

# On the way to a 2000 Watt society

## Zurich's path to sustainable energy use



**2016 Australian Summer Study on Energy Productivity**

**Sydney 25 February, 2016**

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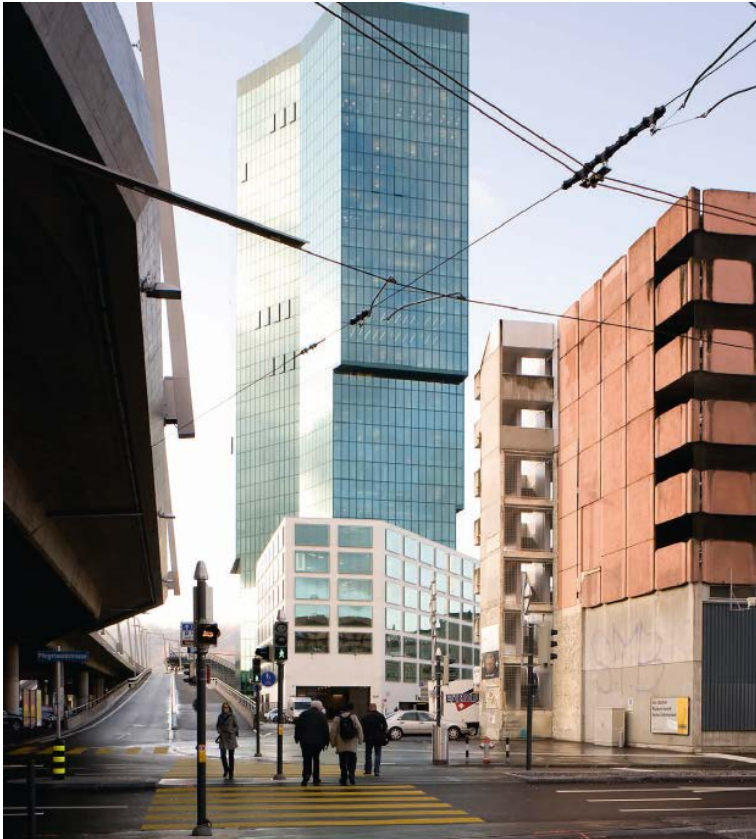
**Stadt Zürich**  
Energiebeauftragter



# Content

- Introduction City of Zurich and its energy politics
- How to become a 2000 Watt society
- Conclusion

# City of Zurich – general information



- Switzerland's largest city and business center  
400'000 residents  
380'000 work places (2x Swiss average)
- Metropolitan region Zurich:  
1.9 Mio. residents  
900'000 work places
- Legislation is made by Canton and Swiss Confederation

Municipalities have a high level of autonomy, according to the principle of subsidiarity



# Zurich is an early mover of energy politics



- 1979 Energy officer, energy savings in city buildings
- 1989 Energy counseling, energy tariffs with saving incentive, energy saving fund
- 1993 Additional energy specifications for buildings
- 1996 Solar exchange for photovoltaics installations, energy services for companies
- 2000 Label „Energy City“
- 2001 „7-Mile-steps“ for low impact/energy efficient buildings
- 2001 Label „naturemade“ for green power
- 2002 Energy Master Plan
- 2004 European Energy Award Gold
- 2006 energy tariff revision (e.g. default renewable energy, efficiency bonus)
- 2010 wood-fired cogeneration plant Aubrugg
- 2014 natural power company > Energy 360°
- 2015 100% renewable electricity

# Referendum of 30 November 2008

30. November 2008

## Reliable power supply Flourishing economy

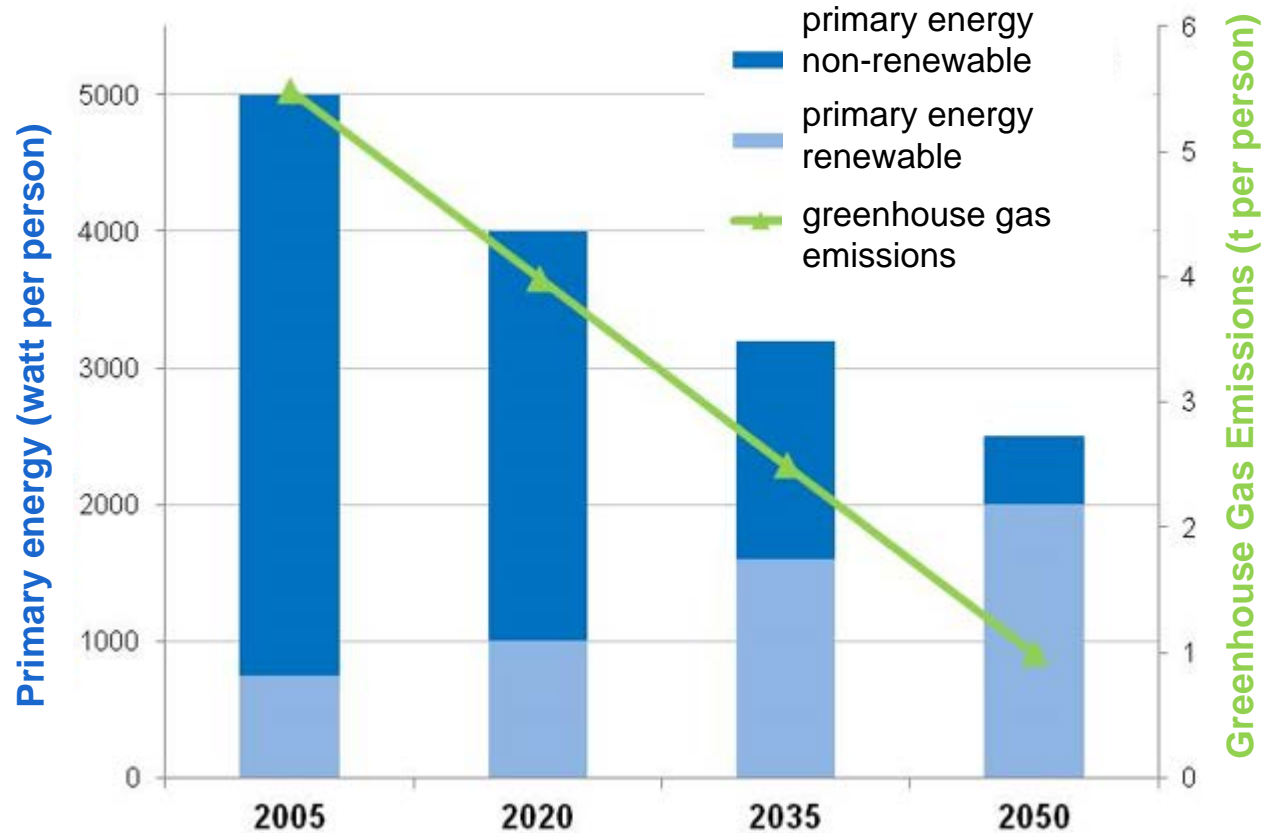


**YES TO SUSTAINABILITY**

76.4 % Yes

2000 Watt Society  
goal becomes part of  
city's constitution

# 2000 Watt targets according to Energy Masterplan



## reduction targets

- **PE: factor 2** → **2500 watt per person**
- **GHG: factor 5** → **1 tonne CO<sub>2</sub> p.p. and yr.**
- **80% renewable** (primary energy)

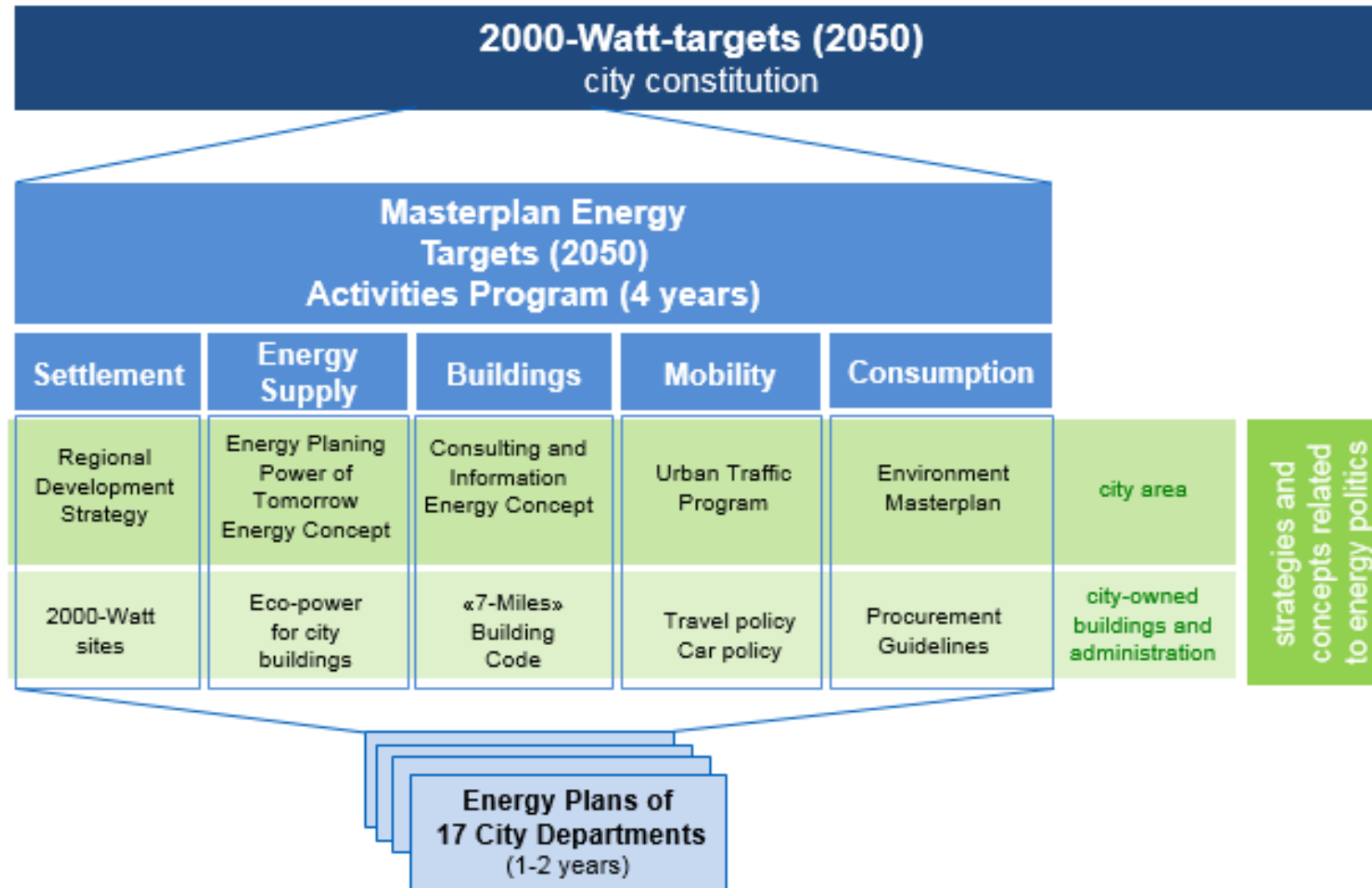
## example PEF and GHG factors

technology	PEF (MJ-eq)	GHG (kg-eq)
nuclear	4.22	0.007
black coal	3.94	0.344
water	1.20	0.004
wind	1.29	0.007

source: KBOB / eco-bau / IPB 2009/1:2014

- ✓ long-term goals: **PE** (primary energy) and **GHG** (greenhouse gas emissions)
- ✓ all energy sources incl. **embodied energy** part of the balance

# Energy Masterplan City of Zurich



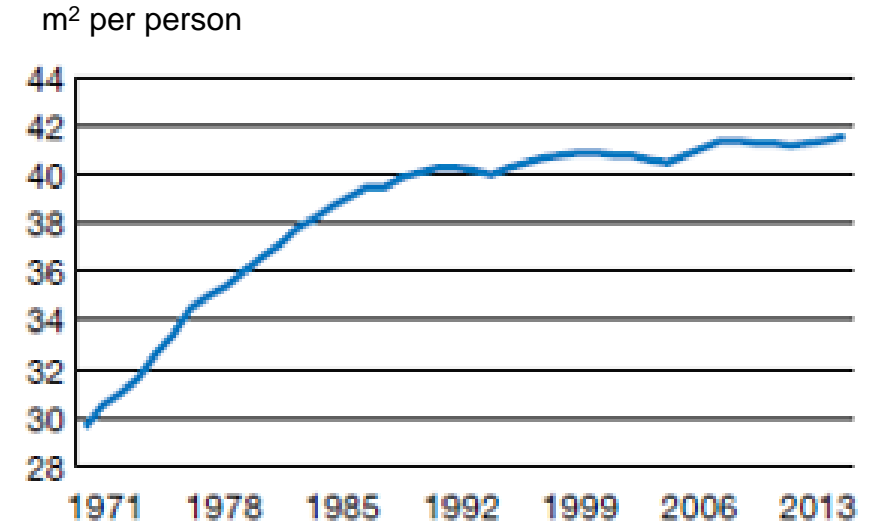
- Energy politics is a cross-functional tasks involving 17 City Departments, e.g. Urban Development Office, Structural Engineering Department, Power and Gas Utilities, Public Transport Authorities
- The Masterplan relates to other long-term strategies of the city



# Local factors influencing 2000 Watt achievement



living space city of Zurich



- energy companies in city's ownership
- high volume of mobility / well-established public transport
- below average living space
- growing city (inhabitants, workplaces, tourism)



# How to become a 2000 Watt society



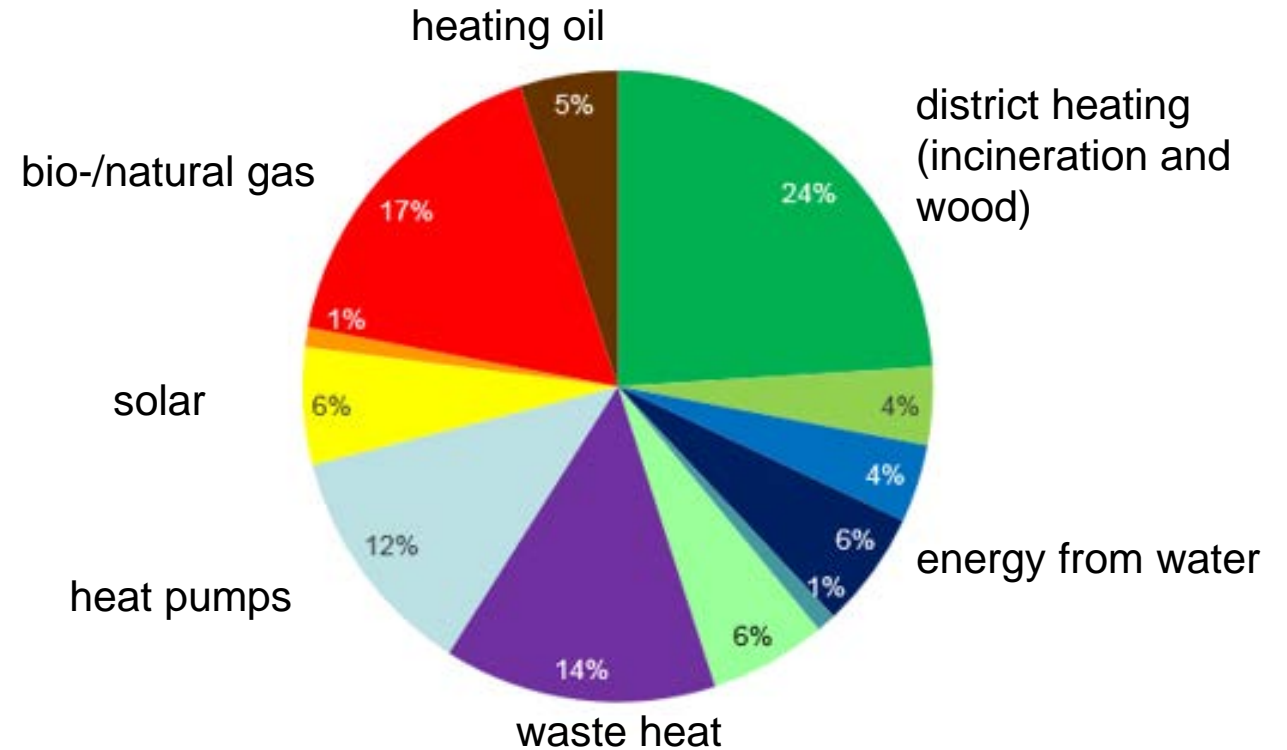
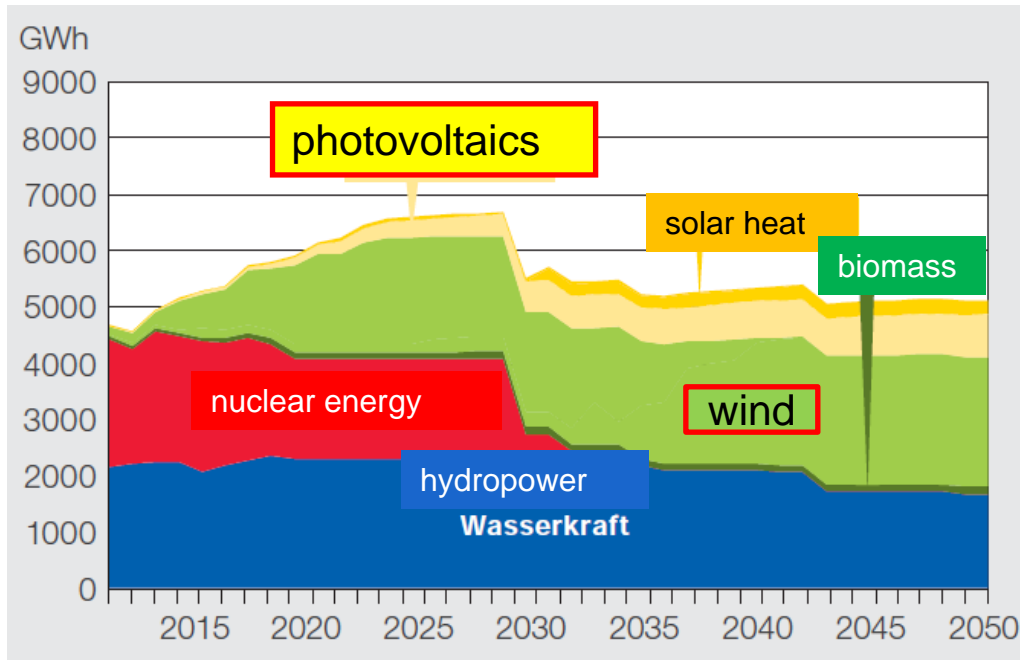
**Substitution** - strategy of 2000 Watt compatible energy supply  
choosing energy sources with low-carbon and low-primary energy factors, i.e.  
energy from incineration, waste heat and renewable sources

**Efficiency** - using less energy to serve the same purpose  
regarding living, working and mobility

**Sufficiency** - reducing the demand for energy-related activities

# Substitution

choosing energy sources with low-carbon and low-primary energy factors



## Electricity

increasing investments in solar and wind

details: see [ewz strategy «power of tomorrow»](#)

## Heat

using various locally available renewables and waste heat

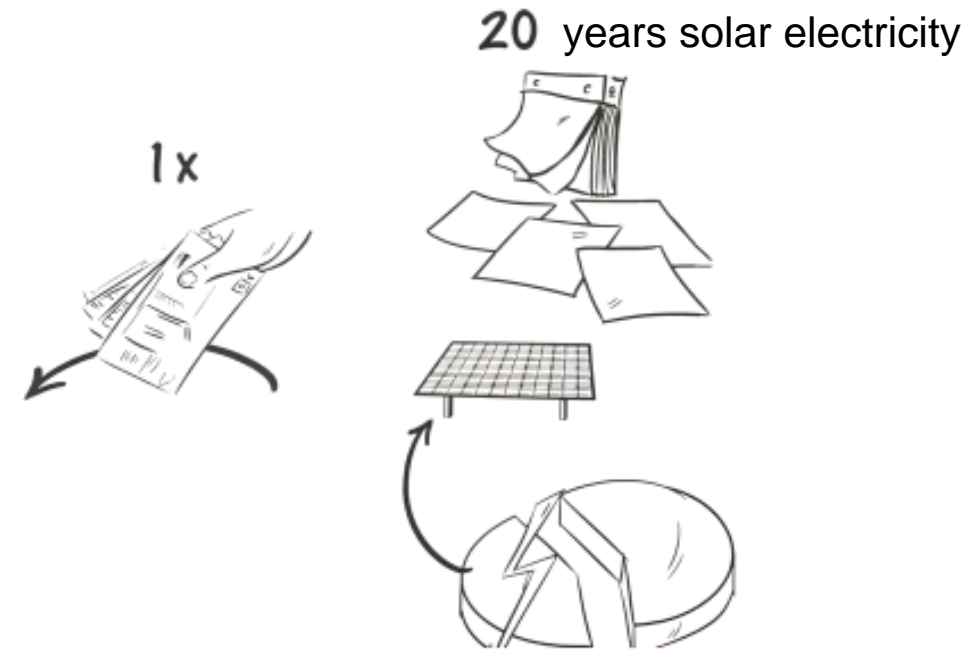
details: see [Energy Concept City of Zurich»](#)



# Examples



participation product «ewz.solarzüri», launch 2015

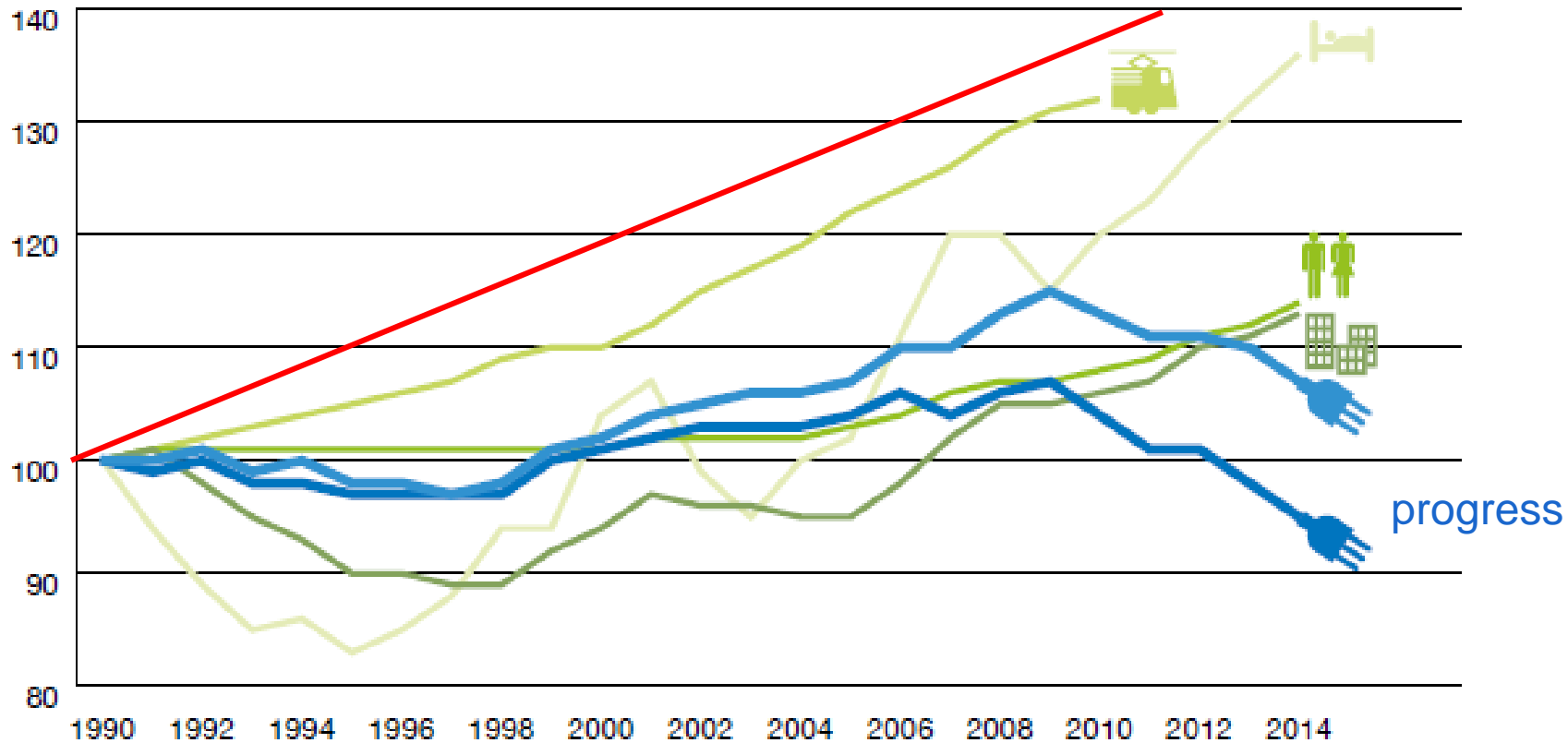


- 2015: all products 100% renewable
- 220 Mio. CHF investments in wind power

# Efficiency

using less energy to serve the same purpose

## Power consumption City of Zurich



- growing city
  - shifting towards non-fossil fuels
- reduction by 5% per inhabitant



# Efficiency - a city's contribution



- **Lead by example:** building code and energy management for city buildings, Energy Masterplan, contribution to 2000 Watt site certificate, e.g. [Greencity](#)
- **Supporting energy efficient appliances** in households and businesses («energy saving fund»)
- **Bonus** on electricity tariff **for energy efficient companies**
- «**Energy coaching**» and information programs for households, companies and schools

# Energy Research City of Zurich



- Harvesting technological potential and renewable energies is necessary but not sufficient
- Everybody can contribute to the 2000 Watt goal
- Research at the interface of energy efficient technologies and human behaviour



## Example: Business and residential area «Kalkbreite»

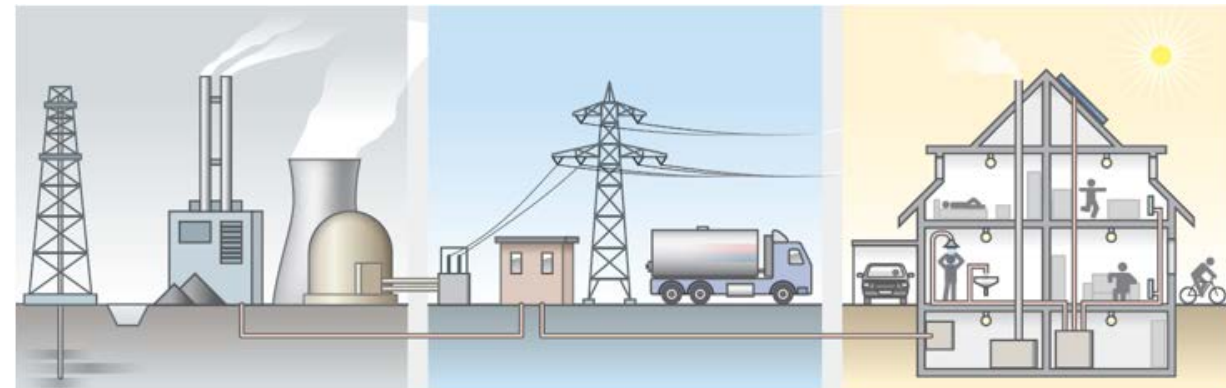


picture: Volker Schopp

- opened 2014, private ownership
- built on public land → binding sustainability standards
- designed for low-resources and new forms of living together
- 250 residents, 200 work spaces
- the areas' concept supports sustainable use of resources
  - ✓ low-energy standard
  - ✓ below-average private living space (32 m<sup>2</sup>)
  - ✓ spacial community areas
  - ✓ car-sharing facilities, no private cars

# Benefits of 2000 Watt society concept

- **conceptual integration of embodied energy**
  - allows influence on energy supply
- **consistent methodology**
  - universal application on strategic as well as project level (primary energy, GHG emissions)
- **coordinated and holistic approach**
  - allows to choose from a range of options (efficiency, substitution etc.)
  - activities in all areas of demand are required (energy, mobility, other consumption)
- **easy to communicate**
  - makes people curious about the number
  - brings it back to the individual



picture: Umwelt- und Gesundheitsschutz Stadt Winterthur



# Contract of residents regarding 2000 Watt society

## Contract

The parties are:

The residents of this building  
and The Rest of the World

The residents of this building commit themselves to reduce their total constant energy demand to a maximum of 2000 watt per person.

In case of breach of contract The Rest of the World is entitled to social or damage compensation.

Jurisdiction is Zurich.  
Swiss law is applicable.

Zurich, 1 May, 2010

The residents of this building

The Rest of the World



# A 2000 Watt society is possible



## YES TO SUSTAINABILITY

Masterplan Energy Targets (2050) Activities Program (4 years)				
Settlement	Energy Supply	Buildings	Mobility	Consumption
Regional Development Strategy	Energy Planning Power of Tomorrow Energy Concept	Consulting and Information Energy Concept	Urban Traffic Program	Environment Masterplan
2000-Watt sites	Eco-power for city buildings	«7-Miles» Building Code	Travel policy Car policy	Procurement Guidelines

Energy Plans of 17 City Departments (1-2 years)

## 1) Strong Political Commitment and Consistent Legal Framework

- long term goals as part of municipal law
- external commitments e.g. European Energy Award help

## 2) Assertive Implementation and Management

- energy politics is a cross-sectoral task (challenge in line-organisations)

## 3) Financial Resources

- transition phase: from subsidies to incentive taxes and market solutions

# Thank you for your interest



Sources pictures in this presentation: publications City of Zurich, picture archives ewz, VBZ and other city departements  
City of Zurich Energy Officer

*This story was filed by CBS News correspondent Elizabeth Palmer.*



## CBS news report

«Can a City Cut Its Energy Use by 2/3?»



## ABC RN Afternoons

«Want to join the 2000 Watt society?»

Energy Policy Report City of Zurich  
English information on the 2kW society  
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