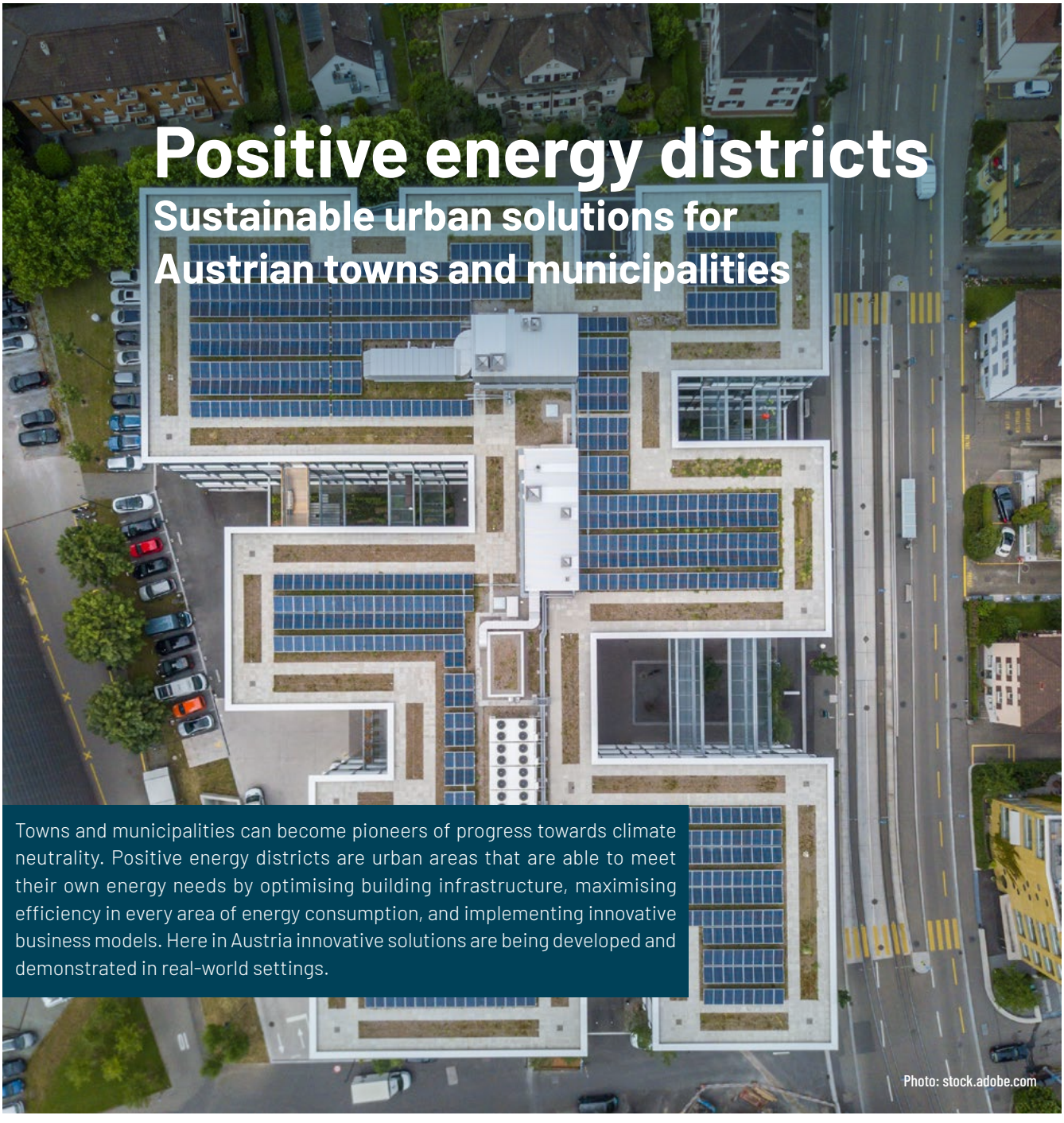
energy innovation austria

4/2020

Current developments and examples of sustainable energy technologies

klima+ energie fonds

Bundesministerium
Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie



Positive energy districts

Sustainable urban solutions for Austrian towns and municipalities

Towns and municipalities can become pioneers of progress towards climate neutrality. Positive energy districts are urban areas that are able to meet their own energy needs by optimising building infrastructure, maximising efficiency in every area of energy consumption, and implementing innovative business models. Here in Austria innovative solutions are being developed and demonstrated in real-world settings.

Photo: stock.adobe.com

Strategies

for climate-neutral cities and communities offering a high quality of life

Increasing urbanisation is one of the great global challenges. Over half the population of the world today lives in cities or conurbations; in Europe this level is expected to reach 80% by 2050.[1] Cities consume large amounts of energy and resources, and cause over 70% of global greenhouse gas emissions.

Strategies for decarbonising urban energy and mobility systems, buildings and industry play a central role in the transition to a climate-neutral economy and way of life. Cities are centres of commerce, research, innovation and new technologies. They can become pioneers of sustainable economic, ecological and social change. Extremely dense usage and infrastructure means they offer great potential for testing innovative solutions such as cross-sector smart systems in practical conditions, providing the basis for wider rollout.

100 CLIMATE-NEUTRAL CITIES IN EUROPE BY 2030

In preparation for the new European research programme "Horizon Europe", experts from all over Europe have defined five major missions, under the heading "Delivering solutions to some of our greatest global challenges", which will shape European research for the period 2021-2027.[2] These missions are intended to stimulate interdisciplinary research and innovations which will deliver solutions to society's most important challenges. With the urban mission of "100 climate-neutral cities by 2030 – by and for the citizens" the European Commission aims to support 100 European cities in their transformation towards climate-neutrality by 2030. The Commission has presented initial strategic objectives, approaches, time frames and budgets to help achieve this. The "Mission Board for Climate-neutral and Smart Cities" has just published an interim report on this process.[3]

100 cities and towns will offer locations for experiments and demonstrate how decarbonisation can work in practice. A multi-step and co-creative process is formulated in a "Climate City Contract", each one adapted to the realities of the city concerned. The aim is to create models for other European cities and in this way to contribute to implementation of the European Green Deal.[4] Central to its success are the commitment and active engagement of the city's residents as stakeholders in the planning, and as users, producers, consumers and investors.

Another key contributor is the "PED Programme", a transnational RTI programme on the theme of "Positive Energy Districts". Under Austria's leadership this is being implemented by the Joint Programming Initiative Urban Europe, in cooperation with the European Strategic Energy Technology Plan (SET Plan). The objective of the programme is to set up 100 positive energy districts in Europe by 2025. In consultation with the cities, a shared definition is agreed and a certification model for positive energy districts is in development. Austria participates in the annual calls for proposals through the national RTI programme "City of Tomorrow", and is actively pursuing the development of positive energy districts in Austrian cities.

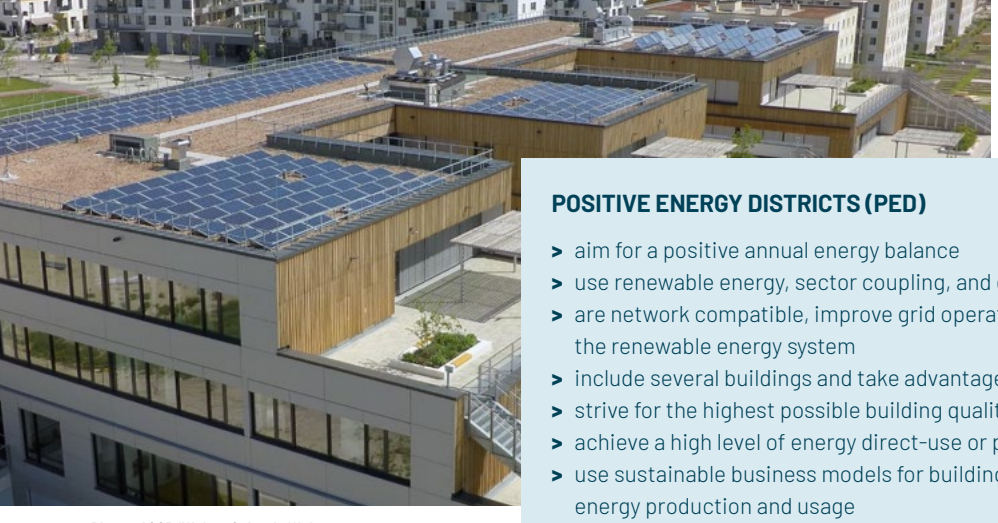


Photo: ASCR/Walter Schaub-Walzer

POSITIVE ENERGY DISTRICTS (PED)

- aim for a positive annual energy balance
- use renewable energy, sector coupling, and energy flexibility
- are network compatible, improve grid operation and make an essential contribution to the renewable energy system
- include several buildings and take advantage of synergies in mixed usage
- strive for the highest possible building quality for new construction and renovation
- achieve a high level of energy direct-use or power grid injection
- use sustainable business models for buildings, energy efficiency and and renewable energy production and usage

nachhaltigwirtschaften.at/resources/sdz_pdf/plus-energie-quartier-folder-2019-en.pdf

NATIONAL ACTIVITIES FOR SUSTAINABLE DEVELOPMENT OF CITIES AND MUNICIPALITIES

Austria is a key player in the implementation of this European mission, through the national technology programme "City of Tomorrow", run by the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK), and the "Smart Cities Initiative" with its support programme "Smart Cities Demo", led by the Climate and Energy Fund.

With its "City of Tomorrow" programme, the BMK aims to help set up positive energy districts, through research and development of urban technologies, technological systems and services, assisted further by digitalisation. This includes innovative technologies and concepts for the production, distribution, conversion and storage of energy, but also for optimising usage in buildings or groups of buildings, as well as technologies and efficiency measures in new construction and renovation.
nachhaltigwirtschaften.at/en/sdz/

The Climate and Energy Fund's "Smart Cities Initiative" aims to accelerate the sustainable transformation of Austria's cities and municipalities. In 2020 a new multi-step development process was launched to test innovative, future-oriented urban solutions (= "Urban Innovation Frontrunners") – especially products, processes and services –, then to implement them more widely (= "Urban Innovation Followers") and to scale them up (= "Urban Innovation Rollout").
smartcities.at/home-en-us/

In this issue we present some projects in this topic area which are currently under way in Austria with support from the BMK and the Climate and Energy Fund. The focus is on the implementation of "positive energy districts". ●

[1] https://ec.europa.eu/knowledge4policy/foresight/topic/continuing-urbanisation/developments-and-forecasts-on-continuing-urbanisation_en
[2] "Horizon Europe Missions": Conquering Cancer: Mission Possible, Accelerating the Transition to a Climate-prepared and Resilient Europe, Regenerating our Ocean and Waters, 100 Climate-Neutral Cities by 2030 - by and for the citizens, Caring for Soil is Caring for Life
[3] https://nachhaltigwirtschaften.at/de/sdz/news/2020/20200930-100-klimaneutrale-staedte.php
https://op.europa.eu/en/web/eu-law-and-publications/publication-detail/-/publication/82f1df57-b68b-11ea-bb7a-01aa75ed71a1
[4] The "European Green Deal" is the roadmap for a sustainable, competitive EU economy and aims to make Europe the first climate-neutral continent by 2050. The package of measures ranges from significantly reducing greenhouse gas emissions and investing in cutting-edge research and innovation, through to preserving the natural environment.
https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

Photo: stock.adobe.com

PROJECT

Itz Smart

Carbon-neutral urban district development in Salzburg

Left: Closing the gaps in the cycle route network, right: New university building in Science City Itzling and expansion of cycling infrastructure, photos: SIR

The district of Itzling in Salzburg is a typical suburb of a medium-sized city with a very diverse mixture of building structures and usage. For some years now Itzling has been a focal point for urban planning, with the aim of transforming it into a vibrant "smart city" district with high quality homes and a high quality of life. In recent years numerous forward-thinking projects have already been implemented here.

SMART CITY TEST AND TRIAL DISTRICT

The city's urban planners designated a development corridor along the S-Bahn route as a test area. Over the last few years some innovative housing projects have been completed along this axis. Additional sites have also been identified with potential for future redensification or restructuring for residential and mixed use. These new housing developments have increased the gross residential density to at least 150 occupants per hectare for the district of Itzling (effectively an increase of around 5000 inhabitants).

COOPERATIVE PLANNING PROCESS

The "ItzSmart" project, managed by the Salzburg Institute for Regional Planning and Housing (SIR)[1], ties in with these activities, providing planning guidelines and specific project ideas for consistent further development of this urban area. As part of the project, various concepts were developed for sustainable residential districts and future mobility solutions, focusing particularly on the idea of the "compact city" (or "city of short distances"), and on carbon neutrality. The planning process took the form of a broad-based cooperative process involving all the key stakeholders.

A vision for 2050 was created, based on an analysis of the current situation and CO_2 emissions in this district. Working with the city administration, property developers, landowners, infrastructure providers, social institutions, research and educational institutions, 27 project outlines were formulated. The topics covered range from individual innovative building projects to be constructed or renovated to meet climate-active standards, through to holistic concepts for residential districts. These ideas form the basis for implementation of some initial flagship projects. Some of these are already under way. They include for example a community housing project as part of a renovation and redensification programme, closing some gaps in the cycle path network and expanding it (work already in progress), initial concepts for construction of neighbourhood parking garages, and plans for a "transport hub 4.0" at the Hagenau interchange, with options for transfer to alternative mobility providers. ●

https://nachhaltigwirtschaften.at/en/sdz/projects/itz-smart.php

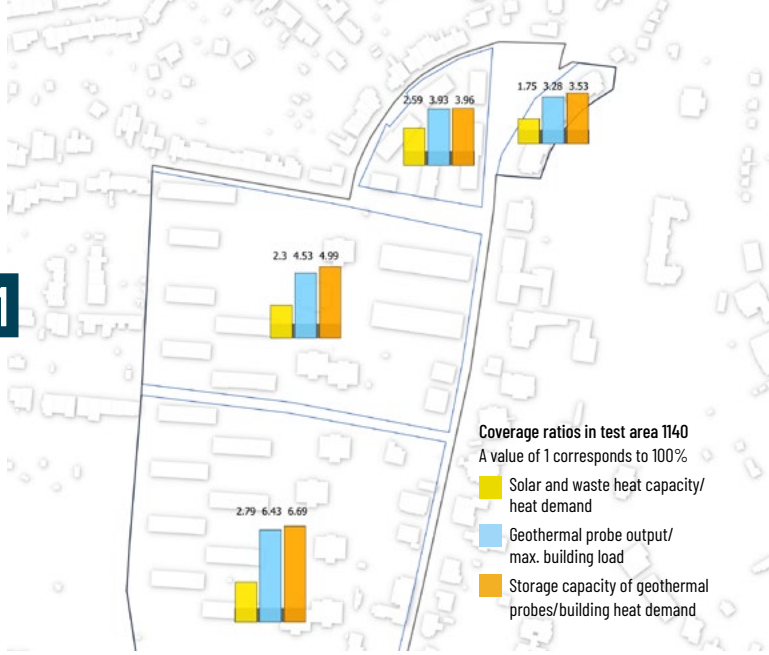
[1] **PROJECT PARTNERS**: SIR – Salzburg Institute for Regional Planning and Housing (project management), Fachhochschule Salzburg GmbH – Smart Building, komobile Gmunden GmbH, Raum & kommunikation GmbH
This project is part of the "City of Tomorrow" programme run by the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology.

"In order to meet the climate protection targets we have to think beyond the parameters of individual projects. A more effective approach is to consider entire districts and urban areas, making conceptual links between buildings, energy and mobility. Climate protection and CO_2 emissions are aspects of urban development, but they are not its driving force. The challenge is to bring together the many different stakeholders, specific projects at various stages of implementation, and numerous ideas and concepts."

Photo: SIR

PATRICK LÜFTENEGGER
SIR – SALZBURG INSTITUTE FOR REGIONAL PLANNING AND HOUSING

Source: OGD Wien, own survey data; cartography: Robert Kalasek 2020



THE CITY AS AN ENERGY STORAGE SYSTEM

Sustainable energy supply in existing buildings

New systems for sustainable heating and cooling in urban areas will make an important contribution to meeting the climate targets. Existing buildings in particular present a huge challenge. One pioneering concept is seasonal use of underground storage systems combined with renewable heat sources and waste heat, transmission pipelines and heat pumps in an "anergy network". Local anergy networks are networks of pipelines that carry low-temperature water (around 4 to 30° C) between geothermal probe storage systems and the central heating and cooling systems of individual buildings or groups of buildings. In the buildings, heat pumps are used to raise the temperature to the level required. Anergy networks make it possible to create a multi-building energy supply by sharing heat sources and storage systems.

Inner courtyard at Geblergasse, left: Gerhard Bayer (under construction), right: Lisi Zeininger (courtyard completed)

SMART BLOCK GEBLERGASSE

Geblergasse is a project area characterised by dense building development dating back to the late 19th century; it is primarily residential and is located in Vienna's 17th district. For the redevelopment and redensification of this area the focus was on testing a multi-property sustainable energy supply, as well as innovative mobility concepts and plans for increasing greenery and open spaces for the residents. As part of the exploratory study "SMART block step II – energy"[1], guidelines for planning and realisation of this pilot project were formulated and the feasibility of an anergy network for a specific residential block was investigated. Implementation of the project began in August 2018.

Geothermal probes and hybrid solar collectors were installed in two buildings, and an anergy network was set up to provide transmission pipelines, in preparation for step-by-step expansion of the network within the residential block.

URBAN ANERGY

Building on the results of this pilot project, the current study, "AnergieUrban: Stufe 1: Die Stadt als Energiespeicher"[2] uses the example of two large test areas in Vienna's 14th and 16th districts to investigate whether this innovative concept is also suitable for supplying heat to a large area of existing buildings. The results of the study show that in both districts there is enough space to install the geothermal heat probes that would be needed, and enough potential heat sources in the form of waste heat and solar energy. 60% of the potential surface area required would be made up of public space such as pavements, parking areas and street surfaces. To allow the potential of these surfaces to be harnessed using geothermal heat probes, an appropriate legal framework needs to be established. According to the project's calculations, the potential of available heat sources significantly exceeds the heating requirements of the buildings.

The cost comparison for a nineteenth-century "Gründerzeit" building over a 20 year period shows that the overall cost of continuing to use gas heating would be comparable to the cost of conversion to the solar/ground probe/heat pump system. From the twentieth year onwards the innovative energy supply concept is in fact significantly more economical, because the operating costs are lower than those of a gas-powered system. ●

[1] **PROJECT PARTNERS**: Burtscher-Durig ZT-GmbH (project management), Jutta Wörtl-Gössler, ÖGUT Austrian Society for Environment and Technology, Komobile w7 GmbH, Martin Gruber, architect Johannes Zeininger
An exploratory study as part of the "Smart Cities Demo" Programme run by the Climate and Energy Fund.

[2] **PROJECT PARTNERS**: ÖGUT Austrian Society for Environment and Technology (project management), TU Wien, Geological Survey of Austria , zeininger architekten
A study commissioned by the Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology, the City of Vienna (Municipal Department MA 20) and the Austrian Association of Cities and Towns (Österreichischer Städtebund).

SMART CITY WÖRGL

Südtiroler Siedlung housing development as a "Zero emission region"

In Wörgl, Tyrol, the housing project Südtiroler Siedlung of NEUE HEIMAT TIROL (NHT) will take shape over the next few years as a flagship development with an outstanding quality of life, and as a model for other regions. The city of Wörgl is working together with commercial partners and researchers[1] to create a large-scale demonstration project for a smart city district. Key influences are the vision of energy autonomy and the roadmap that Wörgl devised as part of the 2012 exploratory study by the Climate and Energy Fund.

INTELLIGENT COMBINATION OF INNOVATIVE TECHNOLOGIES

Construction will take place in five phases, with new buildings designed to meet passive-house standards, providing a total of 360 homes across the total site area of 27,000 m². The innovative concept for this smart district uses a combination of tried and tested technologies and systems which will be intelligently linked, adapted and demonstrated in the course of the project.

These include:

> district heating networks using industrial waste heat, including heat storage systems
> using photovoltaic energy and storing it using environmentally-friendly salt-water storage systems to increase the use of locally generated energy
> networked use of smart ICT systems for residents
> smart vehicle charging and mobility management

Left: Südtiroler Siedlung, Neue Heimat Tirol (NHT), photo: NHT/Kurt Härting
Below: PV system on the roofs, photo: NHT/Robert Schober

[1] **PROJECT PARTNERS**: Stadtwerke Wörgl (consortium leader), BlueSky Energy GmbH, Meo Smart Home Energy GmbH, NEUE HEIMAT TIROL, University of Innsbruck – Department of Structural Engineering and Material Sciences and Department of Infrastructure Engineering

This project is part of the "Smart Cities Demo" programme of the Climate and Energy Fund.
The building was awarded GOLD certification under the federal government's "klimaaktiv" initiative.

PV system with 29 kWpeak output installed on the three roofs of the first-phase buildings. Additional capacity of 40 kWpeak is planned for the second phase of construction, photo: Stadtwerke Wörgl GmbH

In addition, sustainable business models and innovative citizen participation models are being developed with the aim of optimising the cost-benefit ratio for residents and business operators.

A VISION BECOMES REALITY

In November 2019 the first building phase of NEUE HEIMAT TIROL was ready to be handed over to its residents. The buildings were constructed to meet passive-house standards (as defined by PHPP), with controlled ventilation and highly efficient thermal insulation made from wood fibres. In cooperation with the Wörgl municipal utilities a PV system on the building roofs, with an output of 29 kWpeak, is combined with an outstandingly reliable, environmentally friendly and durable saltwater battery storage system (40 kWh storage capacity). This acts as a daytime storage buffer for the PV power and allows maximum use of locally produced energy. In addition a heat pump – powered exclusively by renewable energy – is used to capture the waste heat from the buildings' plant rooms. This means that distribution losses from the central heating and hot water systems can be minimised.

Using innovative control technology from MEOenergy, combined with the NHT's own building control systems, it is also possible to incorporate weather forecasting data into the system's operating parameters. As part of the research project the effects of this innovation are being measured and the data collected. Since buildings constructed to passive-house standards need very little heating energy (between 13 and 15 kWh/m^{2}a), the feasibility will be tested of supplying this with district heating return flows from Wörgl municipal utilities. As a side-effect this would also improve the efficiency of the urban district heating network.

SUSTAINABLE MOBILITY CONCEPT

The Südtiroler Siedlung housing development is designed as a car-free zone with restrictions on parking private motorised vehicles. The neighbourhood has excellent public transport links, with the city bus service and a train station close by. The roads within the development are designated as social interaction zones; private vehicles can only be parked in a central underground garage. The Wörgl municipal utilities department has already installed two e-charging stations on the site for e-vehicles. Intelligent charging management, integrated into the development's energy management system and combined with the battery storage system, means vehicles can be charged using locally captured PV power. In order to reduce the number of vehicles in the development even further, a car-sharing system is also being set up, using e-vehicles. ●

https://smartcities.at/stadt-projekte/smart-cities/#suedtiroler-siedlung-smart-city-woergl

Plant room with heat pump, photo: Stadtwerke Wörgl GmbH

Saltwater battery storage system with 40 kWh capacity, photo: Stadtwerke Wörgl GmbH

CAMPAGNE-REICHENAU INNSBRUCK

Cooperative planning for a smart city district

Construction area 1, Campagne, September 2020, photo: Robert Schober

The urban development project "Campagne-Reichenau" on the east side of Innsbruck is creating a smart city district with an area of about 84,000 m^2. Around 1,100 new homes are planned here, as well as numerous local providers of supplies and services, sports facilities and a community building. This is the first time in Innsbruck that a collaborative planning process has been used to develop a new urban district on the basis of a city council resolution. The process of developing the master plan involved not only local residents, but also clubs, schools and kindergartens in the area.

The aim is for Campagne-Reichenau to serve as an example of best practice for the creation of sustainable and inexpensive homes to a passive-house standard. Optimising the energy and economic aspects of the building envelopes is not the only priority here. In this smart city district the city authorities also will demonstrate intelligent structures for utilities and waste management, as well as pioneering transport and mobility solutions.

The long-term objective is to develop the area into a "zero-emission urban region" and to integrate it with the urban planning concepts of the City of Innsbruck, and the Tyrol Energy Strategy 2050. Key aspects of this include the reduction of greenhouse gas emissions, climate change adaptations, social sustainability, maximum energy efficiency, ecological quality and renewable energy sources as an essential component of the energy supply system.

SUSTAINABLE DISTRICT DEVELOPMENT

Led by IIG (Innsbruck Immobilien GmbH & CoKG), working in co-operation with various partners[1], innovative concepts for energy, utilities and waste management were developed for the new district, as well as appropriate mobility options. Key considerations included cost-efficiency in planning, construction and operation of the new buildings, and the formulation of multipliable, cost-effective and highly efficient solutions for construction and building services technology to meet passive-house standards for new construction.

Construction of the first section began in late autumn 2019. This consists of four buildings with a total of 307 apartments[2] . Plans include a sustainable energy supply system for each of the four construction areas. The buildings will be heated by water/water-heat pump systems (using low-temperature heating systems for each construction area that release warmth through floor heating). The roofs will be fitted with photovoltaic systems designed to maximise the available potential. PV power will supply some of the electricity needed for ventilation and heat pumps. Domestic water heating (high temperature) uses district heating from the regional district heating supplier IKB, with a high proportion of industrial waste heat and bioenergy. ●

https://info-campagne.at/de/campagne-reichenau/campagne-reichenau/29-0.html

[1] **PROJECT PARTNERS**: Innsbrucker Immobilien GmbH & CoKG (consortium leader), NEUE HEIMAT TIROL gemeinnützige WohnungsGmbH, Innsbrucker Kommunalbetriebe AG, University of Innsbruck – Department of Structural Engineering & Material Sciences and Department of Infrastructure

[2] Two of the buildings are being constructed by Innsbrucker Immobiliengesellschaft (IIG) and Neue Heimat Tirol (NHT), respectively.

This project is part of the "Smart Cities Demo" programme of the Climate and Energy Fund.

SUPERBLOCK

Innovative planning tool for energy-efficient urban districts

To achieve a significant reduction in energy consumption in cities, and cut greenhouse gas emissions, new planning measures are needed – particularly in the transport and building sectors. The "superblock" concept is an innovative urban planning tool that was developed in Barcelona and is already being used there in some parts of the city.

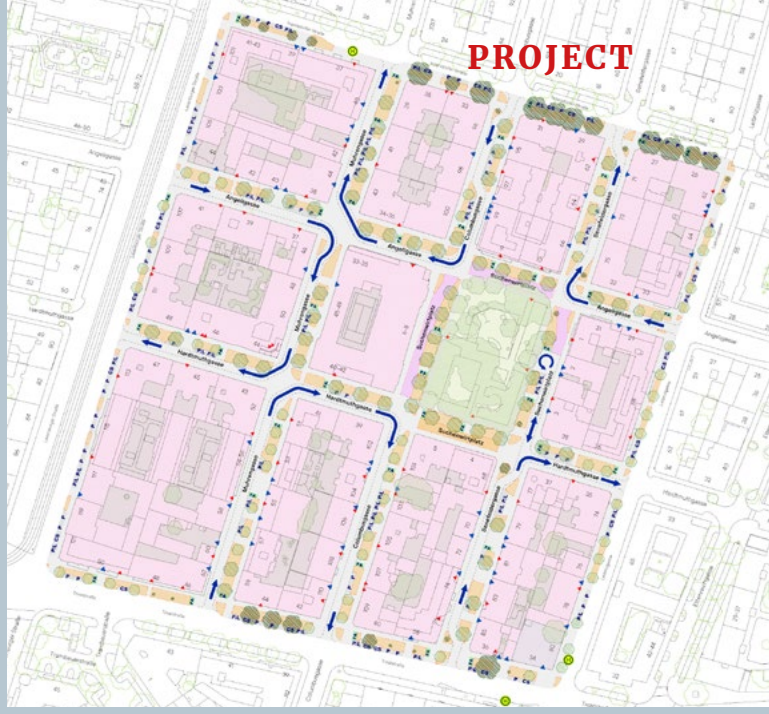
The central principle is to realign traffic priorities to create more open space for pedestrians and cyclists, and to redesign public streets into liveable environments, as part of a city that is configured for strolling. Setting up superblocks offers great potential for energy savings by reducing car-traffic, and by redirecting private motorized traffic into sustainable forms of transport. Streets can be transformed into public spaces, creating a more spacious living environment. This makes a significant improvement in quality of life for the residents.

APPLYING THE CONCEPT IN AUSTRIA

An exploratory study entitled SUPERBE, conducted by TU Wien in collaboration with the AIT Austrian Institute of Technology and Lorenz Consult[1], is investigating for the first time how the spatial organising principle of the superblock could be applied in Austrian cities, and what impact this would have on energy and traffic-related issues. Taking Vienna as an example, the study analysed how to identify possible areas for application, considering urban morphology. Three case study neighbourhoods were investigated, formulating urban planning and traffic management principles for each as a superblock. The study also analysed which areas could potentially be transformed into public space, and what savings could be anticipated with regard to energy consumption and greenhouse gas emissions.

POSITIVE EFFECTS

The findings of the SUPERBE study show that superblock solutions are feasible in the Vienna context, and that many positive effects could be achieved. GIS spatial analysis was used to determine possible areas where the concept could be applied, resulting in a particular emphasis on districts characterised by the 19th century "Gründerzeit".



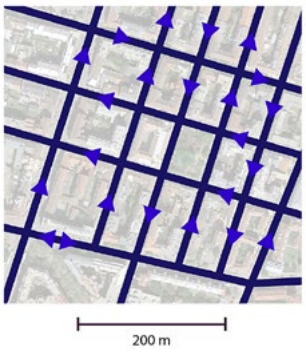
Superblock area potentials, with layering, image: SUPERBE-Team_Lorenz-consult

Detailed definitions of structural measures for the three selected superblock candidates, in Vienna's 7th, 10th and 17th districts, show the resulting potential for the transformation of public spaces. The stock of trees could be increased by a factor of six compared to the present situation, and possible areas for green infrastructure (tree grates, plant basins etc.) by a factor of five.

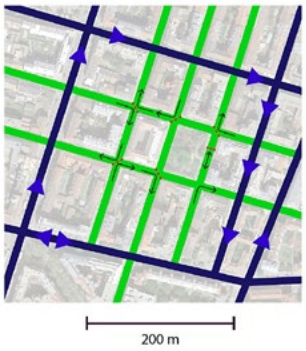
The potential for energy savings through the immediate effects of shifts in means of transportation were illustrated using a mode choice model. This makes it possible to map and predict the means of transport people choose for certain journeys, based on attractiveness and distance. The results showed that up to 0.790 kilometres of car usage per person per day could be saved – which corresponds to 738 kg of CO_2 or 2,644 kWh per day. ●

https://nachhaltigwirtschaften.at/en/sdz/projects/superbe.php

Current situation



Superblock model



Superblock traffic management, Image: SUPERBE-Team_Lorenz-consult

[1] **PROJECT PARTNERS**: TU Wien, Research Unit of Transport Planning and Traffic Engineering (project management), AIT Austrian Institute of Technology GmbH, Lorenz Consult ZT GmbH

This project is part of the "City of Tomorrow" programme run by the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology.


Photo: stock.adobe.com

Positive energy renovation

of the heritage-listed Otto Wagner Area

The Otto Wagner Area in Vienna is an extensive and internationally significant ensemble of art nouveau buildings. Its characteristic pavilion-style buildings are sprawled across a park-like hillside setting and, until 2020, were used as a hospital. Over the next few years, part of this site will become a campus for the Central European University (CEU), which will begin teaching and research activities here in 2025. The historic buildings need to be renovated and adapted to the needs of their future usage (office and university functions, student residences, and some medical institutes which will continue to operate there), while also respecting their protected status as historic buildings.

A detailed feasibility study conducted by a project consortium, consisting of the Central European University (CEU), TU Wien – Institute of Architecture and Design, LANG consulting, the OeAD-Wohnraumverwaltungs-GmbH, and Schöberl & Pöll GmbH (project management), investigated whether it is possible to renovate the entire Otto Wagner area at positive energy standards, while complying with the strict preservation order, and so to meet its future annual energy needs using locally sourced renewable energy.[1]

DEVELOPING THE RENOVATION CONCEPT

The primary objective of the renovation is to achieve optimal building functionality and comfort for the users. First of all the project team analysed the existing buildings and the requirements of their future usage. The next step was to devise a package of measures for construction, building services and electrical systems which were then discussed with the Federal Monuments Authority Austria, and developed further. The results of this comprehensive process show that with appropriate expertise, it is possible to renovate the complex at positive energy standards, while also complying with the strict limitations of the protection requirements for historic buildings, and at the same time to achieve a very high level of comfort for the users.

By adapting the layout of the buildings to the practical needs of their users, and optimising all trades, including operating equipment, the total energy consumption can be reduced by around 90% compared to simply carrying out maintenance renovation ("baseline scenario"). The energy balance for the site is positive within the accepted range of variation. Additional energy requirements can be met using locally sourced energy.

In consultation with the Federal Monuments Authority Austria, the following measures were agreed:

- insulation of roofs and floors, and interior insulation to outside walls
- optimisation of box-type windows
- installation of highly efficient ventilation systems with recovery of heat and moisture
- installation of highly efficient hot water systems with flow-optimised valves
- use of efficient surface heating and cooling systems
- installation of a highly efficient lighting system
- use of highly efficient energy-consuming equipment in all areas
- installation of photovoltaic systems on roof surfaces

If an efficient heat pump system is used, with near-surface geothermal heat collectors, ground probes, and if possible also using groundwater as a thermal carrier, the end consumption of energy can be reduced even further compared to a district heating/ventilation system.

RENOVATION CONCEPT FOR THE OTTO WAGNER AREA

- outstanding comfort for building users
- minimal energy consumption
- additional energy requirements met by production on site
- high cost-effectiveness
- compliance with strict historic building regulations

[1] This collaborative R&D project is part of the "City of Tomorrow" programme run by the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology.

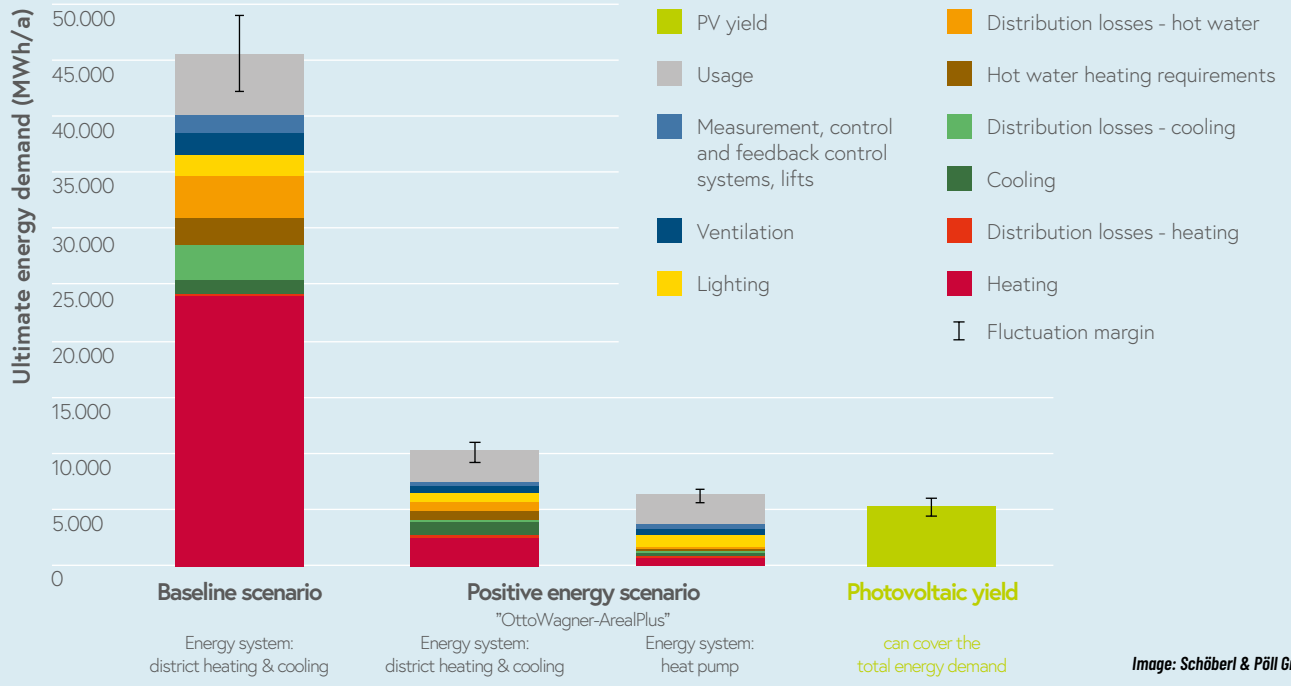


Image: Schöberl & Pöll GmbH

ECONOMIC VIABILITY OF THE RENOVATION MEASURES

As part of the project a comprehensive lifecycle cost analysis was compiled, taking account of numerous different factors. For example, the evaluation includes productivity and health of building users, depending on the condition of the buildings. The results of these analyses show that implementing this innovative renovation concept does involve higher investment and planning costs than a basic renovation or a conventional renovation, which would produce energy savings of 30% and 70% respectively. However, the positive energy renovation variant is the only concept that produces a significant economic benefit over a comparison period of 40 years. Furthermore, after 15 years already this model also has the lowest life-cycle costs. This is partly due to the very high savings in energy costs in the positive energy concept, and also due to the low follow-up costs in the long term, which result from the optimal functional advantages of the buildings. ●

https://nachhaltigwirtschaften.at/de/sdz/projekte/otto-wagner-areal-plus.php

Photo: stock.adobe.com

Photo: CEU

“This project demonstrates that protected historic monuments – the last unconquered territory in the building sector – can be turned into energy producers rather than energy consumers. We believe this to be the final gasp for carbon emitting buildings. It is now up to all of us to switch Europe’s building stock to being climate neutral. The landmark opportunity to refurbish a protected monument into an energy plus district is a world-first. CEU can seize the moment and set a precedent for its peers in the European higher education sector. By doing so it can also provide a unique, deeply valuable learning-by-doing opportunity for its student community.“

PROF. DR. DIANA ÜRGE-VORSATZ
Central European University (CEU)

You can also visit us at:

www.energy-innovation-austria.at

INFORMATION

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