Audits about Climate Change and Climate Change Adaption in the City of Vienna

Edith Knorr-Kranvogel
Department for Environment and Housing
City of Vienna Court of Audit

Renate Mowlam
Department for Buildings, Transport and
Energy
City of Vienna Court of Audit

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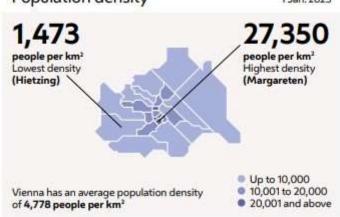
Basic information about Vienna

Population

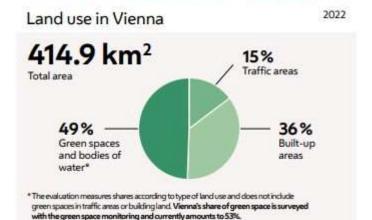


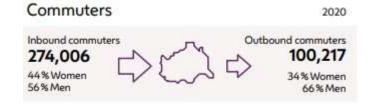
Population density

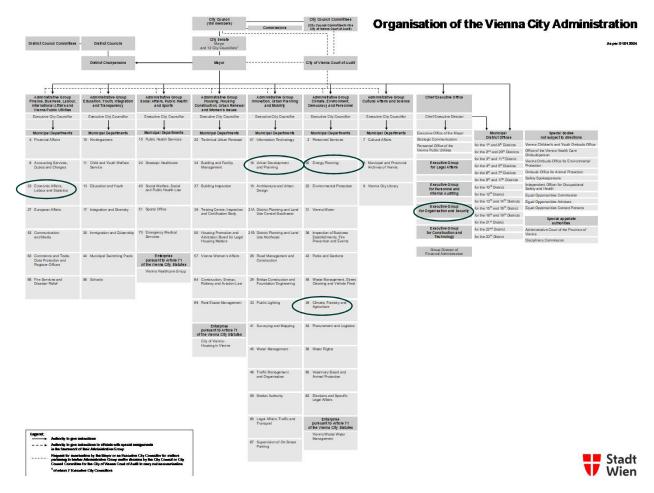
1 Jan. 2023



Urban area & climate







Climate Protection Programs (KLiP) 1999-2021

1999-2009 KLiP 1 with 36 programs and 241 individual measures:

District heating, electricity generation, housing, city administration and mobility

2010-2020 KLiP 2 in 5 fields of action:

Energy supply, use of energy, mobility and town-structure, nature conservation, public relations

Outcome:

39 % decrease of per capita GHG emissions in 2019 compared to 1990

Climate Package: Government Agreement 2020

Vienna will be climate-neutral by 2040

Strategies

- Climate targets
- Greenhouse gas reduction targets by sector
- Expansion targets for renewable energy and increased efficiency

Tools

- Climate budget and greenhouse gas budget
- Climate checks for projects
- Monitoring and evaluation

Governance

- Political steering committee
- Climate Council
- Responsibility of all administrative groups

Focus

- 1. Responsibilities in climate protection agendas
- 2. Development of Smart City Vienna Framework Strategy
- 3. Accounting and presentation of Vienna's greenhouse gas emissions
- 4. Measurability and Governance
- 5. Climate councils way of working
- 6. Development of climate budgeting

Recommendations 1

- Create a centralized management position for climate protection activities
- Develop human resources and competences in the fields of evaluation and assessment of climate protection measures and GHG savings
- Climate Council: consult additional experts on a case-by-case basis

Climate Matters

Division Head of Staff with expertise in environmental management and accounting

Extension of Climate Network and **Climate Council**



Vienna Climate Network



- 93 staff members
- All departments and municipal companies
- Working on climate action plan and climate budget

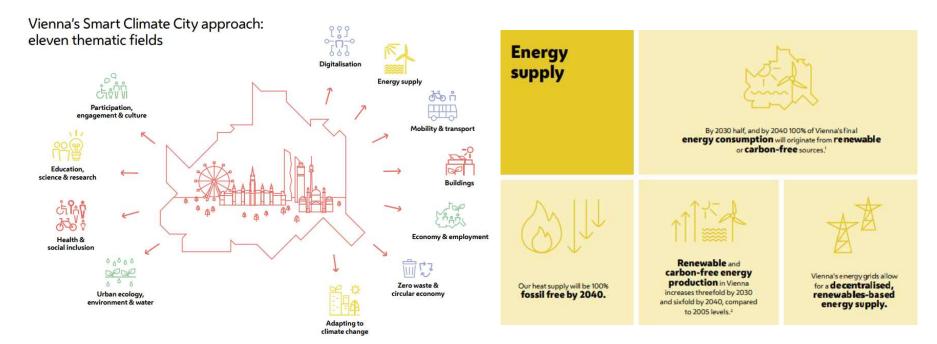
Recommendations 2

- Evaluate existing climate protection measures
- Formulate strategic goals in concrete, clear and operational terms using suitable indicators
- Focus GHG emissions which can be influenced by the City of Vienna
- Include absolute, aggregated and total CO₂ emissions in the assessment

Smart Climate City Strategy Vienna

Vienna Climate Guide

Smart Climate City Strategy Vienna (2022)



Smart Climate City Strategy Vienna (2022)

Mobility & transport

The volume of traffic crossing the municipal boundaries falls by

by 2030.3

Per capita CO, emissions in the transport sector fall by

50% by 3030

and 100% by 2040.4

traffic within the

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

by 2030.5

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

and to well over 85% by 2050.6

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

Per capita final energy consumption in the transport sector falls by

40% by 2030

and 70% by 2040.7

Commercial municipal boundaries is largely CO, free by 2030.

Private motor vehicle ownership falls to

vehicles per 1,000

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

Buildings



much solar power as possible.

Circular planning and

construction to maximise conservation of resources is standard from 2030 in newbuild and refurbishment projects.

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

> % by 2030 and 30% by 2040.8

The associated per capita CO, emissions fall by

55% by 2030 and to zero by 2040.9

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.

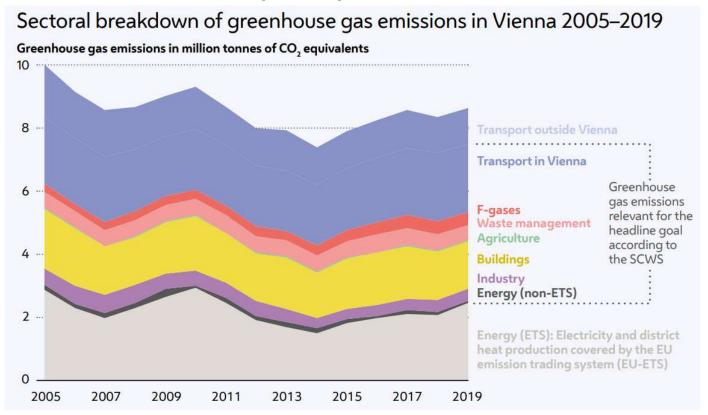
Developers' competitions in the subsidised housing sector drive social innovations and new solutions for mitigating and adapting to climate change - especially greening measures.

By 2040, at least

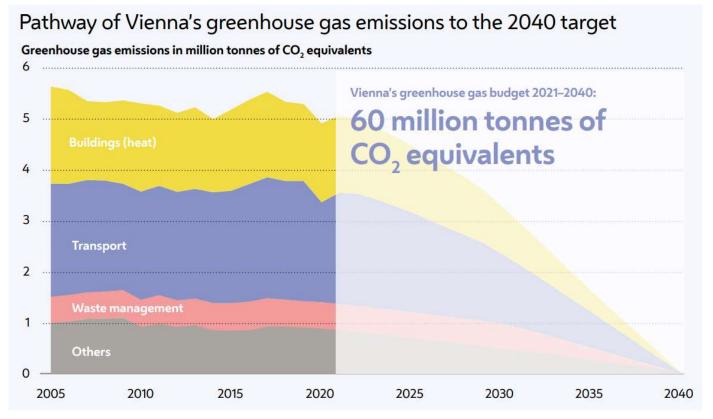
products and materials recovered from demolitions and major refurbishment projects are reused.



Vienna Climate Guide (2022)



Headline goal of climate neutrality by 2040



Recommendations 3

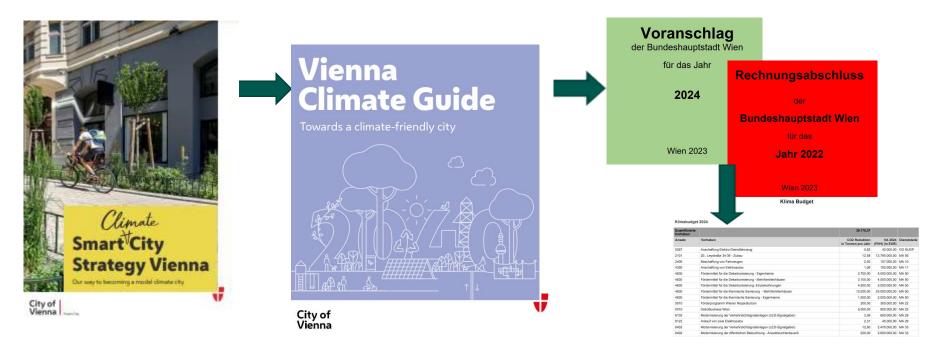
- Draw up a GHG balance for Vienna based on the approach of the Greenhouse Gas Protocol
- Create a programme of measures subdivided into annual packages
- Ensure that climate protection measures are presented in greater detail in future financial statements and clarify the quality assurance of climate budget
- Commission a basline study of assessment methods with regard to climate relevant measures







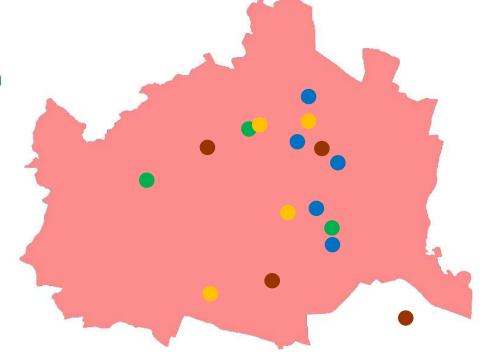
Viennese way: How to put it into practice.....



Audit: Climate protection in the district heating supply, Wien Energie (2023)

Waste incineration plants (CHP)

Exhaust heat



COGAS;
Biomass power plant;
Heat pumps;
Biogas

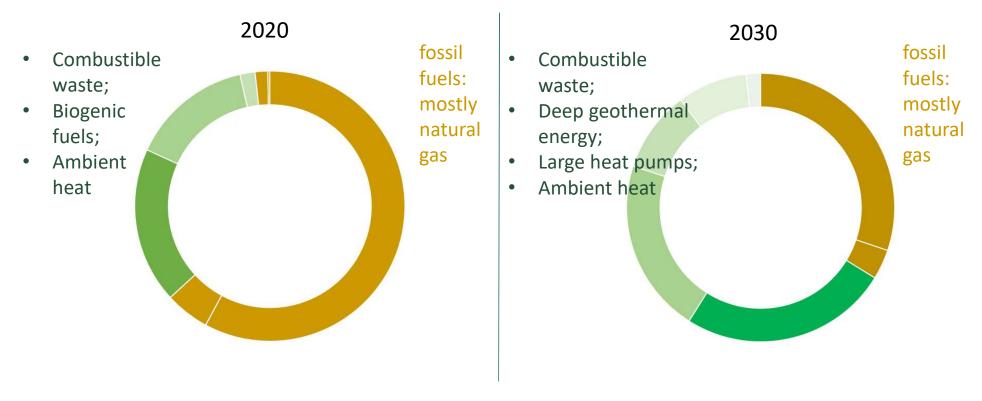
District heating plants

Audit: Climate protection in the district heating supply

Large heat pump in Vienna (sewage treatment plant)



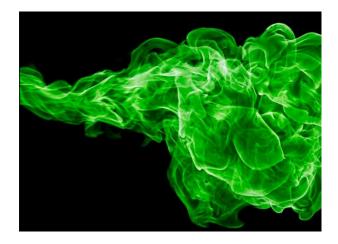
Energy sources of the district heating in Vienna



Audit: Climate protection in the district heating supply

Main recommendation

 A concept for the production and procurement of green gas (hydrogen, synthetic methane and biomethane) should be drawn up and updated in line with technological developments.



Audit: Summer suitability of educational buildings (2019 and 2021)

3 primary and secondary schools







• 3 nursery schools









Audit: Summer suitability of educational buildings

Indoor air quality

- Exhaling -> CO₂
- Excessive CO₂ concentration in the room air: headaches, nausea...
- People generally lose their sense of well-being when the air temperature

exceeds 27 °C.

-> Ventilating



What influences the room temperature in summer?

- Orientation, size and quality of the windows,
- Effective storage mass (concrete, lightweight timber construction, etc.)
- external sun shading
- Room ventilation, especially night ventilation
- Number of people in the room



educational buildings







Audit: Summer suitability of educational buildings

Summer suitability: recommendations

- Building physics calculation of the summer suitability: Take into account the number of people in the room
- Consider the air quality to be achieved (max. CO₂ concentrations)
- Reconsider the general ban on the installation of air conditioning systems.
 Include renewable energy
- Windows in all rooms that are exposed to direct sunlight should be fitted with external blinds



Audit: Summer suitability of educational buildings

Positive findings

Secondary school: Refurbished old building, night ventilation

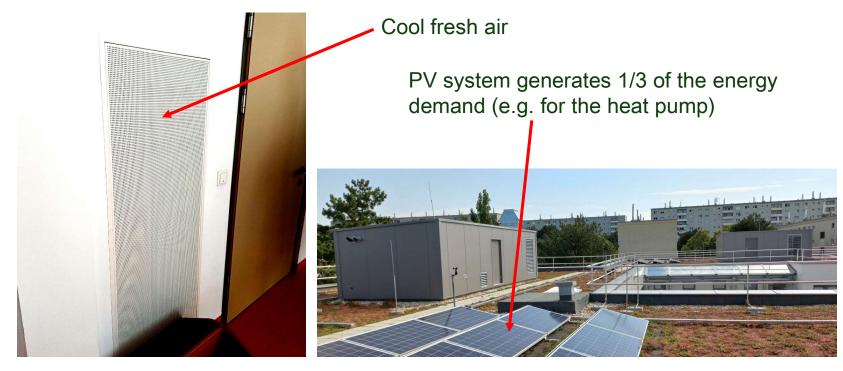






Positive findings

Nursery school: room ventilation and cooling, air source heat pump



Audit: Young tree care, Vienna's Municipal Housing (2023)



- ~ 200,000 flats
- ~ 68,500 trees

Water demand

- approx. 100 liters per week
- Watering bag



Digital tree register

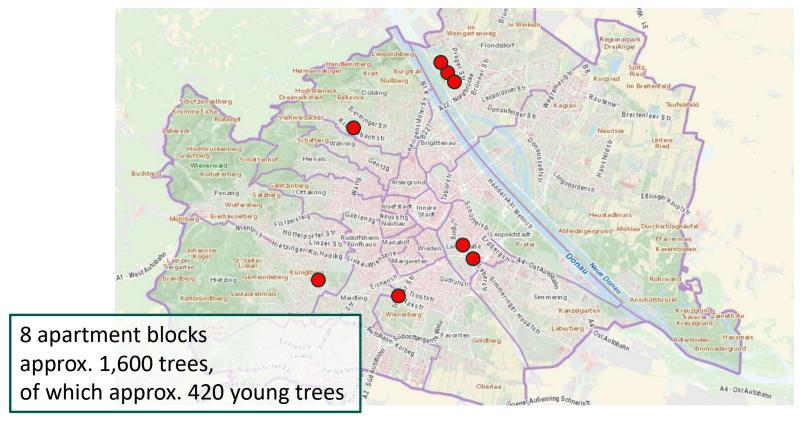
Transponder fixed to the tree





Audit: Young tree care, Vienna's Municipal Housing

Samples

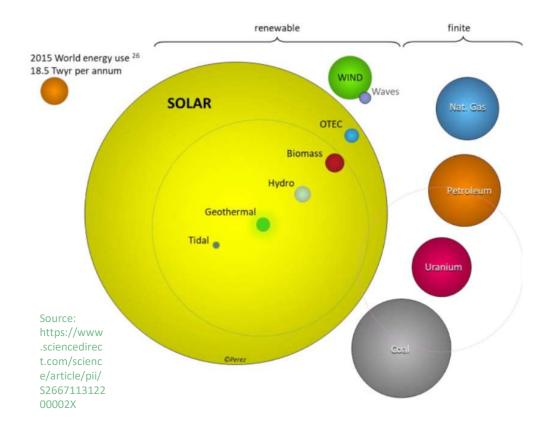


Audit: Young tree care, Vienna's Municipal Housing

Findings and recommendations

- The exchange of dried up young trees was cheaper for the companies commissioned with the watering than adequate watering.
- 39% of the young trees died within 2 years and had to be "replaced"
- Performance checks of the companies!
- Evaluate contractual penalties and compensation if trees die





Edith Knorr-Kranvogel Department for Environment and Housing City of Vienna Court of Audit edith.knorr-kranvogel@wien.gv.at

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