓ Design a clear process for acquiring the required data. Identify potential data providers and determine how you can collect the data.
- ✓ Implement a robust data management system based on a well-designed data management plan to ensure coherent storage, processing, and usage of data.

Good Practice: ViennaGIS City Map

The City of Vienna's online city map is an accessible tool providing extensive geo-information. It includes layers with public transport routes, cycle paths, public facilities, zoning and development plans, monument protection, and world heritage sites. This map is part of Vienna's comprehensive GIS database, supporting analyses and spatial projects. This data foundation promotes transparency and informed decision-making for Vienna's sustainable growth and development.

For further information see Vienna City Map.



Status Quo Analysis and Forecast

Data availability is not an end in itself. The aim of analysis and forecasting is to combine available data in a meaningful way in order to derive new knowledge and thus provide a crucial basis for evidence-based decision-making in future planning. Basic research is essential in spatial planning and must be carried out thoroughly in order to provide well-founded justifications for spatially differentiated decisions, especially in the event of legal challenges.

In the context of spatial planning, data is usually analysed spatially, i.e. represented on maps. The mere visualisation of spatial data on a map is often already the first step towards meaningful analysis, as

things become tangible and relate to the real space. In addition, geo-information systems provide a wealth of analytical tools and possibilities for combining and analysing spatial data. Overlaying different data sets is a simple but very useful way of understanding spatial relationships between circumstances. In mobility and infrastructure planning, the analysis of distances and connections between different points of interest is an important task.

Many datasets are available over a longer period of time, allowing for spatio-temporal analysis and even forecasting. Innovative planning support techniques and tools, such as urban energy maps, environmental maps, climate maps, heat maps, and other spatial and temporal visualisation and mapping tools have the potential to facilitate efficient use of resources and better decision making, including using urban systems modelling for mobility and energy consumption in buildings. They can help to gather information and to understand the need for policies and actions.

Before embarking on a new analysis, it will be helpful to review what is already available and to update existing spatial analyses and scenarios. It is also a good idea to share knowledge about analytical tools and approaches with other communities and regional and national authorities: Are there already established tools for analysing specific datasets? Are there analyses at the national or regional level that you can use for your purposes at the local level? This step should increase efficiency, but also ensure coherence of data use within the country or even the EU.

If you have identified gaps in data analysis that are relevant to your project, you can carry out or commission this task. At this point you may also want to collaborate with other local or regional authorities: What are the appropriate boundaries for the analysis? Perhaps the study should be carried out for the whole region rather than a single municipality? Collaboration in this regard can save time and money, and will contribute to more comprehensive spatial planning. Remember that in addition to the spatial dimension, time is an important factor. Forecasts and different (growth) scenarios should be included in your analysis where appropriate.

Ultimately, the analysis should help you to identify and assess specific needs and challenges, e.g. infrastructure needs for new energy distribution systems, for storage solutions, for new public transport, for new green spaces, etc. It will also provide the basis for developing scenarios and testing proposed spatial interventions. In many cases, it will also identify possible solutions that can be further explored in the planning phase.

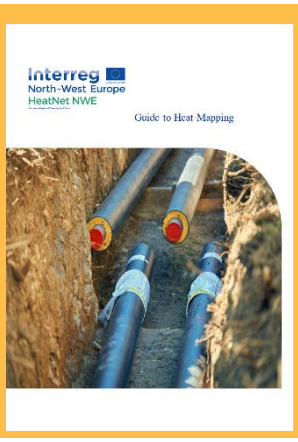
How to proceed:

- ✓ View and, if necessary, update existing spatial analyses and scenarios.
- ✓ Exchange knowledge about analytical tools and approaches with other municipalities, as well as regional and national administrations.
- ✓ Carry out or commission the (spatial) analysis and processing of all available data that is relevant to your project.
- ✓ Include forecasts and different (growth) scenarios in your analysis.
- ✓ Based on the analysis, identify and evaluate specific needs and challenges.

Good Practice: Guide to Heat Mapping

Heat Maps are important analytical tools for spatial and energy planning. They help match energy demand with local resources, showing heat density, current supply sources, and potential renewable or waste heat sources. The HeatNet NWE Guide to Heat Mapping gives detailed guidance on how to develop Heat Maps and which information can retrieved from them.

For further information see Guide to Heat Mapping.



Phase 3: Common Vision and Goals

While the baseline assessment provides a municipality or region an understanding of the current framework and circumstances they are working in, developing clear goals and a vision is crucial for defining the purpose of the planning process. This stage involves asking key questions: Which problems should be addressed through integrated spatial planning? What is the future vision for the municipality or region in relation to these challenges? Which measurable goals should be achieved? It is essential to ensure that the established vision and goals align with exiting strategies, planning documents, and overarching objectives. This alignment guarantees coherence and compatibility with current policies and initiatives. Furthermore, it is important to build support and foster a common understanding of the vision and goals to secure overall commitment to the process. At this stage, engaging all relevant stakeholders is necessary to consider diverse interests and perspectives.

Questions to be addressed in this phase:

- ? What is the overall vision and what are the goals of the project?
- ? How can all relevant stakeholders be brought on board with the defined vision and goals?
- ? Are these goals consistent with the targets defined in overarching (inter/national) strategies?

Outcomes of Phase 3

1. Agreement on overall vision and goals.
2. Broad commitment to vision and goals by all relevant stakeholders.
3. Alignment of goals with overarching strategies.

Agreement on overall vision and goals

A common understanding of current problems forms an essential foundation for developing of a vision. The baseline assessment in the previous phase should have established a robust database and basic maps to provide insights into various spatial challenges. However, at this stage, it is crucial to involve political, public, and private stakeholders to broaden the understanding of local problems. Engaging these stakeholders helps identify nuanced issues and ensures a more comprehensive perspective. Additionally, local challenges should be contextualised within global developments, such as climate change, to understand their origins and dynamics better.

Creating a shared vision for the future is a crucial step in integrated spatial planning. A vision provides a long-term perspective and a framework for decision-making. It should encompass aspirations for a sustainable, resilient, and inclusive community that effectively addresses climate change adaptation, mobility, and energy planning. This vision could include: communities that are well-prepared for climate impacts, with robust infrastructure and adaptive strategies to manage extreme weather events; a transportation system that promotes walking, cycling, and the use of public transit, reducing dependency on private vehicles and lowering carbon emissions; and a commitment to renewable energy sources, such as solar, wind, and geothermal, alongside improved energy efficiency in buildings and infrastructure. The vision should be developed through a participatory process, involving stakeholders from various sectors and levels of government to ensure it reflects the community's values and aspirations (see also next steps).

Based on the overarching vision, specific, measurable, achievable, relevant, and time-bound (SMART) goals should be established. These goals will guide the planning process and ensure that efforts are focused and effective. In the process of setting goals, conflicts may arise. For instance, expanding green spaces might compete with the need for new housing developments. These conflicts should be addressed through transparent dialogue and negotiation, prioritising actions that provide the greatest overall benefit. Trade-offs may be necessary, and a balanced approach should be taken to ensure that progress in one area does not unduly compromise another.

How to proceed:

- ✓ Identify the primary problems and challenges that need to be addressed.
- ✓ Develop an overall vision for the future that incorporates climate change adaptation, mobility, and energy planning.
- ✓ Based on the vision, establish a set of realistic goals to be achieved through the plan.

Good Tool: Newspaper of Tomorrow

This visioning tool helps stakeholders create a shared vision by imagining future headlines for a newspaper. Participants are drafting headlines, sub-headlines, and storylines as if written in a newspaper, magazine, or blog two to five years into the future. Ideal for city practitioners and local stakeholders.

For further information see Newspaper of Tomorrow.

Broad commitment to vision and goals by all relevant stakeholders

The key to broad commitment is participation. Of course, you will already have defined this moment as a crucial point in your stakeholder engagement plan. Involving different types of stakeholders – public, private, civil society, academia, etc. – in the discussion about problems, vision and goals is essential. On the one hand, they bring in a variety of perspectives and real live experiences, that public administration alone can never account for. On the other hand, enabling broad involvement in the first stages of the planning process, establishes public and political backing for the plan. Bringing in the perspectives of colleagues from other departments will also be extremely useful in this planning phase.

This could also be a moment to revise your stakeholder engagement plan as you might encounter stakeholders that seem more valuable to the planning process than expected or others that turn out less relevant. It is important to mention, that this is not the only moment in the planning process, where stakeholders should be involved. But we would like to highlight this as one of the most crucial instances to ensure broad commitment.

How to proceed:

- ✓ Engage relevant stakeholders in the definition of problems, vision and goals.
- ✓ Establish broad political agreement on the defined vision and goals.

Good Practice: Barcelona's Climate Plan

"Barcelona's Climate Plan 2018-2030" is a holistic approach to combat climate change, engaging all stakeholders in a unified vision. With ambitious goals like a 45 % emissions cut by 2030 and climate neutrality by 2050, the plan emphasises collaboration and inclusivity, incorporating input from citizens and over 1,800 organisations. Its aims span from mitigating climate impact to promoting adaptation, ensuring climate justice, and empowering citizen action, reflecting Barcelona's commitment to a sustainable future.

For further information see Climate Plan Barcelona.

Alignment with overarching strategies

A long-term overall strategy to achieve climate neutrality can effectively guide municipal development and planning. Clearly defined visions and goals are essential foundations for this strategy. Once specific goals are agreed upon, it is crucial to ensure they are collectively aligned. This alignment allows for proper prioritisation and implementation of measures and subsequent actions. Additionally, the defined vision and goals should be harmonised with existing energy and climate policy objectives at local, regional, national, and international levels, ensuring coherence and integration with broader policy frameworks.

Policymakers and other relevant stakeholders are often unaware of the intricacies of territorial systems, their interrelations, and a unified vision for long-term objectives. Understanding these aspects is essential for securing political support, driving local action, and ensuring the political commitment necessary to mobilise resources for implementing plans and fostering synergies among ongoing initiatives. Furthermore, it is important that the defined vision and goals align with contemporary legal and normative standards, providing a robust legal basis for actions and facilitating compliance and support.

Additionally, this is a critical moment to involve colleagues from other departments or administrative levels to ensure coherence of visions and goals with spatial relevance. Cross-departmental and inter-level collaboration enhances the integration of diverse perspectives and expertise, ensuring a more comprehensive and effective approach to achieving climate neutrality. This involvement ensures that the strategy is not only aligned with various administrative agendas but also benefits from a multidisciplinary approach, strengthening the overall planning process.

How to proceed:

- ✓ Ensure that the defined vision and goals are harmonised with existing (energy and climate policy) objectives on the local, regional, national and international levels.
- ✓ Ensure that the defined vision and goals are in line with contemporary legal and normative standards.

Phase 4: Planning Phase

Based on the previously identified local problems and the goals agreed upon with all relevant stakeholders, it is now necessary to define activities and measures and to carry out spatial scenarios and modelling, based on which a spatial plan can then be drawn up. The intersection of different thematic indicators can assist in identifying positive as well as negative interactions of spatial designs. The aim is to develop a well-founded, spatially justified decision-making basis to create a feasible formal draft of the plan and subsequently publish a final plan.

Questions to be addressed in this phase:

- ? Which measures can I take to reach the defined goals?
- ? Are these measures effective? Which measures are most effective?
- ? How can I put these measures together into a consistent action plan?
- ? Is this plan feasible and effective?
- ? How can I finalise the plan and ensure the backing of all relevant stakeholders?

Outcomes of Phase 4

1. Potential measures are identified.
2. Various scenarios are modelled and simulated.
3. Drawing up a draft plan.
4. Final check for feasibility and spatial impact
5. A formal draft is created and agreed upon.

Potential measures are identified

In this phase, the goal is to identify and gather measures that will help achieve the defined objectives. Start by understanding the types of measures needed. Assess the existing measures currently in place to determine which can be expanded or enhanced. Measures can generally be categorised into four main types: construction/technical measures, such as infrastructure projects and other technical enhancements; conceptual measures, including strategic plans like a heat action plan; regulatory measures, which involve creating and enforcing restrictions and regulations; and informative measures, such as educational and awareness campaigns.

In the ideal scenario, the measures you select should not only focus on achieving individual goals but also meet several additional quality criteria:

- **Practical Utility**: The measures should maintain their effectiveness even in the face of changing future forecasts.
- **Cross-Sectoral Value**: They should generate added value across various subject areas, fostering synergies and collaborative benefits.
- **Flexibility**: Measures should be designed to adapt to evolving conditions and requirements.
- **Climate Considerations**: They should incorporate elements of climate resilience, adaptation, and protection.
- **Resource Optimisation**: Measures should make use of existing resources and opportunities for integration and linking with other projects.

When identifying measures, it is beneficial to think creatively and interdisciplinarily, identifying a range of adaptation options to achieve the defined goals. In addition to researching databases and literature as well as having in-house experience, exchanging insights with neighbouring municipalities, counties and regions, or assembling of (inter-)national best practices can be valuable for collecting potential measures. Workshop and dialogue formats with identified public or private stakeholders as well as creativity techniques such as mind maps can support the ideation process.

Creating lists and profiles of measures provides a structured overview and facilitates a deeper understanding of the prioritised measures. To achieve this, a catalogue of measures can be developed, typically consisting of two main sections: an overview of all identified measures and a refined set of prioritised measures. The prioritised measures are then detailed into profiles through collaboration with relevant stakeholders. While there is no standardised template for a catalogue of measures, it is crucial to establish a clear structure from the outset. This ensures uniformity for comparison and facilitates the ongoing use of the catalogue in subsequent steps. A catalogue of measures is often presented in tabular format and generally includes the following basic categories: a unique code for each measure, a brief description, the associated goal, the target group, the implementation period, relevant spatial planning instruments, and potential cooperation partners. In order to prioritise measures, it might also be helpful to make a first review of potential financing options (see chapter 4).

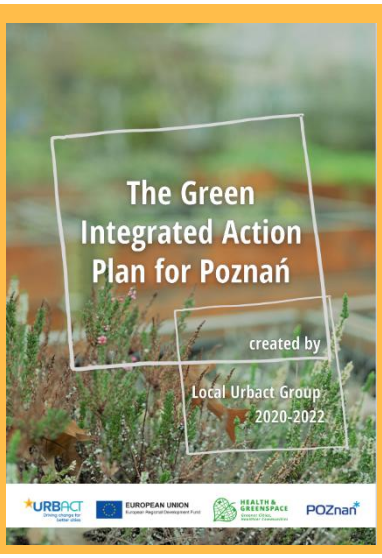
How to proceed:

- ✓ Draw up a list of possible measures. Use the IN-PLAN Checklist!
- ✓ Discuss and specify the collected measures with relevant stakeholders.
- ✓ Create measure profiles for prioritised measures.

Good Practice: Integrated Action Plan (IAP)

Cities and projects that are part of the URBACT network for action planning draw up integrated action plans, which can be downloaded from the URBACT website. One project is the Health & Greenspace project, which focussed on the health benefits of urban green spaces, the lead partners created integrated action plans for their various projects and strategies. Check out how the cities of Poznań (PL) and Breda (NL) drew up their action plans.

Find the action plans of the Health & Greenspace project; Action Plan Breda; Action Plan Ponzan.



Various scenarios are modelled and simulated

Once a pool of measures has been identified, the next step is to assess and categorise their actual impact to establish a basis for decision-making. It is crucial that these measures effectively contribute to achieving the defined goals. To quantify the impact, criteria for evaluating the measures should first be defined so that a score can be determined for each measure in the subsequent analysis. Possible criteria include goal effectiveness, climate impact, implementation timeline, spatial level, synergies, conflict potential, or resource requirements.

Depending on the available resources and in-house expertise, there are different methods to assess the effect of measures. Besides using more complex simulation tools or spatial planning software, simpler methods can be used to estimate effectiveness. For example, the created measure profiles (Phase 4.1)

can be supplemented with the established categories. The criteria for each measure are then assessed with the participation of relevant stakeholders. Note that the input of colleagues from various departments can be particularly helpful to assess synergies and conflicts of measures in relation to other thematic fields.

An effective step in prioritising measures is the creation of various scenarios. A scenario consists of a set of assumptions and conditions that describe a possible future development for a specific area. When developing scenarios, you should define a specific time frame or different time horizons (long-term, medium-term, short-term) and consider key assumptions, for example related to the impact of climate change, the settlement development or economic trends. Select these topics according to their relevance to your plan. Furthermore, create scenarios with current tendencies, as well as optimistic and pessimistic scenarios to check and compare the resilience of the defined measures. The status quo analysis and forecast (phase 2.4) form the basis for scenario development.

Once the scenarios have been created, they should be analysed and compared depending on the method and tools used. A possible visualisation of the scenario results or the impact of specific measures using maps, diagrams or other formats such as dashboards could also be helpful, especially when involving citizens, to highlight the opportunities and risks of each measure. A structured approach to evaluation is essential to provide a solid basis for decision-making. The decision-making process should be transparent and easily comprehensible. This transparency is crucial for acceptance by both the public and decision-makers.

How to proceed:

- ✓ Decide how you want to assess the effect of measures.
- ✓ Model various scenarios with the selected pool of measures.
- ✓ Evaluate and compare the measures per scenario.
- ✓ Include the public in the process of decision-making.

Good Practice: Decide Madrid

Decide Madrid is the digital platform for public participation created by the Madrid City Council. Through this platform, citizens can actively participate in developing action plans and suggest ideas, measures, and projects they believe will benefit the city. Other participants can then support these suggestions with votes and comments.

For further information see Decide Madrid .

Draw up a draft plan

Once the effects of the measures have been compared and evaluated, it's time to determine which measures will be included in the plan and how they will be implemented. Detail the prioritised measures clearly to ensure that all stakeholders have a thorough understanding and to prevent any

misunderstandings. Seek support from relevant stakeholders as needed, and engage in discussions to refine, clarify, and enhance the selected measures. If necessary, identify key measures that will be pivotal. Consult with the steering committee, if one has been established, to ensure political backing for the decision. Select the final measures that are both feasible and most effective in achieving the goals.

Once the measures have been selected, formulate an action and implementation plan to achieve the goals. You should clarify responsibilities, urgencies, possible collaborations, existing dependencies, expected costs and resources, target groups, and an implementation schedule. In the schedule, you define the implementation timeframe for each measure. The timing of the measures should be arranged to maximise synergies between the different subject areas. If possible, coordinate the schedule with other relevant departments and projects to create further synergies.

Now it is time to write the first draft of the plan!

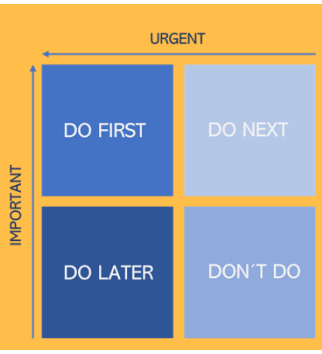
How to proceed:

- ✓ Select the measures with the highest impact and most synergy effects.
- ✓ Define and elaborate the concrete measures.
- ✓ Identify key measures if necessary.
- ✓ Create an action and implementation plan for the measures.
- ✓ Write the first draft of the plan.

Good Tool: Eisenhower Matrix

The Eisenhower Matrix is a tool that categorises tasks into four quadrants based on their urgency and importance. This method aims to improve productivity and decision-making by emphasising critical activities over distractions.

For further information see Eisenhower Matrix.



Final check for feasibility and spatial impact

Before the formal plan is drawn up, an assessment of potential negative effects and unintended consequences of the plan should be made. Additionally, you should carry out a study to assess the feasibility and viability of a spatial development plan or project and potential overarching risks associated with it. This can be done by commissioning external expertise or by starting a process involving practical expertise from different departments and stakeholders at the operational level.

First, it is important to ensure the draft plan is feasible. One objective is to determine whether the plan or project aligns with existing land use plans and objectives and if it is technically, financially, and legally viable. For the plan or each measure, potential risks must be identified, considering factors such as the implementation schedule, financing, responsibilities, possible dependencies, unrealistic expectations, or legal issues.

Next to the feasibility of the plan it is also important to recheck the spatial impact of the entire plan. A spatial impact analysis should be conducted to proof the positive effect on the existing space and spatial environment. You can assess and analyse the potential spatial impacts on the physical environment, landscape, ecosystems, social infrastructure, and other spatially related factors with a variety of methods and tools, such as environmental impact assessments (EIAs), landscape-scale analyses, social impact assessments, transportation and infrastructure impact assessments, etc. These assessments help decision makers better understand the spatial impacts of projects and make appropriate decisions to promote sustainable development.

Identifying potential risks and obstacles at an early stage is crucial, allowing for adjustments to the plan if necessary. This helps mitigate potential risks or implement preventive measures in case a risk materialises. Risks should be evaluated based on their potential impact and likelihood of occurrence. (see also phase 1.5 on risk assessment).

How to proceed:

- ✓ Carrying out feasibility studies on the first draft.
- ✓ Confirm the spatial impact of the plan.
- ✓ Integrate the findings of the assessments into the draft (refinement).

Good Tool: Four C's-method

The Four C'S Review evaluates the effectiveness of an action plan based on coherence, completeness, concerns, and continuation. It is applicable during workshops, peer-review meetings, and for self-assessment. You can find a 4Cs review sheet in the URBACT Toolbox.

For further information see the Four C's-method.

Create the final spatial plan

After reviewing the feasibility and effectiveness of the first draft, a spatial plan is drawn up. The formal plan forms your reference document and consolidates the final decisions. During this phase, the concrete drafting of the plan takes place.

After finalising the plan, a feedback loop should take place. This should involve cross-administrative and cross-thematic departments reviewing and commenting on the plan. This step proves very valuable for ensuring effective integrated planning and maintaining the political commitment for the final plan. Finally, the final plan should be confirmed and approved by the decision-makers.

Another important step is to determine how the plan will be shared with the public. Consider which different groups are affected by the plan and how you can best reach them. Lean on the stakeholder engagement plan, if available.

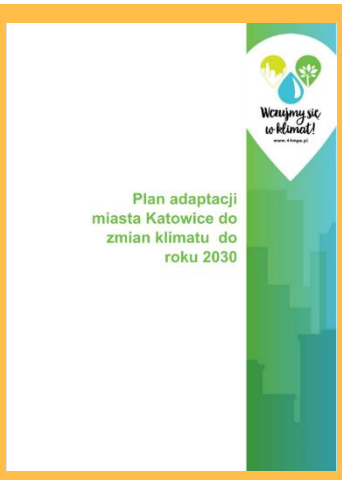
How to proceed:

- ✓ Carry out an (interdepartmental) feedback loop
- ✓ Ensure that all thematic aspects are adequately presented and integrated into the spatial plan. Use the IN-PLAN Checklist!
- ✓ Ensure the backing of all relevant stakeholders
- ✓ Finalise the formal plan
- ✓ Fulfil the mandatory procedures to validate the plan
- ✓ Inform the public about the plan

Good Practice: City of Katowice

The City of Katowice in Poland has transformed from a city with a mining and industrial heritage into a modern city with multi-dimensional transformation processes. Key documents for its development are “Katowice 2030 City development Strategy”, the “Katowice City Adaptation Plan to Climate Change by 2030" and the "Sustainable Energy and Climate Action Plan”

For further information see Stock-take report on available good planning practices.



Phase 5: Monitoring and Evaluation

Monitoring (and evaluation) are critical tools supporting public authorities in implementing and improving integrated spatial development after the plan has been adopted. It allows the project team to assess whether the intended progress has been made and whether corrections are necessary. The monitoring takes part in parallel to the implementation of the plan and has the main purpose of identifying potential issues ahead of time to take corrective action. This chapter provides guidance and highlights some key concepts and elements for developing and making use of a systematic monitoring system suitable for integrated spatial development.

Questions to be addressed in this phase:

- ? How can progress and implementation of the plan be monitored? Which actors are involved in the monitoring phase?
- ? Which aspects need to be considered to develop a meaningful set of indicators?
- ? What happens after the adoption of the plan?
- ? How can monitoring results be communicated and who should be addressed?

Outcomes of Phase 5

1. A monitoring framework has been established.
2. A set of indicators as the basis for monitoring has been developed.
3. Monitoring is periodically carried out and results are summarised.
4. Monitoring results are communicated to relevant stakeholders and utilised.

Setting-up the monitoring system

Establishing a general shared understanding about the purpose of a monitoring system, its benefits, and its limitations is vital. If this is not achieved early in the process of integrated planning, there is the risk to wind up with an ineffective system or waste time in recurring discussions at later stages. To avoid this, the development of a monitoring framework should be started as early as possible and gradually refined and enhanced throughout the different phases of an integrated spatial planning process.

But where to start? A good starting point for the discussion is to look at the differences between monitoring and evaluation activities, which are oftentimes misunderstood or confused with each other. They serve similar but distinct purposes. Monitoring is the principal responsibility of the team in charge of implementing the integrated spatial development plan and focuses on measuring performance and results. It does not question the relevance and effectiveness of the strategy or the plan itself, which is the main purpose of evaluation activities.

Within the context of IN-PLAN we put an emphasis on monitoring activities as they are usually carried out by the project team. Establishing a monitoring system provides several benefits such as the opportunity to learn and improve during the implementation phase, enhance the effectiveness of the plan, the possibility to inform other actors about progress and challenges in achieving the goals of the municipality, increased transparency and accountability as a public body.

To steer the discussion when developing the monitoring system, it is advisable to look at some example goals and discuss how they could be measured and the necessary data obtained. But it doesn't stop there. Who is then responsible for interpreting the data and draw conclusions from it? Is the project team solely responsible or are other municipal departments involved in this step? Questions such as this help to define clear roles for carrying out the monitoring. A good way to start is to define who is responsible for the collection of data, which bodie(s) are involved in analysis and interpretation of the data and how conclusions can then be drawn from the results.

Another important question is periodicity. The monitoring process should be carried out in a regular interval. This helps everyone involved to prepare for the reporting in advance and align other (internal) processes and their outcome with the timeframe of the monitoring process. The actual frequency depends on the available resources as well as the technical and political context. A reasonable timespan is every two years which is also used for monitoring SECAP plans.

How to proceed:

- ✓ Communicate and discuss the necessity and purpose of a monitoring system in earlier phases.
- ✓ Start conceptualising the monitoring system (focus on aspects such as relevant roles, processes, periodicity and guidelines).
- ✓ Develop some examples to make the process and its result tangible (How could goal X be measured? What can we learn from a monitoring system and how can we use the results for integrated planning and other tasks?).

Good Practice: Monitoring Lahti's 2030 SECAP initiative

The "Lahti 2030 Sustainable Energy and Climate Action Plan" is a strategic initiative by Lahti, Finland, to enhance sustainability by 2030. It focuses on renewable energy, energy efficiency, sustainable mobility, and climate adaptation. Progress is monitored every two years, with emissions recalculated every four years, and continuous monitoring by the city ensures effectiveness. The city does that by itself: The Environmental Developments Unit of the City of Lahti oversees implementation and monitoring; specific bodies are assigned to the individual measures of the Action Plan for reporting and accountability.

For further information see 2030 Climate Neutrality Action Plan of the City of Lahti.

Defining a meaningful set of indicators

Integrated spatial development operates within an extraordinarily complex system. Outcomes are influenced by a range of interrelated factors that usually make it difficult to assess the direct impact of singular actions. Planning and its activities are one element influencing real world outcomes but not the only one. In addition to that there are limits regarding what can be measured and availability of data.

Let's look at an example and assume that one of the overall goals of the plan is to promote sustainable mobility which reduces negative effects on the environment, improves health and helps create vibrant neighbourhoods. Progress on this goal can be measured by an indicator such as the modal share of eco-friendly modes of transportation (walking, cycling, public transport). This is an indicator that is available in many countries and cities and is usually regularly updated. Let's assume that the plan includes the goal to increase the modal share of eco-friendly modes of transportation to 70% by 2030. This is an example for a so-called outcome-based indicator.

Monitoring outcome-based indicators is very meaningful when looking at intended results. However, it does not provide any information on the progress of implementation measures. It's easy to imagine a scenario in which the modal share increases in line with the plan's goals, not because of city action, but because of rising gasoline prices.

Outcome-based indicators can be complemented or replaced by input or output-based indicators. They provide the project team with a better understanding regarding the progress in implementing the plan. Using the existing example of promoting sustainable mobility, we can easily come up with the amount of infrastructure expenditure as an illustrative example for an input-based indicator (e.g. yearly amount of Euros per capita invested to improve public transport in the city). The number of kilometres of newly constructed tram tracks would then be the corresponding example for an output-based indicator.

The example shows that outcome, output and input-based indicators all provide valuable information and that they can complement each other. It is of course also possible to focus either solely on outcome-based indicators or solely on input and output-based indicators. In such a case this should be clearly communicated and coherently implemented to avoid confusion.

We have used the example of sustainable mobility so far as it is quite intuitive, and data availability is comparatively good. However, there are always constraints that make concessions necessary. Social cohesion is an example that would be much harder to measure and find regularly updated data. In such cases efforts should be made to improve data availability in the future and to pragmatically focus on input and output-based indicators meanwhile (e.g. increase in number of local neighbourhood improvement initiatives supported by the city).

In the end it is important to stay pragmatic when defining the set of indicators for monitoring. Strive for a complete set of indicators but stay within the boundaries of available resources. Focus on the most relevant indicators and avoid the inclusion of indicators that provide little or no value for the purpose of the monitoring system. Otherwise, you run into the risk of creating an overly complex monitoring system that will be difficult to execute.

How to proceed:

- ✓ Define a set of meaningful indicators that fits the purpose of the monitoring system as defined during the set-up.
- ✓ Have a clear idea on how to obtain data during the actual monitoring phase and who is responsible for it (see also hints regarding data acquisition and data management in the chapter describing phase 2).

Good Tool: Guidelines, tools and handbooks to define indicators for a monitoring system

There are numerous valuable resources and guidelines providing help to define indicators for a monitoring system. For example, have a look at the guidelines by URBACT, the concept of SMART targets and the Handbook on Sustainable Urban Development Strategies by the European Commission.

For further information see Handbook of Sustainable Urban Development Strategies.

Monitoring during the implementation of the plan

After the adoption of the integrated plan the monitoring process can be initiated. Ideally a compact section describes the key points of the monitoring process in the draft plan itself and thereby has become part of the official document that can be referenced if necessary. Depending on the extent and design of the agreed process preparatory activities may have to start immediately after adoption. In general, the monitoring process can be expected to run as smooth as possible when its benefits and roles have been clearly defined as we have elaborated on in the previous chapters.

But how to proceed now that initial data on progress surfaces and the data has been looked at? Discuss the raw data within the project team and consult and engage with other actors and experts to come up with a shared understanding of the results. Guiding questions for this step include:

- Are we on track to achieve the overall goals set out in the plan?
- Where are areas that are developing more positively than initially envisaged?
- Are there areas that lag behind and what are the reasons for that?
- Are proposed measures being carried out on time and are the necessary resources secured?
- What actions are necessary to stay on track to achieve the goals (especially in areas that are lagging behind)?
- Are there developments, events or trends that have not been anticipated beforehand or have developed in an unexpected way? How are they influencing the integrated plan and its goals?

These questions can be discussed in various formats (e.g. internal meetings, interviews, workshops, …). Whatever the form of these discussions, it is important to capture the generated insights in the form of short summaries that can then be used in the next step of the monitoring process and form the basis for an implementation report for utilising and communicating the monitoring results.

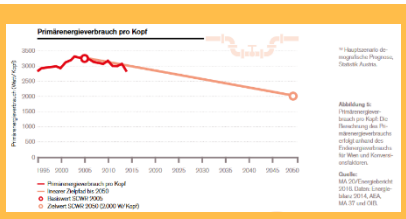
How to proceed:

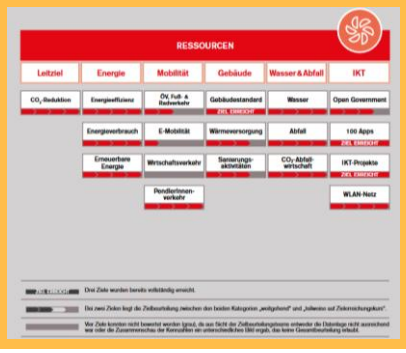
- ✓ Carry out monitoring periodically according to the monitoring concept (e.g. every two years).
- ✓ Involve relevant actors within the administration for interpreting raw data.
- ✓ Strive for an internally shared understanding for the monitoring results (e.g. where are areas that warrant attention and further action) and propose corrective measures if necessary.
- ✓ Document and summarise the initial findings of the monitoring process.

Good Practice: Monitoring Vienna's Smart Climate City Strategy

The City of Vienna has developed a monitoring system with a comprehensive set of quantitative and qualitative indicators that can be publicly examined. The set of indicators has been continuously updated and allows to track the progress on achieving the goals of Vienna's Smart Climate City Strategy. Previous results have been publicly reported in the form of a monitoring report that graphically visualises progress towards the goals.

For further information see Smart City Wien. Monitoring Report in English: Monitoring Report 2017. Latest set of indicators used for monitoring: SKCSW Indicators (only available in German).





Utilise and communicate the monitoring results

We have shown in the earlier chapters that monitoring integrated planning should be designed in such a way that it provides clear benefits and accountability. Now that initial findings on the monitoring process have been collected it is possible to produce an implementation report that summarises the results and that can be shared and communicated within a broader context.

Relevant stakeholder groups that may be addressed now include:

- Decision-makers both on the political and municipal level,
- Members of the municipal council as the highest responsible entity and authority,
- Actors within the municipality that were involved in the drafting process, but not the monitoring process itself,
- Other relevant actors and stakeholders involved in the implementation of the integrated plan (e.g. the public transport agency, private actors and interest groups),
- Citizens and the public.

The type of information and the level of detail that each of these groups need may vary. It is also possible that it is the responsibility of actors outside of the project team to inform about the progress and monitoring of the plan. Digital tools such as a dashboard can also be a great way to communicate the results of the monitoring process and are more easily held up-to date compared to a general report.

Whatever the approach used to inform the groups outlined here, try to cater to each group's information needs and be as open and transparent about the results and underlying data as possible. Especially goals that have been identified in the monitoring process as lagging behind should not be seen as a shortcoming, but as an opportunity to highlight the necessity to take further action and to find new partners to improve on implementation.

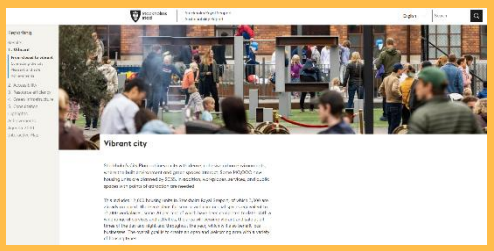
How to proceed:

- ✓ Produce a summary of the results that is easy to understand even for actors not involved in earlier phases.
- ✓ Make sure relevant stakeholder groups (e.g. decision-makers, implementation partners) are informed about the monitoring results and progress of the integrated plan.
- ✓ Inform the public regarding the progress of the plan (e.g. through a high-level summary of the monitoring results, data dashboard).

Good Practice: Stockholm's Royal Seaport Monitoring Webtool

The digital Sustainability Report provides an annually updated overview on the progress of the development of Stockholm's Royal Seaport. For each strategic area, readers can find out more about how requirements for green space factors, energy, waste, transportation, materials, and indoor environment are met.

For further information see Stockholm Royal Seaport 2030.



4. Mobilising Resources and Financing

Mobilising resources and financing is a core **success factor** for integrated energy, climate and spatial planning. In municipal and regional contexts, resources should be understood broadly: they include **human resources** (staff time and expertise), **institutional capacity** (mandates, governance structures), **knowledge and data** (GIS, baseline assessments, monitoring), and **financial resources** for implementation and operation.

4.1. Financing needs

A common challenge in municipalities and regions is that financing is often seen as a one-time task that ends once a plan is approved. Integrated planning needs continuous financing throughout the entire process – **from planning to implementation and long-term operation.** It is therefore useful to distinguish between different types of financing needs:

1. **Financing the integrated planning process**
   This includes staff time, coordination, external facilitation, data work, participation processes and the preparation of investment-ready project pipelines.
2. **Financing implementation**
   This includes physical measures and infrastructure, construction, implementation management etc.
3. **Financing long-term operation and improvement**
   This includes maintenance, monitoring, evaluation, and the continuation of governance structures and staff capacities after project funding ends.

Operational and capital expenditures

To structure different expenditure types, it is helpful to think of the accounting terms of **Operational Expenditure (OPEX)** and **Capital Expenditure (CAPEX):**

Capital Expenditure refers to investments in long-term tangible or intangible assets that generate benefits over several years. Capital Expenditures are typically required to implement measures identified through integrated plans, for example in mobility, public space, energy or climate adaptation.

Operational Expenditure refers to recurring costs required for the daily functioning of infrastructure. These costs are critical for maintaining coordination, quality and continuity over time. In integrated planning, operational expenditures are often a bottleneck, as maintenance and monitoring require stable and predictable capacity.

Operational and capital investments are **complementary**. Without capital expenditures, integrated plans cannot translate into tangible change. Without operational expenditures, investments risk being inefficient or poorly coordinated.

Typical capital expenditures for integrated planning:

- **Green and blue infrastructure:** urban greening elements, water management facilities, climate adaptation constructions, etc.
- **Sustainable mobility investments:** cycling infrastructure, public transport fleets, etc.
- **Energy investments:** renewable energy production elements (large-scale heat pumps geothermal probes, PV, …), district heating networks, building refurbishments, etc.
- **Digital infrastructure:** sensors, data platforms or digital applications for citizens

Typical operational expenditures for integrated planning:

- **Staff and coordination units:** planning coordination, facilitation of cross-departmental teams; Integrated planning requires more cross-departmental coordination and therefore higher staff capacity and facilitation budgets.
- **Participation and communication:** engagement formats, communication and outreach activities
- **Data, tools and monitoring:** GIS work, modelling, dashboards, monitoring and reporting
- **External services:** technical planning, legal advice, or specialised expertise.

4.2. Challenges in mobilising resources for implementation and operation

Municipalities and regions increasingly encounter **financial constraints** when mobilizing financing for integrated planning, implementation and operation:

- **Rising investment and operating costs:** Increasing prices for construction, energy, services and maintenance lead to higher expenditures.
- **Shrinking public budgets:** A growing share of municipal budgets is tied to mandatory tasks, leaving fewer flexible resources for strategic and integrated planning activities.
- **Increased competition for funding:** As public budgets become tighter, competition for national and European funding increases, raising administrative effort and uncertainty.
- **Risk aversion:** Concerns about public acceptance, limited budgets, administrative cultures which prioritise compliance over experimentation, or little experience with innovative models, can make municipalities more risk-averse, reducing their willingness to invest in innovative measures.
- **Knowledge and staff capacities to acquire external funding:** Local governments often lack dedicated staff, specialised expertise and sufficient time to proactively identify, prepare and manage external funding opportunities for integrated actions.

In addition to pure financial constraints, municipalities and regions face several **organizational and governance-related challenges** when mobilizing resources:

- **Rigid budget structures:** Integrated approaches may not fit into existing budget lines; ad-hoc reallocation is often difficult especially when rapid action is required.
- **Governance constraints:** In many municipalities, mandates, roles and responsibilities are clearly defined for sector-specific functions, but less clear when it comes to cross-cutting tasks. This can lead to uncertainty about who is responsible for the implementation of integrated energy, climate and spatial measures, and which budgets apply. Without clearly defined governance arrangements, integrated measures risk being delayed, fragmented or deprioritised in favour of sectoral priorities.
- **Legal constraints:** Legal frameworks often influence how costs can be allocated and shared across departments or institutions. Restrictions on budget transfers, earmarking of funds or limitations on interdepartmental cost-sharing can hinder the financing of cross-cutting measures.
- **Financing of operation and maintenance:** A recurring challenge for municipalities and regions is that funding mechanisms often focus on the development and initial implementation of measures, while long-term operation, maintenance and monitoring are insufficiently addressed. Project-based funding or one-off internal budget allocations may cover planning, construction or pilot phases, but frequently do not provide resources for the ongoing operation of infrastructure, the maintenance of assets or the continuous monitoring of impacts. Without secured funding for operation and maintenance, there is a risk that implemented measures lose effectiveness over time or fail to deliver their intended outcomes.

4.3. Guidance for mobilising resources and financing

There are different types of places to look for resources for implementation and operation:

In practice, municipalities often achieve the best results by combining several ways of mobilising resources. In the following different possibilities of how to mobilize resources as are depicted.

Governance and cooperation structures

Municipal governance improvements

Coordination with finance departments

Early coordination with finance departments is a critical governance improvement for the successful implementation of integrated planning approaches. Financial departments play a key role in shaping budget structures and long-term financial planning. If they are involved only at a late stage, integrated measures may be perceived as additional costs rather than as strategic investments. To ensure effective coordination with internal finance departments, political commitment to integrated planning needs to be established from the outset of the process.

Permanent budget lines

Establishing permanent budget lines for integrated planning is a key step towards moving from project-based approaches to structural implementation. Annual earmarked budgets can finance recurring coordination tasks, facilitation processes, data management and monitoring activities that are essential for integrated planning but are often difficult to fund through project calls alone. In parallel, the creation of permanent staff positions or competence centres helps to institutionalise knowledge, responsibilities and coordination capacity within municipal or regional administrations.

Life-cycle assessments (LCA)

In practice, municipalities often succeed in mobilising funding for the planning process and the implementation, but struggle with the long-term operation and maintenance. A **life-cycle perspective** helps to prevent implementation gaps by clarifying, already at the planning stage, how monitoring, maintenance and governance will be financed once investments are made.

Internal capacity building for the mobilisation of external funding

To support municipalities and regions in building internal capacities for identifying, preparing and mobilising external funding, dedicated support and learning resources are available.

Good Tool: Life-cycle assessments and life-cycle cost planning

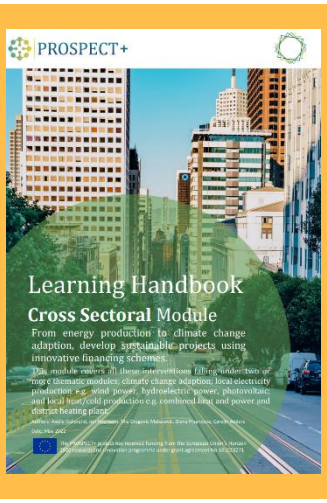
Life cycle assessments (LCA) and life cycle cost assessments (LCCA) are key tools for integrated planning, as they support decisions beyond upfront investment costs and highlight long-term financial and operational implications. While municipalities often secure funding for planning and initial implementation, they frequently struggle to finance long-term operation, maintenance, monitoring, and governance. To support this approach, several tools and methodologies are available to local and regional authorities.

For further information see The European Commission's guidance on life-cycle costing in public procurement and OpenLCA, an open-source software tools for environmental and cost-based life-cycle assessments

Good Tool: PROSPECT+ project

The EU-funded PROSPECT+ project supports local and regional authorities in financing their sustainable energy and climate plans. The project offers training, peer learning and practical guidance for the capacity building of local and regional authorities seeking to strengthen their skills in accessing innovative financing mechanisms, EU funding and other external funding sources.

For further information see Home | PROSPECT+



Regional Cooperation

Joint planning and implementation of cross-municipal measures

If adjacent municipalities plan and implement climate, energy and mobility measures across municipal boundaries efficiency and effectiveness can be increased significantly. Many infrastructure systems extend across administrative borders and therefore benefit from coordinated approaches. Such cooperation may focus on shared networks, such as cycling corridors or public transport lines that connect multiple municipalities and are jointly financed. In other cases, municipalities can jointly develop and operate shared facilities. Examples include solar energy production fields, wind parks, recycling centres or inter-municipal bus terminals. By pooling demand and resources, municipalities can reduce costs, achieve economies of scale and improve service quality.

Joint special purpose associations

Joint special purpose associations pool staff and budgets across neighbouring municipalities to achieve scale and continuity. Instead of relying on temporary project cooperation, these structures provide a stable organisational framework for integrated planning and implementation. Such entities can take various forms, including joint planning departments, regional climate or energy agencies, or legally established special purpose associations.

Shared procurement and shared services

The procurement of external planning, participation formats or monitoring tools would be costly or inefficient to procure individually. By aggregating demand, municipalities can reduce unit costs, increase bargaining power and access higher-quality services. Beyond cost savings, shared procurement also promotes harmonisation and interoperability across municipalities. Using common tools, data standards and methodologies supports coordinated implementation and makes it easier to align measures across administrative boundaries. For example, several municipalities may jointly commission a regional climate risk assessment, a shared GIS-based monitoring platform, or professional facilitation for participatory planning processes.

Internal monetary sources

Budget reallocation and reprioritisation

Shifting existing budget lines towards integrated priorities (often time-consuming, but robust once established).

Earmarking local revenues

Using revenues from local instruments to support integrated objectives, for example

- Parking management revenues for sustainable mobility
- Compensation payments for soil sealing for climate adaptation
- Limited forms of land value capture

National and regional transition funds, capacity building instruments

Regional subsidy programmes

Bundling climate, spatial and innovation objectives at regional level. For municipalities, regional subsidy programmes can offer more flexible funding conditions, lower administrative thresholds and better alignment with functional territories. Typical areas of support include integrated mobility solutions, climate adaptation measures, urban regeneration, energy transition projects and digital planning tools.

Capacity building

Activities that strengthen the ability of municipalities and regional authorities to design, manage and implement integrated planning processes and measures. This includes developing skills, organisational structures, governance arrangements and learning processes that enable long-term transformation

National programmes

National climate, innovation and urban development programmes play a central role in enabling municipalities and regions to implement integrated planning approaches. In many EU Member States, such programmes explicitly combine financial support with advisory services, learning formats and institutional development.

European funding and technical assistance

European funding programmes offer valuable opportunities to access financial support for sustainable development, innovation, and cross-border collaboration and knowledge transfer. Successfully tapping into these resources requires the targeted identification of funding instruments that align with specific project goals. This, in turn, demands a solid understanding of each programme's funding logic, eligibility criteria, application procedures, and funding cycles.

European funding programmes can support integrated planning processes, pilot projects, and implementation, depending on their design. Technical assistance instruments are particularly valuable for project preparation and investment readiness. Most territorial development funding is accessed through national or regional managing authorities and requires alignment with the respective operational programmes. Direct EU programmes such as EUI, Horizon Europe, or LIFE demand stronger consortium-building and co-design but enable innovation and transnational learning. Strategically combining multiple instruments can help bridge the gap between planning and implementation, especially when paired with local co-financing and integrated project approaches.

Multiannual financial framework (MFF) – structural & investment funds

These funds are principally aimed at territorial development and cohesion and are managed in shared responsibility between the European Commission and Member States. Local and regional authorities can apply for funding through their national or regional Managing Authorities, which publish calls under the Operational Programmes (OPs).

European Regional Development Fund (ERDF)

Purpose: Strengthen regional economic, social and territorial cohesion by correcting disparities across EU regions. Support includes sustainable urban development and locally-led development initiatives. The ERDF supports both investment in infrastructure and integrated, cross-sectoral strategies aligned with local development priorities.
For further information see: Official ERDF programme page

Interreg – European Territorial Cooperation

Purpose: Support cross-border, transnational and interregional cooperation between local and regional authorities to address common challenges and exchange good practices. Local authorities often act as lead partners or partners in cross-border consortia addressing climate, mobility, digitalisation and social cohesion.
For further information see: INTERREG portal and programme details

Direct EU funding programmes accessible for local & regional authorities

Some EU programmes operate under direct management by the European Commission or its executive agencies and are open to local and regional authorities:

European Urban Initiative (EUI)

Purpose: Support sustainable urban development through innovative solutions, capacity building and knowledge sharing. EUI features dedicated calls for pilot implementations, governance experiments and integrated urban transitions that align with local planning strategies.
For further information see: EU Urban Initiative details & calls

Horizon Europe

Purpose: EU's flagship research & innovation programme. Local and regional authorities can participate in mission-oriented and collaborative research projects on integrated planning, governance innovation, smart cities, climate adaptation and energy transitions. Often Horizon Europe calls require consortia of public and private partners; local authorities can lead or join.
For further information see: European Commission funding database

LIFE Programme

Purpose: EU's funding instrument for environmental and climate action. It supports pilot, demonstration and capacity building projects directly aligned with European Green Deal objectives. Municipalities can participate independently or as project partners, especially for climate adaptation and nature-based solutions.
For further information see: LIFE programme page

Bottom-up contributions

Crowd-investment

Crowd-investment models mobilise financial contributions from many individuals or local actors to support specific projects or investments. For municipalities and regions, crowd-investment can complement public funding by strengthening local ownership, increasing visibility and sharing financial responsibility for selected measures. Crowdfunding involves many small, non-repayable contributions from local stakeholders to finance specific pilot actions, such as urban greening projects, small-scale renewable energy installations or community spaces. Other forms of crowd-investment include community bonds, citizen shares or cooperative investment models, where contributors receive a financial return or other benefits. In practice, crowd-investment instruments work best as complementary financing tools as they are rarely suitable for financing core integrated planning processes.

Involvement of citizen in maintenance and monitoring

The involvement of citizens in maintenance and monitoring activities can complement municipal resources and strengthen the long-term effectiveness of integrated planning measures. Measures related to public space, green infrastructure and neighbourhood-level interventions can benefit from active citizen participation. A common approach is the involvement of residents as caretakers of green spaces, for example through urban gardening initiatives, neighbourhood greening projects or adopt-a-tree schemes. In addition, digital and web-based applications can support citizen involvement in monitoring processes. For example, citizens may use apps or online platforms to report issues such as littering, damaged infrastructure or water stress in green areas.

Private equity sources

Co-financing with private landowners and developers

Co-financing arrangements are most effective when responsibilities, costs and benefits can be clearly defined and contractually agreeed. Such approaches allow municipalities to leverage private investment for public objectives, for example by linking development rights to contributions towards climate-resilient infrastructure, green spaces, mobility solutions or energy measures. **Urban development contracts** can be used for this purpose. They are a proven tool and enable local authorities to require developers to make financial or in-kind contributions to infrastructure, public space and climate-related measures that are necessary as a result of new developments.

Public-Private-Partnership models

PPPs are long-term contracts between a private party and a government entity for providing a public asset or service. In such agreements, the **private sector provides upfront financing** and takes on significant **risks and management responsibilities**, with remuneration linked to performance. The private party's role can include design, construction, operation, and maintenance of the asset or service.

- **Institutional PPPs** are a joint venture between the city and private entities to carry out development. Ownership shares determine the level of influence; both parties usually

contribute capital. This model allows the public sector to retain certain control rights while benefiting from private financing and expertise (Akademie für Raumforschung und Landesplanung, 2018).

- **Contract-based PPPs:** The public authority outsources planning, construction, financing, and operation of an asset to a private partner for a defined period.
- **Lease model:** The private sector builds a facility (e.g. a public building) and the public authority leases it for a set period. Ownership may be transferred at the end.

PPPs offer several potential benefits for municipalities. They provide **access to private capital** and the **expertise of private companies**, including technical and management know-how, which can enhance efficiency. PPPs can **reduce the financial and administrative burden** on public authorities and enable **faster implementation** through leaner processes and a decoupling of decision-making from political cycles. Market-oriented thinking introduced by private partners may also foster stronger customer focus and **innovation**. Unlike full privatization, PPPs allow the public sector to **retain strategic control** through ownership, contractual arrangements, or oversight mechanisms.

However, there are notable downsides: Long-term contracts can **create dependence on a single partner**, changing contractors later is difficult (Akademie für Raumforschung und Landesplanung, 2018). PPPs are **complex to procure and manage**, involving high **transaction costs** (legal, advisory, tendering). They may **reduce democratic control** if private stakeholders hold a big share of decision-making power. Most problematic, PPPs are sometimes used to **shift debt off public books**. While not visible as public debt, long-term payment obligations act like hidden loans. Thus, PPPs should not be pursued solely for budget optics (Plank, 2017).

Green bonds

Green bonds are **debt securities** that public actors use **to raise capital for environmental and climate projects**. Investors provide money that is repaid over a fixed period – usually with interest. The key difference from conventional bonds is that the proceeds may only be used for clearly defined "green" projects. In practice, integrated plans serve as a basis to identify measures that require **upfront investment**. These measures are then **bundled into an investment package** with a defined maturity period (e.g. 10–20 years) and offered to investors such as institutional investors, sustainable investment funds, banks or pension funds.
With the **European Green Bond Standard**, the EU aims to establish a clear and credible benchmark for green bonds. The standard is voluntary and builds on the detailed criteria of the **EU Taxonomy** to define what qualifies as a green economic activity, thereby increasing transparency and investor confidence. (European Commission, 2025)

Good Tool: Climate City Capital Hub

The Climate City Capital Hub supports cities in securing financing for sustainable urban development and climate neutrality. It provides technical assistance, tools, and resources for project development and investment readiness, partnering with the European Investment Bank to promote climate adaptation, decarbonization, and public-private funding collaboration.

For further information see Climate City Capital Hub.

Good Tool: EU Covenant of Mayors – Funding and Financing Guide

The EU Covenant of Mayors provides a dedicated Funding and Financing Guide to support local and regional authorities in identifying suitable funding opportunities for the implementation of climate and energy actions. The guide is specifically designed for municipalities that are developing or implementing Sustainable Energy and Climate Action Plans (SECAPs) and other integrated climate strategies.

For further information see Financing opportunities | EU Covenant of Mayors.

Good Practice: Crowdfunding for Solar Panels

In June 2020, Križevci, Croatia launched a crowd-investing initiative for solar roofs, led by ZEZ and partners. The project raised €54,000 through crowdfunding, installed solar panels, and promoted renewable energy. It strengthened community engagement, overcame legislative challenges, and established the local energy cooperative, KLIK, for future sustainability projects.

For further information see Crowd invest solar roofs Križevci.

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Good Practice: Urban development contracts in Hamburg (HafenCity)

HafenCity is one of Europe's largest inner-city development areas. Through **urban development contracts and land transfer contracts**, developers were required to contribute to climate mitigation and climate adaptation measures that go beyond individual building plots: They contributed to elevated building structures for **flood protection** and flood-resilient ground floors. Buildings were required to meet **high energy efficiency** standards and had to connect to district heating systems. In the underground car parks of private buildings**, car-sharing system** was set up for all residents and employees. (HafenCity Hamburg GmbH, 2026)

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5. Sources

Akademie für Raumforschung und Landesplanung (2018). Public Private Partnership. In Handwörterbuch der Stadt- und Raumentwicklung (pp. 1794–1798). Hannover: ARL – Akademie für Raumforschung und Landesplanung:

CEMAT (1983). Resolution No. 2 on The European regional/spatial planning charter (Torremolinos Charter). 6th European Conference of Ministers responsible for Regional Planning on "Prospects of development and of spatial planning in maritime regions". Torremolinos, Spain.

Dallhammer, E.; Gaugitsch, R.; Neugebauer, G; Böhme, K. (2018). Spatial planning and governance within EU policies and legislation and their relevance to the New Urban Agenda. Publications Office of the EU.

European Commission (1997). The EU compendium of spatial planning systems and policies.

European Commission (2020). Handbook of Sustainable Urban Development Strategies.

European Commission (2025). The European green bond standard – Supporting the transition.

HafenCity Hamburg GmbH (2026). Die HafenCity leistet in unterschiedlichsten Bereichen große Beiträge zur Nachhaltigkeit.

Holodkov, N.; Salvi, F., Süsser, D., Forstinger, V.; Tomasi, F. (2023). Stocktake on available good planning practices. European Federation of Agencies and Regions for Energy and Environment.

Plank, L. (2017). PPP: Pushing Private Profits. In: A&W Blog: A&W-Blog | PPP: Pushing Private Profits

Stöglehner, G. (2020). Integrated spatial and energy planning: a means to reach sustainable development goals. Evolut Inst Econ Rev 17, 473–486.

TU Dortmund (2023). What is spatial planning?.

URBACT (2020). The Integrated Approach to Implementation.

ANNEX – Good Practice Examples and Tools

Renewable Energy

Good Practice: Adapting Historic Buildings

"Adapting Historic Buildings for Energy and Carbon Efficiency" is an Advice Note by the Historic Buildings and Monuments Commission for England. The comprehensive document emphasises the importance of adapting historic buildings to address climate change while preserving their heritage value. Buildings are significant contributors to carbon emissions, and thoughtful, well-planned changes can help reduce their environmental impact. The document provides guidance on improving energy efficiency in historic buildings, balancing carbon reduction with the protection of their historic character. It outlines key considerations for local planning authorities, heritage consultants, and building owners, including permissions, common adaptations, and decision-making processes. The advice also references additional resources for integrating climate strategies with heritage conservation efforts.

Reference: Energy Efficiency and Retrofit in Historic Buildings | Historic England

Good Tool: Guidance for Cities Developing Heating and Cooling Plans

The guide for developing a Heating and Cooling (H/C) plan was elaborated in the EU Horizon 2020 project Decarb City Pipes 2050. It emphasises the importance of understanding existing heat infrastructure, heat demand, and renewable energy sources (RES). Essential components include the infrastructure map, heat demand density map, and potential map. The infrastructure map details existing heat networks, while the heat demand map assesses the economic feasibility of district heating based on current and future demand. The potential map spatially quantifies available heating and cooling energy sources. Combining these maps results in the H/C map.

The guide describes how to develop these maps, considering data availability and quality, with examples from Winterthur. It explains economic considerations for heat networks and discusses integrating heating and cooling with the power grid, especially in light of increasing electrification. The guide acknowledges varying data availability, offering procedures for scenarios ranging from minimal data to detailed digital twins of buildings.

Reference: Guidance for cities developing Heating and Cooling plans – Decarb City Pipes 2050

Good Practice: Tallaght District Heating Scheme (TDHS)

The Tallaght District Heating Scheme (TDHS), launched in early 2023, is Ireland's first large-scale district heating network, managed by Heat Works, the country's first not-for-profit energy utility owned by South Dublin County Council. This scheme aims to significantly reduce local carbon emissions, saving nearly 1,500 tonnes of CO2 annually, and positioning Tallaght as a leader in climate change innovation. Utilising waste heat from a nearby data centre, the TDHS covers 100% of its heat demand through this sustainable source. Initiated by South Dublin County Council, the project showcases the environmental benefits and potential of district heating in Ireland. Collaboration

between the council, private stakeholders, and the Dublin Energy Agency Codema has created a low-carbon solution using recyclable heat and innovative heat-pump technology. Heat Works aspires to be a model heat network business, delivering economic, environmental, and social benefits to residents and businesses, and becoming a key component of the county's identity by supporting local and national climate action plans and enhancing the quality of life in South Dublin.

Reference: Heatworks – Ireland's first not-for-profit energy utility

Good Practice: Vienna Heating Plan 2040

The Vienna Heating Plan 2040 provides orientation on the way to a climate-neutral heat supply in Vienna. By 2040, space heating and hot water in buildings must be provided exclusively from renewable sources. The Vienna Heating Plan 2040 outlines the most suitable heating solutions for buildings currently heated with oil or gas in different areas. It covers all built-up areas of the city and provides guidance for all people living in Vienna. The designation of areas in the Vienna Heating Plan 2040 is based on existing and expected heat demand up to 2040, renewable energy potentials, and the existing infrastructure.

The Vienna Heating Plan 2040 addresses all existing buildings. In Vienna, approximately 600,000 gas boilers need to be replaced in these buildings. Therefore, the Vienna Heating Plan 2040 serves as an invitation to all residents of Vienna to contribute to achieving a climate-neutral future. All current and future options for climate-neutral heat supply, along with information on available services and consultations, are comprehensively summarised in the Vienna Heating Plan 2040.

Reference: Vienna Heating Plan 2040 (wien.gv.at)

Good Practice: Local spatial energy planning in Styria

Local spatial planning can create the spatial conditions for the efficient use of energy and the utilisation of renewable energy sources, thus contributing to the reduction of energy consumption and greenhouse gas emissions.

Therefore, the federal state of Styria mandates that municipalities develop comprehensive energy supply concepts as an integral component of their municipal development planning processes. These plans, which possess legal binding status, articulate the strategic developmental objectives of the municipality for the forthcoming 10 to 15 years, ensuring that energy supply considerations are systematically integrated into long-term planning frameworks.

The energy supply concept is based on a spatially and contextually detailed energy characterisation of the municipality under consideration, with special attention to aspects of heat supply and mobility. Consequently, the energy supply concept serves as a foundation for developing strategies to guide future spatial development into energy-efficient spatial and settlement structures, known as energy planning location areas.

Reference: Leitfaden_Sachbereichskonzept_Energie_2023.pdf (steiermark.at)

Good Tool: Sankey Diagram

A Sankey diagram for energy flows is a visual representation that illustrates how energy moves through a system. It typically begins with a primary energy source on the left side, such as renewable sources like solar or wind. From there, lines of varying widths extend to intermediate nodes, which represent

different stages of energy transformation or distribution, like power generation or transportation. The width of these lines corresponds to the amount of energy flowing through each pathway, making it easy to visualise where energy is allocated or lost. Smaller branches diverging from the main flow lines indicate energy losses, such as heat dissipation or inefficiencies in conversion processes. Sankey diagrams are useful tools for energy management and policy-making providing a clear and intuitive way to understand complex energy systems and identify opportunities for efficiency improvements.

Reference: Sankey diagrams for energy balance - Statistics Explained (europa.eu)

Good Tool: Smart Readiness Indicator (SRI)

The Smart Readiness Indicator (SRI) is a tool developed by the European Union (EU) to evaluate how well buildings can integrate and utilise smart technologies. It measures the buildings' capacity to effectively incorporate advanced systems like smart meters, energy management tools, and renewable energy solutions. The primary aim is to enhance energy efficiency, reduce environmental impact, and improve occupant comfort and indoor environmental quality. The SRI assesses various aspects such as the integration of smart technologies, their impact on energy performance, and their ability to enhance comfort and well-being for occupants. It also considers the scalability and adaptability of these technologies across different types of buildings and geographic locations. By providing a standardised measure, the SRI supports EU policies that promote sustainable building practices, helping member states set targets, define regulations, and encourage investments in smart technologies.

Reference: Smart readiness indicator - European Commission (europa.eu)

Climate Adaptation

Good Tool: Climate-ADAPT

Climate-ADAPT is a collaborative initiative between the European Commission and the European Environment Agency (EEA) aimed at facilitating Europe's adaptation to climate change. Managed by the EEA with the European Topic Centre on Climate Change Impacts, Vulnerability, and Adaptation (ETC/CCA), the platform offers comprehensive data and information on projected climate changes, vulnerabilities, adaptation strategies, and practical case studies across Europe. It provides tools for adaptation planning and organises information into key areas such as EU policies, sector-specific adaptation (e.g., agriculture, water management), regional and city initiatives, and research projects. Additionally, it features a searchable database of validated information. Climate-ADAPT also supports tracking the EU and Member States' progress towards their 2030 climate and energy goals, complementing data available on the EEA website. Of particular interest are the Climate-ADAPT Adaptation Support Tool and the Climate-ADAPT Case Studies.

Reference: Discover the key services, thematic features and tools of Climate-ADAPT (europa.eu)

Good Tool: i-tree canopy

i-Tree Canopy is a free online tool that helps **estimate how much of an area is covered by trees** and other types of land use (like buildings, roads, or grass).

You can either draw the area on the map or upload a file (e.g. a shapefile) to define it. The tool then shows random points within the area, and you choose what type of land cover each point has (for example, tree, pavement, or water). Based on your input, the system estimates the overall land cover distribution. For reliable results, it is recommended to classify between 500 and 1000 points.

The tool can also help estimate the economic value of the benefits provided by trees (like cooling or air cleaning). But outside the U.S., U.K., Ukraine, Sweden, New Zealand, and South Korea, you need to enter your own values to do this calculation.

For further information see i-Tree Canopy

Good Tool: The "RIE" index

The "RIE" index, developed by the municipality of Bolzano (Italy), aims to introduce environmental mitigation and compensation measures in the municipal land use plan and building regulations. The acronym "RIE" stands for "Riduzione dell'Impatto Edilizio", Building Impact Reduction, and it aims to:

- counteract soil sealing by favouring the infiltration of rainwater to feed the aquifers;
- maximising water retention by reducing runoff, with positive effects on the sewage system and the functionality of treatment plants;
- reduce investment in upgrading sewerage and drainage systems;
- improve the urban microclimate.

The RIE index is a numerical value (between 0 and 10) calculated through a given formula and it must be applied to any urban transformation, whether new construction or renovation, with a surface area capable of catching rainwater. The municipal land use plan assigns a minimum RIE value to each area of the territory ("RIE Z"), according to the status quo and land use permitted by the plan, and any building intervention must have a higher RIE value.

Reference: Richiedere la Certificazione RIE (Riduzione dell'Impatto Edilizio) / Servizi / Città di Bolzano - Città di Bolzano (comune.bolzano.it) (Italian only)

Good Practice: Climate Analysis and Planning Information Maps Zurich

Zurich's climate analysis maps contain information on air temperatures, cold air currents and bioclimatic conditions during the day and at night during a summer fair weather situation. They show at a detailed scale where current and future heat islands and valuable compensation areas as well as important ventilation routes are located. These bases help municipalities and planners to take better account of the issue of heat in urban and local planning.

The planning information maps are differentiated for day and night situations. They contain an area-wide assessment of the climatic stress situations (settlement areas) and relief functions (green spaces, bioclimatic significance) and thus represent the technical basis for weighing up regionally orientated planning. Last but not least, the planning information maps also serve to inform the public so that participation in planning procedures is as well-founded as possible.

Reference: Klimakarten und -daten | Kanton Zürich (zh.ch)

Good Practice: Climate-resilient Public Spaces in Paris

The transformation of public spaces in Paris in recent years has garnered significant attention. The drive to create climate-resilient urban areas is guided by key strategic documents, including the Paris Pedestrian Strategy, Paris Resilience Strategy, Paris Climate Action Plan, Biodiversity Plan for Paris, and the recently revised Bioclimatic PLU. The primary goal is to develop public spaces that offer recreation during summer heat and facilitate active mobility. Paris employs natural solutions like evapotranspirant paving materials, rainwater management, trees, fountains, shade structures, and natural ventilation to ensure comfort. Additionally, road spaces are reallocated to enhance walking and cycling infrastructure. Paris aims to significantly increase the percentage of permeable and vegetated surfaces and the amount of public green space per inhabitant to boost social well-being, inclusion, biodiversity, and health. Public space is seen as the backbone of a resilient city.

Reference: Paris-Resilience-Strategy-English.pdf (resilientcitiesnetwork.org)

Good Practice: LIFE DICCA

The project acronym "DICCA" stands for "Danube Island Climate Change Adaptation." LIFE DICCA's primary goal is to develop a comprehensive strategy for adapting urban ecosystems to climate change, using Vienna's Danube Island as a model. Key measures include ecology and wildlife conservation, sustainable maintenance practices, climate-friendly irrigation systems, and effective visitor flow management. These efforts aim to preserve the Danube Island as both an ecosystem and a recreational area for the Viennese population.

Throughout the project, LIFE DICCA implemented sustainable mowing practices, introduced sheep for landscape maintenance, and supported wild bees with 50 beehives. It created new green spaces, revitalised ponds and riverbanks, and established a wind-powered irrigation system. Climate monitoring was enhanced with weather stations, and public awareness was raised through educational programs, climate gardens, and citizen science initiatives. Visitor flow management included information boards and floor markings to protect sensitive ecosystems.

Reference: The LIFE DICCA project (wien.gv.at)

Good Tool: Toolbox for the Transformation of Streets and Squares by Trans|formator:in

The Trans|formator:in project aims to accelerate the transformation of streets and public spaces over its four-year duration, emphasising increased space for pedestrians and cyclists, greening, and improved public areas. With a diverse team of 23 partners and over 80 experts, the project seeks to make an impact by 2026. It will develop and test successful transformation methods in seven pilot communities, including four of Austria's climate pioneer cities. The project emphasises public participation, learning processes, and communication, aiming to support policymakers and administrators in implementing significant projects. Trans|formator:in focuses on practical application, drawing insights from real-world examples to inspire and guide successful transformations. To this end, the project has set up a comprehensive living toolbox, featuring tools and best practices in categories such as participation and communication, greening and micro-climate, active mobility and public transportation, financing and law, and impact evaluation.

Reference: Toolbox-Navigator – Trans|formator:in (transformatorin.at)

Sustainable Mobility

Good Tool: Policy Brief for Urban Mobility

The policy brief **Urban Mobility Adaptation to Climate Change** is a document designed to raise awareness among policymakers and provide urban planners with insights into the impacts of climate change on Mediterranean cities, particularly focusing on mobility issues. The brief emphasises the need for urban planners to shift from solely focusing on decarbonising transportation to also incorporating adaptation measures to address the already noticeable effects of climate change. It highlights that future transport infrastructures will face new challenges due to climate impacts, necessitating updated planning approaches that consider new environmental, climatic, and socio-economic factors. The policy brief outlines the main impacts of climate change on urban mobility and suggests possible solutions to minimise these impacts. The content of the brief is based on a review of existing literature and feedback from experts in various fields, including mobility planning, urban planning, climate change, economics, and environmental health. These experts contributed through interviews and workshops organised by the Urban Transport project, allowing for a thorough exploration of how urban mobility can adapt to climate change from multiple perspectives.

Reference: UTC_5_3_2_Policy_Brief__4_Eng.pdf (interreg-med.eu)

Good Tool: Walk`n´Roll Cities Guidebook

The "Walk 'n' Roll Cities Guidebook" is designed to introduce public authorities, decision-makers, urban planners, and citizens to innovative concepts for mobility and public space. The guidebook is divided into three sections – WHY, WHAT, and HOW – which address the challenges of sustainable mobility and public space, provide high-level visions, and outline possible measures and steps for implementing transformation, respectively. Additionally, the guidebook illustrates the experiences of six selected cities to demonstrate how these cities are applying these visions and interventions. This mobility guide for cities of all sizes is a product of the Walk'n'Roll initiative, part of the URBACT Action Planning Networks. The process involved more than 25 cities and metropolitan areas working together to create a shared vision for sustainable mobility and public space.

Reference: Mobility | urbact.eu

Good Tool: The Healthy Streets Approach

The Healthy Streets Approach is a framework for designing public streets that promote health and prioritise people in the planning process. Central to this concept are ten Healthy Streets Indicators, each supported by scientific evidence showing that they enhance health, reduce inequalities, and encourage walking and cycling. These indicators include aspects such as *People feel relaxed*, *Easy to cross*, *Shade and shelter*, *Places to stop and rest* or *Clean air*. The city of London and Transport for London (TfL) adopted the Healthy Streets Approach in their first Health Action Plan, published in 2014. In 2017, they also released the strategy "Healthy Streets for London - Prioritising walking, cycling, and public transport." To facilitate implementation, TfL offers a toolkit that includes a qualitative assessment called *Guide to the Healthy Streets Indicators* and a technical assessment tool called *The Healthy Streets Check for Designers*, which is a spreadsheet tool to assist designers in applying the approach.

References: Healthy Streets for London (tfl.gov.uk) & Guide to the Healthy Streets Indicators (tfl.gov.uk)

Good Practice: The Superblock Model

The Superblock concept from Barcelona is an urban planning strategy aimed at reducing car traffic and reclaiming public space for pedestrians and cyclists. It involves grouping several city blocks into a larger block where traffic is restricted. Within these Superblocks, streets are redesigned to prioritise walking and cycling, with more green spaces, seating areas, and playgrounds. This approach not only reduces noise and air pollution but also enhances community life by providing safer and more pleasant environments for residents and visitors. The city of Barcelona has been implementing the Superblock concept since the early 2000s, starting with the first transformation in the Gràcia district in 2003. The city has since refined and adapted the methodology to new standards. The initial Superblock program ran from 2012 to 2015, followed by the "Let's Fill Streets with Life – Establishing Superblocks in Barcelona" program from 2016 to 2019. According to the actual mobility plan, a dense network of Superblocks is planned to be established across Barcelona by 2030.This concept has garnered international recognition, and several other cities are now experimenting with similar models.

Reference: Welcome to Superilles | Superilles (barcelona.cat)

Conflicts and Synergies

Good Practice: Äußere Mariahilfer Straße, Vienna

The redesign of the Äußere Mariahilfer Straße illustrates integrated spatial planning in practice. The project combines the installation of district heating and cooling networks and the renewal of water infrastructure with climate adaptation measures such as new trees, greening, cooling elements and permeable surfaces to support rainwater infiltration. One car lane was removed by introducing one-way traffic, creating space for a high-quality, bi-directional cycle track, wider pavements and improved public space. Tram lines retain a dedicated track, ensuring efficient public transport while enhancing overall liveability.

For further information see Transformation of Äußere Mariahilfer Straße

The Planning Process

Phase 1: Set up integrated planning process

Establish political commitment

Good Practice: Sweden's National Energy and Climate Plan

All European countries are obliged to draw up National Energy and Climate Plans (NECPs) in order to achieve the EU's common climate targets. Sweden's Integrated National Energy and Climate Plan (NECP) from 2020 outlines the country's strategy to meet its energy and climate goals through decarbonisation, increased energy efficiency and security, market integration, and innovation. Building on existing targets, policies, and measures, the plan explores various scenarios to achieve these objectives. It establishes Sweden's political commitment, based on policies and targets adopted by the

Swedish parliament and includes the outcomes of consultations held by the Swedish parliament's Trade Committee on guiding principles and the European Commission's recommendations. This demonstrates Sweden's dedication to achieving its energy and climate objectives through a structured and comprehensive approach. Therefore, the plan aims to achieve a climate-neutral future through sustainable measures and technological advances. A good and valid NECP can serve as a basis for argumentation for the integration of climate measures into spatial planning.

Reference: se_final_necp_main_en_0.pdf (europa.eu)

Good Tool: Climate City Contract

The Horizon Europe Mission 100 initiative introduces the Climate City Contract (CCC), a new governance tool to help cities address their barriers to reaching climate neutrality by 2030. This tool involves a collaborative process with local, regional, and national stakeholders, including both public and private actors. The CCC consists of three interlinked components:

- **Commitments**: Document the outcomes of the co-creation process, including shared ambitions, strategies, and stakeholder commitments.
- **Actions**: Outline the 2030 Action Plan, which assesses existing strategies and creates a coordinated intervention portfolio to meet climate goals.
- **Investments**: Detail the 2030 Investments Plan, focusing on mobilising public resources and attracting private capital for financing climate initiatives.

The CCC is a dynamic, digital document that will be periodically updated to include new stakeholders and commitments. Cities can seek validation from the European Commission for a "Mission Label," which facilitates access to EU funding and resources. The framework is flexible, allowing cities to adapt it to their needs and collaborate regionally or nationally.

Reference: NetZeroCities

Definition of clear roles and responsibilities in process management

Good Practice: Aberdeen's Sustainable Energy Action Plan

"Powering Aberdeen: Aberdeen's Sustainable Energy Action Plan" is an extensive strategic document designed to enhance the sustainability of Aberdeen's energy supply and diminish CO_2-emissions. Its primary objectives include promoting renewable energy, enhancing energy efficiency, and fostering sustainable urban development. To accomplish these aims, the plan underscores the importance of clear leadership and a robust governance structure. Stakeholder workshops underscored the critical need for effective leadership in advancing the plan. Therefore, the Aberdeen City Council is proposed to assume this role, with active involvement from all stakeholders in its execution. This leadership will be exercised at both strategic and operational levels, facilitated by the establishment of a steering group, program board, and thematic sub-groups. These measures will ensure equitable distribution of responsibilities and comprehensive stakeholder engagement. Ultimately, Powering Aberdeen serves not only as a strategy for advancing sustainable energy but also as a framework for concerted and holistic action among relevant stakeholders to cultivate an energy-efficient and environmentally friendly city.

Reference: Powering Aberdeen Appendix 1.pdf (aberdeencity.gov.uk)

Good Tool: RACI-Matrix

The RACI-Matrix is a tried and tested project management tool that is used to clearly structure the roles and responsibilities within a team or organisation. The acronym "RACI" - for "Responsible", "Accountable", "Consulted" and "Informed" - is used to define the various areas of responsibility. This enables a precise allocation of responsibilities for each task or activity to ensure that all team members understand who is responsible for what, who can make decisions, who needs to be consulted and who is merely informed. Through this clear structuring, the RACI-matrix contributes to efficient communication, decision-making and execution of projects.

RACI-Matrix

	Person 1	Person 2	Person 3	Person 4
Task 1	R			
Task 2		A		
Task 3			C	
Task 4				I

Responsible | Accountable | Consulted | Informed

Reference: Responsibility assignment matrix - Wikipedia

Elaborate a clear process design and timeline

Good Tool: GANTT-Chart

A Gantt chart, widely used in project management, visually maps out the sequence of activities within a project schedule using horizontal bars, making it easy to display activities (tasks or events) against time. The charts illustrate the start and end dates of project components, while also showcasing how tasks are linked together. Gantt charts are invaluable for planning complex processes and tracking progress. To delve deeper into the structural framework, the left side of the Gantt chart lists the activities, while the top displays a suitable time scale. Each activity is represented by a bar, whose position and length reflect the start date, duration, and end date of the activity. This visual representation allows you to see at a glance what the various activities are, when each activity begins and ends, how long each activity is scheduled to last, where activities overlap with other activities and by how much, and the start and end date of the entire project. In summary, a Gantt chart shows you what activities need to be done and when.

Reference: What is a Gantt Chart? Gantt Chart Software, Information, and History

Develop a comprehensive stakeholder engagement plan

Good Tool: Open Innovation Model

The Open Innovation model is an approach where organisations leverage both internal and external ideas, resources, and technologies to enhance their innovation processes. Instead of relying solely on internal research and development, they actively involve external stakeholders, including partners,

research institutions and the general public. This collaborative method allows for the faster development of innovative solutions by tapping into a wider pool of knowledge and creativity. It also helps to reduce costs and risks associated with innovation, as external inputs can provide fresh perspectives and identify potential pitfalls early. By opening up their innovation processes, organisations can create more effective and diverse solutions, ultimately leading to improved products and services.

Reference: Open Innovation vs. Closed Innovation (lead-innovation.com)

Good Tool: Power-Interest Matrix

A Power-Interest matrix is a project management tool that categorises stakeholders according to their influence and interest in the project. Stakeholders with high influence and high interest should be intensively involved and informed, while those with high influence but low interest should be satisfied and kept regularly informed. Stakeholders with low influence and high interest should be informed regularly, while those with low influence and low interest should be monitored occasionally. This tool helps to organise stakeholder communication and involvement efficiently to ensure the success of the project.

Reference: Enhancing Stakeholder Engagement through the Power/Interest Matrix - Interreg Central Europe (interreg-central.eu)

Good Practice: Future Team Rothneusiedl

RothNEUsiedl is evolving into a community-driven district where residents will become active city planners, contributing their ideas and wishes to the development process. The project incorporates various participation formats such as events and online surveys, and has established the “Future Team” RothNEUsiedl. This team acts as an interface between Vienna's residents and planners, integrating public input into the vision development.

The "Future Team", comprising 21 members, includes representatives from academia, agriculture, and other local stakeholders, alongside 14 randomly selected residents from a pool. The team ensures gender and age diversity in its composition. Its roles include:

- Engaging deeply with city development topics.
- Gaining a thorough understanding of urban planning.
- Providing valuable input for technical planning.
- Acting as a mediator between planners and citizens.
- Sending three advisory members to the vision jury.

The "Future Team" met four times during the urban and open space planning competition to discuss submissions and offer citizen-centred recommendations, continuing its mediator role throughout the vision development process.

Reference: RothNEUsiedl Stadtentwicklungsgebiet - Stadt Wien

Conduct overall risk assessment

Good Tool: Risk Matrix

A risk matrix is a tool used to assess and visualise risks by comparing their likelihood against the severity of their consequences. It helps management by providing a clear view of potential risks and supports decision-making processes. The risk assessment matrix, or risk control matrix, identifies the probability of project risks and evaluates their potential impact. This matrix offers a visual representation, categorising risks based on their likelihood and impact levels, making it easier for team members and stakeholders to understand and prioritise risks.

For instance, a 5×5 risk matrix features a grid with categories for likelihood ranging from very likely to very unlikely (along the X axis) and impact ranging from insignificant to catastrophic (along the Y axis). This comprehensive tool simplifies risk representation and reduces the need for complex quantitative analyses. By systematically evaluating risks, it ensures that significant threats are addressed effectively. Overall, the risk matrix streamlines risk management by providing a straightforward, visual way to prioritise risks based on their probability and impact.

Reference: Risk matrix - Wikipedia

Phase 2: Baseline assessment

Review of existing planning documents and legal frameworks

Good Practice: Let's Fill the Streets Life

The Let's Fill the Streets with Life programme in Barcelona is based on various municipal plans and commitments, including the Barcelona Commitment to Climate, Urban Mobility Plan, and Green and Biodiversity Plan. These plans aim to combat climate change, improve urban mobility, and enhance green spaces in the city. The establishment of the Superblock Model aligns with these goals by creating synergies and coordinating efforts across sectors. The Superblock Programme, initiated from 2012-2015, began with pilot areas and involved public participatory meetings to analyse the areas and establish initiatives for change. The current Municipal Action Plan continues this initiative, aiming to promote more superblocks across the city to create a more human, eco-friendly Barcelona with sustainable mobility and increased green spaces.

Reference: en_gb_MESURA GOVERN SUPERILLES.pdf (barcelona.cat)

Good Practice: Croatia's First Green Spatial and Zoning Plan

The City of Karlovac in Croatia is pioneering the integration of Sustainable Energy and Climate Action Plan (SECAP) measures into its spatial and zoning plans, marking the first such initiative in the country. Supported by the North-West Croatia Regional Energy Agency, Karlovac aims to create Croatia's first green spatial and zoning plan, aligning urban development with sustainability and environmental protection goals. This innovative approach empowers local governments to enforce sustainable development pathways using existing tools. Karlovac has already presented a draft of zoning changes and climate measures, focusing on a brownfield area within the city. This plan mandates the

implementation of green infrastructure, preservation of natural areas, and the exclusion of fossil fuels for heat production, relying instead on the city's district heating system or renewable sources. This exceeds the national standard for Nearly Zero Energy Buildings.

Reference: Adapting to climate change through spatial planning (europa.eu)

Understanding of contemporary standards and good practice examples in the field

Good Practice: Dutch Cycling Embassy

The Dutch Cycling Embassy is a public-private network of experts who advocate for sustainable and inclusive bicycle mobility. One of their services is a collection of good practice examples for cycling infrastructure and initiatives as well as a knowledge base with more than 600 blog posts on cases and experiences related to bicycle mobility. The website is regularly updated with inspiring news on improvements for cycling in the Netherlands and around the world. Thematic platforms like these can be useful sources when researching good practice cases for your own municipality. European research projects often include outputs that collect good practices for specific issues. Learning from others can be extremely helpful to develop your own strategies, plans and activities.

Reference: DCE (dutchcycling.nl)

Good Tool: PESTEL Analysis

A PESTEL analysis in spatial planning evaluates external factors affecting land use and urban development. It stands for Political, Economic, Social, Technological, Environmental, and Legal factors. In terms of political factors, it may include government policies, zoning regulations, and political stability, which impact infrastructure and land allocation. Economic factors involve funding availability, economic growth, and employment rates, influencing investment in urban projects. Social factors encompass demographic trends, population growth, and community needs, guiding the design of residential areas and public spaces. Technological factors assess advancements in construction, transportation, and smart city technologies, impacting the efficiency of urban planning. Environmental factors consider ecological impacts, climate change, and resource management, ensuring sustainable development. Legal factors cover land use laws, environmental regulations, and building codes that must be followed. By analysing these factors, spatial planners can develop strategies that balance development needs with regulatory requirements and community well-being, promoting sustainable and effective urban and regional planning.

Reference: Context analysis – PESTEL - EXACT External Wiki - EN - EC Public Wiki (europa.eu)

Data Acquisition and Data Management

Good Practice: ViennaGIS City Map

The City of Vienna's online city map is an accessible tool that provides a wealth of geo-information to the public. The map includes layers with essential information for everyday life, such as public transport routes, cycle paths, and public facilities in education, health, culture, and social services. It also features

the zoning and development plan, monument protection details, world heritage sites, and many other planning-relevant contents. This publicly accessible map is a small part of Vienna's extensive and well-organised GIS database, which supports numerous analyses and offers a reliable planning basis for various spatial projects. This data foundation promotes transparency and informed decision-making in the City of Vienna.

Reference: Vienna City Map (wien.gv.at)

Good Practice: CIRO Database

The CIRO Database (Climatic Information and Reference for the Operationalisation of Regional services) for climate data of Italian regions is managed by ISPRA (Istituto Superiore per la Protezione e la Ricerca Ambientale). This database provides comprehensive information about the climate in various regions of Italy, including historical data, climate forecasts, and specific meteorological parameters. It serves as a valuable resource for decision-makers, researchers, and the public by offering precise and reliable climate information for planning, research purposes, and addressing issues related to climate change.

Reference: Presented "CIRO", the first database in Italy to guide the regions towards climate neutrality — English (isprambiente.gov.it)

Status Quo Analysis and Forecast

Good Practice: Guide to Heat Mapping

Developed within the project HeatNet NWE, part-funded through the Interreg NWE programme, this document guides decision-makers in creating heat maps for 4th generation district heating and cooling. These maps help match energy demand with local resources, showing heat density, current supply sources, and potential renewable or waste heat sources. The guide details data aggregation processes and lists available resources in North-West Europe. It points to helpful European projects like Hotmaps and PlanHeat, which offer integrated heat mapping tools. Additionally, it presents heat mapping examples from Dublin and Plymouth to inspire other local authorities.

Reference: 20190826-_-wp-t3-_-d11-_-guide-to-heatmapping-_-final.pdf (nweurope.eu)

Good Practice: Energy Atlas of Zagreb

The Croatian capital Zagreb has developed an Energy Atlas (GIS database and tool) with some detailed energy-related data for buildings, including their energy consumption, building type, number of occupants, energy refurbishment rate.

Reference: Energetski atlas (arcgis.com)

Phase 3: Common Vision and Goals

Agreement on overall vision and goals

Good Tool: Newspaper of Tomorrow

The Newspaper of Tomorrow tool helps create a shared vision for a project by projecting into the future. When stakeholders with diverse perspectives come together, this tool fosters participatory and collaborative work, overcoming differing objectives. It engages stakeholders by having them imagine how a newspaper, magazine, or blog would discuss the project or solution in two to five years. They create headlines, sub-headlines, storylines, and relevant images, and if time permits, start the article. The exercise is structured in steps: first, participants answer pre-written questions on sticky notes to define the topic; second, a group conversation identifies potential headlines; third, a consensus is reached on one effective headline with explanations and quotes. This tool is ideal for city practitioners and local stakeholders, particularly at the beginning of a project, to create a unified vision and can be used in brainstorming and ideation workshops.

Reference: Newspaper of Tomorrow | urbact.eu

Good Tool: Double Diamond

The Double Diamond model is a design framework consisting of four phases. Firstly, in the Discover phase, the focus is on exploring and comprehensively understanding the problem or challenge. Next, in the Define phase, the scope narrows down, and the problem is precisely defined. Following this, in the Develop phase, concrete solutions are generated and prototyped. Finally, in the Deliver phase, the selected solutions are implemented and brought to fruition. This model emphasises both divergent thinking, where a wide range of ideas is explored, and convergent thinking, where the best ideas are selected and refined. It provides a structured approach for teams to develop innovative solutions while ensuring they effectively meet the requirements and needs.

Reference: The double diamond model - Kaospilot

Broad commitment to vision and goals by all relevant stakeholders

Good Practice: Barcelona's Climate Plan 2018-2030

“Barcelona's Climate Plan 2018-2030” represents a comprehensive and inclusive approach to tackling climate change. It involves a wide range of stakeholders, including citizens and organisations, in shaping its ambitious goals. The plan sets clear targets, aiming for a 45% reduction in emissions by 2030 and climate neutrality by 2050. Collaboration and inclusivity are emphasised throughout the planning process, with extensive input gathered from diverse voices. This participatory approach ensures that the plan reflects the needs and priorities of the community. Beyond emissions reduction, the plan prioritises adaptation measures, climate justice, and citizen empowerment. It underscores Barcelona's commitment to sustainable development. A designated Climate Office monitors and implements the city´s Climate Plan. This department coordinates actions into strategic plans and budgets and community outreach, including the work with non-governmental organisations. The plan serves as a

blueprint for other cities, demonstrating the importance of collective action and holistic strategies in addressing climate change. Barcelona's Climate Plan embodies the city's proactive stance and determination to create a more sustainable and equitable future.

Reference: climate_plan_maig.pdf (barcelona.cat)

Good Practice: Freiburg

In 1986, Freiburg became one of the first German cities to establish an Environmental Protection Office, which supported the implementation of environmental policies. Often seen as a model city for integrated and sustainable urban development, Freiburg has an integrated waste management concept. The city introduced the organic waste bin already in 1997 and the organic waste is also used energetically. This is a good practice example for the combination of waste management and energy production. Additionally, Freiburg developed a comprehensive climate adaptation concept in collaboration with various city offices to address increasing heat stress. This concept identifies critical "hot spots" and outlines measures to mitigate heat stress, incorporating broader urban planning elements such as relief areas and water management. This initiative won the "Climate Adaptation" category in the 2019 "Climate-active communes" competition.

Reference: Startseite - Green City Freiburg - www.freiburg.de/greencity -

Phase 4: Planning phase

Potential measures are identified

Good Practice: Integrated Action Plan (IAP)

URBACT is a co-founded program by the EU, which supports the networking and knowledge building of European cities towards sustainable urban development. The mission is to empower cities to work together and create comprehensive solutions to shared urban challenges. URBACT published guidelines for co-producing an integrated action plan for projects that take part in their Action Planning Networks. An integrated action plan is the roadmap of strategies and plans and defines the actions, specifies the timetable, the responsibilities for implementation and the costs and other factors of the measures. The guideline set out the main components, structure and methods for creating IAPs. In its guidelines, URBACT suggests separating the IAP components into one part, which represents the context and the process, and another part, which concludes the actual action plan. The IAPs of the various projects and cities can be downloaded from the URBACT website. These include the IAPS of Breda and Ponzan mentioned above.

References: You can find the action plans of the Health & Greenspace projects here; Action Plan Breda; Action Plan Ponzan; Guideline: How to produce an IAP? (Urbact).

Good Tool: SUMP Self-Assessment

The SUMP Self-Assessment is useful for identifying potential measures to improve urban mobility planning. By evaluating various aspects of the urban transportation system, cities and municipalities can identify weaknesses and areas where improvements or new measures are needed. Based on the results

of the self-assessment, concrete actions can then be developed to make mobility more efficient, environmentally friendly, and enjoyable for residents. These measures can vary from enhancing public transportation to promoting cycling and implementing traffic calming measures, depending on the specific needs and challenges of each city or municipality.

Reference: SUMP (sump-assessment.eu)

Various scenarios are modelled and simulated

Good Practice: Decide Madrid

Decide Madrid is the digital platform for public participation created by the Madrid City Council in 2015. It serves as an e-participation tool that uses Information and Communication Technologies (ICT) to engage citizens and other stakeholders in public decision-making processes. The platform encompasses both participatory agendas and administrative activities. It offers five sections for participation: debates, proposals, polls, processes, and participatory budgeting. Besides citizens, associations, NGOs, and companies can register on the platform to initiate debates and participate in discussions. However, some features are exclusive to verified citizens. Through Decide Madrid, citizens can actively engage in shaping action plans by suggesting ideas, measures, and projects they believe will benefit the city. Other participants can support these suggestions with votes and comments. The City of Madrid uses and has developed the open-source software CONSUL for this platform, which originated as a tool for protests and is now utilised by other cities like Barcelona, Turin, Paris, and Toledo.

Reference: Decide Madrid: plataforma de participación ciudadana

Good Tool: EU City Calculator

The EU City Calculator is a tool for developing and sharing energy and climate transition scenarios. It allows real-time simulations to understand key measures and levers for a low-carbon transition, providing insights into the entire energy system, greenhouse gas (GHG) emissions, resources, and socio-economic impacts.

The EUCityCalc project helps cities develop and implement detailed, scientifically robust pathways to climate neutrality using the EU City Calculator webtool. This open-source tool provides sectoral insights into necessary measures and supports the creation of tailored transition pathways and policy scenarios. The project assists ten pilot cities, including Riga, Mantova, Zdar, Palmela, Sesimbra, Setubal, Koprivnica, Varazdin, Virovitica and Dijon Métropole, in achieving their climate goals.

Reference: EU City Calculator | Prospective modelling tool supporting public authorities in reaching climate neutrality (climact.com)

Draw up a draft plan

Good Tool: Eisenhower Matrix

The Eisenhower Matrix is a time management tool that helps prioritise tasks based on urgency and importance. It consists of four quadrants. The first quadrant is for tasks that are both urgent and

important; these need immediate attention and should be done first. The second quadrant is for tasks that are important but not urgent; these should be scheduled for later. The third quadrant is for tasks that are urgent but not important; these should be delegated to others. The fourth quadrant is for tasks that are neither urgent nor important; these should be minimised or eliminated. The matrix helps individuals focus on what truly matters by prioritising important tasks and managing less important ones effectively.

Resource: Eisenhower Matrix | Untools

Good Tool: KonSULT Measure Option Generator

KonSULT is a comprehensive knowledge base designed to aid urban transport planners in selecting effective policy measures. It tackles common issues such as over-reliance on traditional approaches and insufficient awareness of diverse policy options. The Measure Option Generator helps urban planners identify suitable policy measures by allowing them to specify their context, objectives, and strategies, then generating a ranked list of relevant measures. Users can further refine this list to highlight the top measures, those within specific cost or implementation time categories, or those meeting certain criteria. Additionally, the tool offers options to find complementary measures or create packages of selected measures, facilitating a more tailored approach to urban transport planning. You may also want to check out the KonSULT's Policy Guidebook that includes detailed descriptions and assessments policy measures and case studies, as well as the Decision-Makers' Guidebook, which offers a structured approach to addressing urban transport challenges and provides guidance on each stage of policy development.

Reference: KonSULT | Home (leeds.ac.uk)

Final check for feasibility and spatial impact

Good Tool: Four C´s-method

The FOUR C'S REVIEW sheet is a tool designed to evaluate the Coherence, Completeness, Concerns, and Continuation of an action plan, ensuring that no crucial information is omitted. City practitioners and stakeholders can use this tool to review and enhance their action plans, making them more actionable. Therefore, create a box for each "C" and work through what still needs to be considered for the action plan. It is applicable during workshops, peer-review meetings, and for self-assessment. The four sections stand for:

- Coherence: Assessing whether the plan aligns and integrates effectively.
- Completeness: Ensuring that all necessary components are included.
- Concerns: Identifying areas that still require attention.
- Continuation: Developing strategies to address the identified concerns.

Reference: https://urbact.eu/toolbox-home/planning-actions/four-cs

Good Tool: Maladaptation Self-Assessment Checklist

The Maladaptation Self-Assessment Checklist has been developed in the Regional Pathways to Climate Resilience (REGILIENCE) project. REGILIENCE is a European project that aimed at sharing the most

promising cross-sectoral adaptation solutions, supporting cities and regions across Europe to become more resilient to climate change. The Maladaptation Self-Assessment Checklist is a tool used in climate change adaptation planning to evaluate potential risks of unintended negative consequences, known as maladaptation. It consists of a series of questions or criteria covering issues such as unintended consequences, equity, environmental impacts, social acceptability, sustainability, institutional feasibility, and resilience enhancement. Stakeholders use this checklist to identify and mitigate risks, ensuring that adaptation actions are effective and sustainable.

Reference: Self-assessment Tool for Maladaptation - Regilience

Good Tool: Gap Analysis

A Gap Analysis is a systematic process used to identify and evaluate the differences between the current state of a process and the desired state or goals. It involves assessing the present conditions and comparing them to the target outcomes to find gaps or obstacles that hinder goal achievement. Typically, a gap analysis identifies weaknesses, missing resources, inadequate processes, or insufficient performance relative to the defined objectives. By conducting a gap analysis, organisations or teams can optimise their strategies, plans, or actions to close the identified gaps and achieve their goals more effectively.

Reference: Gap analysis - Wikipedia

Create the final spatial plan

Good Practice: Katowice

The city of Katowice actively integrates its citizens into data collection and urban planning to promote sustainable development. The residents act as ambassadors of urban changes, using digital tools to get involved. With the NaprawmyTo app (Let'sFixIt app), they can report infrastructural issues, while the wCOP drzewo app allows them to suggest locations for new tree plantings. The KATO obywatel (KATO Citizen) project enables citizens to submit their own ideas for a cleaner and greener city and to apply for funding through a "green" participatory budget. This participatory approach promotes transparency and citizen involvement. The Katowice 2030 Development Strategy, which focuses on "Quality of Life," "Transport and City Logistics," "Entrepreneurship and Economic Growth," and "Metropolitan Nature and City Center," serves as a guide for these initiatives. The KATO Citizen project was awarded by the Polish Press Agency in the "Innovative Local Government" competition, highlighting the success and innovation of Katowice's measures.

Reference: T2.1 Stock-take report on available good planning practices.pdf

Phase 5: Monitoring and evaluation

Setting-up the monitoring system

Good Practice: Monitoring Lahti's 2030 SECAP initiative

The "Lahti 2030 Sustainable Energy and Climate Action Plan" is a strategic initiative by the city of Lahti in Finland, designed to make the city more sustainable and environmentally friendly by the year 2030. Key components of the plan involve promoting renewable energy, enhancing energy efficiency, supporting sustainable mobility, and adapting to climate change. As part of the plan, monitoring is conducted every other year to track progress. Additionally, a new emission calculation is carried out every four years to assess the impact of the measures on reducing greenhouse gas emissions. Beyond these scheduled evaluations, the city also implements its own continuous monitoring efforts to ensure ongoing compliance and effectiveness. The Environmental Developments Unit of the City of Lahti Group Services is responsible for the implementation and monitoring of the Action Plan. Specific responsible bodies for the various measures within the plan have been defined separately, ensuring clear accountability and focused efforts across different sectors and initiatives.

Reference: https://netzerocities.app/_content/files/knowledge/4187/lahti_nzc_ccc_ok.pdf

Defining a meaningful set of indicators

Good Tool: Guidelines, tools and handbooks to define indicators for a monitoring system

There are numerous valuable resources and guidelines providing help to define indicators for a monitoring system. Here are some highlights:

- **URBACT guide on applying the results framework to integrated Action Plans.** The main purpose of the guide is to provide guidelines on how to use the results framework in integrated planning. It discusses key concepts (e.g. intervention logic, targets, baseline, result and output indicators, milestones, monitoring and evaluation) in an accessible way.
- **Handbook on Sustainable Urban Development Strategies by the European Commission (JRC).** The handbook provides guidance for planners on how to implement integrated and place-based urban strategies. Chapter 6 provides guidance for monitoring and defining a meaningful set of indicators. Furthermore, key concepts and components in monitoring strategies are reviewed, highlighting what the major challenges are in setting up a monitoring framework for sustainable urban planning.
- **Formulating SMART targets**. Another commonly used relevant framework is the smart target approach. SMART stands for: Specific: Describing the desired results in quantitative and qualitative terms which will be clear to all stakeholders. Measurable: The current baseline has been established by measurements and the desired change is defined. Measurement methods and resources are in place to monitor the changes that occur. Achievable: Goals and objectives are based on the technical, operational and financial competencies available and stakeholder agreements/commitments that have been made. Relevant: Most important is to choose targets that matter, that improve urban mobility and that are synchronised with other urban planning

targets. Time-bound: key dates are given for the achievement of the targets to allow timely monitoring of the desired progress.

References: JRC Publications Repository - Handbook of Sustainable Urban Development Strategies (europa.eu)

Monitoring during the implementation of the plan

Good Practice: Monitoring Vienna's Smart Climate City Strategy

The City of Vienna employs a monitoring system with a comprehensive set of quantitative and qualitative indicators. The results of the monitoring process are designed to serve the municipal administration and policy-makers as a performance management tool and support the city and its enterprises in jointly implementing the Strategy in a focused manner. Monitoring was first carried out in 2017. In this initial process 120 experts from 50 different municipal bodies and agencies were involved. The process was co-funded by the EU (EFRE) and results have been published in English in the form of a monitoring report that includes a graphical overview on the overall progress as well as short summaries regarding implementation progress in specific thematic fields.

References: Home - Smart City Wien. Monitoring Report in English: Wienbibliothek - Digitale Publikationen / Monitoring report 2017. Latest Set of Indicators used for Monitoring: SKCSW_Indikatoren_Mai22.pdf (wien.gv.at) (only available in German)

Utilise and communicate the monitoring results

Good Practice: Stockholm's Royal Seaport Monitoring Webtool

The Stockholm Royal Seaport 2030 project is a sustainable urban development initiative in Stockholm. The project aims to create a vibrant, inclusive, and resource-efficient community with a reduced climate impact. The accompanying digital Sustainability Report provides an annually updated overview on the progress of the development. For each strategic area, the site provides detailed information on how specific targets are being met, such as green space factors, energy, waste, transportation, materials, and indoor environment.

Reference: Results and achievements | Stockholm Royal Seaport 2030 (norradjurgardsstaden2030.se)

Mobilising Resources

Good Tool: Life-cycle assessments and life-cycle cost planning

Life cycle assessments (LCA) and life cycle cost assessments (LCCA) are key tools for integrated planning, as they support decisions beyond upfront investment costs and highlight long-term financial and operational implications. While municipalities often secure funding for planning and initial implementation, they frequently struggle to finance long-term operation, maintenance, monitoring, and governance. To support this approach, several tools and methodologies are available to local and regional authorities.

For further information see The European Commission's guidance on life-cycle costing in public procurement and OpenLCA, an open-source software tools for environmental and cost-based life-cycle assessments

Good Tool: Climate City Capital Hub

The Climate City Capital Hub supports cities in securing financing for sustainable urban development and climate neutrality. It provides technical assistance, tools, and resources for project development and investment readiness, partnering with the European Investment Bank to promote climate adaptation, decarbonization, and public-private funding collaboration.

For further information see Climate City Capital Hub.

Good Tool: EU Covenant of Mayors – Funding and Financing Guide

The EU Covenant of Mayors provides a dedicated Funding and Financing Guide to support local and regional authorities in identifying suitable funding opportunities for the implementation of climate and energy actions. The guide is specifically designed for municipalities that are developing or implementing Sustainable Energy and Climate Action Plans (SECAPs) and other integrated climate strategies.

For further information see Financing opportunities | EU Covenant of Mayors.

Good Practice: Crowdfunding for Solar Panels

In June 2020, Križevci, Croatia launched a crowd-investing initiative for solar roofs, engaging local citizens in the city's energy transition. Led by the Green Energy Cooperative ZEZ, in collaboration with the municipality, the Regional Energy Agency North, and Solvis, the project installed solar panels on the Development Centre and Technology Park. Through crowdfunding campaigns, €54,000 was quickly raised. This initiative promotes renewable energy adoption, community development, and environmental benefits, with investors receiving returns through monthly savings and a cooperative model. Despite challenges with legislative frameworks, the project has strengthened community engagement and established a local energy cooperative, KLIK, fostering further urban sustainability projects.

Reference: Krizevci_crowdfunding-solarPV_2020_en.pdf (energy-cities.eu)

Good Practice: Urban development contracts in Hamburg (HafenCity)

HafenCity is one of Europe's largest inner-city urban development areas. Through **urban development contracts and land transfer contracts**, private developers were required to contribute to climate mitigation and climate adaptation measures that go beyond individual building plots: They contributed to elevated building structures for **flood protection** and flood-resilient ground floors. Buildings were required to meet **high energy efficiency** standards and had to connect to district heating systems. In the underground car parks of private buildings, **car-sharing system** were set up for all residents and employees of HafenCity. (HafenCity Hamburg GmbH, 2026)

Other Guidelines or Toolboxes

Good Practice: Klimalotse

The Klimalotse is a guide for decision-makers in cities and municipalities that helps identify and manage the risks of climate change while also taking advantage of opportunities. It consists of five modules: preparing and planning the adaptation process, recognising and assessing climate risks, formulating goals and measures, implementing these measures considering legal frameworks and financing options, and monitoring and evaluating the adaptation activities. This guide does not require any special prior knowledge and is particularly useful for individuals in environmental agencies or urban planning.

Reference: Klimalotse | Umweltbundesamt

Good Practice: MIP4Adap

MIP4Adapt is a platform that supports European regional and local authorities in adapting to climate change. It fosters knowledge exchange and best practices through a Community of Practice and coordinates EU-funded projects for more effective assistance. The platform provides guidelines, tools, and technical support to help authorities develop climate adaptation plans and secure project funding. Additionally, it organises annual forums and offers a helpdesk function for queries related to climate adaptation. MIP4Adapt continuously monitors and evaluates the progress of the mission and participating stakeholders.

Reference: About MIP4Adapt (europa.eu)

Good Practice: Triple-C

The Triple-C project is dedicated to analysing, evaluating, and capitalising on successful European initiatives aimed at preventing and managing the risks posed by climate change. This project includes a catalogue of EU cooperation projects that have been compiled, showcasing various initiatives and proposals to combat climate change. The catalogue features projects with best practices that enhance adaptation to climate change and improve risk management. One example is "BEGIN - Blue Green Infrastructure through Social Innovation." BEGIN demonstrates how cities can improve climate resilience using Blue Green Infrastructure by involving stakeholders in decision-making processes. This holistic approach provides ecological, social, and economic benefits, helping cities manage extreme weather and create attractive living environments. BEGIN involves 10 local authorities across the North Sea region, working together to test and expand these concepts.

Reference: triplecplatform.com

Good Tool: URBACT toolbox

URBACT is a European funding program for sustainable urban development. It aims to enable cities to work together to develop integrated solutions to common urban challenges. The URBACT Toolbox provides guidance, tools, templates, prompts, explainers to support cities in designing and implementing integrated and participatory actions for sustainable urban development.

Reference: Toolbox | Our City Plans

Good Tool: CIVITAS Urban Mobility Tool Inventory

The CIVITAS Urban Mobility Tool Inventory is a comprehensive online database featuring over 200 tools and methods designed to assist local authorities in urban mobility planning. It includes a wide range of resources such as guidelines, software, manuals, mobile apps, games, and planning approaches, covering all stages from scenario building and measure selection to implementation and evaluation. Users can find the most relevant tools by applying filters based on categories like language or tool type, or by using the search bar. The inventory also supports Mobility Match sessions as part of the CIVITAS Initiative. These sessions allow mobility practitioners and city staff to gain practical insights into specific tools, presented by their developers. This format fosters in-depth exploration of how each tool can impact sustainable mobility planning and provides valuable opportunities for exchange and networking. Users are encouraged to stay updated for future session participation and additional resources through the CIVITAS Initiative.

Reference: Tool Inventory | CIVITAS

Good Tool: Technology-Based Solutions for Resilience Toolkit

The **Technology-Based Solutions for Resilience Toolkit** is designed to assist municipalities in enhancing their resilience against climate change impacts through public spaces. It addresses the growing challenges posed by extreme weather and environmental shifts by leveraging technology and data to understand local risks and make informed decisions. The toolkit includes accessible tools focused on three main themes: Planning for Climate Resilience, Understanding Your Risks, and Action for Mitigation and Adaptation. These tools help communities plan and invest effectively in public spaces to manage risks, provide relief from extreme conditions, and reduce emissions. By integrating technology into resilience planning, communities can create safer, healthier, and more sustainable public spaces. The toolkit serves as a practical introduction for municipal staff, elected officials, and other leaders seeking innovative solutions to climate-related challenges. It is meant to complement existing strategies, allowing municipalities to adapt and implement a tailored approach to building resilient public spaces.

Reference: Technology-Based Solutions for Resilience: A Practitioner's Toolkit - Evergreen Resource Hub

Good Tool: Evergreen Resource Hub

The Evergreen Resource Hub is a comprehensive digital library designed to equip individuals and municipalities with essential research and tools for addressing contemporary challenges. It focuses on integrating data and technology to tackle issues related to climate, infrastructure, housing, and public space greening, while also promoting nature-based education for children. The hub has evolved to offer a wider array of educational materials, including research briefs, podcasts, videos, and more. It serves as a valuable resource for exploring innovative solutions to make cities and communities healthier and more resilient. Users can search the database for insights on topics like climate readiness, housing supply, smart cities, and inclusive placemaking, accessing hundreds of expert-created resources and successful project examples. The Evergreen Resource Hub aims to inspire learning, collaboration, and actionable strategies for improving urban environments.

Reference: Evergreen Resource Hub

Good Tool: ICLEI Platform – Local Governments for Sustainability

ICLEI is the leading global network of local and regional governments dedicated to sustainable development. ICLEI promotes the idea that local actions drive global change, leveraging the leadership of local governments to tackle environmental, economic, and social challenges. Through joint action, peer learning, and partnerships with civil society, businesses, and governments, ICLEI accelerates local sustainability efforts. Its European Secretariat, based in Freiburg, Berlin, and Brussels, supports over 160 sustainability professionals in advancing these goals.

The ICLEI Platform features an extensive collection of case studies, tools, reports, and further information on sustainable local development in categories like nature-based solutions, circular economy, governance, digital transformation, climate adaptation, sustainable energy systems and mobility.

Reference: ICLEI Europe •• Publications & tools (iclei-europe.org)

IN-PLAN

Integrated energy, climate and spatial planning

alea
agenția locală a energiei alba

AREA SCIENCE PARK

ENERGIKONTOR VÄST en del av Innovatum Science Park

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