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An Initiative of the Federal Ministry of Education and Research



As part of the flagship initiative „City of the Future“, the Federal Ministry of Education and Research’s (BMBF) funding initiative **„Resource-efficient Urban Districts for the Future“** supports the development and testing of implementation-oriented concepts for the management of water, land use and material flow for the sustainable development of cities.

The networking and transfer project ReQ+ ensures the networking of the collaborative projects involved and supports the transfer of sustainable solutions into municipal practice.





# ReQ+ – Cross-cutting scientific project – Networking, communication and transfer

**In the context of a funding program to support research projects**

## Motivation

The funding program, as part of the flagship initiative “Zukunftsstadt” (“future city”) addresses the development and implementation of innovative concepts for greater resource efficiency in urban districts. The cross-cutting project supports the participating groups and alliances in the implementation and transfer of sustainable solutions into municipal practice.

## Aims and methods

One objective of ReQ+ is to network the content of the projects involved, e. g. by organizing joint events. In addition, cross-cutting topics of overarching interest are prepared for the groups and alliances in workshops and discussion rounds. A further objective is establishing transparency beyond the project and networking with other relevant stakeholders through targeted public relations work.

## Expected results and transfer

The results of the groups and alliances will be compiled and evaluated, and their contribution to the German sustainability strategy will be presented. The transfer to various stakeholder groups from politics, business, science and municipalities takes place through regional offers and also via a practical handbook and a freely accessible training module.



Resource-efficient urban districts – proposed solutions for water management, area and material flow management

**Funding initiative:** Resource-efficient urban districts (RES:Z)

**Project title:** ReQ+ – Cross-cutting scientific project for the BMBF funding program “Resource-efficient neighborhoods for the future”

**Duration:** 01.12.2018–31.12.2022

**Funding code:** 033W100A-B

**Funding:** 1,299,629 €

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**Photo credits:** Adobe Stock/maryrose5



# BlueGreenStreets – multifunctional streetscape design in urban neighborhoods

## Development of resource-efficient streetscapes for the cities of the future

### Motivation

Green spaces and open water areas within cities do not only contribute significantly to the quality of life, but also for the microclimate within neighborhoods. In growing cities, the risk of flooding is increasing due to urban development. The task of future development is therefore not only to develop different land uses side by side, but also to combine them. Urban greenery and urban flood protection need to be integrated into multifunctional streetscapes.

### Objectives and procedure

The project aims to investigate, evaluate and improve the effectiveness of planning instruments and regulations concerning urban green infrastructure, urban water management, the repair of roads and canals, and streets and open spaces. Streetscapes should be designed to be sustainable and thus to serve the multifunctional needs of urban neighborhoods.

### Expected results and transfer

To increase resource efficiency in growing districts, planning tools are developed and tested on-site, in cooperation with key urban stakeholders. The transferability to other municipalities is ensured by the creation of model solutions which can be integrated into the streetscape.



Multi-talented street space – good examples for future urban development improve still further

**Funding initiative:** Resource-efficient urban districts (RES:Z)

**Project title:** BlueGreenStreets – Multifunctional streetscape design in urban districts

**Duration:** 01.03.2019–28.02.2022

**Funding code:** 033W103A-H

**Funding:** 2,556,322 €

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**Internet:** [hcu-hamburg.de/bluegreenstreets](http://hcu-hamburg.de/bluegreenstreets)

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# BoHei – A neighborhood reinvents itself – Integrated resource-efficient urban development

**Involvement of all relevant stakeholders in the design of urban districts that are worth living in**

## Motivation

The buildings in the Bolzstraße district in the south of Heilbronn were built in the pre-war and immediate post-war period. In carrying out the necessary renovations and urban developments in the context of urban consolidation, the city attaches particular importance to an adequate participation of those affected, especially the residents.

## Objectives and procedure

For the selected urban district, the most balanced and livable building density will be established together with the relevant groups of stakeholders. In the transformation concept, exemplary proposals for increasing resource efficiency in the areas of land management, urban material flows and urban water management will be established and integrated into the planning processes of urban development.

## Expected results and transfer

By the end of the project, an urban development framework plan will have been established for the model district of Bolzstraße in Heilbronn, which can then be implemented in practice. The results will be summarized in a guideline with a set of recommendations for action, and made available to other municipalities throughout Germany.



Bolzstraße urban district in Heilbronn - Exemplary solution proposals for resource-efficient urban development

**Funding initiative:** Resource-efficient urban districts (RES:Z)

**Project title:** BoHei – A district reinvents itself – Integrated resource-efficient urban development in the south of Heilbronn

**Duration:** 01.03.2019–28.02.2022

**Funding code:** 033W104A-C

**Funding:** 990,042 €

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# GartenLeistungen – Evaluation of the multidimensional services of urban greenery

## Urban greenery for sustainable and resource-efficient cities of the future

### Motivation

Urban gardens, public parks and green spaces in cities compete with other land use options for increasingly scarce space. Although urban greenery fulfills a variety of services for urban society, it often plays a subordinate role in urban area management. Economically more lucrative uses of land are often the focus of municipal planning, leading to a crowding-out of green spaces.

### Objectives and procedure

The project evaluates the multidimensional relevance of urban gardens, parks and green spaces for urban society. To this end, material flows and ecological and social impacts are quantified using a set of analytical instruments that are developed and evaluated together with relevant urban stakeholders. In collaboration with the cities of Stuttgart and Berlin, as well as with further stakeholders, the instruments developed are applied to specific case studies.

### Expected results and transfer

Through a comprehensive evaluation of the services provided by urban gardens and parks, the project will provide detailed information for political decision makers regarding sustainable area management. The approaches developed will be tested and optimized in real-world laboratories (living labs) in Berlin and Stuttgart.



Green space in Berlin - recording and evaluation of the multidimensional services

**Funding initiative:** Resource-efficient urban districts (RES:Z)

**Project title:** GartenLeistungen – Urban gardens and parks: Multidimensional services for a socially, ecologically and economically sustainable management of urban areas and material flows

**Duration:** 01.04.2019–31.03.2022

**Funding code:** 033W107A-J

**Funding volume:** 2,164,880 €

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**Project partner:** TU Berlin; Humboldt-Universität zu Berlin; Landeshauptstadt Stuttgart; Universität Stuttgart; himmel-beet gGmbH; Kulturinsel Stuttgart gGmbH; Grün Berlin GmbH; TERRA URBANA Umlandentwicklungsgesellschaft mbH

**Internet:** [gartenleistungen.de](http://gartenleistungen.de)

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# IWAES – Integrative consideration of sustainable heat management in urban districts

## Well-adjusted heat and cold balance for sustainable urban development processes

### Motivation

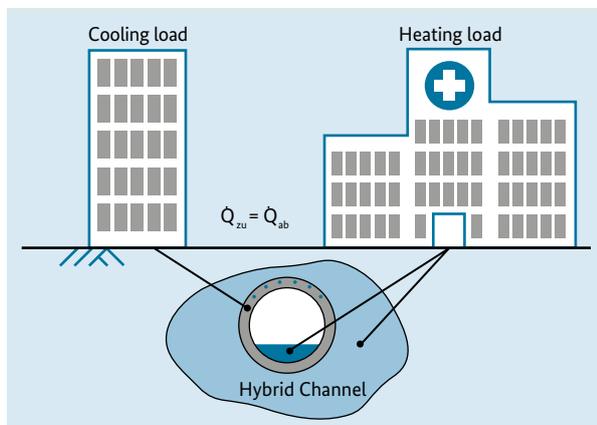
Energy-efficient districts are important for the implementation of the government's climate protection goals. A well-adjusted heat and cold balance in each district is a prerequisite for sustainable urban development.

### Objectives and procedure

The overall objective of the project is to activate the existing infrastructure systems of urban water management usable for the storage, transport and retrieval of heat and cooling energy within a city district. The infrastructural coupling of the cooling and heating requirements of different consumers forms the basis for a well-adjusted heat balance in urban districts. On the basis of measurements and simulations, existing technologies for heat and cold transport will be further developed, and concepts will be established for integrating the approach into urban planning.

### Expected results and transfer

The project provides concepts and technologies for the thermal activation of infrastructures in urban water management. Using a model district in Stuttgart, their implementation and integration into the urban development process will be tested.



Balanced heat balance in the urban district – thermal activation of plants of the urban water management

**Funding initiative:** Resource-efficient urban districts (RES:Z)

**Project title:** IWAES – Integrative consideration of a sustainable heat management of urban districts in the urban development process

**Duration:** 01.04.2019–31.03.2022

**Funding code:** 033W106A-G

**Funding:** 1,311,873 €

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**Internet:** iwaes.de

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# Leipziger BlauGrün – Blue-green district development in Leipzig

## Multifunctional infrastructures for energy- and water-efficient urban districts

### Motivation

Leipzig is a growing city. The development of additional living space in the city center is therefore an important goal of sustainable urban development. However, increasingly dense urban neighborhoods and the consequences of climate change (heat, extreme rain events) put great strain on the water and energy infrastructure. As a result, the city's stakeholders are confronted with new planning and legal issues.

### Objectives and procedure

The project aims to significantly reduce the load on the central sewage system, improving the energy efficiency and the microclimate, and achieving a climate resilient urban water management. The development of new, transferable blue-green technologies and planning tools, and a sensor-based, robust process control, are the key to achieving these objectives.

### Expected results and transfer

The results are directly incorporated into the conception and implementation of the model district „Eutritzscher Freiladbahnhof“ in Leipzig. In addition, impulses and effects in the field of multifunctional blue-green infrastructure are expected for the whole city, which will contribute to sustainable urban development both nationally and internationally.



Green roof - example of multifunctional blue-green infrastructure:  
Energy supply, water retention, water storage, evaporation

**Funding initiative:** Resource-efficient urban districts (RES:Z)

**Project title:** Leipziger BlauGrün – Blue-green district development in Leipzig

**Duration:** 01.10.2019–30.09.2022

**Funding code:** 033W110A-K

**Funding volume:** 2,806,699 €

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**Project website:** [ufz.de/leipziger-bg](http://ufz.de/leipziger-bg)

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**Photo credits:** A. Künzelmann/UFZ

# NaMaRes – Resource management in urban district in the context of sustainable urban development

## Software solutions for sustainable urban development

### Motivation

Cities and communities are affected by climate change and consequences of the use of natural resources and environmental pollution. However, they strongly influence environmental impacts and can actively contribute to sustainable transition. The goal of this project is to develop an Urban Resource Management Support Tool which enables city administrations and other stakeholders to monitor the use of natural resources (here: land, water, materials) on district level and establish an active resource management.

### Objectives and procedure

The overarching goal is to account for and visualize the use of resources in urban areas and its potential consequences for different stakeholders to fill blind spots in the planning process. First, an assessment scheme with relevant fields of interests and subordinate indicators will be developed. Then, interrelations and effects of resource use in the district will be modelled and consequences and conflicting goals for different stakeholders will be examined. With the base of this scientific knowledge a GIS-based software tool will be developed, implemented and tested in an urban case study district in the city of Karlsruhe.

### Expected results and transfer

The tool and an accompanying guideline will enable the transfer of the results and support sustainable decision making in district governance and sustainable urban transition processes.



Resource management in the neighbourhood comprises many aspects: NaMa-Res develops a platform for digital land use, water and resource management

**Funding initiative:** Resource-efficient urban districts (RES:Z)

**Project title:** NaMaRes – Assessment of the ecology, cost effectiveness and social effects of resource-efficiency measures at district level – from an economic to a stakeholder-specific perspective

**Duration:** 01.04.2019–31.03.2022

**Funding code:** 033W111A-C

**Funding:** 1,207,107 €

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**Internet:** [iip.kit.edu/1064\\_4242.php](http://iip.kit.edu/1064_4242.php)

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**Photo credits:** Rebekka Volk, IIP/KIT

# OptiWohn – Development of innovative strategies for the optimized use of living space

## Demand-driven living in resource-optimized urban districts

### Motivation

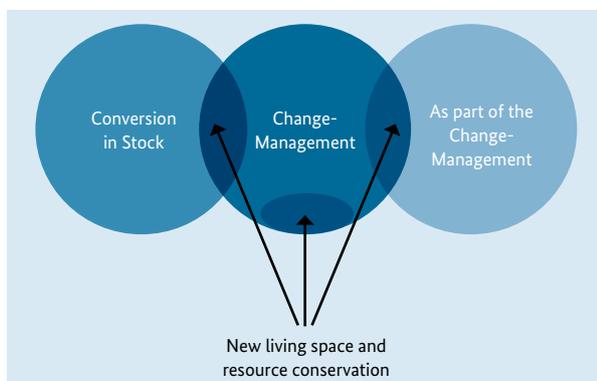
Many municipalities are trying to resolve housing shortages by constructing new residential buildings. The construction of new houses, however, requires significant amounts of land and high resource consumption. Much of the housing demand can be covered by existing residential buildings if, after changes in their living situation (e. g. when their children move out), people opt for smaller living spaces and alternative housing concepts.

### Objectives and procedure

The project is investigating how to actively encourage an optimized use of living spaces. The core of the project is the development and establishment of municipal housing agencies. These will identify housing needs in the district, offer advice to those looking for accommodation, arrange alternative housing or initiate offers to exchange houses.

### Expected results and transfer

In addition to offering advice and support for optimizing the use of living space in the cities of Cologne, Göttingen and Tübingen, the results will be translated into recommendations for municipal action, which are intended to appeal not only to cities and municipalities but also to other stakeholders. In addition, a nationwide funding program for area-efficient living is being developed.



Strategies for the optimized use of living space – Change-Management, reconstruction and new building

**Funding initiative:** Resource-efficient urban districts (RES:Z)

**Project title:** OptiWohn – District-specific exploration and development of innovative strategies for the optimized use of living space

**Duration:** 01.04.2019–31.03.2022

**Funding code:** 033W101A-F

**Funding:** 1,575,185 €

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**Photo credits:** Wuppertal Institut für Klima, Umwelt, Energie



# R2Q – Resource planning for urban districts

## Practical planning instruments for the efficient management of resources

### Motivation

Cities place high demands on land, water, materials and energy resources. It is therefore important to achieve a sustainable use of resources in cities. Residential districts are manageable planning units and particularly suitable for change and participation.

### Objectives and procedure

The project will develop a planning instrument enabling the systematic, efficient and method-oriented management of resources in urban districts. Planning and evaluation tools, construction and process engineering as well as ideas for participation procedures for resource management are brought together in a practice-oriented “building set”. This gives planning authorities, for example, access to improved simulation approaches for flood events and methods to analyze and evaluate multifunctional land uses.

### Expected results and transfer

By involving other cities, the project specifically supports transfer into practice. The modular structure of the project results allows them to be transferred to other municipalities.



Resource planning for urban districts - development and testing in the city of Herne

**Funding initiative:** Resource-efficient urban districts (RES:Z)

**Project title:** R2Q – Resource planning for urban districts

**Duration:** 01.03.2019–28.02.2022

**Funding code:** 033W102A-K

**Funding:** 2,189,651 €

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KWB Kompetenzzentrum Wasser Berlin gGmbH; Jung Stadt-  
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**Photo credits:** Stadt Herne



# RessStadtQuartier – Instruments for a resource-efficient development of urban districts

## Guidelines for the integration of urban “raw material warehouses” into district development

### Motivation

Buildings represent society’s largest “raw material warehouse” and at the same time account for a significant proportion of the energy demand. Urban districts in conurbations are currently subject to a variety of pressures for change. The goal is to use this opportunity to increase the resource efficiency in the “life cycle” of the district.

### Objectives and procedure

The project will develop specific methods and instruments for municipal planning, with which suitable measures can be taken to increase resource efficiency in every phase of the district development process – planning, use, conversion and demolition. Among other tasks, a building material register will be developed for this purpose as a uniform information basis for planning processes.

### Expected results and transfer

The project will develop guidelines and methods for the planning of resource-efficient urban districts that can be implemented by the municipalities. The municipalities participating in the project will integrate the project results directly into their existing urban and district development planning processes.



Study region Ludwigshöhviertel in Darmstadt - conversion into real planning processes

**Funding initiative:** Resource-efficient urban districts (RES:Z)

**Project title:** RessStadtQuartier – Urban material flow management: Instruments for the resource-efficient development of urban districts

**Duration:** 01.03.2019–28.02.2022

**Funding code:** 033W109A-E

**Funding:** 1,571,848 €

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**Internet:** [http://www.iwar.tu-darmstadt.de/sur/fg\\_sr/projekte\\_sr/aktuelle\\_projekte\\_sr/details\\_150976.de.jsp](http://www.iwar.tu-darmstadt.de/sur/fg_sr/projekte_sr/aktuelle_projekte_sr/details_150976.de.jsp)

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# Straße der Zukunft – Future streetscapes in urban districts

## Design and testing of resource-efficient model streets for cities of the future

### Motivation

Future cities are resource-saving, energy-efficient, and offer a high quality of life. Currently, however, cities are often characterized by traffic, high noise and pollution levels and barriers for pedestrians and cyclists. Public streetscapes in particular must be designed in a sustainable way.

### Objectives and procedure

The objective of the project is to help municipalities in planning and building resource-efficient streets. To this end, future needs, potential uses and requirements for streetscapes will be assessed from different perspectives (mobility, water, urban planning etc.). Based on model streets, urban development processes will be optimized and new solutions will be tested.

### Expected results and transfer

The partner cities of Ludwigsburg and Erlangen with their local networks will play an active role in the project and thus ensure a practice-oriented approach, implementation and continuity. As a basis for the future planning of streets in cities, the model streets will show how future cities can be shaped sustainably in the long term.



Sustainable road spaces - resource-saving design with high quality of life

**Funding initiative:** Resource-efficient urban districts (RES:Z)

**Project title:** Straße der Zukunft – Future streetscapes in urban districts at the interface of technological innovation, space distribution and economic viability

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**Funding volume:** 2,250,022 €

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**Photo credits:** Adobe Stock/Monkey Business

# TransMiT – Resource-optimized transformation of mixed and separate sewer systems in existing districts

## Cross-linking urban development and water management aspects for cities of the future

### Motivation

Increasing heavy rainfall events and the growth of urban districts constitute major challenges not only for urban drainage. Three neighborhoods in Braunschweig, Hannover and Hildesheim will serve as examples for district planning that combines urban quality issues and water management aspects in the long term.

### Objectives and procedure

The objective of the project is on the one hand the development and testing of a flexible, multi-measure planning method to transform existing drainage systems. On the other hand, innovative solutions are being implemented in the three districts at different urban planning levels. In Hildesheim, for example, the aim is to increase the inflow capacity of the WWTP during heavy rainfall events and differentiate between possible discharge ways based on rainwater qualities. In Braunschweig, precipitation water from facades and roads will be investigated to determine the content of biocides and microplastics. In Hannover, operational aspects of blue-green infrastructure elements (green roof, moss facades, cisterns, ponds) will be evaluated under the aspect of how to implement multi-functional components into the planning routine of cities.

### Expected results and transfer

The results will be published as methodological recommendation for strategic cross-divisional urban planning supplemented by a web-based module catalogue.



Transformation of existing drainage systems – example of blue-green design in public spaces

**Funding initiative:** Resource-efficient urban districts (RES:Z)

**Project title:** TransMiT – Resource-optimized transformation of mixed and separate sewer systems in existing districts with a high settlement pressure

**Duration:** 01.04.2019–31.03.2022

**Funding code:** 033W105A-M

**Funding:** 2,361,460 €

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**Photo credits:** Foto – Elsner



# VertiKKA – Vertical Air Conditioning and Wastewater Treatment System

## Technological approaches to increase energy and resource efficiency in urban districts

### Motivation

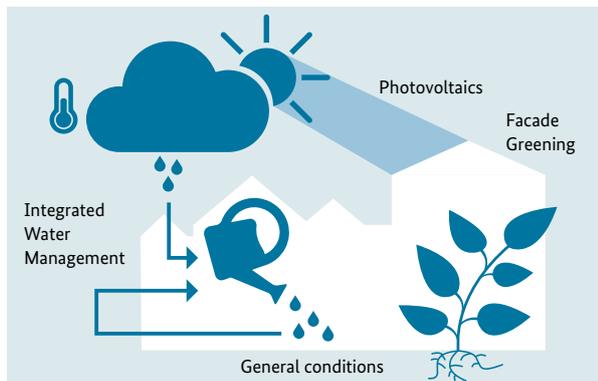
The high population density in cities and the challenges posed by climate change place specific demands on urban infrastructure. Some requirements can be met through innovative technologies, such as a vertical air conditioning and wastewater treatment system.

### Objectives and procedure

The overall objective of the project is to develop an innovative technological approach to increase urban energy, land and resource efficiency, local quality of life and climate protection. For this purpose, low-maintenance, multifunctional green façade elements in combination with façade photovoltaics will be developed. These façade elements will meet a variety of requirements: relief for sewage networks and sewage treatment plants, improved buffer capacity during heavy rainfall events, increased cooling capacity of buildings, reduction of so-called heat islands, improved air quality and fine dust pollution and of course the production of electricity using photovoltaics.

### Expected results and transfer

After a conception phase, concrete testing in selected urban districts is planned. After this trial phase, a prototype will be available for implementation. Knowledge transfer is ensured through scientific publications at national and international conferences.



Vertical air conditioning clarification system for building facades - essential components

**Funding initiative:** Resource-efficient urban districts (RES:Z)

**Project title:** VertiKKA – Vertical Air Conditioning and Wastewater Treatment System to increase resource efficiency and quality of life in urban districts

**Duration:** 01.04.2019–31.03.2022

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