

## Vetschau/Spreewald – A Community Centre with Energy!

The energy-efficient renovation and conversion of a heritage protected school house



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### Summary

Within the context of an Experimental Housing and Urban Development (ExWoSt) pilot project, the former secondary school is being converted into a community centre with a nursery, senior citizens' club, music school and multi-functional civic hall. The energy-efficient renovation of the heritage protected brick building (dating from 1896/97) and the adjoining courtyard wing (built in 1934) includes installing a heating system that uses geothermal energy as well as fitting internal insulation that complies with regulations on historical buildings.

### Location

The town of Vetschau/Spreewald is in the region of Brandenburg on the edge of the Spreewald, approximately 90 km southeast of Berlin.

### Key data/indicators at municipal, regional and/or district level (in brief):

Around 8,800 people live in Vetschau/Spreewald (data from July 2010), however the town is severely affected by demographic changes in the region. The town centre includes the historic old town, with the community centre at its edge, as well as two large industrial housing districts, which are already the focus of comprehensive urban redevelopment measures. The social infrastructure in the town centre includes primary and secondary schools, two nurseries and a library. These are also used by the people living in village districts.

### Realisation/period of implementation

Building work began at the start of 2010. It should be completed in summer 2011.

### Status

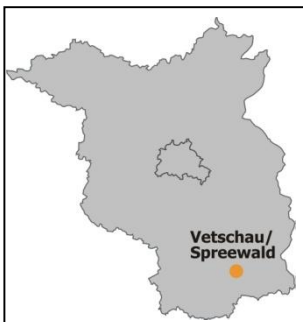
In the process of construction.

### Participants/partners in the project

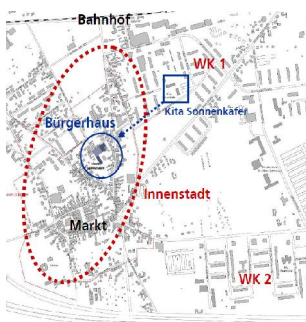
The town of Vetschau/Spreewald (owner of the building and responsible for the facility) in cooperation with the Sonnenkäfer Nursery, the senior citizens' club and the Oberspreewald-Lausitz District Music School.

### Participation/implementation process

The concept for using the building was developed within the framework of a feasibility study. Given the complexity of the task with regards to the architectural, conservation and energy-efficiency objectives, the decision was taken to hold a competition. Following a restricted competition to realise the plans, which attracted many innovative approaches, proposals were developed for the structural implementation of the design (which included an energy concept). The architecture firm which won the competition was commissioned to plan the project. Based on the initial blueprints, an application was made for funding from the Programme to Support the Energy-Efficient Regeneration of Social Infrastructure in Municipalities (Investment Pact – ESI). The plans then steadily took shape. Several workshops were held with the future users of the building to reach an agreement on the structural measures for the building and the grounds. In addition, test drilling was carried out and a suitable energy concept based on these results was developed.



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### Integrated approach

The community centre is a key measure for the Integrated Urban Development Concept, renovation plans for the old town and the concept for redeveloping the town. In addition, the project is linked to the pilot project “Spreewalddreieck Regional Energy Concept”, which was initiated under the National Urban Development Policy (NSP). Vetschau/Spreewald is participating in this initiative. The measure combines a number of different uses for the building and promotes dialogue between generations. This public facility also helps to strengthen the function of the old town and thus bring about a process of revitalisation. By supporting the energy-efficient renovation of the building, Vetschau/Spreewald is making an excellent contribution to climate change mitigation and putting the town’s motto into practice: A town with energy.



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### Technical solutions

The heating system uses a geothermal facility with a heat pump. The peak load requirements are covered by a condensing gas boiler. Under floor heating provides the ground floor with heat energy and overhead heating supplies the upper floors. A heat recovery ventilation system provides an additional way to help conserve energy. Internal insulation is installed in areas connected to the clinker brick facade and external insulation is used in all other parts of the building.

These measures will reduce the building’s energy requirements by over 50%. However, it will only be possible to obtain concrete results after construction has been successfully completed to the standards necessary to be issued with an energy pass.

### Funding/support

The total cost of the project (excluding the grounds) is approximately EUR 1.8 million. The majority of this cost is covered by grants from the Investment Pact ESI and the urban redevelopment sub-programme RSI. The municipalities would not be able to realise this structural renovation without considerable funding.



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### Success factors and innovations

The project demonstrates that it is possible to achieve high levels of energy efficiency in heritage protected buildings. The high costs of the project are mainly due to the renovation work and only partly a result of the energy-efficiency measures. As a multi-functional building, this project is making an important contribution towards strengthening the town centre and encouraging social integration.



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### Challenges and shortcomings

The main challenge is aligning issues such as heritage conservation and fire protection with the energy-efficiency goals, functional requirements and financial resources. Above all, this highlights the limits of the energy-efficient upgrading that can be achieved at a reasonable technical and financial expense.

### Transferability of solutions

The project is a positive example of how a municipality can reduce running costs and engage in climate change mitigation by carrying out energy-efficient renovations to its properties. The concept for using the building and linking the renovations in with the urban redevelopment process are new ways of realising integrated urban development. This initiative to reuse vacant buildings in the town centre that are important for urban planning by making the most of public infrastructure offers is an approach that can also be transferred to other areas. In addition, it shows how holding a competition can have a positive effect on the technical quality and public acceptance of a project.

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## Luckenwalde – District energy concept for the Nuthe/Burg quarter

### Model refurbishment options for typical buildings



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#### Summary

In the ExWoSt pilot project, the energy study of the Nuthe/Burg district is intended to demonstrate areas where action is needed on energy renewal. The study focuses on balance and visualisation of the district's energy needs and coverage (energy flow). Building on the analysis results, alternatives and priorities for implementation of energy measures which are also transferable to other urban districts will be developed. Individual projects will indicate model refurbishment options for typical buildings. They are primarily intended to gain experience in the realisation of ambitious energy remediation projects.

#### Location

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

#### Key data/indicators at municipal, regional and/or district level (in brief):

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

#### Realisation/period of implementation

From 2008, "Burg" day nursery refurbishment: February 2011 – December 2011

#### Status

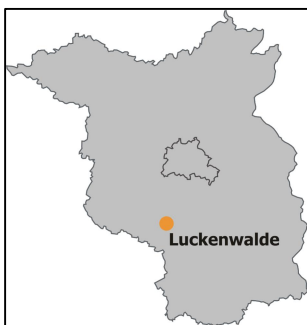
Luckenwalde is currently concentrating on the "Burg" day nursery project. The planning approval procedure was completed in 2010. Construction is expected to begin in 2011. Solutions are currently being researched for the energy improvements to the prefabricated concrete apartment buildings in the district, due to the increased demand for cheap housing. In addition to the refurbishment work, the local road network is also being restructured. This includes traffic calming measures around the day nursery.

#### Participants/partners in the project

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

#### Participation/implementation process

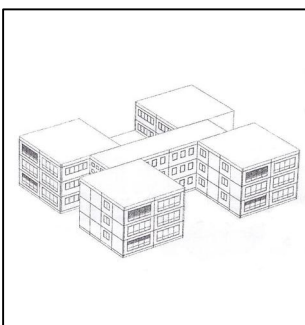
The "Burg" day nursery will be refurbished to energy efficiency standards and converted to a cross-generational district centre under the umbrella of the ExWoSt project. The primary objective of the refurbishment is to save energy through insulation and the use of efficient heating technologies, sustainable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



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## Luckenwalde – District Energy Concept for the Nuthe/Burg quarter

### Model refurbishment options for typical buildings

#### Integrated approach

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



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#### Technical solutions

Energy efficient refurbishment of the day nursery is achieved by the use of complex systems for insulation of the shell such as walls, roofs and basements and by replacement of the windows. Particular importance is placed on the use of ecological building materials and insulation of the building joints. The heat is supplied from a new system which incorporates an automatic ventilation system with heat recovery and the use of renewable energy through solar power for the hot water supply. The measures described can achieve an energy gain of around 60%. Through energy conservation and the use of solar power, CO<sub>2</sub> emissions can be reduced by 70% compared with the previous levels.



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#### Funding/support

The day nursery refurbishment project is financed by a combination of funds from the Investment Pact for Energy Improvements in the Communities (ESI programme) and the region of Brandenburg urban development grant. The energy relevant measures are supported by an 85% grant (Federal/State) under the ESI programme. The local authority provides the remaining 15% as its own contribution. The town receives additional funding for the other project costs in the form of a 90% subvention (Federal/State) from the RSI part of the Federal/State programme “Eastern urban reconstruction” and contributes 10% itself.

#### Success factors and innovations

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



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#### Challenges and shortcomings

One of the greatest challenges was the funding for the project. The refurbishment of the prefabricated concrete apartment blocks has been deferred in order to secure housing stocks for low-paid workers. A refurbishment would have resulted in rent increases.

#### Transferability of solutions

The project demonstrates model improvements in the overall energy balance of an urban district. Transferability is unlikely due to the high costs and the difficulty of funding the project.

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## Spremberg – Gartenstrasse Education and Leisure Centre

Energy upgrading of a former vocational education complex



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### Summary

The town of Spremberg is converting a former vocational education complex near the town centre to an education and leisure centre with a primary school and club house. The complex is built of precast panels and consists of two buildings and a gymnasium. This is an “Urban Energy Regeneration” pilot project under the “Experimental Housing and Urban Development” (ExWoSt) research programme of the Federal Ministry of Transport, Building and Urban Development (BMVBS). The results are incorporated in the production of a comprehensive urban energy concept.

### Location

The town of Spremberg is in the region of Brandenburg on the border with Saxony, about 140 km south east of Berlin.

### Key data/indicators at municipal, regional and/or district level (in brief):

The population of the town of Spremberg was about 24,800 at the end of 2009. Population levels are declining. The town lost around 8.5% of its inhabitants between 2001 and 2009. It has a historic centre with little adjoining ribbon development. The standard of refurbishment in the town centre is high. Around the periphery there are a number of residential areas built of precast panels, most of which are connected to the district heating system. There is full natural gas coverage.

### Realisation/period of implementation

2008 – 2011

### Status

The construction work on the former boarding/day school building with gymnasium and the club house is completed. The former school building has housed a primary school since November 2009. The refurbishment of the gymnasium and club house was completed in 2010. The next task is to update the urban development concept, which had an energy section added in late 2009/early 2010. By the end of 2011 a climate protection concept will be developed by the Spremberg municipal authority on the basis of the urban development concept and the plans implemented on energy measures and future tasks.

### Participants/partners in the project

The participants are the housing associations, the utilities, municipal politicians, interested citizens and the municipal authority.

### Participation/implementation process

On the initiative of the municipal authority, the “Urban Energy Regeneration” working group was set up as part of a workshop at the end of 2008. Its members are working on solutions for an energy supply covering the whole town. Along with the political groups and large housing associations, the working group also includes the utility companies.



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## Spremberg – Gartenstrasse Education and Leisure Centre

### Energy upgrading of a former vocational education complex

#### Integrated approach

The energy factors integrated in the urban development concept of the town of Spremberg form the basis for development of a logical overall strategy for more integration in district and/or town-based considerations of the individual projects on energy conservation, improving energy efficiency and increased use of renewable energies. This coherent overall strategy which takes changes in demographics, the economy and energy will facilitate sustainable urban development.



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#### Technical solutions

The heating supply for the new school building was secured by connection to the municipal district heating system which is based on combined heat and power. A comparison of the geothermal or district heating options based on the design requirements in the 2007 Ordinance on Energy Saving (EnEV) indicated lower primary energy consumption for the district heating option. The main potential for saving energy in the building was through replacing the windows and insulating the basement ceiling.

With regard to the gymnasium and club house which were also part of the complex, a comparison of options was carried out on the use of renewable energies such as solar power combined with different heat pump technologies. The results of the studies showed that the most sustainable package of measures for the gymnasium was the use of an air/water heat pump combined with a solar heating system for the hot water supply. The running costs can then be reduced by more than EUR 40,000.



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#### Funding/support

The refurbishment received about EUR 2.5 million of aid from Federal Government and the region of Brandenburg, with allocations of EUR 327,000 for the school building, EUR 360,000 for the club house, about one million Euros for the gymnasium and EUR 780,000 for the green and open space.

#### Success factors and innovations

The success of the project was assured by a very dedicated participants' organisation on the municipal side.

Thanks to the energy upgrade, savings in running costs have been achieved which are helping towards maintenance of the facilities.

#### Challenges and shortcomings

The refurbishment of the gymnasium with its barrel roof represented a major construction challenge for the town, particularly in terms of overcoming structural problems.

#### Transferability of solutions

The opportunities and limitations associated with measures and concepts for urban energy regeneration will be analysed and documented in the pilot project. The results obtained will be collated and analysed so that they can be used at other locations in the future.

The energy upgrades on the buildings are transferable to other projects. The high standards applied to this research project cannot be achieved without funding.



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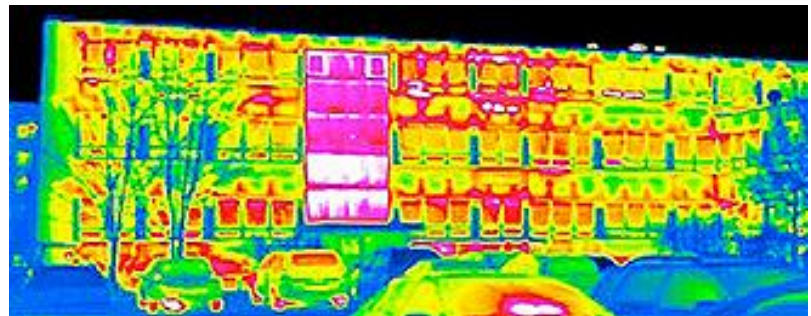
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## Cottbus – An Energy-Efficient School

Renovating a school complex to passive house standard



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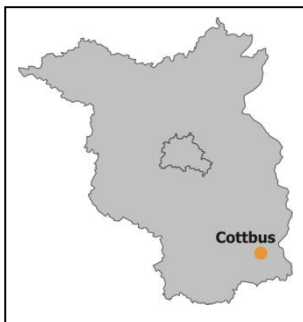
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### Summary

The school building, which was constructed in 1974 in the industrial “Erfurt” building style with an auditorium and sports hall, is undergoing an energy-efficient renovation for future use by the Max Steenbeck Gymnasium. The project has developed an excellent energy concept and its target is to meet the passive house standard and it is therefore a model for both energy-efficient renovation in other areas and climate change mitigation at municipal level. One of the integral components of the project is a monitoring system to analyse the achievement of objectives in the long term. Once construction has been completed at the end of 2011, the Brandenburg University of Technology (BTU) Cottbus will monitor the building operation intensively for two years until March 2014.

### Location

The independent city of Cottbus is in the region of Brandenburg in the Lausitz, approximately 110 km southeast of Berlin.

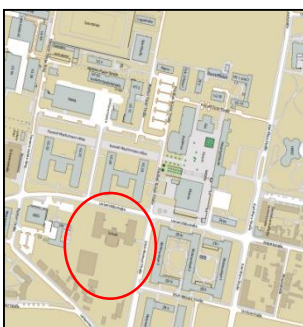


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### Key data/indicators at municipal, regional and/or district level (in brief):

Cottbus currently has around 101,800 inhabitants (data from July 2010), however as a result of demographic change, this figure is expected to decrease in the long term. The city’s urban structure was shaped by industrial development, particularly during the period of the German Democratic Republic, and the housing erected at this time. As a regional centre, Cottbus has a diverse range of social infrastructure and other services of general interest.

The project location is at the edge of the city centre close to the BTU Cottbus.



© BTU Cottbus

### Realisation/period of implementation

Building work began in summer 2010. It should be completed by the end of 2011.

### Status

In the process of construction.

### Participants/partners in the project

The city of Cottbus, ARGE Steenbeck, BTU Cottbus, Federal Ministry of Economics and Technology (BMWi)

### Participation/implementation process

The concept for the creation of a school that would meet the passive house standard was developed on the basis of a feasibility study which examined several renovation alternatives with different energy-efficient standards. A broad-based team of architects and specialist planners is shaping the implementation of the project. The priority was to ensure that the future user of the building, the Max Steenbeck Gymnasium, was intensively involved in the plans. The pilot project is receiving support from a number of sources, including the BMWi through the funding measure “Energy-Efficiency in Schools (EnEff: Schule)”. The project is also a focus of the research accompanying this programme. Another partner is BTU Cottbus, which is responsible for monitoring the project.



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## Cottbus – An Energy-Efficient School

### Renovating a school complex to passive house standard

#### Integrated approach

The project is part of the Integrated Urban Development Concept, which is currently being updated. It has also been incorporated into the pilot project “Brandenburg City Network for Climate Protection (BraNEK)”, which was initiated under the National Urban Development Policy (NSP). Cottbus is participating in this initiative. Energy-efficient renovation measures and housing technology will be part of the curriculum at the school, which specialises in science subjects. Once the project has come to an end, the monitoring technology will still be used because a monitoring post will be established in the experimental laboratory for school pupils (UNEX), which is open to all schools, on the ground floor of the building. Experiments can bring energy efficiency in buildings to life and the topic can be integrated into the curriculum and events held at BTU Cottbus or other training courses. Another component is focusing on accessibility in the building.

#### Technical solutions

The plans include the installation of high-quality external insulation, optimised window and glazing products, external blinds and efficient lighting as well as the use of long-lasting and sustainable energy-efficient building materials. The heating system uses a district heating cogeneration system, highly efficient heating pumps and a controlled ventilation system with heat recovery. Some of the distinctive building components include a geothermal energy transformer to preheat/precool the supply air, special insulating boards (PCM) built into the ceiling of the top floor as well as a geothermal facility for storing excess solar energy near the sports hall. These measures will reduce energy requirements by over 80%.

#### Funding/support

The total cost is around EUR 11.3 million. The project is partially financed by subsidies (primarily from the European Regional Development Fund (ERDF) for sustainable urban development and the Urban Redevelopment Sub-programme RSI) as well as municipal credit. This ambitious energy concept has been made possible by bundling a number of different funding resources.

#### Success factors and innovations

The project's energy concept is comprised of a number of very diverse components, which involve the use of innovative building materials and technology. One of the special features of the project is that different measures are being implemented in each wing of the building. The intensive monitoring system can provide a comparative assessment of their effectiveness. The building's users are closely involved in the project and the school pupils, for example, learn about ways to save energy.

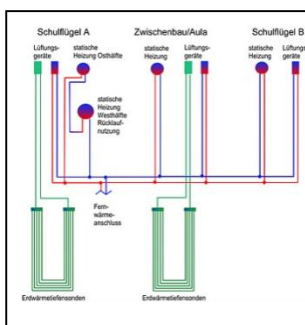
#### Challenges and shortcomings

The combination of different new technologies is particularly interesting. In some cases, there is no long-term practical experience with these technologies and in others it is necessary to develop specific structural solutions. One problem is the structural and financial magnitude of the project, which has its risks for Cottbus.

#### Transferability of solutions

Since the school building is a common type of structure that can be found in other areas (either with the same design or one that is similar), the results of this project could theoretically be easily transferred to other renovation measures. However, it is important to take into account the high financial costs of the technical solutions used.

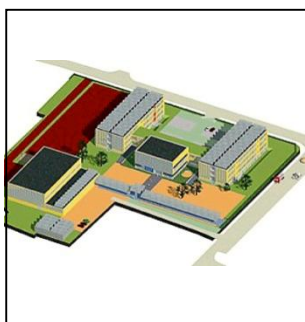
The scientific monitoring process will make it possible for the long-term results of the energy-efficient renovations to be evaluated and published.



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# City of Guben – Integrated Energy Strategy 2020

Reorganisation of energy supplies with regenerative energy sources in urban renewal



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### Summary

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



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### Location

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

### Key data/indicators at municipal, regional and/or district level (in brief):

Since 1990, the city of Guben has lost about 40% of its population and at the end of 2009 had approximately 19,000 inhabitants. Two thirds of the available housing are precast rented apartments which have for the most part been renovated and provide relatively good thermal insulation. Developments in the sphere of heat supply have been even more drastic with a 75% reduction in heat loss. Recently, the thermal power station and the fine distribution of heating supplies have been modernised, but not the transit lines. These are oversized and lead to 30% heat losses in transit to the end consumer.



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### Realisation/period of implementation

May 2009 – December 2009

### Status

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

### Participants/partners in the project

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

### Participation/implementation process

At an early stage, the major participants in the city joined together in advisory groups to develop the energy strategy and to work out the recommended measures for various spheres of activity and to provide information by means of awareness campaigns to be implemented in the short-term. Due to the process-driven nature of the energy strategy, it has to be regularly evaluated and reviewed. For this, a controlling system needs to be established, which is one of the priority measures.



## Stadt Guben – Integrated Energy Strategy 2020

Reorganisation of energy supplies with regenerative energy sources in urban renewal

### Integrated approach

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

Grundsatz	Kriterien
Wirtschaftliche und sichere Energieversorgung gewährleisten	Investitionskosten Energiekosten verlässliche Energieversorgung Lokale Wertschöpfung
Gesellschaftsverträgliche Energieversorgung garantieren	Abwanderung Arbeitsplätze Soziale Spannungen
Umweltverträgliche Energieversorgung sicherstellen	Erhöhung Energieeffizienz Anteil der Erneuerbaren Energien Umweltbelastung (v.a. Wasser, Luft) Stadt- und Landschaftsbild
Massnahmen - Mix gemeinsam mit Akteuren umsetzen	Akteure aus Politik, Wirtschaft und Gesellschaft Mehrere Handlungsfelder Ausmass der lokalen Verankerung
Pionierrolle der Stadt Guben stärken	Leuchtturmprojekt Medienwirksame Projekte Image der Stadtregion Guben

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### Technical solutions

Some of the aims of the energy strategy are implemented with target margins which focus in part on the energy strategy of the region of Brandenburg. In addition, various strategic approaches are being taken towards the renewal of energy supplies. Specific technical solutions that can or should be realised locally have not been identified and require further detailed investigation.

### Funding/support

The entire cost is EUR 100,000, funded 50% by the city's own resources and 50% with funding from the Stadtumbau Ost (Urban Renewal East) programme. Guben is a model city in the ExWoSt (experimental housing and urban development) research sector "Energetic Urban Renewal" and to this extent benefits from exchanges of experiences among the parties involved.

### Success factors and innovations

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

### Challenges and shortcomings

The greatest challenges now are the implementation of the energy strategy and the measures. Both city and power suppliers lack the necessary resources to implement an extensive bundle of measures. This not only affects investment projects but in particular also non-investment measures such as the important sectors of "organisation and coordination" as well as "public relations".

### Transferability of solutions

The project highlights the close interrelationship of technical infrastructure and urban planning and the interactions associated with this. Linking into the urban regeneration process is a vital precondition for the development of long-term sustainable solutions in the context of urban renewal. Early involvement of a wide range of participants highly important to the implementation of subsequent action is essential for the project to receive widespread acceptance from the start.

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## Lübbenau/Spreewald – Lübbenaubrücke / Energy 2021 Master Plan

### Strategies for urban energy regeneration



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#### Summary

The objectives of the Lübbenaubrücke project are refurbishment of housing units in line with requirements, design of urban redevelopment measures (particularly demolition and dismantling) compatible with the town and its inhabitants, upgrading of the residential environment, improvements to the infrastructure and strengthening of the local economy. In the context of the ExWoSt pilot project "Urban Energy Regeneration", the Lübbenau/Spreewald local authority is currently developing a municipal energy concept – "Energy 2021 Master Plan".

#### Location

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

#### Key data/indicators at municipal, regional and/or district level (in brief):

The population of Lübbenau/Spreewald was about 17,000 at the end of 2009. It has lost around 11% of its inhabitants since 2001. The town used to be prosperous due to the extraction of lignite and operation of a power station, but after the collapse of these industries it had to combat increased emigration by its predominantly young population. The old town has grown considerably in importance due to the significant rise in tourism since 1990 and with its castle and harbour its image is now that of an attractive jewel typical of the Spreewald.

#### Realisation/period of implementation

Lübbenaubrücke: From 1999, Energy 2021 master plan: Feb. 2009 – Dec. 2010

#### Status

The Energy 2021 master plan is currently being drawn up. The results at end 2010 will appear in the draft. At the same time detailed energy studies are being undertaken for the Neustadt South West district and the individual project "House for children and senior citizens" is in the construction phase.

#### Participants/partners in the project

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

#### Participation/implementation process

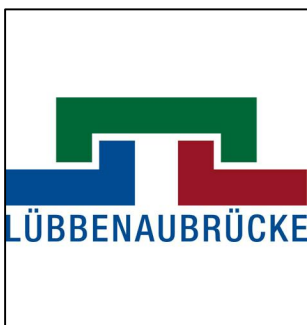
A central focus of the Lübbenaubrücke urban development and housing management project is cooperation and communication between all the participants and promotion of citizen involvement. Since 1999 many individual urban development projects have been completed. As far as refurbishment and modernisation of the housing stock is concerned, great emphasis is placed on energy efficiency and the use of new technologies.



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## Lübbenau/Spreewald – Lübbenaubücke / Energy 2021 Master Plan

### Strategies for urban energy regeneration

#### Integrated approach

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



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#### Technical solutions

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



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#### Funding/support

The Lübbenaubücke cooperation project was initially funded under the Federal States "Socially Integrated City" programme and later under the Federal States "Eastern Urban Reconstruction" programme. Federal Government, the region of Brandenburg and the municipality each provided one third of the funds required. The projects for energy efficient refurbishment of housing stocks are mainly funded by a combination of social housing grants from the region of Brandenburg and the Federal KfW renewable energies programmes.

#### Success factors and innovations

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



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#### Challenges and shortcomings

The challenges for the future will be priority inclusion of energy considerations in the urban regeneration sphere of activity for the town as a whole, implementation of ecologically optimised and economically realistic plans for CO<sub>2</sub> reduction and reducing local energy consumption.

#### Transferability of solutions

The town of Lübbenau/Spreewald is a perfect example of how important it is to include energy questions in the urban development process. More and more towns will have to face this question in the future due to prevailing conditions such as higher fossil fuels prices etc. At regional level the town is working with the three municipalities of Calau, Vetschau/Spreewald and the district of Burg (Spreewald), under a National Urban Development Policy (NSP) pilot project, on the production of a "Spreewalddreieck Regional Energy Concept".

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## Prenzlau – Renovation of the Residential Buildings 25, 27 and 29 Schwedter Straße

Energy-efficient renovation and redevelopment of old, heritage protected buildings



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### Summary

The three 19th century residential buildings (which include an individual heritage protected building) are on one of the main roads leading into Prenzlau city centre. The properties are owned by the municipal housing association and are currently completely empty, but since they are an important part of Prenzlau's cityscape, they are now to be renovated. Within in the context of an Experimental Housing and Urban Development (ExWoSt) pilot project to promote urban regeneration, the plan is to redevelop the buildings in an economically sustainable way to provide accommodation suitable for all generations and at the same time to implement energy-efficient renovations that comply with regulations concerning historical buildings. The project is part of the city's energy supply concept, which involves the city of Prenzlau, housing associations and public utility companies as well as energy producers, plant operators and other business partners.



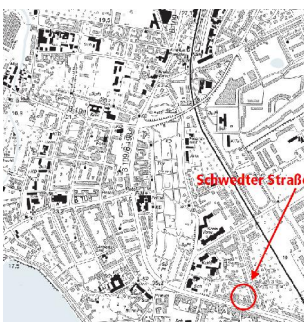
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### Location

The city of Prenzlau is in the region of Brandenburg in the Uckermark District, approximately 90 km north of Berlin.

### Key data/indicators at municipal, regional and/or district level (in brief):

Prenzlau has roughly 20,200 inhabitants (data from July 2010). It is expected that the population will decrease in the future as a consequence of demographic change. The city suffered extensive damage during the war and as a result the structure of the city centre is characterised largely by industrial apartment blocks. Schwedter Straße is one of the city's few remaining areas with old buildings. As the district capital and a medium-sized centre, Prenzlau has assumed an important role in supplying public services, both at local and regional level. These include a complete range of different schools, a hospital, facilities for senior citizens, youth clubs and museums.



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### Realisation/period of implementation

Building work is scheduled to begin in 2011. It should be completed in 2012.

### Status

At the planning stage, funding applications are being coordinated.

### Participants/partners in the project

Wohnbau GmbH, the city of Prenzlau, Stadtwerke Prenzlau GmbH

### Participation/implementation process

On the basis of a feasibility study into renovating the building conducted in 2008, a competition was held in 2009. Five planning cooperatives developed alternative proposals for a redevelopment process that included an energy concept. Two of these bids were revised in the next stage of the process and then re-evaluated by the jury. The winning cooperative then finalised the design, focusing in particular on optimising its cost-effectiveness. At the end of 2010, a funding application was submitted to the investment bank of the region of Brandenburg.



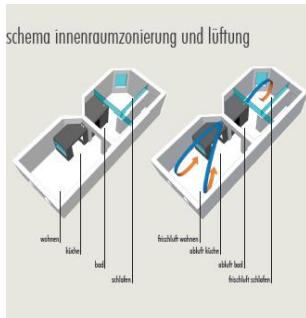
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## Prenzlau – Renovation of the Residential Buildings 25, 27 and 29 Schwedter Straße

Energy-efficient renovation and redevelopment of old, heritage protected buildings

### Integrated approach

The energy-efficient renovation of old buildings to provide accommodation suitable for all generations is a key focus of the Integrated Urban Development Concept and the city's urban redevelopment strategy. By creating new apartments to meet local demand within an old building (part of which is heritage protected), the project is making a contribution to stabilising the city centre area. Linking the project in with the city's energy supply concept, which involves the city, housing associations and public utility companies as well as energy producers, plant operators and other business partners, also contributes to sustainable urban development.



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### Technical solutions

The heating system is connected into the district heating network. Part of the network's supply already comes from renewable energies. The aim is to further increase the efficiency of this system in the future by using geothermal energy. Any excess heat produced in the summer months will be stored in an aquifer and fed back into the network in the winter months. Within the building itself, a heat recovery ventilation system helps to save energy. In order to adhere to heritage protection regulations, internal insulation is installed behind the stucco facade facing the street. External insulation is used for the courtyard facades.

### Funding/support

The estimated total cost is around EUR 4.4 million. Sources of funding include a loan from Brandenburg's social housing fund (Generations-gerechtModInstR) and grants from the Urban Redevelopment Programme and the EU Lifts Directive. It would not be feasible to rely on private financing to realise the project due to the high building costs and the limited opportunity to use rental income for refinancing.

### Success factors and innovations

The project highlights the potential to conserve considerable amounts of energy in heritage protected buildings. In particular, connecting the building to the district heating network, which uses some renewable energy sources, makes it possible to heat the building in an environmentally-friendly way. One of the main success factors is the remarkable involvement of the local authority in organising the project and in making funding available for renovation.

### Challenges and shortcomings

The main challenge with this project is harmonising the various target areas (building costs, rentability, functionality, heritage conservation and saving energy). One particular difficulty is adapting the original floor plan, which was designed to suit the tastes of the haute bourgeoisie and is no longer in demand in Prenzlau, to create small, accessible apartments that meet modern living requirements.

The energy concept illustrates the technical limits of the renovation of old buildings and the importance of examining the cost—benefit ratio for energy-efficient renovation.

### Transferability of solutions

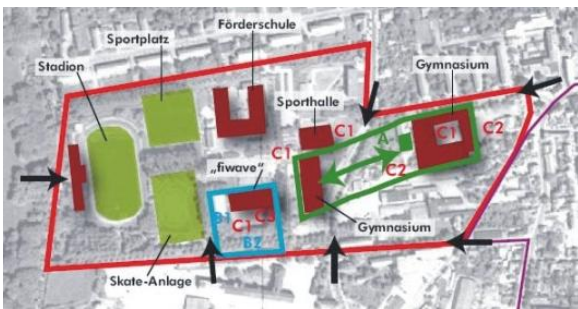
The structural solutions developed in this project can also be used for the energy-efficient renovation of the 19th century structures and similarly old buildings in other cities. This topic is especially important given the need for action to be taken to upgrade city centre residential buildings. Integrating the city-wide energy concept with seasonal heat storage is a pioneering strategy, which could also be considered by other municipalities restructuring their district heating networks.

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## Finsterwalde – School and sports campus

Urban energy regeneration at the Finsterwalde-West sports and leisure venue



© INSEK Finsterwalde



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### Summary

The town of Finsterwalde has set itself the goal of developing sustainable energy supply offerings. In this context it is intended, for example, to reduce the energy requirement of public buildings and switch supplies progressively to renewable energy sources. The school and sports campus project is an ExWoSt pilot project for urban energy regeneration and includes a varied package of measures for energy upgrading of a town centre education and leisure venue with various buildings, some under heritage protection.

The core of the project is the refurbishment of the so-called Former "Innere", an assembly hall shared between two high schools which will be amalgamated in this context.

### Location

The town of Finsterwalde is in Lower Lausitz in Southern Brandenburg, about 100 km south of Berlin.

### Key data/indicators at municipal, regional and/or district level (in brief):

Finsterwalde has a population of about 17,500 (07/2010 data), but is affected by falling population numbers due to the demographic changes in the region. Its centre comprises the historic old town, districts with precast concrete panel housing, small-scale residential areas and industrial areas. As a medium-sized centre, Finsterwalde plays a supply role beyond the local and has important public infrastructure, e.g. the district hospital, many educational institutions, an indoor swimming pool and several museums.

### Realisation/period of implementation

The initial packages (e.g. refurbishment of the gymnasium) are already completed. The energy upgrade of the Sängerstadt high school campus, the largest project module, is due to be completed by 2012. Other parts of the project are still at the planning and preparation stage.

### Status

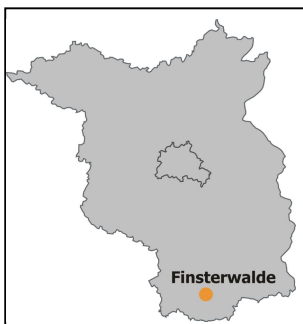
Partly completed, partly under construction, partly in planning

### Participants/partners in the project

Municipality of Finsterwalde, Stadtwerke Finsterwalde GmbH, district of Elbe-Elster, HACON Ingenieurgesellschaft mbH

### Participation/implementation process

The initial project approaches were developed in the context of the Integrated Urban Development Concept. The viability of the alternative energy supply to the school campus was examined in a feasibility study in 2009. The funding for the campus pilot was secured by linking the project closely to the urban redevelopment process, so that construction could begin on that package in the spring of 2010.



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## Finsterwalde – School and sports campus

### Urban energy regeneration at the Finsterwalde-West sports and leisure venue

#### Integrated approach

The project is a key component of the Integrated Urban Development Concept. Rather than just being an energy upgrade for the location consisting of several infrastructure facilities, its main purpose is functional amalgamation: In the context of the school campus pilot, two previously independent high schools are being combined into one high-performance institution. The synergies between schools, sports and other leisure amenities are being expanded. The measures contribute to functional strengthening of the town centre and the sustainable use of precious building stocks.



© Stadt Finsterwalde

#### Technical solutions

In the context of the energy upgrade to the listed school buildings, various measures are planned, such as conversion of the heating system and improvements to the thermal insulation.

For the sports and leisure venue, the possibility of installing a local heating network with energy from combined heat and power and retrofitting buildings with solar power and photovoltaic systems is under review. Long term, another school building and the “FiWave” swimming pool will be integrated in the energy concept to create an even more efficient overall structure.



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#### Funding/support

The costs for the school campus are around EUR 3.1 million and are mainly funded through grants from the RSI urban redevelopment sub-programme. The project would have been impossible to implement without the urban development funding. As yet there are no funding plans for the other project modules.

#### Success factors and innovations

The project highlights the options by which an existing school with some landmarked buildings can be upgraded to a high energy standard. The project's distinctiveness lies in the development of a campus model with many interlocking functional modules.



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#### Challenges and shortcomings

The combination of different providers was a major challenge. Previously the energy regeneration focussed on individual projects such as the sports hall and high school. The amalgamation of all the infrastructure at the location into one joint energy supply concept has not yet been completed due to technical and financial problems. One of the reasons for this is the heterogeneous building stock which is characterised by different types of construction, levels of refurbishment and conditions of ownership and requires a very complex project concept.

#### Transferability of solutions

Regardless of the actual level of realisation, the conceptual approach of amalgamating several structures at a location into a functional complex with a shared energy supply system is generally estimated to be transferable. The chances of realisation should be particularly good if the refurbishment standard is generally lower and the opportunity exists to create an efficient local supply system.

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## Städtekrantz (urban network) Berlin-Brandenburg/Brandenburg energy-efficient city, and climate-change prevention (BraNEK)

Pilot project as part of the National Urban Development Policy of the Federal Ministry for Transport, Construction and Urban Development (BMVBS)/ Federal Institute for Construction, Urban and Land-Use Research (BBSR)



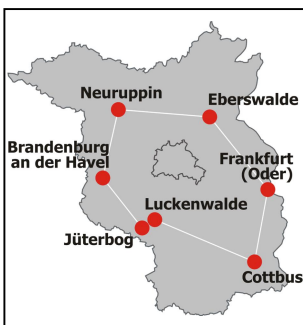
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### Summary

Building on the existing network structures of the intercommunity consortium "Städtekrantz Berlin-Brandenburg" (the Berlin-Brandenburg urban network), Brandenburg energy-efficient city, and climate-change prevention (BraNEK) aims to equip municipal authorities for the challenges of climate-change prevention and energy efficiency. The objective is to collate and process existing community experience and expertise, to identify the most important opportunities for concerted action, the development of a basic general approach to local strategies, the establishment of long-term communication structures between and within the cities, support for local activities and the development of a reference base for pilot projects.

### Location

The seven cities of the BraNEK network are in the region of Brandenburg between 50 and 120 km from Berlin.



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### Key data/indicators at municipal, regional and/or district level (in brief):

The cities of the network vary widely in their structure, with populations ranging between approximately 12,000 and up to 100,000 inhabitants. They play a major role as local and regional centres and have a significant function in development issues in the region itself.

### Realisation/period of implementation

April 2010 – December 2011

### Status

The network project work commenced with the project launch in April 2010.

### Participants/partners in the project

The project has the support of the seven member cities of the intercommunity consortium "Städtekrantz Berlin-Brandenburg". These are Brandenburg an der Havel, Cottbus, Eberswalde, Frankfurt (Oder), Jüterbog, Luckenwalde and Neuruppin. The key participants and also the beneficiaries of the project are the municipal administrations of the seven cities, in particular in the sphere of urban development. The network has agreed on informal cooperation with the Climate Change Research Platform of the Potsdam-Institut für Klimafolgenforschung e.V. (the Potsdam Institute for Climate Impact Research), Brandenburg Energy Technology Initiative (ETI) and the Spreewalddreieck Regional Energy Concept Project.

### Participation/implementation process

The project is designed as a workshop process and relies on experience transfer and the discussion process, building directly on current developments. Since the kick-off meeting in April 2010, three workshops have been held, and a further five are planned to take place by December 2011. In parallel with the workshops, an internet presence on the Städtekrantz Berlin-Brandenburg website and the first of five newsletters are currently being prepared.



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## Städtekrantz (urban network) Berlin-Brandenburg/Brandenburg energy-efficient city, and climate-change prevention (BraNEK)

Pilot project as part of the National urban development policy of the Federal Ministry for Transport, Construction and Urban Development (BMVBS)/ Federal Institute for Construction, Urban and Land-Use Research (BBSR)

### Integrated approach

The BraNEK project is based on an integrated approach, involving all specialist departments of the municipal authorities. As a first step, a baseline survey in the cities, other local participants (including public utility companies) have also been actively involved. Approaches have been identified for urban networks and have also been initiated. The objective is the interlinking of the multidisciplinary issue of "climate-change prevention" with integrated city development in order to benefit from synergetic effects.



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### Technical solutions

The purpose of the project is, among other things, to create a basic procedural framework for local climate-change prevention strategies. In the context of the development of such strategies, which are not part of the project, solutions will be developed which also involve technical implementations and innovations.

### Funding/support

The project, with a budget of approximately EUR 200,000, will be promoted as part of the "National Urban Development Policy" of the BMVBS/BBSR. The member cities contribute both human resources and financial investment by means of membership contributions to the "Städtekrantz Berlin-Brandenburg" intercommunity consortium.



NATIONALE  
STADT  
ENTWICKLUNGS  
POLITIK

### Success factors and innovations

The project is innovative, in particular because of its nature as a network and an experiment in pioneering a new kind of approach in this sector. Highlighting the success factors in the community initiative is an essential part of this project. The involvement of other participants too, is another example to be followed. The chosen approach aims at integration of the spheres of urban development activity affected, as well as concerted action. The planned methodological results will enable the cities to work out specific urban strategies.

### Challenges and shortcomings

The absence or limitations of human and financial resources available to the municipal authorities present significant challenges to the cities. One important task is currently also the generation of awareness among the community, city authorities and local participants concerning the challenges of climate change.

### Transferability of solutions

In particular the innovative networking aspect of the project is a model approach for local community governments. Where financial and human resources are restricted, networking and exchanges of experience provide an effective opportunity to undertake new tasks, joint approaches and also to work out positions on issues. To bring together the many people involved in environmentally-responsible cities, integrated approaches, in particular at city and district level, must be pursued over and above energy-conserving renovation.



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## Spreewalddreieck Regional Energy Concept

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



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### Summary

By taking positive action, the communities involved in the project aim to tap into the ecological, economic and social potential of an energy policy established at local level. The focus is on reducing energy consumption, decreasing CO<sub>2</sub> pollution in the atmosphere, increasing the efficiency of energy distribution systems and encouraging greater use of renewable energies. This project, which was initiated under the "National Urban Development Policy" (NSP), aims to develop a comprehensive overall plan for the region which can be used as a basis for a joint energy strategy and also for producing well-planned individual projects in the future.



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### Location

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

### Key data/indicators at municipal, regional and/or district level (in brief):

The region covers an area of 538 km<sup>2</sup> and is home to around 44,500 people (data from December 2009). Both Vetschau/Spreewald and Lübbenau/Spreewald have been centres of energy production for a long time. In the past, the towns were defined by brown coal mining and the two large power stations nearby; however, since March 2007, both towns have been part of the "Innovative Energy Region Lausitz-Spreewald", which aims to develop sustainable energy policy.

### Realisation/period of implementation

December 2009 – November 2011

### Status

The project is currently working with regional participants to determine the regional framework conditions.

### Participants/partners in the project

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

### Participation/implementation process

A communication platform in the form of a round table has been established to support coordination and decision-making. This enables important participants from the administrative, political and academic spheres as well as regional energy providers, energy producers and energy consumers to discuss strategies and issues. The three working groups (energy providers, energy consumers and energy producers) carry out the substantive work and their findings are brought together during round table sessions to form an integrated overall concept.



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## Spreewalddreieck Regional Energy Concept

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

### Integrated approach

It is expected that linking together various sectorial issues, such as energy conservation, energy production and power supply, and also encouraging cooperation between a broad spectrum of participants will have a considerable synergy effect. Priority is giving to the “learning process”, which promotes discussion between key participants. The municipalities see themselves as the initiators and facilitators of a broad dialogue, however they are also prepared to develop their own contributions. In addition, the project plans to explore, on a pilot basis, an inter-municipal scope of action and to motivate other towns to develop strategies for sustainable and energy-efficient town structures.



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### Technical solutions

With support from the Brandenburg University of Technology (BTU) Cottbus, the project aims to evaluate the technical and economic feasibility of individual measures for increasing energy efficiency and also to draw up proposals for further developing power supply systems.

### Funding/support

The project's gross budget is EUR 88,000. As a recognised pilot project within the framework of the research programme “National Strategy Plan for an Integrated Urban Development Policy – Pilot Projects Initiated Under the National Urban Development Policy”, the initiative has been given a grant of EUR 37,500 by the Federal Government. The municipalities participating in the project provide the remaining funds.



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### Success factors and innovations

The project is exploring a new way to solve the complex challenges posed by climate change mitigation on a regional scale. Both increased cooperation between neighbouring municipalities and providing a means for exchange with key regional actors on interests and problems are an important impetus towards drafting regional development strategies that extend beyond municipal level.

### Challenges and shortcomings

The greatest challenges are in overcoming conflicts of objectives, particularly in technical and economic areas. One problematic issue, for example, is maintaining a steady supply and price stability while at the same time increasing the proportion of renewable energies. Input from a large number of small renewable energy facilities leads to a high fluctuation, making it necessary to reconstruct or upgrade the supply network. Another point of conflict concerns public acceptance of the essential network upgrade. There is already resistance to the construction of further power lines. In addition, any work to improve the electricity network results in price increases for the end consumer.

### Transferability of solutions

Above all, the initiative is expected to develop transferable approaches for “climate change mitigation and global responsibility” and “regionalisation”. In addition, the project is showing potential in “activating regional economic cycles” and “participation”. The aim is to produce recommendations for establishing sustainable cooperation in other towns and regions based on the lessons learned from implementing the project.



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