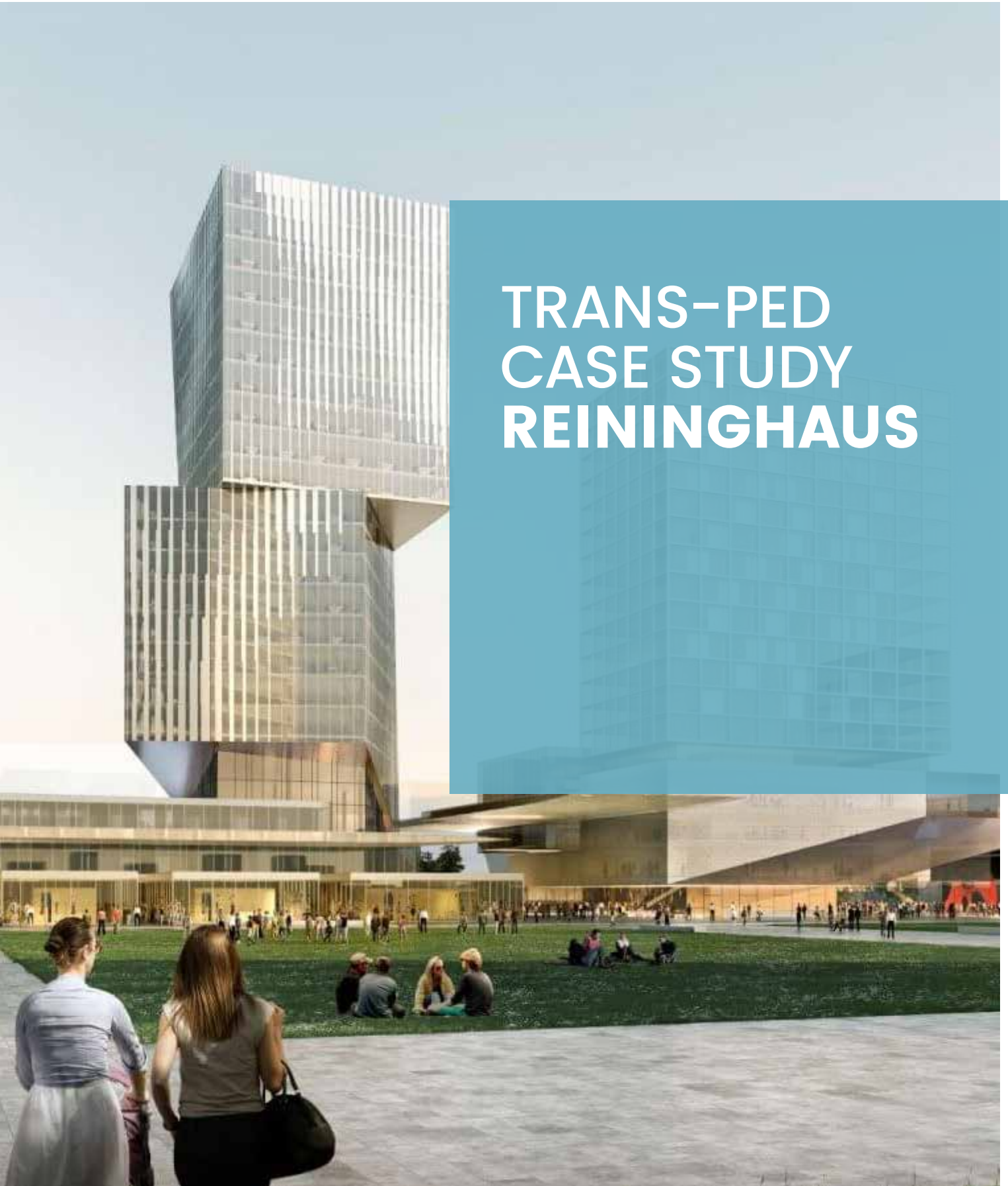


TRANS PED

TRANSFORMING CITIES
THROUGH POSITIVE
ENERGY DISTRICTS

TRANS-PED CASE STUDY REININGHAUS



TRANS-PED CASE STUDY REININGHAUS

The Reininghausgründe is a new quarter near the centre of the City of Graz. On the area of a former brewery, close to more, still working industries, a new town centre is being established. The quarter will include living areas, workplaces, shops, schools and a park, so that the need for individual mobility is minimized. It is connected to the historical city centre by bike paths, busses and a tram. Car sharing is provided as well.

DIMENSION 1

TIME**PROJECT HISTORY**

The Reininghaus development is located on a site where the site of Graz built a toll house in the 16th century, as a replacement for an old toll house dating from the 14th century. In 1853, the site was acquired by the Reininghaus family. In the next years brothers Johann Peter and Julius Reininghaus founded the company Brüder Reininghaus. They built the first steam-powered brewery in Styria and successively expanded the site with ice ponds, a canal to the river Mur and a sports field that still exists. In 1892, the brewery had 700 employees, the site was connected to the southern rail line, and the Reininghaus brothers became increasingly involved in urban development.

The Reininghaus family emigrated in 1939. During the second world war, the Reininghaus brewery was forcibly merged with the Puntigam brewery and weapons and military equipment were produced on the Reininghaus site. The area and the brewery were badly damaged. The Reininghaus family returned from exile in 1946, however, the beer production moved to Graz Puntigam. After the closure of the brewery, the entire Reininghaus area lay dormant for many years.

In 1997, the framework of the EU program URBAN I and the establishment of the University of Applied Sciences gave an important impulse for the upgrading of the western part of Graz. In the same year, the Steirerbrau AG was taken over by Brau Union and six years later by Heineken. Between 2001 and 2005 the western part of Graz continued to be upgraded, including the expansion of the University of Applied Sciences, as well as the establishment of the Business Park Reininghaus and a Start-up-Center.

In 2005 the Reinghaus area was sold to a real estate developer Asset One who, together with the city of Graz, drafted the framework plan Graz-Reininghaus for an integrated development of the area five years later. After the withdrawal from Asset One and a negative outcome of a citizen survey concerning the purchase of the site by the City of Graz, the site was sold to private investors and non-profit developers.

In 2013, the municipal council of Graz adopted amendments to the zoning plan for Reininghaus and took over areas concerning public property and public green spaces. Preparations for infrastructure planning (roads, tram connection) and mobility contracts officially started. From 2014 onwards, architectural competitions for single quarters (20 in total) and the public space in Reininghaus were organized and the first land-use plans were designed.

Since then several steps have been taken. In 2015, two different research projects were set up: the project *'Arbeiten und Wohnen in Graz-Reininghaus'* (living and working in Graz-Reininghaus) to determine synergies with the surrounding area, and the project *'ECR Graz- Reininghaus'* to determine energetic potentials in Reininghaus. In 2016, the *'OPEN.LAB Reininghaus'* was established as a first contact point for people interested in the development of Reininghaus and in 2017 the first building projects were implemented. A city district management Reininghaus was established in 2018. On behalf of the city of Graz the district management works as hub between all important stakeholders: from neighbours and companies, the city of Graz, developers, future inhabitants to initiatives that want to get active in the development of the district. In 2018 the expansion of tram line connecting Reininghaus with the city centre began. In 2021, this tram line 4 became operational. In 2019, the first Reininghaus quarter, quarter 4 *'Linse'*, was completed.

As of 2022, approximately 25% of quarters have been constructed, 30% are currently under construction and 45% are in the planning phase (see figure 1).



figure 1: status of the quarters in Reininghaus, October 2022. (Eigentümerboard Reininghaus)

MAIN REFERENCES

- [Reininghaus Gründe](#) website, in particular the *'Fakten & Hintergründe'* and *'Plan & Übersicht'* sections (in German)
- [Arbeiten und Wohnen in Graz-Reininghaus](#) [report], 2016 (in German)
- [ECR Energy City Graz-Reininghaus](#) website (in German, with summaries in English)
- [OPEN.LAB Reininghaus](#) website (in German)

PROJECT AMBITIONS

URBAN DEVELOPMENT CONCEPT 4.0

In 2013, the city of Graz defined a new urban development approach which aims at making Graz a smart city. This new approach has been integrated within the Urban Development Concept 4.0 (the most important legally binding instrument for the local development planning). In this context, the following aspects are considered important for the development of cities and city quarters:

- compact, mixed-use development (city of short distances)
- promotion of renewable energies and highest building standards
- priority for soft mobility
- attractive public spaces and green areas
- support for socially inclusive urban development
- citizen participation and promotion of functioning neighbourhoods (e.g., through city district management)

MULTIMODAL MOBILITY NODES

Soft forms of mobility are becoming increasingly important when it comes to transition towards more sustainable cities. Therefore, particular importance is attributed at the city district level of Reininghaus to multimodal mobility nodes - locations that allow you to transfer between different means of transport (e.g., public transport, motorized individual transport, e-mobility).

In Graz, Holding Graz, the municipal service provider for the citizens of the provincial capital, developed '*tim*', a mobility service that links together various ways of travel using multimodal nodes. These nodes are already provided at different locations throughout the Graz municipal area and include (e-)car sharing, rental cars, e-taxis, bicycle parking areas and public charging stations for private e-cars. They are located in a close proximity to public transportation, thus ensuring a quick and uncomplicated change between the means of transport. Information systems such as apps or info screens provide citizens with real-time information about all available mobility options.

In the urban development area of Graz-Reininghaus two different multimodal mobility nodes have been planned. The infrastructure for both locations has been already established. The first mobility node, located between quartier 1 and quartier 2, has already come into operation with the start of tram line 4 (end of November 2021). The second mobility node, located at the intersection Brauhausstraße/Wetzelsdorferstraße near quartier 6 Süd, will come into operation with the further expansion of the city district, i.e., with an increasing number of inhabitants.



figure 2: a multimodal mobility node 'tim' in Graz. (tim / Lupi Spuma)

'KLIMAAKTIV' STANDARD FOR BUILDINGS AND QUARTERS

The 'klimaaktiv' building standard is Austria's best-known assessment system for the sustainability of buildings, with a special focus on energy-efficiency, climate protection and resource-efficiency. The klimaaktiv building standard provides concrete assistance for real estate developers, planners, housing developers and housing subsidy agencies in Austria. In addition to energy efficiency, the standard assesses and evaluates the quality of planning and execution, the quality of construction materials as well as key aspects of comfort and indoor air quality.

Several quarters in Reininghaus have been already granted the standard (either bronze, silver or gold), other quarters are currently in the process of pursuing the klimaaktiv standard, including quarter 12 comprising residential area and school campus, to be completed by 2024. Austrian TRANS-PED project partner StadtLABOR is supporting quarter 12 in this process. Quarters in Reininghaus that have already been granted the standard are described in more detail in the energy section.

COMMUNITY BUILDING AND COACHING FOR CLIMATE PROTECTION

As of today, solutions for the energy transition in the residential sector have focused on the construction of energy-efficient buildings and on the energy-efficient refurbishment of existing buildings. Measures to influence user behaviour and to directly address residents and neighbourhoods as actors of the energy transition play a minor role and are also not formalized. At the same time, moving into a new apartment offers a *'window of opportunity'* to establish new everyday practices and behaviour. In already inhabited housing developments, well-functioning neighbourhoods or existing, *'sustainability pioneers'* are key to motivating people to adopt more resource-efficient lifestyles.

In order to prepare such agents of change towards more climate protection and sustainability in the context of housing, Austria launched the BAREWO project. The aim is to develop a kit of formats, methods, and interventions for resource-efficient housing. This toolkit will be tested in six testbeds, among which quarter 12 (Q12) of Graz-Reininghaus, as soon as first residents move in (approx. 2024). Austrian TRANS-PED partner StadtLABOR, which is also a partner in the BAREWO project, will support Q12 in this process.

In parallel, a monitoring system will be developed to make the (climate) effects of the kit measurable. In addition, a guideline for property managers will be developed, which will serve as an orientation for them on how their residents can be coached in matters of climate protection and sustainability in everyday (residential) life. From the very beginning, (communication) measures are implemented and relevant stakeholders are involved in the project (project advisory board) to ensure the multiplicability, financing and broad application of the toolkit. If successful, the toolkit could also be scaled up to other quarters in Reininghaus.

MAIN REFERENCES

- [Rahmenplan Energy City Graz-Reininghaus](#) [framework plan], 2015 (in German)
- [4.0 Stadtentwicklungskonzept Graz](#) [urban planning concept], 2020 (in German)
- [BAREWO – Baukasten für ressourcenschonendes Wohnen](#) website (in German)
- [klimaaktiv](#) website (in German and English)
- 'tim' page at the Holding Graz website (in German and English)

DIMENSION 2

SPACE

GENERAL SPATIAL CHARACTERISTICS

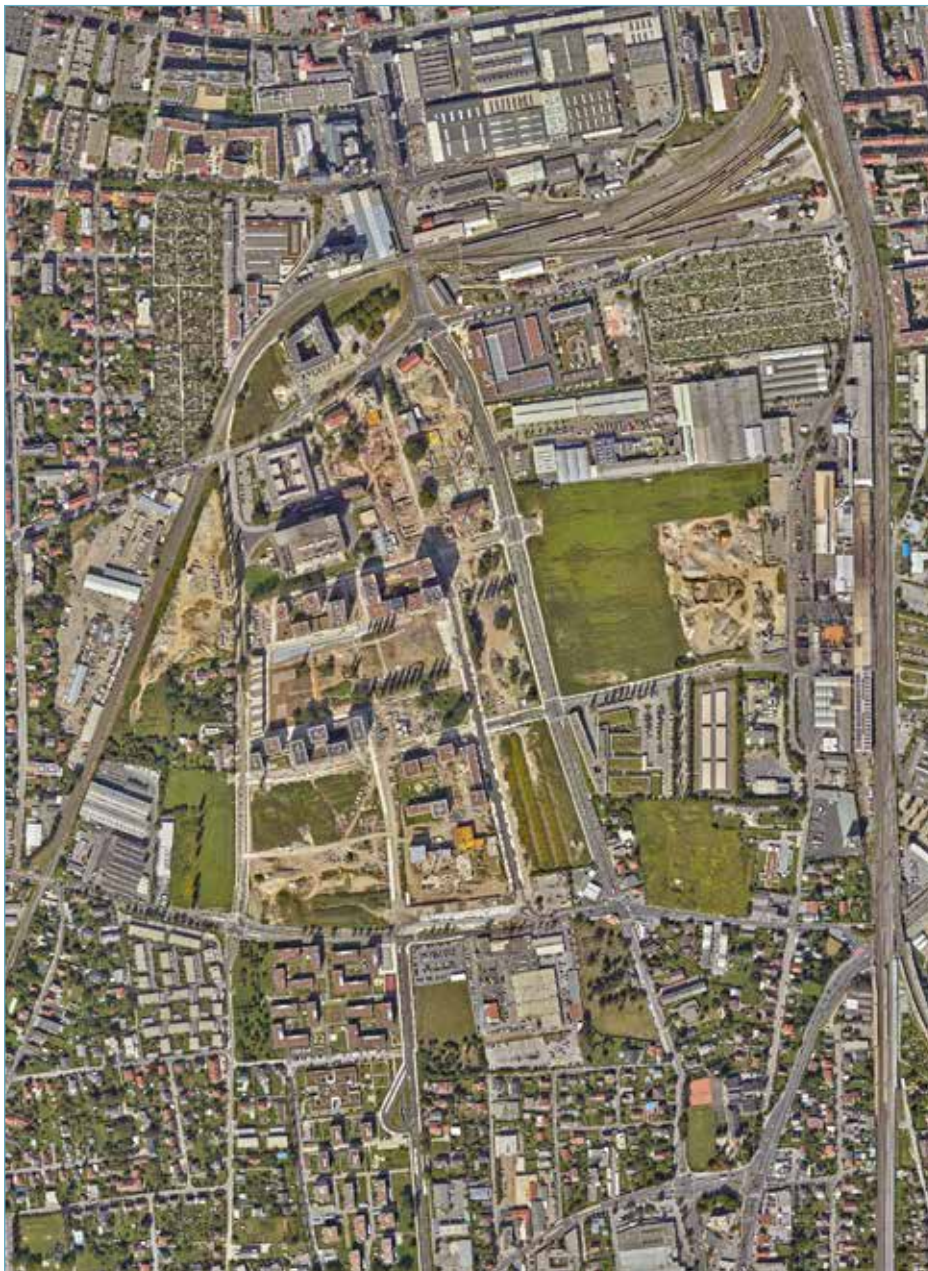


figure 3: aerial view of Reininghaus, 2021. (Magistrat Graz)

Graz-Reininghaus is a former brewery site with an area of about 100 hectares. It is the largest free inner-city area in the central urban area of the city of Graz. Reininghaus is located only 1,8 kilometres from the historic old town of Graz as the crow flies (see figure 4). The area is relatively flat at a height of circa 360 metres.

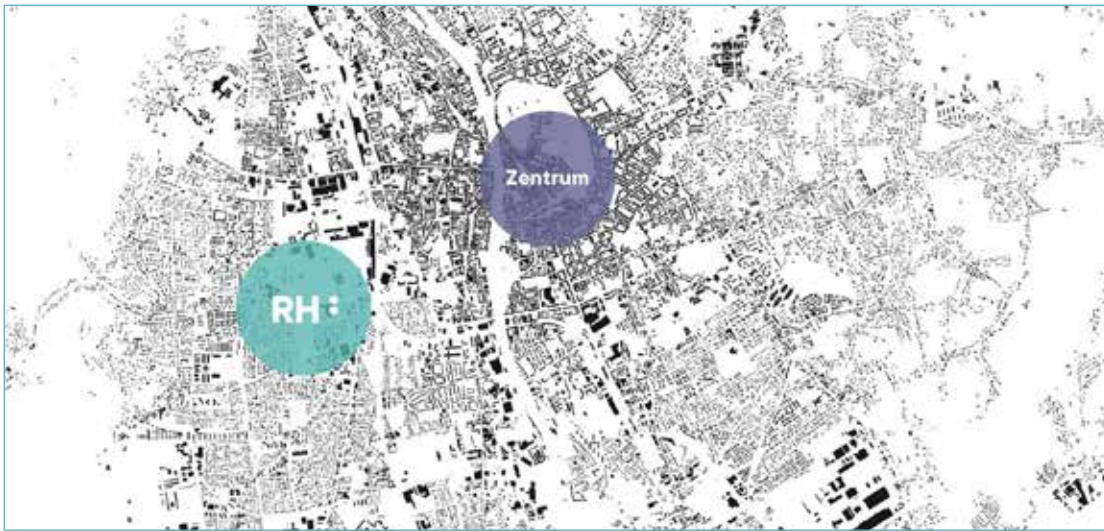


figure 4: distance to the city centre
(Eigentümerboard Reininghaus)

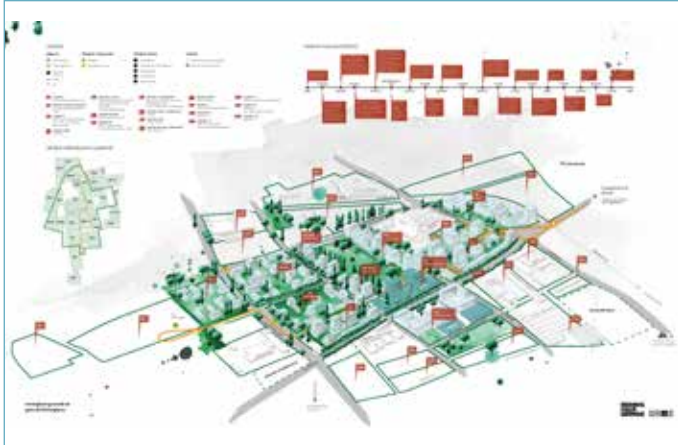


figure 5: project overview
(Eigentümerboard Reininghaus)



figure 6: Framework Plan Graz-Reininghaus
(Rainer, Ernst et al., 2015)

Figure 6 shows the framework plan for Graz-Reininghaus (see also section 5: governance and policy context) which delineates, among others, areas for public space (e.g. road networks, squares, parks), the single quarters (building sites) with quarter parks, building lines, entrances to the collective garages, pedestrian walkways and suitable locations for social infrastructures (e.g. kindergartens and schools).

The project intends to create new living space for more than 10 000 people. The general objective for sustainable development is the creation of a compact building structure, an optimal amount of green space, attractive pedestrian and bicycle connections, a well-developed public transport network, and the reduction of motorized private transport.

Characteristic for the Reininghaus district will be the high amount of public and private green space as well as generous public space. These aspects have been included in the framework plan since they are not only significant for increasing the living quality and well-being but also to manage climatological aspects (e.g. wind speeds). In addition to a public park with a floor area of 3 hectares in the centre of the district, each quarter will have an own park with a size of at least 10% of the quarter size. Already in 2010, 'Pocket parks', small urban forests, have been planted so that they are full-grown when the apartments become occupied. All in all, 900 trees will be planted in the public areas of the project. Additionally, a 2 hectares sports facility will be constructed and will both be used by the secondary school and the general public.

In the whole district attractive foot and cycle paths will be provided. All destinations within the district will be directly accessible by well-developed bike lanes. Since November 2021 the Reininghaus district is connected by the tramway. Aboveground car parking lots in public areas will be reduced to the minimum.

MAIN REFERENCES

- [Rahmenplan Graz-Reininghaus: Schlussbericht Kurzfassung](#) [framework plan], 2010 (in German)
- [Rahmenplan Energy City Graz-Reininghaus](#) [framework plan], 2015 (in German)
- [Rein ins Leben](#) [brochure], 2019 (in German)
- [Bebauungsplan Reininghaus Parkquartier – Brauhausstraße: Erläuterungsbericht](#) [development plan], 2014 (in German)
- [Graz Reininghaus](#) page at the Stadt Graz website (in German)

BUILDING TYPOLOGY

The zoning plan of the city of Graz delineates three types of building zones in the urban development area Graz-Reininghaus: an urban residential area, the central area and a mixed and inner-city commercial area. In order to enable a gradual development of the district, the planning area is divided into several quarters (construction areas), which will be implemented step by step by 18 different developers.

The height of the buildings is based on the existing surrounding building development. The buildings located on the central UNESCO Esplanade will be higher and denser. In addition to apartments, numerous offices and shops, as well as restaurants, will be located along this street. In transition to the existing buildings in the neighbourhood the new building will become lower and have a higher living standard more adapted to families. In figure 7, the functions of buildings in Reininghaus have been depicted. Buildings comprising residential area are coloured white, whereby building comprising commercial area are coloured red. Building coloured blue are historic listed buildings.

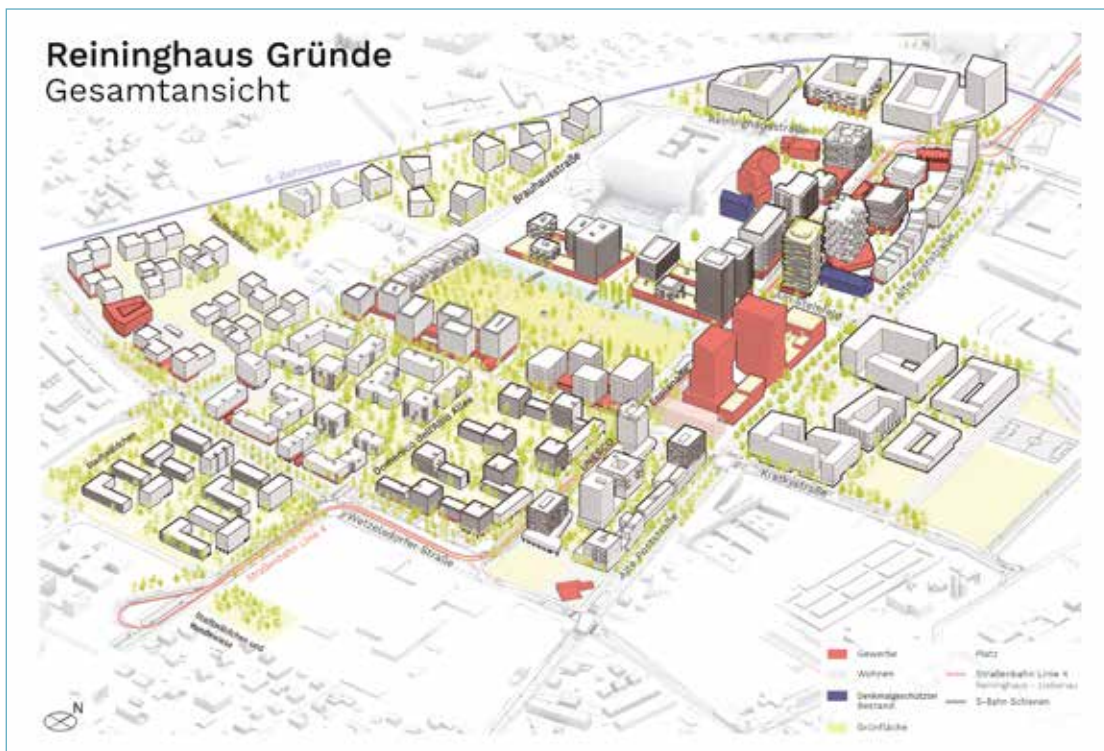


figure 7: functions of buildings in Graz-Reininghaus (Eigentümerboard Reininghaus)

Some buildings and quarters have specific characteristics. Quarter 1, for instance, comprises the majority of the old, partly listed buildings on the site. In response to the diverse needs of the residents, a wide variety of building typologies have been designed. Existing buildings will be preserved and interwoven with new structures. Quarter 2, which will be completed by 2024/2025, is comprised of two interconnected towers (75 and 63 meters high) and will rank among the highest buildings in Graz (see figure 8). Some of the quarters, such as quarter 7 (see figure 9) or quarter 8, have been realised in wooden construction.



•figure 8: Rendering of quarter 2 – 75 and 63 meter high towers will rank among the highest buildings in Graz. (ArchitekturConsult ZT)



figure 9: an example of a wooden residential building by Balloon Architekten and Hohensinn Architektur. (Helmut Pierer)

MAIN REFERENCES

- [Rahmenplan Energy City Graz-Reininghaus](#) [framework plan], 2015 (in German)
- [Rein ins Leben](#) [brochure], 2019 (in German)

ACTIVITIES

In the amendment of the zoning plan, adopted by the Graz City Council in 2013, particular emphasis was placed on the definition of the mix of uses envisaged in the Graz-Reininghaus framework plan. The amendment stipulates a mixed-use development with a combination of living, working and retail activities. It also foresees the development of an *'urban plinth'* with the settlement of businesses (including local suppliers, service providers, ateliers, etc.). This urban plinth concept is part of a strategy to create optimal conditions for the development of a sustainable *'urban district of short distances'*. Additionally, Reininghaus will offer numerous services, including health care, social sector, culture and entertainment as well as leisure activities, educational institutions and child care services. In addition to living space for 10.000 people, it will also provide working space for 5.000 people.

MAIN REFERENCES

- [Rahmenplan Graz-Reininghaus: Schlussbericht Kurzfassung](#) [framework plan], 2010 (in German)
- [Rahmenplan Energy City Graz-Reininghaus](#) [framework plan], 2015 (in German)
- [Rein ins Leben](#) [brochure], 2019 (in German)
- ['Plan & Übersicht'](#) section at the Reininghaus Gründe website (in German)

DIMENSION 3

SOCIAL**SOCIO ECONOMIC PROFILE**

Since most of the quarters are currently in the construction or planning phase the access to socio-economic data in Reininghaus is rather limited. As of today, approximately 2000 people live in Reininghaus. Quarter 7 is the first already inhabited quarter, followed by the first completed building of the quarter 4 'Linse'. When it comes to population density, approximately 10,000 residents can be expected in the full development area of 54 ha (circa 185 inhabitants/ha).

The Reininghaus district will offer living space for people in different living situations. The offer ranges from penthouses to apartments with gardens in wooden construction, as well as apartments for families and singles. There will be a mix of apartments for rent, owner-occupied apartments as well as subsidized housing. In the southern quarter 8, the city of Graz realised a retirement home and urban apartments in wooden construction.

MAIN REFERENCE

- Social initiatives at Graz-Reininghaus are stimulated and supported by the City District Management (Stadtteilmanagement): '[City District Management](#)' page at the Reininghaus Gründe website (in German)
- [Rein ins Leben](#) [brochure], 2019 (in German)

ENERGY-RELATED SOCIAL ASPECTS

ENERGY TRANSITION SUBSIDIES

The Environmental Department of the City of Graz provides several environmental subsidies for households. People who want to install solar systems on buildings in Graz for residential purposes can apply for subsidies. Thermal solar systems are subsidized with up to 100 Euro/m², but with a maximum of 3,000 euros per residential unit. Grid-connected photovoltaic community systems are also subsidized by the City of Graz. In the field of mobility, cargo bikes, bicycle service boxes and bicycle parking facilities are subsidized by the City of Graz at the household level.

The province of Styria also offers subsidies, such as subsidies for solar thermal systems or subsidies for electric mobility for private individuals. The province of Styria also supports individual energy consulting by a qualified advisor on topics such as the installation of a solar system, questions about energy-saving measures, the purchase of energy-saving electrical appliances, etc.

On the city district level of Reininghaus, each new resident moving into the neighbourhood will get an opportunity to acquire an annual pass for urban public transportation paying only 10% of the normal price. The rest is covered by the project developers. For these annual pass holders the basic fee for the use of multimodal mobility node 'tim' (see section 1: time) is covered.

MAIN REFERENCES

- [environmental subsidies by the city](#) at the Stadt Graz website (in German)
- [eco-subsidies by the province](#) at the Land Steiermark website (in German)

LOCAL SOCIAL INITIATIVES CONCERNING ENERGY

In the last years, several local social initiatives concerning energy have been launched at the quarter-level in Reininghaus. For instance:

- A user manual for residents of the quarter *'Plusenergieverbund Reininghaus Süd'* (which was built in the passive house standard) has been developed, providing an operation manual of the energy technologies of the flats.
- In the same quarter, several activities have been organised with the inhabitants on the topic of energy-efficient lifestyles. This happened in the framework of the JPI Urban Europe Project CODALoop between 2016-2019. These activities included: meetings with the investors discussing aspects related to passive house standards of the building, as well as a visit to the low-temperature district heating network that supplies the city district and to the steel and rolling mill Marienhütte of which the excess heat feeds into this network.
- *'Emma'* is a customer-centric app developed by the property developer Wohnbaugruppe, covering different aspects related to the quarter. What concerns energy, the app covers aspects such as energy performance certificates and energy accounting.
- The BAREWO project (see also section 1: time).

MAIN REFERENCES

- [+ERS – Plusenergieverbund Reininghaus Süd: Handbuch für NutzerInnen](#) [manual for residents], 2015 (in German)
- [CODA loop: Community Data-Loops for Energy Efficient Urban Lifestyles](#) [report], 2019 (in English)
- [BAREWO – Baukasten für ressourcenschonendes Wohnen](#) website (in German)

DIMENSION 4

ENERGY (AND OTHER METABOLIC FLOWS)

MAIN ENERGY FLOWS

A long-standing cooperation between two companies, the energy service provider and district heating network operator Energie Graz and the steel and rolling mill Marienhütte, has resulted in a project 'Energy Model Reininghaus'. The aim of this project is supplying heat to the district via a low-temperature district heating network. To do so, a low-temperature heat network was built in the district between 2015 and 2017.

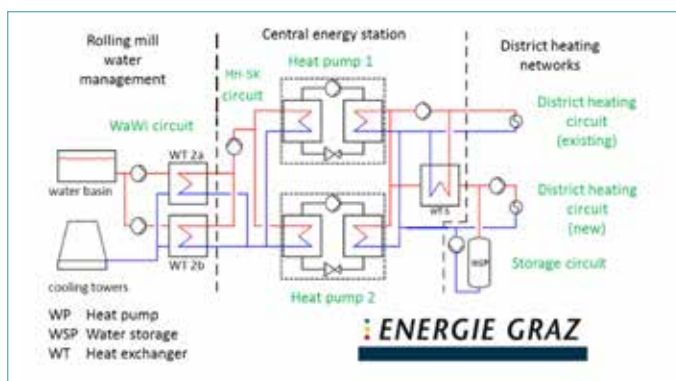


figure 10: Scheme of the district heating networks in Graz-Reininghaus (Energy Graz)

Both the existing district heating network and the new low-temperature heat network are fed with waste heat from the steel and rolling mill Marienhütte. This waste heat has a temperature of 30 to 35°C and would otherwise be dissipated to the environment. Two large heat pumps installed by Energie Graz (figure 11) bring this heat to the operating temperatures of both physically disconnected networks. The low-energy heat network operates with a supply temperature of about 70°C, which is required to be able to provide hot water all year round and a return temperature of about 43°C. The existing district heating has a supply temperature of up to 95°C.

Modular, expandable thermal water storage tanks in Energy Graz's 'power tower' (figure 12), are used to bridge downtimes of the steel and rolling mill production. The storage has a capacity of 1600 m³ which allows for 11,5 MW or 46000 MWh/year of storage. The tower is equipped with PV cells (85 kWp). The electricity generated is used to power the heat pumps.

The system was built in two phases. In the first phase (2015–2016), the steel mill was connected to the Graz district heating network. In a second phase (2017), a heat storage facility was built.



figure 11: One of the heat pumps at the steel and rolling mill Marienhütte (Energy Graz)



figure 12: Energy Graz's 'power tower' (Energy Graz)

Performance indicators of the network:

Heat pump performance	5,75 MW
Coefficient of Performance – heat pump	low-temperature network: 4,5 district heating network Graz: 3,3
Feed temperature	low-temperature network: ca. 69°C district heating network Graz: 95°C
Feed-in power	low-temperature network: 11,5 MW district heating network: 8 MW
Feed-in power / year	low-temperature network: ca. 46 GWh/year district heating network: ca. 43 GWh/year
CO ₂ reduction	13.060 tonnes/year (compared to the heat supply with a natural gas boiler)

(Wärmeversorgung Graz 2020/2030, 2019)

MAIN REFERENCES

- Arnitz, Alexander et al. 'Waste Heat Recovery at the Steel and Rolling Mill "Marienhütte", Graz (Austria)' Heat Pumping Technologies Magazine 37/2 (2019): pp. 20–22. Available online. (in English)
- Wärmeversorgung Graz 2020/2030: Wärmebereitstellung für die fernwärmeversorgten Objekte im Großraum Graz (Statusbericht 2019) [report], 2019 (in German)
- Technische Anschlussbedingungen: Nahwärme Graz-Reinighaus [technical regulation], sd (in German)

ENERGY CHARACTERISTICS

OIB AND KLIMAAKTIV BUILDING STANDARDS

In Austria, the OIB-standard, set by the Austrian Institute of Construction Engineering, is the minimum requirement regulated by Austrian law. The maximum energy consumption is continuously being lowered to reach EU regulation goals within the next few years. In addition, The 'klimaaktiv' building standard is an important energy label at national level. It was established in 2004 by the Austrian ministry of climate protection, environment, energy, mobility, innovation and technology and focuses on four main areas:

1) Low energy use; 2) Higher comfort, 3) Air quality and health, 4) Performance and efficiency. The constantly reviewed list of criteria works as a guideline for sustainable and comfortable construction for all parties involved in the construction or refurbishment of a building. The following quarters in Reininghaus have already been granted the klimaaktiv building standard:

QUARTER	KLIMAAKTIV STANDARD	STATUS	DESCRIPTION
Reininghaus Zehn	klimaaktiv gold	completion, new construction	Reininghaus Zehn was the first project on the former Reininghaus property and was completed in 2019, in combination with numerous green spaces for encounters and sustainable energy and mobility concepts. On the roof of the building a photovoltaic system is installed that provides energy for the communal areas and significantly reduces the operational costs.
Plus-energieverbund Reininghaus Süd	klimaaktiv gold	completion, new construction	The Plusenergieverbund Reininghaus Süd is a demonstration project that combines economically feasible, innovative technological and organisational solutions based on the use of energetic synergies within multifunctional buildings. A photovoltaic system is provided. For the first time in Austria, energy exchange between different properties was realised.
Q12 süd	klimaaktiv silver	in development, new construction	The building combines high quality living, recreation, shopping and working facilities as well as open spaces. The focus is put on green spaces and sustainable mobility solutions.
ENW Hummelkaserne	klimaaktiv silver	completion, new construction	92 Community houses were built on the area of the former military barrack Hummelkaserne. With its four building complexes Hummelkaserne is the highest wooden construction in Styria. A photovoltaic system is provided.
SEG Reininghaus Quartier 7	klimaaktiv bronze	completion, new construction	Quartier 7 combines housing, living and working with a well-planned green space and mobility concept. The building complex, with its 3 to 6 floors and partially wooden load-bearing elements in the building's core and staircases, represents a lighthouse project for the development of wooden construction projects in Styria.

MAIN REFERENCES

- Maier, Stephan. 'Smart Energy Systems for Smart City Districts: Case Study Reininghaus District' *Energy, Sustainability and Society* 6/23 (2016). [Available online](#). (in English)
- [klimaaktiv](#) website (in German and English)

RENEWABLE ENERGY POTENTIAL

Within the framework of the project Energy City Graz-Reininghaus the potential of renewable energy sources within the area of Graz-Reininghaus was determined. The analysis focused on the theoretical energy potential. The amount of renewable energy that is actually produced depends on the optimisation of the system, including economical parameters. Therefore, in real life it is possible that these potentials remain unused.

The project included the study of the energy potential of external waste heat, solar energy, wind energy, near-surface geothermal heat, deep geothermal energy and energy storage, heat from the municipal waste water, bio-gas from carbon in the municipal waste water, bio-gas from organic waste and heat recuperation from air-conditioning systems. The use of external waste heat and solar energy were deemed promising. In case of the former this led to the development of the Energy Model Reininghaus (see above). For the latter, it is expected that one third of the roof surface will be used to install photovoltaics.

MAIN REFERENCES

- [Rahmenplan Energy City Graz-Reininghaus](#) [framework plan], 2015 (in German)
- [ECR Energy City Graz-Reininghaus](#) website (in German, with summaries in English)

DIMENSION 5

GOVERNANCE AND POLICY CONTEXT

PROJECT'S GOVERNANCE STRUCTURE

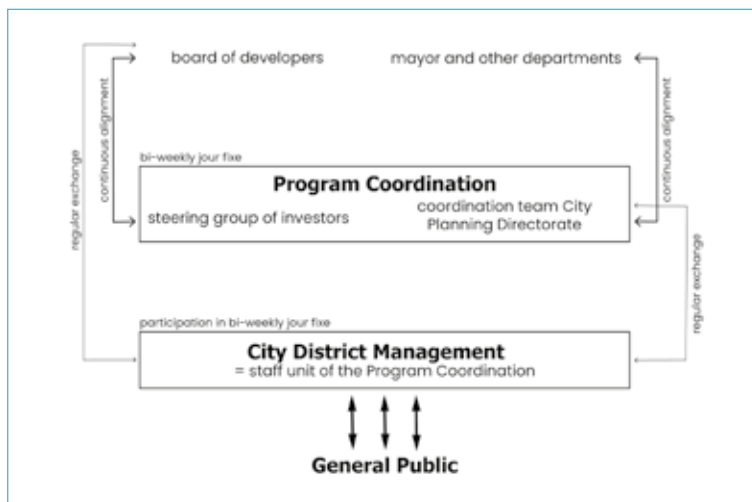


figure 13: Organizational chart of Graz Reininghaus (TRANS-PED, based on Eigentümerboard Reininghaus)

The Graz-Reininghaus project is managed by the Program Coordination committee, which meets on a regular basis (bi-weekly or monthly). It is composed of the steering group of investors (Bauträger Lenkungsgruppe) and the coordination team of the City Planning Directorate Graz. The City District Management is a staff unit of the Program Coordination. It also participates in the program coordination meetings and is in regular exchange with the city of Graz and the investors.

The steering group of investors represents the board of developers, in which all developers active on the site meet regularly. Via these structures, many cross-development topics can be advanced more quickly. For example, the board of developers enabled the implementation of joint logistics for the construction sites, the realization of a joint Reininghaus website, and an agreement on a coordinated approach for the development of the urban plinth. The Program Coordination Committee has to safeguard the overall vision that was developed for Reininghaus and this within the limits set out by spatial planning instruments (framework plan, zoning plan, and land use plan), as well as by the urban development contracts. Additionally, the committee follows up single fields of action from the vision (e.g. the implementation of mobility contracts).

ACTORS

City of Graz

Represented by the City Planning Directorate Graz and relevant departments, including the Department for Green Space and Water Management, the City Surveying Department and the Traffic Planning Department.

- urban planning
- creation of legal planning foundation
- representation of the interests of public administration
- public administration tasks
- development, implementation, management of public spaces
- creation & coordination of social infrastructure
- traffic planning
- clarification of financing for the development of the public good
- coordination tasks within the municipality and with all involved stakeholders

Board of developers

In addition to the tasks described below, there is a steering group of developers composed by 5 investors that represent the board in the Program Coordination Committee.

- planning, development & implementation at quarter level
- development of urban plinth
- mobility concept
- building logistics
- property management and marketing
- coordination tasks with all involved stakeholders and the city of Graz
- communication

City District Management

- communication & participation processes
- networking
- activation
- public relations

POLICY CONTEXT

THE FRAMEWORK PLAN GRAZ-REININGHAUS

The Framework Plan Graz-Reininghaus served as the basis for the creation of an urban development concept for Reininghaus. It was unanimously approved by the municipal council on February 25, 2010. The framework plan provides investors with planning and legal certainty, while at the same time fulfilling the city's steering function. The plan includes general urban planning conditions, designation of green spaces and areas for transportation development. Subsequently, the Framework Plan Graz-Reininghaus led to amendments to the site's zoning plan, to the elaboration of land-use plans and to architectural competitions for the individual quarters. The Framework Plan also serves as the basis for urban development contracts with future investors (see below).

The Framework Plan Graz-Reininghaus and its associated plans define:

- green infrastructure and parks (>10 % of entire surface, more than 900 trees)
- building heights and floor levels
- sport zones (roughly 2 ha)
- public space (e.g. district square and esplanade)
- mix of housing types (typologies of flats, ownership and rental options, subsidized housing)
- locations for economic activities
- locations for educational and cultural activities
- quantity and quality of mobility infrastructure for all quarters and buildings based on a mobility contract with all developers

URBAN DEVELOPMENT CONCEPT 4.0 (STEK 4.0) AND ZONING PLAN

Adopted in 2013, the urban development concept 4.0 sets out the city's long-term goals and constitutes the basis for the zoning plan. This zoning plan breaks down the territory of the municipality by spatial and functional requirements and specifies the land use for each parcel of land. On the 28th of February 2013, the municipal council of Graz adopted amendments to the zoning plan for Reininghaus, with a particular importance being put on the definition of the mix of uses envisaged in the Framework Plan Graz-Reininghaus (combination of residential, work, retail, etc.) as well as on the development of an urban plinth enabling the creation of a sustainable urban district of short distances.

URBAN DEVELOPMENT CONTRACTS

Urban development contracts serve as a complement to classic planning instruments such as a zoning plan or a land use plan. Urban development contracts are contracts under civil law that are concluded between the public sector and landowners and are supplementary to the prevailing zoning and/or development plans. They therefore constitute a flexible and supportive instrument for the implementation of planning goals. Ultimately, the aim of urban development contracts is to ensure, in a legally binding manner, that the legal framework conditions formulated for a construction site are fulfilled, that the desired spatial qualities are implemented, and that the infrastructure required for the development is provided on time.

Since urban development contracts are considered a crucial control instrument at the district level, their contents are described in more detail as a project highlight.

MOBILITY CONTRACTS

Mobility contracts are signed between the City of Graz and the developers of the respective quarters during the development of the land-use plans. They aim at reducing the car traffic expected as a result of the new construction project. In Graz-Reininghaus, mobility contracts are expected to be concluded for all quarters and are part of the urban development contracts under civil law that are concluded between the City of Graz and developers.

The mobility contracts are drafted along 4 key principles:

1. a combination of effective *'push & pull measures'* (e.g. the reduction of car parking spaces, while optimizing accessibility to public transport and walking and cycling networks, providing tickets for public transport and mobility information, etc.)
2. a modal shift in favour of sustainable forms of transport for new inhabitants
3. a reduction of construction and maintenance costs (underground parking spaces, public road infrastructure)
4. an easier realisation of large building projects in the inner city area because of a lower demand for cars

The mobility contracts usually include:

- parking space limit for cars
- optimal and sufficient bicycle parking
- provision of (e-)car-sharing
- one-year public transport tickets for first-time occupants (developers cover 90% of the total price)
- provision of charging facilities for e-vehicles
- installation of parcel boxes
- organisation of bicycle service days in the quarter, and installation of bicycle service boxes
- mobility advice and information packages
- electronic displays at the house exits for public transport departure times
- evaluation report after implementation (biennially)

TECHNICAL CONNECTION CONDITIONS FOR THE LOCAL HEATING NETWORK GRAZ-REININGHAUS

The Technical Connection Conditions for the Local Heating Network Graz-Reininghaus is a document developed by Energie Graz that applies to the planning, construction, modification, maintenance and operation of heat transfer stations and customer installations in connection with the heat supply contract. The standards and requirements stipulated in this document are legally binding.

MAIN REFERENCES

- [Rahmenplan Graz-Reininghaus: Schlussbericht Kurzfassung](#) [framework plan], 2010 (in German)
- [Rahmenplan Energy City Graz-Reininghaus](#) [framework plan], 2015 (in German)
- [4.0 Flächenwidmungsplan Graz](#) [land use plan], 2018 (in German)
- [Städtebauliche Verträge in Graz](#) [brochure], 2018 (in German)
- [Positionspapier der österreichischen Städte zu städtebaulichen Verträgen](#) [position paper of the Austrian Association of Cities and Towns], 2020 (in German)
- [Mobility contracts](#) page at the Stadt Graz website (in German)
- [Technische Anschlussbedingungen: Nahwärme Graz-Reininghaus](#) [technical regulation], sd (in German)

HIGHLIGHTS

URBAN DEVELOPMENT CONTRACTS AS IMPORTANT CONTROL INSTRUMENT IN GRAZ

Urban development contracts are a contractual form of regulation between the City of Graz and landowners. The contracts ensure a flexible control of public interests in the development of city districts. They define property-related specifications in accordance with urban planning regulations (e.g. an urban development concept, a framework plan or a zoning plan) and other requirements, (e.g. on infrastructure and mobility). This ensures well-functioning infrastructure, public services and settlement development at a district level.

Zoning or development plans often impose requirements and are therefore associated with extra costs. Urban development contracts lay down how the contractual partners will contribute to the infrastructure and planning costs and/or who assumes responsibility for the construction of the necessary facilities. This form of regulation enables a flexible, long-term control of spatial development by the creation of joint planning interests while at the same time also reducing the burden on the public sector.

The start of the projects Graz-Reininghaus and Smart City Graz established the first use of urban development contracts in the city of Graz. The contracts regulate measures in the fields of:

- energy (e.g. Energy Model Reininghaus)
- mobility (e.g. pedestrian, bicycle and public transport infrastructure, parking space, traffic, e-mobility, car sharing, multimodal hubs)
- architecture, public space, green space (e.g. the organization of architectural competitions, façade design, quality assurance of public spaces and green spaces, public facilities)
- social sustainability (e.g. types of housing units, construction of common rooms, support of district management, planning of urban plinth)
- Measures in the field of art in public space
- Measures in the field of flood protection (e.g. drainage infrastructure)

Next to the question which costs may be transferred to the contractual partners, a major issue concerning the urban development contracts is how this can be done. In some areas in Reininghaus, the City of Graz makes sure the works are carried out and then retrieves the actual (share of the) costs from its partners. In other areas, the contractual partners have to finance and organize the works themselves.

In order to secure the implementation of the measures, the contracts contain guarantees and regulations on the succession of rights and obligations. To monitor the fulfilment of the urban development contracts during the preparation and implementation of the projects, a compliance management framework has been established by the City of Graz and the landowners. It makes use of a specification sheet released by the City Planning Department which includes a list of the relevant contractual aspects, such as costs, deadlines, responsibilities or inspection results.

In Graz, the City Planning Department is responsible for the negotiation and coordination of the contracts. They are supported by other, specialized departments, including the departments of urban and traffic planning and for green space and water management. In Graz, Linz and Innsbruck, urban development contracts are signed by the municipal council.

MAIN REFERENCES

- [Städtebauliche Verträge in Graz \[brochure\]](#), 2018 (in German)
- [Positionspapier der österreichischen Städte zu städtebaulichen Verträgen](#) [position paper of the Austrian Association of Cities and Towns], 2020 (in German)

Resources for PED practitioners & researchers

For more resources and project results from the Trans-PED project, visit the results section on its [website](#).



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