

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

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STADTRECHNUNGSHOF  
WIEN



# Basic information about Vienna

## Population

Who lives in Vienna?

1 Jan. 2023

Population

**1,982,097**



Women  
**51.1%**



Men  
**48.9%**

Population density

1 Jan. 2023

**1,473**  
people per km<sup>2</sup>  
Lowest density  
(Hietzing)

**27,350**  
people per km<sup>2</sup>  
Highest density  
(Margareten)



Vienna has an average population density  
of **4,778 people per km<sup>2</sup>**

- Up to 10,000
- 10,001 to 20,000
- 20,001 and above

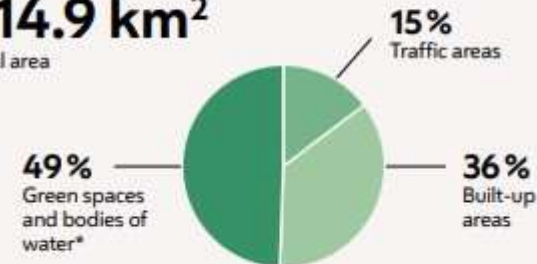
## Urban area & climate

Land use in Vienna

2022

**414.9 km<sup>2</sup>**

Total area



\* The evaluation measures shares according to type of land use and does not include green spaces in traffic areas or building land. Vienna's share of green space is surveyed with the green space monitoring and currently amounts to 53%.

Commuters

2020

Inbound commuters

**274,006**

44 % Women  
56 % Men

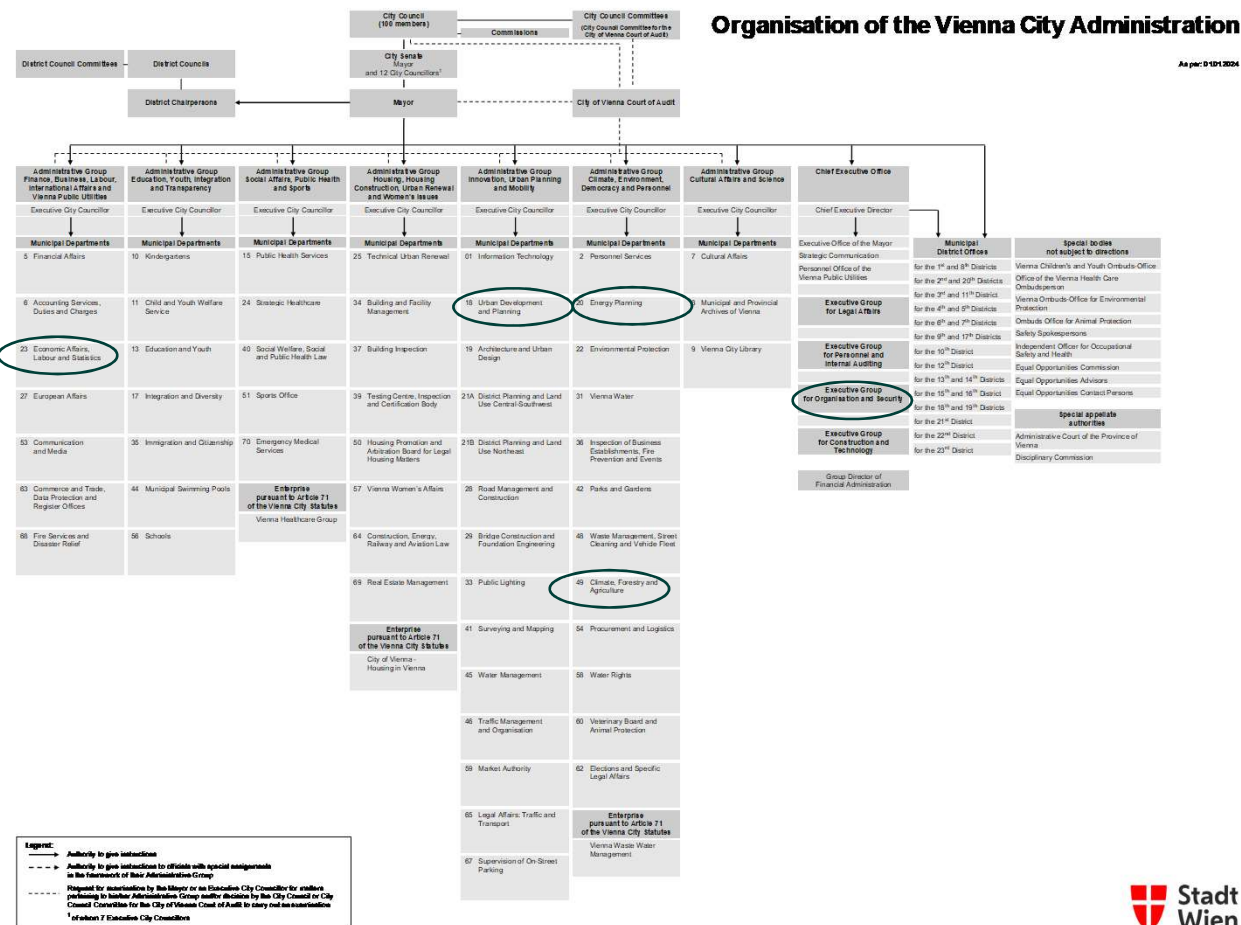


Outbound commuters

**100,217**

34 % Women  
66 % Men





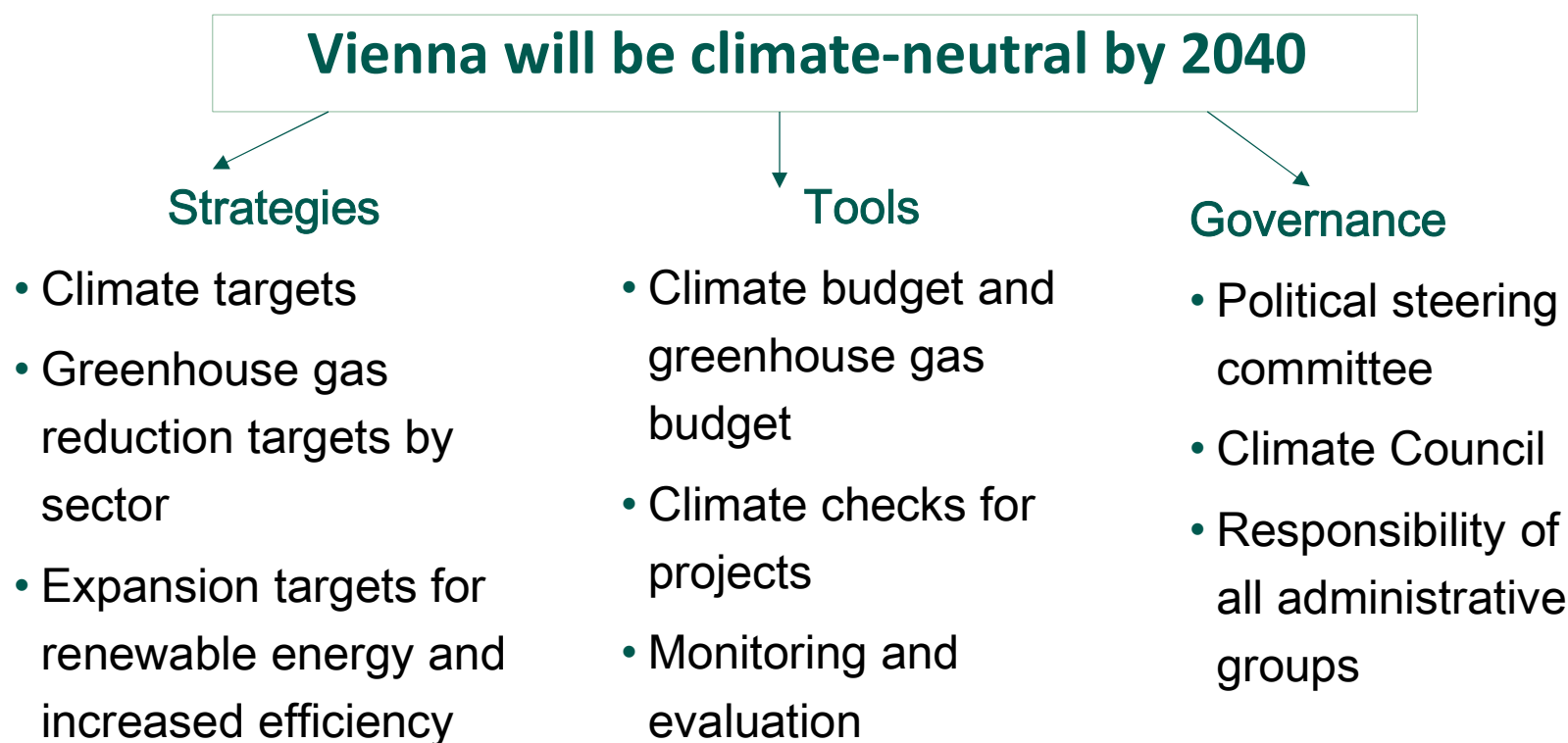
# Climate Protection Programs (KLiP) 1999-2021

- 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



# Audit: Basis for climate protection targets and measures in the City of Vienna (2021)

## 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

↓  
**Division Head of  
Climate Matters**

↓  
**Staff with expertise  
in environmental  
management and  
accounting**

↓  
**Extension of  
Climate Network and  
Climate Council**





Audit: Basis for climate protection targets and measures in the City of Vienna (2021)

## 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 CO<sub>2</sub> emissions in the assessment

↓

**Smart Climate City  
Strategy Vienna**

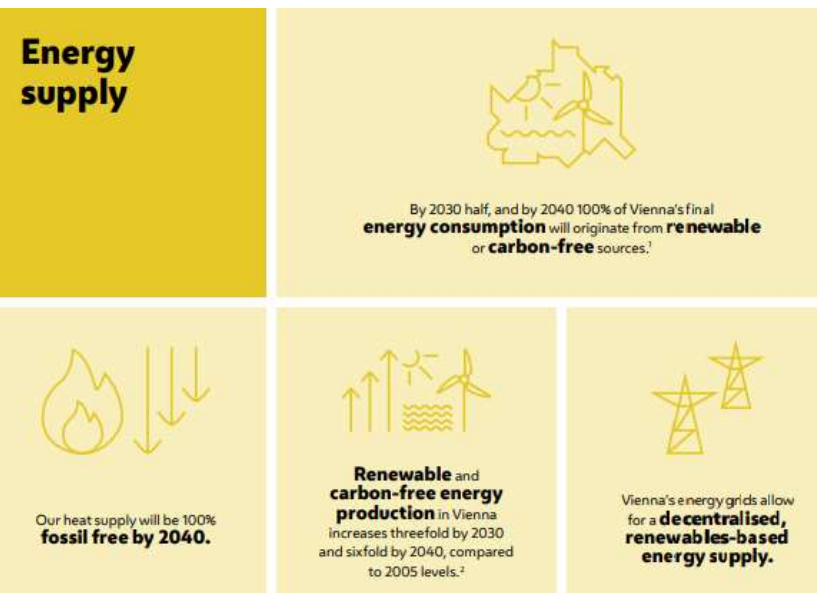
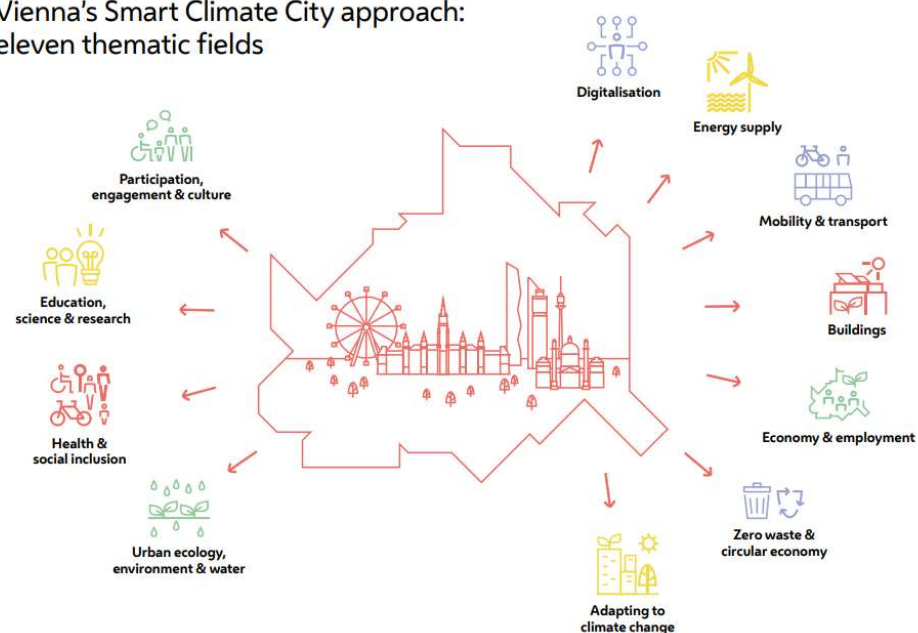
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**Vienna Climate  
Guide**



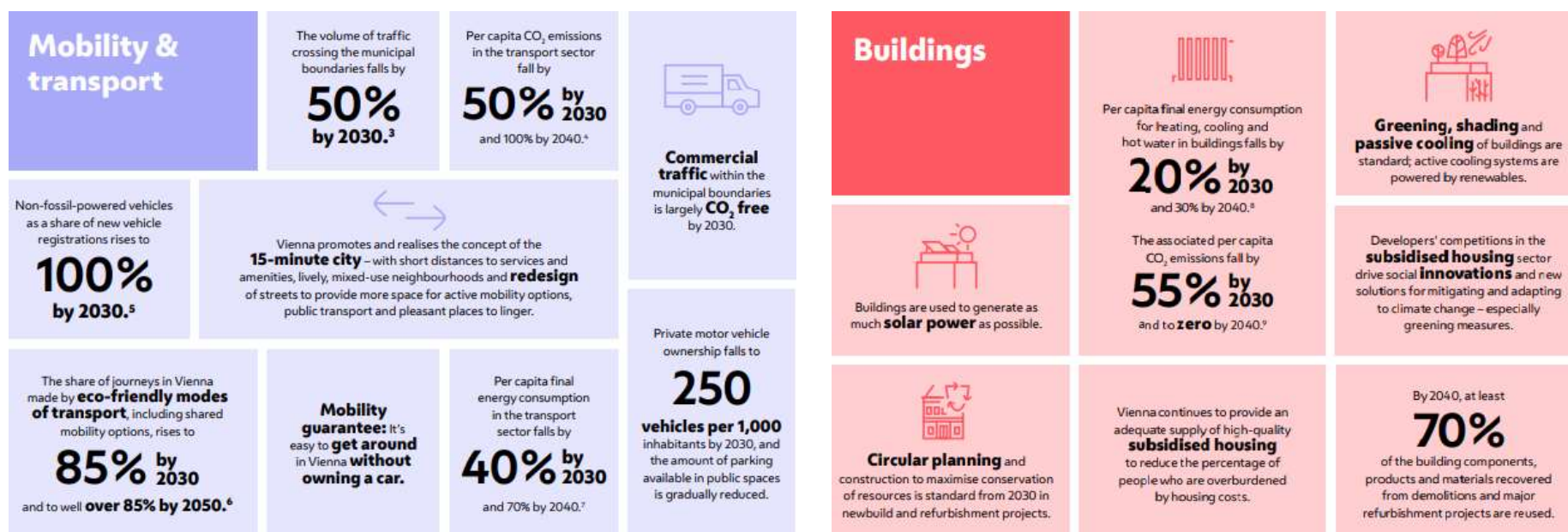
## Smart Climate City Strategy Vienna (2022)

Vienna's Smart Climate City approach:  
eleven thematic fields

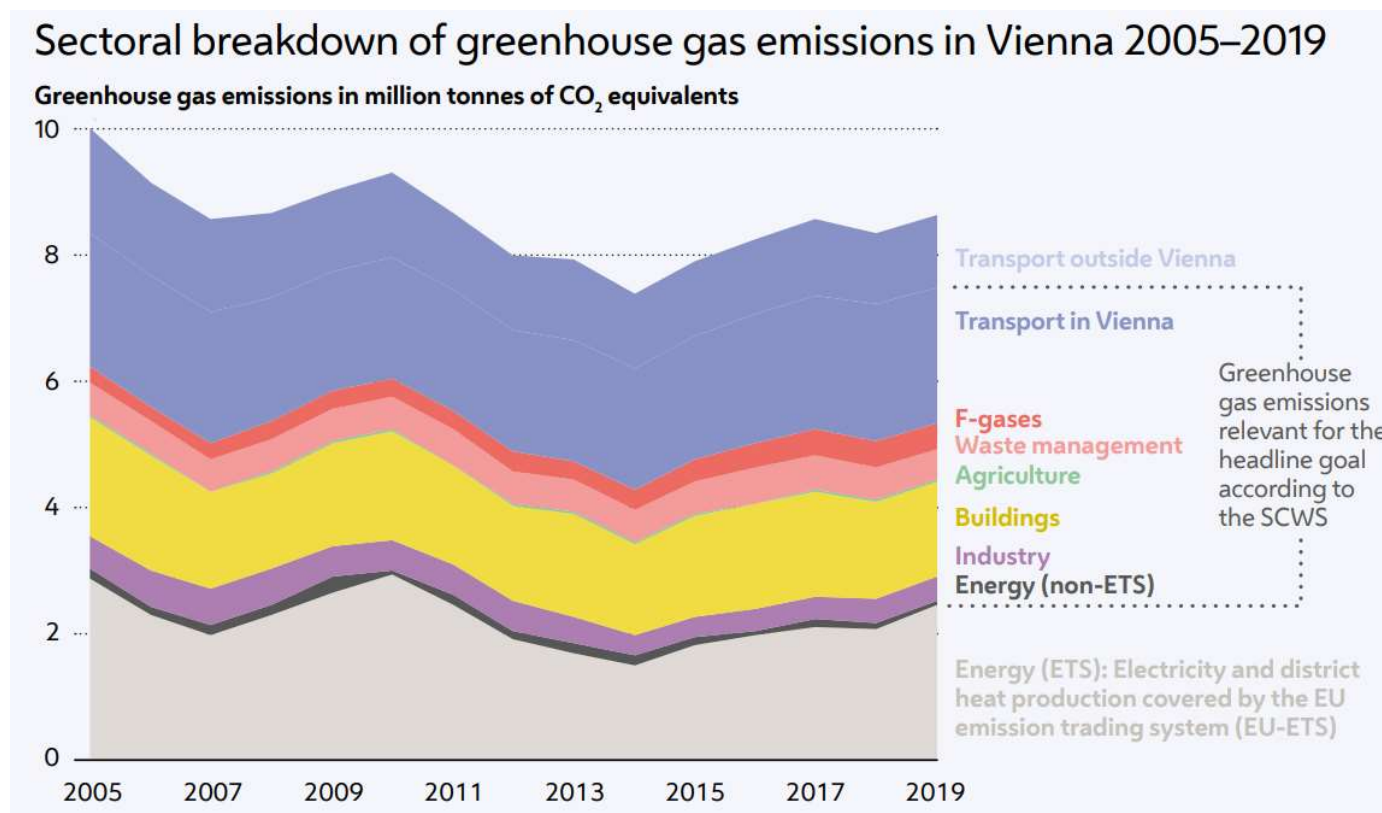


## Audit: Basis for climate protection targets and measures in the City of Vienna (2021)

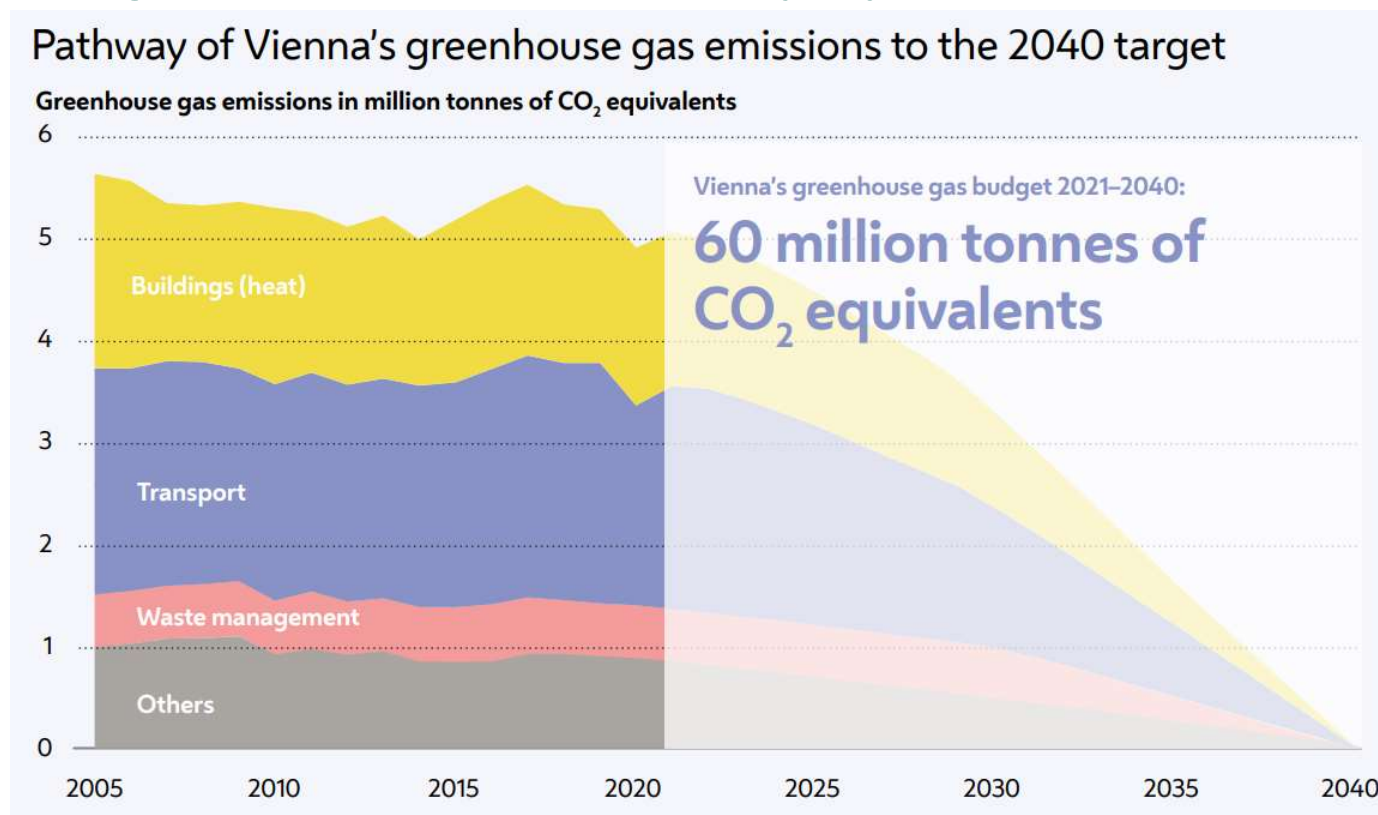
# Smart Climate City Strategy Vienna (2022)



## 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 baseline study of assessment methods with regard to climate relevant measures



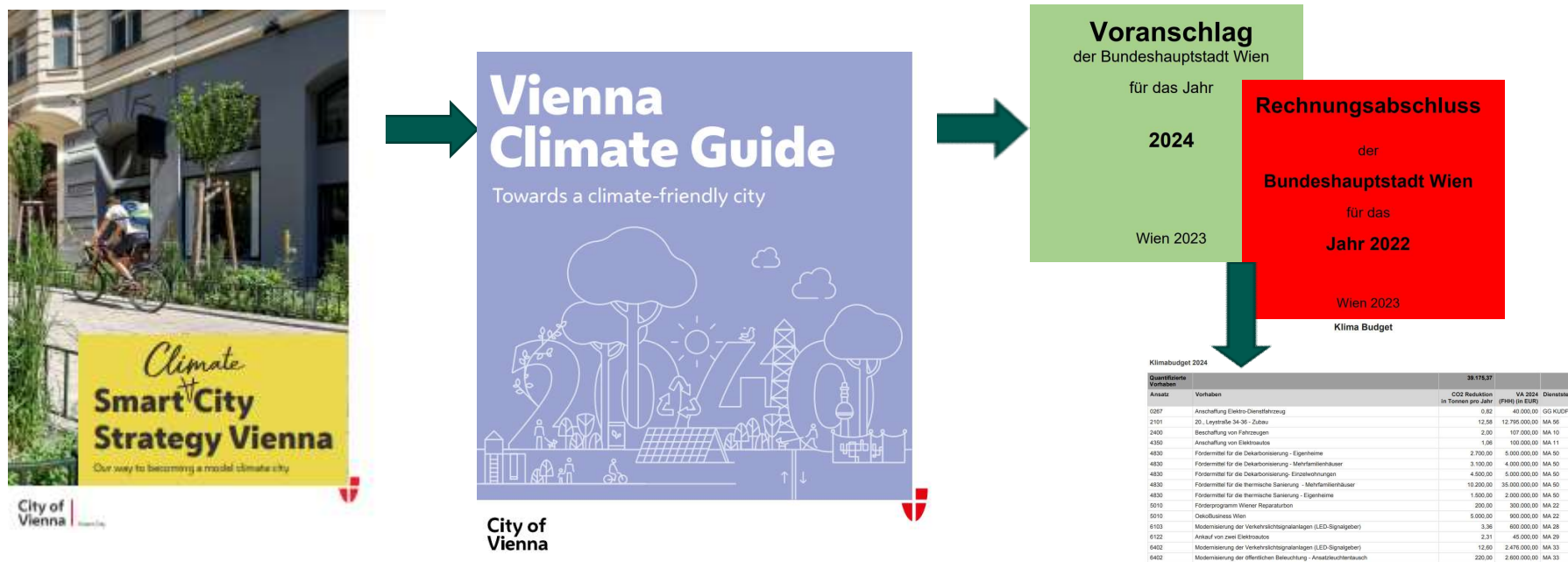
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**Work in progress**





## Audit: Basis for climate protection targets and measures in the City of Vienna (2021)

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

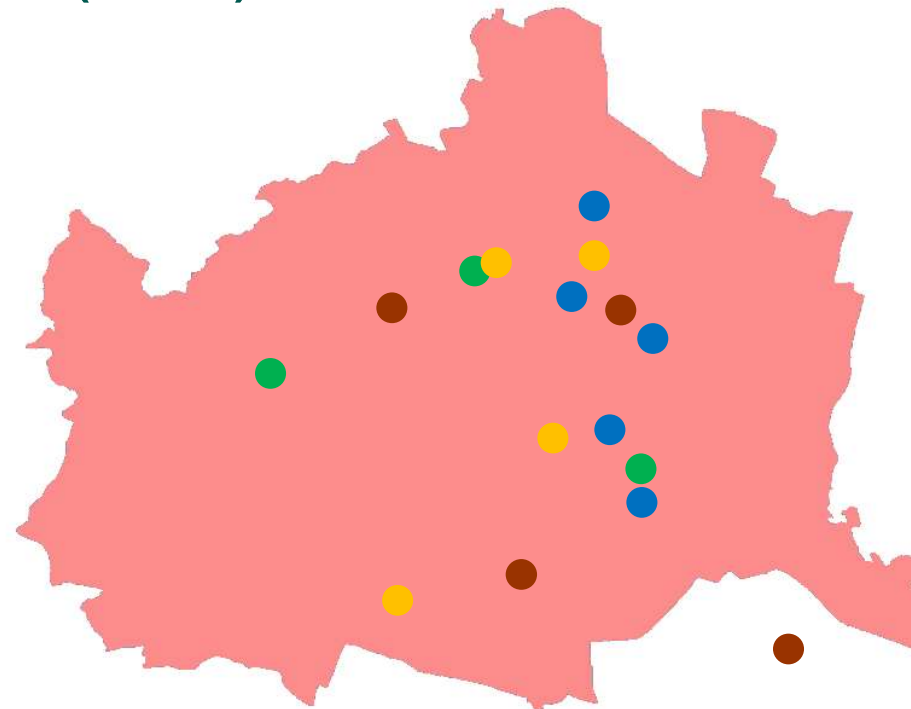




# Audit: Climate protection in the district heating supply, Wien Energie (2023)

Waste incineration  
plants (CHP)

Exhaust heat



COGAS;  
Biomass power plant;  
Heat pumps;  
Biogas

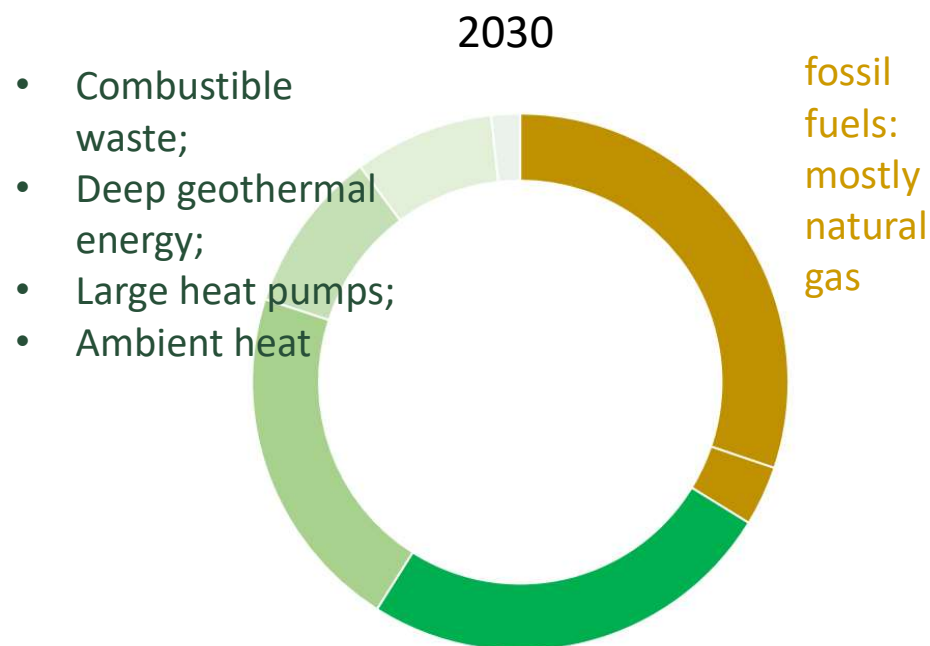
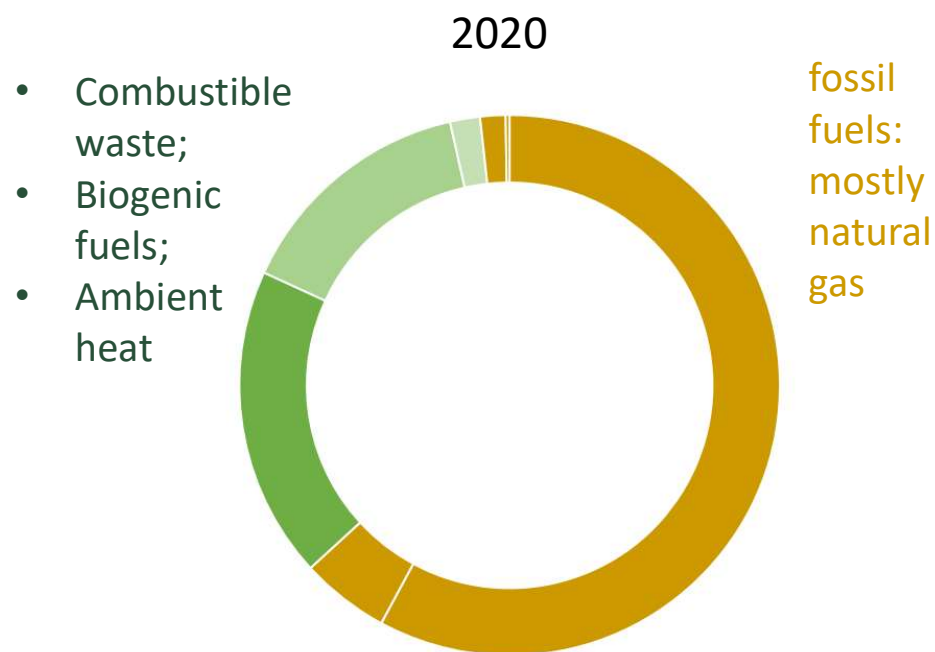
District heating  
plants

Audit: Climate protection in the district heating supply

## Large heat pump in Vienna (sewage treatment plant)

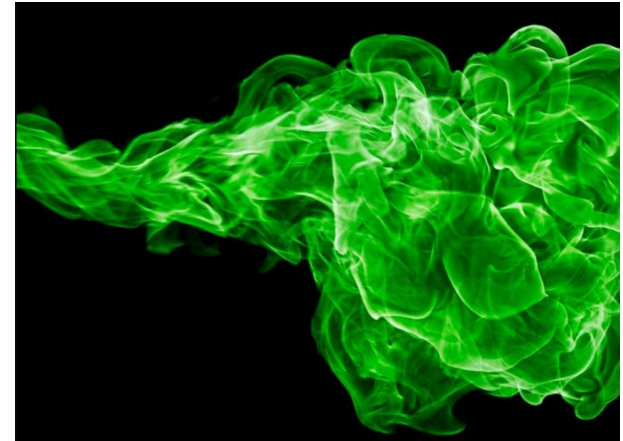


## Energy sources of the district heating in Vienna



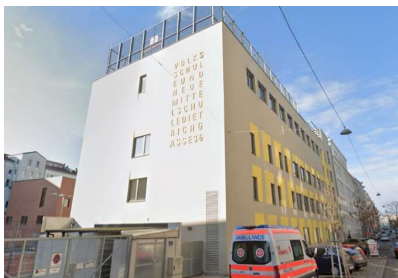
## Main recommendation

- 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



## Indoor air quality

- Exhaling → CO<sub>2</sub>
- Excessive CO<sub>2</sub> 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

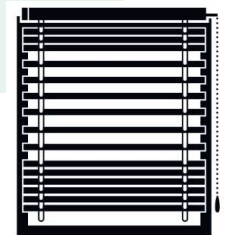
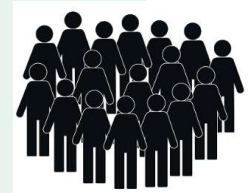
**educational buildings**





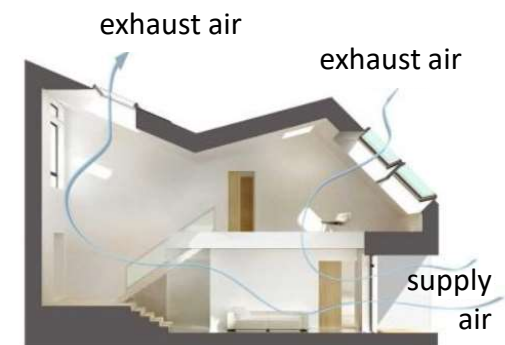
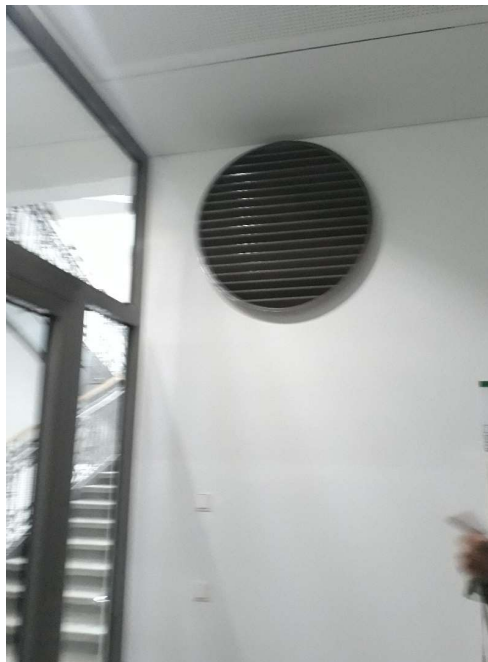
## Summer suitability: recommendations

- **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. CO<sub>2</sub> 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**



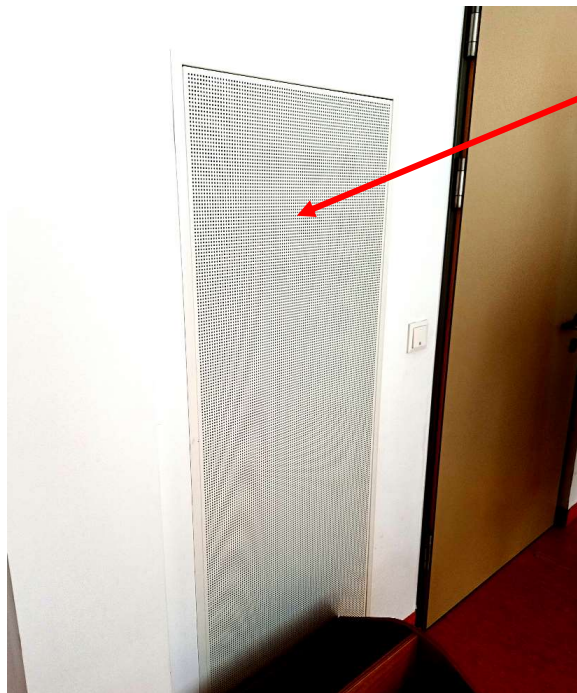
## Positive findings

Secondary school: Refurbished old building, night ventilation



## Positive findings

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



Cool fresh air

PV system generates 1/3 of the energy demand (e.g. for the 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



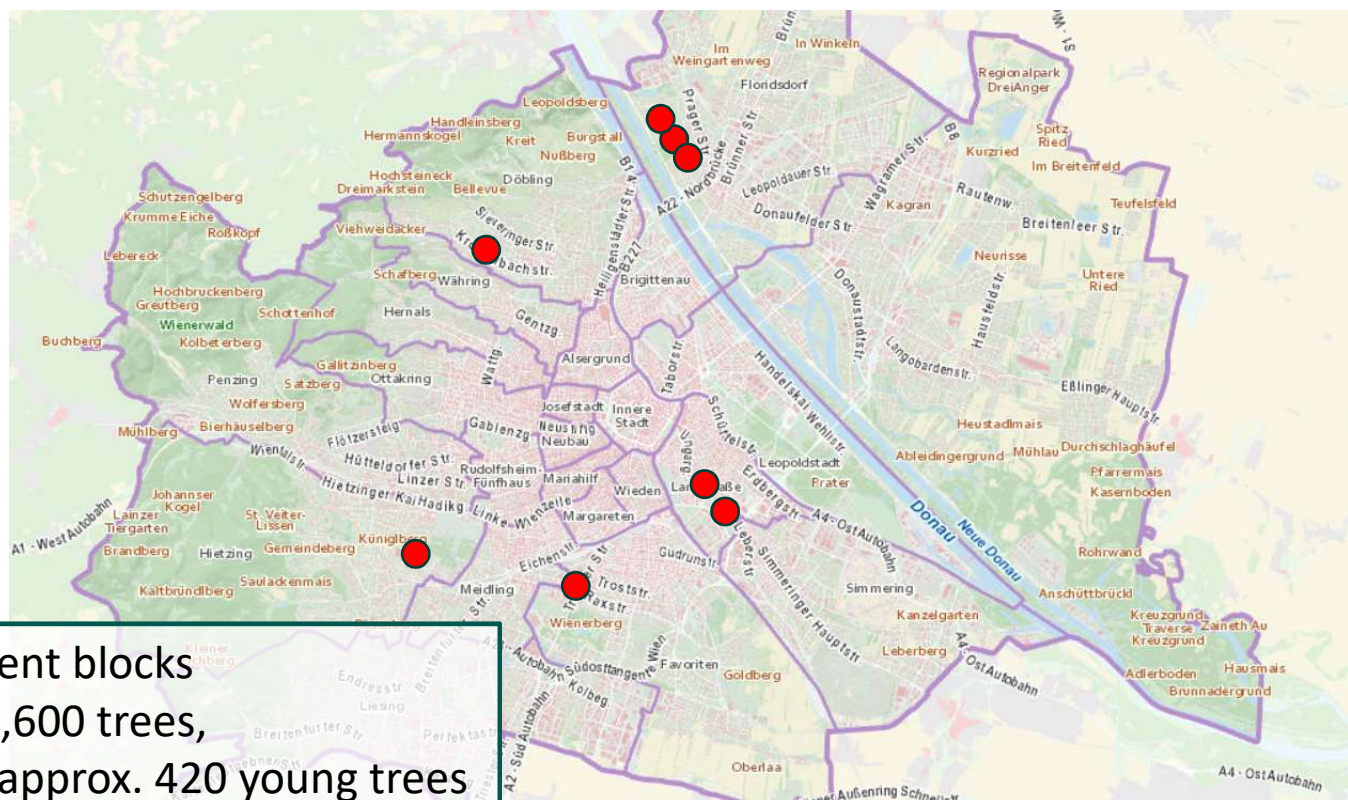
## Digital tree register

- Transponder fixed to the tree





## Audit: Young tree care, Vienna's Municipal Housing Samples



8 apartment blocks  
approx. 1,600 trees,  
of which approx. 420 young trees

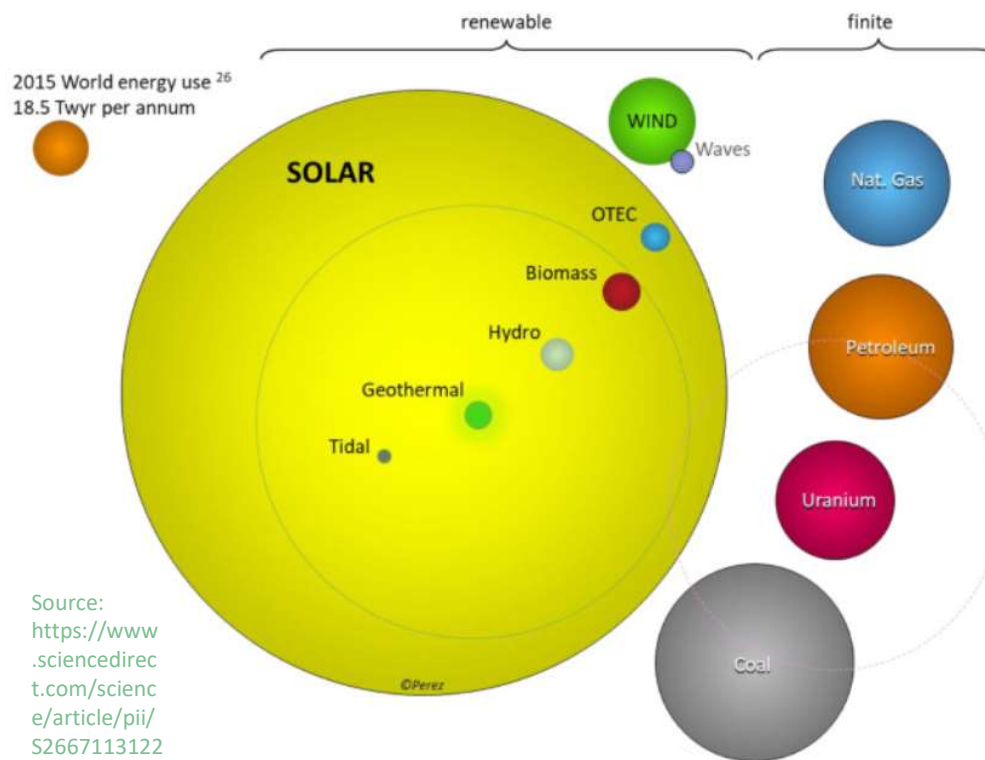


## Findings and recommendations

- 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







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