

Climate Smart City Strategy Vienna

Our way to becoming a model climate city

City of Vienna | Smart City

Vienna's strategy for sustainable development

Credits and publishing details

Owner and publisher:
Vienna Municipal Administration

Project coordinators:
Julia Deistler & Ina Homeier
City of Vienna, Municipal Department for Urban Development and Planning

Editorial team:
Julia Deistler, Ina Homeier, Christina Lengauer, Eva Pangerl, Lena Rücker
City of Vienna, Municipal Department for Urban Development and Planning

Johannes Lutter, Michael Cerveny, Herbert Bartik, Johannes Hofinger, Andreas Veigl
UIV – Urban Innovation Vienna GmbH

The contents were drafted in consultation with staff of the Vienna Municipal Administration, its associated organisations and enterprises and other experts.

Design & layout:
The Gentlemen Creatives GmbH

English translation:
Angela Parker

Further information about Smart City Wien:
https://smartcity.wien.gv.at/site/

The selected activities and projects listed here in the "Vienna shows how" boxes are merely a snapshot. A comprehensive, continuously expanded and updated overview of smart projects in Vienna can be found at:
https://smartcity.wien.gv.at/en/projects/

The Vienna Smart City Strategy was adopted by Vienna City Council on 23 February 2022. The present document includes some minor adjustments which do not change the meaning of the original text.

© February 2022, Vienna Municipal Administration
ISBN 978-3-903003-71-2

The future starts now!

An interview with Mayor Michael Ludwig and Executive City Councillor for Innovation, Ulli Sima



"Vienna will achieve net zero by 2040!" How does the city intend to reach that goal?

Ludwig: The City of Vienna has been facing up to the climate crisis for over twenty years now, having already launched a comprehensive programme of climate action measures back in 1999. We are working resolutely at all levels to deliver science-based solutions and find the right answers to the big questions of the future. Last year also saw the launch of the revision process for the Smart City Wien Framework Strategy. The revised version defines the framework for development in the coming decades, and the expanded title "Smart Climate City Strategy for Vienna"

places the focus on action required to mitigate and adapt to climate change. Nevertheless, Vienna's definition of what constitutes a Smart City remains unchanged: high quality of life for everyone through social and technical innovation, while maximising conservation of resources – in short: a good, climate-friendly life for all.

A revised Smart City Strategy – what's the rationale behind it?

Sima: The Smart City Wien Framework Strategy hasn't simply been updated, but reassessed and revised from scratch with reference to the climate targets. By adding the new thematic field "Adapting to climate change" and defining all the goals more precisely and in greater detail, we have placed the focus firmly on environmental and climate issues as essential prerequisites for high quality of life. Furthermore, absolute target values based on the city government's policy programme leave little scope for "greenwashing". The result is a clearly structured yet vividly presented, readable, smart policy document. Its long time horizon means that Vienna's Smart City Strategy needs to be adapted at regular intervals to reflect changing circumstances such as international targets and/or policy objectives.

How can we all do our bit to mitigate climate change and uphold Vienna's high quality of life for generations to come?

Ludwig: By taking joint responsibility, adopting a sustainable lifestyle, conserving resources and making smart use of modern technologies we create new qualities that safeguard and enhance quality of life for everyone in Vienna. Once again, Vienna's Smart City Strategy places the focus on people – as active, engaged stakeholders working together to transform our city and make it climate proof.

Sima: Our high quality of life makes Vienna a model for many cities all over the world. To uphold this quality of life, even as the effects of climate change increasingly make themselves felt, we need to take bold and effective measures. And that also means that we all can and must do our bit to make sure we meet our climate and environmental targets! Because Vienna can only become a smart model climate city if we engage people and give everyone an equal chance to participate.

Joint action on climate change

Dear citizens of Vienna,

For many years now, Vienna has ranked among the world's most liveable cities. Vienna is growing – and it is also readying itself for the challenges of the coming years and decades.

Today, far-sighted urban planning is more important than ever as we all face the biggest challenge of the 21st century: the climate crisis. Our task is to ensure that the city we pass on to the younger generations is one that will still be among the most liveable on the planet in 50 or 100 years' time.

That is also the reason why Vienna's progressive coalition government has committed to some very decisive measures, on the one hand to ensure that Vienna achieves net zero by 2040, and on the other to adapt our city to climate change and mitigate its effects.

This strategy involves all the different urban systems – from mobility to the energy supply, from housing through urban green spaces to carbon-neutral construction, for instance, where we are leading the way with our "cool schools" that have won awards all over Europe.

We must, and want to, see this challenge as an opportunity to lead Vienna into a modern future. Making the transition away from oil and gas; short distances, modern, sustainable urban transport solutions and much, much more – all of this will also bring new, innovative companies to Vienna and thus create jobs.

The Smart City Strategy is the overarching strategic framework for the myriad individual climate action measures implemented in Vienna. A plan that sets out the steps to be taken in a format that is clear and transparent for all.

Vienna's progressive coalition government took the decision to reassess the 2019 Smart City Wien Framework Strategy, sharpening up the climate action targets and defining them more precisely. We have set ourselves ambitious objectives, because the times require it, and because we don't make policy just for the period until the next election, but beyond that for the generations to come.

As the City Councillor for Youth, I want to deliver on our promise to make Vienna the best city in the world for children and young people. An essential part of this is enabling young people to live in a city with plenty of green; a modern metropolis that generates solar energy on its roofs and uses geothermal energy for heating; a city with excellent public transport and extensive, well-designed footpaths and cycle routes.

The Smart City Strategy maps out our way ahead – let's follow it together!



Christoph Wiederkehr
Deputy Mayor & Executive City Councillor for Education, Youth, Integration and Transparency

Table of contents

Editorial 13

1. **Why Smart City Wien?** 15

2. **Smart City – Vienna's vision** 21

3. **The Smart City Wien headline goals** 27
   - Quality of life 28
   - Resource conservation 32
   - Innovation 36
   - Vienna's Smart City goals at a glance 40

4. Thematic fields **47**
Energy supply 48
Mobility and transport 54
Buildings 60
Economy & employment 68
Zero waste & circular economy 76
Adapting to climate change 82
Urban ecology, environment & water 88
Health & social inclusion 96
Education, science & research 102
Digitalisation 108
Participation, engagement & culture 114
Overview of thematic fields and their contribution to achieving the SDGs 120

5. From strategy to implementation **123**

Index of illustrations 130
In-depth sectoral strategies 130
Indicators and data sources 130
Selected references and further reading 131


© Stadt Wien / Christian Fürthner

Editorial

Far-sighted, smart solutions and a tradition of pioneering urban development have made Vienna the city with the highest quality of life in the world. From the compact urban structure of the 19th-century city and the building of the springwater mains for the water supply to the legislation to preserve Vienna's green belt; from the ambitious social housing projects and the construction of the Danube Island to the expansion of the district heating network and the massive investments in public transport – the people of Vienna are still benefitting from these ideas today. However, it is not enough to rest on the laurels of days gone by. The very essence of a city lies in change and being open to innovative solutions. And urban development also means assuming responsibility for future generations.

Having said that, issues such as the climate crisis are posing major new global challenges, especially for cities. As a response to these challenges, Vienna City Council set an initial milestone back in 2014 with its adoption of the first version of the Smart City Wien Framework Strategy. This sustainability strategy for the City of Vienna is continuously evolved and updated in multiple wide-reaching processes of dialogue. The first monitoring cycle to evaluate progress with its implementation was carried out in 2017, forming the basis for the first comprehensive revision of the strategy in 2019. The latter was especially necessary with regard to the targets set by the Paris Agreement on Climate Action, to which Austria became a signatory in 2015. The United Nations Sustainable Development Goals (SDGs) serve as another overarching reference framework.

In view of the ever more palpable impacts of climate change, the time has come to sharpen the climate action targets once again and define our goals more precisely. In 2020, the goal of achieving net zero by 2040 was enshrined in the legislative programme of Vienna's new coalition government. Meeting this goal will demand even more ambitious collective efforts and major progress in all the municipal administration's fields of activity. Work was therefore begun on a further revision of Vienna's Smart City goals, in order to ensure that the strategy continues to be the definitive framework for the future sustainable development of our city. The strategic focus is defined by our new overarching target: "Vienna will achieve net zero by 2040!" In affirming this ambition, Vienna is renewing its commitment to meeting the global and European climate goals and targets.

With this revised and updated strategy, Vienna intends to uphold its leading position within the alliance of responsible cities and to continue to play an active role in shaping the international debate.

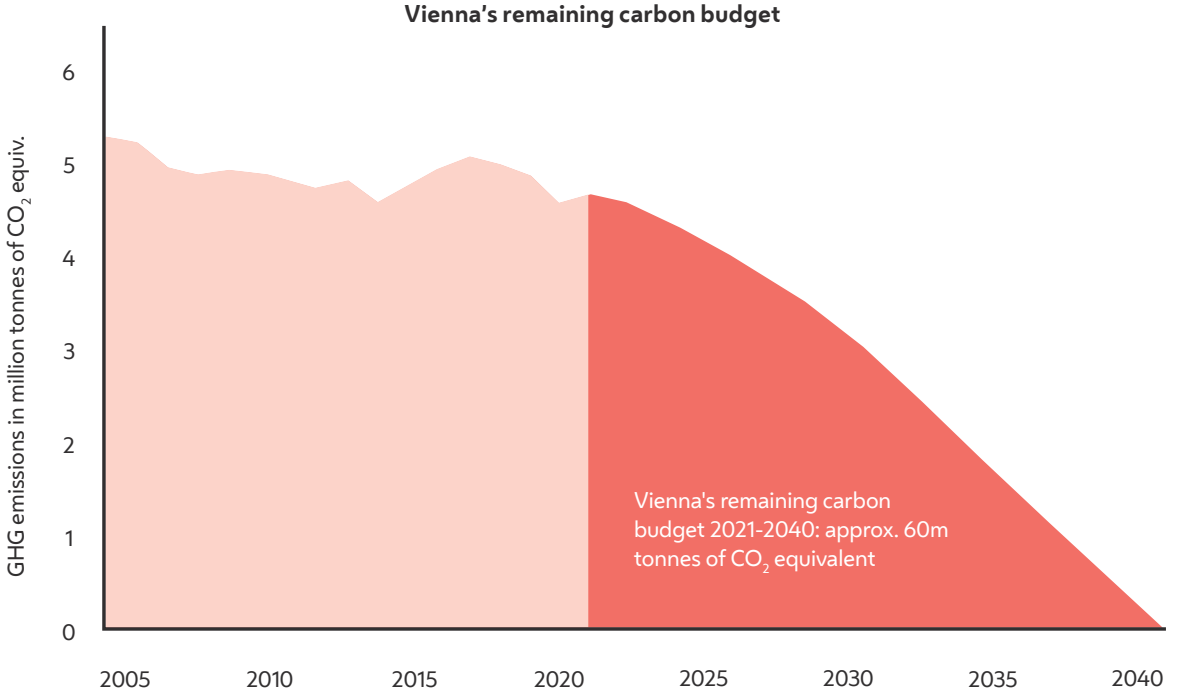
1. Why Smart City Wien?

Smart City Wien sets out the local response to global challenges.

Cities are growing. All over the world, increasing numbers of people are flocking into cities. Vienna's population has also risen drastically in recent years, and is likely to reach the two-million mark before 2030. This growth brings with it the challenge of providing infrastructure and urban services on a whole new scale and in the accustomed high quality while simultaneously conserving limited natural resources.

The global technological revolution is also rapidly gathering pace. The burgeoning technical possibilities and advancing digitalisation are opening up new ways of developing innovative solutions for a number of future urban issues. At the same time they raise a host of new issues, for instance regarding data protection, digital ethics and digital equal opportunities.

Vienna's remaining carbon budget



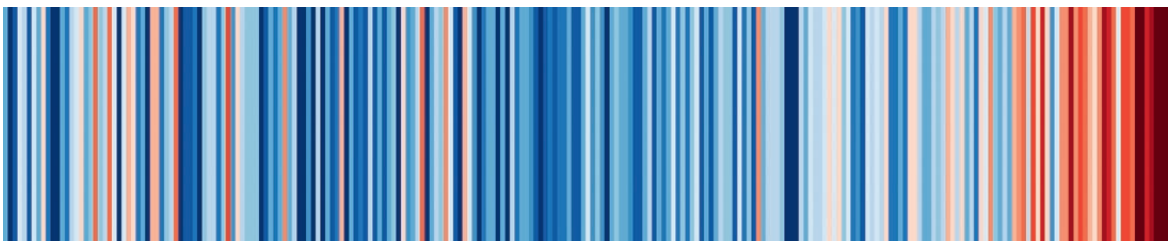
Own diagram based on data from Environment Agency Austria (2021) and calculations by Urban Innovation Vienna.

Development of greenhouse gas emissions (according to SCSW definition) as projected by the climate targets. The red area represents the remaining carbon budget for 2021-2040 of approx. 60m tonnes of CO_2 equivalent.

The global climate crisis is rapidly getting worse. The concentration of greenhouse gases in the Earth's atmosphere is constantly increasing, and global warming is intensifying as a result. The remaining "carbon budget", i.e. the maximum amount of CO_2 emissions that humans can emit while still having a chance of at least curbing global warming, is constantly diminishing. At the same time we are consuming vast quantities of natural resources, many of which are non-renewable, and which after use end up as waste and pollutants in air, water and soil.

We are already seeing and feeling the consequences of this today. Global warming has triggered a sharp increase in extreme weather events in recent years. Both heatwaves and torrential rainfall are increasingly necessitating repair work and investment in preventative measures. The heatwave temperatures place a great strain on people's health, while extreme weather is simultaneously a major burden on urban infrastructure and ecosystems.

Our climate has already changed considerably



Copyright:
Ed Hawkins (www.showyourstripes.info).
Data: Central Institute for Meteorology and Geodynamics (ZAMG)

Average annual temperatures in Vienna, 1775–2020. Blue bars indicate temperatures below and red bars temperatures above the long-term average for the years 1970–2000.

Increasingly, the climate crisis is thus becoming a social and economic crisis as well. Children, the elderly and people on low incomes and/or with few social contacts are particularly severely affected by the consequences of overheating. At the same time, city-dwellers are increasingly suffering from energy poverty and housing shortages. Urban authorities must therefore be placed in a position to make the necessary investments in a green and equitable city, in the interests of the common good.

Vienna cannot overcome these challenges by itself, but it can develop sustainable solutions that work locally and thus set an example globally.

The Smart City Wien initiative embodies basic values and targets agreed by the international community.

Vienna is committed to the UN 2030 Agenda for Sustainable Development and its global Sustainable Development Goals (SDGs).

With the UN 2030 Agenda for Sustainable Development, the international community has agreed on 17 Sustainable Development Goals (SDGs). Vienna has pledged its commitment to these global SDGs. The Smart City Strategy builds upon the SDGs and, as Vienna's sustainability strategy, it provides the strategic framework for their delivery; local implementation and monitoring of the Smart City goals and the UN SDGs are very closely interlinked.

The Vienna Smart City Strategy is based on all 17 Sustainable Development Goals (SDGs) set out in the UN 2030 Agenda.




© Stadt Wien / Christian Fürthner

Vienna is contributing to the attainment of the global, European and national climate goals.

The Smart City Strategy is aligned with the targets of international and national agreements and strategies, first and foremost the UN Paris Agreement on Climate Action. Its goal is to keep human-induced global warming to well below 2°C above pre-industrial levels, striving for 1.5°C if possible, and to reduce global greenhouse gas emissions to zero by the middle of the 21st century. In 2020, the EU member states jointly agreed a new target as their contribution under the Paris Agreement, to cut emissions in the EU by at least 55% below 1990 levels by 2030 and to achieve net zero by 2050. The policy framework for these efforts is the European Green Deal, a package of new and reformed regulations and directives unveiled in summer 2021 under the slogan "Fit for 55". This is in addition to the EU Circular Economy Action Plan adopted back in 2018, which aims to help accelerate the EU's transition from a linear to a circular economy. What is still missing at European level are funding instruments and regulations to support cities in implementing sustainable investments.

The EU emission reduction targets also result in binding targets for Austria. The measures required to meet the targets must be set out in the "National Energy and Climate Plan for Austria (NECP)". Above and beyond this, the Austrian federal government has committed to the target of achieving net zero by 2040 and a 100% renewable electricity supply by as early as 2030.

With its Smart City Strategy, Vienna is making an explicit commitment to the global, European and national targets and contributing to their attainment. The policy programme of Vienna City Council goes a step further still: in line with the target of the Austrian federal government it has committed to achieving net zero by 2040, focussing on the three central pillars of mitigating and adapting to climate change and moving towards a circular economy. Vienna has revised its Smart City Strategy to incorporate new goals and targets, taking into account the challenges and consequences of the corona pandemic and the recommendations of the Vienna Climate Council. By the same token, in order to realise its Smart City goals Vienna requires suitable policy frameworks at federal and EU level. Smart City Wien embodies the basic values and targets agreed by the international community.

2. Smart City – Vienna's vision

Smart City Wien means high quality of life for everyone in Vienna.

In Vienna's interpretation, a Smart City is one that never loses sight of the "human dimension"; a city that places the focus on the needs of local people. The development of a sustainable, liveable city is only successful if everyone benefits and everyone is able to play their part.

Smart City Wien is the vision of a city where life is good, but not at the expense of the environment and thus of future generations.

Consistent climate policy, a complete transition from fossil to renewable energy, responsible use of resources and a focus on sustainable behaviours – these all create new qualities that make the city a pleasant place to live.

Smart City Wien means always keeping on the move.

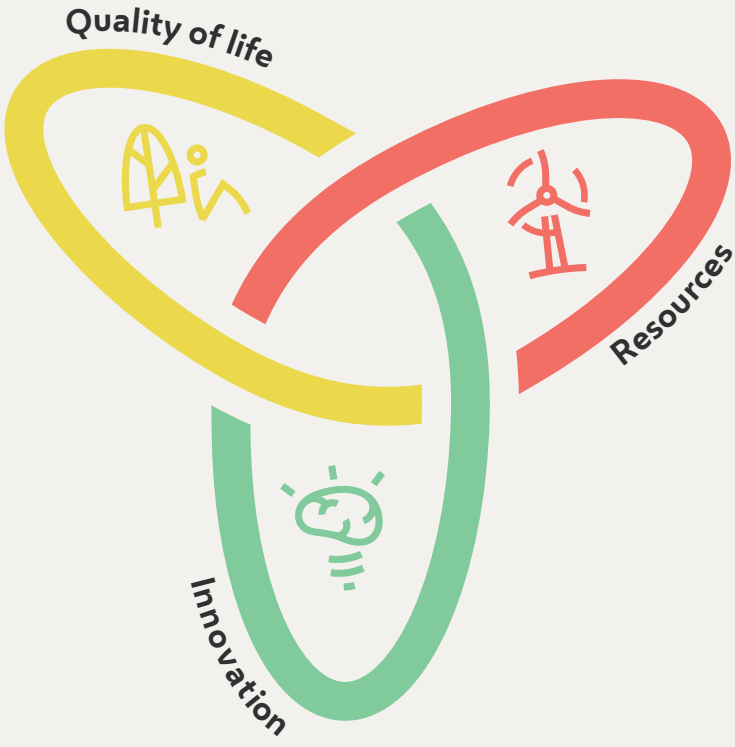
Vienna makes active, prudent use of the opportunities offered by social innovations, new technologies, and above all digitalisation to help it realise its goals. With this approach, Vienna is also positioning itself on the international stage as a city which is developing viable solutions that are fit for the future.

The Smart City Wien mission in a nutshell:

- **high quality of life for everyone in Vienna**
- **through social and technical innovation in all areas**
- **while maximising conservation of resources.**

The Smart City Strategy is the umbrella for all topics of relevance to the city's future. The Strategy guides policy decisions as well as the actions of the municipal administration. All sectoral strategies, programmes and specialised thematic concepts take account of and implement the goals and principles of the Smart City Strategy.

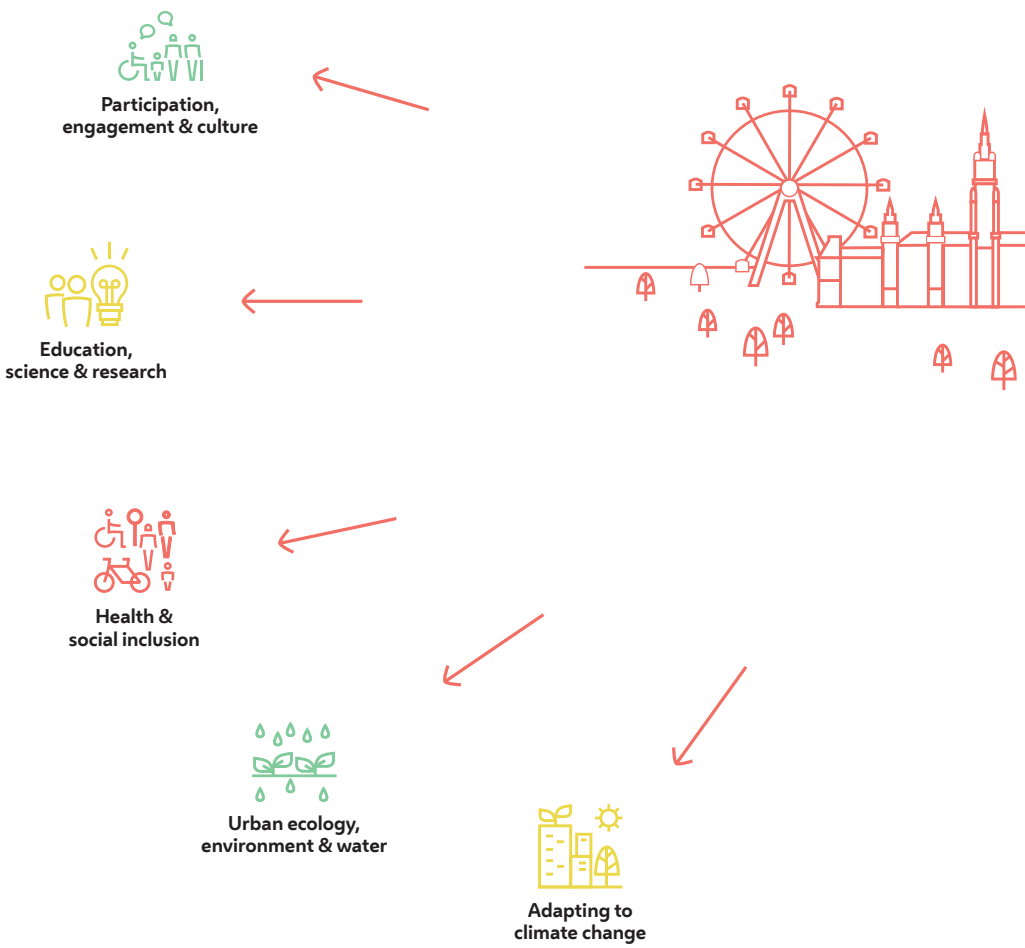
As a blueprint for a liveable future, the Smart City Strategy extends far beyond local government and the municipal administration: broad public participation and creative input from all the city's citizens are required to help deliver this vision of a sustainable future for Vienna.

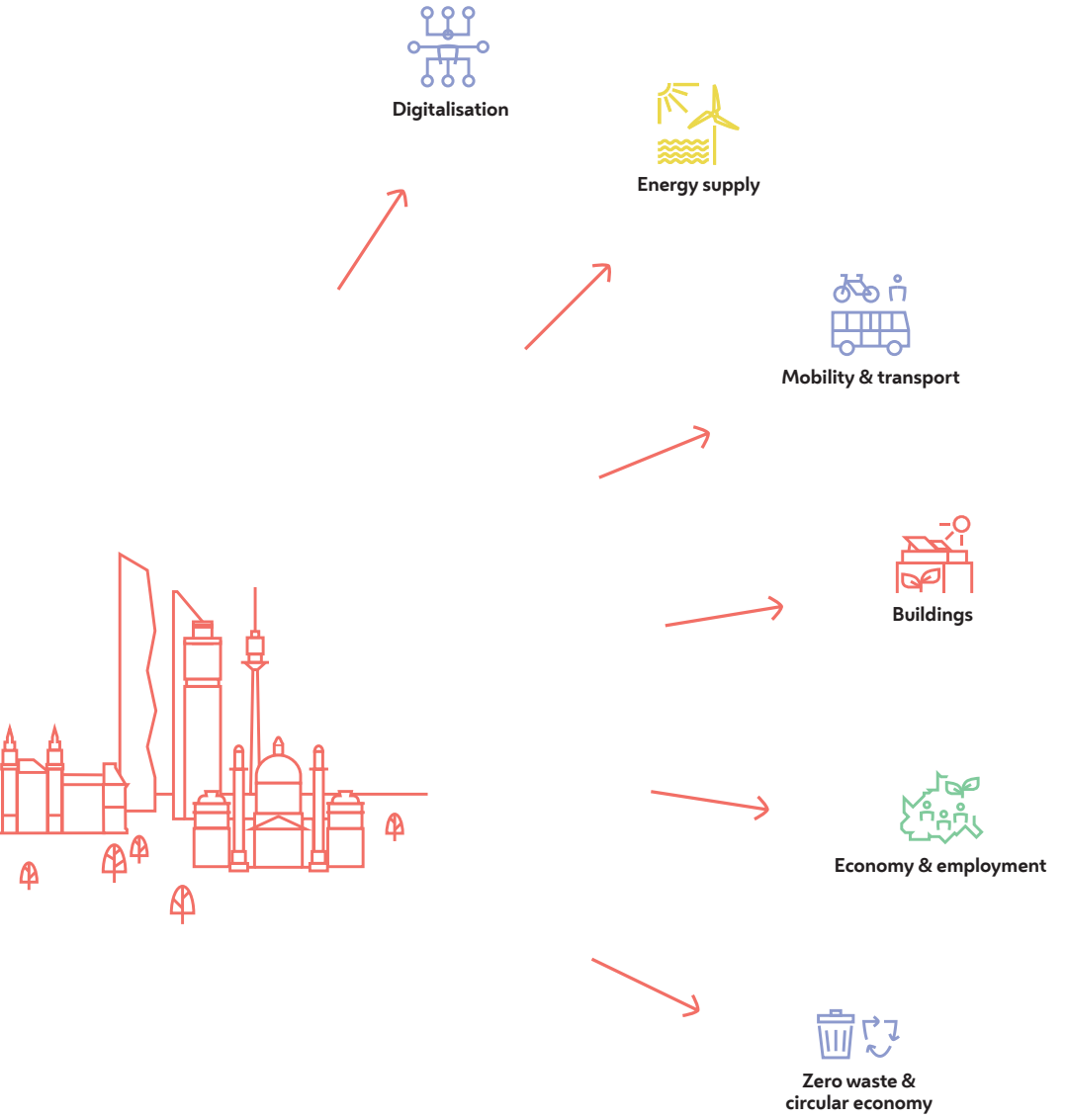


Vienna's Smart City approach develops its full impact and effectivity through the combination and interplay of the three dimensions **Quality of Life, Resource Conservation and Innovation.**

These three dimensions are translated into concrete goals in **eleven thematic fields**, which are strongly interconnected and thus give rise to synergy effects.

Vienna's Smart City approach: eleven thematic fields





The thematic fields are closely interconnected: goals and measures in different thematic fields often reinforce one another and give rise to synergy effects. By the same token, the integrated approach means that any conflicting objectives can be quickly identified and resolved. Cross-cutting issues such as cooperation across municipal boundaries or public participation & engagement touch upon a number of thematic fields.

3. The Smart City Wien headline goals

Quality of life

Vienna is the city with the highest **quality of life and life satisfaction** in the world.

Vienna focuses on social **inclusion** in its policy design and administrative activities.

Vienna is a great place for **children** and **young people.**

Quality of life as a strength and a key future endeavour

Quality of life is not achieved by accident. Vienna is well known as a city with outstanding quality of life, and that is thanks to many decades of steadfast, consistent work and far-sighted planning. Excellent infrastructure, an extensive and reliable public transport network, first-class water quality and good healthcare provision all play their part in this, not to mention a diverse range of educational, cultural and leisure facilities, affordable, well-built housing and high environmental quality.

Quality of life is the combination of a large number of factors. Access to the labour market, fair pay and a good level of social security; opportunities for participation, engagement and personal development based on a wide range of universally accessible education and training options; a broad spectrum of job opportunities that allow a good work-life balance; access to public services, delivered by strong public sector service providers; affordable housing; diverse and widely accessible cultural and

leisure facilities; public safety and social calm, and, last but by no means least, an intact environment.

The Smart City Strategy also opens up new visions for urban quality of life. Vienna is building upon its existing qualities as well as focusing on new aspects: quality of life also means being able to use the street space for a more diverse range of activities – for pavement cafés, strolling and relaxing, play and sport. Quality of life likewise means having access to a wide range of mobility options without having to own a vehicle oneself; enjoying new levels of home comfort thanks to eco-friendly yet low-cost heating and cooling systems, or being able to use products for longer because they don't have to be thrown away the first time they develop a fault.

Adapting to climate change is an urgent necessity. In order that everyone in Vienna can maintain a good quality of life despite global warming and the growing incidence of heatwaves and extreme weather events, strategies are required to limit the consequences of climate change and deal with them more effectively.

Quality of life as an economic pull factor. Quality of life makes Vienna stand out from its competitors on the international stage. Factors such as environmental quality, good educational institutions and social calm make Vienna attractive to international companies, start-ups, professionals and talent. Culture is another decisive factor in the city's high quality of life: the diversity and accessibility of Vienna's cultural scene make it a European capital where cultural participation is open to all alike.



© Stadt Wien / Gerd Götzenbrucker

Opportunities for all

Participation and active engagement. A distinctive feature of Smart City Wien is that it takes account of people's diverse lifestyles and everyday realities – regardless of age, gender, ethnicity, health and social status – so that all sectors of the Viennese population can look forward to a continued improvement of their living conditions. The more people buy into the vision and play an active role in making it reality, the more successful it will be.

Inclusion and equality as the foundation and keynote theme. Vienna is committed to social inclusion as a keynote theme in all policy areas and to universal equality in political, social and economic terms. The City of Vienna continues to use the assets under its ownership – from municipal housing to public utilities and transport providers – consistently and in the common interest.



The multi-generational city – a great place for children and young people

Focus on the needs and interests of children and young people. Children and young people are affected by the consequences of the climate crisis in multiple ways: they are among the hardest hit by the environmental impacts and will have to live longest with climate change. The City of Vienna therefore places an active focus on the needs and interests of children and young people.

Active involvement of the younger generation. Vienna aims to work with the next generation to create a city for the next generation. Children and young people should be given the opportunity to formulate their own interests and opinions and play an active role in co-shaping the future of our city. Tackling the climate crisis is a joint endeavour to which all generations make an active contribution.


© Stadt Wien / Christian Fürthner

Resource conservation



Vienna reduces its local per capita greenhouse gas emissions by 55% by 2030 (compared to the baseline year of 2005), and achieves **net zero** from **2040**.



From 2021 onwards, Vienna's total local greenhouse gas emissions **will not exceed 60 million tonnes of CO_2** equivalents.[1]



Vienna reduces its consumption-based **material footprint** per capita by 30% by 2030, 40% by 2040, and 50% by 2050.[2]

Vienna **reduces** its local per capita final **energy consumption** by 30% by 2030, and 45% by 2040 (compared to the baseline year of 2005).

Vienna will achieve net zero by 2040

Vienna has already been pursuing an ambitious climate policy for many years now. The implementation of the Vienna Climate Protection Programmes for the periods 1999–2009 and 2010–2021 already brought about a significant reduction in carbon emissions. Ground-breaking steps to this end included expansion of the district heating supply using incinerated household waste and industrial waste heat, comprehensive subsidy schemes to fund the upgrade of thermal insulation and heating & cooling systems in residential buildings, and the introduction of spatial energy planning. With schemes such as the "OekoBusiness Wien" consultancy service, the City of Vienna supports local companies in their transition to a climate-friendly business model, and under the Municipal Energy Efficiency Programme it implements an array of measures to reduce its own energy consumption within the municipal administration, its agencies and enterprises.

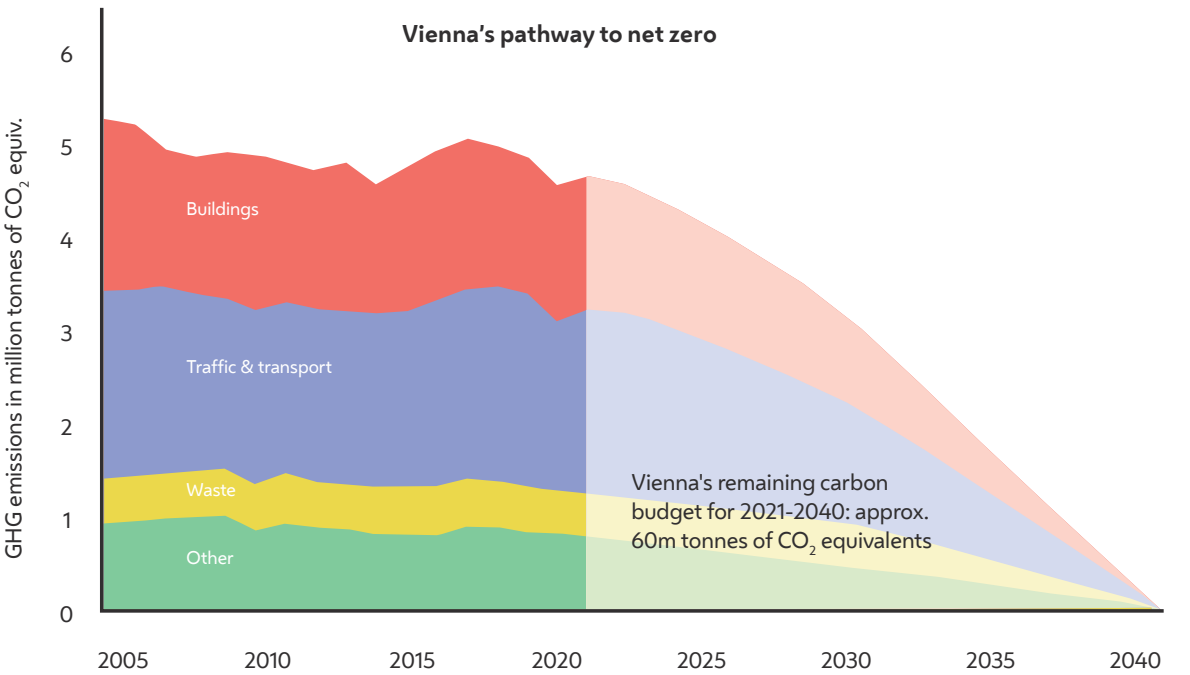
Limitation of the remaining carbon budget. The decisive factor for the extent of climate change is the absolute total of greenhouse gas emissions, first and foremost carbon dioxide (CO_2), that are released into

[1] In the non-ETS sectors, i.e. those not covered by the EU Emissions Trading System.
[2] Baseline year 2019.

the atmosphere. If global warming is to be limited as set out in the Paris Agreement, the remaining carbon emissions budget must therefore be limited as well. Vienna has set its remaining carbon budget at 60 million tonnes of CO_2 equivalents from 2021 onwards[3].

Full decarbonisation. Vienna aims to reduce its local (per capita) greenhouse gas emissions to zero by 2040, and by 55% by as early as 2030 (compared to the baseline year of 2005). The target pertains to all carbon emissions that are not (yet) covered by the EU Emissions Trading System.[4] From 2040, any remaining residual emissions are to be offset by carbon sinks in line with international and national targets (net zero carbon emissions).

Reduce energy consumption. Vienna can only meet this ambitious climate goal by prioritising the transition to renewables while simultaneously achieving a radical reduction in energy consumption across all sectors. Alongside other thematic fields, this applies in particular to the mobility sector as well as to heating, air-conditioning and hot water supply in buildings.



Own diagram based on data from Environment Agency Austria (2021) and calculations by Urban Innovation Vienna.

Development of greenhouse gas emissions (according to SCSW definition) as projected by the climate targets, broken down by sector. The grey area represents Vienna's remaining carbon budget for 2021-2040 of approx. 60m tonnes of CO_2 equivalents. "Traffic & transport" comprises traffic and transport emissions in Vienna according to the second estimate by Environment Agency Austria. "Buildings" comprises emissions from the burning of coal, oil and natural gas for heating of buildings. "Waste" comprises emissions from waste incineration, landfilling and sewage treatment. "Other" comprises emissions from energy consumed by industry and business as well as emissions of greenhouse gases other than carbon dioxide (esp. fluorous gases).

[3] In the non-ETS sectors.
[4] This definition applies to all greenhouse gas emissions targets in this strategy.

Careful use of resources

Reduce material consumption. Radical conservation of resources refers not only to fossil fuels, but to all raw materials that are processed to provide goods and services. High material consumption is one of the main causes of greenhouse gas emissions.

Transition to a circular economy based on the zero waste principle. Sustainable future development calls for a new economic approach that significantly reduces material consumption, keeping products and materials circulating within the economy for as long as possible. Products of all kinds are designed to be durable, reparable, reusable and recyclable ("green design").

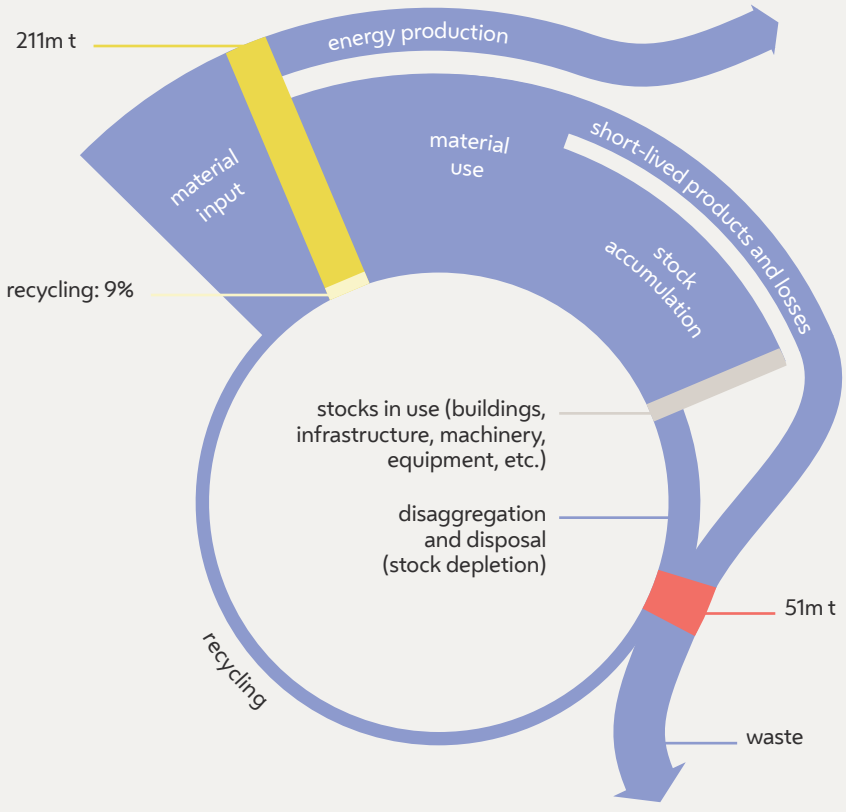
Vienna's waste management system is based on the zero waste principle and thus forms part of a functioning circular economy. Products no longer in use are repaired, repurposed or recycled, and non-avoidable waste is processed into secondary raw materials. Less waste is produced thanks to a wide range of waste prevention measures, and at the same time existing goods can be used considerably more efficiently, for instance through shared-use schemes. Buildings, too, are an important source of raw materials at the end of their lifespan. This reduces the carbon footprint over the entire lifecycle of the materials, enhances security of supply, creates new jobs and boosts the economy.

Cost transparency thanks to a consumption-based approach. Vienna uses a consumption-based approach to calculate its material footprint. This approach not only factors in the goods produced in the city, but also all goods that are consumed here, many of which are produced elsewhere and leave a corresponding material and carbon footprint in those places as well as during transport.

Resource conservation as an opportunity

This necessary transformation of energy, transport and economic systems also presents Austrian business with a huge opportunity to carve out an international profile in these sectors. An aggressive climate and energy policy to strengthen the domestic market would lend important support to this endeavour.

Material flows in Austria



Own diagram (2019) based on: Jacobi et al. (2018): Providing an economy-wide monitoring framework for the circular economy in Austria: Status quo and challenges. https://doi.org/10.1016/j.

Simplified diagram of overall material flows in Austria. Over 90% of the material input consists of domestically produced raw materials (e.g. agricultural products, timber, extracted minerals, sand and gravel) and imports, and at present only around 9% of the materials are recovered and reused (recycling). About a quarter of the input materials are used for energy production. A reduction in energy consumption would thus also make a significant contribution to reducing material consumption. Approx. three-quarters of the input is processed for material use, though only a small proportion of this is used to produce short-lived consumer goods. The lion's share goes into the accumulation of "stocks" (buildings, infrastructure, machinery, equipment, etc.), from which materials are only recovered for potential recycling after a long useful life.

Innovation





By 2030 Vienna is an **innovation leader.**



Vienna is Europe's **digitalisation capital.**

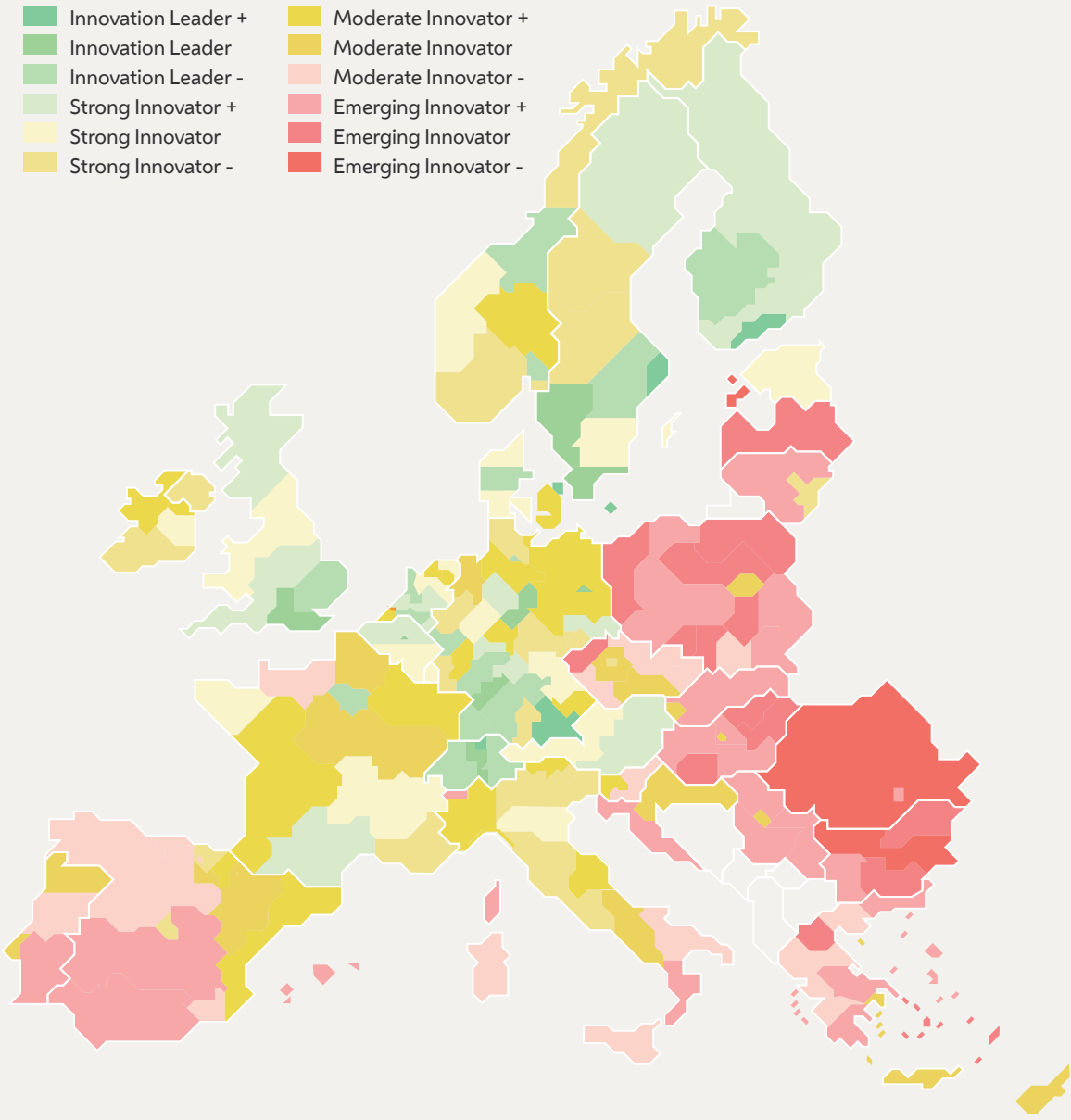
Vienna as a European centre of innovation

Boosting the capacity for innovation. It is virtually impossible to envisage many of the challenges we will face in the future – which makes it all the more important to invest in Vienna's fundamental capacity for innovation. In the European context, Vienna and Austria's eastern region already rank among the group of "strong innovators". However, further efforts are required if we are to catch up with the top group of "innovation leaders".

Technical and social innovations. New technologies often act as a catalyst here, but social innovations and new, inclusive innovation processes are playing an increasingly prominent role. These are more strongly inspired by the needs of local people, more broadly accepted, and support the piloting of new solutions.

New opportunities for the Vienna economic region. This opens up vast opportunities for science and research organisations as well as start-ups and the wider business community. Vienna's growing reputation as an innovation leader, and particularly as a competence centre for Smart City solutions, increases the opportunities for local companies and institutions to land international contracts and projects or recruit high-calibre talents from all over the world to join their staff.

Comparative innovative capacity of European regions



Illustrative diagram based on the European Commission's Regional Innovation Scoreboard. 2021 data.

Regional Innovation Scoreboard: The EU's Regional Innovation Scoreboard assesses the strengths and weaknesses of innovation systems in the individual member states at national and regional level. The assessment is based on input indicators (such as R&D spending) and indicators measuring innovation output (e.g. number of patent applications) in science and research organisations as well as in companies. Out of over 200 regions assessed in the latest Scoreboard (2021), 38 were categorised as "innovation leaders"; Eastern Austria (Vienna, Lower Austria and Burgenland) was ranked with 67 other European regions among the "strong innovators", ahead of the "moderate" and "modest innovators".

Vienna as a digitalisation capital

Digital humanism. Vienna aims to be the centre for digital humanism. The overriding principle of digitalisation, in Smart City Wien's view, is to serve people and their needs and further improve the quality of life in our city.

Digitalisation as a driver of innovation. Digitalisation offers enormous potential for innovation and co-creation processes. The city promotes a culture of innovation and creates a suitable framework to support social and technological innovation.

Digitalisation promotes transparency and active engagement & participation. Digitalisation drives Vienna's evolution into an open, participatory city. Digital platforms and communication channels are used to increase public engagement and participation.

Digitalisation creates new jobs. New technologies and their applications mean that old occupations will disappear and new ones emerge. Vienna will help its citizens to make the most of the opportunities offered by the digital revolution.

Digitalisation as the driving force for delivering Vienna's Smart City goals. Digitalisation is a key tool for transforming the city's energy and mobility systems, driving the transition to a circular economy and supporting measures to protect the urban ecosystem. More effective monitoring and management mechanisms can maximise resource efficiency in all spheres of life. However, Smart City Wien takes care to ensure that systems are only digitalised if the benefits derived from this are greater than the cost in terms of consumption of energy and resources.


© Stadt Wien / Christian Fürthner

Vienna's Smart City goals at a glance

Quality of life

- Vienna is the city with the highest quality of life and life satisfaction in the world.
- Vienna focuses on social inclusion in its policy design and administrative activities.
- Vienna is a great place for children and young people.



Resource conservation

- Vienna reduces its local per capita greenhouse gas emissions by 55% by 2030 (compared to the baseline year of 2005), and achieves net zero from 2040.
- From 2021 onwards, Vienna's total local greenhouse gas emissions will not exceed 60 million tonnes of CO_2 equivalents.[5]
- Vienna reduces its local per capita final energy consumption by 30% by 2030, and 45% by 2040 (compared to the baseline year of 2005).
- Vienna reduces its consumption-based material footprint per capita by 30% by 2030, 40% by 2040, and 50% by 2050.[6]



Innovation

- By 2030 Vienna is an innovation leader.
- Vienna is Europe's digitalisation capital.

[5] In the non-ETS sectors.
[6] Baseline year 2019.

Thematic fields

Energy supply

- Our heat supply will be 100% fossil free by 2040.
- Vienna's energy grids allow for a decentralised, renewables-based energy supply.
- Renewable and carbon-free energy production in Vienna increases threefold by 2030 and sixfold by 2040, compared to 2005 levels.[7]
- By 2030 half, and by 2040 100% of Vienna's final energy consumption will originate from renewable or carbon-free sources.[8]



Mobility and transport

- Per capita CO_2 emissions in the transport sector fall by 50% by 2030, and 100% by 2040.[9]
- Per capita final energy consumption in the transport sector falls by 40% by 2030, and 70% by 2040.[10]
- The share of journeys in Vienna made by eco-friendly modes of transport, including shared mobility options, rises to 85% by 2030, and to well over 85% by 2050.[11]
- Mobility guarantee: It's easy to get around in Vienna without owning a car.
- Private motor vehicle ownership falls to 250 vehicles per 1,000 inhabitants by 2030, and the amount of parking available in public spaces is gradually reduced.
- Vienna promotes and realises the concept of the 15-minute city – with short distances to services and amenities, lively, mixed-use neighbourhoods and redesign of streets to provide more space for active mobility options, public transport and pleasant places to linger.
- The volume of traffic crossing the municipal boundaries falls by 50% by 2030.[12]
- Commercial traffic within the municipal boundaries is largely CO_2 free by 2030.
- Non-fossil-powered vehicles as a share of new vehicle registrations rises to 100% by 2030.[13]

[7] Including any utilisation of geothermal energy from the surrounding region.
[8] Including any utilisation of geothermal energy from the surrounding region.
[9] Baseline year 2005.
[10] Baseline year 2005.
[11] The wider definition of ecomobility encompasses walking, cycling and public transport plus shared-use schemes such as car sharing and car pools.
[12] Baseline year 2021.
[13] With the exception of special-purpose vehicles.



Buildings

- Per capita final energy consumption for heating, cooling and hot water in buildings falls by 20% by 2030, and 30% by 2040.[14]
- The associated per capita CO_2 emissions fall by 55% by 2030, and to zero by 2040.[15]
- Buildings are used to generate as much solar power as possible.
- Greening, shading and passive cooling of buildings are standard; active cooling systems are powered by renewables.
- Circular planning and construction to maximise conservation of resources is standard from 2030 in new-build and refurbishment projects.
- By 2040, at least 70% of the building components, products and materials recovered from demolitions and major refurbishment projects are reused.
- Vienna continues to provide an adequate supply of high-quality subsidised housing to reduce the percentage of people who are overburdened by housing costs.
- Developers' competitions in the subsidised housing sector drive social innovations and new solutions for mitigating and adapting to climate change – especially greening measures.



Economy & employment

- The productivity of Vienna's urban economy constantly increases, underpinning the city's prosperity, resource efficiency and competitiveness.
- The incomes and job satisfaction of Viennese citizens constantly increase, while social inequality declines.
- The material efficiency of the Viennese economy increases by 30% by 2030, and a further 10% by 2040.[16]
- Products manufactured in Vienna are durable, easily reparable, reusable and recyclable, and their production processes are largely waste and pollutant free.
- In 2030, Vienna has a global reputation as the hub of a resource-efficient circular economy and attracts investment and talent in this sector.
- The City of Vienna champions a sustainable urban economy by introducing appropriate legal frameworks and targeted subsidy schemes, by creating "living labs", and as a public-sector client.
- The City of Vienna and Viennese businesses establish a climate action alliance for the joint development of a sustainable urban economy.

[14] Compared to the average for the period 2005–2010.
[15] Compared to the average for the period 2005–2010.
[16] Baseline year 2019.



Zero waste & circular economy

- Less waste is produced thanks to a wide range of waste prevention measures.
- Vienna exceeds the EU target of a 60% recycling rate by 2030.
- By 2050, 100% of Vienna's non-avoidable waste is recycled.
- Vienna's waste management system achieves net zero by 2040.
- Food waste is cut by 50% by 2030 and reduced to a permanent minimum by 2050.

Adapting to climate change

- To mitigate and protect against summer overheating, green and open spaces are newly created and existing ones expanded and structurally upgraded to improve the urban microclimate.
- All citizens of Vienna have access to high-quality green space within a radius of 250 metres.
- In new urban development zones, provision is made for high-quality green public spaces at an early stage of the planning and design process.
- Green roofs and facades on buildings improve the urban microclimate, especially in densely built-up areas.
- Greening measures, shading features and other installations in the public space substantially reduce the (perceived) ambient temperature in summer and provide the backdrop for vibrant, climate-proof neighbourhoods.
- In Vienna, as much rainwater as possible is fed back into the local natural or near-natural water cycle.
- All planned buildings and urban developments in Vienna are assessed in terms of their contribution to adapting to climate change and optimised where necessary.



Urban ecology, environment & water

- The share of green space in Vienna is safeguarded for the long term at over 50%.
- Vienna creates additional new woodlands and green spaces as recreation areas for its growing population and to improve the urban microclimate.
- The natural functions of the soil are maintained through preservation of existing unsealed surfaces and creation of new ones.
- Vienna promotes biodiversity.
- In the interests of people's health and well-being, air, water and soil pollution, noise and heat pollution and light pollution are all minimised as far as possible.
- The city's food supply is largely sourced from the city itself and the surrounding region, preferably from organic producers supplemented by urban agriculture.
- Vienna's water supply and waste water management infrastructure is maintained and operated to a high standard and in a resource-efficient manner.



Health & social inclusion

- Health literacy is improved at individual and organisational level – Vienna focuses on health promotion and disease prevention.
- By 2030 the healthy life expectancy of the Viennese population has increased by two years.[17]
- All social groups, especially vulnerable ones, are protected against the health risks associated with climate change.
- Vienna supports healthy, active ageing – care-dependent Viennese citizens receive high-quality care at home or close to home for as long as possible.
- The decarbonisation of Vienna's healthcare sector is accelerated by prioritising measures to improve energy efficiency and conserve resources.
- Vienna is a diverse city that promotes gender equality and opportunities for participation for all who live here.
- Vienna offers high quality of life in all districts of the city – by investing in public infrastructure and mitigating & adapting to climate change, strengthening community cohesion and providing a wide range of opportunities for public involvement and participatory decision-making.

Education, science & research

- The city-wide roll-out of learning communities ("Bildungsgrätzln") by 2030 and the subsequent evolution into a Learning City will create learning spaces that are tailored to local neighbourhoods, communities and lifestyles – supported by multiple use of buildings and spaces.
- Vienna boasts a comprehensive, needs-based, inclusive programme of digital education for all sectors of the population.
- Raising awareness of sustainable, resource-efficient development is a standard teaching objective in all educational institutions.
- Education and qualification programmes cater for changed occupational profiles to foster new smart technologies and practices and support career choices that break with traditional gender roles.
- In 2030, Vienna is one of Europe's Top Five research and innovation hubs and a magnet for top-flight international researchers and the research units of international corporations.
- Vienna initiates large-scale mission-led research and innovation projects as a contribution to the socio-ecological transformation.
- In Vienna, specific challenges relating to sustainable development are identified and resolved cooperatively by the municipal administration, higher education and research institutions, companies and end users.
- International congresses, trade fairs and events increase the global visibility of Vienna's research excellence.

[17] Baseline year 2019.



Digitalisation

- By 2030, all processes and services of the municipal adminstration that are of relevance to the public are digitalised and fully automated wherever possible.
- Vienna has a needs-based and resilient digital infrastructure designed to operate with maximum resource efficiency.
- By 2030, 75% of the energy requirement for digital services and infrastructures of the City of Vienna and its municipal enterprises will be covered by renewables, rising to 100% by 2040.
- The City of Vienna creates an excellent pool of data and utilises this for decision-making and management purposes, as well as making it publicly accessible ("open government data").
- The City of Vienna is a pioneer in the field of digital participation and uses digital tools to create transparency and promote active democracy and public involvement in decision-making.
- The City of Vienna prioritises digital human rights and promotes digital literacy.



Participation, engagement & culture

- The City of Vienna continuously works on its participation standards in partnership with local people, and overall levels of public participation and engagement increase.
- All social gorups are empowered to play an active role in the co-creation and transformation of the city.
- Vienna develops and employs various tools to give the public a say in budgeting and use of public funds.
- The opportunities for public participation offered by the City of Vienna are visible and accessible to all.
- "Living labs" are created at neighbourhood level to pilot innovative new methods and processes and build networks of local stakeholders.
- The City of Vienna supports projects that actively encourage cultural participation – from plain-language and multilingual outreach activities to a wide range of free events.

4. Thematic fields


© Stadt Wien / Christian Fürthner

Energy supply

What it's all about

Smart City Wien means that Vienna's future energy supply will be based almost fully on renewables, which in many cases are produced in the region and used locally. Energy consumption will decrease markedly thanks to significant improvements in energy efficiency. This will be enabled by the increasing electrification of the transport and heating sectors (primarily through the use of electric cars and heat pumps), the coordinated expansion of the district heating network, new technologies and business models, but also as a result of the growing environmental awareness and changed mobility habits of the Viennese population.

- A secure, affordable, green energy supply is and remains one of the most important prerequisites for the city's high quality of life and economic development. At the same time, the city's energy system requires redical transformation if CO_2 emissions from the burning of petroleum, fossil fuels and natural gas are to be reduced to zero.

- Massive investments are therefore being made to improve energy efficiency throughout the entire system, from power generation to distribution to end consumers, and from heating and cooling of buildings to production processes in Viennese companies.

- In parallel, the transition to renewables will be expedited as a priority in all areas, especially through a shift to highly efficient electrically powered vehicles and shared mobility options in the transport sector, and to a heat supply based on district heating and heat pumps.

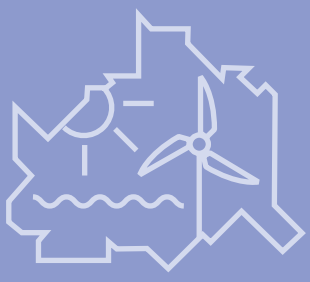
- The city's future energy supply will be based on renewable instead of fossil energy, and the potential for utilising waste heat will be optimised. Here a special focus will be placed on converting the district heating network to renewable energy sources, primarily deep geothermal energy, large-scale heat pumps and, in all probability, green gas.

- Private households and companies will also be increasingly involved in power generation (via PV systems, for instance). Smart grids allow the networked interconnection of all these decentralised energy production systems, optimising coordination of energy consumption and generation and interlinking the previously separate sectors of heat supply, transport, industry & commerce and electricity generation.

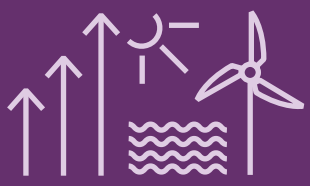
Our goals



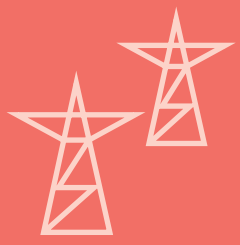
Our heat supply will be 100% **fossil free by 2040.**



By 2030 half, and by 2040 100% of Vienna's final **energy consumption** will originate from **renewable** or **carbon-free** sources.[18]



Renewable and **carbon-free energy production** in Vienna increases threefold by 2030 and sixfold by 2040, compared to 2005 levels.[19]



Vienna's energy grids allow for a **decentralised, renewables-based energy supply.**

[18] Including any utilisation of geothermal energy from the surrounding region.
[19] Including any utilisation of geothermal energy from the surrounding region.

What we are planning

Equipping energy grids for net zero: Vienna is investing in the expansion of its energy grids, thus creating the basis for an efficient, renewable energy supply system that will remain reliable in the future. The energy supply to households and businesses is secure at all times.

Construction, expansion and maintenance of **flexible (grid-compatible) storage facilities and grid infrastructures for electricity and heat** to ensure a reliable supply, including at peak times, and to be prepared in the event of outages.

Expansion of the electricity grid to cope with the foreseeable increase in consumption and capacity requirements, primarily due to electromobility and heat pumps.

Increasing district heating take-up in existing built-up areas by converting housing from gas to district heating.

Coordinated **expansion of the district heating network** in areas of high heat density to provide alternatives to natural gas.

Optimum **coordination of works involving underground infrastructure** (cables, mains, etc.) with works to redesign the street space above ground (e.g. tree planting).

Providing customers, energy providers and grid operators with a **sound basis for planning**, both within the existing urban fabric and in newly developed areas, by integrating planning of the area heat supply into urban development processes ("spatial energy planning").

The production of renewable energy is weather dependent and difficult to control. In strong winds, for example, turbines sometimes generate more electricity than is currently needed, so there is a power surplus. This is when Wien Energie's power-2-heat plant is activated. The plant works like an electric kettle, using surplus electricity from the grid to heat up water in electrode boilers. A heat exchanger feeds the hot water into the district heating network at a temperature of approx. 160°C.

Since 2019, Vienna has been home to Central Europe's most powerful heat pump. Located in the district of Simmering, it utilises waste heat from power plants to supply what will soon be 106,000 households with climate-neutral energy.

Wien Energie

Making the transition to a renewables-based energy supply: Vienna is systematically accelerating the transition to renewables and investing in energy production systems within the urban area.

The planned expansion of photovoltaic systems will increase solar electricity production in Vienna 16-fold by 2030.

Installation of **photovoltaic arrays** with a combined capacity of 800 megawatt peak[20] by 2030. That is a surface area equivalent to 90–100 football pitches per year.

Utilising **thermal energy from groundwater, waste water, from the ground** and (possibly) from the air.

Converting the **district heating network to renewable energy sources**, particularly by utilising large-scale heat pumps and tapping deep geothermal energy.

Installation and expansion of production and supply structures for **green gas** (biomethane, synthetic methane, renewable hydrogen, etc.). First and foremost, green gas is to be used in applications where few alternatives are available, such as in combined heat and power plants, industrial manufacturing processes, and, in the medium term, in parts of the public transport network.


© Wien Energie / Michael Horak

[20] Megawatt peak is the unit of measurement for the maximum power output of solar PV modules under standard test conditions.

Where we need support

In order for Vienna to meet its climate goals, measures are required at federal level to create a solid long-term basis for planning and investments – be it through reform of the legislative framework, national funding programmes, or targeted taxation and/or exemption from taxes and duties. With regard to energy supply, this applies in particular to the following areas:

- **Electricity:** Legislative and policy frameworks for the expansion of renewable electricity production, grid expansion and for ensuring security of supply by means of flexible power generation capacities (e.g. combined heat and power plants and gas-fired peaking plants) and (grid-compatible) power storage facilities.

- **Heating:** Legislative and policy frameworks for the expansion of renewable thermal energy production and the progressive decarbonisation of district heating (e.g. the legal conditions pertaining to drilling for deep geothermal energy should be more favourable or at least equal to those for oil and natural gas)

- **Gas:** Clear priority to be given to renewable gas (for combined heat and power plants and other energy-intensive applications, such as e.g. certain industrial processes); in line with the above, legislative and policy frameworks for modification and resizing of the existing gas infrastructure (dismantling and/or conversion to renewable gas).


© Wien Energie / Christian Fürthner

Vienna shows how:

Solar power campaign

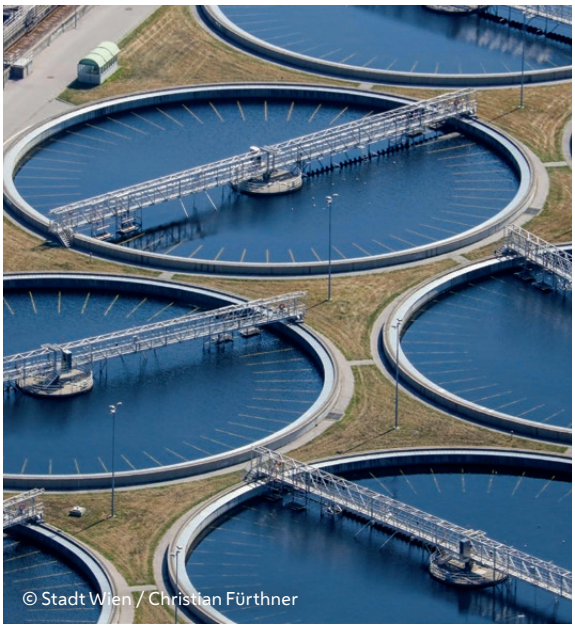
Operating 260 solar arrays with a combined capacity of just under 60MW, Vienna's utility provider Wien Energie is already Austria's biggest solar electricity producer, generating enough solar power for the equivalent of 25,000 households – i.e. more households than in the city's 1st and 8th districts combined. The majority of Vienna's solar energy arrays are on the roofs of buildings. However, other sites will also need to be used for photovoltaic expansion in order to meet Vienna's climate targets. The photovoltaic plant on the 12.5-hectare site of a former municipal gravel depot in the district of Donaustadt, for instance, now produces over 12 gigawatt-hours of solar electricity for 4,900 Viennese households, thereby saving 4,200 tonnes of CO_2 emissions every year!

Community-funded solar power plants give Viennese citizens the opportunity to make a collective investment in clean energy. Wien Energie is in charge of operating the photovoltaic installations. In return for their investment the co-owners of the plants receive an annual remuneration in the form of vouchers from Wien Energie over a period of five years.

Green energy from the sewage treatment plant

Vienna's main sewage treatment plant produces more green energy than it requires for the purification of effluent. Sewage treatment plants are generally among the biggest consumers of energy in cities. Until recently, Vienna's main sewage treatment plant, which handles all the city's waste water, consumed more than 1% of the electricity produced by Vienna's largest energy utility. Now all that has changed. Around 2 million cubic metres of sewage sludge are produced in Vienna every year. If stored under optimum conditions and then heated, this sludge produces sewage gas, which consists of two-thirds energy-rich methane and is used to power cogeneration plants. This means that the sewage plant can self-generate 100% of the energy it requires for waste water treatment and even produce a surplus, which is fed into the city's electricity and district heating grids. This saves 40,000 tonnes of CO_2 emissions per year.


© Alexandra Kromus


© Stadt Wien / Christian Fürthner


© Stadt Wien / Gerd Götzenbrucker

Mobility & transport

What it's all about

Low-carbon mobility that is compatible with the urban environment means reducing the need to travel wherever possible, shifting journeys from private cars to efficient modes of transport, and making the transition from fossil fuels to carbon-free propulsion systems for all vehicles. Even with continuing population growth, Vienna's transport policy must be aligned with its climate targets and the goal of ensuring high quality of life in all quarters of the city, as well as the principle of social inclusion and affordable mobility for everyone who lives here.

- With this in mind, Vienna's streets in future will be rearranged and redesigned to make them greener and cooler, with more shade; they will be gender sensitive in design, safe and geared to everyday use, with more room for active mobility, fast, efficient public transport and shared-use mobility schemes.

- Public transport continues to form the backbone of the city's mobility systems.

- In addition, various shared-use mobility options – from car sharing to car pools, liftshare and on-demand mobility services, in new urban development zones as well as in the existing built-up area – are promoted, expanded and made easily accessible via the WienMobil platform.

- Vienna supports the transition to non-fossil, environment-friendly vehicle propulsion systems and efficient clustering of inner-city goods traffic in the interests of sustainable, low-carbon urban logistics.

- Neighbourhood planning in Vienna is based on the concept of the 15-minute city, meaning that people's everyday needs are covered within a short distance of their homes: from housing, education and work to shopping and healthcare, leisure and culture, sport and recreation.

- The opportunities brought by digitalisation are to be actively leveraged to support flexible work practices and reduce the amount of long commutes.

Our goals



Commercial traffic within the municipal boundaries is largely **CO_2 free** by 2030

The share of journeys in Vienna made by **eco-friendly modes** of transport, including shared mobility options, rises to

85% by 2030

and to well **over 85% by 2050.**[21]

Mobility guarantee:
It's easy to **get around** in Vienna **without owning a car.**

The volume of traffic crossing the municipal boundaries falls by

50% by 2030[22]

Private motor vehicle ownership falls to

250 vehicles per 1,000

inhabitants by 2030, and the amount of parking available in public spaces is gradually reduced.



Vienna promotes and realises the concept of the **15-minute city** – with short distances to services and amenities, lively, mixed-use neighbourhoods and **redesign** of streets to provide more space for active mobility options, public transport and pleasant places to linger.

Per capita final energy consumption in the transport sector falls by

40% by 2030

and 70% by 2040.[23]

Per capita CO_2 emissions in the transport sector fall by

50% by 2030

and 100% by 2040.[24]

Non-fossil-powered vehicles as a share of new vehicle registrations rises to

100% by 2030[25]

[21] The wider definition of ecomobility encompasses walking, cycling and public transport plus shared-use schemes such as car sharing and car pools.
[22] Baseline year 2021. [23] Baseline year 2005. [24] Baseline year 2005. [25] With the exception of special-purpose vehicles.

What we are planning

Expansion of the public transport network: Fulfilling Vienna's mobility guarantee by expanding the public transport network and providing easy access to rental and sharing services. Components of the mobility guarantee:



Further **expansion of the public transport network** and faster, more frequent services on underground, suburban rail, new tram and (express) bus routes.



Expansion, further development and enhancement of **shared-use (e-)mobility platforms** to ensure **full mobility** across the entire urban area without needing to own a car.



WienMobil provides access to the entire range of mobility options via a single platform, with easy, convenient search, journey planning, booking and payment functions.



Particularly in **urban development projects**, shared-use schemes are factored in right from the outset, allowing residents to get around without owning a car.

Every million euros invested in the expansion of the tram network, besides additional added value of €1.1 million, also creates an average of 11 new jobs during the construc tion phase and safeguards others once the line goes into operation.

Economic Development Advocate for Vienna[26]

Subsidies from the City of Vi enna make the annual season ticket the most reasonably priced in Europe, helping to finance the very extensive public transport network.

Adapting to climate change and promoting active mobility: More space is made available for greening, walking, cycling and public transport.



Consistent installation of **greening, cooling and shading features** in public spaces to improve amenity value and help adapt to climate change. Facade greening measures also play a vital role here and are expedited accordingly.



The **cycling infrastructure** is massively expanded through closing of gaps in the coverage. The existing network is also upgraded by improving through routes for cyclists, making them safe for children as well as adults to use. Additional bike parking facilities continue to be installed.

Switching from driving to cy cling increases an individual's life expectancy by an average of 3 to 14 months.

Climate Change Center Austria[27]

[26] Economic Development Advocate for Vienna (2020): Ausbau der Wiener Straßenbahnen ("Expansion of Vienna's Tram Network") (German only) URL: https://www.wko.at/site/standortanwalt-wien/20200928_4_Strassenbahnen_SiS-web.pdf

[27] Climate Change Center Austria (2020): Report on co-benefits of measures to mitigate and adapt to climate change (in German). URL: https://ccca.ac.at/fileadmin/00_DokumenteHauptmenue/02_Klimawissen/Themenaufbereitung_CoBenefits_06022020.pdf



Priority for trams and buses, especially on major traffic arteries. The resulting shorter journey times further enhance the appeal of public transport.



City-wide traffic-calming schemes, e.g. as part of "Supergrätzl" neighbourhood regeneration zones, and improved traffic safety thanks to targeted speed reduction measures, among others.



Systematic widening and **improvement of pavements.**



Compact neighbourhoods, vibrant centres and ground-floor zones, local services, amenities, parks and leisure facilities within walking distance encourage walking and cycling.

The WienBox project lays the foundations for Vienna's fu ture (parcel) logistics. Wien Box is a contactless smart locker system that allows anything that fits inside to be deposited or collected 24/7 by businesses, delivery ser vices or private individuals. That saves time and journeys – whether you're buying, selling, sending, receiving or forwarding.

Switching to alternative propulsion systems and introducing sustainable measures to manage private car traffic: Vienna develops suitable tools to manage demand for private motorised transport. The City of Vienna expedites the transition to new technologies, particularly electromobility, and thus reduces energy consumption and CO_2 emissions.



Following expansion of the **parking management scheme** to cover the entire city, the outcomes will be evaluated and the scheme adapted and/or further developed as necessary.



Implementing measures to accelerate the transition to **non-fossil-fuelled vehicles.**



Expediting the expansion of **smart charging infrastructure for electric cars** in garages and semi-public spaces (off-street parking facilities) to ensure optimum security of supply for users. Charging facilities will be mandatory for garages in new-build projects, and retrofitting in existing buildings will be significantly facilitated.



Reducing the number of delivery trips by means of smart logistics concepts and the development of **eco-friendly transport and delivery systems,** including e.g. white-label delivery boxes and a digital networking platform that reduces the number of trips for customers as well as for logistics providers.



Expediting the conversion of the municipal vehicle fleet and the vehicle fleets of delivery companies to carbon-free propulsion systems, in partnership with businesses and the logistics sector.



Strengthening of **multimodal logistics and supply hubs** like the Wiener Hafen port facilities.

Joint development of mobility solutions for the metropolitan region, especially for commuters: Working in partnership with the provinces of Lower Austria and Burgenland and its surrounding municipalities, the City of Vienna will create forward-looking solutions to tackle the challenge of cross-border commuter traffic.

Planning and realisation of regional **tram links ("Regiotrams") and express bus services** between the Vienna urban area and surrounding communities, along with expansion of suburban rail services.

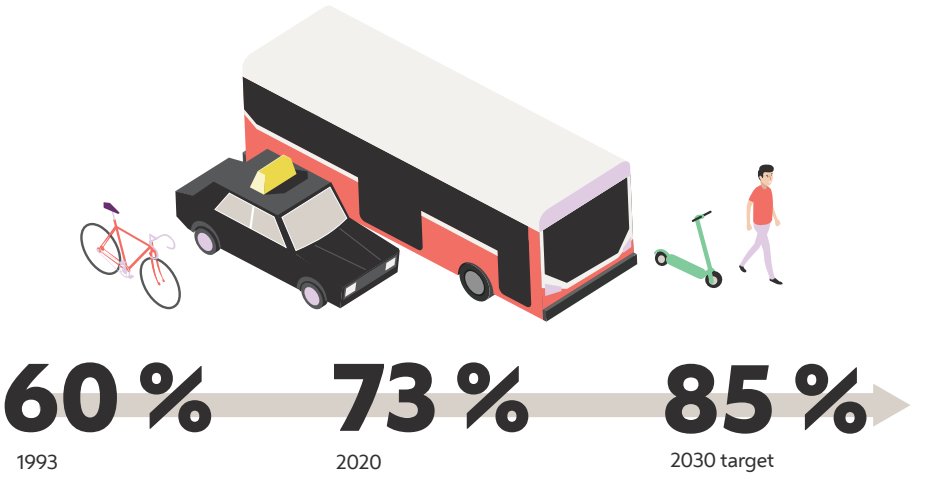
Development of viable, easy-access car pool and liftshare models as a resource-efficient alternative for commuter journeys.

Installation of **long-distance cycle paths** into the city centre from the outskirts and surrounding municipalities.

Coordinated **urban development planning** along major public transport axes across the metropolitan region.

A corporate **mobility management service** acts as an interface between the City of Vienna and businesses, developing incentives to choose more sustainable modes of transport for commuting and business travel.

Promotion of energy-efficient, eco-friendly modes of transport



Data & diagram: Wiener Linien (Vienna Public Transport)

Journeys in Vienna made on foot, by bike, by public transport or using shared-use schemes (such as e.g. car sharing or car pools). Nine out of ten Viennese citizens agree that "In Vienna it's possible to manage perfectly well without your own car". (Source: City of Vienna, Survey on Quality of Life in Vienna, 2018)

Where we need support

Vienna calls for the remediation of false incentives at federal level in the transport sector and advocates targeted measures to promote innovation:

- Reform of the Austrian Highway Code to place a greater focus on people's mobility needs, and, in particular, to make due provision for the requirements of eco-friendly modes of transport (walking, cycling, public transport).
- Development of policy instruments to take fair account of the high ecological cost of car traffic, e.g. by "greening" of tax relief on commuting costs.
- Targeted incentives for innovations and alternative mobility options, which are often not profitable in the development phase.
- Definition of common legal and organisational frameworks at federal level for new mobility services in the shared-use and on-demand segments.

Vienna shows how:

WienMobil mobility points

The WienMobil points installed by Wiener Linien, Vienna's public transport operator, conveniently combine public transport with an array of other services and shared-use options. The points act as interchanges for a wide range of different mobility services – whether you need to transport items or just get somewhere fast. The aim is to interlink public transport with providers of onward mobility options (e.g. car sharing, e-scooters, bike rental), allowing users to switch easily between bus, tram, underground and shared-use schemes and find the best mobility option for their particular needs.



© Wien Energie / Manfred Helmer


© Stadt Wien / Gerd Götzenbrucker

Buildings

What it's all about

Key features of buildings in Smart City Wien include a long useful life, multi-purpose design, efficient use of materials and low energy consumption. In future, their energy requirements will be covered from climate-friendly sources – locally or regionally produced wherever possible.

- In view of the city's ongoing population growth, it is important to ensure the continued construction of sufficient high-quality affordable housing and to prevent energy poverty.
- At the same time, measures are taken to significantly reduce consumption of energy and resources, in new-build projects as well as in the existing built-up area.
- New buildings – whether for residential or commercial use – are planned from the outset to minimise consumption of materials and energy throughout the entire life cycle and ensure that building materials can be largely reused or recycled at the end of the building's useful life. The city itself is viewed as a repository of materials.
- Wherever possible, existing buildings are refurbished at the end of their useful life and repurposed for other uses.
- In line with the concept of the 15-minute city, a good mix of housing and workspace is striven for within neighbourhoods and, where possible, also within buildings.
- Roofs and facades are greened and used to generate solar power.
- Vienna aims for a complete phase-out of gas heating systems, not only in new-builds, but also as part of a comprehensive upgrade of thermal insulation and heating & cooling systems in existing buildings in line with the principles of energy efficiency and the circular economy, combined with a steady transition from fossil fuels to district heating – in future likewise carbon neutral – and renewables.
- The main prerequisites for this are planning and investment security for building owners, energy providers and grid operators, together with appropriate subsidy schemes for the upgrade of thermal insulation and heating & cooling systems, especially for people on low incomes.

Our goals

Developers' competitions in the **subsidised housing** sector drive social **innovations** and new solutions for mitigating and adapting to climate change – especially greening measures.

By 2040, at least

70%

of the building components, products and materials recovered from demolitions and major refurbishment projects are reused.



Per capita final energy consumption for heating, cooling and hot water in buildings falls by

20% **by 2030**

and 30% by 2040.[28]

The associated per capita CO_2 emissions fall by

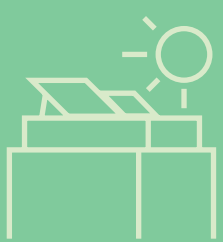
55%

by 2030

and to **zero** by 2040.[29]

Vienna continues to provide an adequate supply of high-quality **subsidised housing** to reduce the percentage of people who are overburdened by housing costs.

Greening, shading and **passive cooling** of buildings are standard; active cooling systems are powered by renewables.



Buildings are used to generate as much **solar power** as possible.



Circular planning and construction to maximise conservation of resources is standard from 2030 in new-build and refurbishment projects.

[28] Compared to the average for the period 2005–2010. [29] Compared to the average for the period 2005–2010.

What we are planning

Phase-out of oil and gas – roadmap for the phase-out of fossil-powered heating systems: The City of Vienna, in consultation with grid operators and energy providers, will draft an overall operational concept and issue binding targets for the gradual phase-out of heating oil and natural gas for heating and cooling, hot water and cooking.

According to estimates by TU Vienna, decarbonisation of Austria's building stock by 2050 would result in annu al employment growth of around 2.5%.

Kranzl et al.[30]

It will play an active role in relevant talks between the federal and regional governments and enact commensurate **binding regulations** within its own sphere of influence in the Province of Vienna.

Roll-out of **spatial energy planning** from new development zones to existing built-up area to accelerate the phase-out of oil and natural gas and the take-up of district heating in existing buildings.

Phase-out of oil-powered heating systems by 2035 **and natural gas-powered heating systems** by 2040.

Creation of a **"one-stop shop"** for all issues relating to building refurbishment and energy efficiency by upgrading the "Hauskunft" advisory service into a central information, advice and service centre.

Leading by **example with flagship projects in buildings owned by the municipal administration and its associated enterprises** (focus on: thermal insulation, phase-out of individual gas heating boilers, photovoltaics campaign, e-charging stations). Sustainable building and refurbishment methods will also be incorporated into new-build and renovation projects in the cultural sphere.



© Stadt Wien / Alexandra Kromus

[30] Lukas Kranzl, Andreas Müller, Iná Maia, Richard Büchele and Michael Hartner (2018): Wärmezukunft 2050. Erfordernisse und Konsequenzen der Dekarbonisierung von Raumwärme und Warmwasserbereitstellung in Österreich.("The Future of Heating 2050. Requirements and consequences of decarbonising heating and hot water systems in Austria.") (in German) URL: 'https://eeg.tuwien.ac.at/fileadmin/user_upload/projects/import-downloads/PR_469_Waermewende_finalreport.pdf

Upgrade of thermal insulation and heating & cooling systems: Vienna has multiple subsidy schemes in place to promote building refurbishment and the transition to climate-friendly energy sources. This is subject to the allocation of sufficient budget funds by the City Council as well as the federal government. The new and/or expanded funding priorities include:

Although the initial investment costs of climate friendly heating systems are around 2.5% to 6% higher, this is more than offset by reduced operating costs, thus relieving the burden on household incomes.

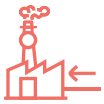
Kranzl et al.[31]



Upgrade of **thermal insulation in buildings** to improve energy efficiency and reduce the temperature of heating systems.



Replacement of individual heating systems by **central heating** in multi-storey residential buildings as a prerequisite for decarbonisation.



Preferred options are connection to **district heating network** or conversion to **heat pumps**.



Innovative complete energy solutions for entire urban **neighbourhoods** (heating & cooling systems powered by locally produced renewables).



An efficient **subsidy programme for new housing** including targeted incentives for use of climate-friendly heating systems.

Use buildings for greening, power generation and storage and adapt them to climate change: Vienna recognises the roofs and facades of buildings as important resources that can be used for PV systems and, in the case of roofs, as recreational spaces. Greening measures mitigate urban warming and help conserve biodiversity, while renewables are used to power active cooling systems. In the coming years, further buildings will therefore be greened where possible. To this end, the following measures are envisaged:



Systematic survey to identify suitable surfaces on existing buildings and in new-build projects.



Planning and subsidy policy measures and streamlining of planning permission to prioritise and expedite **roof and facade greening measures and rooftop solar energy installations** for self-consumption and surplus production.



Roll-out of **mandatory installation of PV systems** to all new buildings and all projects involving major structural modifications at roof level.



Use of **concrete core activation in buildings** to store energy and improve thermal comfort in both summer and winter.



Passive **cooling of buildings** (through external sunblinds, night-time ventilation, etc.) as well as active cooling using energy- and resource-efficient technologies (district cooling powered by renewables, geothermal pumps, etc.)

[31] Lukas Kranzl, Andreas Müller, Iná Maia, Richard Büchele and Michael Hartner (2018): Wärmezukunft 2050. Erfordernisse und Konsequenzen der Dekarbonisierung von Raumwärme und Warmwasserbereitstellung in Österreich.("The Future of Heating 2050. Requirements and consequences of decarbonising heating and hot water systems in Austria.") (in German) URL: 'https://eeg.tuwien.ac.at/fileadmin/user_upload/projects/import-downloads/PR_469_Waermewende_finalreport.pdf

Moving towards a circular economy in the construction sector: To facilitate the transition to a circular economy in the construction sector, the City of Vienna has launched the transdisciplinary programme "DoTank Circular City Wien 2020–2030", comprising the following activities:



Development of a **circular economic strategy** for buildings and infrastructure together with a detailed roadmap for its implementation ("Circular City Wien Roadmap").



Realisation of a **new urban neighbourhood** based entirely on circular economic principles on the site of the former Nordwestbahnhof rail terminal – an innovative, ground-breaking project based on cooperation between the research and business communities, policy-makers and civil society.



Adaptation of the City of **Vienna's Building Code and Guidelines** for the Built Environment to reflect the principles of the circular economy.

Expediting digitalisation in the construction sector: Building materials should be reused and/or recycled in a resource-efficient manner. To do this we need to know what materials are available where, when and in what quality. Digitalisation will help us achieve this transparency with regard to materials:



Development of the basis for a future **material passport for buildings.**



Digital model of the existing built environment: Production of a "digital twin", i.e. a complete virtual 3D model of every building and structure in the city, that can also be linked to other data (population trends, energy consumption, maintenance schedule, sensor and real-time data, building material passports, etc.)



Development of the legal and technical basis for a **digital building permit system**.

Investing in social housing: Vienna keeps its share of subsidised housing at a high level:

Secure, long-term, needs-based **supply of affordable cooperative and municipal housing** – with a particular focus on the housing needs of vulnerable groups.

Ongoing enhancement of the high **quality of social housing.** Developers' competitions deliver innovations in mitigating and adapting to climate change (especially with regard to energy and heating systems, energy efficiency and greening measures), as well as in architecture and social sustainability. Vienna's social housing policy thus produces solutions that the market alone does not.

Quality assurance panel oversees design quality of new urban developments.

Funding safeguarded through own budget funds and earmarking of federal funds specifically for social housing.



Where we need support

Vienna advocates the elaboration of an Austrian heat strategy setting out a regulatory and funding policy framework to ensure that buildings are fully climate neutral by 2040, particularly with a view to decarbonisation of heating systems in multi-storey residential buildings in urban areas, most of which are individual, stand-alone systems at present. In particular, Vienna will call for the following key policy parameters:

- Introduction of quotas for the allocation of special federal subsidies above and beyond the standard housing construction subsidy, depending on the number of cases and the type of property ownership.
- Prioritising the conversion of buildings with individual gas heating boilers through adequate provision of additional special federal subsidies for climate action.
- Adequate provision of additional special federal subsidies for socially disadvantaged groups.
- Improvement of the legislative and policy frameworks for the expansion and decarbonisation of district and communal heating networks.

The following are required to ensure large-scale conservation of resources and implementation of circular economic principles throughout the construction sector:

- Establishment of supraregional building materials exchanges to facilitate reuse of materials.
- Capacity-building for education and training programmes in circular planning and construction (trades/apprenticeships, technical colleges, higher education).
- Nationwide legislation to incentivise sparing use of resources (e.g. a tax on primary resources).
- A federal subsidy package to create economic incentives for circular business models (e.g. product-as-a-service, circular supply chain).

The pressure on accessibility and affordability of housing is growing, especially in the private sector. The loosening of rent regulations is exacerbating this tendency and making things difficult for tenants on lower incomes. For this reason, the City of Vienna has long been advocating fair reform of tenancy law at federal level. This lobbying work will be continued. At the same time, the principle of cooperative housing ownership, which underpins the legal and fiscal framework for the building of affordable housing by cooperative housing associations, must at any rate be retained.

Vienna shows how:

WieNeu+

WieNeu+ is an integrated programme of the "Wir san Wien" urban renewal initiative. It encompasses an array of different activities designed to help future-proof Vienna's urban neighbourhoods, from eco-friendly refurbishment of buildings, clean energy production and management, neighbourhood development and regeneration of ground-floor zones to energy-efficient cooling systems, vertical greening and circular construction principles. Local residents and businesses are encouraged to get actively involved in the process. The programme kicked off with a pilot project in Vienna's Favoriten district, where a neighbourhood with a population of over 35,000 people is to be completely regenerated over the coming years.


© Stadt Wien / Christian Fürthner


© Stadt Wien / Gerd Götzenbrucker

Economy & employment

What it's all about

The City of Vienna is a pioneer in terms of creating a thriving yet sustainable economy that secures the basis for a good life, both now and for future generations. How? Economic prosperity is not automatically linked to increased consumption of energy and resources and a growing burden on the environment; instead, it is aligned with social and ecological principles.

- New forms of circular economy are starting to replace the linear economic model that currently predominates. Sustainable production processes, regional value chains, the repair economy, consistent reuse and repurposing of products and recycling of materials and waste all reduce consumption of resources and energy.

- The "use, not own" approach that underlies the sharing economy increases the usage efficiency of infrastructure, buildings and products of all kinds throughout their lifespan and beyond.

- Vienna continues to be synonymous with first-class service provision – internationally as well as closer to home. Vienna is committed to upholding and further enhancing this reputation in future by pursuing an ongoing active policy of investment, also with a view to retaining staff in service-intensive sectors and encouraging people to seek employment in these sectors.

- The greening of the economy will create a strong demand for skilled labour, which requires the City of Vienna to foster vocational training in climate-related sectors (see also > Education, science & research) and support the evolution of new occupational profiles at the interface between climate action and digitalisation. This creates and secures jobs.

- Adequate provision of services and amenities in the local neighbourhood creates the basis for the "city of short distances".

- Vienna maintains an active dialogue with pioneers from the corporate world, research institutions, civil society and other cities in order to discuss, co-develop and pilot innovative solutions for a sustainable urban economy.

- In its business development policy, Vienna focuses and builds upon its acknowledged strengths, in fields that can provide answers to the major challenges of the years ahead. Vienna's highly developed "Smart City capability" makes it an attractive target for investment, innovative companies and start-ups, creating new jobs and opening up new career opportunities.

Our goals

The productivity of Vienna's urban economy constantly increases, underpinning the city's **prosperity, resource efficiency** and **competitiveness.**

The **material efficiency** of the Viennese economy increases by

30% by 2030

and a further 10% by 2040.[32]

The incomes and **job satisfaction** of Viennese citizens constantly increase, while social inequality declines.



Products **manufactured in Vienna** are durable, easily reparable, reusable and recyclable, and their production processes are largely waste and pollutant free.



In 2030, Vienna has a **global** reputation as the hub of a resource-efficient circular economy and attracts investment and talent in this sector.

The **City of Vienna champions** a sustainable urban economy by introducing appropriate legal frameworks and targeted subsidy schemes, by creating "living labs", and as a public-sector client.

The City of Vienna and Viennese businesses establish a **climate action alliance** for the joint development of a sustainable urban economy.

[32] Baseline year 2019.

What we are planning

Advocating and promoting a circular economy: Vienna supports the transition to sustainable economic structures by introducing appropriate legal frameworks, as well as through a wide range of incentives such as start-up funding, subsidy schemes and advisory services. The municipal administration itself becomes the first client for innovative products, services and business models.

Since its launch in 1998, the OekoBusiness Wien consul tancy service has helped over 1000 local businesses save more than 740,000 tonnes of CO_2 – roughly 4,000 times the capacity of Vienna's iconic gasometers thereby reduc ing their own operating costs by a total of €167 million.

OekoBusiness Wien



Taking **environmental factors** into consideration when allocating land for new business premises/extension of existing ones, issuing plant permits and granting business subsidies.



Continuation, new development, interlinking and appropriate funding of **advisory schemes and subsidy programmes for "greening" of production processes** and business operations (along with the relevant certifications), to incentivise innovation and provide financial support until economies of scale are established. Networking with key stakeholders from the municipal administration and the business and science communities to evolve the OekoBusiness programme into a hub for sustainable business models.



Targeted **promotion of the share & repair economy** (cf. Vienna Repair Network, Vienna Repair Voucher initiative) along with development of innovative, sustainable solutions.

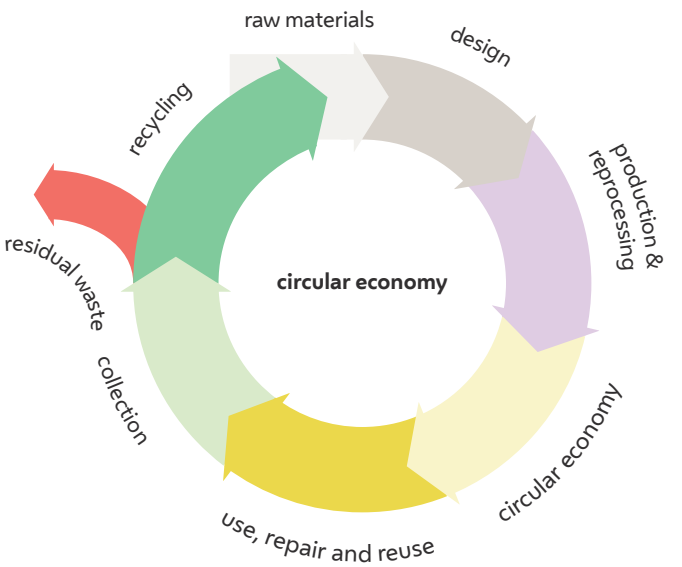


The City of Vienna leverages **public-sector procurement processes** to incentivise innovation, for instance by creating demand for circular products, services and business models before they are fully ready for market. The City of Vienna's sustainable procurement criteria ("ÖkoKauf") are expanded further in line with the principles of mitigating and adapting to climate change and moving towards a circular economy and mandatorily applied throughout the municipal administration and its associated agencies and enterprises.



Establishment of new "living labs" with access to data and infrastructure for **piloting of innovative products and services.**

The principle behind the circular economy



Circular products have a long useful life and can be repaired and upgraded; at the end of their useful life they can be dismantled and largely reused or recycled. Remaining parts that cannot be reused or recycled are generally biodegradable. Circular products are manufactured in energy-a nd resource-efficient processes using secondary raw materials and reusable parts of other products. Biogenic products and raw materials are embedded as seamlessly as possible into natural cycles.

Create space in the city for sustainable economic structures: Vienna aims to create mixed-use urban neighbourhoods. Innovative productive enterprises need to to be close to high-quality services and R&D facilities. Modern property development concepts provide housing and office space, commercial and retail premises, culture and leisure facilities – all under one roof.

Earmarking of suitable sites for light industry and **manufacturing** within the urban area.

Prioritising **mixed use** by facilitating and supporting innovative property development concepts.

Development of functioning neighbourhood centres – in the existing built-up area as well as in new urban development zones – that provide space for commercial as well as non-commercial, social and community uses.

Neighbourhood stimulus campaign to revitalise, empower and improve local **neighbourhoods and shopping streets**.

Prolonging the lifespan of all the washing machines, laptops, vacuum cleaners and smartphones in the EU by just one year would save some 4 million tonnes of CO_2 emissions. This idea inspired the Vienna Repair Voucher initiative, which subsidises 50% of the repair costs up to a maximum of €100.

European Environmental Bureau[33]

Promoting **modern forms of work** by mobilising vacant premises and creating neighbourhood office spaces.

Promoting an economically, environmentally and socially sustainable and diverse **tourist industry** that creates added value both on and off the beaten track for visitors and locals alike and is aligned with the needs of local people.


© Mobilitätsagentur / Christian Fürthner

[33] European Environmental Bureau (2019): Cool Products. Report briefing on the planned obsolescence of electrical products and the positive climate impact of more durable, reparable products. URL: https://eeb.org/library/coolproducts-briefing/

Position Vienna as a top location with Smart City expertise: Vienna positions itself as a hub for the development of smart solutions that set new international standards for a circular, resource-efficient economy. This priority focus earns Vienna a global reputation that attracts investment, start-ups and talent to the city. For Austrian companies, Vienna acts as a springboard into new global markets.

Further development of Vienna's strength in **"Smart solutions for life in the 21st-century city"**, as defined in the economic development strategy "Vienna 2030 – Economy and Innovation", through active dialogue among pioneers from the municipal administration, the corporate world, research institutions, civil society and other cities (for instance in the context of co-creation labs, Smart City Challenges and the start-up event Vienna UP).

Pooling the city branding expertise of Vienna's institutions to develop a common approach to **positioning and actively marketing** Vienna and its Smart City capabilities.

Pro-active measures to attract **start-ups, companies and research institutions** developing environmentally and socially sustainable solutions for urban life in the 21st century.

Supporting Viennese businesses in **tapping new markets** and initiating **international cooperations** and joint ventures.

Strengthening Vienna's brand profile as the home of international **flagship events** (trade fairs, congresses, etc.) on Smart City topics; positioning the city as the go-to venue for **"green meetings & events"** with the focus on conservation of resources.



© UIV / David Bohmann

Where we need support

Alongside the promotion of innovative circular economic systems, the transformation to a sustainable economy also requires fair taxation of emissions that have a harmful impact on the environment. Vienna welcomes the draft bill on eco-social tax reform issued at federal level, but explicitly advocates that the tax revenues be used to mitigate social inequality as far as possible while simultaneously creating targeted incentives for climate-friendly behaviour.

Vienna is lobbying at federal and EU level for mandatory use of reusable packaging (legally binding and sanctionable reuse quotas) and mandatory labelling of reusable/single-use products.


© Die Umweltberatung / Elmar Schwarzlmüller

Vienna shows how:

Repair instead of replacing – the Vienna Repair Network

The Vienna Repair Network (Wiener Reparaturnetzwerk) is the umbrella for over 140 specialist firms that repair used products – from age-old furniture to the latest generation of smartphones. Some of the companies in the network also offer fully tested second-hand goods for sale. Over a million repairs have already been carried out since the network's inception in 1999. With its "Vienna Repair Voucher" scheme, the City of Vienna subsidises 50% of the repair costs up to a maximum of €100, thus providing a targeted incentive not to simply throw away appliances and items that could be repaired. The network is coordinated by the environmental advice centre "Die Umweltberatung".

Gewerbehof Seestadt

Currently under construction on a 7,500 m^2 site at Seestadt is a smart building housing a small business centre where the entire workflows of craft businesses, manufacturing trades and production-related service providers are clustered under one roof. Here on the premises small businesses can produce their goods, run their office, keep track of their inventories and plan joint projects with the other production companies and craft businesses in the building. Heavy-duty goods lifts, wide aisles and corridors for electric forklifts, spacious storage facilities and a central disposal point for special waste ensure optimum efficiency of business operations. Thanks to the high roof load capacities, compact production facilities can be installed on all five floors. The Gewerbehof building is pollutant-free, with a sustainable, needs-based power supply.

OekoBusiness Wien

The OekoBusinessPlan Wien is the City of Vienna's environmental services package for businesses in the Austrian capital. Established in 1998 by Municipal Department 22 – Environmental Protection, the OekoBusinessPlan helps companies launch eco-friendly initiatives and save costs in their day-to-day operations. The aim is to generate clean profits for businesses while benefitting the environment, showing that sustainable business operations and profitable performance can go hand in hand. The package comprises professional, co-funded consultancy services, support in applying the recommended measures, legal compliance and effective public relations. OekoBusiness Wien's pool of expert environmental consultants develop customised solutions for participating businesses.

"Guter Grund" – peat-free organic compost from Vienna's organic waste bins

The "Guter Grund" compost produced by Municipal Department 48 – Waste Management, Street Cleaning and Vehicle Fleet (MA 48) is made from the organic waste collected in the city's waste bins, with no added peat. The compost is suitable for all indoor and outdoor planting purposes, for potting, repotting and planting out of flowering and garden plants as well as for improving the soil in flower beds and vegetable plots. By using recycled organic waste collected from Vienna's organic waste bins together with other substances such as bark humus, each 40-litre sack of compost saves up to 36 litres of peat. This means that each 40-litre sack of "Guter Grund" saves at least eight kilograms of CO_2 emissions.



Zero waste & circular economy

What it's all about

Vienna's waste management system forms part of a functioning circular economy: non-avoidable waste is separated and processed into high-quality and thus highly sought-after secondary raw materials. The waste processing facilities meet the very latest standards and contribute to the city's efforts to achieve net zero. Already today, Vienna's waste management system saves more CO_2 than it emits.

- In order to reach its targets of net zero by 2040 and 100% waste recycling by 2050, Vienna's policy is "Reduce – reuse – recycle".
- Priority is given to avoiding waste and to reusing products and materials – for instance through consistent promotion of reusable packaging and repair and upcycling. After all: the best waste is the waste we don't produce in the first place.
- To boost the recycling rate, waste is segregated at source wherever possible for separate collection and recycling. Today's "waste" is tomorrow's valuable resource. Waste that cannot be reused or recycled is to be used to generate energy for the district heating and cooling networks and the electricity grid.
- Combustion residues and waste gases will also be sent for recycling. In future, modern carbon-scrubbing and separation processes will allow CO_2 from the waste gases emitted by the thermal waste-to-energy (waste incineration) plants to be captured and reused. Vienna's thermal waste-to-energy process will thus be made carbon neutral.
- Awareness-raising activities, information campaigns and appropriate supporting measures in partnership with the business community significantly reduce food waste along the entire value chain – in private households, in the retail sector, in canteen kitchens and in the hospitality industry.

Our goals



Less waste is produced thanks to a wide range of waste prevention measures.



Food waste is cut by

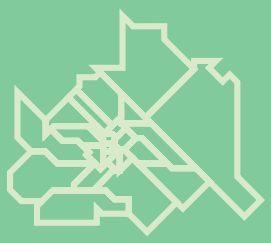
50%

by 2030 and reduced to a permanent minimum by 2050.



Vienna's waste management system achieves **net zero** by

2040.



Vienna **exceeds** the EU target of a

60%

recycling rate by 2030.

By 2050,

100%

of Vienna's non-avoidable waste is **recycled**.

What we are planning

Zero waste by 2050 – reduce, reuse, recycle: Vienna leverages all the available channels – from public information campaigns and educational programmes to public-sector procurement processes and appropriate organisational and legal frameworks – to reduce the amount of waste and boost the recycling rate.

Thanks to the OekoBusiness programme, Viennese compa nies have saved 127,000 tonnes of waste within a 20 year period. That is 300 times the weight of Vienna's world famous giant ferris wheel.

OekoBusiness Wien



Further development and consistent implementation of the **Vienna Waste Prevention Programme:** expansion of the Vienna Repair Network, promoting use of reusable products and packaging, advising businesses on how to conserve resources, avoid waste, etc.



Inventorisation, mapping, recovery and recycling of **reusable materials in exist- ing buidings** ("urban mining").



Ongoing optimisation of Vienna's **waste capture and collection system.**



Implementation of the **concept for waste collection centres** and establishment of modern, barrier-free "super centres" for household waste.



Processing of residual waste to separate out reusable components for **recycling** (especially plastics).



Reduction of food waste along the entire value chain through awareness-raising activities and joint measures with the business community.



Introduction of a scheme to prevent food waste in **canteen kitchens in Vienna** (company canteens, hospitals, nursing homes, etc.).

In Vienna, 350,000 tonnes of waste and biogenic waste per year is segregated at source for separate collection and re cycling – thus avoiding 70,000 tonnes of carbon emissions annually.

Municipal Department MA 48

Utilising combustion residues: Vienna develops and pilots innovative technologies to produce secondary raw materials from the waste products of thermal waste-to-energy plants.

Separation and recycling of CO_2 (carbon capture) from the waste gases of thermal waste-to-energy plants – e.g. to produce renewable methane or other chemical raw materials, for further processing into solid carbon, or for use in production processes.

Recovery of raw materials such as phosphorus (essential for the production of fertilisers) from combustion residues.

Since 2009, 100% of Vienna's residual waste has been recycled in the city's thermal waste to energy plants, supplying district heating for 214,000 Viennese households and electricity for 95,000. No household waste has been sent to landfill since that date.



Where we need support

Landfilling of residues from thermal waste-to-energy generation can be avoided in future if slag and ash waste can be processed to eliminate substances harmful to health and/or the environment and subsequently used as a building material (e.g. in road construction). Before this can be done, appropriate standards and legislation are required at federal level. The latter are also a key prerequisite for establishing a market for these materials and enabling economic operation of the relevant processing plants.

Vienna shows how:

Clean electricity from landfill gas

Through biological decay, waste deposited on a landfill site in the past continues to produce landfill gas today. The gas has a high calorific value and is used to produce electricity. In operation since 1994, the active degasification system consists of 150 gas wells, ten kilometres of gas collecting mains and a power generation plant to produce clean electricity from the landfill gas. The electricity currently supplies around 1,000 households.

48er Tandler – Vienna's coolest reuse shop

Great finds for bargain-hunters, quirky vintage furniture, crockery, clothing, books, sports equipment: 48er Tandler offers all this and lots more besides. Serviceable items deposited at Vienna's household waste collection points are inspected, repaired where necessary, and then taken to 48er Tandler for resale. 48er Tandler is a flagship project that has attracted attention worldwide.



© Stadt Wien / Christian Fürthner



© Christian Houdek


© PID / Christian Houdek



Adapting to climate change

What it's all about

Smart City Wien is responding to advancing climate change with far-sighted planning underpinned by evidence-based forecasts and simulations, with a focus on supporting particularly vulnerable groups in coping with the consequences of global warming. Resilient infrastructures and thoughtful design of urban spaces and buildings, streets, squares and green areas ensure high quality of life for everyone in Vienna.

- The impact of the global climate crisis is now being clearly felt. Densely built-up inner-city areas are disproportionately affected by the "urban heat island effect" – with its Urban Heat Islands Strategic Plan, the City of Vienna is pioneering the development of adaptation strategies.

- High ambient temperatures can have a massive impact on people's health, well-being and productivity. Children and the elderly, people with few social contacts, those on low incomes and the chronically ill are particularly severely affected. Adapting to climate change is thus also a social issue.

- Urban planning needs to provide for fresh air corridors and cool air streams and create an interconnected network of high-quality open and green spaces. New-build developments should not produce additional heat islands, but ideally actually improve the urban microclimate.

- At local level, cooling and greening measures, water and shade are key – not to mention significantly more efficient and environment-friendly than air-conditioning.

- Rainwater management measures create surfaces that allow the water to trickle away naturally or evaporate where it falls – this cools the air while simultaneously relieving the burden on the sewer system. A porous water retention layer underneath the road or pavement surface provides water for trees planted along the street ("sponge city" concept).

The measures required to adapt the city to the effects of the climate crisis cut across all spheres of urban life – further goals and fields of activity are therefore incorporated in the thematic fields Health & social inclusion; Urban ecology, environment & water; Buildings; and Mobility & transport.

Our goals

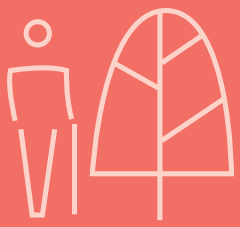


Greening of buildings improves the urban **microclimate**, especially in densely built-up areas.

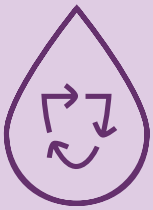
In new urban development zones, provision is made for **high-quality green public spaces** at an early stage of the planning and design process.



All planned buildings and urban developments in Vienna are assessed in terms of their contribution to **adapting** to **climate change** and optimised where necessary.



All citizens of Vienna have access to **high-quality green space** within a radius of 250 metres.



In Vienna, as much **rainwater** as possible is fed back into the local natural or near-natural **water cycle.**

Greening measures, shading features and other installations in the public space substantially reduce the (perceived) ambient temperature in summer and provide the backdrop for vibrant, **climate-proof neighbourhoods.**



To mitigate and protect against summer overheating, **green** and **open spaces** are newly created and existing ones expanded and structurally upgraded to improve the urban microclimate.

What we are planning

Climate-sensitive neighbourhood planning: In all its planning activities, Vienna's urban planning department takes account of the microclimatic conditions and potential future effects of the climate crisis. A wide range of coordinated measures, from planning of green spaces to traffic-calming schemes, make Vienna's urban neighbourhoods climate proof and reduce the urban heat island effect.

"Cool spots" like those at Esterházy Park and the Schlinger Market can reduce the perceived ambient temperature by up to 6°C.

Research project Tröpferlbad 2.0[34]

Preservation of existing **fresh air corridors** and areas where cool air is generated.

Generous provision for **green and open spaces when planning new urban development zones.** Green spaces are laid out right at the outset when construction work begins and protected as far as possible throughout, so that they are available to new residents as soon as they move in ("early green").

Climate-sensitive planning of new streetscapes and appropriate layout of buildings.

Planning processes take **account of existing trees** and provide for their protection.

Expansion and upgrading of **green and open spaces in existing built-up areas,** especially ones that are very intensively used. Wherever possible, spaces are greened and lighter coloured and/or more permeable surfaces installed (e.g. greening of inner courtyards; light-coloured, permeable paving of streets and squares, and so on). Infill developments, extensions and conversion projects in existing built-up areas should in any case be designed so as to improve the urban microclimate.

Planning of **greening measures in existing neighbourhoods** is increasingly strategic and impact-based rather than building-based.


© PID / Christian Fürthner

[34] Research project Tröpferlbad 2.0 (2021) (in German). URL: https://www.troepferlbad.at/das-tr%C3%B6pferlbad-2-0-1/

Heat-proof (re)design of urban spaces for all: The City of Vienna designs its streets and squares, green spaces and parks in such a way that they can be used by all social groups and offer high amenity value, even in very hot weather. Besides mitigating the urban heat island effect, green spaces in the local neighbourhood also fulfil an essential social function.

Trees with dense crowns can reduce the perceived ambient temperature during the summer period by up to 18°C.

Stangl et al.[35]

Phase-out of asphalt surfaces: **Greening and shading of public spaces**, especially through street planting of suitable large tree species to act as a "natural air-conditioning system". Financial and personnel resources are likewise earmarked for the care and maintenance of existing trees and other plants in the streetscape (e.g. by increasing the size of tree pits and root spaces; unsealed surfaces).

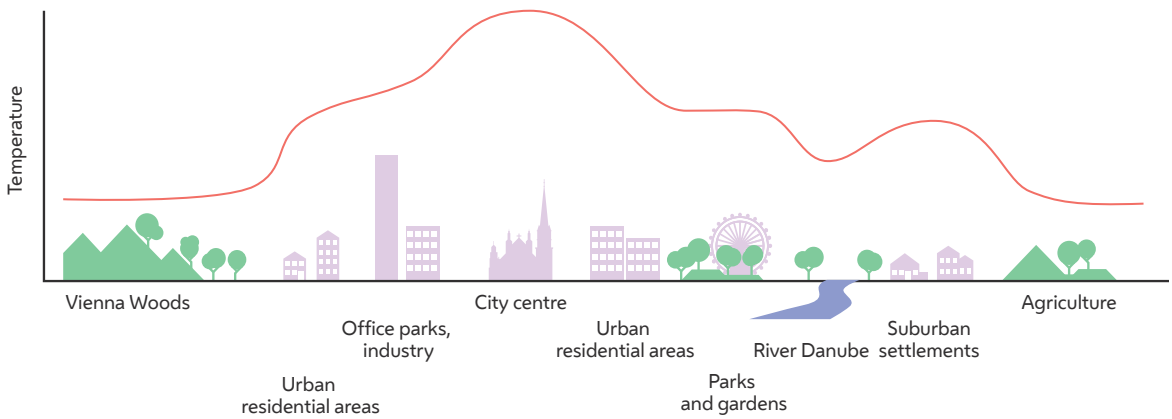
Shading features and greening measures on roofs and facades not only cool the buildings themselves but also improve the microclimate of the street.

Adapting existing parks to higher temperatures ("cooling parks") by providing more shade, optimising natural evaporation and improving air circulation.

Installation of **additional drinking fountains** in public spaces, creation of shady seating areas and incorporation of water features such as misting systems, water jets, splash pads and other cooling elements in the design of squares and parks.

Choosing suitable **surface materials for buildings** and pavements, to reflect sunlight to the required degree, and – where possible – to allow rainwater to permeate.

Urban greenery instead of air-conditioning



The so-called heat island effect occurs in densely built-up urban areas. However, it is strongly influenced by factors such as the structure of the urban fabric, the existence of green and open spaces and bodies of water, fresh air corridors and greening of buildings.

[35] Rosemarie Stangl, Alexandra Medl, Bernhard Scharf and Ulrike Pitha (2019): Wirkungen der grünen Stadt. Studie zur Abbildung des aktuellen Wissenstands im Bereich städtischer Begrünungsmaßnahmen ("Effects of the green city. An overview of the current body of knowledge on urban greening measures") (in German). In: Reports from the energy and environmental research sector (in German). URL: https://www.klimawandelanpassung.at/newsletter/nl37/kwa-kuehleff-begruen

Feeding rainwater back into the natural water cycle: Vienna uses appropriate rainwater management methods to channel precipitation run-off from sealed surfaces into a near-natural water cycle. Allowing rainwater to seep away and evaporate naturally improves the microclimate and relieves the burden on the sewer system.

Preference is given to **rainwater management systems** based on natural seepage, run-off, evaporation and on-site water retention when planning and developing new urban districts.

Preventing warming and the formation of urban heat islands by creating large surfaces for rainwater percolation and evaporation and optimising the design and layout of streets and green spaces.

Implementation of the **"sponge city" principle** and installation of new cisterns for the watering of street trees.

Developing tools to help tackle the climate crisis: Advancing climate change is confronting the city with constant new challenges. Vienna is developing innovative tools and methods with which to tackle them.

Introduction of a **climate-proofing check** for built developments: Vienna employs a team of urban climatologists to assess all planned building and urban development projects and verify their effect on the local microclimate, the overall urban microclimate and/or what positive contribution they make in terms of adapting to climate change.

Creation and utilisation of a suitable **pool of data** (e.g. analysis of Vienna's urban microclimate).

Elaboration of **heatwave action plans and guidance** for all municipal departments, agencies and enterprises setting out detailed measures to protect vulnerable and at-risk groups in the event of heatwaves.

Development and utilisation of **climate simulation models** for relevant projects as well as suitable methods for evaluating the impact of planned measures on the urban microclimate. The City of Vienna provides targeted research grants to support the development of these methodologies.

Adaptation of planning processes, building quality criteria and construction standards to reflect the impact of the climate crisis.

Evolution of **funding instruments** to take account of climate change aspects in new-build and building refurbishment projects.

Where we need support

The comprehensive programme of measures necessary to adapt the urban space to the impacts of climate change requires swift and substantial investments – and hence a pooling of municipal resources with funds from the federal budget.

Austria's Climate Change Adaptation Strategy can make a valuable contribution to ensuring that suitable measures are implemented in all federal provinces in line with common key principles. Support from the federal level is required for monitoring and subsequent adjustment of the adaptation measures, as is coordination between the respective federal provinces on supraregional issues (such as preservation of fresh air corridors and cool air streams, local flood prevention schemes, etc.). Support for Vienna's planned measures through appropriate funding programmes (EU or national).

Vienna shows how:

Climate-sensitive redesign of Johann-Nepomuk-Vogl-Platz

Johann-Nepomuk-Vogl-Platz, a square in Vienna's Währing district, has been adapted for climate change in a redesign process involving local people, businesses and citizens' initiatives. New trees and plants provide plenty of green, lots of new seating encourages people to linger and relax, and a water jet feature cools the air. The new weekly market area has extra-wide pavements for strolling, and an additional tram stop has been installed for easy access by public transport.

The square was designed using the "sponge city" rainwater management system to provide a heat-proof environment for the newly planted trees, with a layer of coarse gravel and finer, water-retentive materials underneath the paved surface. Instead of being discharged into the sewage system, all the surface run-off from the square, the water from the fountains and some of the roof run-off from the market units percolates down for storage in this retention layer. The trees can supply themselves with stored rainwater from this "sponge" layer for extended periods – especially during summer heatwaves.

Cooling points

Measures to mitigate extreme heat are installed all over Vienna in the summer months. A three-metre attachment with 34 fine nozzles transforms 100 water hydrants into cooling misting features, while a further 75 hydrants are converted into drinking fountains with an integrated misting facility. Misting pillars and hoses together with water jet features and fountains in many of the city's parks all provide a refreshing boost for city-dwellers on hot days. These neighbourhood measures supplement the cooling effect of major green infrastructure installations like parks, trees and green spaces.



Urban ecology, environment & water

What it's all about

Intact, climate-resilient ecosystems, the high proportion of green space in the city and low levels of environmental pollution are essential to Vienna's high quality of life. Having said that, however, the city's healthy, pleasant living conditions also depend on the environmentally aware mobility habits and consumer behaviour of the Viennese people.

- The ecosystems of the green belt surrounding Vienna and the green corridors that criss-cross it are the city's "green lung", and the cool air they produce has a major influence on the city's urban microclimate. The size and quality of these ecosystems must therefore continue to be safeguarded in future, and they must remain barrier free and easy to reach on foot, by bike and by public transport.

- Vienna's extensive recreation areas and stretches of natural countryside are preserved, interconnected and expanded.

- Local green and outdoor spaces play an essential role in regulating the urban microclimate, preserving biodiversity, maintaining social cohesion and enhancing the amenity value of the public space.

- In the city, land is generally a scarce resource, while unsealed surfaces in a near-natural state are an essential prerequisite for biodiversity and a properly functioning water cycle. Vienna's urban development policy is therefore geared for optimum efficiency and careful use of land. Vienna's land consumption per capita is the lowest in Austria. Whereas most of the other federal provinces have seen further expansion of built-up areas, the percentage of land taken up by buildings, roads & transport infrastructure in Vienna has been reduced (-18% from 2005 to 2019). Wherever possible, sealed surfaces are being unsealed again.

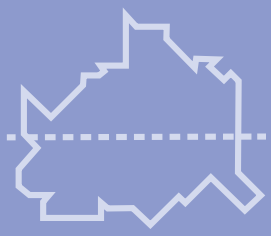
- Vienna maintains and safeguards its diverse urban agriculture sector and fosters a sustainable food supply system: activities to this end range from supporting resource-efficient organic farming practices and providing access to healthy organic produce through to promoting urban farming and gardening and reducing food waste.

- Vienna has a secure, long-term supply of drinking water and ensures reliable, environmentally sound disposal of all waste water and sewage.

- The water supply infrastructure is continuously expanded, so Vienna remains well equipped for further population growth and the growing incidence of heatwaves.

- Flooding is prevented thanks to far-sighted investments in the sewage system and stormwater retention and storage basins (e.g. the Wien Valley Sewer).

Our goals



The share of green space in Vienna is safeguarded for the long term at over **50%**.

Vienna creates additional new woodlands and green spaces as **recreation areas** for its growing population and to **improve** the **urban microclimate.**



The **natural functions of the soil** are maintained through preservation of existing **unsealed** surfaces and creation of new ones.

In the interests of people's health and well-being, **air, water** and **soil pollution, noise** and **heat pollution** and **light pollution** are all **minimised** as far as possible.

Vienna **promotes biodiversity.**

The city's **food supply** is largely sourced from the city itself and the surrounding region, preferably from organic producers supplemented by urban agriculture.

Vienna's **water supply** and waste water management infrastructure is maintained and operated to a high standard and in a resource-efficient manner.

What we are planning

Preserving and extending green spaces and areas of natural countryside: Vienna preserves its green belt of woodlands, meadows and bodies of water, both now and for the future. Existing green areas are upgraded – with regard to climate resilience, among other things – and new high-quality spaces added.



Maintenance and interconnection of extensive **conservation zones**.



Acquisition and landscaping of additional urban **recreation areas** through purchase, land use designation or contractual agreement. To this end the municipal administration will also work closely with other stakeholders in the metropolitan region.



Expansion, upgrading and interconnection of **green spaces**, as well as green and open spaces serving local neighbourhoods in existing built-up areas.

To date, more than ten kilo metres of river in Vienna have been restored to a near natural state. Half of the 18.4 kilometre River Liesing has been restored since October 2020, and work to improve flood protection and water quality and restore further stretches of riverbank to a near natural state will con tinue until the end of 2027.



Preservation of valuable **agricultural land** (priority areas for agriculture).

Careful use of land in urban development: In individual building projects or when developing new urban districts, Vienna pays attention to careful use of land as a non-renewable resource.



New urban districts are planned to be compact in design, based on short distances and with sufficient functional density to keep consumption of land to a minimum. Public spaces are designed to give priority to eco-friendly modes of transport and ensure high amenity value.



Consistent optimisation of **existing built-up areas** and regeneration of brownfield sites (e.g. disused railway premises).

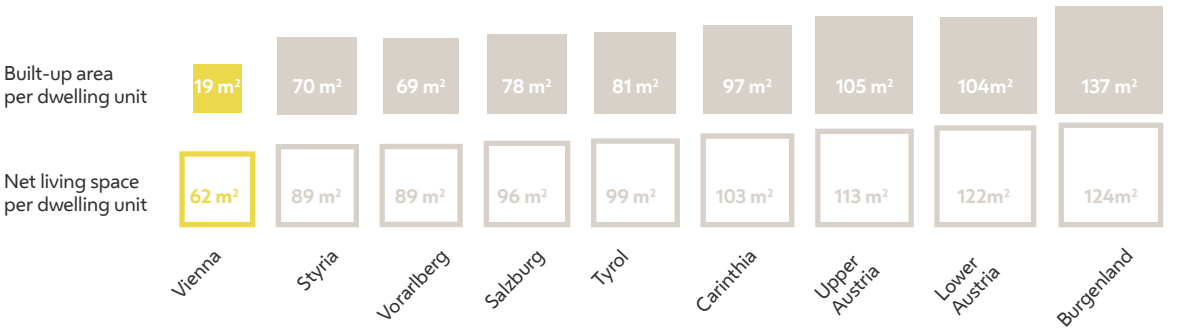
Since 2005 the City of Vienna has invested more than €100 million in further improve ment of the flood defences along the River Danube. The measures simultaneously help to counteract drying out of the Danube wetlands and protect the diverse local flora and fauna.



Temporary and multiple use: Vacant or partially used buildings and sites can provide (temporary) space for local initiatives and generate positive impetus for the local neighbourhood.

Vienna consumes by far the least land per new-build dwelling unit.

Whereas several federal provinces consume over one square metre of land for every square metre of new living space, the area of land consumed in Vienna is less than half the new living space.



Calculations by Urban Innovation Vienna based on data from Statistics Austria.

The diagram shows the average net living space and the average built-up area per dwelling unit in new-build residential projects that received official approval from 2018 to the 3rd quarter of 2021.

Promoting biodiversity: Vienna preserves its many and diverse animal and plant habitats.

Habitat management, protection and restoration of **biotopes**, e.g. near-natural management of woodlands; preservation and species-appropriate maintenance of meadow habitats; safeguarding areas of shelter for animals and plants.

Restricting the use of **pesticides**.

Enforcement of stringent legislation to **protect endangered species** such as wild bees and butterflies and their habitats.

Consistent implementation of the City of **Vienna's protection programme for waterways** and bodies of water, e.g. through near-natural landscaping of riverbank and shore zones or ensuring passability for fish.

Use of site-appropriate, diverse **planting concepts** to enhance **biodiversity**.

Reducing exposure to air, water, noise and light pollution: With an array of measures in the traffic & transport, energy supply and buildings sectors, the City of Vienna ensures that the levels of airborne pollutants and noise are as far below the legal limits as possible throughout the entire city. In addition:



Measures to protect the city's bodies of surface water and groundwater reservoirs against input of pollutants.



Environment-friendly planning and (re) design of public **lighting** using modern LED street lighting.



Targeted noise control and mitigation measures to **reduce exposure to traffic noise** (e.g. noise barriers, planting schemes), together with sustainable traffic planning and management (e.g. speed limits).

Ensuring a sustainable, climate-resilient food supply system: The City of Vienna works with all key stakeholders in the metropolitan region to reduce the ecological footprint of the entire food supply system (food production and processing, transport, sale and consumption). A wide range of measures to this end are implemented under the Vienna Food Action Plan.



Preservation of valuable agricultural land and expansion of the acreage used for organic farming.



Prioritising and promoting **resource-efficient organic farming practices**. The City of Vienna's own agricultural operations are 100% organic, and it supports private agricultural enterprises in converting to organic farming and co-operates with the agricultural enterprises throughout the metropolitan region to facilitate a range of distribution channels and ensure a good neighbourhood food supply (farmers' markets, collection points, box delivery, etc.).

Eating a typical Austrian diet causes around 1,257 kg of CO_2 emissions per person and year a substantial amount, and one that can be signifi cantly reduced through sim ple adjustments to municipal procurement processes or in dividual consumer behaviour.

Wolbart[36]

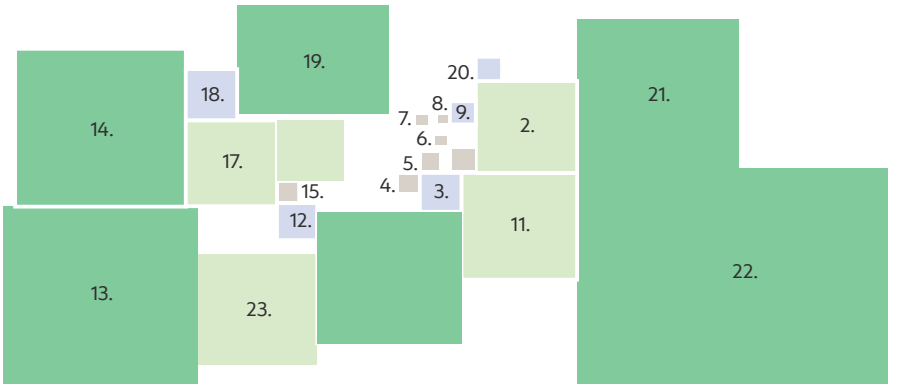
[36] Nadine Wolbart (2019): Treibhausgasemissionen österreichischer Ernährungsweisen im Vergleich ("Comparison of greenhouse gas emissions associated with different types of diet in Austria") (in German). In: Social Ecology Working Paper 176. URL: https://boku.ac.at/fileadmin/data/H03000/H73000/H73700/Publikationen/Working_Papers/WP176_Web.pdf

Providing support for **new agricultural models** such as urban farming, urban gardening, aquaponics with appropriate species and community gardening.

Facilitating **access to organically produced food** (e.g. through organic "islands" on the city's markets). The City of Vienna plays a pioneering role here by purchasing sustainable products for its own municipal institutions such as schools, nurseries, hospitals and nursing homes.

Reduction of food waste along the entire value chain through awareness-raising activities and joint measures with the business community.

Half of the municipal territory is green space



Naturally, the city's green spaces are very unevenly distributed. The 22nd district, with large expanses of land used for agriculture, is the clear frontrunner, but the 13th and 14th districts also have extensive green areas. Some of the inner districts, on the other hand, only have a 2–3% share of green space. This makes it all the more important to gradually expand provision of outdoor spaces in densely built-up areas and make them more conducive to public use.

Green space per municipal district. Diagram from Vienna Chamber of Labour magazine (AK Stadt 02/2019). Data: Municipal Department MA 18, land use map (2016).

Ensuring a long-term water supply and waste water and sewage management system: The City of Vienna invests in the relevant infrastructure and develops innovative solutions to ensure that all its citizens are supplied with top-quality drinking water and that its waste water and sewage disposal systems are environmentally sound and energy efficient.



Consistent protection of the springwater catchment areas for Vienna's **drinking water supply.**



Ongoing maintenance, refurbishment and needs-based expansion of the sewer system and **drinking water supply network.**



Development of new methods of **generating power from Vienna's waste water and sewage.**

Where we need support

Legislative frameworks at federal level are the most essential prerequisite for effective reduction of all kinds of pollution, consistent wildlife protection measures and efforts to minimise food waste. Safeguarding of the green spaces and areas of natural countryside that make up Vienna's green belt and the green corridors and waterways that extend beyond the city boundaries requires joint coordination with the surrounding municipalities, who likewise benefit to a high degree from these ecosystems. National and European funding available to both public and private-sector entities can support innovative greening projects in the densely built-up urban area.

Vienna shows how:

Multiple and temporary use

Besides installing new parks and sports facilities, the City of Vienna also makes existing indoor and outdoor spaces available for additional uses. Organised multiple use, for example, enables young people to use a school's sports ground after school hours, at weekends and during the holidays. Or families to use the outdoor spaces around Vienna's open-air swimming pools outside the opening season. Multiple use reduces land consumption and maximises the lifespan and/or capacity utilisation of existing facilities. It also strengthens community spirit and creates additional opportunities for sport and exercise without sealing new surfaces.

Temporary use is when previously unused sites or premises, such as e.g. empty plots or vacant commercial premises, are mobilised to provide space for exercise and leisure activities, arts and cultural events, creatives, start-ups, social projects and other initiatives. Vienna has been prioritising multiple and temporary use since 1998 and has implemented well over 100 projects since then. Since 2016 the agency "Kreative Räume Wien" has been tasked with coordinating and facilitating the use of vacant premises, advising both property owners and people seeking space for their activities.

DreiAnger regional park

The planned DreiAnger regional park in the north of the Vienna metropolitan region will create an extensive recreation area across municipal and province boundaries. Covering an area of approx. 3,000 hectares, it will extend from Bisamberg hill in Vienna's 21st district via Gerasdorf to the future woodland of Norbert-Scheed-Wald in the 22nd district. The regional park is named after the three villages of Stammersdorf, Gerasdorf and Süßenbrunn, which all have a central village green ("Anger" in German).

As a local amenity and recreation area, the DreiAnger regional park will allow visitors to explore the pretty countryside on Vienna's northern outskirts on foot or by bike, with new rest areas, leisure trails and play facilities to add a fun element. Another focus will be on information and educational outreach activities on the theme of regional agriculture and organic produce.


© Stadt Wien / Gerd Götzenbrucker


© Martin Jordan


© Stadt Wien / Gerd Götzenbrucker

Health & social inclusion

What it's all about

Social cohesion and equality of opportunity are at the heart of the City of Vienna's Smart City activities. Vienna's pathway to net zero is designed so as to ensure that everyone in Vienna benefits from it and nobody is left behind or excluded. The health policy of Smart City Wien aims to maintain, promote and improve the health of the Viennese population. Climate change is changing the environmental conditions we live in, so far-reaching measures to mitigate and adapt to climate change are extremely important if the health and social goals are to be met.

- Vulnerable social groups are particularly severely affected by the negative impacts of climate change, therefore they benefit especially from climate action measures. Taking appropriate measures to support these groups and giving them the opportunity for active participation in processes of change is thus a fundamental principle of the City of Vienna.

- The public health system is an essential factor for employment and local economic development. Vienna's expertise in developing solutions in this field is internationally recognised and empowers the city's people – in prevention as well as in treatment.

- Vienna's healthcare sector will make a significant contribution to decarbonisation, placing a strong focus on sustainability, conservation of resources and energy efficiency of buildings to substantially improve its carbon footprint.

- In future, the City of Vienna will continue to focus on subsidised housing as an effective tool to support social inclusion.

- Social innovations in the local neighbourhood, from swap shops to building groups, are becoming increasingly important. Vienna will continue to invest in quality of life and amenity value in all districts of the city, responding to the initiatives and ideas of local people.

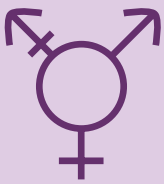
- In Vienna, social inclusion also means digital inclusion. The digital transformation must also benefit those groups who do not yet engage with new technologies in their everyday lives. Vienna therefore steers the digitalisation process with due consideration for both its positive and negative impacts.

Our goals

By **2030** the healthy life expectancy of the Viennese population has increased by **two years.**[37]

Health literacy is improved at individual and organisational level – Vienna focuses on **health promotion and disease prevention.**

Vienna supports **healthy, active ageing** – care-dependent Viennese citizens receive high-quality care at home or close to home for as long as possible.

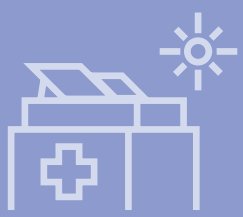


Vienna is a **diverse city** that promotes **gender equality** and opportunities for participation for all who live here.

Vienna offers high **quality of life in all districts of the city** – by investing in public infrastructure and mitigating & adapting to climate change, strengthening community cohesion and providing a wide range of opportunities for public involvement and participatory decision-making.



All social groups, especially vulnerable ones, are **protected** against the health risks associated with climate change.



The **decarbonisation** of Vienna's **healthcare sector** is accelerated by prioritising measures to improve energy efficiency and conserve resources.

[37] Baseline year 2019.

What we are planning

Implementation of a climate action & environmental protection programme: The Vienna Health Association (WiGeV) draws up and implements a climate action & environmental protection programme. Focus areas include:



Optimising the **energy consumption of buildings** in the healthcare sector by means of a comprehensive programme of modernisation plus clear specifications for new builds.



Hospitals and care facilities to be equipped with **solar power plants** where possible (by energy utility Wien Energie).



Other priority areas include **transport, procurement and waste prevention.**

In 2014, the carbon footprint of Austria's healthcare services was around 6.8 mega tonnes, equating to almost 7% of the country's total carbon footprint. The Austrian health sector is thus close to the median of the OECD countries and the largest carbon emitter of all the service sectors.

Weisz et al.[38]

Prioritising health promotion at all levels: Health promotion is a cross-cutting issue – health literacy and promotion measures are becoming increasingly important in view of the growing negative health impacts associated with advancing climate change, and they have to be planned and implemented in close coordination with measures from other thematic fields such as Mobility & transport, Economy & employment and Urban ecology, environment & water:



Health promotion in the workplace, especially in small and micro enterprises, and improvement of organisational health literacy.



Initiatives to improve **health literacy**, especially among the elderly, young people and socio-economically disadvantaged groups, including outreach and awareness-raising campaigns and advisory services with a particular focus on (heat-related) negative health impacts of advancing climate change.

Vulnerable groups include, for instance, people in precarious employment, people at risk of poverty, the chronically ill and single parents. People with few material resources, in particular, often demonstrate social strength and resilience. Recognising this social capital as an asset and resource is another aspect of Vienna's Smart City approach.



Continuation of the City of Vienna's **women's health programmes**, including outreach, advisory and prevention activities and the commitment to gender-sensitive healthcare provision and health research.

[38] Ulli Weisz, Peter-Paul Pichler, Ingram S. Jaccard, Willi Haas, Sarah Matej, Peter Nowak, Florian Bachner, Lena Lepuschütz, Andreas Windsperger, Bernhard Windsperger and Helga Weisz (2019): Health Footprint. Carbon footprint of the Austrian health sector (in German). URL: https://www.klimafonds.gv.at/wp-content/uploads/sites/16/HealthFootprint_Einleitung-und-Kernausssagen-lektoriert.pdf



Close coordination of urban planning and health **promotion measures to facilitate everyday exercise in the local neighbourhood** – active mobility options, play and exercise facilities, attractive public spaces.



Further development of **heatwave warning systems** and provision of **cool spots**, by opening of existing spaces as well as creation of new ones, both temporary and permanent.



Training of medical staff in the health impacts of heatwaves, recognising the symptoms of heat stroke & heat exhaustion and appropriate first aid measures.



Development and roll-out of a **monitoring and risk management system** to contain diseases that may occur more frequently due to highly allergenic plants and disease-carrying insects expanding their geographical range as a result of climate change.

Climate-proofing of urban districts: When developing new urban districts, Vienna sets standards in terms of climate action and mitigating and adapting to climate change. Targeted investments and interventions make existing neighbourhoods climate proof.



Realisation of **urban development projects** like Rothneusiedl as a model for climate-proof urban planning and climate change adaptation.



Implementation of **innovative local projects** to combat climate change and its consequences. Investments in local neighbourhoods strengthen solidarity and social justice and tackle existing inequalities.



All measures and infrastructure projects are designed so as to further increase the city's **accessibility to people with disabilities.**



Safe, barrier-free routes through the neighbourhood facilitate everyday journeys and support sustainable mobility and social interaction.

Sharing ideas for the city's future: All citizens of Vienna, irrespective of gender, age, education, income or disability, should be given a say in shaping our city's future. Innovative, socially equitable, gender-sensitive participatory consultation processes are the tool that will make this possible. The corona pandemic has highlighted the importance of social innovations in coping with everyday challenges:

By 2025, the City of Vienna's funding programme "Live able Model Climate City" will invest some €100 million in projects by Vienna's municipal districts to mitigate the nega tive effects of climate change and adapt the public space accordingly.



Supporting and facilitating **diverse local (community) initiatives**, including cultural activities, to make the local neighbourhood a liveable place for all.



Unbureaucratic support for **social initiatives and innovations** that strengthen the community at large, drive gender equality, positively shape the immediate living environment and promote urban skills and a sustainable lifestyle.



Social innovations enable the evolution of **new occupational profiles with high societal value.** The City of Vienna takes appropriate measures to support these new roles.

Where we need support

The evolution of the healthcare system, and in particular the increased focus on preventive medicine, requires the continuous roll-out of new primary care provision via group practices and health centres. This relieves the burden on hospital outpatient clinics, and patients benefit from short waiting times and comprehensive patient treatment and health advisory services under one roof. The City of Vienna is therefore working in close partnership with the Austrian public health insurance agency Österreichische Gesundheitskasse, which is putting in place the necessary contractual und organisational framework for a nationwide roll-out of primary care provision.

Vienna shows how:

Wiener Gesundheitsförderung (WiG) for healthy districts and neighbourhoods

Wiener Gesundheitsförderung (WiG) is a non-profit organisation of the City of Vienna devoted to promoting healthy lifestyles, healthy living environments and good mental health for people in Vienna.

Health promotion is most effective if delivered where people live and work, so WiG has been supporting initiatives in nine "Healthy Districts" since 2016 under the headline "Healthy Ideas for Your District". The activities organised include regular workout sessions in the local park, a senior citizens' football tournament or the installation of a vegetable bed in the rear courtyard of a residential building. Focussing on topics like healthy eating, exercise, mental health and healthy living environments, the initiatives and activities are designed to be low threshold and welcoming and improve people's health literacy.

Neighbourhood Oasis – co-shaping the local environment, enhancing quality of life

The Neighbourhood Oasis initiative provides support for people working to enhance the amenity value of public spaces and foster community spirit. Its "Young Neighbourhood" scheme supports ideas and interventions that provide new options for children and young people in the city – including temporary play streets, edible hedges with fruit to pick, or raised gardening beds. Initiatives dealing with the environment, nature, climate change, health & exercise and diversity are especially welcome. "Green parklets" are new community spaces created by and for people in the neighbourhood, with lots of greenery and shade to improve the local microclimate. A jury selects the best initiatives from among all those submitted, which then receive funding and expert support with the official approval process and getting the project off the ground.


© Stadt Wien / Gerd Götzenbrucker


© Martin Jordan


© MedUni Wien / Mark Glassner

Education, science & research

What it's all about

Vienna is one of Europe's leading research centres, an innovation hub for smart solutions for urban living environments, and an attractive place for academics and students, researchers and innovative companies and start-ups. Knowledge and education ensure social and societal advancement and contribute to personal development and social cooperation. A good education is a solid foundation that creates opportunities and options for participation and engagement and is a prerequisite for active and constructive involvement in debates and projects relating to sustainability and conservation of resources.

- An equal start for all children and young people: delivering educational and career opportunities means greater fairness and social inclusion, greater individual and societal resilience and greater innovative capacity for the City of Vienna.
- Educational institutions – from nurseries and schools to libraries and further education centres – are housed in attractive, sustainable flagship buildings; appropriate measures are taken to make existing buildings climate proof.
- Further education, training and qualification programmes place special emphasis on skills and sectors that are of importance for delivering on the Smart City goals. The focus here is on fostering education and training pathways that break with the traditional gender roles, especially in the natural sciences and the technical and social sectors.
- Vienna is committed to providing inclusive digital education in all educational institutions. City-wide installation of adequate digital infrastructures is an essential part of this, as are digital media skills.
- Vienna is already an important incubator for innovation, but further efforts are required to catch up with the top-flight group of innovation leaders.
- This requires strong research institutions with top-grade infrastructure that is used by science, industry, SMEs and start-ups alike, combined with a cosmopolitan, outward-looking climate that attracts high-calibre individuals and young talent from around the globe.
- Special attention should also be devoted to top-level research and promoting excellence.

Our goals



Vienna boasts a comprehensive, needs-based, inclusive programme of **digital education** for all sectors of the population.

In 2030, Vienna is one of **Europe's Top Five research** and **innovation hubs** and a magnet for top-flight international researchers and the research units of international corporations.

The city-wide roll-out of **learning communities** ("Bildungsgrätzln") by 2030 and the subsequent evolution into a Learning City will create learning spaces that are tailored to local neighbourhoods, communities and lifestyles – supported by multiple use of buildings and spaces.

Vienna initiates large-scale mission-led **research and innovation projects** as a contribution to the **socio-ecological** transformation.

Raising **awareness** of **sustainable**, resource-efficient development is a standard **teaching objective** in all educational institutions.

In Vienna, specific challenges relating to **sustainable development** are identified and resolved cooperatively by the municipal administration, higher education and research institutions, companies and end users.

Education and qualification programmes cater for changed **occupational profiles** to foster new smart **technologies** and practices and support career choices that break with traditional gender roles.



International congresses, trade fairs and events increase the **global visibility** of Vienna's research excellence.

What we are planning

Rolling out learning communities to create a Learning City: Vienna ensures adequate provision of high-quality educational institutions for all age groups and levels of educational attainment. Alongside this we will focus on sustainable new builds coupled with expansion and refurbishment of existing premises to create shared learning spaces for all children and young people. The learning communities ("Bildingsgrätzl") concept will be rolled out step by step to cover the entire city. "Bildungsgrätzl" are learning spaces with a visible profile in the local community that help children and young people make the transition between the various educational institutions:

Roll-out of new learning communities wherever educational institutions in a neighbourhood wish to establish closer cooperation.

Increasing availability of spaces and premises by creating multi-purpose spaces and multiple use of public and private premises. This gives rise to shared learning spaces, which in turn make neighbourhoods livelier and more resilient.

Implementation of the digital education strategy: The "Digital Education 2030" strategy is the framework for delivery of Vienna's digital education policy, inter alia through:

Targeted, purpose-led implementation of **digital technologies in schools** – aligned with teaching formats based on personal interaction.

Teaching of **media skills** and a critical awareness of the opportunites and risks associated with Internet use.

In line with its policy of **digital humanism**, the City of Vienna empowers its citizens to participate and have their say in an increasingly digitalised society.

Attracting scientific excellence, talent and skilled professionals to Vienna: The City of Vienna creates an attractive environment to attract young talent and high-calibre individuals, excellent institutions and start-ups to the city and keep them here.

In the long term, every additional euro of public funding spent on research & development generates an increase of around 6 euro in GDP.

Austrian Research and Technology Report[39]

Working to bring **international research institutions and innovation-led companies** to Vienna.

Promoting Vienna's higher education strengths in important fields of expertise, for instance by funding research teams and endowing professorships at the city's higher education institutions.

Delivering **training and qualification programmes for a skilled workforce**, inter alia through the establishment of a "Vienna Skills Centre". Provision of state-of-the-art training courses in the field of smart technologies and sustainable professions (e.g. building refurbishment, heating engineering, recycling and upcycling, corporate training and development).

Development of a broad, needs-based range of support **facilities and services for international professionals and academics.** Official processes and procedures associated with setting up a business will be made as client-friendly as possible, with a Business Immigration Office as a central one-stop service point.

Harnessing the power of research and innovation for the Smart City: The City of Vienna initiates and promotes research and innovation projects with local and international research partners to help find answers to pressing future issues, particularly in the fields of mitigating and adapting to climate change and moving towards a circular economy, and to pool the expertise of companies, researchers and pilot users.

An array of excellent interdisciplinary research projects in the field of environmental systems have been realised in the last three years alone thanks to funding of almost 10 million euro from the City of Vienna.

Wiener Wissenschafts-, Forschungs- und Technologiefonds

Promotion of top-level university and non-university research in recognised **key fields**, as well as **corporate R&D**; support in accessing national and EU funding programmes.

Funding schemes for business, science and research and for start-ups and spin-offs have a targeted focus on Smart City issues and promote interdisciplinary cooperation.

Long-term support and further development of Vienna's higher education institutions in accordance with the **Vienna Higher Education Agreement.**

Development and roll-out of formats for **knowledge transfer** in business and society.

[39] Federal Ministry for Digital and Economic Affairs (2021): Austrian Research and Technology Report. https://www.bmdw.gv.at/dam/jcr:2df2bde6-ad79-4e11-a8c1-9869297d5e47/FTB_2021_engl_barrierefrei.pdf

Creation of local "living labs": Vienna provides an innovative collaborative milieu with local "living labs" for the development and roll-out of new, unconventional approaches and solutions. The latter are also ideal places for public engagement and participation projects.

Initiating and funding of **innovative local projects at neighbourhood level.**

Involvement of various local stakeholders in **innovation processes** – from framing of the issue to piloting of possible solutions. Innovation and networking platforms are designed to generate impetus and promote cooperation.

Providing access to urban infrastructure (e.g. public spaces, transport facilities, networks and data) as a **testbed** for the development and piloting of new technologies and social innovations.

Where we need support

Expanding the availability of high-quality education options and needs-based provision of childcare facilities in Vienna requires additional support from the federal government, especially in the form of funding for additional permanent posts in compulsory schools. Vienna is also lobbying at federal level for inclusive, barrier-free education options, knowledge transfer and cultural outreach programmes and vocational training schemes to ensure equal educational and career opportunities for all. Vienna is likewise lobbying at federal level for an outward-looking immigration and integration policy and employment, citizenship & residency legislation that makes Vienna an attractive place to study for a degree, start an academic career or set up a business, for non-EU as well as EU citizens. This also requires faster, service-led processes and procedures and, if need be, allocation of additional resources to the relevant departments. Within the scope of its remit as a regional authority, Vienna makes appropriate resources available to further strengthen top-level research in the city.

Vienna shows how:

Seestadt public library

Seestadt public library is a modern learning space, a place where different generations and cultures come together and a space for communication with easy access to knowledge and information ("learning lab"). The aim is to facilitate lifelong learning in an array of new dimensions. The Maker Space encourages visitors to get creative with art and crafts, while the Libary of Things lends out useful items like tools and appliances. The "open library" facility allows the premises to be used when the lending library is closed, and there is also a café and an 80m² reading garden. The library has a dedicated children's section and runs a programme of fun education and outreach activities in close cooperation with the WienXtra children's leisure service and Vienna Public Libraries to get kids interested in books and reading.

Aspern Smart City Research

Launched in 2013, Europe's biggest energy research project, a joint venture by Siemens and the City of Vienna, conducts research into real-life energy applications using the aspern Seestadt urban development zone as a "living lab". A team of over 100 researchers from various scientific fields use real-time data from aspern Seestadt to analyse interactions and correlations between user behaviour and state-of-the-art technology in the operation of energy-efficient buildings. The buildings analysed simultaneously produce and consume energy and are integrated into a smart power grid. Air from an underground car park is recycled to heat flats, and smart building control systems predict building energy requirements on the basis of weather forecasts and other data. Over 100 households participating in the research project supply daily user data for practical control purposes.



© Stadt Wien / Büchereien Stephan


© Stadt Wien / Gerd Götzenbrucker



© Reiterer / enjoythesoup

Digitalisation

What it's all about

Smart City Wien is a digitalisation capital of a special kind, with a typical Viennese people-centred focus. Vienna's path to becoming a European digitalisation capital is characterised by openness to new technologies and their useful, resource-efficient application. Vienna sees digitalisation as an effective tool to drive innovation and achieve the city's net zero target while simultaneously maintaining its superlative quality of life.

- Digitalisation is not an end in itself. In line with its policy of "digital humanism", the City of Vienna, in all its efforts, keeps its focus on the rights and needs of everyone in the city. The city leverages new technologies to create an inclusive urban society with equality of opportunity and barrier-free participation of all social groups. Digitalisation should make life easier, create jobs, and make Vienna an even more equitable city.

- The City of Vienna faces up to the challenge of actively managing the digital transformation, supporting stakeholders and providing up-to-date infrastructure – from broadband Internet to traffic sensors – that meets the most stringent quality standards.

- Vienna makes increasing use of digital tools to facilitate active public participation in decision-making.

- Step by step, all municipal services and official processes are also to be made available in digital form via the central platform mein.wien (www.mein.wien.gv.at). This will make life easier for members of the public and also help realise the concept of a "city of short distances".

- Digitalisation is also an important tool in combating climate change. Vienna makes targeted use of digital data and applications in the joint effort to overcome the greatest challenge facing humanity.

- Vienna recognises the pivotal value of reliable data – for the public, for science, industry and business, and as the prerequisite for information and knowledge in the digital era. At the same time, members of the public retain full sovereignty over the utilised data at all times.

The relevant strategic basis, guidance and official policy are set out in the Digital Agenda Vienna, which is updated at regular intervals.

Our goals



By 2030, all processes and services of the City of Vienna that are of relevance to the public are digitalised and **fully automated** wherever possible.

Vienna has a needs-based and resilient **digital infrastructure** designed to operate with maximum resource efficiency.

By 2030,

75%

of the **energy requirement** for digital services and infrastructures of the City of Vienna and its municipal enterprises will be covered by **renewables**, rising to 100% by 2040.



The City of Vienna creates an **excellent pool of data** and utilises this for decision-making and management purposes, as well as making it publicly accessible ("open government data").

The City of Vienna is a pioneer in the field of **digital participation** and uses digital tools to create transparency and promote active democracy and public involvement in decision-making.



The City of Vienna prioritises digital **human rights** and promotes digital literacy.

What we are planning

Creation of digital services and processes: The City of Vienna creates transparent, user-friendly digital services for its citizens and businesses, thus helping to maximise the efficiency of the municipal administration.



Creation and expansion of digital **municipal services and processes** in all relevant spheres of life. In the interests of equality of opportunity and resilience, the City of Vienna will also continue to provide alternative analogue channels where necessary.

Far-sighted planning and delivery of digital infrastructure: In terms of "digital services of general economic interest", the City of Vienna ensures that the digital infrastructure for members of the public, businesses and academic and scientific institutions is maintained to a standard that meets the requirements of a modern municipal administration and a competitive, environmentally sustainable location for business, science and research.



Roll-out of a **resilient, needs-based digital infrastructure** in partnership with all relevant stakeholders, with a special focus on broadband and the Internet of Things (IoT).



Roll-out of a secure, stable, state-of-the-art **ICT infrastructure in Vienna's educational institutions.** Alongside high-performance broadband and WiFi, this also includes digital end devices and smart boards.

The Internet of Things (IoT) describes a network of physical objects that can communicate with one another. The fridge registers that the milk has run out and sends an online order to the supermarket for more, for instance, or the heating system automatically makes an appointment for its annual service with the maintenance technician. A number of Viennese households at aspern Seestadt already have this kind of technology installed.

Generating and utilising data as the basis for the Smart City: Where available, Vienna makes targeted use of digital data and applications to help it attain and evaluate its Smart City goals.



Creation of an up-to-date, **city-wide pool of data** as the basis for efficient performance of municipal tasks and services and as a prerequisite for decision-making and targeted roll-out of innovative applications. **Smart sensors** assist in the monitoring of urban processes and targets.



Pre-processing and publication of anonymised data as **"open government data"**, made available to the public in machine-readable open formats for unrestricted further use.



The City of Vienna consciously and consistently protects **personal data** and ensures transparent provision of detailed information on how it is used and processed.

More than 300 applications (apps, websites, creative designs, etc.) developed by members of the public or private companies make use of open government data from the City of Vienna.

Open Data Austria[40]



Development of a **digital twin**, i.e. a complete digital replica of the city, incorporating data from a wide range of sources (particularly e.g. real-time IoT data or images of the urban space). Applications like these enhance the efficiency of urban systems management (e.g. through predictive maintenance) and flag up potentials for reduction of CO_2 emissions.

Building partnerships and facilitating digital participation: The municipal administration works in partnership with business, industry and the public to develop and pilot digital applications. Digitalisation also opens up new opportunities for participation and co-creation.



Digital public participation channels for all – from participatory development of strategies to involvement in the design of specific projects (e.g. traffic calming, greening, etc.) at neighbourhood level. Accessible, user-friendly design enables all social groups to participate.



Installation of **digital "living labs"** to develop and pilot innovative solutions – swiftly, with a minimum of bureaucratic obstacles and in a real-world infrastructure.

Vienna is also one of the first cities in Europe to develop a dedicated strategy for the use of artificial intelligence (AI) within its remit. The aim is to define rules governing the use of AI within the municipal ad ministration as well as reach ing agreement on concrete application scenarios.



Building networks in Vienna's digital community through initiatives such as DigitalCity.Wien.

[40] Open Data Austria (2021) (in German). URL: https://www.data.gv.at/applicationdatapublisher/stadt-wien/?post_type=anwendungen&applicationsystem=0&applicationtype=0

Digital humanism – using the opportunities offered by digitalisation for the benefit of all: Vienna takes a wide range of measures to ensure that everyone benefits from digitalisation. The city takes special care to bridge "digital divides" with regard to gender, age, ethnicity or special needs, and to ensure good working conditions for everyone employed in the digital economy.

Since 2019, the City of Vienna has been an active member of the international Digital Rights Coalition, which works to protect human rights in the digital age.



Establishment of education and qualification programmes as well as targeted training to promote **digital skills.**



Definition of standards for the transparent and ethical use of **artificial intelligence and IoT** within the municipal administration.



Vienna takes specific proactive measures to support **schoolchildren, people aged 65+ and women in the field of IT and digitalisation**, with the focus on digital education.



Measures to help make Viennese companies from all sectors, especially SMEs, fit for the digital age. Digitalisation of local authority services also significantly reduces the administrative burden on businesses.



Vienna prioritises initiatives on **digital human rights, data protection and digital security** and plays an active role in policy-making on these issues at national and European level.



The City of Vienna provides increased support for **basic interdisciplinary research**, with a primary focus on legal and societal issues and questions relating to social policy and democracy in the digital age.

Where we need support

In order to successfully leverage new technologies and digital infrastructure to deliver equality of opportunity and barrier-free participation and help meet our climate goals, existing and new legislation and directives at all levels need to be reviewed with a view to their "digitisability". Digital projects at federal level that affect areas within the sphere of competence of federal provinces, cities and municipalities (e.g. health apps) should actively involve and consult the latter and further stakeholder representatives at an early stage in the planning process.

Vienna shows how:

Digital building permit

In partnership with a large team of researchers and practitioners from the relevant sectors, the City of Vienna is developing a model to digitalise the approval process for building projects – from submission of plans right through to granting of the building permit. The new process saves time, provides developers with a sounder basis for planning and enables swift adjustments. Building Information Modeling (BIM) software enables the production of digital 3D models containing data on the planned building's architecture, structural engineering, technical installations, etc. and allows simple comparison with the precise planning specifications for the respective site. Augmented reality also allows members of the public to obtain a clear view of proposed developments in situ before construction work even commences. In the medium term, the fully digital building permit system will contribute to the development of greener, more resource-efficient building methods, because it integrates all the necessary assessment mechanisms, quality criteria and standards and automatically ensures compliance.

Culture Token: a bonus system for residents of Vienna

Wouldn't it be great if people were directly rewarded for exemplary environment-friendly behaviour? The Culture Token app does exactly that! The app issues rewards for environmentally aware transport choices such as public transport or cycling, in the form of e.g. theatre or museum tickets. By 2025, the Culture Token will be expanded into a Vienna Token with an even wider bonus system.

Sag's Wien app

Broken paving stone, malfunctioning traffic light or empty dog waste disposal bag dispenser? The Sag's Wien app is a fast, easy, electronic means of notifying the municipal administration of any problems, defects or other issues local people encounter while out and about in the city. Designed to facilitate electronic dialogue with the local authority, the app provides ongoing updates on the status of the reported issue. More than 100,000 reported problems have already been resolved since the app's launch in early 2017. The app enables Viennese citizens to do their bit day by day to help make their city an even nicer place to be.


© PID / Walter Schaub-Walzer



© Stadt Wien / message



Participation, engagement & culture

What it's all about

Smart City Wien relies on the engagement and initiative of the Viennese public. The project thrives when as many people as possible buy into it and make an active and autonomous contribution – by sharing their experience and creative ability, joining discussion processes, developing and implementing innovative projects, and through responsible consumer behaviour and mobility choices. The Smart City initiative is founded on a shared awareness of the current challenges and a shared vision of the future that is worth committing to. Culture and the arts can play a major role in facilitating and co-shaping this transformation.

- The City of Vienna fosters this engagement and creates the necessary supportive framework for it with an array of different policy instruments and a culture of participation based on mutual respect. In doing so it also makes use of the additional possibilities offered by digital technologies and new forms of democratic engagement and participation.

- Everyone living in Vienna has the chance to get involved – irrespective of income or social status, age, gender or ethnicity.

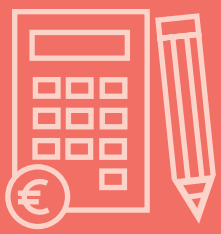
- Children and young people, in particular, should be given the chance to have a say in shaping the future of their city.

- Likewise, special attention is to be paid to those groups who for various reasons including language and educational barriers, lack of time and/or financial resources (cf. work-life balance, family and childcare commitments, etc.) only have limited choices and scope for decision-making and therefore tend to be under-represented in traditional public participation processes.

- Smart City Wien leverages the creative potential of its artists and cultural producers, setting up urban "cultural labs" to explore alternative approaches und concepts for the future and using artistic means to ask questions about why we do things the way we do.

- This makes the joint discussion and negotiation of future issues into an important learning process. Dialogue flags up different interests and needs, which then form the starting point for development of common perspectives and potential solutions.

Our goals



Vienna develops and employs various **tools to give the public a say** in budgeting and use of public funds.

The City of Vienna continuously works on its **participation** standards in partnership with local people, and overall levels of public participation and engagement **increase.**



All social groups are empowered to play an **active role** in the **co-creation** and transformation of the city.



The opportunities for public participation offered by the City of Vienna are **visible** and accessible to all.

"Living labs" are created at neighbourhood level to pilot **innovative new methods** and processes and build **networks** of local stakeholders.

The City of Vienna supports projects that actively encourage **cultural participation** – from plain-language and multilingual outreach activities to a wide range of **free** events.

What we are planning

Building expertise and fostering a culture of participation and engagement: Vienna creates a framework for inclusive, low-threshold forms of participatory policy-making – Vienna's new culture of participation becomes a core element of active democratic engagement.



Establishment of a **participation hub within the municipal administation** as a central, service-led contact point for civil society initiatives and all municipal departments and agencies involved in participatory projects.



This will include agreement on binding **rules of participation and quality standards** for handling of input from the public, timely responses and open communication about the administration's own actions (building upon the guidance set out in the "Vienna Public Participation Handbook").

The Neighbourhood Oasis in itiative gives all Viennese cit izens, organisations, schools and local businesses the op portunity to realise their ideas for better quality of life in the local neighbourhood. More than 380 projects have been implemented since 2015.

Vienna Local Agenda 21 (2021)

Expanding the range of channels and tools for civic participation: Vienna supports independent citizens' initiatives and actively develops and evolves channels and tools for participation. In doing so, it takes account of people's lifestyles and the specific needs and potentials of different social groups.



Establishment of **new formats for participation and cooperation** (e.g. local citizens' committees, panels and advisory groups, selection by lottery, dialogue platforms for children and young people, etc.) to reflect upon urban policies and projects and generate impetus for the attainment of Vienna's Smart City goals.



Launch of a City of Vienna **digital participation platform** that provides information on all civic participation channels and encourages people to get actively involved. Analogue formats and channels will also continue to be supported alongside the digital ones. Establishment of a platform for social entrepreneurship and innovation to put people with ideas for new projects in touch with social institutions and additional financial donors.

Participatory budgets: Vienna develops and pilots new formats for transparent and participatory budgeting and allocation of public funds.



Establishing a **participatory budget for mitigating and adapting to climate change** (Vienna Climate Action Team), to enable members of the public to have a say on the funding of concrete projects to deliver net zero by 2040.



Introduction of a **participatory budget for children and young people** to get the next generation actively involved in the planning of concrete projects.



Strengthening **participatory budgeting at municipal district and neighbourhood level** through standardised, transparent processes and methods.

"Living labs" at neighbourhood level: The local neighbourhood is the ideal setting for public participation projects, as new solutions can be piloted and successful outcomes are immediately visible. For this purpose, the City of Vienna installs contact points for interested parties, along with multi-purpose physical premises and "think spaces" for self-organised initiatives.



Support and network-building for existing local organisations (neighbourhood management and local area renewal offices, branches of the NGO Local Agenda 21, community centres, regional forums, etc.) and forging of new partnerships between municipal and local district policy-makers, the municipal administration, businesses, local communities and pro-active citizens.



Strategic development of the NGO **Local Agenda 21** as a contact and coordination point for sustainable neighbourhood development and civil society engagement.



Local arts and cultural activities should focus on incorporating participatory elements, to promote exchange on local developments and provide creative, expressive tools for public engagement and participation at municipal district level.



Community arts & culture hubs deliver a **programme of low-threshold cultural activities** in the various municipal districts, while the outreach teams of cultural institutions such as the Zoom children's museum and Dschungel children's theatre put on events across the entire city. Support is also given to numerous projects and initiatives in which established cultural institutions engage with artists and cultural practitioners in other parts of the city – thereby also reaching new, broader audiences.

Where we need support

Concerted action to combat climate change also requires greater scope for cities and municipalities to be consulted and involved in policy-making at higher levels of governance (federal level, EU level, etc.), in order to reinforce the principles of partnership, cooperation and sustainability.

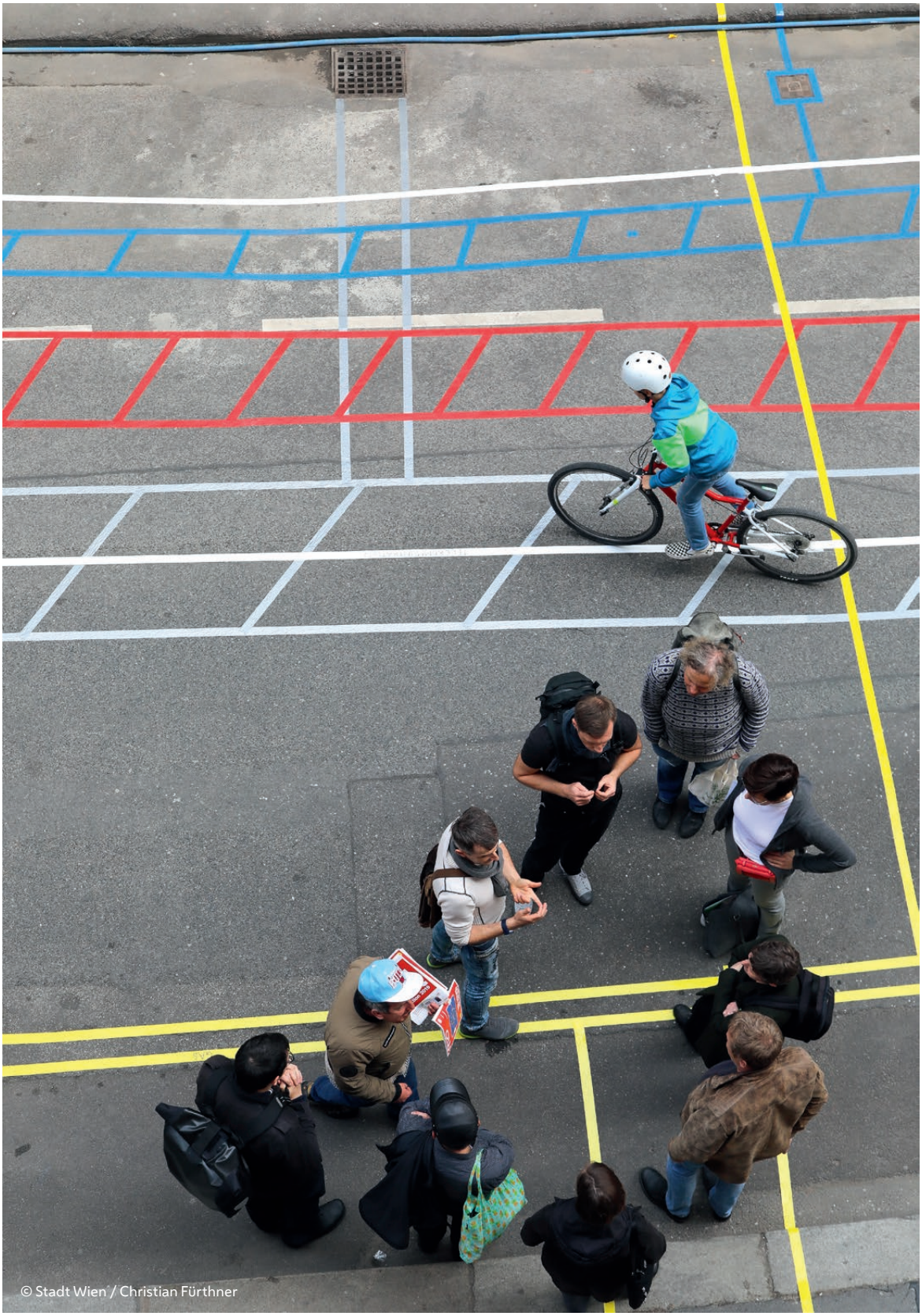
The City of Vienna is lobbying at federal level for extensive involvement of civil society in these processes of transformation, so that hard-to-reach groups are also brought on board and given a say in policy decisions relating to climate change.

Vienna shows how:

Werkstadt Junges Wien

Vienna is home to over 360,000 children and young people, who help make the city a lively, colourful and diverse place. Children and teenagers are the experts when it comes to the concerns and interests of their own age group. The "Werkstadt junges Wien" platform places the focus on children and teenagers and encourages them to voice their own needs and opinions. Over 1,300 workshops recently gave more than 22,000 children and young people the chance to think about their city and contribute their ideas. The outcome was the City of Vienna's Children & Youth Strategy, covering issues such as Nature & Environment, Opportunities & Future, Health & Wellbeing and Participation & Opinion.




© Stadt Wien / Christian Fürthner

Overview of thematic fields and their contribution to achieving the SDGs



Economy and employment
Urban ecology, environment & water
Health & social inclusion
Education, science & research
Digitalisation



Adapting to climate change
Urban ecology, environment & water
Health & social inclusion



Adapting to climate change
Urban ecology, environment & water
Health & social inclusion



Energy supply
Buildings
Adapting to climate change
Education, science & research
Digitalisation



Economy & employment
Health & social inclusion
Education, science & research
Digitalisation



Economy & employment
Education, science & research
Digitalisation



Energy supply
Mobility and transport
Buildings
Adapting to climate change
Education, science & research



Urban ecology, environment & water



Zero waste & circular economy
Adapting to climate change
Urban ecology, environment & water



Economy & employment
Health & social inclusion
Education, science & research
Digitalisation
Participation, engagement & culture



Economy & employment
Health & social inclusion
Education, science & research
Digitalisation
Participation, engagement & culture



Zero waste & circular economy
Adapting to climate change
Urban ecology, environment & water



Economy & employment
Health & social inclusion
Education, science & research
Digitalisation
Participation, engagement & culture



Energy supply
Mobility and transport
Buildings
Economy & employment
Zero waste & circular economy
Adapting to climate change
Urban ecology, environment & water
Health & social inclusion
Education, science & research
Digitalisation
Participation, engagement & culture



Energy supply
Buildings
Economy & employment
Zero waste & circular economy
Adapting to climate change
Education, science & research
Digitalisation



Health & social inclusion
Digitalisation
Participation, engagement & culture



Economy & employment
Health & social inclusion
Participation, engagement & culture

5. From strategy to implementation

The Smart City Strategy as a central pillar of the City of Vienna's climate policy.

The Smart City Strategy is the umbrella strategy for the "Vienna Climate Action Package", which ensures that Vienna meets its Smart City and climate goals:

- With its Smart City Strategy the City of Vienna sets out its long-term goals with regard to mitigating and adapting to climate change and moving towards a circular economy – in alignment with the targets defined by the Paris Agreement on Climate Action and the Sustainable Development Goals of the UN 2030 Agenda.
- The Vienna Climate Roadmap, the roadmap for implementation of the strategy, defines priority tools and measures that have to be initiated right now in order to meet the long-term Smart City climate goals.
- The Smart City goals define the content framework for the City of Vienna's specialised thematic concepts, sectoral strategies and programmes.
- The Vienna Climate Budget provides for the measures necessary to deliver the Smart City goals for mitigating and adapting to climate change. A climate check procedure will be introduced to evaluate the climate impact of specific measures and their compatibility with the climate goals.
- Periodic monitoring at regular intervals evaluates Vienna's success in pursuing the Smart City goals and targets. This evaluation is based on a set of indicators that were defined together with the goals.

What are our goals and targets for mitigating and adapting to climate change?

Vienna Smart City Strategy
Climate goals & central pillars

What needs to be done in order to meet the climate targets?

Vienna Climate Roadmap
Priority tools & measures

Sectoral strategies, specialised thematic concepts & programmes

What concrete action is being taken?

Climate Budget
Planning of measures





Success factors on our way to becoming a smart model climate city

Vienna's Smart City vision means rethinking the future in a bold, creative way and questioning established ways of doing things – including, not least, how we manage the city. At the same time, crises of various kinds – from global financial crises to pandemics – show how vulnerable our society is. What is needed here is resilience, that is, the ability to cope with unexpected adversity, remain functional and bounce back afterwards having learnt from the crisis. Vienna is facing up to this challenge and investing in seven key fields of expertise:

- **Adaptability:** An openness to new approaches is necessary if past successes are to be carried forward into the future. That applies to internal processes and structures as well as to procedures and services for the Viennese public and businesses.

- **Far-sightedness & forecasting ability:** Disruption, rapid changes and global crises call for far-sightedness, pro-active planning and preparation for various scenarios.

- **Cooperation in all areas:** The thematic fields covered by the Smart City Strategy are closely interconnected; measures are not defined in isolation. Eco-friendly forms of transport also improve traffic safety, for instance, and promote health by encouraging physical exercise. To exploit these synergies we need to avoid a silo mentality and foster cooperation and knowledge transfer across departments and remits.

- **Willingness for dialogue & empowerment:** Vienna needs input and ideas from companies and research institutions, NGOs and local citizens' initiatives. The city provides platforms for open dialogue and supports new forms of engagement and partnership.

- **Transparency:** Open communication and a well-developed culture of participation make decision-making processes more transparent and strengthen people's trust in institutions and democratic processes – an essential prerequisite for overcoming crises.

- **A new positive error culture & learning from mistakes:** Ground-breaking innovations often emerge from experimental projects with an open-ended approach. The ability to learn from mistakes is important: a positive error culture drives improvement and harbours potential for future projects.

- **Stability of values & high quality standards:** Different factors influence the actions of the City of Vienna and its citizens. The Smart City consistently pursues its goals and builds upon core values. No matter what changes ensue as a result of unforeseen events or innovations – the Smart City ultimately considers the needs of everyone living in Vienna.

Tools for implementation

On the one hand, far-sighted legislative frameworks, public-sector investments and subsidy schemes need to be put in place in order to meet the Smart City goals and targets. Standards and norms provide orientation, create a sound basis for planning and play a key role in ensuring that innovations emerging from pilot projects are rolled out for wider implementation. At the same time, the success of Smart City Wien crucially depends on input from a large number of stakeholders! A wide range of tools are used for this purpose:

- **Interdisciplinary beacon projects:** Cross-departmental innovation projects with broad involvement of a number of different organisational units of the City of Vienna, sometimes together with private stakeholders.

- **Public-private partnerships:** Here the municipal administration works in partnership with business, industry and civil society. The aim is to create an institutional framework (such as project budgets jointly funded from public and private sector sources) to set up joint ventures and implement key projects.

- **Pilot projects & "living labs":** In "living labs" at local neighbourhood level, research institutions collaborate with local public sector and civil society stakeholders to develop technical and social innovations, new products or procedures and test them out in the local community.

- **Incentive systems for sustainable behaviour:** The Viennese public are rewarded with discount offers, vouchers or other incentives for making sustainable choices in their everyday lives. The schemes are based on apps and online platforms and are a fun way of incentivising climate-friendly behaviour.

- **Research calls & partnerships:** This includes longer-term cooperation agreements, providing support with recruitment to key posts at Viennese universities and research institutions, embedding Smart City issues in university teaching syllabuses and research, and major inter- and transdisciplinary research projects. To this end the City of Vienna takes on the role of initiator, funding provider and user of innovations; Vienna's higher education institutions define research priorities with an explicit focus on Vienna and are open to exchange and engagement with the municipal administration and the general public.

- **Communication and awareness-raising:** The City of Vienna shares its Smart City vision via a strong communications strategy that presents the goals in a real-life context. Showcase projects, ambassadors for the Smart City ethos and partners from the education, media and culture sectors bring the concept of a smart future to life.

- **Participation & engagement:** The evolution of Smart City Wien is not only built upon broad public acceptance – it also opens up an array of new opportunities for public participation. Vienna is committed to a culture of active public participation and engagement in the Smart City project, which aims to involve everyone living in the city.

Alliances and partnerships

Vienna forges alliances with like-minded partners for joint lobbying activities relating to the climate and sustainability goals of the Smart City Strategy – with regard to safeguarding the principles of general public interest and provision of public services for instance, or ensuring that the relevant thematic priorities are incorporated in federal and EU funding programmes.

- Vienna metropolitan region – Smart Region platform: Close coordination and collaboration with Vienna's neighbouring federal provinces and the local authorities within the "Smart Region". The "Platform for Energy and Climate Action (Smart Region)" under the auspices of Planungsgemeinschaft Ost, the joint planning organisation of the three federal provinces of Vienna, Lower Austria and Burgenland, is the springboard for cooperative strategies and measures across the administrative boundaries.

- Federal-municipal cooperation: Active leverage and further development of the Memorandum of Understanding concluded in July 2013 between the City of Vienna and the Federal Ministry for Transport, Innovation and Technology[41] to coordinate activities at the municipal and federal level.

- Cooperation with other cities: Deepening of city alliances in Austria and with other metropolitan regions in Europe and worldwide (especially within the context of existing networks and organisations such as Eurocities and the Council of European Municipalities and Regions) for mutual exchange of expertise and to advocate common positions and arguments that help to deliver the Smart City goals.

- Strategic partnerships & cooperation agreements: Agreements in which major stakeholders in the city, be they from the business & industry, tourism or science and R&D sectors, commit to specific goals and targets and are thus involved in a regular dialogue with the municipal administration.

- Climate action alliance with Viennese businesses: Establishment of a long-term partnership between the City of Vienna and pro-active Viennese businesses to provide them with early notification of the administration's plans, ascertain the experiences and views of the business community, plan and implement joint activities and agree an emissions reduction roadmap and medium-term development goals.

[41] Now the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology.

Monitoring & evaluation

Long-term strategies like the Vienna Smart City Strategy require regular monitoring and review to evaluate progress achieved so far and ensure that the goals and targets are met. The monitoring results provide policy-makers and the municipal administration with sound information as a basis for decision-making, assessing where action is needed, and timely provision of the necessary resources. The monitoring process provides an overall picture of the various policy fields, enabling joint consideration and evaluation of the city's development.

Attainment of Vienna's Smart City objectives is monitored on the basis of suitable indicators or sets of indicators that are pre-defined together with the respective goals and targets. In the interests of efficient data collection, the city's existing data sets are used wherever possible, and the collection of further required data is assured where necessary. By these combined means, a solid pool of data is put together for Smart City Wien.

All relevant departments and agencies of the municipal administration and its associated enterprises and organisations are involved in the monitoring process.

In terms of methodology and content, the Smart City monitoring process is synchronised with other monitoring and evaluation processes carried out within the municipal administration, especially the reporting procedure for the UN Sustainable Development Goals and the regular evaluation and review of the Climate Roadmap and Climate Budget.





Index of illustrations

Vienna's remaining carbon budget 16
Our climate has already changed considerably 17
Vienna's Smart City approach: eleven thematic fields 24
Vienna's pathway to net zero 33
Material flows in Austria 35
Comparative innovative capacity of European regions 37
Promotion of energy-efficient, eco-friendly modes of transport 58
The principle behind the circular economy 71
Urban greenery instead of air-conditioning 85
Vienna consumes by far the least land per new-build dwelling unit 91
Half of the municipal territory is green space 93

In-depth sectoral strategies

A regularly updated list of detailed sectoral strategies and specialised programmes with relevance to the Smart City goals can be downloaded from the Smart City Wien website under the following link: https://smartcity.wien.gv.at/en/appendix-smart-city-wien-framework-strategy/

Indicators and data sources

A list of indicators used to evaluate attainment of the Smart City goals and targets can be downloaded from the Smart City Wien website under the following link: https://smartcity.wien.gv.at/en/appendix-smart-city-wien-framework-strategy/

Selected references and further reading

APCC (2014): Austrian Assessment Report on Climate Change (in German)
https://austriaca.at/APCC_AAR2014.pdf

Austrian Federal Chancellery: Sustainable Development – 2030 Agenda 2030/SDGs
https://www.bundeskanzleramt.gv.at/en/topics/sustainable-development-2030-agenda-sdgs.html

Austrian Federal Chancellery (2020): Austria's Voluntary National Review – Report on the Implementation of the Sustainable Development Goals
https://sustainabledevelopment.un.org/content/documents/26511VNR_2020_Austria_Report_English.pdf

Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (2022): Draft for a National Circular Economy Strategy (in German)
https://www.bmk.gv.at/dam/jcr:ccbbe6aa-d0eb-4dbb-ae50-cab89e251cd5/Kreislaufwirtschaftsstrategie_Begutachtungsentwurf.pdf

Federal Ministry for Sustainability and Tourism (2019): Integrated National Energy and Climate Plan for Austria for the Period 2021–2030
https://ec.europa.eu/energy/sites/ener/files/documents/at_final_necp_main_en.pdf

Federal Ministry for Sustainability and Tourism (2017): The Austrian Strategy for Adaptation to Climate Change (Parts 1 & 2)
https://www.bmk.gv.at/dam/jcr:a97fb5f2-85c5-4027-b377-383f80eee354/NAS_Context_2017_en.pdf https://www.bmk.gv.at/dam/bmvitgvat/content/themen/klima/klimaschutz/national/oesterreichische-strategie/NAS_Action_Plan2017_en.pdf

European Commission (2021): Forging a climate-resilient Europe – the new EU Strategy on Adaptation to Climate Change
https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52021DC0082&from=DE

European Commission (2020): A new Circular Economy Action Plan. For a cleaner and more competitive Europe
https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52020DC0098&from=DE

European Commission (2019): 'Fit for 55': delivering the EU's 2030 Climate Target on the way to climate neutrality
https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52021DC0550&from=DE

European Commission (2019): The European Green Deal
https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52019DC0640&from=DE

United Nations Intergovernmental Panel on Climate Change (IPCC): Assessment Reports on climate change, its causes, potential impacts and response options
https://www.ipcc.ch/reports/

Stockholm Resilience Centre: Planetary boundaries
http://www.stockholmresilience.org/research/planetary-boundaries.html

Environment Agency Austria: Environmental impact and emissions reports (incl. Annual Air Emission Inventory) (some available in English)
https://www.umweltbundesamt.at/emiberichte

UN Habitat III (2017): New Urban Agenda
https://unhabitat.org/sites/default/files/2019/05/nua-english.pdf

United Nations (2015): 2030 Agenda for Sustainable Development
https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_70_1_E.pdf

United Nations (2015): Paris Agreement on Climate Change (English version)
https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:22016A1019(01)&from=EN

Wegener Center for Climate and Global Change (2021): Treibhausgasbudget für Österreich auf dem Weg zur Klimaneutralität 2040 ("Austria's greenhouse gas budget on the way to net zero 2040") (in German)
https://wegccloud.uni-graz.at/s/ezopLM6ycRk8Txo



© Stadt Wien / Christian Fürthner