LAND BRANDENBURG
Ministerium für Infrastruktur und Landwirtschaft

Energy Efficient and Integrated Urban Development Action
URB Energy

WP 3 Urban Development

REPORT 1

Energy efficiency in integrated urban development

Interim assessment

May 2010

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Note: References to ‘federal state’ in this document refer to the Federal State of Brandenburg, not Germany.

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URB Energy
Energy Efficient and Integrated Urban Development Action

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LIST OF ABBREVIATIONS

BMVBS	Bundesministerium für Verkehr, Bau und Stadtentwicklung (national ministry for transport, construction and urban development)
BraNEK	Städtekranz Berlin-Brandenburg / Brandenburger Städte-Netzwerk Klimaschutz (BraNEK) (Berlin-Brandenburg planning association / Brandenburg urban network on climate protection)
BTU	Brandenburgische Technische Universität Cottbus (Brandenburg Technical University of Cottbus)
CO_2	Carbon dioxide
EEWärmeG	Erneuerbare-Energien-Wärmegesetz (Renewable Energies and Heat Law)
ERDF	European Regional Development Fund
EnEV	Energieeinsparverordnung (Energy Saving Order)
ESF	European Social Fund
EU	European Union
ExWoSt	Experimenteller Wohnungs- und Städtebau (Experimental Residential and Urban Construction)
INSEK	Integriertes Stadtentwicklungskonzept (Integrated urban development concept)
KfW	Kreditanstalt für Wiederaufbau (Credit institution for reconstruction)
MIL	Ministerium für Infrastruktur und Landwirtschaft des Landes Brandenburg (Ministry for Infrastructure and Agriculture of the Federal State of Brandenburg)
MIR	Ministerium für Infrastruktur and Raumordnung des Landes Brandenburg (Ministry for Infrastructure and Land Use Planning for the Federal State of Brandenburg) (since November 2009 MIL)

1 INTRODUCTION AND PRELIMINARY REMARKS

Urb.Energy is a transnational European cooperation project part-financed by the European Union in the context of the Baltic Sea Region Programme 2007-2013. The project started in January 2009 and runs for a three-year term. A total of six nations are partners in the project, including five major and medium-sized cities and one region.

The project addresses the ever-increasing significance of energy efficiency in all spheres of urban planning. The interlinking of measures in the spheres of construction, neighbourhood and infrastructural improvement is intended to lead to solutions for those involved in administration, housing and infrastructure. In addition to technical approaches to solutions, suitable financial models, the role of integrated urban development and the involvement of various parties (in particular municipal authorities, owners, investors and residents) are further areas of concern.

The Federal State of Brandenburg, represented by the Ministry for Infrastructure and Agriculture (MIL) as project partner in Urb.Energy, can draw upon extensive experience as it pursues integrated urban development. Over the 20 years following the political turning point in 1989, all cities have undergone sweeping processes of transformation and development. In the meantime, urban development strategies and tools have been the subject of continual improvements which can serve as a model for medium-sized and smaller cities in Eastern Europe too.

The objective of this report is to set out experiences involving strategies and procedures of integrated urban development as well as to present and evaluate specific energy-efficiency projects in the context of integrated urban and district development in the Federal State of Brandenburg. These projects have been assessed using a selected catalogue of criteria taking into account the three Urb.Energy Work Packages on the themes of “Integrated Urban Development” (WP3), “Technical Solutions” (WP4) and “Financing Opportunities” (WP5).

Section 2 sets out the experiences and learning processes of integrated urban development. General principles and instruments of integrated urban development and the integration of energy efficiency are covered by Section 3. Selected specific energy efficiency projects are the subject of Section 4. Section 5 summarises experiences so far and looks to the future.

The report is primarily aimed at international partners in the Urb.Energy project. However, in the context of the public relations work of the Federal State of Brandenburg and the Ministry for Infrastructure and Agriculture, it also serves to describe urban development processes and previous approaches to increasing energy efficiency.

In a second planned report in the context of the Urb.Energy project, the focus in 2011 will be on specific recommendations on energy efficiency in integrated urban development.

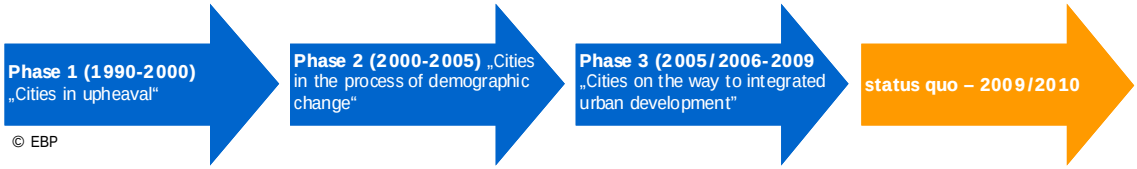
2 PROGRESS OF INTEGRATED URBAN DEVELOPMENT AND POLICY IN THE FEDERAL STATE OF BRANDENBURG

All Brandenburg cities since the political turning point and German unification in 1990 have faced a considerable process of transformation and development reflected in land use planning, economic restructuring, politics and administration. Extensive redevelopment of cities and infrastructures has taken place since the 1990s and has led to a recovery of urban potential. Since 2000, however, clear demographic changes and resultant negative growth processes have also been identified.

Correspondingly, urban development work in the Federal State of Brandenburg since the political turning point of 1989 has been in a state of continual change and refinement. Along with this, there has occurred a shift in the thematic focuses and strategies for action ranging from relevant sectoral terms of reference through to complex and integrated approaches. The publication of the masterplan "Strong cities – urban redevelopment" in 2006 represents a major milestone in such development.

The deployment of an integrated approach to urban development and urban development policy in the period between 1990 and today can essentially be divided into three phases for the Federal State of Brandenburg:

- Phase 1 (1990-2000): "Cities in upheaval"
- Phase 2 (2000-2005): "Cities in the process of demographic change"
- Phase 3 (2005/2006-2009): "Cities on the way to integrated urban development"



Due to the comparability of their land use, economic structure, social and demographic trends, many Eastern European cities faced – and still do face – some very similar challenges.

2.1 Phase 1 (1990-2000): "Cities in upheaval"

The reunification of Germany has meant a "turning point" for the development of cities in Brandenburg as well. "From city under socialism to city under capitalism" (Häußermann 1996).

URBAN DEVELOPMENT/PLANNING

With the reunification of Germany, the extent of the need for action in Eastern German cities became clear. Such need included lack of housing, a redevelopment backlog for existing buildings (homes in need of refurbishment in old and prefabricated buildings), changes in demand for living space (in particular demand for detached and semi-detached houses) and ownership structure (increasing purchase of own homes), a "fast-motion" process of suburbanisation, adaptation of infrastructure, massive movements of people and a severely

fluctuating population as well as the emergence of extensive areas of fallow land in the city districts as a consequence of economic structural changes. In many cases, the cities in the Federal State of Brandenburg were generally only able to react to such urban challenges in the 1990s. Short-term measures were needed in the face of a pressingly urgent urban situation. Highly attractive subsidies for new builds favoured good investment in supplying needs, but also led to urban development and socio-geographic conflicts. The creation and implementation of integrated approaches to urban development, both costly and time-consuming, could, therefore, not be realised.

This "reactive urban development policy" was predominantly characterised by a sectoral approach and sweeping subsidies. The much-needed interlinking of departmental planning was not possible. The emphasis lay on conceptualisation and realisation of separate projects usually without their being embedded in a city-wide context.

THE SIGNIFICANCE OF ENERGY EFFICIENCY

In this period, the emphasis was on ensuring contemporary living conditions, among other things by restoration of structural substance, improvement of fixtures and fittings by modernisation measures and, in particular, reducing operating costs by new heating systems and measures to control and regulate these systems. The focus of action in the building sector, in addition to the renovation of historic city centres, was also the modernisation of existing residential buildings in prefabricated districts where energy effects began to take on a higher priority.

Modernisation measures in particular were carried out from the point of view of cost saving by a reduction of heating energy (rapidly growing fuel prices after the political turning point) and the improvement in air quality (high levels of pollution due to high concentrations of coal-fired heating). In 1995, thermal insulation regulations came into force setting out specifications for energy-saving thermal insulation in buildings throughout Germany.

CONDITIONS/POLICY FOR FUNDING – ENERGY EFFICIENCY

Since 1991, the government of the Federal State of Brandenburg has been intensively involved in the financing of energy-saving redevelopment measures. This concerns, in addition to municipal buildings such as schools and nurseries (urban planning funding), also the renovation of housing (residential property funding), which is usually owned by community or cooperative housing associations, but also by private landlords.

City development/planning in the 1990s was sectoral and reactive in focus. The high pressure to invest in infrastructure, existing buildings and in particular in new builds had to be met – there was barely room for sustainable urban planning strategies.

2.2 Phase 2 (2000-2005): "Cities in the process of demographic change"

Demographic transformation and its recognisable medium and long-term effects were decisive factors in urban development in the cities of Brandenburg. Populations were in negative

growth due to migration, ageing and changes in domestic structure. Radical changes were also identified in the housing industry with a great many homes standing empty, as well as more severe socio-geographic differentiation due to internal movements within the cities into new residential districts at the expense of the inner cities and the estates built in the period of state socialism.

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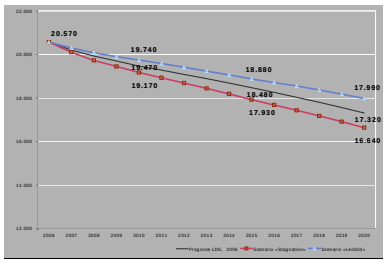
URBAN DEVELOPMENT/PLANNING

In the period between 2000 and 2005, urban development and urban development policy strategies in the cities of Brandenburg laid heavy emphasis on housing management. There was a concentration on the demolition of homes that were no longer needed long term, the upgrading of existing buildings and the adaptation of social and technical infrastructure within the scope of the national government/regional government programme “Urban Renewal East” (Stadtumbau Ost) launched in 2002. The cities and housing associations were reacting to the challenges of massive losses in population and an ageing population in some city districts.



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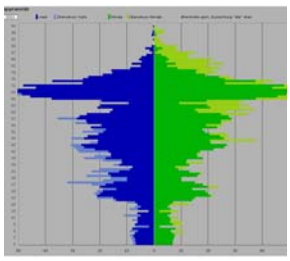

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Nevertheless, it took several years until the local decision-makers, key players in urban development (housing associations, provider and urban planners) and the citizens accepted the change and translated this change in awareness into urban development planning. The prevailing economic circumstances surrounding organised housing management (high numbers of empty homes, massive loss of value in established residential complexes, etc.) had a significant effect on urban development and planning. Urban development and the residents could initially only react.

THE SIGNIFICANCE OF ENERGY EFFICIENCY

The key players in urban development in the Federal State of Brandenburg have become increasingly aware of the scarcity of conventional energy resources and dependence on global developments. The background to this has been, among other things, ever-increasing energy costs, but also a higher level of environmental consciousness. The latter found expression at national government level in the law giving priority to renewable energies (EEG) (2000) and in the Energy Saving Order (EnEV) (2002).

CONDITIONS/POLICY FOR FUNDING – ENERGY EFFICIENCY

Since 1999, the objectives of federal state funding programmes in Brandenburg have been even more clearly focused on the issues of "energy saving" and "climate change prevention". In this context, the federal state was at the cutting edge with its funding policy for housing. New tools such as the general energy diagnosis were introduced as a means of measuring the efficiency of the action being funded.
The general energy diagnoses enabled comparative calculations to be made regarding the energy requirement of buildings before and after refurbishment and specific savings objectives to be implemented. In this way, packages of measures could be devised to enable energy savings of 50 to 70% to be made by comparison with conditions before modernisation. This tool was used until 2006 by the funding authorities. In 2007, the general energy diagnosis was replaced by the Energy Performance Certificate for buildings required by the European Union (EU) to be submitted by the applicant.

Urban development/planning in the cities of Brandenburg was characterised between 2000 and 2005 by reaction to demographic change and dominance by organised housing management.

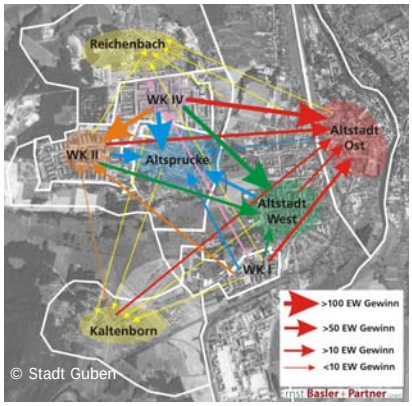
2.3 Phase 3 (2005/2006-2009): "Cities on the way to integrated urban development"

The complexity of the urban challenges has led to the increased significance of an integrated and holistic approach to urban development. Urban development is understood to be a "framework policy" both for the Federal State of Brandenburg and for its communities, while integrated urban development concepts (INSEKs) are framework strategies for the Brandenburg cities.

URBAN DEVELOPMENT/PLANNING

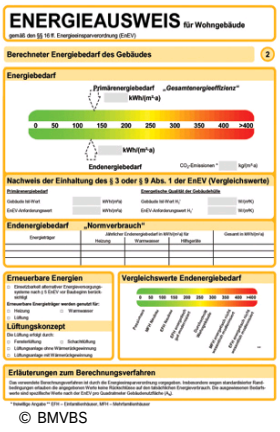
After 2005, the requirements of the Brandenburg cities became ever more complex. Urban development and urban renewal were characterised by the juxtaposition of different strategies: new building with simultaneous (partial) dismantling or demolition of permanent homes that were no longer needed, upgrading of the existing housing stock and adaptation of the technical and social infrastructure.
There was a large number of funding programmes, the complexity of which, in terms of the conditions of funding and application by the parties involved, was sometimes overwhelming. Moreover, there were countless development plans in and for the cities. This gave rise to both the need and recognition in the Federal State of Brandenburg and the Brandenburg

cities that joint urban development strategies were required for increasingly complex issues at the various planning levels (state, region, city and district).



One consequence of this realisation was the evaluation of former urban development processes and a change in awareness of the need for inter-agency urban development (i.e. integrated urban development), which primarily means coordination in terms of space, fact and time of various specialist policies with the coordinated use of resources on the basis of an Integrated Urban Development Concept (INSEK). The "Strong Cities – Urban Renewal" masterplan, which included a realignment of funding policy by the former Ministry for Infrastructure and Land Use Planning (MIR) (since 2009, Ministry for Infrastructure and Agriculture or MIL) in the spheres of urban development and housing, was decreed in 2006 by the cabinet of the Federal State of Brandenburg and represented the departure point for the creation of INSEKs by the Brandenburg cities.

THE SIGNIFICANCE OF ENERGY EFFICIENCY



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With the entry into force of the amendment of the EnEV (German Energy Conservation Regulations) on 1 October 2007, there was an obligation to furnish Energy Performance Certificates after structural work on existing buildings. Since 2009, Energy Performance Certificates have also been required for both residential and non-residential existing buildings. The Energy Performance Certificate gives information on the energy-consumption of a building and is intended to facilitate a general comparison between buildings. Furthermore, the Renewable Energies and Heat Law (EEWärmeG) effective since 1 January 2009 has required owners to use renewable energies for their heat supply when new buildings are constructed.

CONDITIONS/POLICY FOR FUNDING – ENERGY EFFICIENCY

The objective of the creation of INSEKs was to redress sectoral planning strategies and isolated project concepts, to develop practical sustainable strategies and to incorporate individual measures more intensively into district-related issues. Since 2008, the allocation of funding by MIL has been managed via Integrated Urban Development Concepts. This has further increased efficiency in the use of resources.

In this phase, the funding programmes of the Federal State of Brandenburg have become more intensively focused on taking into account energy efficiency in urban construction and the provision of housing.

Urban development is increasingly being understood to be an interdisciplinary function ("framework policy"). Since 2005, the instrument of the integrated urban development concepts (INSEKs) has served as a communal "framework strategy" and the basis for all sectoral planning, major projects and funding.

2.4 Status Quo – 2009/2010

Climate change and the achievement of or increase in energy efficiency are increasingly recognised as key challenges for rural and urban development, which a large number of cities in Brandenburg are already embracing. The development of integrated communal and regional energy and climate change prevention strategies are increasingly gaining in significance in the context of urban development.

URBAN DEVELOPMENT/PLANNING

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Integrated urban development concepts (INSEKs) have become established in most Brandenburg cities. Meanwhile, all the federal state's larger towns have developed INSEKs. Consequently, integrated thought and action has become established to a large degree at city and regional revel. This is evident, for example, in the fact that in many Brandenburg cities, different specialist departments act together and urban development projects are agreed upon and implemented across departments.
Over the coming years, the INSEKs tabled in 2006 by the Brandenburg cities will be the subject of updating and quality control. The task here will be to incorporate the new issues of "climate change prevention" and "energy efficiency" as a module into the INSEKs and to take them into consideration more intensively as key spheres of action in the second phase of urban renewal in the Federal State of Brandenburg.

THE SIGNIFICANCE OF ENERGY EFFICIENCY

For about two years now, the issues of "climate change prevention" and "energy efficiency" have been on the agenda in the Brandenburg cities. The urgency for action has become more pressing, among other things, due to increased energy prices. At the same time, awareness is growing among those involved in urban development policy and among the population that global climate problems can be influenced at local level, not only in a metropolis, but also in the multitude of small and medium-sized towns in the Federal State of Brandenburg. At the same time too, sensitivity is growing as is awareness of these issues. Citizens, users, consumers and investors expect urban policy to have an impact locally in the districts. In the course of this, a large number of energy-related measures have been implemented in existing buildings although the domains of "climate change prevention" and "energy efficiency" have for some time now seldom featured and been incorporated into existing integrated urban development concepts.

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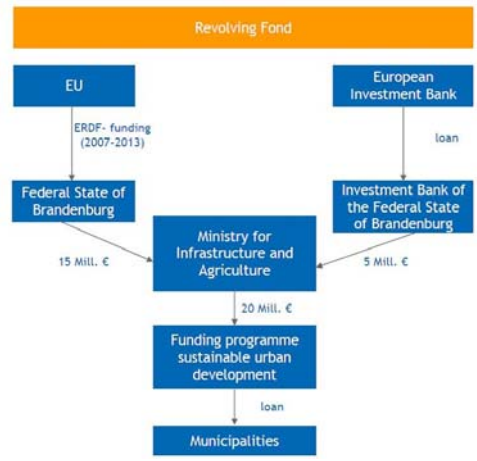
CONDITIONS/POLICY FOR FUNDING – ENERGY EFFICIENCY

The increasing importance of energy efficiency in urban development is currently apparent in the focus of the existing funding guidelines for the Federal State of Brandenburg. For example, the current urban construction funding guidelines for the strengthening of the inner cities emphasise that in particular the requirements of the built environment and the specific demands of climate change prevention and energy saving should be taken into account. Furthermore, the federal state supports sustainable energy saving and reduction of CO_2-emissions by promoting modernisation and maintenance measures in both owner-occupied buildings in the inner cities as well as in buildings where the accommodation is rented.

As energy measures have an economic return, reflected in particular in lower consumption costs, the conversion of future funding programmes to revolving funds, including in the sectors of urban development and housing, is being considered by the Federal State of Brandenburg.

Some of the resources from ERDF funding are already being allocated to sustainable urban development in Brandenburg in the form of revolving funds (JESSICA principle). These resources are in principle also available for energy projects. The objective is to secure financial resources by a revolving financing system, even after any future reduction of EU funding, by converting the funding models from (lost) subsidies to revolving funds. Revolving funds have the advantage that recirculating resources can continue to be reused – even after the end of an EU funding period – for the defined funding purpose. In the Federal State of Brandenburg, 20 million Euros have already been allocated from ERDF funding in the form of revolving funds in the sector of sustainable urban development. This urban development fund has been commissioned by MIL and established at the investment bank of the Federal State of Brandenburg (InvestitionsBank des Landes Brandenburg or ILB) and has been provided with 15 million Euros of ERDF resources and 5 million Euros of co-financing (ILB deposits). The urban development fund for Brandenburg was initiated at the beginning of 2009. Loans from the fund will be exclusively allocated to communities for risk-free projects that are part of an integrated urban development concept. For co-financing, the ILB takes a loan from the European Investment Bank.

Financial process for the urban development fund in the Federal State of Brandenburg



An integrated approach to urban development has become established in the Federal State of Brandenburg at every level of planning, in particular in the cities. Nevertheless, the issues of "climate change prevention" and "energy efficiency" are still intensively focused on individual measures (building level) and have up to now rarely been integrated into city-wide concepts and plans.

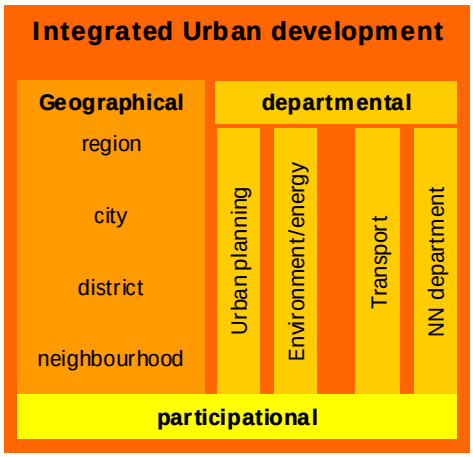
3 OVERALL CONCEPT AND INSTRUMENTS FOR INTEGRATED URBAN DEVELOPMENT IN THE FEDERAL STATE OF BRANDENBURG

In the Federal State of Brandenburg, the government has been pursuing an integrated approach to urban development for several years now. In the following, it will be shown what is meant by the term “integrated urban development”, the tools that the Federal State of Brandenburg is using to implement this holistic approach in urban development and the value currently being placed on the issues of “climate change prevention” and “energy efficiency” in the Brandenburg urban development policy at federal state and community level.

3.1 Integrated urban development – A definition

Integrated urban development is a holistic approach, the key elements of which are the interlinking of various departments having an impact on urban development policy (including construction, transport, economic, social, education, cultural and environmental policy). Essentially, a distinction is made between three dimensions of integrated urban development:

- Geographical: from urban/regional through city-wide level and down to district level
- Sectoral: affecting all departments
- Participation: new breadth and quality of participation and activation of administration, those involved in city development policy (housing associations, utility companies, etc.) and citizens/residents



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3.2 Integrated urban development – Implementation by the Federal State of Brandenburg and the cities

The implementation of this integrated approach in urban development takes place in the Federal State of Brandenburg on all political levels:

- At federal state level, various ministries work together with urban-development-relevant funding programmes. Across the departments, for example, the use of ESF and ERDF resources are decided upon in urban development and social projects.

- At community level, all relevant departments work together in task forces or other forms of organisation. Management is usually the responsibility of the planning department or the offices assigned to urban development.

3.2.1 The "Strong cities – Urban Renewal" masterplan

With the "Strong Cities – Urban Renewal" masterplan (referred to hereinafter simply as the "Urban Renewal Masterplan"), the Federal State of Brandenburg (here through the MIR) has set out the objectives of an integrated and sustainable urban development policy, i.e. in particular the strengthening of the inner cities, consistent advancement of urban renewal, inclusive infrastructure in the context of urban development and activation of involvement of the residents and local networks.

In January 2006, the cabinet decided on the Urban Renewal Masterplan. This involves the realignment of the funding policy of what was then MIR (now known as MIL) in the areas of urban development and housing. Whereas before the adoption of the masterplan issues of dismantling and consolidation of the housing market were the main focal points of interest in urban renewal, policy since 2006 has a wider definition for the term "urban renewal". Accordingly, in addition to the original understanding of the tasks, economic, technical, cultural and social aspects have also been more intensively integrated into urban development.

The background for the creation of the Urban Renewal Masterplan, which has been accompanied by comprehensive discourse with the cities and specialist public, has been characterised by changed circumstances (continuing economic fragility, restricted financial room for manoeuvre in the communities and the federal state, and the consequences of demographic change). This has required a further increase in efficiency, a more intensively integrated approach and a more intensive concentration on selected spheres of action and measures in urban development. To meet such challenges, the MIR established the Urban Renewal Masterplan for the sphere of urban development and housing policy in order to set out the essential strategic points of departure in terms of urban development policy, giving future direction in the Federal State of Brandenburg.


Landtag Brandenburg Drucksache 4/2385

Bericht

Starke Städte - Masterplan Stadtumbau

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The objectives formulated in the Masterplan for the Federal State of Brandenburg correspond to the direction of EU policy in the current structural funding period 2007-2013 (i.e. contribution of the cities to growth and employment, creation/maintenance of sound urban structures, provision of adequate educational and professional training facilities, ensuring a high standard of living and a broad spectrum of commitment on the part of citizens and of business). The Masterplan also stipulates that integrated urban development concepts set the definitive basis and planning provisions for funding decisions by the Federal State of Brandenburg in the fields of urban development and housing.

3.2.2 Integrated urban development concepts (INSEKs)

As set out in the Urban Renewal Masterplan, INSEKs expressly serve to combine and, where appropriate, selectively supplement the existing concepts in the Brandenburg communities. INSEKs are communal "framework strategies" and provide the basis for financial and organisational support for cities in line with their circumstances. This means that they are a key management tool both for local urban development strategy and for agreements with the MIL and other departments. On the basis of the INSEKs, future funding decisions will be made by the federal state for the financial support of urban development and housing measures. The objective of INSEKs is the simplification and transparency of planning principles in the cities of Brandenburg and their coordination with the federal state.

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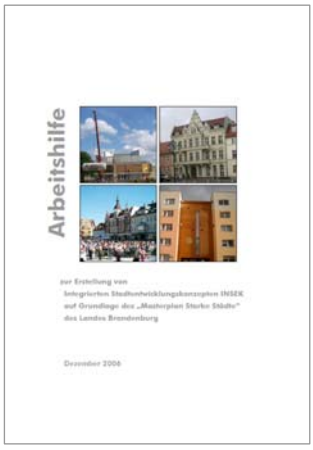

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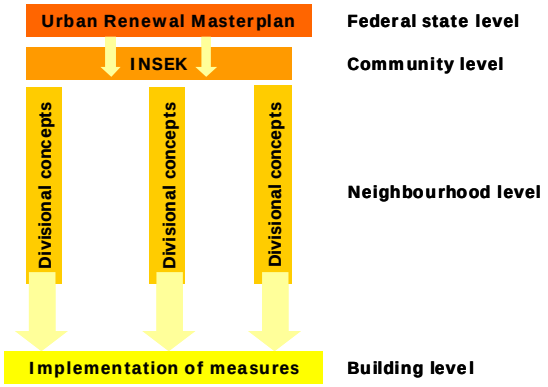
To support the Brandenburg cities in the creation of integrated urban development concepts, MIR published a working guide in December 2006. This working guide is intended to provide the cities with a guideline to establishing an INSEK, i.e. information on the design and key contents of an INSEK.

3.2.3 Integrated city-division concepts

Urban development processes are implemented in individual sub-city divisions. For this reason, on the basis of the city-wide urban development strategy (INSEK), integrated divisional concepts are developed for parts of a city that have a structural/geographic and/or functional connection. Integrated divisional concepts serve to intensify action and project planning at a smaller geographical level.

Divisional development scenarios and future need for action are derived on the basis of comprehensive analysis of existing conditions (i.e. evaluation of existing divisional population and housing market trends, profile of strengths/weaknesses). Building on this, principles and development objectives are formulated for future district development and recommendations for action and specific measures determined, as well as divisional approaches to action. The process of preparing integrated divisional concepts is – as in the case at the larger geographical strategy levels of the integrated urban development concepts – to be agreed in the context of an intensive coordination process, with the specialist administrations responsible, mediators of public concerns and municipal policy committees, as well as the populace.



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3.2.4 Participation

In Brandenburg, participation is taking on an ever-increasing importance in urban development. Apart from the justification of democratic policy, participation also represents an important opportunity to make funding programmes, city-wide strategies, urban development plans and concepts more effective and place them on a broader basis.

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The Federal State of Brandenburg and its communities are making efforts to ensure that urban development policy decisions are supported by as broad a majority of the population as possible. With the adoption of the Urban Renewal Masterplan and the creation or continuation of integrated urban development concepts, both the federal state and the cities of Brandenburg acknowledge the advantage of obtaining a broad spectrum of commitment and participation among the people on relevant issues and future urban development matters (for example demographic change, climate change prevention and urban renewal). This recognition is reflected at European level in the Leipzig Charter. Here the responsible ministers argue on the one hand in favour of advancing the instruments of integrated urban development and on the other of promoting the structures of governance for their implementation.

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In the Federal State of Brandenburg, essentially two opposite approaches are taken towards engaging the commitment and involvement of the population: top-down and bottom-up. Effective citizen-participation processes are characterised by a balance of top-down and bottom-up. On the one hand, guidelines and statements of objectives are necessary from the politicians or administration (top-down) and on the other sufficient scope should be ensured for ideas, proposals and projects from the citizens (bottom-up).

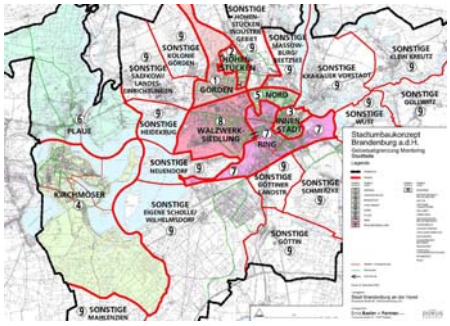
The targeted involvement of various players is a challenge. A general distinction can be made between formal and informal involvement processes. In the case of what are known as formal planning processes, participation is mandatory. Here, it is the law that determines who can participate. Participation of the public and specific agencies by means of informal participation processes has become increasingly important in the management of complex developments. They are on a voluntary basis and may take very different forms depending on the task in hand. In the context of integrated urban development processes in the Brandenburg cities, various approaches to participation are taken: from the implementation of participation management through to the setting up of city offices, establishment of city forums and the organisation of citizens' questionnaires or the setting up of work and support groups, round tables and the holding of themed workshops with all those involved (including local businesses, industry, politicians, experts and the population).

3.2.5 Monitoring

The objectives and action set out in the INSEKs and in particular divisional planning must be the subject of impact assessment. The cities must also define suitable indicators, e.g. concerning population and social development, on the economy and the job market – but to an ever-increasing degree also regarding energy efficiency. At city-wide, divisional and sometimes even at building level, suitable data must be prepared and analysed from city administrative departments, housing authorities, infrastructure operators, etc.

In 2005, the Federal State of Brandenburg introduced an urban renewal monitoring. This monitoring system, serving both the monitoring and management of the "Urban Renewal East" programme as well as a predictive and preventive urban development policy, has largely become established in the Brandenburg cities undergoing urban renewal. In addition to the aspect of evaluation and management of the funding programme, monitoring is also intended to create transparency for collaboration in partnership between federal state, communities, private businesses and citizens. The monitoring data is made available to the federal state by the communities. The MIL undertakes the monitoring using expert software.

Many Brandenburg cities, over recent years, have built up their own urban development and urban renewal monitoring systems which have an important strategic function as an observation, support and management tool. Using monitoring as an "early-warning system", city-wide and district statements can be made regarding development trends and tendencies and the effectiveness of urban development measures checked. The establishment of an urban monitoring system is a requirement for funding for the Brandenburg cities on the part of the Federal State of Brandenburg.



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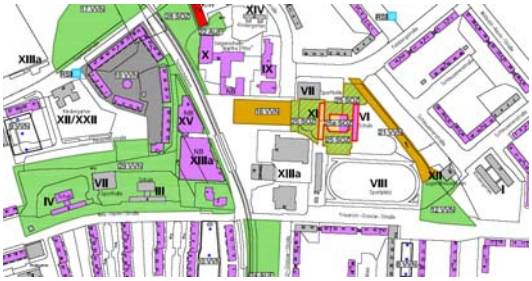

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3.3 Energy efficiency in integrated urban development

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The government of the Federal State of Brandenburg has formulated some key policy aims in its energy and climate change prevention strategy (including reduction of energy-related CO_2 emissions by 40 % of the 1990 figures by 2020 and increase in the proportion of renewable energies in the energy mix for primary energy consumption in the federal state to 20 % by 2020), which is a pioneering aim even for the Brandenburg cities and their urban development policy. For example, urban development and housing funding for the federal state sets clear guidelines regarding minimum requirements concerning energy which are mandatory for applicants (communities, organised housing providers and private owners). Furthermore, the ministry responsible for infrastructure and agriculture commissions reports in order to obtain more detailed information on relevant issues regarding these primary concerns and supports model projects to try out possible designs at the “Energy-saving urban renewal” and “climate change prevention” interface.

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In the communities in the Federal State of Brandenburg, an acute awareness of the problems surrounding the issue of “climate change prevention” is discernible. In the light of this, planning principles have been developed and a great many measures taken (in particular in the sphere of energy-saving building modernisation) in recent years. Nevertheless, there still exists an urgent need to act at both a local and regional level as well as a necessity to include issues of “climate change prevention” and “energy efficiency” as interdisciplinary functions more intensively in city-wide planning. The tried and trusted tool of integrated urban development concepts offers cities the opportunity to take up these new spheres of action and incorporate climate and energy strategies as modules in INSEKs. Up to now, these two

general issues have barely been touched upon by existing INSEKs. Here, the Urb.Energy project can provide significant motivation and so satisfy its aspiration to stimulate mutual learning processes at every level of involvement.

Integrated urban development is a long-term learning process.

Integrated urban development concepts (INSEKs) are the right instrument at city-wide level for incorporating the issues of "climate change prevention" and "energy efficiency" as interdisciplinary functions in city-wide planning.

4 ENERGY EFFICIENCY IN INTEGRATED URBAN DEVELOPMENT – OBJECTIVES, PROJECTS AND MEASURES IN THE FEDERAL STATE OF BRANDENBURG

It is the objective of German government to double energy productivity by 2020 by comparison with 1990 in order to counteract rising demand for energy, increased energy prices and climate change, as well as reducing dependence on energy imports and the discharge of carbon dioxide (CO_2) and at the same time to safeguard national supplies. One condition for this is increased energy efficiency throughout the chain, i.e. from fossil fuel supplies through to the use of heat and power.
The surrounding legal and economic circumstances for more efficient use of energy have already been established at national and federal state level, for example with the expansion and financial top-up of the existing CO_2 building renovation programme by the Kreditanstalt für Wiederaufbau (KfW – the Development Loan Corporation), the adoption of the national government's integrated energy and climate programme and the 2020 energy strategy, as well as the catalogue of measures for climate change prevention and adaptation to the consequences of climate change in the Federal State of Brandenburg.
With reference to the issues of climate change prevention and energy efficiency, distinct local awareness of the problems can already be discerned in the Brandenburg cities. In addition to a reduction in CO_2 emissions by the extension of the use of renewable energies in the sphere of electricity production, an increase in energy efficiency in the building sector and in power consumption has also been identified as a further key sphere of activity to achieve national climate policy aims. Action is still highly urgent, even if there already exists a number of strategic planning initiatives and a great many energy efficiency measures have been implemented or are currently in planning.

Eight selected projects to increase energy efficiency in the context of integrated urban development in the Federal State of Brandenburg are presented below, including measures for energy-efficient refurbishment of residential buildings, housing estates and public infrastructure, as well as for the implementation of higher-level community and regional climate and energy strategies. These have been divided into four geographical levels: national and regional level, city level, district level and building level. These projects have been assessed using a catalogue of criteria containing a total of 14 characteristics.

Catalogue of criteria

The catalogue of criteria includes the spheres of "Integrated (urban development) approach", "Technical solutions" and "Financing"; these correspond to the three work packages of the Urb.Energy project.

Integrated approach (WP3)

- Geographical plane of reference/planning principle: incorporation of a project into the city-wide/regional context, submission of a higher-level integrated concept
- Associations with specific issues: interaction of social, economic, ecological and cultural dimensions
- Administration/organisation: integrated action in the cities (e.g. interdisciplinary work), combination of urban development policy with other geographically-relevant specialist policies
- Financing: combination of funding resources
- Participation: involvement/mobilisation of the population and local/regional agencies (e.g. support rounds, workshops, round tables, newsletters, city forums)

Technical solutions (WP4)
- Energy saving (primary energy requirement before and after modernisation in kWh/m²a)
- CO_2 emissions (before and after modernisation in kg)
- Energy consumption (primary energy requirement)
- Use of renewable energies (yes/no)
- Cost of energy-effective measures during modernisation (insulation of exterior walls, windows, insulation of basement and attic, modern heating systems, hot-water heating, renewable energies (e.g. waste heat recovery, solar panels)

Financing (WP 5)
- Financing model (e.g. combination of funding programmes)
- Funding (yes/no)
- Funding programme
- Funding conditions (e.g. subsidy, loan)

4.1 National / regional level

The national urban development policy of the German government aims to obtain new ideas and commitment in a broad range of spheres of activity in urban development. Pilot projects should provide the impetus for this. These are projects that provide an incentive for the urban development policy in the Federal Republic and can trigger public debate on the future of the cities and regions. The national government therefore promotes pilot projects, in collaboration with the federal states, in order to support new methods of urban development.

National urban development policy concentrates on six spheres of activity: civil society, social city, economic development, climate change prevention, the built environment and regionalisation. In the context of the "climate change prevention" sphere of activity, a total of three projects in the Federal State of Brandenburg are supported by funding from the national urban development policy: the Brandenburg urban network on climate protection (BraNEK), the Spreewalddreieck regional energy concept and an initiative involving various cities – the "Zero Emission Park" – developing sustainable industrial zones in Bottrop, Bremen, Kaiserslautern and the Brandenburg city of Eberswalde.

Project profile: Städtekranz Berlin-Brandenburg / Brandenburg urban network on climate protection (BraNEK)

Objectives

Building on the existing network structures of the Städtekranz Berlin-Brandenburg, the Brandenburg urban network on climate protection (BraNEK) aims to provide targeted administrative action on the set of issues of "Energy-saving urban renewal and climate change prevention" for small and medium-sized towns in a systematic and efficiently methodical way. The result should develop principles for city-wide energy saving and climate change prevention strategies and create sustainable communication platforms and structures.

Main issues

Specifically, this project is concerned with making use of collaboration in the Städtekranz as a platform for systematically evaluating previous efforts and experiences of the cities in relation to energy-saving urban renewal and climate change prevention and to consistently open up efficiency reserves. With the partners involved, a methodical basic framework for local energy saving and climate change prevention strategies is being collaboratively developed in workshops and a monitoring system for verifying the effectiveness of task-oriented and issue-related measures is being incorporated.

Project partners

The project is being managed by the seven member cities of the urban network "Städtekranz Berlin-Brandenburg" (Brandenburg an der Havel, Cottbus, Eberswalde, Frankfurt (Oder), Jüterbog, Luckenwalde and Neuruppin), which have agreed on informal cooperation with the climate change research platform of the Potsdam Institute for the investigation of the effects of climate change (Potsdamer-Institut für Klimafolgenforschung e.V.) and the Brandenburg Energy Technology Initiative (ETI).

Period of implementation

January 2010 and expected to continue until December 2011

Status

The allocation decision was made at the end of 2009. Work on the project began in January 2010.

Project budget

EUR 200,000 gross

Financing / funding

A proportion of funding for the project is supplied by the "National urban development policy". The member cities provide personnel and make their own financial contribution via the membership contribution to the cities for the intercommunity network "Städtekranz Berlin-Brandenburg".

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Assessment of the project

The intercommunity network approach of BraNEK in the sphere of activity "Energy-saving urban renewal" and "climate change prevention" could be a successful model at a regional, federal state and national as well as an international level. Due to the very short project period, no assessment of the project has been possible at the time of writing. In order to enable the findings of this innovative approach of BraNEK obtained in the course of the project to contribute to Urb.Energy, initial results of the work will be presented and evaluated in the planned Report 2 – "Energy efficiency in integrated urban development. Perspectives".

Integrated approach (WP3)

The BraNEK project is based on an integrated approach, in which all specialist departments of the city administrations involved will contribute to the project.

Technical solutions (WP4)

The development and implementation of technical methods of resolution and measures are not a primary issue in the context of the project. The emphasis is on networking and intercommunity exchange of experiences in matters of "energy-efficient city" and "climate change prevention" in the seven member cities taking part, using the established network structures of the Städtekranz Berlin-Brandenburg.

Financing (WP5)

Proportionate funding of this model project from resources of the federal programme "National urban development policy" is deemed necessary for the testing of this novel and pioneering initiative which is time and cost intensive in terms of project management and implementation.

Project profile: Spreewalddreieck Regional Energy Concept

Objectives

The objective of this project is to develop a forward-looking energy concept including developing an overall concept for regional energy policy which strategies are underpinned by coordinated specific individual measures of the partners involved.

Main issues

By means of active measures, the cities and communities involved intend to mobilise ecological, economic and social potential in the sphere of energy. Reduction of energy consumption, reduction of atmospheric pollution with CO_2 , increased efficiency of energy distribution systems and intensified use of renewable energies (in particular biomass) are the focus of attention.

A communication platform is being created for coordination and reconciliation taking the form of a "round table" enabling discussion between key players from administration, politics, science, regional energy suppliers, power generators and energy consumers regarding strategies and content. In a second stage, the commitment of

citizens in the sphere of energy should also be strengthened.

The work content takes place in focal points in the three workgourps of energy suppliers, energy consumers and power generators. The results will be combined into an integrated general concept during the “round table”.

Project partners

The project’s initiators are the cities Vetschau/Spreewald and Lübbenau/Spreewald, which, together with Amt Burg/Spreewald form the region known as Spreewalddreieck. In addition to representatives of the communities, in particular there are also representatives of energy suppliers, of the agriculture and forestry industries, bio-sphere reserve management, local enterprise and other major energy customers such as housing associations.

Implementation period

December 2009 to May 2011

Status

Various representatives involved from the spheres of power generation, energy supply and energy consumers have already come together in an initial kick-off meeting. Initial talks on coordination and participation in the context of a round table and specific workgroups have been agreed. The project is currently in its initial phase, setting out the prevailing conditions in the region, taking into account those partners involved.

Project budget

EUR 75,000 gross

Financing / funding

The project is a pilot project in the context of the research programme “National strategic plan for an integrated urban development policy –national urban development policy pilot projects” and receives a national government subsidy of 50 %. The remaining 50 % of project resources will be provided by the communities involved.

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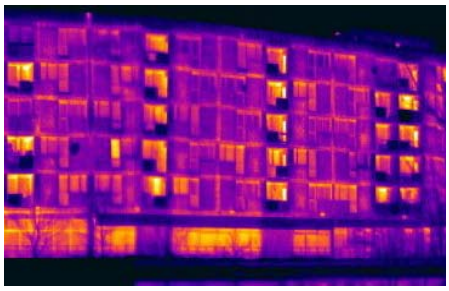

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Assessment of the project

The project is intended to develop a comprehensive concept which may form the foundations for a general energy policy among the communities involved. At the same time, it is necessary to verify whether and in what way bio-mass produced locally can be used for power generation. Furthermore the project intends to discover whether a sales market for renewable raw materials can be established in the medium term and local business cycles can be activated. With the initiative, the municipalities involved are assuming a major local coordination function.

Integrated approach (WP3)

The combination of various sectoral requirements (energy consumption, power generation, energy supply) and the collaboration of a broad group of partners is expected to produce considerable synergy effects. Moreover, the intention is to gauge scope for intercommunity action taking this project as a model and to be able to motivate other cities to strike out along the path of sustainable, energy-efficient urban structures.

Technical solutions (WP4)

The technical and economic feasibility of individual measures to increase energy efficiency are to be evaluated with the support of the Brandenburg Technical University of Cottbus (BTU).

Financing (WP5)

Funding from national urban planning policy supports this regional initiative.

4.2 City level

ExWoSt "Energy-saving urban renewal in Brandenburg"

At the end of 2007, the sphere of research into "Energy-saving urban renewal" was created in the context of the experimental residential and urban construction project (ExWoSt), a research programme of the Ministry for Transport, Construction and Urban Development (BMVBS). Its objective is to gather experience in sample projects of the "Urban Renewal East" programme related to the issues of energy saving, increased energy efficiency and use of renewable energies and where possible to establish these with the broadest possible effect. From the experience obtained in the model projects, in addition to the energy findings on climate change prevention, renewable energies and energy saving, corresponding answers are expected in terms of the advancement of urban planning and housing in the context of urban renewal.

Eight model cities with exemplary projects in the Federal State of Brandenburg are involved in the ExWoSt research programme "Energy-saving urban renewal". These cities have joined forces to form an "ExWoSt network" in order, in the context of a common platform and regular network meetings, to be better able to exchange information and innovative ideas. Moreover, the project has scientific support until 2011 from the chair of the Research Institute in Municipal Engineering at BTU Cottbus. The project's scope extends from energy-related integrated concepts for city districts and neighbourhoods though to the renewal of structurally valuable old buildings and modernisation/maintenance of key institutions of social infrastructure in a way which meets current needs.

As ExWoSt model schemes, the projects receive a status that benefits them in applying for federal state or national government funding. Further-reaching funding in the form of a grant or loan from the research programme is not expected.

Some of the projects are presented as examples. Particular attention is drawn to the criteria set out at the beginning.

Project profile: Integrated energy strategy for the city of Guben

Objectives
The objective is a safe, cost-effective and sustainable energy supply for companies, private households and public services. The city of Guben also wants to take on a pioneering role, making an active contribution to energy and climate change prevention objectives in the Federal State of Brandenburg by specific initiatives.

Main issues
The focus of the project is an analysis of the prevailing circumstances (population growth and forecast, trends in settlement, energy demand, energy production and distribution, and potential for energy saving and use of renewable energies), the derivation of objectives of energy supply referring to the energy strategy of the Federal State of Brandenburg, as well as the combination of key measures (organisation and coordination, energy efficiency, renewable energies, positioning of local energy supplier and urban planning). Existing dependencies and interactions have been taken into account by close interweaving of energy and urban planning aspects.

Project partners
The project has an interdisciplinary management. Management groups have representatives from various sectors of city administration (urban development and planning authorities) and the housing associations, local and national energy suppliers, public utilities and local industry. Preparation and management of the energy strategy was provided by the company Ernst Basler + Partner Potsdam/Zurich.

Implementation period
May to December 2009

Status
The “Integrated Energies Strategy 2020” report has been available since December 2009. In January 2010, the project was presented and discussed in the committees UVOSE (Environment, Transport, Order, Security and Euro Model City) and WSBW (Economy, Urban Development, Building and Living) of the city of Guben. On the basis of this report, specific follow-up activities will be tested and prepared.

Project budget
EUR 100,000 gross

Financing / funding
Combining the municipal energy strategy with urban renewal strategies represents a new challenge expected to deliver important findings for broad-based implementation of energy-saving urban renewal. The ExWoSt programme “Energy-saving urban renewal” is dedicated to this issue in that the city of Guben was accepted with its scheme as a model project for 2008.
The project was financed with 50 % funding from resources of the RSI sub-programme in the context of Urban Renewal East. The community also provided 50 % of the necessary resources.

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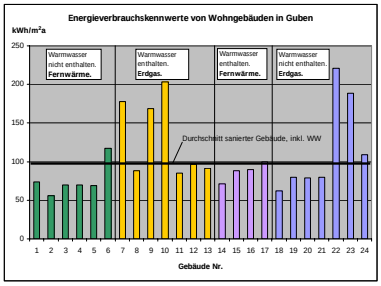

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Assessment of the project
With the existing integrated energy strategy, the city of Guben now has a comprehensive basis for decision-making on new concepts of community energy supply and further-reaching detailed studies in line with expected population trends, the existing settlement structure and desired future urban development.

Integrated approach (WP3)
The emphasis of the project was on strategy development for sustainable and future-viable energy supply for the city of Guben. In drawing up the integrated energy strategy, various specialist issues (in particular urban renewal/urban development and power supply) were combined and the effect of their interaction analysed. The public too was involved in supporting the project, for example in the context of a workshop with political representatives. The organisation of a comprehensive information event is planned for 2010.

Technical solutions (WP4)
In the result of the integrated energy concept, initiatives for the use of regional renewable energies and options in the sphere of energy efficiency were demonstrated, however the trial and implementation of technical solutions was not the subject of the project.

Financing (WP5)
Funding for the project from resources from the Urban Renewal East programme is considered necessary in order to accelerate the process.

4.3 District level

Two projects are presented here: “Wasserturmsiedlung (water tower estate) in Schwarzheide” and “Lübbenaubrücke – Energy Masterplan 2021”, the geographical emphasis of which is at building level.

Project profile: Wasserturmsiedlung (water tower estate) in Schwarzheide

Objectives
The objective of the project was to modernise the historical 1930s factory estate taking a holistic approach in order to achieve sustainable revitalisation. The chemical company BASF, as owner of the estate, decided in 1995 to refurbish the estate with the objective of providing “good jobs and good housing”. Here, the intention was to build modern living space by contemporary, cost-effective modernisation affordable even for families on a low income.

Main issues

In order to achieve a positive redevelopment of the Wasserturmsiedlung district as a whole, a holistic strategy was chosen, which, in addition to authentic restoration and energy-efficient refurbishment of the historic housing, also involved the upgrading of the neighbourhood, further development of the locality and promotion of regional business. An urban planning framework concept from 1995 was the basis of the project. This was an integrated concept in which the existing residences, population and social structure, green and open spaces, traffic areas, and supply and waste disposal systems were studied and specifications developed regarding structural measures and design aspects.

In order to fulfil the overall concept, a pioneering cooperation model was developed in the form of a public-private partnership.

A cooperation team with regular “round table” meetings each with a representative from all partners involved in the project ensured efficient collaboration in construction management, social and project planning.

One focus in the renewal of the district was the energy-efficient refurbishment of the residential buildings. Reduction in energy consumption and CO_2 emissions was achieved by the interaction of the following energy-effective measures:

- Loft insulation
- Thermal insulation and plastering of the external walls
- Renewal of the floors in the non sub-basement area
- Installation of a modern heating system with remote heating supply using the combined heat and power principle
- Renewal of the electrical installations and waste and supply pipes
- New windows and external doors

Project partners

Public and private actors committed themselves to the project. Those involved were the city of Schwarzheide, BASF housing associations (GEWOGE, LUWOGE, SEWOGE), BASF Schwarzheide GmbH, the Ministry for Infrastructure and Land Use Planning (MIR) of the Federal State of Brandenburg and WohnBund-Beratung Dessau, an independent project manager. In the spheres of planning, management and execution, the services of planning offices Reinhart + Engel Architekten + Ingenieure and Infraplan Gesellschaft für Infrastruktur, Wasser und Umwelt GmbH were enlisted.

Implementation period

March 1996 to December 1998

Status

Renewal of the four-road estate with 175 homes in one and a half to two-storey terraced housing with private gardens and one apartment building was successfully completed and gave an impetus to surrounding housing estates.

Project budget

The total project cost was EUR 19.4 million and consisted of EUR 9.7 million construction site costs, EUR 5.5 million for garages and ancillary buildings and EUR 4.2 million for neighbourhood design.

Financing / funding

The project was financed by public loans, i.e. a low interest loan from the Federal State of Brandenburg's housing construction programme (EUR 5.8 million) and a low interest KfW loan (EUR 2.8 million) as well as private funds. For neighbourhood design, there was a subsidy from the Federal State of Brandenburg urban development fund of EUR 3.4 million. To secure private funds, the chemical company BASF AG absorbed losses of GEWOGE and SEWOGE amounting to approx. EUR 7.7 Mio.

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Assessment of the project

The Wasserturmsiedlung in Schwarzheide is one of the first urban development projects in the Federal State of Brandenburg in which an integrated approach was taken. The project fulfils a holistic aspiration which is a requirement of successful local development. The cooperation process implemented has a pioneering character and may be translated into other estates in Germany and throughout Europe in a similar manner.

Integrated approach (WP3)

The project is outstanding due to its combination of community housing policy (provision of living accommodation at affordable rents), urban planning (preservation and authentic refurbishment of historic buildings, upgrading of the public areas), energy policy (reduction of energy consumption and use of an energy-efficient remote heating concept) and district development ("soft" site factors) with an integrated urban development approach. Close cooperation of agencies involved from society, politics and business and strict management of project, timing and financing enabled the concentrated deployment of the professions, building companies and suppliers and therefore optimisation of costs.

The project was carried through in a socially-acceptable manner, in particular with intensive tenant involvement and special consultancy. This approach also helped consolidate the existing sense of identification for the residents.

Technical solutions (WP4)

The focal point of the project was the authentic restoration of these historic homes and energy-saving modernisation in accordance with contemporary energy standards.

By full thermal insulation, replacement of individual boilers by remote heating provided by waste heat from the BASF Schwarzheide GmbH works, a great deal of energy will be saved and CO_2 emissions reduced long term.

The energy requirement of the terraced houses after refurbishment was reduced to a level corresponding to 8 l heating oil/m² per year, a value that is only very rarely achieved in present times.

Financing (WP5)

The interlinking of residential and urban development funding options and the successful mobilisation of private capital in significant measure led to the success of the district development. It was to great advantage that BASF was a partner in an economically strong position with a long-term interest in the positive development of the Schwarzheide site.

Project profile: Lübbenaubrücke – Energy Masterplan 2021

Objectives

The objectives of the Lübbenaubrücke project are the adaptation of homes to modern requirements, design of urban renewal measures (in particular demolition and dismantling) while keeping close contact to the city and its residents. Moreover the project intends to upgrade the area, to improve the social and technical infrastructure and to strengthen the local economy.

Main issues

A central focus of the urban and residential project is cooperation and communication between all stakeholders involved and the securing of the commitment of the residents. Since 1999, many individual projects concerning city-wide development have been realised. In addition to the priorities of refurbishment and modernisation of living space, energy efficiency and the use of new technologies such as solar heating are of great importance. Moreover the project is well known in particular for its comprehensive identity-creating measures in the spheres of culture (e.g. the Kulturhof project), ecology (use of alternative energies) and business (e.g. tourism and training).

The model initiative "Barrier-free Modernisation to Low-Energy Housing Standards" of 2005 is one outstanding energy-efficient refurbishment project. Using comprehensive thermal insulation in combination with the installation of air-conditioning with waste heat recovery and duct heating, the primary energy requirement was reduced by approximately 70 %. At the same time, changes to the floor plan provided disabled access and the construction of balconies gave a new quality to life.

Project partners

The Lübbenaubrücke initiative has mobilised and joined together a large number of different stakeholders from the local population, business, science and public institutions of the Federal State of Brandenburg, the Landkreis (administrative district) of Oberspreewald-Lausitz and the city of Lübbenau/Spreewald.

Other organisations have already grown out of Lübbenaubrücke such as "SOS Lübbenaubrücke" (School-

Organisation-Urban renewal) and
"Freunde der Lübbenaubrücke e.V." (Friends of Lübbenaubrücke), supporting the implementation of the key objectives.

Period of implementation

The project was set up in 1999 as a community initiative by the two housing associations Wohnungsbaugesellschaft im Spreewald mbH (WIS) and Gemeinnützige Wohnungsbaugenossenschaft der Spreewaldstadt Lübbenau e.G. (GWG) and the city of Lübbenau and since then has become a firmly-established part of the city.

Status

In the context of the ExWoSt model initiative "Energy-saving Urban Renewal", the city of Lübbenau/Spreewald is currently working on a municipal energy project – "Energy Masterplan 2021" and some comprehensive divisional concepts in which in particular possible alternatives in the use of building materials, power supply and primary energies are being discussed. In parallel, a concept is currently being developed for the energy-efficient refurbishment of the future „Haus für Kinder und Senioren" (house for children and senior citizens) completion of which is scheduled for 2011.

Financing / funding

The Lübbenaubrücke cooperation project was initially supported financially by the national government/federal states programme "Social City", and later by the national government/federal states programme "Urban Renewal East". This involves the national government, the Federal State of Brandenburg and the city of Lübbenau/Spreewald each providing one third of the funding required. The projects for energy-efficient refurbishment of residential buildings are primarily funded by a combination of residential building funding from the Federal State of Brandenburg and the national government's KfW programme.

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Assessment of the project

The Lübbenaubrücke project has succeeded in establishing an exemplary local cooperation model which successfully implements permanent collaboration of its project sponsors with one another but also early and intensive participation by residents and by locally-established companies. Developing a municipal energy concept makes Lübbenau one of the first cities in the Federal State of Brandenburg to take into account to significant extent municipal climate change prevention in integrated urban development.

Integrated approach (WP3)

The focal point of the project is a holistic approach to planning focusing on comprehensive reinforcement of the Lübbenau location. Direct involvement by the highest decision-makers ensures rapid implementation and reliability in the urban renewal process. With the municipal energy concept, the city of Lübbenau sees the development of an energy mission statement with long-term and long-lasting objectives as an important milestone for future urban development.

Technical solutions (WP4)

In the refurbishment of existing buildings, energy considerations such as thermal insulation of the building shell, modern heating systems and in some places the use of new technologies such as solar heating have long been prioritised. The objectives of the municipal energy concept currently being developed are to incorporate renewable energies and efficiency-increasing energy generation and distribution measures into urban development processes and existing supply structures and to implement future plans for energy conservation under optimum conditions.

Financing (WP5)

A combination of different funding programmes has enabled the implementation of the Lübbenaubrücke cooperative project as well as numerous individual projects for energy-saving urban renewal. With its innovative cooperative approach and the implementation of projects of high standards, serving as a model to others in the sphere of energy-saving urban renewal, Lübbenau/Spreewald has been able to arouse a great deal of interest in the federal state and has been rewarded accordingly by the granting of federal state funding.

4.4 Building level

Three selected projects are presented below as good practice examples at building level in the Federal State of Brandenburg: the „Bürgerhaus mit Energie" (town house with energy) in Vetschau/Spreewald, the "Burg" children's day care centre in Luckenwalde and the energy-saving refurbishment of three residential buildings in Prenzlau.

Project profile: Bürgerhaus mit Energie in Vetschau/Spreewald

Objectives

A former grammar school and listed building is to be converted into a social amenity offering various possibilities for use. Energy-saving refurbishment, improvement of building services and the use of renewable energies are intended to reduce the energy requirement and CO_2 emissions, considerably reducing costs by comparison with the existing institution.

Main issues

The "Bürgerhaus mit Energie!" project in the old town of Vetschau is a key measure in the integrated urban development concept for the modernisation of social infrastructure. The concept for the use of the multifunctional social amenity includes a day-care nursery, facilities for a senior citizens' club, a music school, exhibition space for the display of local history and a citizens' hall with various possible uses. At the same time, high energy efficiency is a priority.

In terms of energy-saving refurbishment, special requirements imposed by the specific conditions of the preservation order have been met by this project in an exemplary manner.

The historic front façade will be the subject of interior insulation. The basement ceiling and the floor against the ground will be insulated and there will also be thermal insulation of the roof and the top floor ceilings. On the ground floor, under-floor heating and in the upper stories ceiling heating will be integrated. The windows installed in 1995 will be retained as they already have an insulating function. To further reduce energy requirements, the existing electrical installations will be replaced by new power-saving systems. For the efficient supply of heat, a modern system and new radiators will be installed which will be further supported by the integration of an innovative air-conditioning system with waste heat recovery. To reduce the requirement for fossil fuels and therefore CO_2 emissions, renewable geothermal energy will also be used provided that the economic efficiency of this solution can be established in the course of more detailed studies.

Project partners

The city of Vetschau/Spreewald is responsible for the involvement of various parties, in coordination with B.B.S.M. which is the district urban renewal agent. The planning, in addition to specialist planners, involved in particular the relevant community committees and future user groups.

Implementation period

November 2008 to December 2010

Status

After completion of a restricted tendering process for the work, further workshops took place with the future users in order to refine the planning. Commencement of construction for energy-saving refurbishment is planned for the spring of 2010.

Project budget

The estimated total costs are EUR 1.8 million. Approximately one third of this is for energy-relevant measures.

Financing/funding

The project will be financed with a combination of investment pact, a funding programme for the energy-saving renewal of social infrastructure in the municipalities (known by its abbreviation of ESI), and the national federal state government programme Urban Renewal East. The ESI programme funds the energy-relevant measures where they meet the stipulated high energy-saving requirements, in the form of a subsidy which is restricted to a maximum of EUR 300/m2 and two thirds by the national and federal state government. Additionally there is a supplement from the Urban Renewal programme from the "Restoration of Urban Infrastructure" sub-programme (known by its abbreviation of RSI). RSI funding will be supplemented at a rate of 90 % (national and federal state resources) in form of a subsidy and 10 % co-financed by the city of Vetschau.

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Assessment of the project

The project is one of the ExWoSt model "Energy-saving urban renewal" initiatives and is another milestone within the strategic focus of the city of Vetschau/Spreewald in the cutting-edge energy sector. As a signal project for innovative energy-saving historic building restoration, the "Bürgerhaus mit Energie" serves to mobilise further potential within the process of energy-saving urban renewal in the old town.

Integrated approach (WP3)

The objective of the project is to convert the grammar school which has been closed since 2006 into a sustainable and future-viable building and so make a significant contribution to the revitalisation of the old town. The planning integrates various specialist policies from the spheres of urban renewal/urban development and social institutions with the aim of increasing the energy efficiency of the city of Vetschau and intensifying the use of renewable energies. From the beginning, the public, future users and community committees were involved in the process. The city of Vetschau/Spreewald wants to promote energy saving, climate change prevention and the use of renewable energies in its communities and so advance the refurbishment of its municipal properties.

Technical solutions (WP4)

Despite the preservation of a historic building, a high level of energy efficiency has been achieved. The structural measures can reduce the primary energy requirement from 407.9 kWh/m² per year to 185.2 kWh/m² per year. This approximately corresponds to an energy saving of 55 % and reduces CO_2 emissions by a total of 78,578 kg (absolute) per year. This approximately corresponds to 60.7 kg/(m²a) or a reduction of 65 %. The incorporation of geothermal energy into the system concept for the building is of great advantage in that for a relatively low additional cost, significant long-term savings can be made in conventionally-generated heat energy.

The proportion of the costs of energy-relevant measures is rather low in this project by comparison with the other energy-saving refurbishment projects. The reason for this is the high costs arising for conversion measures for a planned new use for the building.

Financing (WP5)

The project will be financed by a combination of two funding programmes. The investment pact subsidy associated with the fulfilment of minimum requirements that are considerably more stringent than the statutory regulations demand will support a particularly energy-efficient project.

Project profile: "Burg" in Luckenwalde

Objectives

The "Burg" children's day care centre is to be refurbished in the context of the "Energy-saving urban renewal project for the Nuthe-Burg district" in an energy-efficient manner and is to be converted into an intergenerational facility for the district. The primary objective of the refurbishment is energy saving by thermal insulation and the use of efficient technologies and renewable raw materials and eco-friendly building materials.

Main issues

The emphasis of the refurbishment of the children's day care centre lies in the development of a holistic solution. In addition to the primary objective of energy-efficient refurbishment, in particular how energy consumption can be reduced even further with little financial expenditure with simultaneous upgrading of the exterior appearance and the creation of new opportunities for the use of the building should be demonstrated.

Energy-efficient refurbishment will be carried out by complex measures to insulate the exterior surfaces such as walls, roofs and foundations and replacement of the windows (double glazing). The use of eco-friendly building materials and the insulation of the building joints will make a significant contribution to this. A new heating system will be installed which integrates ventilation with waste heat recovery (60 % heat recovery) and the use of renewable energy via solar heating for hot water (52 % coverage).

Project partners

The project will be implemented in collaboration with the city of Luckenwalde, specialist planners and the operators of the Volkssolidarität LVB e.V. institution, regional association for Fläming-Elster.

Project period

February 2009 to May 2011

Status

Currently the project is in the planning and application for funding phase. The refurbishment is expected to start in 2010.

Project budget

The estimated overall costs will be EUR 3.2 million. Of this, approximately EUR 2.2 million (70 % of the costs) has been assigned to energy-relevant measures.

Financing / funding

The project will be financed by a combination of the investment pact for energy-saving refurbishment of social infrastructure in the municipalities (ESI programme) and the urban planning funding from the Federal State of Brandenburg. The costs of energy-relevant measures will, where they are in line with the stringent minimum requirements for the programme, be funded in the context of the ESI programme with an 85 % subsidy (national/federal state government). The community will make their own contribution of 15 %, being the remaining funds, and will receive supplementary funding for further costs of the initiative in the form of a 90 % (national/federal state government) subsidy of the costs from the urban planning fund of the "Urban Renewal East" national and federal state government programme from the RSI sub-programme and make its own 10 % contribution.

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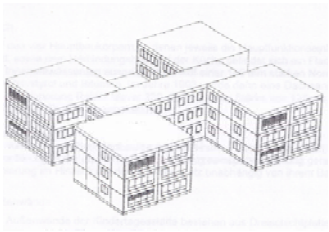

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Assessment of the project

Due to the model status of the initiative and its incorporation into the city-wide upgrading strategy, the plan was selected by the BMVBS and the Federal State of Brandenburg for the ExWoSt research field "Energy-saving urban renewal" in Luckenwalde.

Integrated approach (WP3)

In the course of the complete renovation of the building, in addition to the existing children's day care centre, an after-school care club and a senior citizens' centre will be established, thereby providing permanent use for the building as a whole in the long term.

Technical solutions (WP4)

The measures described can reduce primary energy consumption from 175 kWh/(m²a) to 70.2 kWh/(m²a). This approximately corresponds to an energy saving of 60 %. By saving energy and using solar heating, the building's CO_2 emissions can be reduced overall by 129,465 kg or 67.2 kg per m² per year, therefore 70 % by comparison with the initial situation.

The combination of energy-relevant measures leads to a significant reduction in energy requirement. After the refurbishment, the building undercuts the minimum energy requirements for new building projects in accordance with statutory guideline EnEV by approximately 50 %.

Financing (WP5)

Financing for the project in the quality described will be made possible in particular by a combination of two funding programmes. The energy-saving refurbishment will lead to a clear reduction in running costs which results in a long-term saving in incidental costs.

Project profile: Prenzlau – Schwedter Straße 25/27/29

Objectives

The objective of the project is to preserve three historic residential buildings at no. 25, 27 and 29 Schwedter Straße in Prenzlau, which, with their self-contained design, form part of the townscape. The energy-saving refurbishment of these long-empty buildings is intended to reduce energy requirements long term and provide living space suitable for the elderly, which is in increasing demand in the wake of demographic change. Historic buildings requirements for the building at no. 29 must also be respected.

Main issues

The project is derived from the overall concept of the city of Prenzlau as a "City of renewable energies" and is a part of Development focus III (inner city development) of the integrated urban development concept. To optimise the design ideas, an expert appraisal process was held in which 5 architectural practices, in collaboration with specialist engineers, developed floor plan and usage solutions as well as energy concepts and submitted them to a select panel of judges in the context of a one-day workshop. The judges selected one design representing the conversion of the buildings in 2 variants. In the first variant, building no. 25, 27 and 29 are modernised and renovated. The second variant represents modernisation and renovation of buildings 27 and 29 and a replacement new build for building no. 25.

At the current state of planning, measures for the energy-efficient refurbishment at 25, 27 and 29 Schwedter Straße, in particular measures for the thermal insulation of the external walls, the upper storey and the floor in the basement, will be carried out. Due to the partially listed status of the buildings, for the insulation of the external walls in buildings 25 and 27 a combination of external and internal insulation is planned and for building no. 29 internal insulation only.

Heat will be supplied by a use-dependent combination solution. The basic supply will be provided by controlled, decentralised ventilation of the residential units with preheating and heat recovery. In addition, conventional and individually-adjustable convectors are also being proposed under the windows. Preheating of the supplied air in winter is by a geothermal heat exchanger which in summer can be used to pre-cool the air. The use of renewable energies is by a retentive solar panel support installed in the roof area of no. 25 and 27.

The city also intends to develop a heat-supply concept for the inner city using almost exclusively renewable energies (sewage gas, biogas, geothermal energy). To this end, in September 2008, the city received a grant from the REN programme (guideline on the promotion of energy efficiency and the use of renewable energies) of the ministry for economy of the Federal State of Brandenburg.

Project partners

The main partners in this project are the city of Prenzlau and Wohnbau GmbH Prenzlau, the owner, B.B.S.M. (responsible for preparation of the feasibility study and management of the experts' appraisal process and financing) and the specialist planners of the Arbeitsgemeinschaft Architekturbüro Keller Mayer Wittig/Integral Projekt GmbH and GWJ Ingenieurgesellschaft für Bauphysik. It may be that further partners such as social sponsors (e.g. Volkssolidarität or AWO) will become involved in order to take care of the interests of future residents.

Implementation period

A feasibility study was drawn up in 2008. Competitive technical tendering took place in 2009 and the corresponding funding applications were prepared. The conversion work is planned for 2010/2011.

Status

The project is currently at the planning and funding application phase.

Project budget

The estimated total costs of the 1st variant are approximately EUR 3.3 million (without lift).The proportion of energy-relevant measures is approximately one quarter of the costs. For the 2nd variant, costs of approx. EUR 4 million (without lift) have been calculated. In the replacement new build, the proportion of energy-relevant measures in this variant are approximately one fifth and so are below the 1st variant.

Financing/funding

The financing of the project is based on funding as a combination of residential and urban planning funding from the Federal State of Brandenburg and KfW loan from the national government. The federal state funding is made up of (1) a low interest state loan for the promotion of generationally-compatible adapting of residential rented buildings by modernisation and renovation (GenerationsgerechtModInstR); (2) a subsidy from urban planning funding (the national government/federal state programme Urban Renewal East, accompanied by sub-programme upgrading, i.e. financing of residual margin for non-profitable costs); and (3) a subsidy for funding the creation of barrier-free and generationally-compatible access to rented accommodation (AufzugsR). There are also low interest loans from the national government in the form of a KfW "Energy-efficient renovation" loan

for existing buildings, and in the event of planning variant 2 being selected, a KfW “Energy-efficient building” loan for replacement new builds.

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Assessment of the project

The project is an ExWoSt energy-saving urban renewal model project and therefore among other things focuses on the energy-efficient refurbishment of existing buildings. Moreover, it contributes significantly to the implementation of the climate policy objectives of the city and can be assessed as a model project for further similar building initiatives by private owners in Prenzlau and beyond the city's borders.

Integrated approach (WP3)

The project is a good example of the compatibility of energy-saving refurbishment, historic building preservation requirements and options for the application of the latest energy and ecological standards. By the creation of residences suitable for elderly people, it also succeeds in linking the initiative to demographic change and changing requirements in the urban market for homes.

Technical solutions (WP4)

The complex energy-relevant measures for refurbishment result in a significant reduction in the buildings' primary energy requirement.

At 25/27 Schwedter Straße, the primary energy requirement after refurbishment will be reduced by approximately 90 % from 253.4 kWh/(m²a) to 27 kWh/(m²a). This means that the energy requirements for new build projects will have been undercut by approximately 65 % in accordance with EnEV.

The energy concept for the listed part of the building at 29 Schwedter Straße stipulates a reduction in the primary energy requirement from 218.4 kWh/(m²a) to 41 kWh/(m²a). This achieves a reduction of 80 %. The EnEV required value for old buildings will therefore be significantly undercut by 55 %.

Financing (WP5)

Independently-financed refurbishment of the buildings by the owners would not be possible under the circumstances. The situation of the buildings, both in the urban renewal area and in a prime residential area, enables combined funding made up of loans from the federal state from the social living fund and subsidies from the urban planning fund of the Federal State of Brandenburg as well as a loan from the KfW. Only by such a combination of funding is this cost-intensive modernisation initiative feasible.

5 CONCLUSION AND FORECAST

The issue of energy efficiency is of particular importance in cities and communities. Of equal importance are measures and concepts of energy generation, energy distribution, efficient energy use and general land use strategies. Many decisions in this context are made by local agents on a small geographical scale. Activities and measures by cities are becoming increasingly important in the context of the debate on climate change prevention as well. At community level, in the Federal State of Brandenburg there are already a great many strategic initiatives and measures being planned and implemented. The projects described are examples of commitment and success at various geographical levels in and for cities. These projects can be taken as a model even by smaller and medium-sized towns in Eastern Europe.

ENERGY EFFICIENCY AS AN ELEMENT OF INTEGRATED URBAN DEVELOPMENT

Integrated urban development, because of its interdisciplinary and city-wide approach, offers optimum conditions for identifying energy saving opportunities, increasing energy efficiency and the intensified use of renewable energies. Nevertheless, in many integrated urban development concepts in past years, the “energy efficiency” aspect has been given insufficient emphasis. In future, the issue should be taken up as a cross-cutting task in integrated urban development concepts. Integration of energy efficiency into urban development is, however, primarily also a social process that only leads to success if it can be anchored long term in policy beyond the administration itself, among companies and among the population. Examples such as the Wasserturmsiedlung estate in Schwarzheide and the Lübbenaubrücke cooperative project show how successful this can be.

INNOVATIVE PROJECTS NEED INCENTIVE AND FUNDING

Since the introduction of the Thermal Insulation Regulation and the Energy Saving Order (EnEV) in Germany, there have, in recent years, been many amendments to the legal basis, setting an ever higher standard of thermal insulation for new builds and for the refurbishment of existing buildings. As the examples show, complex technical solutions incorporating good thermal insulation, efficient systems of heating and the use of renewable energies can achieve energy savings of between 55% and 90% at building level and thereby significantly improve upon the statutory requirements, at least in part.

When high minimum energy-saving requirements are coupled with attractive funding opportunities (in the sphere of public infrastructure this should be by means of subsidies), there is a higher incentive for urban agencies to become involved to a significant extent. Projects such as the Bürgerhaus mit Energie in Vetschau and the “Burg” children’s day care centre in Luckenwalde can in this way be accelerated and their particularly energy-efficient implementation reinforced.

With the energy-efficient refurbishment of public infrastructure and the intensified use of renewable energies, the cities can move forward on the basis of good models. The availability of sustainable resources has increased. In the context of building renovation, the proportion of energy-relevant measures in projects receiving funding has risen considerably and may now be estimated at around 50% of total costs. In future, minimum energy-saving requirements in the award of any funding, as already present in some programmes such as

the investment pact or the KfW loan, have a role to play in creating awareness of the cross-cutting task of achieving energy efficiency.
As the model projects described indicate, high energy efficiency is only possible in many cases by using a combination of funding options. This is demonstrated for example in the project at 25/27/29 Schwedter Straße in Prenzlau, which could not have been realised in this form without urban development subsidy funding and supplementary loans for energy initiatives. Such solutions must continue to be pursued. It has also proved very successful to combine the granting of funding with minimum energy-saving requirements and increased standards for projects which clearly go beyond the minimum requirements in order to give an incentive for the creation of particularly innovative solutions.

ENERGY SUPPLY AND NETWORKS

If we consider the building level alone, the opportunities are limited in terms of the external circumstances, e.g. technical and economic conditions determined by the utility companies and the connection conditions for the heat and power network. Therefore, the communities in particular should examine the issue of energy efficiency in greater depth. In addition to improving energy efficiency at building level, the creation of efficient energy supply systems must also be considered. The issues of energy generation, energy distribution and energy consumption at the various geographical levels in the districts, cities and regions must be considered in an integrated way, therefore, and interlinked. To increase energy efficiency, for example, greater emphasis should be placed on combined heat and power as well as the reorganisation of remote heat supply.

JOINT STRATEGIES, PROJECTS AND BRINGING PEOPLE TOGETHER

The integrated energy concept of the city of Guben and the regional energy concept of the Spreewalddreieck are intended to show how isolated approaches to projects can be overcome and a practical general strategy developed in order to be able to incorporate individual initiatives more intensively into district or city-wide and regional considerations, and to interlink individual aspects of an issue into the context of an integrated energy policy. For the cities, it is a great challenge to develop solutions with local agencies which are economically sound, ecologically justifiable and socially compatible.

MOVING TOGETHER TOWARDS GREATER ENERGY EFFICIENCY

In the Federal State of Brandenburg, major steps along this path have been taken. Since 2008, the issuing of funding in the sphere of urban development and housing has been managed through integrated urban development concepts. Model projects have been interlinked and exchanges of experiences are being pursued.
Instructions for action as to how energy efficiency and climate change prevention can be integrated into urban development should, over the coming two years, emerge from the "Brandenburg urban network on climate protection (BraNEK)" project. Many Brandenburg cities too are only just starting: suitable strategies, methods and tools at planning, funding and project level must be developed jointly, tried and further tested. The results and the recommendations for action derived from experience for the Federal State of Brandenburg

and its communities will be evaluated for the Urb.Energy project in a follow-up report in 2011.