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Ministerium für Infrastruktur und Landwirtschaft

Energy Efficient and Integrated Urban Development Action
URB Energy

WP 3 Urban Development

Analysis on realized integrated urban development concepts in Brandenburg

Energy efficiency in integrated urban development in Brandenburg – interim assessment

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Salutation

The European and national urban development policy focuses on all dimensions of sustainable deployment by taking economic prosperity, social balance and a healthy environment into the perspective.

European cities and their housing stock need to become more energy efficient in order to implement EU climate and energy policies. However, sustainable and energy efficient neighbourhoods and cities can only be achieved by integrating approaches that tackle urban structural and social problems as well as energy waste. These approaches need to be supported by innovative and sustainable financial instruments.

The Federal State of Brandenburg has formulated objectives in the Urban Renewal Master Plan to strengthen the cities which corresponds to the direction of EU policy in the current structural funding period 2007-2013. This includes in particular the contribution of the cities to growth and employment, creation and preservation of functional urban structures, provision of adequate education and training, ensuring a high standard of living and a broad spectrum of commitment on the part of citizens and business.

Moreover the government of the State of Brandenburg has formulated some key policy aims in its energy and climate change prevention strategy. Mentioning some figures, Brandenburg is targeting at a reduction of energy-related carbon dioxide emissions by 40 percent between 1990 to 2020 and at increasing the proportion of renewable energies to 20 percent by 2020.

Combining the Urban Renewal Master Plan and the energy and climate change prevention strategy is a pioneering aim for Brandenburg's towns and cities and their urban development policy. 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 integrated urban development concepts.

To support this aim the State of Brandenburg has implemented clear funding guidelines regarding minimum requirements concerning energy standards which are mandatory for applicants, like municipalities, organised housing providers and private owners for financial support of urban development and housing. Furthermore, the ministry responsible for infrastructure and agriculture commissions reports regularly to parliament in order to enhance detailed cross actor information on relevant issues regarding these primary concerns and it supports model projects designed to test and implement possible designs at the interface of energy-saving urban renewal and climate change prevention.

Up to now, these two issues have barely been touched upon by the existing integrated urban development concepts. The Urb.Energy project helps significantly in initiating motivation and to stimulate mutual learning processes at every level of involvement.

Jörg Vogelsänger

Minister for Infrastructure and Agriculture of the State of Brandenburg

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Introduction


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Urb.Energy is a transnational cooperation project part-financed by the European Union within the Baltic Sea Region Programme 2007-2013. The project Urb.Energy started in January 2009 for a three-year period.

Urb.Energy's key objective is the development of integrated concepts and strategies for the comprehensive energy efficient renewal of residential areas in the Baltic Sea Region. To reach this target the project's work is focussed on three main topics:

- **Integrated Urban Development**
- **Energy Efficient Renewal**
- **Innovative Financial Schemes**

Although the key issue of this brochure is integrated urban development in the State of Brandenburg, it combines the approach of energy efficient refurbishment of residential buildings with integrated urban development concepts, the modernisation of the energy supply infrastructure and the identification of innovative financing instruments. It therefore emphasises the interaction between all three topics of the Urb.Energy project.

The 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 last 20 years following the political turn 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 also help in enhancing the current practice in medium-sized and smaller cities in Central and Eastern Europe.

This brochure is an abstract of the Report 1 "Energy efficiency in integrated urban development – an interim assessment" providing the reader with key messages of the report to allow a brief and concise overview.

Hence the brochure does not make a claim to be complete but it points at essential aspects and focuses mainly on practical information.

The objective of this brochure is to set out experiences involving strategies and procedures of integrated urban development, as well as to present specific energy-efficiency projects in the context of integrated urban and regional development in the State of Brandenburg.

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


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The first part of the brochure presents a review of the progress of integrated urban development and policy in the State of Brandenburg and its instruments.

By giving project examples, the second part provides more detailed information towards the three main topics of Urb.Energy. Here experiences and good practice gained are presented.

The last part of the brochure summarizes experiences by interlinking all themes. Moreover it casts a closer view look at the follow-up report, which will focus on specific recommendations on energy efficiency in integrated urban development strategies.

The brochure is primarily aimed at the international partners in the Urb.Energy project. However, in the context of the public relations work of the 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.

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Energy Efficient and Integrated Urban Development Action

Progress of Integrated Urban Development and Policy in Brandenburg

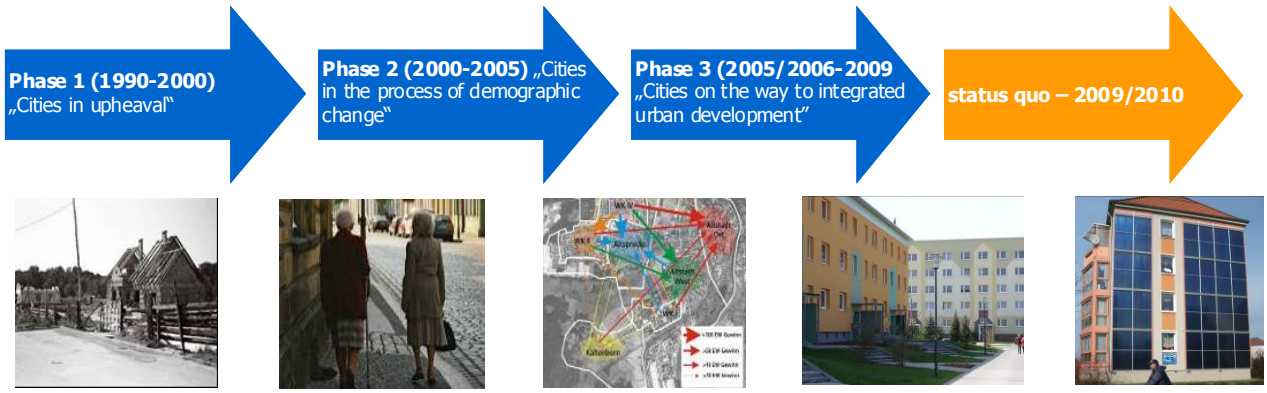
Since the political turn of 1989 and German unification urban development in the State of Brandenburg has been in a state of continuous change and refinement. Along with this a shift in the thematic focuses and strategies for action has emerged that is ranging from defining the sectoral terms of reference towards complex and integrated approaches.

The deployment of an integrated approach towards urban and regional development in the State of Brandenburg can essentially be divided into three phases during the period between 1990 and today:

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"



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

With the unification of Germany, the tremendous need for action in Eastern German cities became clear. In the face of a pressingly urgent urban situation, short-term emergency measures were needed. Hence the focus of city development/planning in the 1990s was sectoral and reactive. The high pressure to invest into infrastructure, existing buildings, and in particular in the new production of housing had to be met. There was barely room for the development of sustainable urban planning strategies. The much-needed interlinking across departmental planning divides was not possible.

Reducing energy consumption during the first years after German unification was mainly a by-product of urban refurbishment and the efficiency of new buildings. Reducing the rapidly growing energy costs and keeping housing affordable was a major policy goal. The main objectives were a good insulation, metering and avoiding losses in the distribution. Since 1991, the government of the State of Brandenburg has been intensively involved in the financing of energy-saving redevelopment measures e.g. urban planning funding or funding for residential property.

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

During the second phase demographic transformation and its recognisable medium and long-term effects were decisive factors for urban development.

Due to outward migration, ageing and changes in the household- structure, the population turned into negative growth.

In 2002 the national government and the states' governments launched the programme "Urban Renewal East" (Stadtumbau Ost) to face the resulting challenges, mainly vacancies in the neglected inner-cities and the estates of the state-socialist period.

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The reaction of cities and housing associations was a concentration on the demolition of homes that were no longer needed in the long term, the upgrading of existing buildings and the adaptation of social and technical infrastructures to changing and shrinking demand.

The focus of energy efficiency has shifted more and more towards a higher level of environmental consciousness and sophisticated technology. This found expression at national government level. Several regulations like a law giving priority to renewable energies (EEG 2000) and the Energy Saving Ordinance (EnEV 2002) tend to reduce the CO_2 footprint of housing and public infrastructures. Since 1999, the objectives of federal funding programmes in the state of Brandenburg have been even more clearly focused on the issues of "energy saving" and "climate change prevention".

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

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 vacant homes that were no longer needed, upgrading of the remaining existing housing stock and adaptation of the technical and social infrastructures.

An evaluation of the previous urban development processes showed the need for integrated urban development across thematical and departmental boundaries, which primarily means the coordination in terms of space, means and time across the various specialist policies and the coordinated use of resources on the basis of local integrated urban development concepts (INSEK).

Urban development is increasingly being understood as an interdisciplinary function; a "framework policy" enabling the local actors. Since 2005, the instrument of integrated urban development concepts (INSEK) has served as a municipal "framework strategy" and the basis for all sectoral planning, major projects and funding.

Over the years there was a growing significance of energy efficiency. Since the introduction of the Energy Saving Ordinance in Germany, there have over the recent years been many amendments to the legal basis, raising standards of thermal insulation for new builds and for the refurbishment of existing buildings. Since 2008, the allocation of funding by the responsible Ministry for Infrastructure und Agriculture Brandenburg has been managed on the basis of integrated urban development concepts. This has further increased efficiency in the use of resources. In addition, the specific funding programmes of the State of Brandenburg have become more intensively focused energy efficiency in urban construction and the provision of housing.

Status Quo – 2009/2010

During the last years the testing phase of the various tools for integrated development has changed into a routine and more and more, government initiative has been taken up by the urban actors, mainly the municipal administrations, housing companies and individual owners.

The increased uses of renewable energy and energy saving urban structures have gained more and more importance. A large number of energy-related measures have been implemented in Brandenburg cities. Urban and regional energy strategies are increasingly gaining importance.

Integrated urban development concepts have become established in most Brandenburg cities. Over the coming years, the first generation INSEKs as they were developed after 2006 will be the subject of updating and quality control. The task will be to formally incorporate the new issues of "climate change prevention" and "energy efficiency" as modules into the INSEKs for the future phases of urban renewal in the State of Brandenburg.

The increasing importance of energy efficiency in urban development is currently made apparent in the funding guidelines of the State of Brandenburg. For example, the current urban development funding guidelines (Städtebauförderrichtlinien) aiming at strengthening 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.

As energy measures have a multiple economic return, reflected in particular in lower consumption costs and the jobs in environmental measures, the conversion of future funding programmes into revolving funds, including all sectors of urban development and housing, is being considered by the 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 according to the JESSICA principle.

An integrated approach to urban development has become established in the 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.

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The Overall Concept and Instruments of Integrated Urban Development in Brandenburg

Integrated Urban Development – A Definition

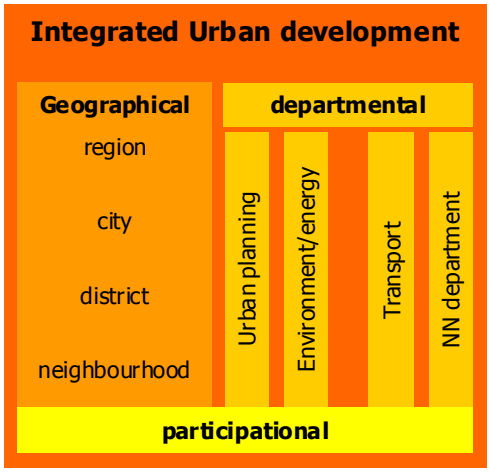
In the State of Brandenburg, the government has been pursuing an integrated approach to urban development for several years. Integrated urban development is a holistic approach interlinking various departments like construction, transport, economy, social matters, education, cultural and environmental policy, which have an individual as well as a combined impact on urban development policy.

Essentially, a distinction is made between three dimensions of integrated urban development:

Geographical: from urban/regional through city-wide level and down to the neighbourhood

Sectoral: affecting all administrational departments and actors

Participation: new intensity and quality of participation and activation of the administration, those involved in city development policy (housing companies, utility companies, etc.) and the citizens/residents



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

At the **federal level**, various ministries work together with urban-development-relevant funding programmes. Across the departments, for example, the use of ESF and ERDF resources is targeted at urban development as well as social and labour market inclusion projects.

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

The Overall Concept "Strong Cities - Master Plan for Urban Renewal"

With the Master-Plan "Strong Cities – Urban Renewal", the State of Brandenburg (through the Ministry for Infrastructure und Agriculture Brandenburg) has set out the objectives of an integrated and sustainable urban development policy in 2006. Whereas before the adoption of the master-plan 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.

This also involves the realignment of the funding policy. Since 2006 integrated urban development concepts set the definitive basis and planning provisions for funding decisions by the State of Brandenburg in the fields of urban development and housing.

Instruments

The State of Brandenburg is using the following tools to implement this holistic approach in urban development:

Integrated Urban Development Concepts (INSEKs)

INSEKs combine and, where appropriate, selectively supplement the existing sectoral development concepts in the Brandenburg cities. They are municipal "framework strategies" and provide the basis for financial and organisational support for cities, taking into account their specific potentials. This means that they are a key management tool both for local urban development strategy and for agreements with the Ministry for Infrastructure und Agriculture of the State of Brandenburg and other departments.

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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Integrated Neighbourhood Concepts

Urban development processes are implemented in individual spatial sub-divisions of the cities, mainly on neighbourhood level. Therefore integrated neighbourhood concepts are developed for parts of a city that have a structural/geographic and/or functional connection. Integrated neighbourhood concepts serve to intensify action and project planning on a smaller geographical level.

Neighbourhood development scenarios and future need for action are derived on the basis of comprehensive analysis of existing conditions (i.e. evaluation of the existing neighbourhood population and housing market trends, profile of strengths/weaknesses in SWOT analyses). Building on this, principles and development objectives are formulated for future neighbourhood development and recommendations for action and specific measures determined, as well as divisional approaches to action. The process of preparing integrated neighbourhood 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 population.

Participation

In Brandenburg, participation is taking on an ever-increasing importance in urban development. 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 room and attention should be given for ideas, proposals and projects from the citizens (bottom-up).

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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 according to German planning law (BauGB). Here the law determines who and how participation takes place. Participation of the public and specific actors by means of informal participation processes has become increasingly important in the management of complex developments. They are on a volun-

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tary basis and may take very different forms depending on the task at hand.

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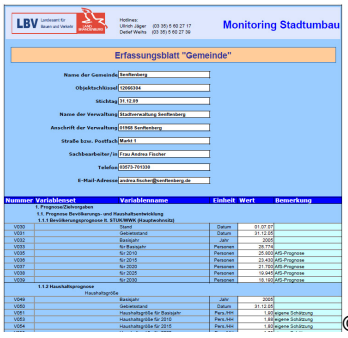
Monitoring

The objectives and action set out in the INSEKs and in particular divisional planning must be the subject of impact assessment.

Monitoring system



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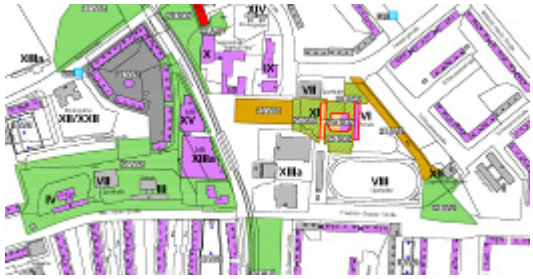
The Ministry for Infrastructure und Agriculture Brandenburg undertakes the monitoring using expert software.

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 and climate protection. 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.

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 neighbourhood statements can be made regarding development trends and tendencies and the effectiveness of urban development measures checked.



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The establishment of an urban monitoring system is a mandatory requirement for funding for the Brandenburg cities on the part of the State of Brandenburg.

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.

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Energy Efficiency in Integrated Urban Development in Brandenburg

Over the last two decades the State of Brandenburg has made climate protection and saving energy a key policy issue in urban development and housing.

Distinct local awareness of the problems can already be discerned in Brandenburg cities. In addition to a reduction in CO_2 emissions through the extended use of renewable energies in electricity production, an increase in energy efficiency in the building sector and in power consumption has also been identified as a further key element of activity to achieve the national and federal climate policy targets. Hence a number of strategic planning initiatives already exist and a great number of energy efficiency measures have been implemented or are currently in planning.

Practical experiences and good practice projects to increase energy efficiency concerning integrated urban development (WP3), energy efficient refurbishment (WP4) and financial schemes (WP5) in the State of Brandenburg are presented below.

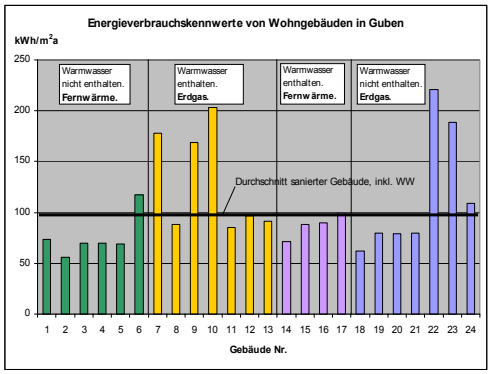
Integrated Urban Development

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.

The city of **Guben** developed an **integrated energy strategy** for sustainable and future viable-energy supply. The project is an example of good practice showing how to identify and combine various specialist issues; in particular urban renewal/urban development and power supply and their joint effects through interaction.

The analysis of the prevailing circumstances and their interaction was taking different dimensions into account, like a forecast of demographic development, trends in land use patterns, energy demand, energy production and distribution, and potential for energy saving and the use of renewable energies.

Energy consumption of housing estates



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Interlinking urban renewal and energy consumption

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.

Incorporating former and upcoming projects into a wider regional context the project **Regional Energy Concept "Spreewalddreieck"** is developing a common regional energy policy.

Solar gymnasium in passive house standard in Vetschau

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Project which integrates urban development, energy efficiency and renewable energy

In accordance with an integrated regional energy concept for the three neighbouring municipalities Vetschau, Lübbenau and Burg, the project will give recommendations to reach sustainable, energy-efficient urban structures. Moreover key measures for energy saving, preventing climate change and strengthening the regional potential of renewable energies will

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be mobilised. With the initiative, the communities involved are assuming a major local coordination function by defining a regional planning principle.

The organisation and administration of integrated urban development demands an interlinking of different dimensions, various departments and a combination of urban development policy with other geographically-relevant specialist policies.

The **BraNEK** project (BraNEK = Brandenburg urban network on climate protection) is based on an integrated approach, to which all specialist departments of the city administrations involved will contribute.

BraNEK - Intercommunity network initiative

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Emphasis on networking and intercommunity exchange of experiences in matters of "energy-efficient city" and climate change prevention

Providing 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 is the aim of the project. The project is managed by the seven member cities of an 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). The result should develop principles for city-wide energy saving and climate change prevention strategies and create sustainable communication platforms and structures.

Integration of energy efficiency into urban development is, however, primarily also a social process that only leads to success if it can be anchored permanently in policy beyond the administration itself, among companies and among the population.

In the context of integrated urban development processes in Brandenburg's cities, various approaches to participation are taken: from the implementation of participation management through to the setting up of city offices, establishment of public city forums and the organisation of citizens' questionnaires or the setting up of work and support groups, round tables and the holding of thematical workshops with all those involved (including local businesses, industry, politicians, experts and the population). Experiences have shown that cooperation models in the form of a public-private partnership are gaining sustainable results.

Examples such as **Lübbenaubrücke cooperative project** show how successful this can be.

The project was set up in 1999 as a community initiative by the two housing associations and the city of Lübbenau and since then has become a firmly-established part of the city. Lübbenaubrücke has mobilised and joined together a large number of different stakeholders from the local population, business, science and public institutions of the State of Brandenburg, the administrative district Oberspreewald-Lausitz and the city of Lübbenau.

Workgroup meeting urban development

© Lübbenaubrücke

Round table: bringing together different stakeholders

In the refurbishment of existing buildings, energy considerations such as thermal insulation, modern heating systems and 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 as well as distribution measures into urban development processes and existing supply structure to implement future plans for energy conservation under optimum conditions. Direct involvement by the highest decision-makers ensures rapid implementation and reliability in the urban renewal process. With the community energy concept, the city of Lübbenau envisages the development of an energy mission with long-term and long-lasting objectives as an important milestone for future urban development.

The energy efficient issue can be seen as a forthcoming cross-cutting task in integrated urban development. Integrated urban development concepts and their implementation offer optimum conditions to realize this responsibility.

Energy Efficient Renewal of Buildings and Energy Supply

As part of the integrated urban development approach methods, energy efficient modernisation and district heating gain more and more importance.

Since the introduction of the Thermal Insulation Regulation and the Energy Saving Ordinance (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.

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 legal requirements.

In addition to improving energy efficiency at building level, the creation of efficient energy supply and distribution systems must also be considered. Therefore, the municipalities in particular should examine the issue of energy efficiency in greater depth.

The project **Community centre Vetschau** combines energy-saving refurbishment, improvement of building services and the use of renewable energies to reduce the energy requirement and CO_2 emissions. The listed building is a former grammar school and is to be converted into a social amenity offering various possibilities for use, as for example a day-care nursery and a music school.

"Community centre with energy!"

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Good practice for complex refurbishment measures in combination with the use of renewable energies

Apart from a 55% reduction of energy demand through energy efficient refurbishment, a modern heating system and new radiators will be installed, which will be further supported by the integration of an innovative air-conditioning system with heat recovery, to reduce the demand for fossil fuels and therefore CO_2 emissions. Geothermal energy will also be used provided that the economic effi-

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ciency of this solution can be established in the course of more detailed studies.

All in all saving of 79 t (absolute) CO_2 per year will be reached after the refurbishment which equals a reduction of 65%.

Besides the preservation of a historic building, a high level of energy efficiency has been achieved. The incorporation of geothermal energy into the system concept for the building is of great advantage. With relatively low additional costs significant long-term savings will be made in conventionally-generated heat energy.

A good practice example of energy efficient refurbishment in the field of residential buildings is the project **Barrier-free Modernisation to Low-Energy Housing Standards** in the city of Lübbenau. Launched in 2005 this is an outstanding energy-efficient refurbishment project. Using high-standard thermal insulation in combination with the installation of air-conditioning and surplus heat recovery as well as duct heating, the primary energy requirement was reduced by approximately 70%. The EnEV required value of the building was therefore be significantly undercut by 30%. At the same time, changes to the floor plan provided disabled access and the construction of balconies gave a new quality to life.

Barrier-free modernisation to low-energy housing standards

© MIL

First low-energy housing standard building in the State of Brandenburg

Another good practice example of energy efficient refurbishment in the field of residential buildings is the project **Prenzlau – Schwedter Straße no. 25/27/29.**

At the current state of planning, measures for the energy-efficient refurbishment, 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 no. 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.

Prenzlau – Schwedter Straße

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Energy-saving refurbishment of these empty buildings is intended to reduce energy consumption and provide living space suitable for elderly

The city also intends to develop a heat-supply concept for the inner city using almost exclusively renewable energies (sewage gas, biogas, geothermal energy).

The complex energy-relevant measures for refurbishment in combination with the use of renewable energies result in a significant re-

duction in the buildings' primary energy requirement.

At 25/27 Schwedter Straße, the primary energy requirement after refurbishment will be reduced by approximately 90%. This means that the energy requirements for new build projects will be undercut by approximately 65% in accordance with EnEV. The energy concept for the listed part of the building no. 29 stipulates a reduction in the primary energy requirement of 80%. The EnEV required value for old buildings will therefore be significantly undercut by 55%.

Prenzlau interior view

©B.B.S.M.

Therefore this project is a good example for the compatibility of energy-saving refurbishment, historic building preservation requirements and options for the application of the latest energy and ecological standards. Hence it can be assessed as a model project for further similar building initiatives.

Wasserturmsiedlung Schwarzheide is a project which is outstanding due to its combination of district housing policy (provision of 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 district heating concept) as well as district development ("soft" site factors) with an integrated urban development approach is.

The objective of the project was to modernise a historical 1930s factory housing estate with 175 homes building upon a holistic approach in order to achieve sustainable revitalisation. Implemented between 1996 and 1998 the Wasserturmsiedlung in Schwarzheide is one of the first urban development projects in the State of Brandenburg in which an integrated approach was taken.

In addition to authentic restoration and energy-efficient refurbishment of the historic housing estate, the project also involved issues like energy supply, upgrading of the neighbourhood, further development of the locality and the promotion of regional business.

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.

Water tower estate Schwarzheide

© MIL

Combination of authentic restoration and energy efficient refurbishment in accordance with contemporary energy standards

The long term reduction in energy consumption and CO_2 emissions was achieved by complex energy-effective measures. Heat supply is provided by district heating using the industrial surplus heat from the chemical factory of BASF Schwarzheide GmbH. Hence the combined heat and power principle was taken into account.

When projects like the energy efficient renewal of buildings consider complex measures and integrate renewable energies advanced reduction in energy consumption and CO_2 emission will be achieved. Moreover the consideration of efficient energy supply systems beyond individual buildings is important to enhanced energy efficiency.

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Innovative Financial Schemes

Integrated and energy efficient urban development measures need to be financed.

Over the last years a set of experiences with financial schemes and tools to fund integrated urban development activities including energy efficient refurbishment have already been gained in the State of Brandenburg.

In the field of urban development there are different support programmes on federal level, e.g. for integrated urban development, which support sustainable urban structures but also for social housing projects and the modernization of living areas. Those programmes differently supported either by grants or interest reduced loans.

Moreover there are loans from the KfW Bank (the federal government's public investment bank), which support housing projects or municipal purposes with special energy efficient refurbishment measures that exceed the legal minimum requirements.

The financing concept of the just described project **Wasserturmsiedlung Schwarzheide** is a good practice for funding sustainable development of housing estates.

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

Water tower estate Schwarzheide

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Implementing an overall concept by a combination of various resources

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.

Moreover the State of Brandenburg offers a loan programme for modernization and restoration of flats according to age related specific demands (Generationsgerecht ModInstR), which is not an energetic programme but offers additional subsidy for special expenditures in connection with heat insulation that exceeds the legal minimum requirements or that cause the reduction of energy consumption, CO_2 emissions and energy savings under special conditions.

Prenzlau, Schwedter Straße is an outstanding good practice project for combined funding for energy efficient refurbishment of residential buildings in the inner city.

Financing the project is based on funding as a combination of housing and urban development funding from the State of Brandenburg and KfW Bank's loan from the national government. The federal state funding is made up of (1) a favourable-interest state loan for the promotion of generationally-compatible adapting of residential rented buildings by modernisation and renovation (Generationsgerecht-ModInstR); (2) a subsidy from urban develop

ment funding (the national government/federal state programme Urban Renewal East "For liveable cities and attractive living", 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 generation-compatible access to rented accommodation (AufzugsR). There are also favourable-interest loans from the national government in the form of a KfW "Energy-efficient renovation" loan for refurbishment of existing buildings.

Façade from the yard

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Independently financed refurbishment would not be possible

Independently-financed refurbishment of the buildings by the owners would not be possible under the circumstances. The project demonstrates that especially high energy efficiency is only possible by using a combination of funding options. It 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.

Beside the previously described programmes there is the Investment Pact (Investitionspakt: special federal programme to fend off the effects of the global financial crisis) with support for refurbishment measures in municipal buildings and social infrastructure. It is a grant and aims at upgrading at least up to new building standard (defined by a regulation for saving energy) and reduction of costs of primary energy demand for fossil fuel (incl. use of renewable energy). The conditions are quite moderate as the following example of a children's day care centre **"Burg" ("Castle") Luckenwalde** shows.

The "Burg" children's day care centre will 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.

Children's day care centre "Burg" in Luckenwalde

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Investment pact combines high energy efficient requirements with attractive subsidies

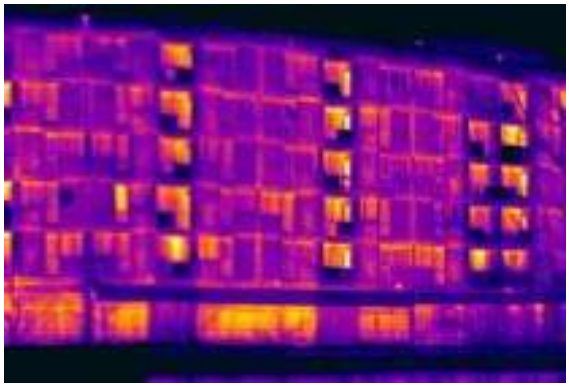
The project will be financed by a combination of the Investment Pact for energy-saving refurbishment of social infrastructure in the communities (ESI programme) and urban development funding from the State of Brandenburg. In the context of the ESI programme costs of energy-relevant measures will, where they are in line with the stringent minimum requirements for the programme; be funded with an 85% subsidy (national /federal part). For the remaining costs the city will make its own contribution of 15%. For further costs of the project the city will receive supplementary funding in the form of a 90% (national/federal part) subsidy of the costs from the urban planning fund of the "Urban Renewal East" national and state government programme from the "Restoration of Urban Infrastructure" subprogramme (RSI) and make its own 10% contribution.

Financing for the project with high energy efficiency 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.

Another support programme is the national urban development policy of the German government (Nationale Stadtentwicklungspolitik) which aims at obtaining new ideas and commitment in a broad range of fields of action. In the context of the "climate change prevention" as one of these fields of action, two of the former described projects are supported by funding from the national urban development policy: **BraNEK** the Brandenburg urban network on climate protection and the **Spreewalddreieck** regional energy concept.

Thermograph of an apartment building



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Thermographs show loss of heat through the outer shell

Pilot projects receive a national government subsidy of 50%. The remaining 50% of project resources need to be provided by the partners involved.

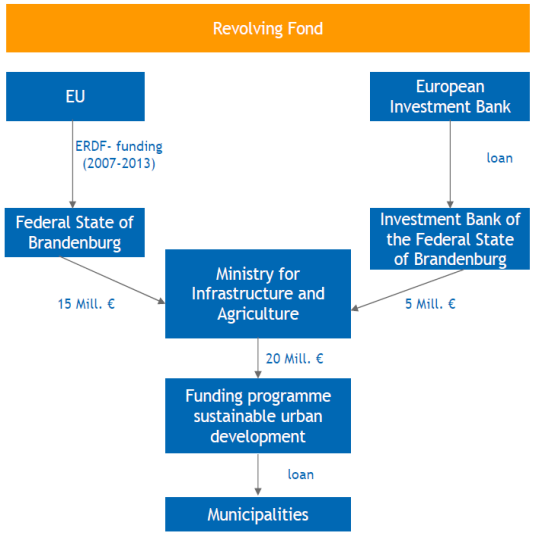
To design sustainable funding on federal level the European funds for urban development in Brandenburg was additionally initiated as revolving fund using the JESSICA principle. 20 million Euros have already been allocated from ERDF funding at the beginning of 2009 in form of revolving funds in the sector of sustainable urban development.

These resources are in principle also available for energy projects.

This urban development fund has been commissioned by the Ministry for Infrastructure und Agriculture Brandenburg and established at the investment bank of the State of Brandenburg (InvestitionsBank des Landes Brandenburg – ILB) and has been provided with 15 million Euros of ERDF resources and 5 million Euros of co-financing (ILB deposits).

Loans from the fund will be exclusively allocated to public projects that are part of an integrated urban development concept. For co-financing, the ILB takes a loan from the European Investment Bank.

Overview revolving fund scheme in the State of Brandenburg



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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 State of Brandenburg many support programmes for energy efficient refurbishment and renewable energies are available.

By a combination of different funding programmes financial support for integrated and energy efficient urban development measures can be realised.

Conclusion and Outlook

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 municipal level in the 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

Although integrated urban development offers optimum conditions for identifying energy saving opportunities, increasing energy efficiency and the intensified use of renewable energies, in many integrated urban development concepts of the last 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. Moreover the sustainable implementation of energy efficiency in urban development is also a social process that only leads to success if it find acceptance among all stakeholders, including policy and administration but also companies and population. Examples such as the Lübbenaubrücke collaboration show how successful this can be.

INNOVATIVE PROJECTS NEED INCENTIVE AND FUNDING

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 actors to become involved to a significant extent. Projects such as the community centre in Vetschau and the "Burg" children's day care centre in Luckenwalde can thus be enhanced and particularly their energy-efficient implementation can be furthered 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 rehabilitation, 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 good practice projects described indicate, high energy efficiency is only possible in many cases by using a combination of various 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

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companies and the connection conditions for the heat and electricity network. Therefore, the municipalities 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 ('intelligent networks') 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 put 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 stakeholders, which are economically sound, ecologically justifiable and socially compatible.

MOVING TOGETHER TOWARDS GREATER ENERGY EFFICIENCY

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

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