Towards Carbon Neutral Cities

Michael Sattler

Deputy Head of the Executive Office of the Co-ordination of Climate Protection Measures

KLIP WIEN

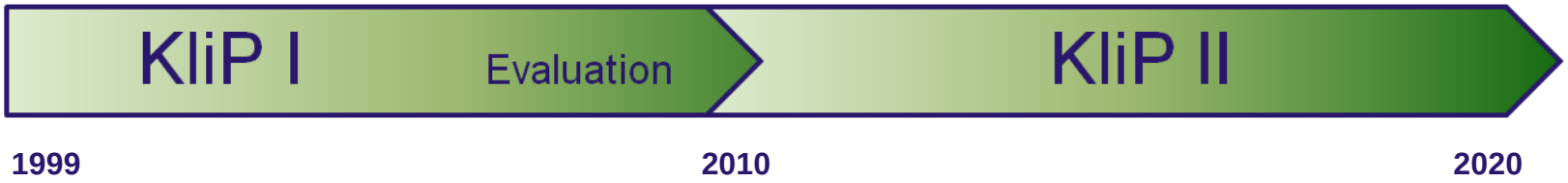
StaDt Wien

Wien ist anders.

Milestones in the Policy of Climate Protection in Vienna

KLIMASCHUTZPROGRAMM WIEN

- 1969 Founding of Fernwärme Wien
- 1991 Accession of the Climate Alliance
- 1996 Commitment of the Aalborg Charter
- **1999 KliP I** was adopted by the Vienna City Council
- 2008/2009 Evaluation of KliP I by the Austrian Energy Agency
- **2009 KliP II** as the update of KliP I, agreed upon by the City Council of Vienna



The Goal of KliP II

Reduction in greenhouse gas emissions by the year 2020

- **minus 21%** greenhouse gas emissions per capita by the year 2020 compared to 1990
- prevention of furthermore **1.4 million** tons of greenhouse gases
- 1990 – 2020: Prevention of **4.5 million tons per year** of greenhouse gas emissions total.

The measures target areas that can be **influenced directly** by the City of Vienna.

The Results of the Evaluation (1/2)

From 1999 to 2015 due to the implementation of the measures of the KliP

- ✓ **3.81 million** tons of CO_2 per year have been **avoided,**
- ✓ **33 billion** euros **investment volume** has been triggered,
- ✓ **31 billion** euros **value added effect** has been achieved,
- ✓ app. **53.000 jobs** were secured.

The Results of the Evaluation (2/2)

Main factors for success:

- ✓ massive expansion of **district heating**
- ✓ **thermal rehabilitation** of residential buildings
- ✓ **strict energy standards** for new buildings
- ✓ forceful promotion of a **combination of public transport, walking and cycling**
- ✓ the constantly increasing use of **renewable energy sources**

Main challenges:

- ➢ massive improvement in the **efficiency of final energy use**
- ➢ significant i**ncrease in the share of renewable energy sources** within the total final energy mix
- ➢ **reduction in traffic emissions** via city and transportation planning and technical measures

The Most Important Measures (1/2)

- **Increasing the share of district heating to 50%**
  - continuous development plans of „Wien Energie District Heating“
  - expansion of heating network
  - increasing energy efficiency
  - use of renewable energy

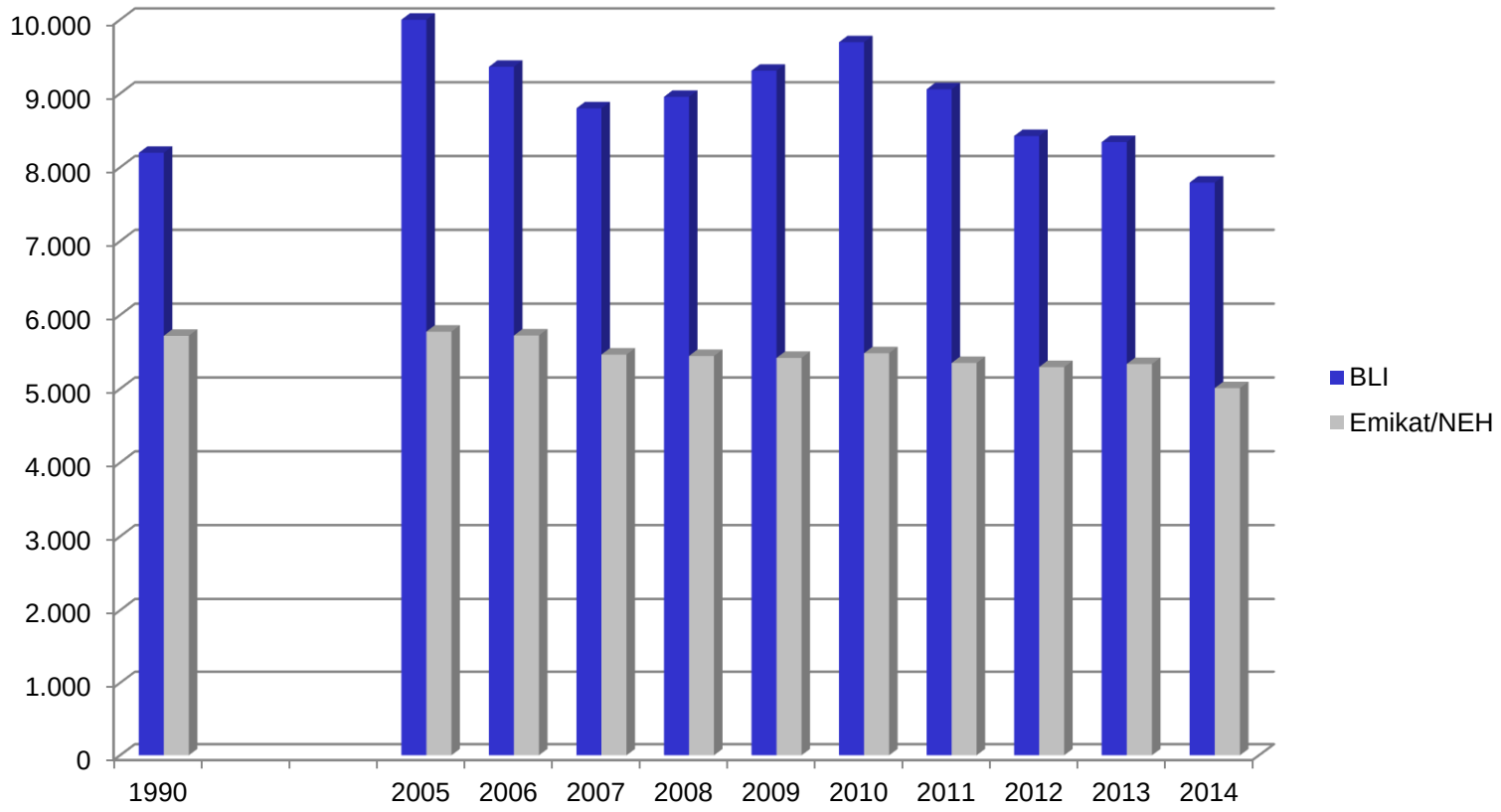
- **Further promotion of thermal rehabilitaton of residential buildings**
  - adoption of subsidy guidelines (Thewosan)
  - adaptation of the statutory provisions (e.g.: building code)

The Most Important Measures (2/2)

- **Expansion of public transportation, reduction of passenger car traffic**
  - promotion of public transport, bicycles and walking
  - particular attention paid to bicycle use and walking
  - advances in automative technology and accompanying measures
- **More than doubling of the amount of final energy produced by renewables compared to 1990**
  - make use of the different kind of renewables within the urban area as well as outside
- **Creation of a plan for the secure supply of energy**
  - energy efficiency and renewables are of utmost importance when compiling this plan

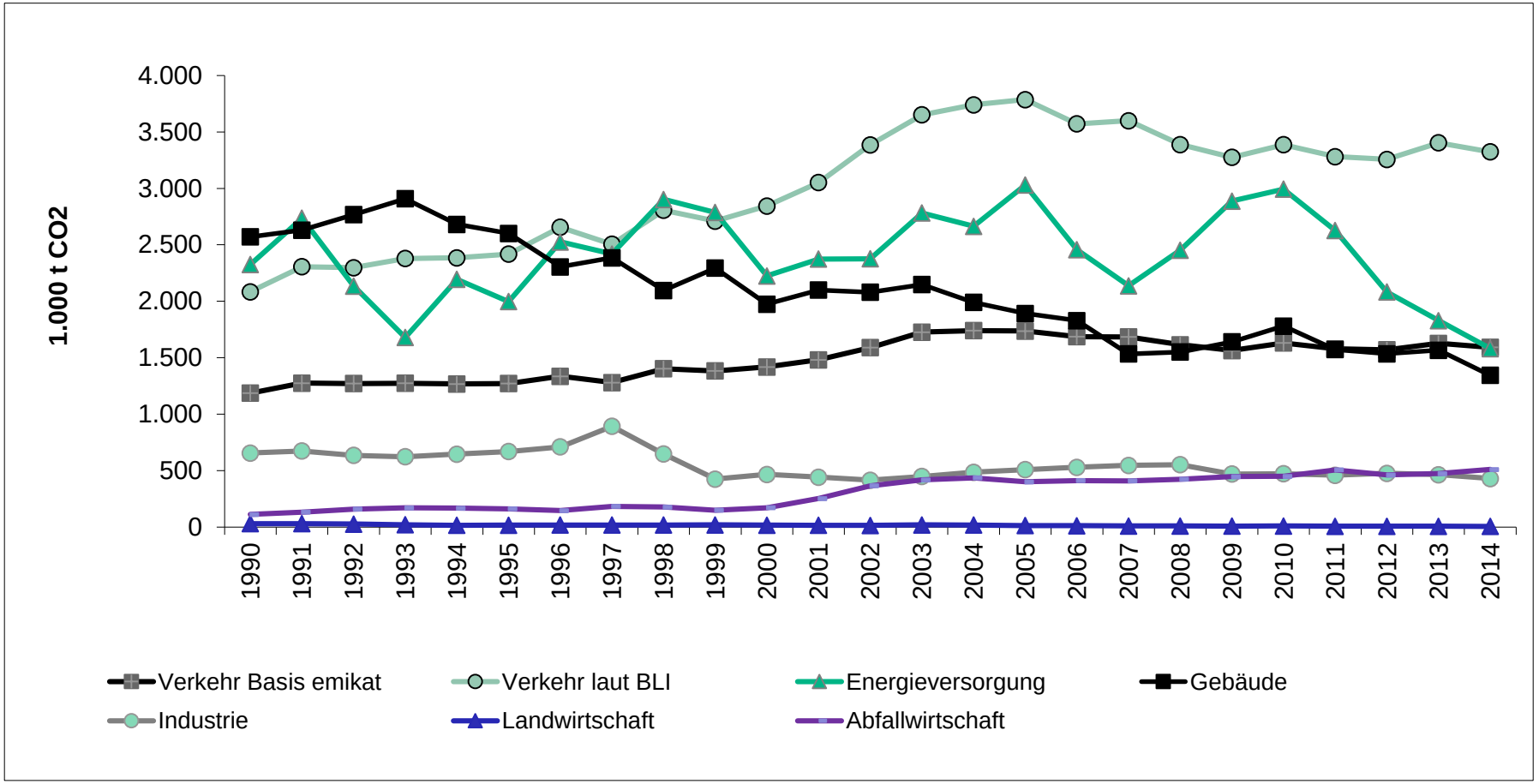
Vienna and Climate Protection

Greenhouse Gas Balance 1990, 2005- 2014 of Vienna



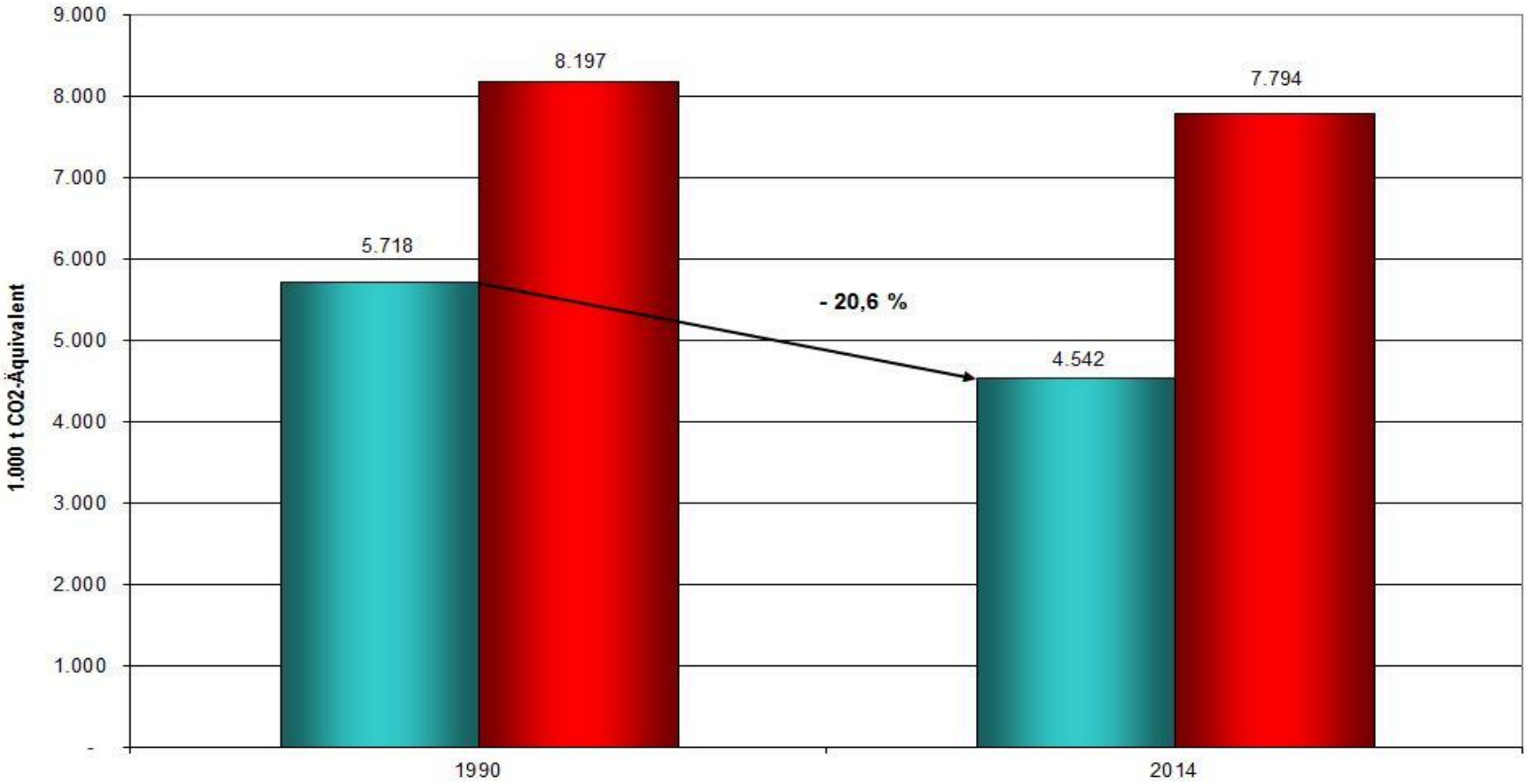
Vienna and Climate Protection

Greenhouse Gas Balance 1990- 2014 of Vienna



Vienna and Climate Protection

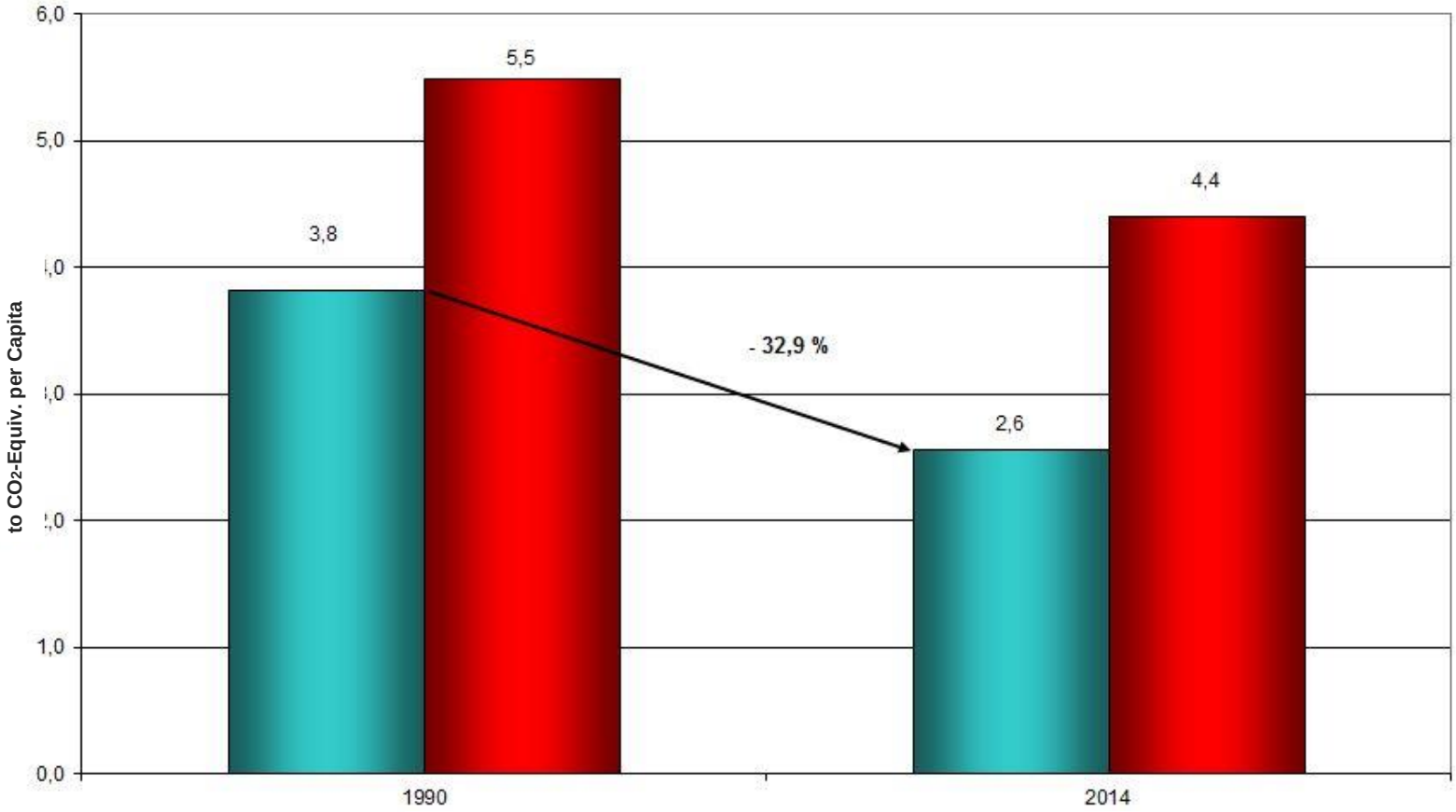
Greenhouse Gases
Influenceable by Vienna´s Measures



Vienna´s Emission Development 1990–2012 per capita, based upon Emikat (without ET-companies) and BLI

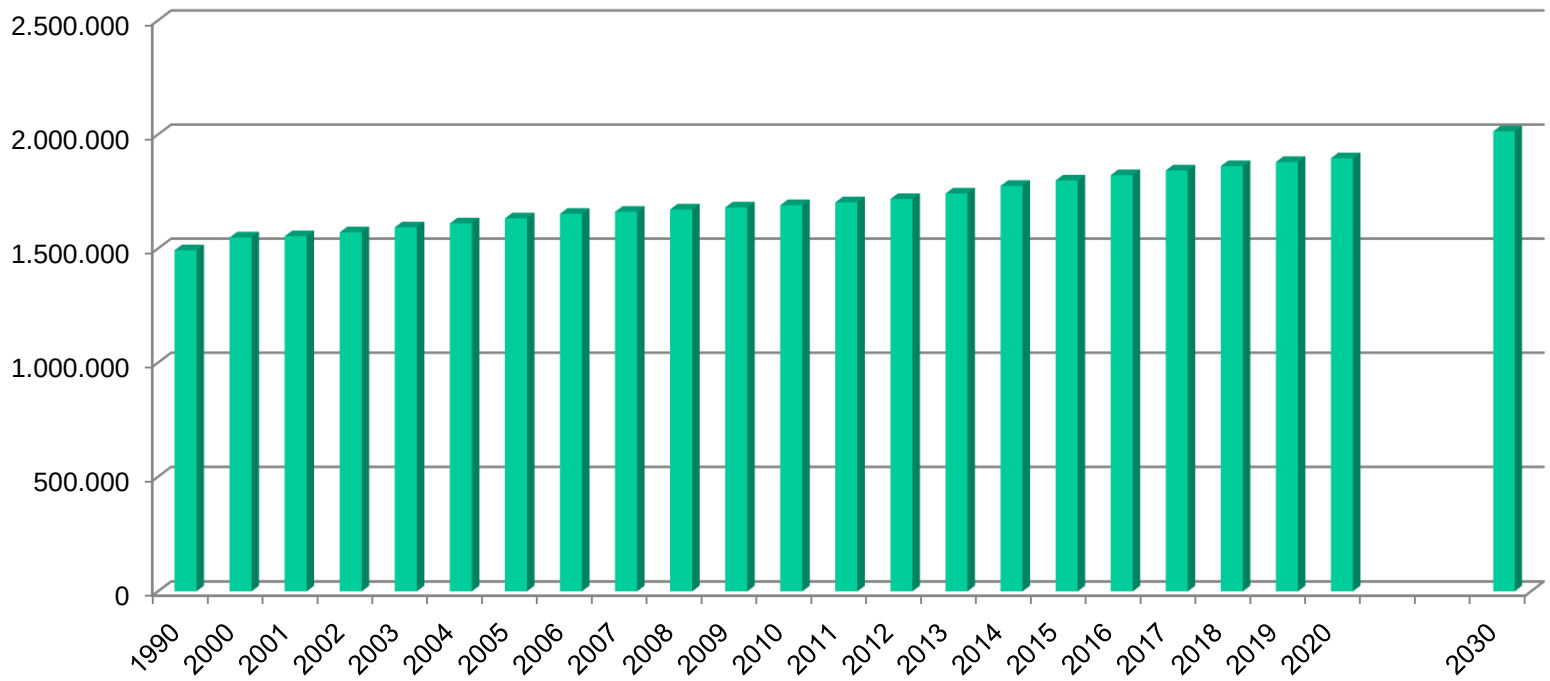
Vienna and Climate Protection

Greenhouse Gases Influenceable by Vienna´s Measures

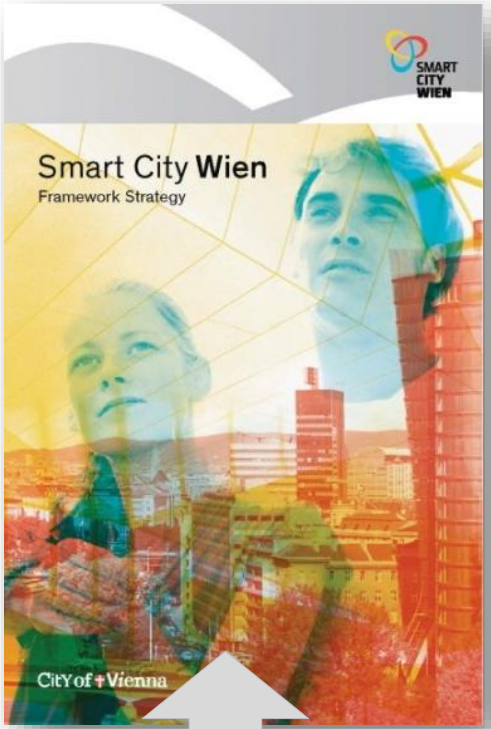


Vienna´s Emission Development 1990–2012 per capita, based upon Emikat (without ET-companies) and BLI

Demographic Development



In 2011, Vienna started to develop the Smart City Wien Framework Strategy



The Smart City Wien **framework strategy** creates a structuring framework for numerous sectoral plans, programmes and strategies by the City of Vienna.

3 Dimensions of Smart City Wien

Quality of life

Social Inclusion

Participation

Healthcare

Environment

Resources

Energy

Mobility

Infrastructure

Buildings

Innovation

Education

Economy

Research, Technology and Innovation (RTI)

Long-term objectives for Vienna

Overview of Selected Objectives

- Reduction of CO2 emissions to 1 tonne per capita.
  (- 80% CO2 from 1990 to 2050)
- By 2050: 50% of Vienna's gross energy consumption will originate from renewable sources. Primary energy input should drop from 3,000 to 2,000 watt per capita.
- Reduction of energy consumption of existing buildings for space heating/cooling/water heating by 1% per capita and year.
- Decrease of motorized individual traffic (MIT) from currently 28% to 15% by 2030. By 2050 all vehicles within the municipal boundaries run without conventional propulsion technologies.
- The share of green spaces will remain at over 50%.
- All people in Vienna should enjoy good neighbourly and safe life conditions irrespective of their background, physical and psychological condition, sexual orientation and gender identity. Safeguarding of medical care at the highest level.

Smart City Wien – a summary

- **Smart City Wien understands urban life as a social and secondary as a technical and logistic challenge. For Vienna, „smart“ also means social inclusion.**
- **Smart City Wien is building strong partnerships between the city, the research sector and the industrial sector via a stakeholder process.**
- **Smart City Wien requires a holistic approach. To think on a district, local, national and European level.**

Project Vienna Central Station

- **Key Factors:**
  - **2004 Masterplan „Vienna Central Station“ was enacted**
  - **an urban district of 110 ha shall be newly constructed until 2020**
  - **not only an traffic site with interconnection of railway, pedestrians, bikes, public transport**
  - **also use of renewable energy sources, district heating and cooling**
  - **modern social housing, parks, recreation zones and 20.000 workplaces**

District cooling

- Cooling capacity: 20MW (25MW in final state of expansion)
- This equals the power of 125,000 household refrigerators
- Cooling provided for 400,000 sqm office space
- Rejected heat is used to power absorbtion chillers
- Reduction of CO2 emissions by 64% compared to conventional air conditioning
- Heating capacity 79 MW
- Approximately 5,000 households
- Heating provided for offices and residential buildings
  Total investment: approx. €54 million

Social housing

- Quarter Sonnwendviertel
  - app. 5000 flats
  - influenced by the City of Vienna – app. 2000 flats
  - subsidized “smart appartements”
    - equity capital: € 60,-- /m²
    - rent: € 7,50 gross/m²
    - 2 or 3 rooms
  - Buildings connected to the district heating grid
  - heating demand of subsidized buildings: at least 20-25 kWh/m²a
  - 680 flats built like passiv houses (10 – 15 kWh/m²a)