

Integrated Urban Development Approach Targeting at Energy Efficient Residential Areas

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Table of Contents

Foreword and project background	4
Introduction to the manual	7
1 Explanation and benefits of an integrated urban development approach	8
2 Framework conditions for an integrated urban development concept with energy efficiency in focus	11
3 Energy related fields of actions within an integrated urban development concept	13
4 Steps of elaborating an integrated urban development concept	15
4.1 Analyse the current situation	15
4.2 Secure integrated, cross-sectoral and management structures.....	16
4.3 Organise the participative process and information and awareness campaigns	17
4.4 Develop a target and implementation orientated action plan	19
4.5 Secure the political and financial support.....	20
5 Conclusions and recommendations.....	22
6 Summary	25
7 Good practice examples for integrated urban development approaches	27
7.1 Target area Piaseczno, Poland.....	27
7.2 Target area Rakvere – Seminari Street, Estonia.....	33
7.3 Target area Lida (Grodno Oblast), Belarus	37
7.4 Target Area Jelgava, Latvia.....	41
7.5 Target area Riga-Jugla, Latvia.....	46
7.6 Target area Siauliai, Lithuania	50
7.7 Case study Berlin: Frankfurter-Allee-Süd/Kaskelkiez, Germany	55
7.8 Case studies from Brandenburg.....	60
7.8.1 Lübbenau/Spreewald –Energy 2021 Master Plan.....	60
7.8.2 Luckenwalde – District energy concept for the Nuthe/Burg quarter	62
7.8.3 City of Guben – Integrated Energy Strategy 2020.....	64
7.8.4 Spreewalddreieck Regional Energy Concept	66
8 Appendix.....	68
List of Images	68
List of Figures	68
Literature List	69
List of Abbreviations.....	70



Foreword and project background

Significance of energy efficient refurbishment

In view of the increasing significance of energy efficiency in the field of urban development, the transnational cooperation project UrbEnergy was launched in January 2009. The aim of the project was to combine measures of energy efficient refurbishment of the housing stock with the overall improvement of residential neighbourhoods. The project was co-funded by the territorial cooperation programme "Baltic Sea Region Programme 2007–2013" as well as by the German federal programme "Transnational Cooperation". 15 partners from Estonia, Germany, Latvia, Lithuania, Poland and Belarus took part in the project and represented key actors in national activities for energy efficient settlement structures.

Approximately 85 million people live in residential settlements in the EU which were constructed after the Second World War and prior to 1990 using standardised industrialised construction methods. Of these, approximately 11 million residential units houses approximately 34 million inhabitants which are located in the large housing estates of the 6 former Eastern states Czech Republic, Slovak Republic, Hungary, Bulgaria, Romania and former German Democratic Republic. A further approximately 600,000 (Latvia), 435,000 (Estonia) and 750,000 (Lithuania) residential units, constructed using prefabricated and other industrialised construction methods, may be added to these 11 million units for these accession countries; therefore it may be assumed that a total of almost 13 million such residences exist in the eastern region of the EU. It is estimated that a further approximately 1.9 million industrially constructed post-War residences may also be found in Belarus, the only UrbEnergy project partner state outside the EU.

Measures for increasing energy efficiency have been carried out in many West European countries for around three decades and the pace of their implementation has accelerated over the past two decades. A considerable amount of the housing stock in



the northern EU Member States has now undergone extensive upgrading to improve its energy efficiency. Hence, the adoption of a perspective that goes beyond the level of individual buildings and extends to the sustainable development of neighbourhoods, renewable energy sources and intelligent distribution structures is gaining significance.

Alternative solutions, such as the use of low-threshold measures and stand-alone solutions, which are tailored to local energy supply conditions as well as innovative financing processes and energy partnerships reduce unilateral dependencies and increase the flexibility for action.

In contrast, comparable projects have only been carried out to a limited extent in the eastern EU accession countries and, in particular, in the Baltic States; considerably less than 10 % of the post-war building stock in these countries has been refurbished. Parallels to the experience gained in the area of integrated urban and district development projects in the EU in the 1990s, e.g. with the 'New Deal for the Communities' in Great Britain, the 'Politique de la Ville' in France

and the ‘Soziale Stadt’ in association with the ‘Stad-
tumbau’ programme in Germany, can only be found
to a very limited extent in the new Eastern European
Member States.

Strategic and financial challenge

Overall, the challenges posed by the necessary in-
crease in the energy efficiency of cities and housing
stock represent a strategic and financial problem on
a pan-European scale that cannot be overcome on
national level alone. Based on the assumption that
(only) EUR 5,000 per residential unit is required in the
neighbourhoods with buildings constructed using
industrialised methods and calculated for the total
number of such residences in the Eastern EU coun-
tries and in Belarus alone, a total of EUR 75 billion
would be required to meet the requirements of en-
ergy efficiency and climate protection.

As investments that are carried out independently by
the market, this sum would not include any further
measures for optimised heat production and energy
distribution and does not take into account schools,
other infrastructure buildings or the older residential
building stock, which have long been neglected and
whose energy efficiency may be assessed as similarly
deficient.

Key objective of Urb.Energy

Urb.Energy’s key objective is the development and
implementation of integrated concepts and strate-
gies for the comprehensive energy efficient renewal
of residential areas in the Baltic Sea Region. The pro-
ject is co-ordinated by the German Association for
Housing, Urban and Spatial Development as Lead
partner and the Housing Initiative for Eastern Europe
(IWO).

The partners worked together to develop Integrated
Urban Development Concepts (IUDC) to combine en-
ergy efficient housing refurbishment with the renew-
al of the energy supply infrastructure, the upgrading
of the residential environment, the improvement of
the social and economic infrastructure and the par-
ticipation and mobilisation of residents.

“Old” and “New” EU Member States provided their
experience in the energy efficient revitalisation of
residential buildings, large housing estates and the
development of integrated concepts for urban neigh-
bourhoods and districts. The approaches applied
provide valuable transferable know-how, interesting
methods and administrative procedures as well as
practical examples that will be helpful to practition-
ers in other municipalities in BSR and Eastern part-
nership countries.

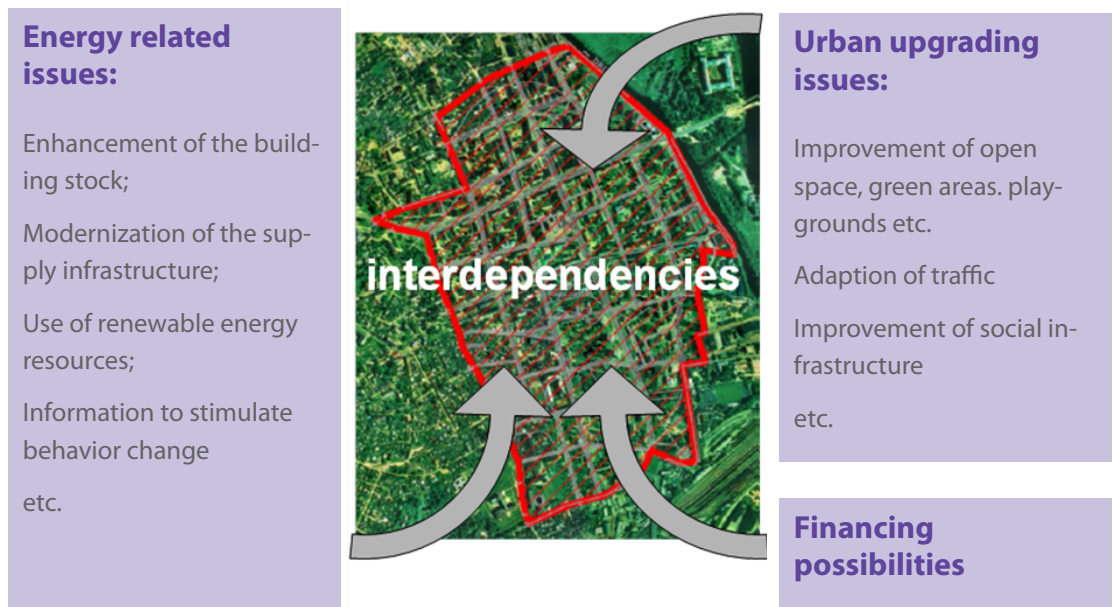


Diagram 1: Urb.Energy approach (Source: Britta Schmigotzki, Housing Initiative for Eastern Europe (IWO) e.V.)

The project partners developed and partially implemented integrated urban development concepts in six target areas aiming to improve the energy efficiency of residential neighbourhoods. These activities were implemented with the involvement of local stakeholders including residents, homeowner associations, energy providers, city councils and others. These integrated urban development approaches were combined with embedded concepts and measures for the energy-efficient refurbishment of buildings, the renewal of energy supply infrastructure, the upgrading of the residential environment and the identification of innovative financial instruments.

Urb.Energy main outputs

In addition to this manual about **the integrated urban development approach targeting at energy efficient residential areas**, the results and findings of the 3-year Urb.Energy project are summarised in three further documents:

- **Manual on holistic strategies for energy efficient refurbishment of the housing stock and renewal of the related energy supply system**
The manual presents an overview of various suitable and realistic approaches to implement energy

and climate friendly measures to improve energy efficiency and the use of renewable energy sources in the building sector embedded in the framework of an integrated energy efficiency concept for urban districts, especially for residential areas.

- **Guidelines for innovative use of EU Funds for Measures in the Housing Sector and deprived urban Areas**

The guidelines present a more practical approach to available funding options on both national and EU level. They can be used by local, regional or national actors when drawing up financing schemes for EER or integrated urban development concepts.

- **Policy recommendations: Energy efficient urban areas and neighbourhoods – A contribution to liveable and competitive cities**

This paper presents five main recommendations, based on the experience of the Urb.Energy partners, to put municipalities in a good position to increase the energy efficiency of cities and their neighbourhoods and to develop an affordable and climate friendly energy supply in combination with the modernisation of city districts.



Introduction to the manual

This manual presents the results of the Urb.Energy project related to the development of integrated urban development approaches targeted at energy efficient residential areas. The strategic focus of the work was to enhance the application of the integrated urban development approach being an important basis to upgrade and increase the energy performance of urban quarters. Thereby, the following fields of action were important:

- Energy efficient refurbishment of buildings and modernisation of the energy supply structure,
- Upgrading of the residential environment and improvement of the social and economic infrastructure,
- Participation of owners and residents.

The project partners combined the evaluation of implemented urban development processes and the elaboration and partial implementation of integrated development concepts for the urban target areas. These experiences formed the base for exchange and transfer of knowledge within the partnership. In this context, transferable, practical guidelines and models to other urban areas were developed.

This manual presents the operational methodology, procedures and solutions identified for setting up integrated urban development concepts with a focus on energy relevant issues for the project's target areas with focus on transferable operational steps and measures.

It aims to explain the need for integrated urban development approaches in order to target the improvement of energy efficiency in residential neighbourhoods and gives practical operational advice to local administrations on how to plan and implement such approaches successfully for the areas in their municipalities.

Thus, *Chapter 1* provides an explanation of the integrated urban development approach and the associ-

ated benefits, in particular in combination with energy efficient refurbishment.

In *Chapter 2*, the framework conditions are presented that have to be in place for the implementation of an integrated urban development concept with energy efficiency in focus.

In *Chapter 3*, energy-related actions that should be addressed in an integrated urban development concept are described.

Chapter 4 describes the steps of elaborating an integrated urban development concept containing an energy efficient refurbishment project.

In *Chapters 5 and 6*, the conclusions and recommendations of the Urb.Energy project as well as the main statements of this document are summarised.

In *Chapter 7* good practice examples of integrated urban development approaches are presented.

Energy efficiency measures and concepts are a key part of an integrated urban development concept. The technical, methodological and planning approaches for energy efficiency measures are presented in detail in the "Manual on holistic strategies for energy efficient refurbishment of the housing stock and renewal of the related energy supply system".

Contributions to the manual

This manual is based on documents and reports developed by the Urb.Energy project partners (see literature list p.82) and the intense discussions at various meetings, seminars and conferences. Important contributions were the Reports 1 and 2 from the German Federal State of Brandenburg and the report on the Berlin case study (see literature list p.82).

1 Explanation and benefits of an integrated urban development approach

Approaches to integrated urban development are gaining increasing importance in many EU Member States. This is emphasised in policy instruments such as the “Leipzig Charter on Sustainable European Cities”, which was signed at an informal ministerial meeting of the EU ministers responsible for Urban Development and Territorial Cohesion on 24/25th May 2007 during the German EU presidency.

The concept of an “integrated approach” to urban issues was developed with urban renewal projects for disadvantaged areas at the beginning of the 1990s. As certain urban areas, particularly large social housing projects, deteriorated, it became necessary to develop territorial initiatives that combined not only physical investments in buildings and infrastructure, but also measures to promote economic development and social inclusion. The idea was to break away from a compartmentalized approach to territories, issues and policies, in order to promote a “holistic” approach that takes into consideration the physical, economic and social dimensions of urban development. With time, the concept of an integrated approach expanded to include all urban issues rather than only the renewal of disadvantaged neighbourhoods.

A crucial component of the integrated approach is its **vertical and horizontal integration**; vertical in terms of the early integration and involvement of the various players of government, administration and non-governmental players relevant to urban development; horizontal in terms of integrating and coordinating the various sectoral policies and actions of the public and also private sector for the sustainable improvement of the area. The underlying idea is to reduce friction and conflicts between the different (sectoral) stakeholders and to coordinate sectoral

policies, concepts, objectives and action towards a common goal to avoid misleading developments and to make use of synergy effects.

Furthermore, through the involvement of different administrative and governmental bodies, there is the chance to raise their awareness about both the needs and potential of the respective area and the issues and actions to address to ensure a sustainable urban development.

Therefore the integrated approach demands the following as key fields of activity:

- Mobilisation and participation,
- The construction of suitable management and organizational forms at all relevant steering and implementation levels,
- Pooling of finances and know-how,
- Addressing a set of different field of actions at the same time.

These fields are aimed at all-embracing sustainable improvement in spatial, social, economic and ecological urban development (for energy-related fields of action cf. Chapter 3).

Integrated urban development concepts (IUDCs) are one of the core instruments to implement the integrated urban development approach. They have already been established in many areas in EU Member States. They have proven to be an instrument that enables the integration of cross-sectoral topics like “climate and energy” into the field of urban development. Thus, IUDCs introduce new issues into urban development such as energy efficiency, the reduction of energy consumption and the use of renewable energy sources.

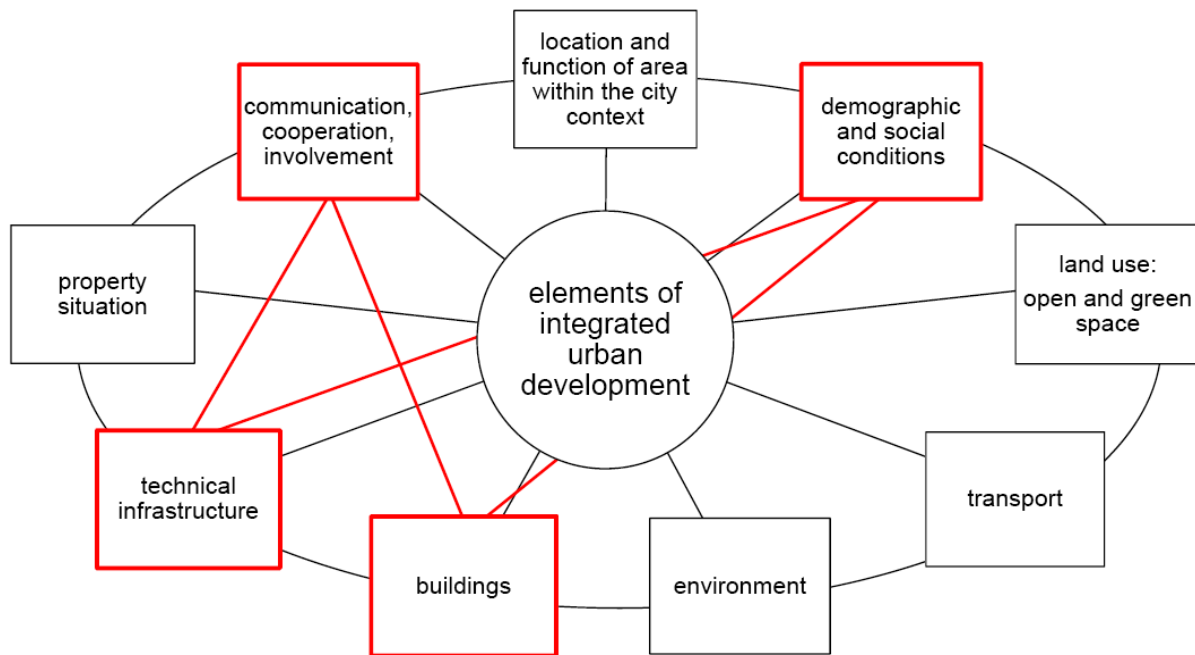


Diagram 2: Field of actions of an integrated urban development (Source: Archive Planergemeinschaft)

Integrated neighbourhood development concepts

Since the district or neighbourhood is a very important level within the urban setting in relation to the housing stock, integrated neighbourhood development concepts are to be drawn up within the framework of integrated urban development. These concepts should be based on an integrated urban development strategy and a municipal energy efficiency concept, which encourages a greater focus on its implementation.

Integrated neighbourhood development concepts can also form the basis of pilot and demonstration projects. In areas with a heterogeneous building structure it can be useful to form “energy clusters”. It is then possible to develop specific recommendations for action for neighbourhoods with similar characteristics, in relation to utilities provision, socio-spatial organisation and urban development without having to examine each building individually, which can be costly. Large homogeneous housing developments can be turned into “model energy-efficient districts” and provide good examples of consolidation. A set of criteria should make it easier to decide whether to opt for a centralised or decentralised heating network when drafting energy efficiency district concepts, especially in neighbourhoods with old buildings.

Benefits of integrated urban development concepts for the energy efficient refurbishment

Often when talking about energy efficient refurbishment, people think automatically of the refurbishment of buildings to improve their energy performance. Embedding this issue in an integrated urban development concept allows the consideration of all relevant fields of action which concern “climate and energy” within the urban development context (cf. Chapter 3). This enables the correlation between the upgrading of the neighbourhood and the energy efficiency renewal and to develop a comprehensive and coordinated approach and measures towards energy efficiency, reduction of energy consumption and use of renewable energy in the area. This also permits the development of solutions and actions which have a better cost-effect ratio considering the local infrastructure, social and financial constraints.

The use and planning of efficient combined heat and power for example, is only efficient and effective, if in addition to the electricity also the heat can be used for a meaningful purpose. Thus, a district heating network for the distribution of the generated heat loses efficiency when many buildings are refurbished to improve their energy performance. When planning an adequate and efficient energy supply and distribution system, demographic developments also

have to be considered as they change the future energy demand.

For the increased use of renewable energy resources, IUDCs and embedded energy efficiency concepts can provide helpful analysis and methodological tools and support, such as mapping geothermal power or identifying suitable locations for small scale wind plants and solar stations.

In the past, the functional, social and physical renewal of neighbourhoods was often the focus of IUDCs. In today's focus the energy related renewal plays a key role too. So IUDCs with energy efficient refurbishment as an integral component open up the perspective of the renewal and development. New funding possibilities for urban development and for energy

efficient refurbishment can support this conceptual approach and stimulate related investments.

Another beneficial aspect of IUDCs is the participative approach, which gives the opportunity to motivate owners and get them interested in the improvement of their neighbourhood and raise the awareness about the energy related improvement needs and benefits. This can lead to better identification and pride in the neighbourhood. Also owners are usually more open to invest in their property and apartments when they see positive changes around them and feel accepted and important within the planning process. In this way integrated concepts facilitate and enhance private investment in energy efficiency.

Benefits of energy efficiency related integrated urban planning on a large scale

Integrated urban development concepts with a focus on energy efficient refurbishment are useful on all levels of municipal planning. Though this project focuses on a relatively small scale planning level for residential areas and/ or a set of buildings, it will be beneficial to see integrated urban development concepts focusing on energy efficiency and climate protection in a broader picture.

At the level of territorial planning for the whole city/ municipality/region integrated urban development concepts with a focus on energy efficiency based on the principles of sustainability and climate protection are needed. For urban areas, this includes, in particular, integrated energy efficiency-orientated urban and transportation development planning as well as settlement structures that are as compact as possible and focus on inner urban development, multi-use options, short distances and minimising the extent of coverage by impervious surfaces (following the "compact city" planning model).

The planning process for new buildings and neighbourhoods can actively control energy and heat-

ing requirements as well as the compact design of the buildings and should also ensure the optimum use of renewable energy sources. In this context, attention can also be paid to urban structure requirements for adapting to the consequences of climate change (e.g. avoiding heat islands, creating ventilation corridors and protecting against flooding).

The contribution of cities to climate protection and energy efficiency objectives of the EU are deeply interlinked with the territorial planning objectives of the city or region, including energy supply concepts and the general development strategy.

Newly developing urban sprawl might lead to higher energy consumption and CO₂ emissions by increased traffic. The revitalisation of existing neighbourhoods might lead to a reduction of energy consumption and traffic that will improve the general balance of the city and its ecological footprint. It is of importance to develop urban visions including energy efficient refurbishment and energy efficiency measures in order to reach win-win situations for the whole city.



2 Framework conditions for an integrated urban development concept with energy efficiency in focus

Certain framework conditions are required to be able to develop and implement an IUDC successfully:

1. A legal planning framework which allows and encourages the development of IUDCs in support of the urban and energy efficient renewal of cities and neighbourhoods.
2. A certain need and pressure for action to deal with specific energy, economic, social and ecological challenges for the renewal of the city and its neighbourhoods and to be able to administer opportunities for the sustainable development.
3. The political commitment within the mayor's office and the municipal council to develop an IUDC with energy efficiency in focus.
4. Sufficient resources (finances, personnel, know-how) for the development and later for the implementation of the IUDC and its measures.
5. Mobilisation of the stakeholders to engage in the development of the IUDC and later support its implementation.

Barriers and obstacles

The following findings about framework conditions were derived from the evaluation of Integrated Urban Development Concepts of the case study area Berlin (cf. p. 65ff) and the project discussions on options, barriers and obstacles that hinder or slow down the energy efficient refurbishment and the implementation of integrated urban development concepts.

Some framework conditions cannot or cannot be quickly changed like the legal planning system of the project partner countries or the individualised owner structure in the Eastern European housing sector. Therefore solutions must be found for how to implement energy efficient related IUDCs under various and sometimes unfavourable framework conditions. Other framework conditions can be changed but need an active approach by the local administration and the local council, like the decision to change the planning procedures towards an integrated urban

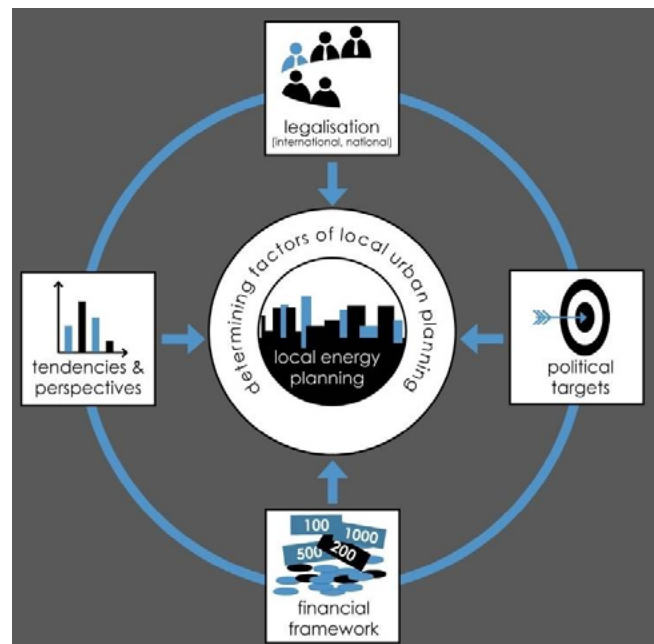


Diagram 3: Framework conditions for IUDCs (Source: pro:21 GmbH)

development approach in general and to improve energy efficiency in residential areas by such concepts.

The situation concerning tenancy and property law is assessed as a fundamental framework condition. The individual ownership structures in the Eastern European Countries without ownership of grounds/estates can result in an insufficient balance within the cooperative structures between the state, local policy and administration, property owners and their property managers. Individual property owners tend to operate in isolation and this, combined with the current income situation and the weak regulation of residential property, makes it difficult to stimulate collective action with the view to improve energy efficiency and implement integrated urban development concepts.

Heterogeneous single-ownership structures and their deficits of organisation also make the agreement and implementation of energy efficiency measures in the

housing stock difficult. Insufficient funding schemes and a lack of secure loans for apartment and property owners complicate the financing of energy efficiency measures as, in the new Member States, the land, on which the property is built, is often not owned by the property owners. The lack of integrated policies and concepts and insufficient organisational structures make it difficult to promote the energy, economic, social and ecological renewal of neighbourhoods that is both coordinated and target-orientated.

Stable and favourable framework conditions

The planning and especially the successful implementation of IUDCs require a setting of stable and favourable framework conditions: Legal stability, sufficient administrative capacity, well-proven participation models, available financial funds and promotion and awareness raising campaigns are important key elements. Furthermore each integrated urban development concept has to take the socio-economic framework conditions of the inhabitants in the relevant district and the specific physical and technical conditions into account.

The findings of the German Federal State of Brandenburg have been that reliable institutions are a prerequisite for the development of cooperative strategic action. Project partners should therefore consider in which sectors, in addition to energy and environmental policy, it might be useful to strengthen urban and environmental policy institutions. This relates in particular to the importance of having a reliable legal and regulatory framework (planning, property, regulation of tenancy and residential property rights) and robust, independent stakeholder structures (municipal constitution, regional development, housing, residential property and tenants’ associations, chambers of professional associations, district representation).

Organisational structure and participation

The project showed that an integrated approach towards urban development and the energy efficiency of buildings is highly facilitated by ownership structures that hold the responsibility for a whole area of

buildings. Individual ownership structures or missing institutionalised managerial umbrella structures are a major challenge for the implementation of energy efficient refurbishment measures and increased use of renewable energy sources.

It is therefore important to establish organisational structures (local energy rehabilitation agencies and housing associations or cooperatives) to support the individual owners and serve as information points and representatives. These organisations should be organised as legal persons in order to be able to receive funds and deal with contracts.

Owner associations or cooperatives may be suitable to work as such an organisational or umbrella structure for the management of the energy efficient refurbishment concepts implementation and as representative of the owners within the IUDC process. It is also important to define clear rules regarding the decision making process in such organisations (consensus versus majority decision). The economic benefit and affordability for owners and residents after the implementation of energy efficient refurbishment measures and increased use of RES in housing remains an important key factor.

Clarification of legal status of ground

It is important to clarify the legal status of the buildings and apartments and also of grounds and outdoor facilities. Since energy efficient refurbishment implementation requires additional funds, the credit worthiness and the eligibility of estates/parts of estates to serve as collateral are absolutely influencing factors. For the part of the investment that needs to be financed by the owners, it is of utmost importance that they can get an advance on their mortgage or a subprime loan.

The development of energy efficient refurbishment concepts as part of an IUDC offers the possibility to identify and prioritise the adequate activities in balance between the technically feasible measures and the measures that will be agreed and accepted under the specific conditions in a neighbourhood.



3 Energy related fields of actions within an integrated urban development concept

For the enhancement of energy supply, energy efficiency, reduction of energy consumption and use of renewable energy in neighbourhoods, it is of special importance to address all energy relevant fields of actions within the integrated neighbourhood development concept to be able to develop coordinated and cost-benefit effective measures. The energy related fields of actions are:

Rehabilitation of buildings

Rehabilitating the buildings in a neighborhood represents a great potential to increase their energy efficiency. It also offers to upgrade the living conditions of their residents. After a basic analysis of the existing level of energy efficiency and the potential to make savings in buildings e.g. in the form of energy performance certificates, basic energy checks etc., the main areas of activity are the energy efficient refurbishment including insulation of façade and ceilings and the replacement of windows, as well as the modernisation of the existing technical facilities and heating systems to increase energy efficiency and energy efficient solutions for heat and power supply. Also it is important to implement the use of renewable energy sources (photovoltaic, solar thermal and geothermal energy).

A municipal or regional register of different surface areas can assist municipalities in setting up a solar suitability map, to determine which rooftops are suitable for solar installations, which areas are unsuitable for solar farms, etc.

Also low cost measures can be carried out, for example installing heating and hot water systems in such a way that they achieve optimum performance, implementing smaller technical measures, installing individual room controls in residential buildings, providing information about consumption (e.g. smart meters), and also encouraging housing associations and other property managers/community associations to provide advice to tenants on energy conser-

vation in the home in order to optimise consumers' behaviour.

Green space

The development and the improvement of urban landscape as green spaces including parks, private gardens or street trees, not only increase the living quality for residents as recreational areas, they also help urban areas to adapt to the impact of climate change and improve the city climate. These green spaces can contribute to flood storage in periods of heavy rain or relieve the effects of raised temperatures in high density residential areas and town centres. Particularly trees can counter poor air quality by absorbing greenhouse gases such as carbon dioxide and other air pollutants. Improving the quality of urban green spaces to ensure they are well-planned, safe and appealing could also encourage people to walk or cycle rather than use cars for short journeys, and indeed provide for recreation and access to nature nearer to home. This also helps to reduce carbon emissions.

Attractive and healthy public space

Improvement of the urban environment in general and of the quality of public spaces in particular is an important objective within an IUDC. The aim is to establish a well designed, safe, appealing and functioning open space, with meeting places for all social groups including the elderly, families, youths and disabled people and with playgrounds, sports and cultural facilities. A well planned public space is important for urban identity and should help community members to improve their relationship to the neighbourhood and with one another.

An important further aspect is the function of public space to adapt to climate change, like the introduction of technical solutions to reduce the overheating of city districts as for example spanning awnings in streets, painting buildings and streets surfaces white

to reduce heat absorption and planting biomass to create CO₂ sinks.

Environmentally friendly mobility

The reorganisation and optimisation of traffic routes, traffic calming measures, the rearrangement of parking lots, the optimisation of the public transport system and the improvement of paths and the cycling network lead to environmental friendly mobility. Municipalities should also prevent the use of motorised private transport (in particular cars) as much as possible and shift towards environmentally friendly, low-emission forms of transport. The main focus here is on expanding and incentivising “soft mobility”. This includes non-motorised private transport (walking and cycling) as well as public transport (with attractive bus and rail systems) which form an integrated transport system and links up with regional and long-distance transport services. The bus system should take advantage of new low-emission technologies (e.g. buses powered by natural gas). It is also important to establish favourable conditions for the development of electro-mobility in this area as well as the motorised private transport sector.

By converting the city’s vehicle fleet, municipalities can take a leading role and stimulate a ripple effect. Alongside the many options that can be used to incentivise environmentally friendly mobility, municipalities can also turn to more restrictive measures, for example focused traffic management, traffic calming and parking management.

Modernisation of technical and energy infrastructure

Within the field of technical infrastructure, there are significant opportunities to conserve energy and in-

crease energy efficiency; examples are the areas of affordable and climate-friendly energy supply, sewage treatment, waste collection and disposal, and street and traffic lighting (e.g. dismantling street lamps that are no longer needed, “half night” lighting, use of LED lamps).

There is also a great potential to take action in the area of renewable energy. Municipalities in particular should work towards developing and utilising renewable energy sources and sustainable, low-emission technologies for generating power (e.g. natural gas, cogeneration) as well as exploring decentralised energy supply options (e.g. block unit heating power plant). The choice between local heating and district heating will depend on the urban, district and building structure. Also it is possible to minimise heat losses by refurbishing or reducing the supply network and to optimise the networks while at the same time reducing the buildings’ heating requirements.

Business environment

It is also essential to raise the economic value and vitality of an area. Important is the improvement of the business environment, sufficient shops for daily needs and a sufficient number of work places near home.

If a residential area includes small business locations, it is useful to include them into the IUDC process as some rather small businesses have quite a high energy consumption (i.e. bakers and butchers) and can benefit from energy efficiency modernisation concepts.

4 Steps of elaborating an integrated urban development concept

To successfully elaborate an integrated urban development concept (IUDC) the following steps should be carried out:

1. Analyse the current situation
2. Secure integrated, cross-sectoral and management structures
3. Organise the participative process and information and awareness raising campaigns
4. Develop a target and implementation orientated action plan
5. Secure the political and financial support

4.1 Analyse the current situation

The analysis of the current situation is of particular importance as it helps to provide an overview and raise awareness regarding the renewal and energy efficiency needs of an area. It assists the responsible institution in charge of developing the IUDC and the stakeholders involved in disclosing strengths, weaknesses/limitations, opportunities, threats and conflicts and in understanding and recording them. In addition, the need for the improvement of structures, procedures and measures to upgrade the area and make it more energy efficient can be disclosed.

Also the inventory and analysis of the current situation helps to precisely determine the needs and fields of action to be addressed in the IUDC. It will help to develop a 'tailor made' and target orientated IUDC with adequate action for the upgrading and energy efficiency of the area in the identified fields of action. Relevant fields of action might be energy and heating requirements, the design of buildings, green spaces, transportation, infrastructure, social welfare and the use of renewable energy (cf. Chapter 3). The public should be involved in the analysis for example by being asked about their opinions and needs concerning the area.

Prior to the analysis the first step is to identify and select areas with a special need for integrated urban development and energy efficiency measures. There should be a political and expert-based agreement about which criteria lead to initialising an integrated urban development process related to upgrading and the energy efficient rehabilitation. These criteria should consider urban structure, functional aspects and a balance between economic, social and ecological development. Energy efficiency should be explicitly included.

For energy efficiency the relevant criteria include the energy demand (heat, ventilation, power and process power for industry) and the potential for energy reduction as well as the state of the supply network, the available options to improve the situation and the willingness of owners to invest. To facilitate the eligibility for funding from ERDF, the selection criteria should be compatible with the area criteria in the operational programmes, for example through the presentation of various unfavourable aspects in an area (decline, high unemployment, low security status, derelict or empty buildings, low income structure, many elderly residents, bad energy performance of buildings and technical equipment/network).

Having identified the area, a coherent and thorough analysis of the energy, economic, social, ecological and urban situation is to be conducted in order to address the specific local conditions and to identify the qualities and potentials of the area on one hand, and deficits and constraints on the other hand. This for instance can be done with a "Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis as was performed for all target areas in the Urb.Energy project.

To address the energy situation in particular, the energy supply and consumption of the neighbourhood has to be determined (e.g. with an energy plausibility check). It has to be established which energy suppliers are present, the quantity of energy that comes

into the neighbourhood and where it is consumed (sector and area based). Based on this, the potential opportunities for saving energy in the neighbourhood, both in terms of new technology and economics, have to be identified as well as the interaction between climate/ energy-related measures on the building and neighbourhood level and the adaptation of the energy supply.

Another important point is the relevance of user behaviour and user comfort. User behaviour can be counterproductive to certain energy efficiency measures. If, for example, somebody always sleeps with an open window and leaves the balcony door open the whole day in summer, a building cooling and heating ventilation system will be overwhelmed. User behaviour is very difficult to influence even if the user is in principal aware of the way they should behave. Apartments, balconies and outdoor facilities are also used differently depending on the user’s lifestyle. Therefore IUDCs with embedded energy efficient refurbishment should start with a survey of the specific user behaviour and take the results into account.

4.2 Secure integrated, cross-sectoral and management structures

As the integrated approach includes horizontal and vertical integration (cf. Chapter 1), cross-sectoral and management structures are to be set up and implemented to be able to address and coordinate all relevant fields of action for the upgrading and energy efficient refurbishment of the neighbourhood. The structures, responsibilities and procedures for the development and implementation of an IUDC must be clear and transparent.

The development and implementation of an IUDC with commonly agreed objectives and measures needs to be clearly appointed to an administrative body with sufficient capacity in terms of staff and experience (supported by a private agency if necessary e.g. a local energy or coordination organisation). This body needs to organise and coordinate the development process and the day-to-day management for the implementation of the IUDC. It has to be aware of the needs of the stakeholders and of all conflicts

that might arise during the process of the neighbourhood improvement. This body can be an appointed team in the administration or a public institution like a local energy agency. The important point is to agree on an institution that will deal with all of the administrative procedures and will act as trustworthy and competent partner in the target area for private and public actors.

In addition, it is recommended to establish a multi-disciplinary working group within the administration, which support the development of the concept and its implementation (in particular the departments responsible for urban development, the environment and social and economic promotion should be involved). It might be helpful to (temporarily) integrate further key public and private stakeholders in that working group that are needed for the development and implementation of the IUDC. The working group should meet at regular intervals to discuss interim results and develop and agree on objectives and actions. Transparent rules concerning decision-making should be set up. A political mandate for the working group is highly recommended.

Furthermore it can be helpful to set up an independent specialist advisory council that includes interested parties and stakeholders, and forms a local network. Regular coordination meetings are a good instrument to harmonise subjects and interests.

For the implementation of energy efficiency measures energy/climate protection managers can play a key role in supporting this new area of action in local administrations. Any additional capacity is determined by the size of the town or city. It is highly recommended to establish this role within the municipality’s core administrative structure, either as a separate department or within a department that takes a cross-sectoral approach (e.g. urban development). It is crucial that an adequate job profile is created to maintain expertise and also to develop and publicise the topic within the administration and the town or city.

Furthermore an IUDC “manager” should be appointed. They could be a member of the administrative body responsible for the development and implementation of the IUDC or be an external service provider who works in close contact with that administrative body. The manager would be responsible for

steering the planning process and more importantly its implementation, to ensure that the action plan is carried out. They would also be responsible for the organisation of all coordination and cooperation procedures.

A further task of the manager would be to monitor the development of the area by appropriate indicators to recognise new problems and challenges and transmitting this knowledge to decision makers (for example the local council, head of administration, property owners). The monitoring would allow the manager to check whether the implementation of the IUDC is advancing as planned i.e. if objectives are reached and actions are realised as scheduled. Such monitoring will help to revise and adapt the IUDC, keeping it up-to-date. Communicating the monitoring results to target groups can also raise the awareness about the situation of the area as well as bear on decisions affecting the area.

4.3 Organise the participative process and information and awareness campaigns

In many EU countries, planning legislation requires a formal participation procedure for certain stakeholder groups. The idea is to clarify problems and conflicts before the implementation starts to be able to adapt planning results, if it is still possible at this stage. If, for example, vertical solar panels are planned for several buildings and residents on the other side of the street are concerned about the reflections, it is helpful to identify this conflict soon and find an appropriate solution.

The requirements for formal participation procedure differ according to national planning legislation. In Germany, it is mandatory to publically display formal planning documents to give concerned stakeholders, in particular inhabitants of an affected area, the opportunity to see the project and inform the planning authority about their concerns, if they think their interests are neglected or endangered. Also public agencies that might be concerned by the formal planning documents have to be consulted in written form about their statement.

The participation within the development of an IUDC goes beyond the formal participation procedure. Here more direct and extensive participation approaches are applied. To achieve an implementable IUDC with objectives and actions that local stakeholders can agree on, it is of utmost importance to include all relevant stakeholders as well as the general public in the development of the IUDC, developing joint objectives and actions for the upgrading and energy efficient refurbishment of the area. Involving different stakeholders is important as they have manifold needs and demands which have to be coordinated and balanced. This requires a direct dialogue with and among the stakeholders, allowing them:

To recognise and understand each other's needs,

- To develop sustainable solutions closer to these needs and
- To balance and coordinate the needs and projects among the stakeholders and bring them in line with the requirements of the energy efficient refurbishment.

The involvement in the elaboration of the IUDC will also lead to the stronger identification with the objectives and actions for the area and stronger support for their implementation ("feeling of ownership": a person is more willing to support something when being involved in its development). To a certain extent this can help to tap further (private) resources (manpower, knowledge and finances) for the implementation of the actions.

Thus, intense participation procedures make planning more time consuming but on the other hand, it facilitates the implementation of measures. Experience from Berlin and Brandenburg have demonstrated very clearly that success stories of integrated urban development approaches and energy efficient refurbishment of housing estates correspond directly to the proactive involvement and the commitment of the stakeholders.

A further opportunity that participation offers is to make use of the local knowledge of the stakeholders. For the analysis of the current situation as an example (cf. Chapter 4.1), relevant information and expertise can be drawn from local energy agencies or public utility companies (like district heating or electricity or water suppliers).

The stakeholders who have an interest in the further development of the area should get the opportunity to address their needs and proposals and be involved in the development of the IUDC. In general they should be included from the very beginning, already during the analysis phase (cf. Chapter 4.1). There are two typical approaches of involving local stakeholders:

One approach is characterised as follows: The content of the IUDC is developed step by step in very close cooperation with the multidisciplinary working group (cf. Chapter 4.2) and, during certain phases, with further stakeholders. At the end of the process there is the final version of the IUDC. The other approach aims at the widest possible participation beyond the multidisciplinary working group. In the first

phase input on the content of the IUDC is collected from the multidisciplinary working group members and further stakeholders. Then, a complete draft of the IUDC is written by the organisation in charge of its development. This draft is discussed in public consultations in the second phase. Based on the results, the final version of the IUDC is written by the responsible organisation.

In general, workshops provide a better opportunity to involve stakeholders than general public meetings or opinion surveys because they allow a more intensive exchange of ideas.

The following example from Berlin shows the activities to motivate and involve stakeholders at each step of the development of the IUDC.

Step	Activity
1. Preliminary enquiry and selection of IUDC area	Make enquiry and selection transparent to the public (especially to residents and owners)
2. Inventory and evaluation	Make public that IUD planning process is starting (public meeting, newspaper, poster, letters, etc.), include local actors in inventory and evaluation (opinion survey, etc.), explicit participation of public agencies, especially energy provider
3. Needs for action Development goals	Integrate different sectors and interests of actors, set up coordination meetings (for different responsible administrative departments), include owners' and residents' opinions, keep political actors informed about process (applies to all steps)
4. Alternative concepts Weighting of priorities IUDC plan	Present alternatives to the public (e.g. public meeting, workshop) and discuss them with the public, make weighting of priorities transparent to the public, present IUDC plan to the public (e.g. newspaper, poster)
5. Measure and financing plan	Talk to potential partners who would implement measures and get them to be responsible for projects, determine all possibilities of financing and funding for planned measures, include the public in prioritisation of measures
6. Political passing of IUDC	Present IUDC to deciding politicians (at best most of them had followed the IUD planning process), prepare the wording of the legal document, make the document public

Diagram 4: Detailed Steps of IUDC Implementation (Source: Centre of Competence for Major Housing Estates)

Key stakeholders

To involve the necessary stakeholders in the development of the IUDC including energy efficient refurbishment, a stakeholder analysis should be carried out to identify the relevant stakeholders and their interests. Relevant stakeholders in particular for the energy efficient refurbishment (EER) may include differ-

ent local administrations, property owners, housing corporations and associations, tenants, business and social initiatives, energy suppliers, grid companies and the representatives from these groups.

In particular residents, tenants and property owners need to be given a serious opportunity to have a say in how their housing and neighbourhood are to be

developed. The local energy providers are important as they are responsible for changes within the energy supply network, especially for heating, and technical improvement measures to adapt to changing socioeconomic and demographic structures. They also have the data from all of the households that are needed for a proper survey of energy demand. In the case study area in Berlin, it happened that the energy provider was not included in the participation carefully enough, which resulted in a missed opportunity to connect one neighbourhood to the district heating network.

Energy supply is also particularly relevant at regional level, especially for the expansion of renewable energy sources and the upgrading or adjustment of power grids. The suppliers need to undertake the important task of assessing the efficiency of existing networks or rethinking local energy concepts. Issues need to be considered, like whether constructing local heating or standalone systems might be a more beneficial alternative or how to switch to using other sustainable, low-emission technologies for generating power (e.g. cogeneration).

Therefore cooperation with the local energy supplier is vital for an energy efficiency based IUDC.

Information and awareness raising

The general public and stakeholders who are not directly involved in the development process of the IUDC, should be informed about (interim) results too. Here public relations, information and awareness raising campaigns are suitable. This is necessary to make these stakeholders aware about the current situation, needs for improvement and possible action to be implemented in the future according to the IUDC. Such campaigns therefore have to be a key component in the process of developing and implementing an IUDC.

Experiences from target areas like Jelgava or Rakvere have demonstrated that a series of meetings and workshops work well as awareness raising events.

The information during the implementation phase should concentrate in particular on communicating benefits and economically feasible energy efficiency measures. This should include information about financing opportunities in particular for individual property owners. In order to emphasise the role of

the municipality in setting a good example, the municipal administration should actively provide the public with information about its own activities and measures for the upgrading and the energy efficient refurbishment of the area.

Supporting the formation of residents' groups can be helpful to obtain their assistance for the information and awareness activities regarding energy efficient refurbishment.

4.4

Develop a target and implementation orientated action plan

To ensure the coherency of measures for the upgrading and the energy efficient refurbishment of an area, they should be directly derived from the defined objectives in the IUDC; this to ensure the development of measures that directly target the improvement of the area. The measures should be as specific as possible, as too general or complex measures are difficult to be implemented. Thus, complex actions are to be broken down into implementable measures. When defining technical measures, social and economic conditions have to be taken into account in order to develop socially acceptable and economically feasible measures. Also private measures i.e. from investors and property owners should be taken into account and coordinated with the public measures.

As funds and resources are limited it is likely that not all measures can be financed. Thus, an action plan with a list of prioritised measures should be set up, determining which measure ought to be implemented in the short, medium and long term. Local stakeholders should be involved in the definition of the action plan to encourage their support of the measures. An action plan can already prepare the implementation of the measures, when it provides further information about the prioritised measures, as for example:

- Project title and short description
- Responsibility: Naming the responsible institution/ person for the implementation of the measure as contact person and coordinator. In addition, the stakeholders to be involved in the develop-

ment and implementation of the measure should be named.

- Financial resources: Estimation of the financial resources needed for implementing the measure.
- Funding by/Funding programme: Recording where the financial resources will come from (i.e. from municipal budget, regional, national or EU programme, private institution, etc.).
- Financial resources secured: Stating “yes” or “no” depending on whether the financial resources are secured or not. If they are not, the next step will be to acquire further resources or to adapt the measure to the financial constraints.
- Time schedule: Stating in which year the measure ought to be implemented. By that time the required resources should be available.
- Links to other projects: Stating links to other projects which are directly related to the measure.

4.5 Secure the political and financial support

Political support

The political approval of an IUDC is fundamental for the successful internal and external steering of the development process. It also offers security for (energy efficient) investment decisions of private stakeholders. This means the information and pro-active involvement of the local council is worthwhile in order to get continuous support and backing.

Therefore, the city council should be informed about the development of the IUDC with energy efficient refurbishment at the very beginning i.e. before the development process has started. An official resolution is recommended. During the development process the city council should be regularly informed about interim results. This makes it possible to react to comments raised by political representatives. The approval and commitment of the city council to the final concept and actions should be obtained at the end of the process.

It is however not enough to only ask for formal approval; political actors need background information and understanding for the necessity of the objectives

and actions as well as for the procedures and necessary budget. This information has to be provided.

Financial support

Sufficient financial resources are required to initiate and implement the IUDC process and any public measures of the IUDC. Financial support can also activate private stakeholders to engage and to invest. An experience made in Germany is that public financial support can provoke a multiple amount of private investments. Also investments in the public space can encourage private investments in the private sphere. Acquiring a range of good sources of funding is therefore essential. Thus, regional, national and EU programmes e.g. Operational Programmes of ERDF and ESF and financing instruments like ELENA and JESSICA, should be checked to see if the development of the IUDC with energy efficient refurbishment, the implementation of actions as well as the management and organisation structures for the energy efficiency modernisation process can be funded. This should be done at an early stage to be able to assess the financial options for the implementation of energy efficient refurbishment measures. The municipality should try to proactively engage the regional or national (Managing) Authority of ERDF and ESF funds to identify fundable actions through regional operational programmes.

The municipality’s own contribution must also be guaranteed. In addition municipalities should examine the possibility of receiving sponsorship from local businesses. All economic consequences of the measures should be made clear to the relevant stakeholders and the concept should take the potential of property owners and tenants into account in this respect, making them aware of the effect on their income (this is a crucial point especially in Eastern European municipalities with scattered ownership and low incomes). Financing should be planned on a long-term basis and the consequences of the measures should be made clear in binding agreements. It is also recommended to combine different funding options available. Together they can help to develop the capacity of both the municipalities and other stakeholders to take action.

Steps		Energy efficient focus
1 Preliminary enquiry and selection of IUDC-area	←	Criteria of selection: Balance between economic, social and ecological aspects → EE to be included
2 Inventory and evaluation	←	All-embracing set of integrated elements: EE concerns buildings, energy infrastructure, transportation, green space and demography and social conditions
3 Need for action Development goals	←	Formulation of integrated needs for action and integrated development goals: Explicitly elaborate EE for all sectors and name EE as a development goal
4 Alternative concepts	←	Alternative concepts with different approaches to EE or with differently strong EE measures
5 Measure and financing plan	←	Appoint EE projects to party responsible for carrying out the measure, Compile possibilities of financing and funding for EE projects, Set priorities of action taking EE into account
6 Political approval of IUDC	←	Prepare for political approval of IUDC, Point out EE balance that might be reached through implementing the IUDC

Diagram 5: Steps and components of a Berlin IUDC integrating energy efficiency aspects (Source: Centre of Competence for Major Housing Estates)

5 Conclusions and recommendations

Transferability of project concepts

The Urb.Energy project clearly demonstrated that specific situations in the urban context require specific solutions and tailored concepts. The conclusion is similarly clear that the individual obstacles and solutions found for each target area of the partners are not simply transferable to other municipalities in the EU and neighbouring countries.

On the other hand the general philosophy and methodology of the integrated approach for urban development and to improve the energy efficiency is meanwhile a common goal inside the EU, at least since the Charta of Leipzig.

The main project outputs and especially this document sum up the transferable parts of the many lessons learnt and solutions developed within the Urb.Energy project.

Transferability is understood not as the simple copying of solutions, but rather as the qualitative and quantitative transferability of the general idea and approaches related to specific framework conditions, the use of special methodological tools for defined types of urban areas and building types to tap into their energy efficiency potential. However to maximise the full potential of energy efficient refurbishment of neighbourhoods, it is necessary to adjust to local conditions.

Transition from separate plans to integrated concepts

The experiences of the Urb.Energy project partners revealed that the measures initiated by the EU to increase energy efficiency and for the benefit of climate protection at municipal level are actually inspiring the participating actors to act increasingly on an interdepartmental basis and develop integrated concepts.

The project has also clearly demonstrated to the actors that the efficiency targets agreed in the EU can

only be achieved by considering the systematic links between buildings, energy-technology infrastructure and settlement structures as well as the associated social and economic conditions. Demographic trends, economic and income development, the behaviour of users and finance modes are particularly important in this context.

This transition from the previous processes, which were separate and related to individual cases, to integrated overall concepts, which was triggered by the policies for increasing energy efficiency, is a complicated process and not without contradictions or resistance.

Demand for change

The demand for change is high and is viewed by the Urb.Energy partners as a challenge to adapt the existing sectoral planning culture and centralistic traditions to the integrated approach with vertical and horizontal integration (cf. Chapter 1) and stakeholder and network-orientated strategies. The case study-orientated potential and deficit analysis methodology (SWOT) and the integrated action concept for the target areas, accompanied by the international exchange of experience and knowledge between the project partners, proved to be a suitable strategy for the Urb.Energy partners and will also prove suitable for local actors in other municipalities with similar framework conditions.

An integrated approach to urban development has the potential to transform sophisticated, technical modernisation measures of individual buildings into an overall rehabilitation strategy of urban quarters with a sustainable supply infrastructure. Thereby the combination of energy efficiency measures with neighbourhood upgrading measures offers multiple improvements at different levels.

Integrated approach – a suitable instrument to activate energy efficiency potentials

Based on national and especially transnational experiences, integrated approaches to urban development are suitable instruments to activate individual energy efficiency potentials in urban areas and implement upgrading measures. The holistic approach of IUDCs with energy efficiency measures concerns the main principles of urban planning and development. Therefore the fields of action of IUDCs are manifold and can be summarised as: buildings, green space, public space, mobility, technical infrastructure and also behaviour change and mobilisation of inhabitants.

Existing barriers and open questions

Reflecting the complex challenges for the energy efficient refurbishment of the building stock, it is clear that integrated concepts for the energy efficient urban renewal alone will not be sufficient to solve the retrofit dilemma. Experiences in Urb.Energy have shown that there are different fields to work on to overcome existing barriers:

- Integrated urban development approaches need to be integrated into the planning process at city level, but also in national urban policy and planning law with a focus on energy issues.
- Comprehensive and differentiated analysis of the energy standards and the saving potentials of the building stock interlinked with the most suitable energy supply system are needed. These are prerequisites to identify and realise suitable refurbishment measures and also measures to adapt the energy supply.
- The ownership structures in housing areas need to be regarded and respective difficulties need to be coped with. Especially in the new Member States these structures require adjustments in e.g. energy efficient measures or financing possibilities. Of great importance is the support of homeowners’ associations in, for example, the clarification of their legal status or property rights. The affordability of energy efficient refurbishment remains to be the core question for homeowners.
- Suitable and long-term financing schemes are essential to support integrated urban planning processes as well as refurbishment measures of build-

ings. Here variable financing instruments need to be available, giving support through long-term revolving loan programmes and addressing diverse parts and bodies of the integrated process. Grants can serve as an incentive for investments of sole owners.

- Communication strategies between administrations, property owners, housing companies and tenants’ initiatives as well as residents are to be developed, financed and maintained.
- Continuity is a relevant factor, therefore not only the financing of investments has to be established but support and mentoring is important.
- The capacity of the local government needs to be enhanced to initiate and coordinate a lasting refurbishment process, e.g. by setting up special rehabilitation units within the city administration or specialised (external) agencies.
- Awareness raising and information campaigns as well as technical support (for example by a local agency) are crucial instruments and need to be used to inform residents on the potential and benefits of integrated and energy efficient measures. To change consumption patterns and behaviours there is the need to invest in human resources.

Recommendations on operational level

A strong basis formed by the legal, administrative, stakeholder-related and financial framework is a key element in order to set up an IUDC. Legal stability, administrative capacity, well-proven participation models and financial funds are further important key elements.

To successfully develop an IUDC, the following aspects should be taken into account:

1. Analysis of the current situation,
2. Securing of integrated, cross-sectoral and management structures,
3. Organisation of a participative process and information and awareness raising campaigns,
4. Development of a target and implementation oriented action plan and
5. Securing the political and financial support.

The conclusions derived from the practical work in the project target areas have led to the following set



of operational recommendations for practitioners in the BSR and Eastern partnership countries who want to start developing an integrated urban development concept targeted at increasing the level of energy efficiency in residential neighbourhoods:

- Present the IUDC including an EER concept at a very early stage to the local council and reach a formal decision on it (if IUDCs are not a routine part of planning procedures).
- Combine actions for energy efficiency with general upgrading activities for the area.
- Include measures to enhance the energy efficiency of neighbourhoods, including construction measures as well as awareness raising activities to influence user behaviour and modernisation of supply network, introduction of decentralised CHP and a higher share of renewable energy sources.
- Plan overall upgrading activities such as green spaces and social meeting areas in order to raise acceptance and commitment of owners and residents.
- Include a cost-benefit analysis in the preparation of the IUDC and work within a step by step action plan to gain the most effects from it.
- Set up a communication and action plan for internal cooperation as well as for external efficiency.
- Establish a coordination team for each IUD area or a coordination agency for larger IUD areas, preferably with an office on site.
- Set up an inter-sectoral working group and regular coordination meetings.
- Involve stakeholders through information and communication measures from the very beginning.
- Keep the commitment of residents high and enhance information on user behaviour.
- Invest in public spaces to improve areas with old housing stock and by that increase the value of the estates. If so, mortgages can be higher and payback rate of investments will be higher.
- To reach higher energy efficiency contributions funding options should be differentiated with lower grants for standard measures and higher grants or more attractive loans for better measures.
- Give residents and tenants a serious opportunity to have a say in how their building and their neighbourhood are to be developed. In terms of energy efficient measures it is important to reach common consensus or a real majority decision.

6 Summary

Approaches to integrated urban development for the comprehensive energy efficient renewal of residential areas are gaining increasing importance in many EU Member States. Within the Urb.Energy project, the partners worked together to develop an integrated development approach which combines energy efficient housing refurbishment with the renewal of the energy supply infrastructure, the upgrading of the residential environment, the improvement of the social and economic infrastructure and the participation and mobilisation of residents.

A crucial component of this integrated approach was vertical and horizontal integration; vertical in terms of early integration and involvement of the various players of government, administration and non-governmental players relevant to urban development, horizontal in terms of integrating and coordinating the various sectoral policies and actions of the public and also private sector for the energy efficient renewal of their areas. The underlying idea was to reduce friction and conflicts between the different (sectoral) stakeholders and to coordinate sectoral policies, concepts, objectives and actions towards a common goal to avoid misleading developments and to make use of synergy effects.

Integrated urban development concepts (IUDCs) have been one of the core instruments to implement this integrated urban development approach. The IUDCs have proven to be a valuable instrument integrating the cross-sectoral topics "climate and energy" into the field of urban development. This enabled the correlation between the upgrading of the neighbourhood and the energy efficient renewal and the development of a comprehensive and coordinated approach and measures towards energy efficiency, reduction of energy consumption and use of renewable energy in their target areas.

However, the experience of the Urb.Energy partners demonstrated that certain framework conditions are

required to be able to develop and implement an IUDC successfully:

1. A legal planning framework which allows and encourages the development of IUDCs in support of the urban and energy renewal of cities and neighbourhoods.
2. A certain need and pressure for action to deal with specific energy, economic, social and ecological challenges for the renewal of the city and its neighbourhoods and to be able to administer opportunities for the sustainable development.
3. The political commitment within the mayor's office and the municipal council to develop an IUDC with energy efficiency in focus.
4. Sufficient resources (finances, personnel, know-how) for the development and later for the implementation of the IUDC and its measures.
5. Mobilisation of the stakeholders to engage in the development of the IUDC and later support its implementation.

These framework conditions lay the foundations for the successful production of an IUDC, which consists of following main steps (cf. Chapter 4):

1. Analyse the current situation
2. Secure integrated, cross-sectoral and management structures
3. Organise the participative process and information and awareness raising campaigns
4. Develop a target and implementation orientated action plan
5. Secure the political and financial support

To secure the energy efficiency renewal of their neighbourhoods, the experience of the Urb.Energy partners was to address all energy relevant fields of actions within the development of the IUDC. This facilitated the development of coordinated and cost effective measures as scope for public and private actions. The most important energy related fields of

actions were the energy efficient refurbishment of buildings, modernisation of technical and energy supply infrastructure, environmentally friendly mobility, attractive public and green spaces for a healthy urban climate and improvement of the business environment for energy related services.

The production of an IUDC with energy efficient refurbishment in focus is a complex process as relevant stakeholders have to be involved and sectoral poli-

cies and issues coordinated. Nevertheless the experience demonstrates that the effort is worth the endeavour as the thorough production of an IUDC will support the increase of the energy efficiency of cities and the development of an affordable and climate friendly energy supply in combination with the modernisation of neighbourhoods for the benefits of its inhabitants and users.



7 Good practice examples for integrated urban development approaches

This chapter contains descriptions of the integrated urban development approaches, related energy efficiency measures, framework conditions, analysis and activities in the target areas and in the case studies of the German partners from Berlin and Brandenburg. The overall aim of the development of the integrated urban development approaches was the facilitation and improvement of energy efficiency refurbishment of residential areas. Therefore the best practice examples and case studies in this manual describe the integrated planning approaches that form the base

for successful implementation of the measures and concepts presented in the manual on holistic strategies for energy efficient refurbishment of the housing stock and renewal of the related energy supply system.

The examples from Brandenburg differ, due to a different research approach. The following four Brandenburg examples were chosen out of sample of 10 due to their innovative approaches to integrated urban development concepts.

7.1 Target area Piaseczno, Poland

General information

Piaseczno is with about 67.000 inhabitants a middle-sized municipality, located in the centre of Poland and in the direct neighbourhood of the southern part of Warsaw. It is the seat of the county authorities and has a strong countrywide importance as a satellite of the capital. The target area is located within a cluster encircled by Kusocińskiego, Wojska Polskiego, Fabryczna and Puławska streets, rapidly developing districts which offer lot of newly developed services. Unfortunately, the target area itself remains underdeveloped.

Current situation

Due to the vicinity to Warsaw the neighbourhood is a typical suburban residential area characterized by middle sized apartment buildings and a high number of open green spaces between the buildings.

Key figures:	
Size	8.26 ha
Number of inhabitants	2079
Number of buildings	26 apartment buildings
Period of construction	1961–1974
Owner structure	30% housing cooperative 70% individual owners
Current annual energy consumption of multi-apartment buildings*	229.7 kWh/m ²

* Average annual final energy demand of a typical not modernized building (Space heating + hot water preparation)

The 26 buildings were erected between 1961 and 1974 and cover a total useful area of 40.000 m², for about 2000 inhabitants. Eight of the buildings belong to the housing cooperative “Jedność,” while the remaining 18 are part of a housing estate belonging

to housing communities and are managed by three licensed property managers. The buildings are located on parcels limited by external outlines of buildings, while the surrounding green areas and small infrastructure belong to the Municipality of Piaseczno. Eight of the 26 buildings have undergone some thermomodernization. The energy performance of the existing building stock is rather poor with an urgent need for improvement of thermal insulation, heating system and domestic hot water installation. The entire neighbourhood is connected to a central heating system that supplies the area with heating energy. The city grid is operated by PCU Sp. z o.o., a company owned partly by the city and partly by the housing cooperative Jedność, operating a low-temperature boiler room powered by natural gas. District heating grids belong to Piaseczno Municipality. However, the

warm water supply is organized by apartment-related individual gas boilers. The target area is located in a well-served area of the city, but due to its ownership structure and age structure of the inhabitants, its vitality has been well beyond the normal pace of the life quality growth as compared to developing parts of the city. Despite of an amount of potential amenities, social life suffers severe conflicts and inadequacies in daily life, as well as in general well-being. Most inhabitants are either the elderly or youth and middle-age unemployed, who seem to inherit social inaptitude. A significant share of the residents used to work in a nearby factory but due to the reduction of labour force a relatively high number of inhabitants was laid-off. This also caused to some extends social tensions.



Image 1: Strategic developments financed by Municipality © City of Piaseczno and NAPE SA

Most new inhabitants of the city move to Piaseczno for the proximity of Warsaw and its job and education opportunities, steadily turning Piaseczno into satellite of the capital even more. Improvements in Piasec-

zno status by the introduction of high-profile cultural amenities like theatre, amenities and leisure grounds for children and quality commercial services is widely

desired and perceived as vital for its prominence and attractiveness.

Although one can state, that the crave for an appreciation of an improvement of the neighbourhood to higher cultural standards and a more appealing environment does not widely express in local initiatives yet but there are strong indications that the inhabitants are willing to participate in the process.

The inhabitants are ready to give up their garages to devote them for community facility of local prestige and competent local leaders emerged during realization of the EU BEEN project and, among other things, took care of the improvement of access to the buildings for impaired people. Also the residents are showing a strong commitment to take over responsibility for the green areas in between the buildings by self-organized gardening activities like cultivating the gardens adjacent to the buildings' ground floors. There is a consensus, that gardens cultivation should be supported, but some restrictions to unfavourable cultivation like trees shall be subject to regulation because uncontrolled tree plants often collide with underground infrastructure lines, endanger the stability of buildings' foundations or pose considerable fire protection disadvantage and fire rescue obstacles. Apart from that problems result out of restrictive environmental legal ordinances as these trees are under legal protection as well as naturally grown and there are considerable fees for their removal.

Major challenges regarding the urban structure of the neighbourhood is the improvement of the quality of the open spaces in terms of social use and security. For instance there is a considerable area of underutilized space on buildings' underground floors, originally designed as laundries. Possibilities of putting them into all-year-round use were positively consulted with the buildings' managers. Further an old out of order boiler house occupies the key location in the neighbourhood where it covers a big area of many potential uses, excellently connected to the regional road network. Well planned investment in this area may become the threshold investment for further development of the target area and adjacent properties. There is however a danger, it will be annexed by adjacent retail quarter to little advantage to the target area's development. There are conflicts of semi-public space uses among the clients of a retail shop and

other community residents. As the shop is a meeting point for alcohol consumers, there have been reports of aggressive behaviour. Incidents like this cause other inhabitants to seclude from semi-public spaces.



Image 2: Piaseczno Target Area © Tomasz Pawlak/Janusz Bielicki



Image 3: Public spaces for the local community © Tomasz Pawlak/Janusz Bielicki

Due to the strong rise of the private car ownership, in comparison to the construction period, there is a need to develop appropriate solutions for the internal traffic and parking situation. The problem will reach the point with subsequent age structure change in the target area as new residents will consist mostly of young postgraduates with strong jobs and social relations to Warsaw, who will use cars either for practical or social status reasons. However, one can also state that from the point of sustainability, public transport is inadequate for people to resign from private vehicles at present and that cooperation on the development of parking lots with the City of Warsaw seems non-rational as long as public transport still suffers under-financing. Usually migrant people do use personal vehicles to commute with the country. However, to convert them to public transport us-

ers would be more sustainable but requires cultural change that cannot be induced by usual planning processes only.

Aim of the Project

Despite the fact that the Target Area is located in a rapidly developing district of Piaseczno, the development pressure on the neighbourhood itself is rather low and therefore the emphasis on future activities lays on the stabilization and improvement of the residential environment. The enhancement of energy efficiency is also on the agenda. This applies on the one hand to the modernization of the building shells and on the other hand to the development of more adequate solutions for the up to now apartment-related warm water supply. Due to the specific conditions of the district heating system (seasonal heat production only and difficult property rights) the emphasis of the possible solution approaches lies on decentralized building-related cogeneration devices.

Based on a survey among the residents of the neighbourhood the focus of the upgrading activities of the residential environment is on the improvement the amenity value in front of the local supermarket and the enhancement of the green areas in between the buildings.

The municipal administration considers the development of the integrated development concepts within the frame of the project as driving force to engage both, local owners and the municipality to initiate working, communication and decision patterns for the overall development and in particular for the enhancement of the energy efficiency of the neighbourhood. The concept contains a prioritized package of measures and becomes, after the approval by the city council, a local bylaw.

Activities

Based on the integrated concept the city implements a prioritized package of measures for the public space. To enable the self-organized enhancement of the buildings in the neighbourhood, the concept includes as well detailed proposals for the technical upgrading of the 26 buildings in the quarter as well as financial supporting resources for the owner associations and the housing cooperative Jedność. In the frame of the project work all buildings are the sub-

ject to an energy audit in order to provide to the owner a solid basis for tailor-made further refurbishment activities in respect to the special conditions in the neighbourhood.

Eight of the 26 buildings have undergone some modernizations. Although the housing estate qualifies for financial support from the European Union, the owners of these buildings decided to use the Polish scheme of support for thermomodernisation undertakings to finance a comprehensive refurbishment including insulation of walls, flat roofs, replacing windows in staircases and in non-heated basements, replacing doors and the central heating system. The total cost of remaining investments in thermomodernisation, identified in energy audits for all 26 buildings is 12.5 mln PLN. Inhabitants of all the buildings will save about 0.63 mln PLN annually. The average payback period for the whole housing estate is approximately 20 years. Calculated savings from realization of the planned refurbishments for all the buildings add up from 35.1% to 51.3%. Among the financing sources considered for thermomodernisation of these buildings were: own sources, loan with thermomodernisation bonus, and European Union sources. A rough realization schedule was also prepared.

Some of the underutilized space on buildings' underground floors is temporally adapted for several local associations' offices. Those offices are planned to be moved to a community Cultural Centre building, which is currently under construction. Future uses of abandoned underground spaces are of consideration, with preference for elder or youth, or mixed local community centres like after-school learning, 3rd age universities, youth clubs, elder people rings.

Basic recommendations concern adequate development of the old boiler house plot and adjacent multifunctional building owned by Municipality. In this area the retail / small services building with multi-storey car parking with approx. 240 lots is proposed. At the same time 28 existing private garages and 9 trees are removed. Existing garages users declare they would support change of land use if it is to be devoted to local community centre. Detailed architectural concept should be consulted with existing garages users prior to any administrative approval. To maintain efficiency in the process of decision-mak-



Image 4: Modernised buildings and replaced windows in the target area © Tomasz Pawlak/Janusz Bielicki

ing it is recommended to pass a separate, detailed local spatial development plan for this location. New commercial development should be composed into functional whole complementary with a new local community building, which should contain meeting places for residents, multimedia library, after-school day care centre, and laboratories for local hobbyists groups. Optional multi-level private vehicle parking for approx. 120 lots location is possible in the northern area of the target area. This area should be reserved. Delivery of parking lots is vital for increasing the attractiveness of the neighbourhood for new residents to rebalance the age structure.

Thermomodernisation projects should leave the opportunity to cover building roofs with vegetation. Green roofs lower the surface temperature, reducing heat-island effects. Green roofs should be considered only when building owners can afford their maintenance, however. It is also recommended that thermomodernisation designs envisage possibility of installing retention tanks for rainwater reuse for toilets flushing and vegetation irrigation. The possibility of installing local ground storm water retention tanks should be checked as well. Storm water retention should qualify for financing from revitalization funds. Extension of 3 and 4-storey residential buildings by adding a new storey shall be allowed with no further planning – related requirements, if they are conform to the technical requirements of building code. It should be stressed that introducing new residents are decisive for revitalization. Furthermore the distinct architectural style of Piaseczno should be unified.

The alcohol retail shop should be moved into a new commercial building on the old boiler house plot, however this may violate anti-alcohol legislation due to proximity to after-school day care centre, therefore

attention should be given to naming conventions in the construction designs. Moving alcohol retail to well monitored areas, intensively used public spaces will prevent antisocial character of its consumption. Immediate measures to discourage alcohol-drinkers from socializing in the vicinity of the shop should be minimalistic and cheap. It is proposed to install prevention systems like a sound system to play music detested by the target group and vandal-proof street lighting.

From the social point of view the target area should create an elder-friendly community and engage people into inter-generation activity.

Results/Lessons learned

It's vital for local urban planning to maintain strong relationship with metropolitan region of Warsaw area and to opt for common urban planning policy within the metropolitan area to ensure the local agenda is well represented. The establishment of metropolitan area as a political entity, with Piaseczno Municipality as a co-founding partner will put the municipality in a better position than as a mere client to Warsaw. An integrated management of the whole metropolitan area would allow externality cost-benefit optimization of real functional urban entity. Currently some functions are reserved to areas within administrative borders of Warsaw, e.g. metropolis is not allowed to locate some demanded facilities like theatre in Piaseczno, even if significant workforce from Piaseczno is on Warsaw's market.

There is a considerable, underused human potential to perform bottom-up actions in the local community. One can state that financial incentives from the government and the European Union are capable of mobilizing local community and local leaders. UrbEnergy project preceded by BEEN project was able



to empower local leaders to undertake management tasks on behalf of the local community also these financial incentives allow employment of professionals to provide unbiased expertise for local citizens.

The continuation of the thermomodernisation process requires stronger co-operation among stakeholders, in particular the building's owners, district heating plant and network operator, and Piaseczno Municipality, in accordance with the development concept.

Existing plot division structure advantage is that most public and semi-public spaces are solely owned by Municipality, making large projects easier to perform.

Many features demanded by the residents are being realized by the Municipality but those developments do enhance the target area's attractiveness indirectly only, with little effect on demand for its existing housing stock.

Since April 2011, the process of development planning and spatial development in Piaseczno is fully operated using digital maps.

New investments shall conform to the revitalization program. The only legal way for the municipality to require investors to proceed in line with revitalization programs is to enact revitalization guidelines into local spatial development plan.

7.2 Target area Rakvere – Seminari Street, Estonia

General information

The city of Rakvere is situated in north Estonia and the administrative, economical and cultural centre of the Lääne-Viru County. According to the Estonian settlement system Rakvere is considered as one of the so called old county centres and with about 17.000 inhabitants the 7th largest City in Estonia. The city covers an area of 10.7 km² which results in a population density of 1,580 people/km². Rakvere has been divided to 19 historical areas. The kernel of the town is formed by 3 adjacent areas in the middle of the town (Vanalinn, Südalinn and Õpetajate heinamaa).

Key figures:	
Size	80 ha
Number of inhabitants	800
Number of buildings	18 apartment buildings
Period of construction	1960–1989
Owner structure	97% individual owners 2% institutional (rental) ownership 1% cooperatives
Current annual energy consumption of multi-apartment buildings*	170–180 kWh/m ²

* Average annual final energy demand of a typical not modernized building (Space heating + hot water preparation)

The city has joined the Covenant of Mayors as first city in Estonia and wants to become the leading city in energy saving in Estonia.

Current situation

Seminari Street was founded in 1920ies as a part of a general extension of the historic city. Today the street is bordered by houses originating from different times as well as different architectural styles and sizes. One can see wooden and stone houses from pre-war era as well as typical apartment houses from Soviet time. Single-storied houses are rowed up with five-storied panel colossuses.

The neighbourhood is situated in a most densely populated area in Rakvere where almost half of the population lives. This is due to typical multi-apartment

buildings that were built around the area during Soviet period and which are the dominating structure in the area today. Besides their non-characteristic appearance the thermal conditions of the apartment buildings do not correspond to contemporary needs or expectations. Because these buildings are located in the city’s centre, they directly influence the general impression of the town. Thus they are considered as to destroy the general town image but otherwise they also keep the city from diffusing and maintain human activity in the centre of the town.

In Seminari Street are two lines for cars in both driving directions which is actually clearly over-dimensioned since Seminari Street is not a transit road or a highway and therefore is lacking importance as far as traffic is concerned. In principle, it is a channel street of a block that is used for getting to the houses located in that very block. Therefore pedestrians use it even more actively.

The population has been quite stable in Rakvere over the last years, although slightly diminishing due a relatively low birth rate. According to the population prognoses of Rakvere (2009–2030), a larger emigration tide from Rakvere is to be expected among the 15–24-year olds, a huge population class in the most intensive migration-age (migration due to starting the studies or work, starting the families). The emigration from Rakvere will, however, diminish when the 90-ies generation will reach the migration-age. There is a tendency to move from the areas with a high density – like the target area – to single-family house areas. In order to encourage a more compact and energy efficient settlement structure, it is of public interest to enhance the living quality in the existing building stock and to improve the overall quality of urban environment in the target area. In compliance with the Master Plan and the Sustainable Energy Action Plan of Rakvere city government the overall upgrading of inner-city areas shall inhibit diffused urbanization and contribute hence to a sustainable settlement structure.

Apartments in the buildings are owner occupied. Management of the buildings is organized by apartment associations. All the buildings are connected to

centre in urban planning, the competitive capability of the urban environment is preserved inhibiting diffused urbanization and encouraging more compact and energy efficient settlement structure.

Furthermore Rakvere is aiming to promote the usage of KredEx support programmes among residents in order to achieve energy efficiency in renovation of existing housing stock. Municipality is covering the expenses of the professional consultant offering advisory service for housing associations.

Activities

Social, technical and financial aspects have been identified to be the most important action fields when compiling an urban development concept in the frame of the project.

According to this a thorough technical expert evaluation of the buildings in the target area has been implemented and a competition for architects and town-planners to reach the best planning results for the public space has been organized.

To address the financial aspect an evaluation of the existing financial support structures and credit lines plus a professional consulting to housing associations in the budgeting and crediting process for preparing the energy efficient refurbishment are considered as to be of utmost importance. A consultant can support the manager of the housing association in decision making process with the apartment owners and on general meetings.

Technical aspects of the buildings

Construction projects will be implemented for different types of residential buildings of the target area. These Projects serve as a basis for later implementation of recommendations set forth by the audit documents. The constructional projects do not only consist of the mere insulation concepts of the houses but also take into account the overall appearance or image of the city by assigning colour scheme and design principles for the houses.

An analysis of the energy consumption in 2005-2010 as well as energy audits for the target area buildings will be conducted. An aim of the analysis is to find out the best solutions for insulation of the buildings following the principles of architectural value, energy efficiency, cost effectiveness and urban develop-

ment. This is followed by the refurbishment of the 18 multi-apartment buildings, which among others benefits will lead to energy saving in these buildings of 30 %.

Further options of using renewable energy in pilot buildings will be evaluated and solutions for reconstruction of the heating and ventilation system will be developed. Financial calculations evaluate the needed investments to guarantee high energy efficiency, good indoors climate and high architectural quality of the target area buildings.

Development of public space

An architectural competition for planning housing and surrounding urban area combines both architectural as well as landscape architectural aspects. The City Government of Rakvere expects solutions for refurbishing the façades of the typical Soviet-style dwelling buildings surrounding the area according to contemporary requirements. Also, landscape architectural solutions are expected on how to alter the area of Seminari Street into an attractive urban landscape and a connecting corridor between the heart of the city and the forest situated in the southern part of the town. The goal is to get an integral solution where both elements of the task are solved in a mutually complementing manner: forming a united and integral urban environment.

The next step of the project is the preparation of specific renovation projects that are carried out on the basis of the attained idea solution in cooperation with the house owner associations of the area. Those building projects are the basis for future renovation works on apartment houses in order to make the houses energy efficient and adding to the more attractive urban environment. The intention of Rakvere's City Government is, by investing in the compiling of the building project documentation, to inspire the different individual owners of the housing associations to take up the actual renovation works.

Further an urban area has to be developed with the aim to improve the living quality of the specific residential quarter, including: creating green space in the middle of the town instead of outskirts of town and a reduction of pollution and diminishing the possibility to use motor vehicles in the area and strengthening

of public transportation and use of alternative transportation means.

Information activities and cooperation with the residents

A close cooperation between the municipality and the residents has been seen as the key to success. Because of that an ongoing work with the residents of the pilot area has been implemented since the very beginning of the project including: Information seminars for the apartment owners and for the managers of the housing associations, interviews with apartment owners and managers of the target area, introduction of the results of the architectural competition to the target area's apartment owners and negotiating with them to start renovation project with the help of technical consultant supporting the managers of the housing associations. These measures were accompanied by ongoing public advertisement campaigns, articles and presentations presenting the main aims and activities of the project.

Results/Lessons learned

The citizens benefit on many levels. The inhabitants of the dwelling houses receive an idea solution for reconstruction of the façades of the houses and a technical project that they can apply for a license for construction and bank loan, find a construction company and conduct a building process and as a result continue to live in a beautiful house corresponding to contemporary requirements.

However there is low interest towards energy efficient refurbishment from the side of the residents, since they are satisfied with the current situation and their living environment. Residents need to be convinced. Best practice example form an important work in this. Furthermore there is lack of financial resources for financing of the refurbishment activities among the residents and the current terms for loans are too complicated for the end beneficiaries and more transparency is needed. Therefore an ongoing communication between municipality and residents has been turned out to be of utmost importance. Information should be available for the residents relevant on continuous bases. Promotion through public media has to continue, since the achievement of positive results take time among end beneficiaries.

All relevant stakeholders should be linked to the process. If the decision over the architectural appearances of the buildings will solely be left to uninformed housing associations, only price will be the determinant when choosing between different options. Furthermore the economical profitability should always be taken into account when implementing whatever means of energy saving. Very often the recoupment period of the planned insulation of exterior peripheries is longer than 15 years. Thus it should be carefully considered if the attainable energy saving will weigh up the economical capabilities to implement the energy saving measure. The work of a personal consultant who assists managers of the housing association is seen as very important.

7.3 Target area Lida (Grodno Oblast), Belarus

General information

Lida, towards the west of Belarus is a regional centre of about 100,000 inhabitants slightly declining until 2009, since then rising again to only slightly below the figures of 1999. As a project partner, Lida, which is part of the Grodno oblast, is the only city outside of the European Union and under a centralised state regime with a strong hierarchical structure. Local housing policy and management is arranged under the strong influence of the oblast administration. The city has joined the Urb.Energy project and the special provisions and has fully taken over the project’s methodology.

Key figures:	
Number of inhabitants	98.000
Number of buildings	6250
Owner structure	14,4% state owned 85,6% private owners
Sample buildings	Type 1: Sovetskaya, 43: constructed 1979; 5 stories, 40 flats Type 2: Tavlaya, 35: constructed 1980, 9 stories, 60 flats Type 3: Mitskevicha, 24: constructed 1972, 5 stories, 5 flats
Current annual energy consumption of multi-apartment buildings*	237.7 kWh/m ²

* Average annual final energy demand of a typical not modernized building (Space heating + hot water preparation)

The Housing Department of Grodno Oblast (=district, region, province) Executive Committee (administration of the Province Grodno) is responsible for the majority of the existing housing stock in the entire Province of Grodno. Residents’ influence is restricted to some maintenance issues of the buildings and their direct surroundings, as all public space is public property.

In Lida the integrated development covers the entire area of the core city. As a preparatory step, three sam-

ple buildings (that are representative for the housing stock in Lida) will be analyzed and refurbished. The district of Lida is located in the North of Grodno Region. The Town of Lida is located in the centre of Grodno Region on the river Lideya and 112 km to the North-East of the town of Grodno. The area of the town of Lida is 38,2 km².



Image 6: A map of Lida © Grodno Oblast Executive Committee

Current situation

In 2009 the population of Lida was 97,600 inhabitants. The density of the population was 4,153 people per km². The city of Lida, one of the important industrial centres of Grodno Region, is a very old city with roots back to the 13th century. However, the city suffered serious damages during WWII and nowadays the city is predominately characterized by multi-apartment buildings from the Soviet era. Recently, large renovation activities have been carried out in order to upgrade the public spaces in the city centre and to improve the general conditions of the buildings. However, still a major part of the housing stock in the city lacks sufficient insulation. Regarding the district heating system there is an urgent need to install in-



Image 7: Tavlaya street 35, Lida © Grodno Oblast Executive Committee



Image 8: Mitskevicha street 24, Lida © Grodno Oblast Executive Committee

dividual meters as well as to modernize generation plants and networks.

Currently the major energy resource is gas and local energy sources (like fire wood, peat and sawdust). There is the intention to increase the share of cogeneration (3–4% at the moment) but currently there are no special financial programs available to support the extension. At the present time there are no renewable energy sources in use in Lida. This is due in particular to the lack of experiences and certain skepticism about the efficiency of renewable sources.

The major part of the Target Area is connected to the central heating system. The heat supply is made by 11 communal boiler facilities with 34 installed boiler units with a produced power of 46,2 Gcal/hour. 7 facilities work on gas, 4 work on local sources of fuel. The electro generating equipment is installed on 2 facilities (community of the mini TEC Lida-46, and boiler facility of the Maladziozhny district. The length of the heat supply network amounts to 144,6 km (33,2 km are previously isolated) 49,6 km have expired terms of depreciation, 10,2 km need to be substituted.

The housing stock of Lida consists of 6250 houses which include 51 hostels, 3982 One-apartment living buildings and 2217 Multi-apartment living buildings. These cover a total area of 2.155.000 m². From more than 30 thousand apartments citizens own privately above 86% the rest 14% is a state owned housing stock. About 31% of the living houses are older than 55 years, 39% are older than 20 years and 30% were erected within the past 20 years. Less than 7% of the roofs of the building are being repaired each year.

The buildings 43 Sovetskaya St (type1), 35 Tavlaya St. (type2) and 24 Mitskevicha St. (type3) are typical buildings in Lida. The type1 is a brick building, meanwhile type 2 and 3 are concrete slab buildings. Together there are 535 buildings in Lida of the same typology.

Currently they have a very poor overall energy performance, insufficient internal heating systems and they are not embedded into an overall energy concept of the surrounding neighbourhood.

The water supply of Lida is provided by the Administration of water-sewage industry. 12,7 km of water supply networks and 35,5 km of sewage disposal networks need to be substituted.

The main factor of air pollution in Lida is transport. Due to the fact that Lida is located on the intersection of the major Republican and international ways the share of transport emissions amounts up to 80–85% of the air pollution in the district. During the last 3–4 years the quantity of transport increased radically in Lida. Traffic jams begun to appear constantly at certain points of the city. Legislation regulates quite well the controlling exhaust opacity and toxicity of car emissions of commercial and industrial vehicles but unfortunately there are no regulations for private cars.

Furthermore Lida lacks high quality café’s, restaurants and night clubs. However the level of income of the majority of the inhabitants is insufficient for recreation in high quality places anyway. Apart from that there are problems with the quality of performed work in general which is often done with many drawbacks and results in overfinancing. This problem is



The main action fields of the master plan include:

Improvement of city water supply infrastructure:

- Water supply pipes were modernized in 2010.
- Individual water meters were made obligatory.

Improvement of Transport system

- More than 300.000 m² of asphalt covering were replaced
- 29 streets were reconstructed and renewed.

Housing stock improvement

- The fronts of 123 living and public buildings were modernized.
- Planned repairs of Houses were conducted.

Improvement of social infrastructure

- Social sites were constructed and reconstructed in 2010: Ice Palace, Sport centre, Park, Stadium, Cinema, Centre of folklore crafts etc.

Improvement of energy efficiency

- Introduction of Cogeneration plants
- Transition to local sources of fuel

However, according to local actors the city’s master plan lacks many of the communicative elements that are common to the IUDC concept in other countries. The master-plan’s development is judged as over-complex, as are the approval mechanisms, which include 16 national ministries. In the opinion of the local experts, the master-plan is a slow and inflexible instrument, in the past only revised after longer periods.

Regarding security in the houses 98.9% of doorways in Lida were supplied with on-door speakerphones with the help and participation of the residents.

In 2008, 6.9 km of heat supply networks were substituted (4.8%). In 2009, 7.4 km of heat supply networks were substituted (5.2%).

There have been measures within the preparations of the national festival “Dazhynki”, which included the

renovation and major repairs of 99 buildings with a common area of 47 thousand m², reconstruction and renovation of 6 block yard territories including 21 living houses. The rest of the housing stock including private houses and yard territories will be serviced according to the set time-limit of works (renovation of plastering, painting of facade elements, benches, childrens’ playgrounds, fences, repairs of holes in the pavement and roads).

Results/Lessons learned

The IDUC of Lida states the difficulty of bottom-up approaches which are traditionally common in Europe but can lead to problems or inefficiencies in areas that lack experience with this approach and culturally incline to top-down concepts. However, Urb. Energy and other foreign collaborations in the Grodno oblast have been utilised to develop a professional network, which could represent a bottom up element in the otherwise strong top down planning methodology in the future. Thus, it is understood as a first step at modernizing outdated administrative structures, which were said to be irrational in some parts. Widening these efforts of a new professional planning culture towards the residents’ participation is understood to be encountering a lack of peoples’ consciousness for the relations between the energy efficiency of their housing, and their own opportunities to act. The Urb. Energy project is seen as a first entry point into building up a local counterweight to central planning and in is supposed to be highly successful in this respect. The personal support from the EU is seen as beneficial in building up political and professional awareness for the technical opportunities of neighbourhood enhancement in energy efficiency, even though active resident inclusion seems still a distance away.



7.4 Target Area Jelgava, Latvia

General information

Jelgava is located in the central part of Latvia, the largest city of Zemgale planning region and, according to territory and population, ranks fourth among the cities in Latvia. The geographical location and the point of intersection for main roads have encouraged developing Jelgava as one of the most important centers of transit.

The city center is located in the central part of the territory and its area is about 170 ha. The city center has a significant role as the business card of Jelgava, both as the center of transactions, services and transit. Leading industries in Jelgava are metal-working, machinery building, food processing, textiles production and wood-working industries. Most of the active businesses in Jelgava are engaged with trade.

Key figures:	
Size	170 ha
Number of inhabitants	20,630
Number of buildings	220 apartment buildings Public buildings and shops
Period of construction	1948–1989
Owner structure	94% individual owners
Current annual energy consumption of multi-apartment buildings*	188 kWh/m ²

Current situation

Jelgava is a central Latvian town with near 64.000 inhabitants and a shrinking population over the last decade due to outward migration and demographic change. The density of population in Jelgava is 1.076 inhabitants per km².

The target area is situated in the city centre of Jelgava and is a mixed type of a residential and business buildings area. With around 20.630 inhabitants approximately one third of the total population of Jelgava is living here.

The target area is well connected to the public transport network and contains retail, public services and cultural institutions with lots of culture events – shows, concerts, children song festivals, art, fam-

* Average annual final energy demand of a typical not modernized building (Space heating + hot water preparation)



Image 11: Aerial view of the target area © City of Jelgava

ily and other activities. Furthermore the area is well equipped with public and green spaces as well as with educational and health institutions.

After World War II 90% of the buildings in Jelgava were destroyed. The reconstruction started in the central part of the target area in the late 1940ies to the 60ies with mostly individual planned buildings in the common Soviet-style of this time. In the 1970–80ies the area was completed with standardized multi-story apartment buildings. This heavy and boring soviet architecture resulted in a rather impersonal city. The technical conditions of the main structures of buildings in the neighbourhood are relatively good. On own initiative of the residents especially windows were replaced to avoid heat losses. However, insulation and the internal utilities remain rather poor.

The average thermal energy consumption for heating in the dwelling houses is 166 kWh/m² per year. The roof coverings in dwelling houses mainly are made without soft hydroisolation (damp-proof-course) and in some places they have already started to become dilapidated. As the result of stated construction deflections in brick stone wands there were found gaps in walls. Also the thermal resistance of outer walls and roofs does not meet the up-to-date standards, wooden windows and doors also are low grade.



Image 12: Typical multistorey residential buildings © City of Jelgava

In the target area there are also located some important cultural historic heritage sites like the museum Academia Petrina and the Tower of St. Trinity Church. A huge part of the territory is under protection as a historical site of national importance. In the city there is located the third biggest educational and science institution of Latvia – the Latvia University of Agriculture.

The organization of traffic was established about 25 years ago, focusing on educational institutions, market places, individual housing schemes and mansion areas which are obsolete for today. There are missing alternatives for route transport transit. At the moment, the main road Riga's street – Liela's street – Dobeles freeway is too overloaded with transit and cargo transport that inconveniences traffic for public transport. Parking in area of the city centre has become outstanding, especially in territories of public establishments and mansion areas. Driveways are very narrow, and parking places which are built in soviet time are not being able to provide the amount of private transport in nowadays.

The major part of the area is connected to the central heating system. The former pipeline-system from the Soviet period was mostly replaced and two co-generating power stations provide heat and feat-in into the electric power grid. Both power stations were re-developed to a modern standard of cogeneration on the basis of natural gas with the option in both systems for a future instalment of biomass as the basis of energy production.

The personnel capacity of the public sector has since 2009 been limited by the effects of the crisis by over 20% due to partial redundancies and is only in the future to be partly compensated. For the municipality, at present the finalization of plans and preparation for an eventually oncoming period of activity on the bases of a more vivid economy on state and local level are having priority. The building up of network structures in order to limit the difficulties in communication between the municipality as the core actor, central state authorities and residents and owner associations is on the agenda, but suffers from a lack of opportunities for realising projects on a larger scale. In a short-term perspective, efforts to start steering small-scale energy-related investments of residents and residents associations (windows, installation of

roofs, improved heat converters on the building level) to integrate these into the more comprehensive neighbourhood energy concept are being an action focus of the municipality in collaboration with housing management companies.

Aim of the Project

Jelgava utilizes the urban energy project and especially the integrated urban development concept as an incentive, to build up a vision for the future of the town centre and to engage into the energy efficient upgrading of infrastructures and blocks of flats as well as public buildings. The major emphasis of the upgrading activities lays on the rise of the energy efficiency of the multi-storey residential buildings within the area and on the enhancement of the living environment.



Image 13: A city square in Jelgava © City of Jelgava

The target is improving the central area as a core element of the urban image for the whole city and the local residents and to develop the area as an appealing, healthy, sustainable and safe residential environment and to enhance its business capacity. The urbanistic approach emphasizes building a visual identity for the centre and making the city readable, highlighting the few remaining historical buildings. Parallel, approaches are developed to improve the amenity values of the yards of the multi-storey buildings, to develop modern recreational areas and play grounds as well as to develop the transport system including the modernization of parking lots, access roads and pedestrianisation.

Activities

The improvement of the energy efficiency of the buildings, energy transfer and generation has been so far addressed through a limited number of model projects, focusing on the insulation of the outer hull and on enhancing the neighbourhood’s public space. It is seen as a necessity to include energy conservation and efficiency as a topic in its own right, integrated into Jelgava’s city development plan. Currently, enhancing the energy efficiency of state owned or municipal public buildings is on the agenda and is expected to serve - together with the improved blocks of flats - as example to build up public awareness. The city supports the refurbishment of the buildings by providing sample energy audits for the most common building types to the owner associations. To promote the idea of energy efficiency, the municipality provides trainings for house managers and organizes regular information activities for flat owners and the general public about energy efficiency measures and about economic benefits.

Whereas energy generating and distribution technologies were upgraded, the planned inclusion of biomass as a source of energy so far remains in the planning stage.

From the urbanistic point of view a clear, comprehensible and safe structure of the city centre should be accomplished. In order to do that the existing buildings should be reconstructed, visual accents should be used in appearance of building in order to emphasize street crossings. On the detailed level measures should be taken to ensure daily feeling of safety and security of residents. All streets should be lit, varying the intensity, colour and height depending on the kind and intensity of use in the particular section of the street.

Hercoga Jekaba square can be reconstructed as an attractive, presentable, vibrant place - full of different features organizing urban patten and supplementing it with works of art. Along by the streets Liela and Pasta there is forming a sub centre for transactions where unified recreation system will be made with actual parks, squares, coasts and recently made public outdoor spaces, as well as courtyards of developments which could be included. Wide green areas in Jelgava give the opportunity to provide a high quality living in the city, and various short term entertain-

ment activities in the city centre. Movement of pedestrians could be organized on Driksa's Street. It is planned to make it longer – from the coast of river Driksa up to Matera Street, including actual and newly formed outdoor spaces.

The efficiency of land use in quarters with relatively high number of ancillary buildings will be improved by removing low value buildings and using the space thus acquired for provision of publicly accessible outdoor facilities.

Territories of multi storey residential buildings in the city centre should be viewed as both – residential space for residents of the quarters and at the same time also as an attractive and rich in function city centre. Main permitted use of territories in the city centre is that of residential areas, associated objects of service, culture, education, administrative buildings and well kept public space.

Inner blocks of multi-storey residential buildings should be developed as visually secluded and quality open air residential areas and should be used mainly for recreational needs of residents of the block. Depending on the location these can be included as significant part of the city recreational system. These inner quarters should provide feelings of safety, belonging and cosiness. A unified recreational system should be developed, which should include existing parks, squares, embankments and newly created public outdoor facilities, as well as improved space of inner quarters.

All business objects should be relocated outside of the inner quarters. Business objects should be placed only as standalone buildings or objects on ground floors of buildings accessible from streets of the city for example along Lielā and Pasta streets.

Availability of educational and culture facilities in the city centre is considered as sufficient. However additional objects would be required for leisure time of residents, development of creative abilities and offer of life-long education.

In order to develop the traffic system public transport nodes are to be combined and relocated to the territory of railway station. Joining of railway and bus traffic nodes and creation of spacious parking lot will provide much better facilities for these means of transportation. Therefore the city centre will be relieved of unjustified traffic flow. The network of pub-

lic transportation has to be expanded. Also important is the development of spacious parking lots and expanding of existing parking lots through multi-level parking, where feasible, parking lots can be constructed underground. Many cars are parked in inner yards of residential blocks at the moment where, according to solutions offered, quality inner yard space should be developed for recreation of residents. Inner yards of quarters should be used only for parking of residents' cars in designated places. Bicycling and the conditions for pedestrians have to be improved by creation of devoted bicycling lanes along with elements for parking of bicycles and by expanding pedestrian walks.

The project currently is in the state of the technological upgrading of the outdated heat provision networks, development of an implementation strategy for the integrated urban development concept above the level of individual model projects, designing a coherent financing strategy for the future.

Results/Lessons learned

Tasks to be addressed in the area of energy efficiency are mainly concerned with improvements of public utilities infrastructure, prevention of inexpedient use of energy resources, as well as development of unified support policy for increasing of energy efficiency in buildings and systems of heating supply companies.

Energy efficiency measures are divided by the size of investment, repayment period and complexity of implementation. However, before taking on implementation of any investment requiring measure, the assessment of energy consumption or audit should be carried on.

Considering governmental targets in the area of energy efficiency, a separate section should be developed in the Jelgava City Development Plan regarding a complex of energy efficiency measures, providing that the best indicators efficiency of investment use could be reached, by simultaneously implementing measures of energy production, including, development of cogeneration, transmission, distribution and consumption sectors. Thus the energy loss in buildings and transmission systems can be decreased, energy production process can be optimised, consumption of fuel and other raw materials can be low-

ered, and the level of hazardous emissions can be decreased.

The limited financial capacity of the municipality, of the residents and partly segmented action of the various public actors, have made the implementation of integrated and owner inclusive approaches difficult in the past. This is aggravated by the fact that the current economic crisis has further limited public and residents' financial means for investment into energy efficiency even though it is acknowledged by residents' associations that energy losses would become more costly on the long run.



Image 14: A city centre road in the target area © City of Jelgava

Building up a consistent system of urban governance for enhancing the energy efficiency and implementing the accompanying measures in the urban

environment is according to the local actors (policymakers, planners, other experts) dependent on the emergence of sufficient funding structures that would allow the extension of measures on the level of flats and buildings above individual model projects. These have proved exemplary in the past, but are lacking attraction, as for the majority of the residents they are connected to special funding concepts, which are not expected to be widely available in the future. Thus a robust strategy of implementation, based on a credit programme supplemented by means-tested individual or owner association oriented subsidies is seen as a vital precondition to kick-start a continuous process of debate leading towards widespread measures to bring about a climate friendly future image and the necessary changes on buildings and in the urban structure.

After Urb.Energy had initially led to a series of internal targeted debates about strategies and plans that where partly extended to the local population in Jelgava, the crisis has led to a reluctance by local politicians and the administration to engage into to close a communication with the residents except in the case of model projects with a potentially secure outcome. Engaging residents at the time could lead to expectations that couldn't be fulfilled and would be expected to hinder future collaboration. Only with a sound basis for action, communication with the residents will be entered.



7.5 Target area Riga-Jugla, Latvia

General information

Riga is a modern city with 712.000 inhabitants and an area of 304 km². The target area is situated in the Jugla neighbourhood on the eastern outskirts of the city. The total area of Jugla neighbourhood is 1409.9 ha, which is approximately 3 times greater than the average area of a typical neighbourhood in city of Riga. Geographically Jugla is located at the fringe of of the city core, allowing it to serve as the gateway to the North and to larger lakes and natural forests. Jugla is part of the Vidzeme district (since the year 2010 – centre district) and the second largest neighbourhood throughout Riga. It is divided from the planning perspective in five smaller units with very different characters.

the area. Today, there are major housing estates and one-family house areas, but predominately the neighbourhood is characterized by the Soviet-era high-rise (mainly 5-storey) residential buildings constructed in the 1960s and 70s. There are also some post 1990 additions of varying but partly high-quality.

Even though Jugla is predominately a residential area, elements of a centre can be found along the main arterial road and there are sub-centres situated across the entire area for the provision with convenience goods.

The location at the eastern edge of the city and close to forests and lakes offers a high potential for recreation and leisure. However Jugla suffers from a lack of necessary recreational facilities.

Key figures:	
Size	1,400 ha
Number of inhabitants	27,250
Number of buildings	182 apartment-buildings; Public buildings and shops
Period of construction	Before 1950: 8 % 1951–1960: 12 % 1961–1970: 67 % After 1979: 13 %
Owner structure	Almost 100% individual owners
Current annual energy consumption of multi-apartment buildings*	207 kWh/m ²

* Average annual final energy demand of a typical not modernized building (Space heating + hot water preparation)

Current situation

The majority of housing and service buildings comprises of various industrially built entities from panel buildings to composite structures typical for the former Baltic republics of the USSR of between four and more than 10 floors. The estate benefits from external and internal green.

The main development as residential area began in the 1960s when multi-apartment blocks were built in



Image 15: Jugla typical multi-apartment blocks © City of Jugla

In contrast to the overall development in Riga, where the number of inhabitants is decreasing, the number of the 27.000 inhabitants in Jugla (95% in the multi-storey and 5% private houses) is very stable with slight increase in the last few years. Since the neighbourhood itself offers only a little number of employment possibilities, the majority of the residents are commuters or retired persons. As the demographic change will lead to a further ageing of the population there is a demand for age-related infrastructure and services.

Monitoring the social development of Jugla has led to the opinion that after a long period of stability, the social situation might be at a turning point. Although outward migration has gone down since the begin-

ning of the economic crisis, incomers are increasingly of a lower social standard than the aged population. The entire area is covered by a central heating system. Like in most parts of Riga the local heating company “Rigas Siltums” is maintaining the central heating network and provides heat mainly to high-rise apartment housing estates and all kinds of public as well as service buildings. Individual homes – and to some extent – new residential apartment projects use often autonomous heating on a gas or solid fuel basis. The heating pipeline network is relatively old but it is partially replaced with prefabricated pipes and is still undergoing the renovation process which stabilizes the average technical condition of the heating grid in Jugla. So far the present technology has been understood as set, and alternatives like geothermal power has only come under consideration lately. It needs to be seen, whether the inclusion of alternative energies into the system could lead to cost reductions, which would partly compensate the cost of investment for increased energy efficiency.

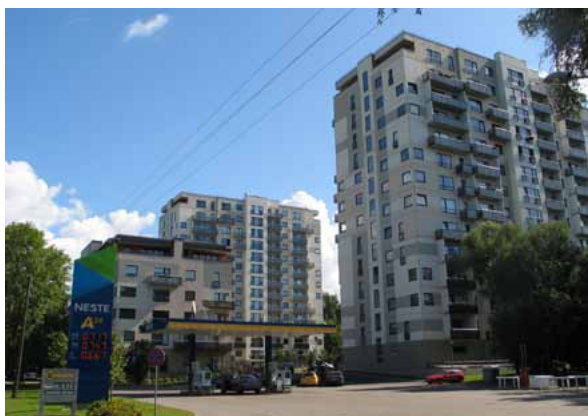


Image 16: Multistory buildings with need for action © City of Jugla

In particular the Soviet-era multi-apartment buildings, like many other places in Riga and Latvia, are facing large heat losses and a poor internal infrastructure while some public buildings have lately been upgraded to European Union standards. Installation of energy efficiency measures together with overall renovation and refurbishment of the buildings is the main challenge for future in this field. Energy price increase together with physical poor condition of the buildings will be the catalysts for renovation and refurbishment works.

Major challenges in Jugla are to initiate this refurbishment process of the buildings in the context of a very heterogeneous owner structure and to find solutions for the reduced working load of the two existing central heating plants that supply heat to the neighbourhood. Parallel the share of renewable energy sources (currently 2% in Riga) should be fostered. So far energy efficiency measures have only reached a small number of housing blocks and have had limited impact. This might be due to the fact that the population is only interested in a slight improvement of maintenance and in energy standards at minimal cost, because incomes are mostly insufficient to support large-scale rehabilitation. This is the case, despite the fact that currently very high energy cost is consuming a considerable part of income, which could be minimised if the buildings’ energy efficiency were improved.

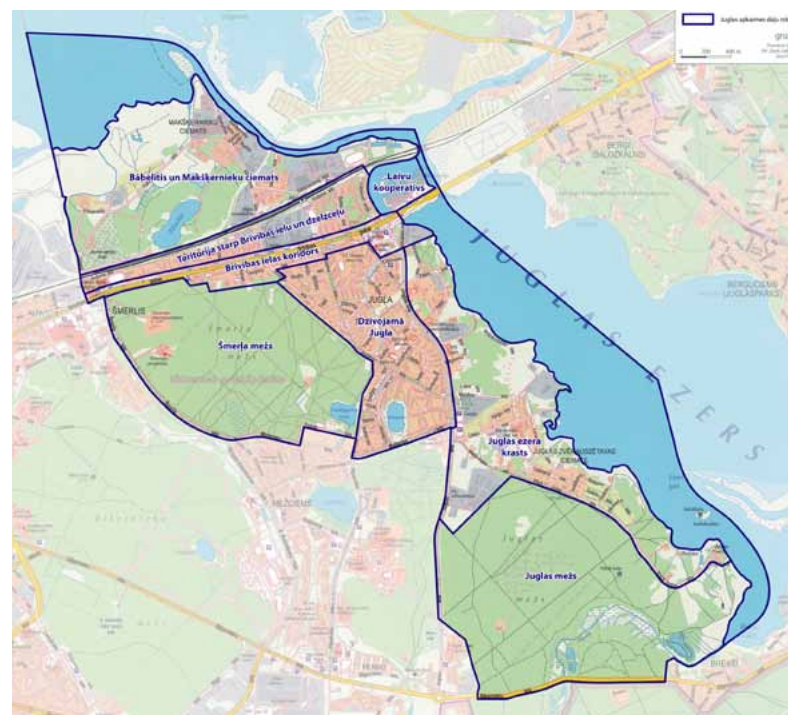


Image 17: A map of the target area © City of Jugla

From the urban planning perspective major challenges are the inner accessibility on foot, by bicycle and public transport as well as the parking situation and the insufficient street lightening. Due to the uniform construction style the neighbourhood lacks a visual identity.

Jugla's "developed out" spatial structure restricts future development as there are only few places with dwelling development opportunities: to the north from the railway and in the area of formerly known as the Juglas fur-farm where suitable land for development is provided. Development of the north part is closely linked to the development of the Northern traffic corridor. The lack of free and appropriate space in Jugla has restricted the development of new projects. As Jugla within Riga City is considered as "Riga gate" to accent this on the entrance to Jugla according Riga territory plan it is allowed to build 17-24 storey houses. This option should be reconsidered because of the lack of parking places already at the moment.

As a prerequisite to start an upgrading process it is very important to identify and communicate financial possibilities for complex approaches, to involve the public and to clarify legal issues about property questions.

City planners and politicians are of the opinion that without improvement the estate could lose attraction to a population that might be able to support improvement, a dilemma difficult to solve and potentially leading to conflict between various groups of residents, if EU energy directives were strictly applied. Generally it is stated that the current residents, mainly due to their limited and over the last years decreasing incomes, are fending off any consideration of major changes. Especially the older generation and low income households are seen as passively resisting interference from the planners. On the other hand, presently the municipality has little to offer. Revolving funds, which might be handed out as credits and/or subsidies might be available in the near future, but so far at an insufficient quantity. There is a need for prioritising investment, which might go into model projects in housing improvement and upgrading public spaces and infrastructures.

A specific problem of parts of the estate is a high floodwater risk that needs planning attention. Turned into an asset, the floodwater risk could lead to lively landscaping and a specific form of a green face for the neighbourhood.

To improve recreational facilities the city plans to develop bicycle and walking paths, pedestrian crossing and cafes.

Aim of the Project

It is the aim of the municipal administration to counter the threatening devaluation of the housing stocks' value and usability by implementing a policy to reduce energy consumption, to start the process of modernization of dwellings and public buildings and to enhance the living environment of the population. It is seen as a target, to increase public participation in the estates' development and to attract younger families with a higher social status. In order to achieve this goal, the maintenance standard of buildings needs to be raised, the cost risk of inefficient energy systems needs to be reduced, public space should be improved and the provisions of social and commercial should be upgraded to fit the envisaged population, albeit without excluding the present inhabitants economically.

Also the administration plans for the visibly positive development, which was started through post-1990 new developments at the rim, to be extended to the older parts (1960-90) to avoid further segregation. According to the administration and planners, also the small homes neighbourhoods need better integration into the urban tissue of the estate and a link-up to services.

Activities

Riga benefits from an outstanding integrated development and planning instrument, the urban master-plan which envisages a perspective for the city until 2025. It deals with the triangle of spatial and economic development, societal development and the development of the urban environment. The master-plan formulates detailed planning guidelines from a research grounded top-down perspective for a greener sustainable future. However, its key points are at present not fully matched on the district and neighbourhood level.

There the integrated urban development concept focuses on a sustainable and rational strategy including visual aspects of neighbourhood enhancement, public space and supply, energy use and distribution, and on improving public space including car parking. However, a consequent local action plan, which is pursued by the local authority, has not been approved as part of the city's longer-term master-plan strategy.

Since the majority of the apartments in Jugla are owned by individual owners the success of a development concept depends on the activation of them. It is important to enable individual owners by influencing unfavourable framework conditions and providing information. Therefore, a special municipal building renovation company as well as a municipal revolving fund are being developed.

Bridging the various actor interests, one main purpose is to design a strategy and to communicate it towards the local residents, who as individual property owners and final decision-makers decide over most of the measures. A comprehensive funding model, which would need to include means-tested subsidies and the sustainable credits scheme, is seen as indispensable for the success of this company. Also it is considered that step-by-step implementation and measures which can be realised with small investment should have priority as a precondition for the inclusion of residents. The independence of the envisaged public private company from everyday politics and a strong capacity for neighbourhood management, including energy matters, influence on market development and social issues is seen as vital. To provide better information to the end-user, a special internet portal for online monitoring informs about indoor climate and consumption parameters of renovated and not renovated buildings.

Further public buildings are under energy-related reconstruction, there is a strategy for energy audits

to cover the whole of the estate and plans are under development as well as are for the enhancement of public space and greenery. Together with national institutions and the city of Riga, a financing strategy and the kick off programme are underway.

Results/Lessons learned

Since the majority of the apartments in Jugla are owned by individual owners the success of a development concept depends on the activation of them. Energy efficiency measures have to be according to and not in contrast to the owners in individual interests. So it is important to change unfavourable framework conditions and to provide information to all relevant actors. Therefore it is essential to identify and communicate financial possibilities for complex approaches, to involve the public and to clarify legal issues about property questions.

The foundation of a non-profit public-private urban development company can be an asset as it can bridge the various interests of actors involves, build up partnerships with local owner associations and design a strategy and communicate it towards the residents. A step-by-step implementation and measures which can be realised with small investment can be a further precondition for the inclusion of residents. Furthermore a comprehensive funding model including subsidies and sustainable credits schemes are vital.

7.6 Target area Siauliai, Lithuania

General information

Šiauliai is the fourth largest city in the north of Lithuania with 130,000 inhabitants and covers an area of 81.13 km². Within the project the city administration developed integrated urban development concepts for the two target areas Lieporiai (between Gegužių, Lieporių and S. Dariaus ir S. Girėno Streets) and Miglovara (between Vytauto, Žemaitės, Miglovaros and M. Valančiaus Streets).

The two target areas were selected on one hand because they are very typical regarding their structure and the experiences in the target areas can be used as samples for further municipal activities regarding the develop of approaches for the modernization of the “soviet planning legacy” in the city.

On the other hand there are active communities and NGOs in the target area that could be a favourable factor to promote the modernization process in the area.

Current situation

The stock of dwellings in the Šiauliai city comprises about 2, 74 million m² of useful area. Private properties account for approximately 97% of the stock of dwellings. The state-owned and municipal properties make up 3%. Often the apartment buildings are privately owned, whereas the land on which the buildings were built is state-owned. The apartment buildings in both target areas have practically no formed and registered land plots.

The number of residents has been declining over the last decades, mainly through emigration of residents at working age, which so far has lead to a relative increase of younger and aged inhabitants, which however is expected to be followed by the growth of the working age group, if outward migration can be lowered.

Both target areas, Lieporiai as well as Miglovaros, are predominately characterized by the standardized multi-storey apartment buildings from the soviet time in a typical settlement layout of the period. Meanwhile Lieporiai is a typical major-housing estate with neighbourhood related schools, park area and shops for the local supply, the target area Miglovaros

is a smaller pure residential area. All residential buildings in both target areas were built after the Second World War, the main apartment and social infrastructure buildings were constructed between 1968 and 1982.

Key figures AREA 1 – Lieporiai	
Size	91 ha
Number of inhabitants	11,500
Number of buildings	106 apartment buildings; Public buildings and shops
Period of construction	1968–1982
Owner structure	97% individual private owners 3% institutional (rental) ownership
Current annual energy consumption of multi-apartment buildings*	Max. 84 kWh/m ²

* Average annual final energy demand of a typical not modernized building (Space heating + hot water preparation)

Key figures AREA 2 – Miglovaros	
Size	6.1 ha
Number of inhabitants	1,403
Number of buildings	19 apartment buildings; 25 single family-homes
Period of construction	1960–1989
Owner structure	97% individual private owners 3% institutional (rental) ownership

Lieporiai

This target area which is significant for the Šiauliai city is distinguished for its urban consistency and completion of social infrastructure. There are 82 apartment buildings, 6 individual houses, 9 commercial objects, and 9 educational and training institutions. In terms of age, the area is dominated by retirement

age residents whereas families with children live only in every fourth apartment.

The area has a large green zone intended for public use – the Lieporiai Park. Although the Park is currently maintained it is not properly adapted for public use. There is no land plot formed for the Park and its functional purpose has not been determined either. The Lieporiai Park as a recreational centre would slightly counterbalance the orientation of the area towards supermarkets.



Image 18: Target Area 1 – Lieporiai © City of Šiauliai

In the urban aspect, the planned residential area is a complete complex with the developed social, engineering infrastructure. No designing of new large complexes is associated with this residential area; only individual new objects are possible.

The engineering infrastructure of the area is very well developed: there is a central water-supply, household waste and rainwater collection systems; there are well-developed electricity and gas supply networks; district heating and telecommunications are provided as well. The performance quality of all the engineering networks is aggravated by their age: all the engineering communications were laid around 1975; thus, currently they are already outworn and in need of upgrading.

Miglovara

This area is located next to Žemaitės Street, which is one of the transport connections in the Šiauliai city, as it runs in parallel to Tilžės Street and continues up to the southern district of the city. Žemaitės Street has great significance and impacts directly the removal of the growing transport flows from the central part of the city. There are no parks in the territory of the area, except for the green zones by the residential buildings.

The area is dominated by the low-rise and high-rise residential buildings: there are 19 apartment buildings, 30 individual houses, and 1 private medical treatment facility (based in one of the apartment buildings). The majority of the land plots of individual houses has been formed and registered. Apartment buildings have practically no formed and registered land plots. Larger (daily service) supermarkets located next to the residential area include IKI, RIMI, Cento, Norfa, and Maxima.

The existing square Sukilėlių Hill adjoins the residential area – the area is maintained and adapted for public use, there is a land plot formed for this territory, and its functional purpose has been determined. The majority comprises of senior citizens. This age group is dominant in the area. Disabled account for approx. 5% of the total number of the residents in the planned area.

The development of the social infrastructure objects is good; therefore, there is no necessity to establish additional institutions.

One of the largest problems in both target areas is the outdated stock of dwellings. Until now only a small number of blocks have been improved with regards to energy efficiency measures, mostly by insulating the outer hull. It is seen as a major problem that public space and social infrastructures do not develop in conformity with the residents’ changing demands. Some residents of both target areas started with own activities to enhance the energy efficiency of the buildings. However, these activities vary widely in terms of quality and complexity and are mainly focused on apartment-related measures. Activities that require a general structural change or activities of the entire house owner community are rarely applied. For this reason the general refurbishment rate is still very low – as in the entire municipality of Šiauliai –

and there is the urgent need to prepare integrated concepts for a holistic overall upgrading of the two neighbourhoods that take into account a common and an integrated approach.



Image 19: Target Area 2 – Miglovaros © City of Šiauliai

Both areas are connected to the central heating system of the city. However, the heating grids are in poor condition and there are high energy losses up to 40 percent. Due to the losses the price for district heating is very high. Residents as well as the energy supply company are very reluctant about the introduction of renewable energy sources. Although for the majority of residents, the heat losses through bad insulation of buildings and of the distribution network are producing excessive energy cost leading to economic problems. The high cost for energy is partly attributed to the monopolistic structure of energy service providers and to the partly outdated aged technology currently used for energy production. In both target areas, along with the increase of auto mobilization, illegal parking lots have been established next to the buildings at the expense of common use areas. Approximately the parking lots should be twofold larger as currently as they accommodate cars of only 50% of the residents. As the target areas were started to be built forty years ago there is a distinct shortage of common use areas next to the apartment buildings already, a lack of quality children’s playgrounds and recreational and sports grounds as well as of parking lots. Also in the territories between the apartment buildings, little attention is paid to the sensitive part of the society – children and the elderly.

The household waste collection and management system in both target areas works poorly as the required number of household waste container sites has not been established.

Both target areas face the problem of unformed land plots which make it almost impossible to objectively assess the necessity or to adequately design measures.

Altogether, in Šiauliai considerations about a fundamental change of the meaning of the two neighbourhoods for the city seem not to be a central issue. Above the needed general improvement of the technical energy appliances of the building and the neighbourhood, the two neighbourhoods are seen by the municipal actors and by the administration as in a satisfactory condition, where no fundamental turnaround of the neighbourhood development is seen as necessary. In the estates’ public space, the focus is on smaller measures, including improvements in car-parking facilities. Enhancing the public park area is expected to lead to a continued attraction for the current residents and on the local housing market. Also the recent modernisation including energetic improvements on public buildings has been seen as an important contribution to the sustainability of the neighbourhoods.

Aim of the Project

Cooperation between the city’s planning administration on the one hand, and flat owners associations and contracted housing management firms on the other is the central collaborative element of planning. The main effort is to produce a coherent plan for the energy lead refurbishment of the neighbourhood, which is thought to be sufficient in rendering the estates sustainable for the future. Sectoral independence, e.g. of the energy providers, is understood to be the factual situation, but not an excessive problem, as they are investing into the technological improvement of their installations.

Integrated neighbourhood development concepts are being elaborated and the strategy towards energy audits and the evaluation of existing model projects is under consideration as a starting point for a citywide implementation of improvements step-by-step.

The Šiauliai Strategic Development Plan (ŠSDP) highlights an open, creative and responsible community, the economic competitiveness of the city and the quality of the residential environment of both target areas. The main focus is on the improvement of the existing residential environment rather than the planning of new entities. Currently, one of the most important planning tasks is to make every effort to approximate the target areas to the modern design norms, taking into consideration the modern needs of its residents.

The goals to be achieved in the field of housing improvement include the upgrading of the city's residential areas, improvement of the quality of the residential environment, and promotion of new housing development. The implementation of these goals involve the balanced development of the stock of dwellings, promotion of the renovation and upgrading of apartment buildings, creation of favourable conditions for the development of the new stock of dwellings, solution of social housing problems, fixing of public spaces of residential areas, improvement of the municipal waste collection, management and processing system, parking spaces, use of other vehicles and alternative modes of transport and reduction of the noise and pollution levels in the residential environment.

Also the adaptation of the environment to the needs of disabled persons is a very important aspect of the improvement of the residential environment.

Further the whole centralised engineering infrastructure must be preserved and upgraded, the conditions of its use must be improved, and the costs must be reduced.

As a precondition for further upgrading activities as well land property issues are addressed within the project. Solutions are developed to clarify the property rights of the related area in the surrounding of the buildings which has not been so far part of the land titles of the apartment owners.

Special focus of the enhancement of the living environment is the quality of the public space, playing grounds and the development of the Lieporiai park and further green zones. Additionally the supply with public transport, parking space, infrastructure for disabled persons is improved and the cycleway network is extended.



Image 20: Using existing greenery for IUDCs © City of Šiauliai

Activities

Currently the focus is on building up a reliable professional network, which includes the municipal planners, contracted urban and landscape planners, energy experts and the representatives of flat-owners associations to provide the communicative background to future enhancements of the energy status of the buildings.

To encourage the enhancement of the energy efficiency the city provides owners with information about financing possibilities and adequate technical approaches for the specific situation in the different building types. For this reason the city organises energy saving days and meetings with the heads of the housing communities.

The residents are seen as customers to be well informed of the planned energy efficiency measures. In the past of recently finished model projects residents were supported with a 50 per cent subsidy, making energy savings lucrative from a very early stage onwards. Further forms of an inclusion into the integrated planning and management of the estates is currently not seen as on the agenda of the municipality. For both target areas it is sought to balance the development of the stock of dwellings by forming land plots around the existing apartment buildings. This will provide a possibility to develop the upgrading of apartment buildings, and thus the maintenance and use of the residential environment will be controlled more easily. At present only very few apartment buildings have a formed land plot assigned to them. Regarding solutions for the traffic a fairly dense bicycle and pedestrian network is planned to be built in the residential areas of both neighbourhoods. Also

the public transport route network will be optimized, the quality of the services provided by public transport will be improved by upgrading the fleet of buses and adapting it for the disabled and modern bus parking, maintenance and production facilities will be established.



Image 21: Outdated dwelling stock © City of Šiauliai

For the development of public spaces in Lieporiai there will be a drafting of the project for the fixing of the Lieporiai Park, which also has is no formed land assigned to its area yet, including the construction of children’s playgrounds. Also there is a planned bulky waste site (Garažų St.) at a distance of approximately 300 m from the residential area and it is projected to build mixed waste container sites and 24 secondary raw materials sites next to each apartment building. According to the Šiauliai City Special Plan for Water Supply and Waste Management, no new networks are being developed in the planned area; however, the plans are to upgrade the existing networks. In Miglovara however the projections are to build a new water supply pipeline of 200 m and a new wastewater disposal pipeline of 300 m in the area. Also it is projected to build mixed waste container sites and 3 secondary raw materials sites next to each apartment building.

In the Šiauliai City Special Plan for Transport and Motor Vehicle Parking Spaces no parking spaces were provided within the area in question. Bicycle paths are currently built only in Žemaitės Street, up to the crossroads with Vytauto St. According to the Bicycle Transport Development Scheme of the Šiauliai City, the proposal for the immediate future is to establish a bicycle route in Žemaitės St. and bicycle routes are also planned to be established in the future in S. Daukanto and Vytauto Street.

Results/Lessons learned

Forming land plots for groups of buildings will have a very positive impact on the social condition and employment of the residents and the evolution and culture of the community. As the infrastructure (children’s playgrounds, common use areas) will be used commonly by several buildings, the residents will be able to communicate more among themselves. The most important reason for the residents’ transport need is the territorial scattering of entities satisfying the interests of the residents, companies, institutions and firms; thus, public transport must ensure the satisfaction of the transport need which is considered to be the desire to have the means of transport that do not restrict their lifestyle or social and economic activities. A city’s public transport network must be well developed and the means of public transport must be fast, convenient, and attractive. One of the most important objectives is to promote the use of public transport and ecological vehicles, thus reducing the overall level of automobilization. A major challenge of the upgrading activities in both neighbourhoods is to enable the different house owner communities to start with own coordinated refurbishment activities. For this reason it is necessary to provide adapted technical and financial solutions. For example the installation of heating energy-saving materials in external walls of buildings would not only allow for saving heat but also would improve the condition and aesthetics of the whole building. However, the implementation of such measures requires large investments, the return on which exceeds the period of 5 years.

7.7

Case study Berlin: Frankfurter-Allee-Süd/Kaskelkiez, Germany

General information

The area “Frankfurter Allee Süd and Kaskelkiez” is located at the Eastern inner city periphery in the district of “Lichtenberg”. With a number of 260.000 inhabitants Lichtenberg is the seventh biggest of the 12 districts in Berlin.

The area covers 0.66 km². Within the area there are two neighbourhoods which differ in urban form: The northern neighbourhood Frankfurter-Allee-Süd is a large housing estate with prefabricated buildings, was developed over a short period of time, the southern neighbourhood “Kaskelkiez” is a mixed use historic area, that “grew” over more than 120 years and was developed since the second half of the 19th century (1872).

Since the early 1990ies integrated urban development planning is being executed in the two neighbourhoods. Although the improvement of energy efficiency of buildings and supply infrastructure was not the major focus of the activities from the beginning, both areas have been comprehensively modernized step by step during the last 20 years.

The Case Study Berlin documents integrated urban development approaches and solutions to implement EU energy/climate measures and elaborates a critical evaluation on retrospective measures and plans for the two very different residential areas.



Diagram 6: Map of the case study areas (Source: Archive Planergemeinschaft)

Situation in the areas before modernization

Frankfurter-Allee-Süd

Key figures AREA 1 – Frankfurter-Allee-Süd	
Size	44,5 ha
Number of inhabitants (1992)	11.000
Number of buildings (1992)	22 prefabricated multi-apartment buildings 37 others (church, schools, etc)
Period of construction	1970-1974
Owner structure	66% owned by one building association (rental ownership) 34 % owned by cooperatives Almost 100 % tenants
Annual energy consumption of multi-apartment buildings 1991* ¹⁾	190 kWh/m ² (range 160-340)
Annual energy consumption of multi-apartment buildings 2010* ²⁾	87 kWh/m ² (range 84-220)

*¹⁾ Average annual final energy demand of sample buildings before modernization (Space heating + hot water preparation)

*²⁾ Average annual final energy demand of sample buildings after modernization (Space heating + hot water preparation)

Frankfurter-Allee-Süd has around 10,000 inhabitants, the total residential area amounts to 418.500 m². The neighbourhood is a large housing estate with prefabricated buildings from between 1970 and 1985 and a predominantly residential use. Very typical for the urban structure of the neighbourhood are the large green spaces in close connection to residential buildings. The area is well connected to public transport and in the north it borders on one of the main arterial roads in Berlin which leads to a high traffic density in the area. With about 5 km distance to the Eastern City centre of Berlin, the neighbourhood is located at the periphery of the inner city. The parking “pressure” on the neighbourhood is rather high.

In 1992 Frankfurter-Allee-Süd was characterized by a relatively balanced social structure.

In the area are four kindergartens, four schools, one youth facility, and one cultural facility (“Studio Bildende Kunst”) in the year of 1992. No facility for elderly care exists.

Overall the area was lacking facilities for youth and elderly and had a high deficit in design of public green space and squares. The amount of public playgrounds and schools was sufficient, although these lacked open space. The neighbourhood has an offer of a relatively large number of flats with large size (regarding number of rooms), which could be a potential especially for the development of the neighbourhood as a habitation for families.

The neighbourhood possessed a district heating system that covered the entire area but had an urgent need for modernization. The building stock had a poor energy performance with defects in the façade as well as in the technical equipment.

Frankfurter-Allee-Süd was threatened by a small existing vegetation potential, a high building density, a high rate of sealed surface, an increasing traffic volume and a high atmospheric load due to industrial emissions. The case study alerts the danger of urban climatic effects and advices of the indispensable enhancement of the urban climatic situation in connection with building activities and refurbishment measures.

Kaskelkiez

Kaskelkiez has around 3,500 inhabitants and covers an area of around 187,450 m².

The neighbourhood is located south of Frankfurter-Allee-Süd, separated by railway tracks.

The neighbourhood has a traditional European urban fabric, composed of a scheme of roads and blocks. The blocks are predominantly built up with attached 4-5-storey buildings. In 1992 there are 284 buildings in 12 blocks in the study area (excl. the industrial zone west of Kaskelkiez), of which 155 are monuments. In World War II the area was marginally destroyed and for this reason the neighbourhood is rich of historic buildings of which the most were constructed in the period from 1875 – 1920. Most of the buildings in the neighbourhood suffered very desolate structural and

poor energy conditions. About 76% of the households were using coal-burning stoves.

Key figures AREA 1 – Kaskelkiez	
Size	21,7 ha
Number of inhabitants (1992)	2.500
Number of buildings (1992)	284 Traditional European urban fabric Predominately attached 4-5 storey brick buildings
Period of construction	1872-1918
Owner structure	Today: 15% building association 85% private owners, ‘fragmented ownership’ (in 1992 about 50% individual ownership, 50% of the buildings were under public control due to unsettled property rights)
Annual energy consumption of multi-apartment buildings 1991* ¹⁾	340 kWh/m ²
Annual energy consumption of multi-apartment buildings 2010* ²⁾	200 kWh/m ² (range 60-360 kWh/m ² depend on the refurbishment status)

*¹⁾ Average annual final energy demand of sample buildings before modernization (Space heating + hot water preparation)

*²⁾ Average annual final energy demand of sample buildings after modernization (Space heating + hot water preparation)

Kaskelkiez is an area with mixed use, but still holds a large proportion of residential buildings. In 1992 the area was characterized by a relatively high unemployment rate (19%) and about 15% of the households had an income below the official minimum living wage.

In 1992 only two small kindergartens (on the first floor of residential buildings) and one cultural facility (a small library) exist. Other facilities of social infrastructure are missing. Children went to the neighbouring schools in Frankfurter-Allee-Süd and Nöldnerstraße, Weitling-Kiez. The parking of the neighbourhood took place in the streets and in the courtyards. Parking spaces were sufficient in number. Only few green



areas existed and public spaces as well as the yards were lacking amenity values. Almost all courtyards were paved and used for waste containers and parking.

Coal-burning stoves in 76% of the housing units in Kaskelkiez as well as the traffic volume caused a high atmospheric load in this area. Noise exposure through S-Bahn and transit traffic on cobbled streets was high. Also groundwater contamination was feared, mainly because of waste deposits on the premises of a near industrial area and on some of the plots that were used for business.

Furthermore, there was an unclear **ownership situation**. This causes questions about the responsibilities of maintaining the greenery and open space, about the structural condition of foot paths, and about the belonging of waste container spaces and parking spaces. In Kaskelkiez the ownership of 50% of all flats are not clarified in 1992. Because of this the development of refurbishment is blocked. Although this problem could not be sufficiently resolved a solution for these flats and plots could be found in terms of legal and administrative handling. These flats were set under public control (municipality level) and administered by the municipal building society.

In Kaskelkiez there are also neighbourhood conflicts as there are about 100 squatters (persons that moved into a house without owning it or paying rent for it) whose aggressiveness is targeted at a project of youth welfare service which tries to encourage right-wing young people to find their way back to civil society. Also these people are described as aggressive. It is reported of violations and fights between these groups.

The constraint of the case study area in general is its physical isolation from the neighbouring quarters.

Railway tracks and highway Frankfurter-Allee completely separate both neighbourhoods from the adjacent areas. On top of that the industrial and commercial zone east of Frankfurter-Allee-Süd and the industrial zone west of Kaskelkiez tighten the situation. Road and path connections to the surrounding quarters are limited to few streets. There is also only one connection between Frankfurter-Allee-Süd and Kaskelkiez:

On the other hand the grand potential for green space is the large non built-up area that is surrounding both neighbourhoods – it is a plot of railway tracks. In Frankfurter-Allee-Süd the large non built-up spaces between the buildings offer potentials for a living environment that offers good options for different kinds of uses. Especially children and elderly could benefit from this if the various green spaces were designed and furnished.

Both neighbourhoods show a lack of cultural and economic vitality due to insufficient cultural facilities, retail and services and gastronomy. Also in both areas the situation for cyclists was insufficient. There were conflicts between car traffic and bicycles in the residential streets. Also the pavement material was dangerous.

The networks for gas, electricity, heating, water, and telecommunication are in bad condition and partly insufficient regarding capacity and energy efficiency. Diagram 7: Energy parameters Frankfurter Allee-Süd (Source: Archive Planergemeinschaft)

In both neighbourhoods the percentage of persons at age 65 and older (4%) does not represent a normal portion. In Kaskelkiez on top of that the portion of people aged 18–45 (58,1%) is 18,1 percentage points above district average. The unbalanced demographic structure can be a risk for the sustainable de-

Surface-related energy parameters 2010 and reduction in comparison to 1992:

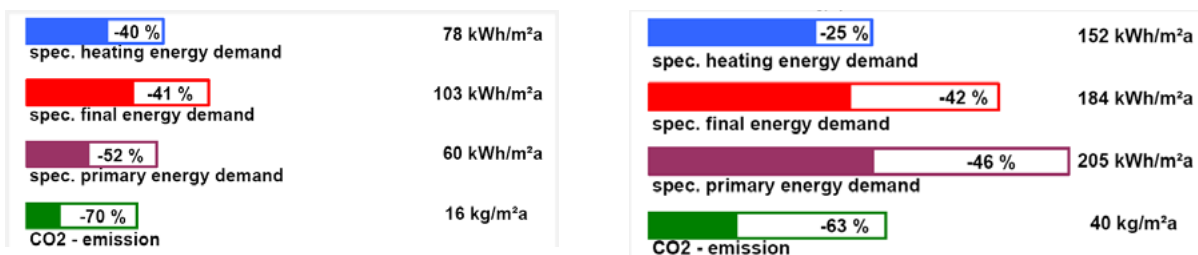


Diagram 7: Energy parameters Frankfurter Allee Süd (Source: Archive Planergemeinschaft)

velopment of the area because it causes demographic waves which necessitate suitable adaptation of the infrastructure offer.

Integrated planning activities

Urban development of the case study area has been steered in several planning processes throughout the last 20 years. The integrated aspect of energy efficiency had been followed imminently in the 1990ies but was fostered strongly and explicitly only since the past years. In the first planning phase (1990–1995) basics for development and first integrated concepts were set up. After having concentrated on constructional qualities and measures in the first years after the fall of the Berlin wall, one started to include social issues more intensively into the urban development planning processes during the second planning phase (1995–2000). The third planning phase (2000–2005) is characterized by integrated concepts reacting to population decrease. Only since the fourth planning phase (2005–2010) energy efficiency explicitly becomes an important issue.

Since 2002 the public sector conducts energy-efficient refurbishment of the social infrastructure and from 2005 onwards specific superior energy-efficient measures are conducted by housing societies on residential buildings. Measures for the energy-efficient improvement of buildings and supply infrastructure by public and private owners now are an integral part of the activities.

Various stakeholders (mainly housing societies, municipal and private supply companies) and residents were involved in legally binding and legally non-binding planning processes. In Kaskelkiez the residents were involved through an institutionalised residents' board (Betroffenenvertretung) between 1993 and 2008, when the neighbourhood was formally designated as redevelopment area.

In addition to that several social, labour market-oriented and educational measures had been realized on the neighbourhood level, such as the "Climate Office Lichtenberg" ("Lichtenberger Klimabüro"), project "energy consultants" (Energieberater) or the opening of a sample "show-flat" by the housing association HOWOGE to demonstrate possibilities for energy saving.

Activities and achievements until today:

During the last 20 years numerous different measures have been implemented to improve energy efficiency and the living conditions in the two neighbourhoods. In both areas it was possible to halve the total primary energy consumption between 1992 and 2010.

Selected measures in Frankfurter Allee Süd:

- Refurbishment of 100% of the residential buildings, including insulation of façade and ceilings, replacement of windows and the modernization of the supply equipment
- Partial renovation of schools and kindergartens
- Construction of a new neighbourhood centre
- Reconstruction of a multi-storey building as Europe's biggest low-energy building, which is now equipped with a combined heat and power unit.
- Renovation and maintenance of the district heating system
- Reorganization of traffic routing, traffic calming measures, rearrangement of parking lots as well as the improvement of path network
- Reorganization of the allocation of public and private green, greening of the main streets and construction of a new green corridor in the neighbourhood
- Realization of several awareness rising, educational, social and labour market-oriented projects
- Establishing of good cooperation between housing associations and public authorities
- A municipal housing company (HOWOGE) was founded and buildings and land properties were transferred to the company. The juridical constitution of the existing housing company was changed.

Selected measures in Kaskelkiez:

- The existing residential buildings were returned to the former owners (restitution)
- Modernization of more than 60% of the residential buildings and construction of 323 new flats
- Replacement of existing stove heating by decentralized heat generators. For cost reasons at later stage the connection to the central heating system of the neighbouring district was not carried out.

- Installation of several solar heating systems, photo-voltaic or biomass furnaces
- Establishing of a new neighbourhood centre
- Extension of the kindergarten supply, refurbishment of a school building
- Stepwise increase of the number of shops, cafés, arts and crafts enterprises
- Reorganization of traffic routing, traffic calming measures and re-arrangement of parking lots
- Redesign of all existing and construction of additional green spaces and play-grounds
- Organization and implementation of an intensive communication process during the entire modernisation process by formal committees, informal meetings and publications.

Results/Lessons learned

Integrated urban development needs time. Within the analyzed period most of the targets were accomplished. The major target frame stayed unmodified although some of the focal points changed during the long process. To efficiently accomplish sustainable targets stable cooperation between all relevant stakeholders as well as the actor's endurance are vital for their success.

The goal of a sustainable development in the area of the case study was on the agenda since the early nineties. Also the integral aspect of energy efficiency was attended to very early albeit not explicitly. A clear promotion of energy efficiency measures takes place only since recent years. Regarding an integrated development Berlin could rely on several former experiences like the Leipzig charter on Sustainable European Cities 2007.

The elaboration of integrated development concepts initiates cooperation processes. Collective concepts of public, private and local actors strengthen the development of neighbourhoods and districts. All stakeholders must understand and accept that the potential for the implementation of higher energy ef-

iciency is determined by the economic capacity of owners and residents. To stimulate energy efficiency measures specific information and the promotion of public awareness can be helpful.

It is complicated to communicate isolated and loose energy efficiency measures. The acceptance is much higher if these measures are integral parts of overall integrated development concepts. Particularly public investment with visible improvements of public space and buildings are necessary for a high acceptance by the relevant actors.

Also vital is a reliable political, legal, administrative and institutional framework. Without a) clear political responsibilities, b) a stable legal framework, c) administrative capacities and d) a clear institutionalized owner structure in the early nineties the successful development in the analyzed area would have been impossible.

Integrated development concepts are a binding framework for the development of cities, districts and neighbourhoods. They are a prerequisite for the public management of development processes and offer a reliable frame for investment decisions of owners, also in regards to energy efficiency measures. Therefore to adopt integrated development concepts through political decisions is necessary.

Integrated development concepts can be the initiator for the development of neighbourhoods and districts if a) all measures planned are assigned to the respective authorities or service providers and b) possibilities of investment are specified. For that public as well as private resources are necessary.

The economic profitability plays a vital role for investment decisions of private owners. Energy-saving measures are part of this calculation. Private owners are not always capable of financing these measures and sometimes the investments do not amortize through the avoided energy costs alone. Therefore it is important to offer incentives through public financial funding of energy-saving measures.

7.8 Case studies from Brandenburg

7.8.1 Lübbenau/Spreewald –Energy 2021 Master Plan

Strategies for urban energy regeneration

Summary

The objectives of the Lübbenaubücke project have been the refurbishment of housing in line with residents’ requirements, the development of urban regeneration measures (particularly partial demolition of surplus housing) to make the urban structure compatible with the town’s demands. Also upgrading of the residential environment, improvements to the infrastructure and strengthening of the local economy were on the agenda. In the context of the Ex-WoSt pilot project “Urban Energy Regeneration”, the Lübbenau/Spreewald local authority has developed a comprehensive municipal energy concept – “Energy 2021 Master Plan”.

Location

Lübbenau/Spreewald is in the region of Brandenburg, about 90 km south east of Berlin.

Key data/indicators at municipal, regional and/or district level:

The population of Lübbenau/Spreewald was about 17,000 at the end of 2009. It has lost around 11% of its inhabitants since 2001. The town used to be prosperous due to the extraction of lignite and operation of a power station, but after the collapse of these industries it had to deal with the increased emigration by its predominantly young population. The old town has grown considerably in importance due to the sig-

nificant rise in tourism since 1990. With its castle and harbour its image is now that of a touristic jewel typical of the Spreewald.

Realisation/period of implementation

Lübbenaubücke as a communicative planning concept started in 1999, Energy 2021 master plan: Feb. 2009 – Dec. 2010

Status

The Energy 2021 master plan has been published at the end of 2010 as a draft for continuous reviewing according to the changing demand. At the same time detailed energy studies have been undertaken for the Neustadt South West district and the individual project “House for children and senior citizens”.

Participants/partners in the project

The Lübbenaubücke approach mobilises a large number of participants from the local population, industry, science and public institutions from the region of Brandenburg, the district of Oberspreewald-Lausitz and the town of Lübbenau/Spreewald.

Participation/implementation process

A central focus of the Lübbenaubücke urban development and housing management project is on cooperation and communication between all the participants and the promotion of citizen involvement. Since 1999 many individual urban development projects were completed boosting the residents identi-



Image 22: Modernised buildings in Lübbenau © Stadt Lübbenau/S.

fication with the town. As far as refurbishment and modernisation of the housing stock is concerned, great emphasis is placed on energy efficiency and the use of innovative technologies.

Integrated approach

At the forefront of the project is a comprehensive planning approach which is directed towards all-round strengthening of the Lübbenau location. The direct involvement of the top decision makers ensures a high flexibility, reliability and accountability in the urban redevelopment process. The town of Lübbenau/Spree-wald views the municipal energy concept, with the development of an energy model with medium and long term targets, as an important building block for future urban development.

Technical solutions

Energy considerations such as thermal insulation of the building shell, installation of modern heating systems, and in some cases the use of new technologies such as solar heat, have had high priority for some time in the refurbishment of existing buildings. An outstanding energy efficient refurbishment project is the 2005 pilot “Barrier-free refurbishment to low-energy home standards”. It was possible to reduce the primary energy requirement by some 70% by means of full thermal insulation combined with installation of a ventilation system with heat recovery and heat storage. The objectives of the municipal energy concept are to integrate renewable energies and efficiency raising measures in energy production as well as in distribution into the urban development processes and existing supply structures. It provides the framework for the implementation of future regeneration projects under optimum energy conditions.

Funding/support

The Lübbenaubrücke cooperation project was initially funded under the Federal programme “Socially Integrative City” and later under the “Eastern Urban Reconstruction” programme. Federal Government, the

region of Brandenburg and the municipality each provided one third of the funds required. The projects for energy efficient refurbishment of housing stocks were mainly funded by a combination of social housing grants from the region of Brandenburg and the Federal investment bank’s (KfW) renewable energies programmes, based on the concept of revolving funds.

Success factors and innovations

The Lübbenaubrücke project has enabled a model of local cooperation to be established which successfully achieves continuous collaboration between the project sponsors and also the early and close involvement of the population and local businesses. With the development of a municipal energy concept, Lübbenau/Spree-wald becomes one of the first towns in Brandenburg to include municipal climate protection in its Integrated Urban Development on a significant scale, namely at municipal, neighbourhood and building level.

Challenges and shortcomings

The challenges for the future will be prioritising the inclusion of energy considerations in all urban regeneration activities for the town as a whole, the implementation of ecologically optimised and economically realistic plans for CO₂ reduction and reducing local energy consumption.

Transferability of solutions

The town of Lübbenau/Spree-wald is a perfect example of how important it is to include energy matters in the urban development process. More and more towns will have to face this question due to higher fossil fuels prices etc. At the regional level the town is working with the three municipalities of Calau, Vetschau/Spree-wald and the district of Burg (Spree-wald), under a National Urban Development Policy (NSP) pilot project, on the production of a “Spree-walddreieck Regional Energy Concept”.



7.8.2

Luckenwalde – District energy concept for the Nuthe/Burg quarter

Model refurbishment options for typical buildings



Image 23: Aerial view of the quarter © fotos-aus-der-luft.de

Summary

In the ExWoSt pilot project, the energy study of the Nuthe/Burg district was used to find out the areas where action is needed on energy renewal and how a partial conversion can lead to an opening for the use of the neighbourhood. The study focused on balance and visualisation of the district's energy needs and coverage (energy flow). Building on the analysis, alternatives and priorities for implementation of energy measures were developed, which are also transferable to other urban districts. Individual projects were indicating model refurbishment options for typical buildings and neighbourhoods. It was a priority goal to produce experience for the realisation of ambitious energy remediation projects.

Location

The town of Luckenwalde is in the Land of Brandenburg, about 60 km to the south of Berlin.

Key data/indicators at municipal, regional and/or district level:

The town of Luckenwalde had a population of about 21,000 at the end of 2007. Its population had fallen by about 20% since the end of 1990. Luckenwalde has a compact medieval centre with peripheral estates with industrially produced housing blocks. Surrounding the old town are late 19th century areas and smaller districts of prefabricated concrete construction, particularly in the north east and north west. About 1/3 of the housing stock and many public buildings are connected to the district heating system.

Realisation/period of implementation

Starting in 2008, the "Burg" day nursery refurbishment will be finished in the fourth quarter of 2011

Status

Luckenwalde is currently concentrating on the "Burg" day nursery project as an example to be integrated into the energy concept for the neighbourhood. Due to the increased demand for low-cost housing, the neighbourhood concept is currently under scrutiny and lower cost improvements to the prefabricated concrete apartment buildings in the district are being implemented. In addition to the refurbishment, the local road transport network is also being restructured. This in particular includes traffic calming measures around the day nursery.

Participants/partners in the project

The refurbishment of the day nursery is being implemented in collaboration with the town of Luckenwalde, the municipal utilities company, the operator of the facility, Volkssolidarität LVB e.V., Fläming-Elster Regional Association and external research consultants.

Participation/implementation process

The "Burg" former day nursery is being refurbished to energy efficiency standards and converted to a cross-generational district centre under the umbrella of the ExWoSt project. The primary objective of the refurbishment is to save energy through insulation and the use of efficient heating technologies, the use

of renewable energy in generation and ecological building materials.

Integrated approach

The main focus of the day nursery refurbishment was on developing an integrated solution. Apart from the primary objective of energy efficient refurbishment, the particular intention is to demonstrate how energy consumption can be even further reduced at low financial cost, while at the same time upgrading the external appearance and creating new options for the use of the building. As part of the total redesign, a school playground and a community centre for the elderly will be established, alongside the existing use by the day nursery. Thus the building will be made ready for a long term use, despite falling birth rates. The project is part of the regional energy concept and is integrated in the “Brandenburg Community Climate Protection Network (BraNEK)” pilot project under the National Urban Development Policy, in which the town is involved.

Technical solutions

Energy efficient refurbishment of the day nursery was achieved by the use of complex systems for insulation of walls, roofs and basements and by replacement of the windows. Particular importance is placed on the use of ecological building materials and insulation of the building joints. Heat is supplied from a new system which incorporates automatic ventilation with heat recovery and the use of solar power for hot water supply. The measures described will achieve an energy gain of around 60%. Through energy conservation and the use of solar power, CO₂ emissions are being reduced by 70% compared with the previous levels. The results will be scientifically monitored and become the basis for future benchmarks.

Funding/support

The day nursery refurbishment project is financed by a combination of funds from the Investment Pact for

Energy Improvements in the Municipalities (ESI programme) and the Land of Brandenburg urban development grant. The energy relevant measures are supported by an 85 % grant (Federal/Land) under the ESI programme. The local authority provides the remaining 15% as its own contribution. The town receives additional funding for the other project costs in the form of a 90% subsidy (Federal/Land) from the RSI part of the Federal/Land programme “Urban Regeneration East” and contributes 10% itself.

Success factors and innovations

An energy concept has been developed for the neighbourhood. It includes refurbished or still un-refurbished apartment blocks (prefabricated concrete construction), a shopping mall and a day nursery. The range of energy measures associated with the refurbishment of the day nursery will produce a significant reduction in running costs, leading to savings long term. Innovative features are the use of low energy construction in an existing day nursery and the funding concept.

Challenges and shortcomings

One of the greatest challenges was funding the project. The refurbishment of the prefabricated concrete apartment blocks is under reconsideration in order to secure an affordable housing stocks for the lower income population. The originally planned full-scale refurbishment would have resulted in unsustainable rent increases.

Transferability of solutions

The project demonstrates model improvements in the overall energy balance of an urban district. For the model-project, a direct transferability is unlikely due to the high costs and the difficulty of funding the project. In Contrast, the reconsideration of high-end rehabilitation will become more common.



7.8.3 City of Guben – Integrated Energy Strategy 2020

Reorganisation of energy supplies with regenerative energy sources in urban renewal

Summary

By means of its Integrated Energy Strategy, the city wishes to create the conditions for safe, economical and sustainable energy supply and make an active contribution, by taking a focused approach, to the energy and climate-change prevention objectives of the Land of Brandenburg. The objectives include increased energy efficiency, the use of renewable energy sources, the reduction of CO₂ emissions, but also ensuring that the area remains an attractive residential and business location, preserving a minimum residential or client density in the supply area. The initial focus however is on separating district heating from the gas supply network and on building up decentralised local heating ‘island’ solutions. A medium to long-term priority is cooperation with the neighbouring Polish city of Gubin.

Location

The city of Guben is in the east of the Land of Brandenburg, on the border with Poland.

Key data/indicators at municipal, regional and/or district level:

Since 1990, the city of Guben has lost about 40% of its population and at the end of 2009 had approximately 19,000 inhabitants. Two thirds of the available housing are precast rented apartments which have for the most part been renovated and provide relatively good thermal insulation. Developments in the sphere of heat distribution have been even more drastic with

a 75 % reduction in heat loss. Recently, the thermal power station and the fine distribution of heat have been modernised, but not the transit lines. These are still oversized and lead to 30% heat losses in transit to the end consumer.

Realisation/period of implementation

Since May 2009

Status

After completion of the energy strategy, in 2010 an action plan was developed, building on the recommendations of the energy strategy.

Participants/partners in the project

Right from the start, an interdisciplinary project group has managed the initiative, consisting of representatives from various areas of municipal government, local housing companies and industrial enterprise, local and regional power suppliers and city councillors.

Participation/implementation process

At an early stage, the major participants in the city joined together in advisory groups to jointly develop the energy strategy and to work out the recommended measures for the various spheres of activity. They also provide information by means of awareness campaigns. Due to the process-oriented nature of the energy strategy, it has to be regularly evaluated and reviewed. For this, a monitoring and control-



Image 24: Energy supply City of Guben © Ernst Basler + Partner AG

ling system has been established as one of the priority measures.

Integrated approach

The integrated energy strategy is closely related to the integrated urban development and urban renewal (IUDC) concept. Because technical infrastructure and urban development are closely intertwined, the project has several interrelated objectives. Heat must be supplied economically, and the supply structure must ensure affordable energy prices for the consumer as well as environmental benefits achieved by the use of regenerative energies and through increasing energy efficiency. To ensure integrated local action, advisory groups with an interdisciplinary membership have been deployed.

Technical solutions

Some of the aims of the energy strategy are implemented with target margins which were developed building upon the energy strategy of the Land Brandenburg. In addition, various strategic approaches are being taken towards the renewal of energy supplies. Research in detail suggested that implementing a variety of concepts side by side and in ‘island networks’ leads to a maximum of energy savings at lowest investment cost.

Funding/support

The entire cost of the concepts amounts to EUR 100,000, funded 50% by the city’s own resources and 50% with funding from the Stadtumbau Ost (Urban Renewal East) programme. Guben is a model city in the ExWoSt (Experimental Housing and Urban Development) research sector “Energetic Urban Renewal” and to this extent benefits from exchanges of experiences among the parties involved.

Success factors and innovations

Essential success factors in the acceptance of the energy strategy, in addition to the multidisciplinary nature of the project, have been in particular the direct involvement of the mayor and commitment at an early stage of the most important participants in view of the implementation of potential measures. The general background situation in 2008 also favoured the plans: increasing energy prices as a consequence of world market development and as a result of the high level of dependence on third parties. One innovation is the close link between the strategic approach and the requirements of urban development resulting in the creation of a heat supply structure that is as flexible in response as possible to future uncertainties, in particular as regards the demographic situation.

Challenges and shortcomings

The greatest challenges have been the implementation of the energy strategy and the measures. Still, both city and power suppliers lack the necessary resources to rapidly implement an extensive bundle of measures. This not only affects investment projects, but in particular also non-investment measures such as the important sectors of “organisation and coordination” as well as “public relations”.

Transferability of solutions

The project highlights the close interrelationship of technical infrastructure and urban planning and the interactions associated with this. Linking into the urban regeneration process is a vital precondition for the development of long-term sustainable solutions in the context of urban renewal.

Early involvement of a wide range of participants has proved highly important to the implementation of subsequent action and was essential for the project to receive widespread acceptance from the start.



7.8.4 Spreewalddreieck Regional Energy Concept

A pilot project introduced under the federal “National Urban Development Policy” initiative



Image 25: Wind energy from the Spreewalddreieck © Stadt Vetschau/S.

Summary

The municipalities involved in the project of the ‘Spreewald Regional Triangle’ aim to tap into the ecological, economic and social potential of an energy policy established at local level. The focus is on reducing energy consumption, decreasing CO₂ output into the atmosphere, increasing the efficiency of energy distribution systems and encouraging a greater use of renewable energies. This project, which was initiated under the “National Urban Development Policy” (NSP) under the auspices of the federal government, aims to develop a comprehensive overall plan for the region which can be used as a basis for a joint energy strategy and also for producing well-planned individual projects for an energy efficient future.

Location

The towns of Vetschau/Spreewald, Lübbenau/Spreewald and Calau as well as the Amt Burg-Spreewald (the collective municipality of Burg) are in the touristic hotspot of the Spreewald region of Brandenburg, approximately 90 km southeast of Berlin.

Key data/indicators at municipal, regional and/or district level:

The region covers an area of 538 km² and is home to around 44,500 people (December 2009). Both Vetschau and Lübbenau have been centres of energy production for over a century. In the past, the towns were defined by brown coal mining and two large power stations nearby; however, since March 2007, both towns have become part of the “Innovative En-

ergy Region Lausitz-Spreewald”, which aims to develop sustainable energy policy.

Realisation/period of implementation

December 2009 – November 2011

Status

A joint strategy and conceptual framework has been developed with the regional participants and individual projects have been developed and are under collective survey.

Participants/partners in the project

The project was initiated by Vetschau and Lübbenau which together with Calau and Amt Burg make up the Spreewald-Triangle region. In addition to these municipalities, the initiative also involves energy providers, the agriculture and forestry sectors, the Spreewald Biosphere Reserve administration, businesses and housing associations.

Participation/implementation process

A communication platform in the form of a round table has been established to support coordination and decision-making. This enables all important actors from the administrative, political and academic spheres as well as regional energy providers, energy producers and energy consumers to enter a permanent discourse over strategies and project issues. The three working groups were initiated: energy consumers, energy producers and distributors). They are carrying out the substantive work and their findings are

brought together during round table sessions that have lead to an integrated overall concept.

Integrated approach

Interlinking various otherwise sectoral issues, such as energy conservation, energy production and power supply, and also encouraging cooperation between a broad spectrum of participants has lead to a considerable synergy effect. Priority is giving to the “learning process”, which promotes discussion between key participants. The municipalities see themselves as the initiators and facilitators of a broad dialogue of the regional society and actors, however they are also prepared to develop their own contributions. In addition, the project has explored, on a pilot basis, an inter-municipal scope of action and has motivated other towns to develop strategies for sustainable and energy-efficient town structures.

Technical solutions

With the expertise of the Brandenburg University of Technology (BTU) Cottbus, the project has evaluated the technical and economic feasibility of individual measures for increasing energy efficiency and also drawn up proposals for a further development of an innovative and intelligent power supply and distribution system for the municipalities and the region.

Funding/support

The project’s gross budget is EUR 88,000, not including pilot measures. As a recognised pilot project within the research programme “National Strategy Plan for an Integrated Urban Development Policy – Pilot Projects Initiated Under the National Urban Development Policy”, the initiative was given a grant of EUR 37,500 by the Federal Government. The municipalities participating in the project are providing the remaining funds.

Success factors and innovations

The project has explored new ways to solve the complex challenges posed by climate change mitigation on a regional scale. Both increased cooperation between neighbouring municipalities and providing a means for exchange with key regional actors have been an important impetus towards developing regional development strategies that extend beyond the municipal level.

Challenges and shortcomings

The greatest challenge has been to overcome conflicts of objectives, particularly in the technical and economic fields. A key issue has been maintaining a steady energy supply and price stability, while at the same time increasing the proportion of renewable energies. Input from a large number of small renewable energy sources leads to a high volatility in the grid makes and it necessary to reconstruct or upgrade the supply network, focussing on ‘intelligent network architecture’. Another point of conflict concerns the public acceptance of the essential network upgrade. The fear of price rises due to the turn towards a more efficient energy network has read to a reluctance amongst the residents towards the construction of further power lines.

Transferability of solutions

Above all, the initiative has developed transferable approaches for “climate change mitigation and global responsibility” and “regionalisation”. In addition, the project has shown a potential in “activating regional economic cycles” and “local participation” across politicians, energy related actors and research. Recommendations for establishing a sustainable model of collaboration have been produced that have proved to be attractive for other towns and regions, based on the lessons learned from implementing the project.



8 Appendix

List of Images

Image 1: Strategic developments financed by Municipality © City of Piaseczno and NAPE SA.....	28
Image 2: Piaseczno Target Area © Tomasz Pawlak/Janusz Bielicki	29
Image 3: Public spaces for the local community © Tomasz Pawlak/Janusz Bielicki	29
Image 4: Modernised buildings and replaced windows in the target area © Tomasz Pawlak/Janusz Bielicki	31
Image 5: Aerial view of Seminari Street © City of Rakvere	34
Image 6: A map of Lida © Grodno Oblast Executive Committee.....	37
Image 7: Tavlaya street 35, Lida © Grodno Oblast Executive Committee.....	38
Image 8: Mitskevicha street 24, Lida © Grodno Oblast Executive Committee	38
Image 9: Lida city centre © Grodno Oblast Executive Committee.....	39
Image 10: Sovetskaya Street 43, Lida © Grodno Oblast Executive Committee	39
Image 11: Aerial view of the target area © City of Jelgava	41
Image 12: Typical multistorey residential buildings © City of Jelgava	42
Image 13: A city square in Jelgava © City of Jelgava	43
Image 14: A city centre road in the target area © City of Jelgava.....	45
Image 15: Jugla typical multi-apartment blocks © City of Jugla	46
Image 16: Multistorey buildings with need for action © City of Jugla	47
Image 17: A map of the target area © City of Jugla	47
Image 18: Target Area 1 – Lieporiai © City of Šiauliai	51
Image 19: Target Area 2 – Miglovaros © City of Šiauliai	52
Image 20: Using existing greenery for IUDCs © City of Šiauliai	53
Image 21: Outdated dwelling stock © City of Šiauliai	54
Image 22: Modernised buildings in Lübbenau © Stadt Lübbenau/S.	60
Image 23: Aerial view of the quarter © fotos-aus-der-luft.de	62
Image 24: Energy supply City of Guben © Ernst Basler + Partner AG.....	64
Image 25: Wind energy from the Spreewald dreieck © Stadt Vetschau/S.....	66

List of Figures

Diagram 1: Urb.Energy approach (Source: Britta Schmigotzki, Housing Initiative f. Eastern Europe (IWO) e.V.)..	5
Diagram 2: Field of actions of an integrated urban development (Source: Archive Planergemeinschaft)	9
Diagram 3: Framework conditions for IUDCs (Source: pro:21 GmbH)	11
Diagram 4: Detailed Steps of IUDC Implementation (Source: Centre of Competence for Major Housing Estates)	18
Diagram 5: Steps and components of a Berlin IUDC integrating energy efficiency aspects (Source: Centre of Competence for Major Housing Estates).....	21
Diagram 6: Map of the case study areas (Source: Archive Planergemeinschaft)	55
Diagram 7: Energy parameters Frankfurter Allee Süd (Source: Archive Planergemeinschaft).....	57

Literature List

The manual was prepared on the basis of contributions from the different project partners of the respective partner countries.

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List of Abbreviations

BEEN	Baltic Energy Efficiency Network
CHP	Cogeneration Heat & Power
EE	Energy Efficiency
EEC	Energy Efficiency Commitment
EER	Energy Efficient Refurbishment
EnEv	Energie-Einsparverordnung (German Energy Saving Ordinance)
ERDF	European Regional Development Fund
IUD	Integrated Urban Development
IUDC	Integrated Urban Development Concept
JESSICA	Joint European Support for Sustainable Investments in City Areas
KfW	Kreditanstalt für Wiederaufbau (KfW Banking Group)
NGO	Non-Governmental Organisation
OP	Operational Programme
PP's	Project Partners
RES	Renewable Energy Sources
SWOT	Strengths, Weaknesses, Opportunities, Threats
TA	Target Area
WP	Work Package

