

From 2015 to 2017, a German-Lithuanian cooperation project has been dedicated to the topic “Energy-efficient redevelopment of urban areas”. The energetic refurbishment of the Lithuanian housing stock is a key aspect for sustainable urban development. Aware of this, the Lithuanian government is looking at new approaches to meet their energy-saving targets in urban areas. In June 2016, the **Ministry of Environment of Lithuania** published recommendations for the preparation and implementation of energetic refurbishment programmes in urban areas. The national agencies **BETA** and **VIPA** are acting as contact points for Lithuanian municipalities and will accompany the preparation and implementation process of energetic refurbishment programmes. Respective guidelines are provided by **BETA**. Within the German-Lithuanian project, the municipalities of **Šiauliai**, **Utena** and **Birštonas** have prepared first integrated concepts for urban redevelopment. This leaflet summarises the ideas and basic principles of integrated urban planning at neighbourhood level. It addresses municipalities, urban planners, architects and engineers that are involved in the preparation and implementation of energetic refurbishment programmes.

## Integrated Strategies for Energy-Efficient Urban Development

### A brief manual

**T**oday, energy efficiency is no longer perceived as an isolated approach detached from other development measures. In fact, awareness prevails that – compared to stand-alone sectoral activities – effects and values of different measures can be increased by combining them along various implementation levels and embed them in an overall urban development strategy. Considering the renewal of housing stocks, increased attention is given to energy-saving potentials in the fields of urban mobility, infrastructures, and land use and local industries.

As an overall paradigm for development measures, energy efficiency can be combined in an integrated strategy with other approaches of sustainable urban development and thereby achieve synergies. Thus energy-efficient urban structures can be seen in one

direct line with other targets of inclusive, low-carbon and economically resilient urban development.

Drafting a strategy for the future development of their city and deducing guiding approaches and principles can put municipalities into the position to actively shape their development and master today’s and future challenges. Perceiving energy efficiency as key part of a holistic approach enables administrations, agencies, stakeholders and residents to orientate and adjust individual measures along an overarching goal, realise synergies and develop practical strategies.

Integrated approaches are integral parts of European urban development policies and fundamental requirements for access and eligibility to EU funds. That means, that investment in preparation of integrated concept could facilitate leverage effects.

## Relevant Sectors for Energy Efficiency



**L**and use is basis and key field of action for achieving energy-efficient urban structures and can be used as guiding instrument in urban development processes.

A mix of functions makes urban areas multifunctional 24/7 while securing economic efficiency. The vicinity of different functions such as housing, work places, shopping and social facilities entails shortened travel and delivery distances, concise infrastructure provision in terms of network size and efficiency, and taps synergy potentials.

Land-use planning can be used for adjustment of existing urban areas as well as guiding instrument in expansion areas and future development measures.



**D**ensity is a very powerful planning sector to achieve energy efficiency. It enfold its full potential in correlation with land-use planning. Concentrating buildings and functions in dense structures leads to a higher number of inhabitants and users and thus has a direct impact on the efficiency of local infrastructures, transport systems, social and economic services and other facilities.

In a city characterised by short distances and efficient infrastructure, building activities are concentrated within existing centres. This is more effective than a sprawling structure with low densities at the fringes of a city. Within larger urban areas, it might be useful to develop a structure of polycentric, interconnected growth poles with higher densities (centres and sub-centres).



**B**uildings are the most tangible, physical elements of energy efficiency concepts. For energetically optimising new buildings, aspects like building orientation, volume-surface quotient, ground plan, building equipment and appliances need to be interlinked already in the planning phase.

Depending on the building typology, age and overall condition, the energy demand of existing buildings can be optimised, too. Insulating the building envelope as well as modernising other building elements and supply systems can reduce energy demand. For an efficient use of investment, priority should be given to buildings and housing typologies that are needed in a long-term perspective.



**I**nfrastructures, both physically and institutionally, represent the main supply network for energy, mobility and social services within a city. As city-wide supplies must be ensured, efficiency of infrastructures is strongly related to the size, expand and density of settlement structures. Infrastructures are usually more efficient in compact settlements than in less dense areas regardless of an equal number of inhabitants – the number of users is spatially concentrated and the expansion of technical networks is smaller.

In larger cities, the concept of central places can be an approach to concentrate new building activities and infrastructure supply within a small number of core areas to optimise or reduce network sizes and provide city-wide service.



**M**obility is the sum of all movements of people and goods within the city and therefore more than just car traffic. Motorised mobility is responsible for a large share of energy consumption in a city and for a major part of a city’s emissions. Reducing daily trips and travel distances and increasing the share of public transport and non-motorised modes of travel must be priorities. Again, urban structure, density and allocation of functions affect the size and efficiency of road and transport networks as well as distances.

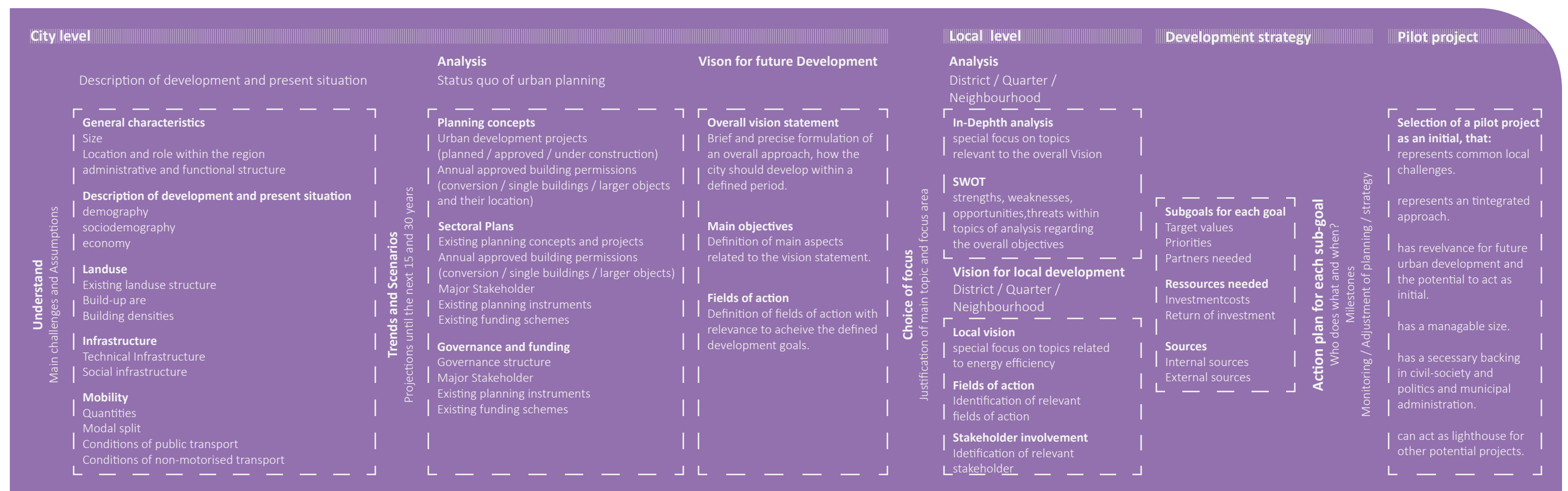
High-quality infrastructures for pedestrians as well as the opportunity to travel smoothly from door to door are basic requirements for the operation of public transport.



**O**pen spaces can be seen as a soft factor in terms of energy efficiency. Public squares are often meeting places serving social exchange. Parks and green spaces are a city’s lungs serving as fresh-air reservoir and places for recreation. Streets connect different urban areas and facilitate the movement of goods and people. By this, the condition of a city’s public open spaces directly affects the quality of living.

Combining public spaces with other functions increases their usability, utility value and frequency and promotes public life and should be considered in land-use planning. Well maintained public spaces are a city’s business card and a home’s surrounding can make inhabitants identify with their neighbourhood.

## Development of Integrated Concepts



**I**ntegrated concepts must be understood as processes rather than stand-alone solutions. Because they represent overall strategies, it is crucial to identify and involve all relevant stakeholders – ministries, administrations, network operators, building owners, civil society, etc. – right from the start. Existing plans need to be integrated and their goals and strategies should be aligned to a holistic approach. Thus, integrated planning is an iterative process in which overall ideas and individual measures are constantly adjusted and improved. It is the second key besides involvement and participation.

In a first step, an overall topic and approach – e.g. energy efficiency – is defined. Next, relevant stakeholders are identified and their interest and appreciation is strived to ensure they have the same level of

knowledge and to prevent misunderstandings.

The overall approach acts as a thematic filter which helps investigating and assessing the present situation. What is more, considering future trends in different sectors, as just as important because integrated plans are steering tools for present actions and guidelines for future developments alike.

The assumed outcome needs to be reflected against the present status of urban planning. How can recent sectoral plans and actions answer to identified problems and needs? Which status and time frame do present projects have and who is in charge? Based on these analyses, an overall strategy will be formulated and main objectives and fields of action defined.

Identifying the appropriate scale and level depends on

the outcome of the analyses and identified fields of action. Areas or districts are spatial levels where different scales and networks meet in a local context. It might be worth continuing working on this scale, but some topics – e.g. those related to networks and infrastructure – require a broader focus. An in-depth analysis has to be carried out within the chosen focus, in the course of which topics of the overall analysis need to be specified regarding the respective scale.

Strengths, weaknesses, opportunities, and threats (SWOT) of the overall approach should be identified in a SWOT analysis. The results will serve to draft a local development strategy that focuses on topics derived from the analyses. The strategy defines specific fields of action and all stakeholders who need to be involved.

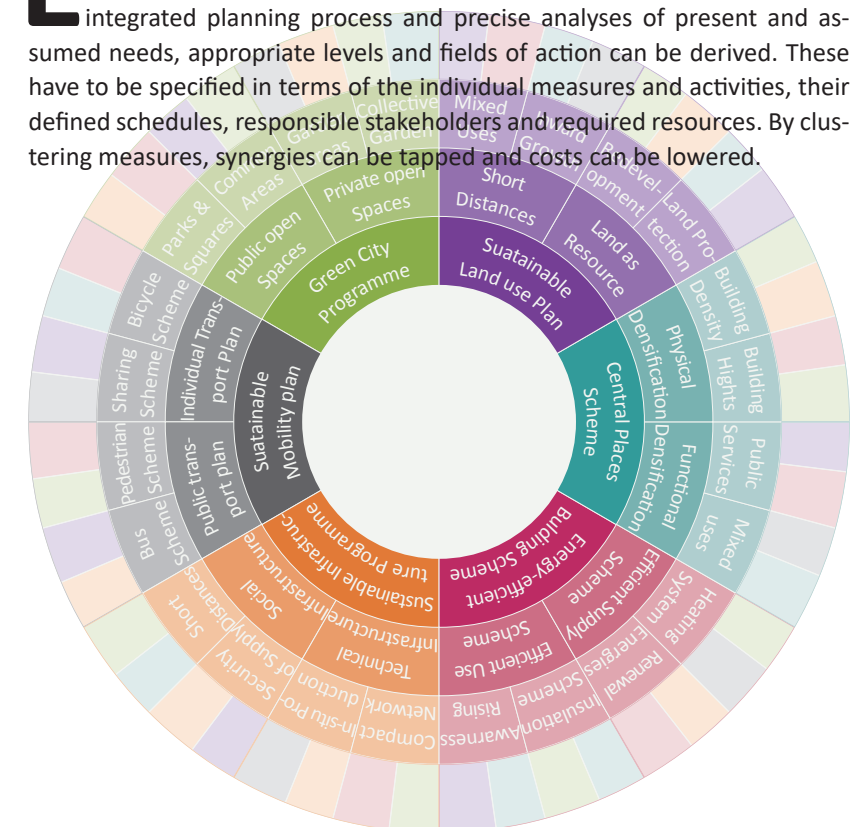
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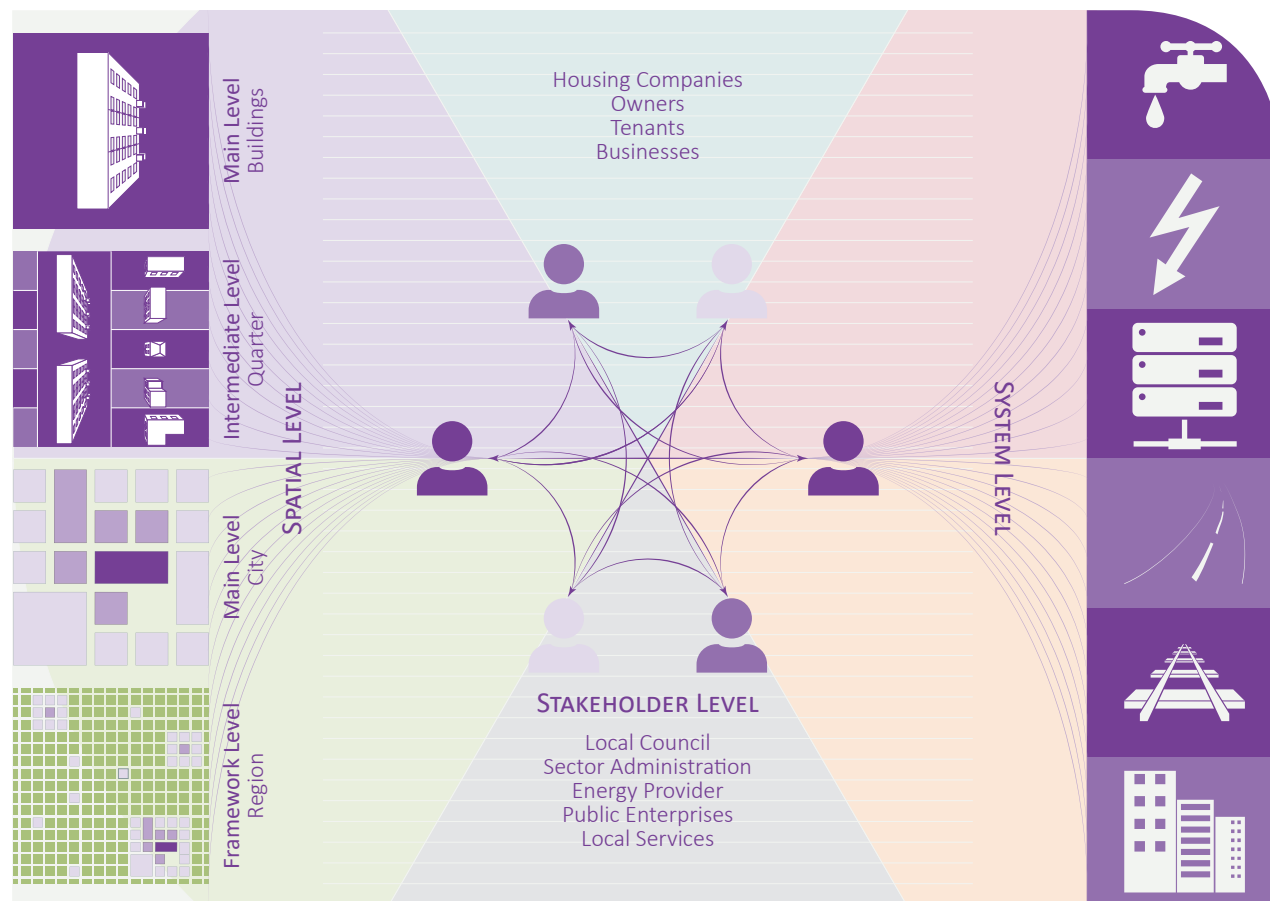
precise implementation strategy with defined sub-goals, measures, indicators and needed financial and personnel resources will be developed. Saving potentials need to be estimated carefully and reflected in a cost-benefit analysis. This will also help to identify potential national and international opportunities for funding. Afterwards, a detailed implementation plan for each sub-goal needs to be developed in which each step is connected to necessary resources and stakeholders.

The last step of this process is the first one to continue with further processes - monitoring the implementation process and its effects will help to constantly review and adjust the overall planning strategy and its single parts. This ensures that the strategy can be adapted to changing circumstances.

## Measures

**E**nergy efficiency in an urban context can be increased by a set of complementary measures in different levels of action and scale. From the integrated planning process and precise analyses of present and assumed needs, appropriate levels and fields of action can be derived. These have to be specified in terms of the individual measures and activities, their defined schedules, responsible stakeholders and required resources. By clustering measures, synergies can be tapped and costs can be lowered.





## Levels of Implementation

**F**or developing integrated strategies, different levels of action and impact need to be observed – a process that starts with the definition of goals and prevails throughout implementation. Depending on the approach, different leverage effects can be achieved on individual levels. In reverse, choosing an inappropriate level may mean missing development targets.

Once goals are defined, a potential analysis on different levels needs to be done. In general, there three major levels: the system, the spatial, and the stakeholder levels. The system level includes all technical and physical matters like buildings and infrastructures. The spatial level concerns different aspects' impact, moving from a regional or citywide scale to a local scale.

At stakeholder level, the focus lies with roles and inter-

ests of all people and parties concerned.

For tapping energy saving potentials, the status quo and estimated impact of measures needs to be assessed during the planning process. Where is energy produced, where is it used? How is energy distributed? How high are energy losses, where do they occur? Here, it is crucial to choose the appropriate level of investigation and further action. While building-related questions require a local focus in the first place, infrastructure, mobility or energy production and distribution need a broader perspective up to the regional level.

The spatial level of the neighbourhood or district plays a significant role in the implementation of an overall development strategy. As transition level between different scales and contexts, neighbourhoods are the

interface of global planning and local action. Here, comprehensive development approaches are facing spatial conditions and need to be transferred into tangible individual measures. Furthermore, this is the level where technical, social, and economic processes become obvious and are – at least partially – managed.

Depending on the selected spatial and system levels, the parties involved or concerned change. While mostly institutions or municipal administrations are affected at the regional or citywide level, it is likely that the number and types of stakeholders are more diverse and individual at neighbourhood level.

For developing an integrated concept, individual measures need to be chosen for each single level, and interdependencies and interferences need to be identified subsequently.

## How to choose an urban area?

**T**he identification of an appropriate urban area strongly depends on the outcome of the overall analysis, strategy and defined levels of action.

In general, five main questions can be used for orientation when choosing an urban area for energy-efficient re-development:

- What is the city's overall development approach and strategy?
- Which are the main objectives?
- Which are the main sectoral levels?
- Which are the main levels of implementation?
- Which initial measures would be likely to have an effect on a citywide development?

The focus of these examinations can be on socio-economic characteristics as well as on building typologies, infrastructure networks, property structures or administrative boundaries. A comprehensible line of reasoning from the overall analysis through to the implementation of individual measures is crucial.

The urban area chosen for redevelopment should reflect a city's overall challenges in order to facilitate future dissemination of experiences and knowledge. This is the only way to ensure that solutions and strategies can be successfully adapted into a broader context.

A transparent process in selecting an urban area for redevelopment is a key for success. Integrating communication and participation measures from the beginning is crucial. Tractable decision-making will enable politicians, planners and residents to understand and support concepts, plans and measures.

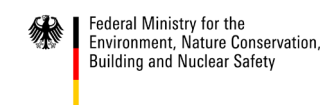
## Contact Partner in Lithuania



[www.betal.lt](http://www.betal.lt)



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