SVENSKA ARALSJÖSÄLLSKAPET

Swedish Aral Sea Society

10. The challenges of sustainable urban development

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Urbanisation

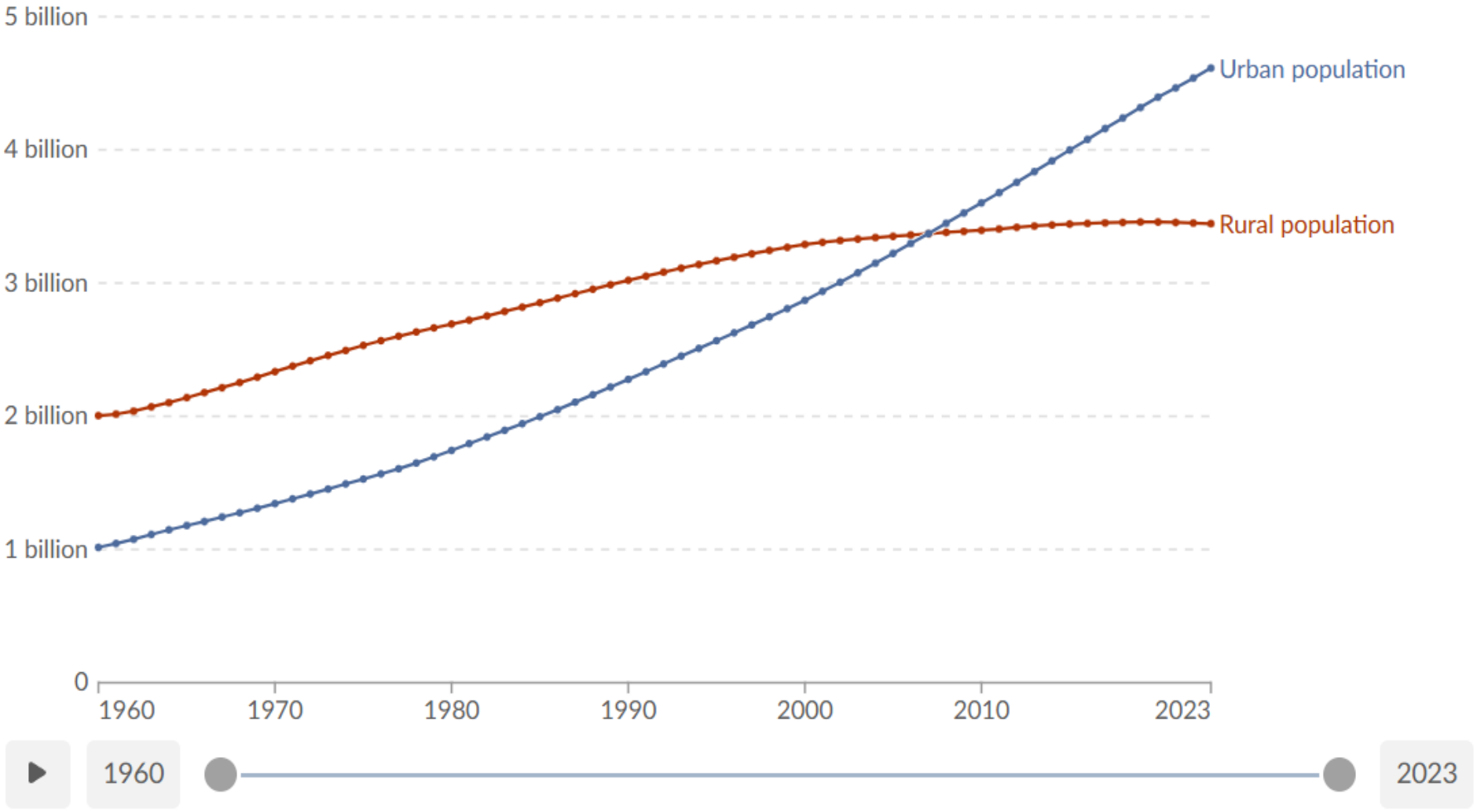
- More than 4 billion people – more than half of the world – live in urban areas.
- 1 out of 3 people in urban areas live in a slum.
- Populations urbanize as they get richer. (In Sweden 85 % lives in cities and towns.)
- Large land areas become almost empty.

Number of people living in urban and rural areas, World

Our World in Data

Table | Chart

Change country or region



1960 2023

Data source: World Bank based on data from the UN Population Division (2025) – Learn more about this data

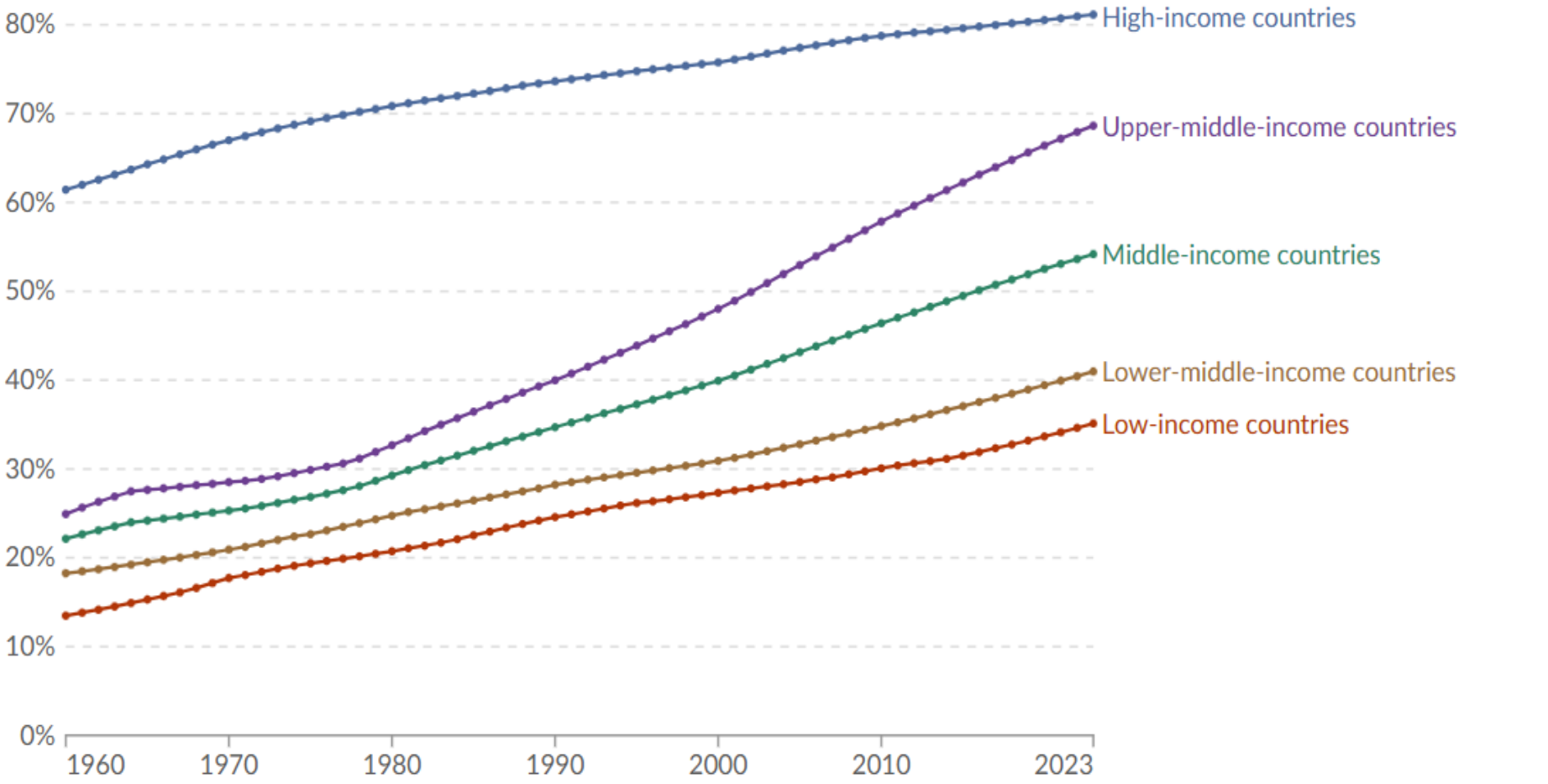
Note: Because the estimates of city and metropolitan areas are based on national definitions of what constitutes a city or

Share of the population living in urban areas, 1960 to 2023

Our World in Data

Table | Map | Chart

Edit countries and regions | Settings



1960 2023

Data source: UN Population Division (via World Bank) (2025) – Learn more about this data

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Guangzhou, a city of 18.7 (?) million people, is one of the 9 adjacent metropolises located in the largest single agglomeration on earth, the Pearl River Delta of China. The nine cities have together 86 (?) million inhabitants (2022) and is the largest urban area in the world (Wikipedia)


Slum area in
African cities
Image © 2009 DigitalGlobe
1°18'52.05" S 36°47'49.43" O
Visningshöjd


Slum area in
African cities

Slum, Rio de Janeiro

Depopulated countryside Portugal

What would be a Sustainable Human Habitat?

The sustainable city – models since antiquity
City on the hill (France)

Urbanisation and densification

Stockholm County 300 000 new apartments to 2030

More traffic and congestion

Sthlm & NY 70% PT. Kph 40% bike.

Urban challenges

- Rate of urbanisation/urban growth
- Demand for land (direct and indirect)
- Demand for natural resources and energy (incl. water)
- Pollution (air, water, land)
- Mobility (congestion)
- Health (air- and waterborne diseases, pandemics)
- Safety (natural disasters, deteriorating infrastructure, terrorism)

Urban strengths/opportunities

- Engines of economic growth and knowledge
- Cultural integration/multiculturalism
- High potential for efficiency (energy/land/water etc.)
- High potential for sustainable/affordable system solutions

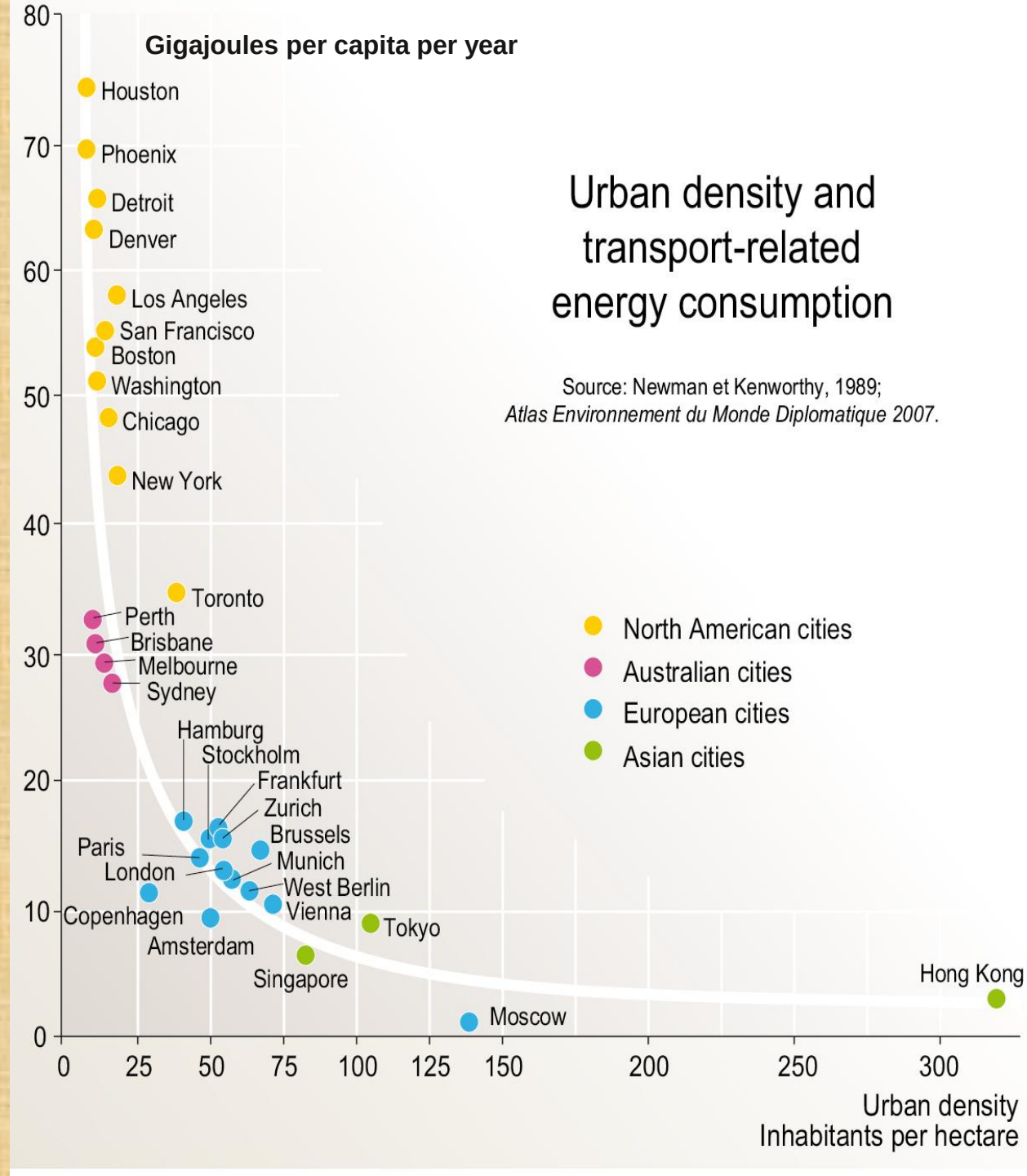
Main challenges for the local level

1. **Energy**
   Transition to energy without fossils
2. **Materials management**
   Recycling all materials
3. **Economy**
   Transition to a post-industrial economy
4. **Demography**
   A growing and aging population

Elements of sustainable urbanisation

Preserving space and improve mobility!

Increase urban density to achieve energy efficient mobility



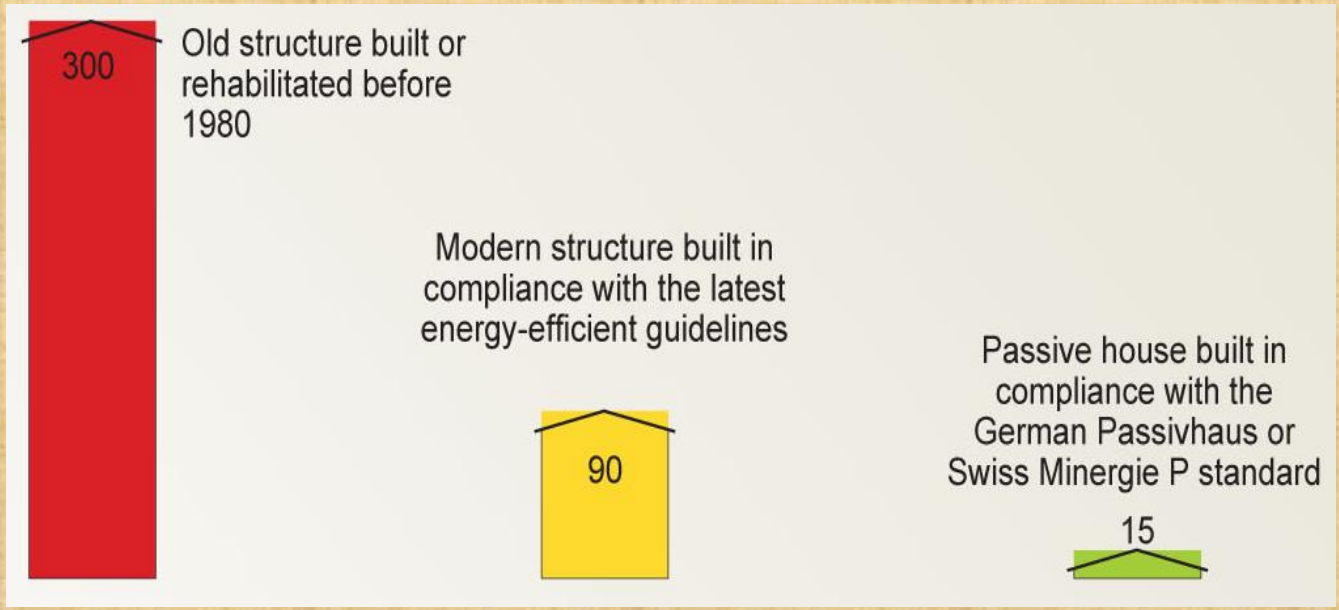
Source: Atlas Environnement du Monde Diplomatique 2007

http://maps.grida.no/go/graphic

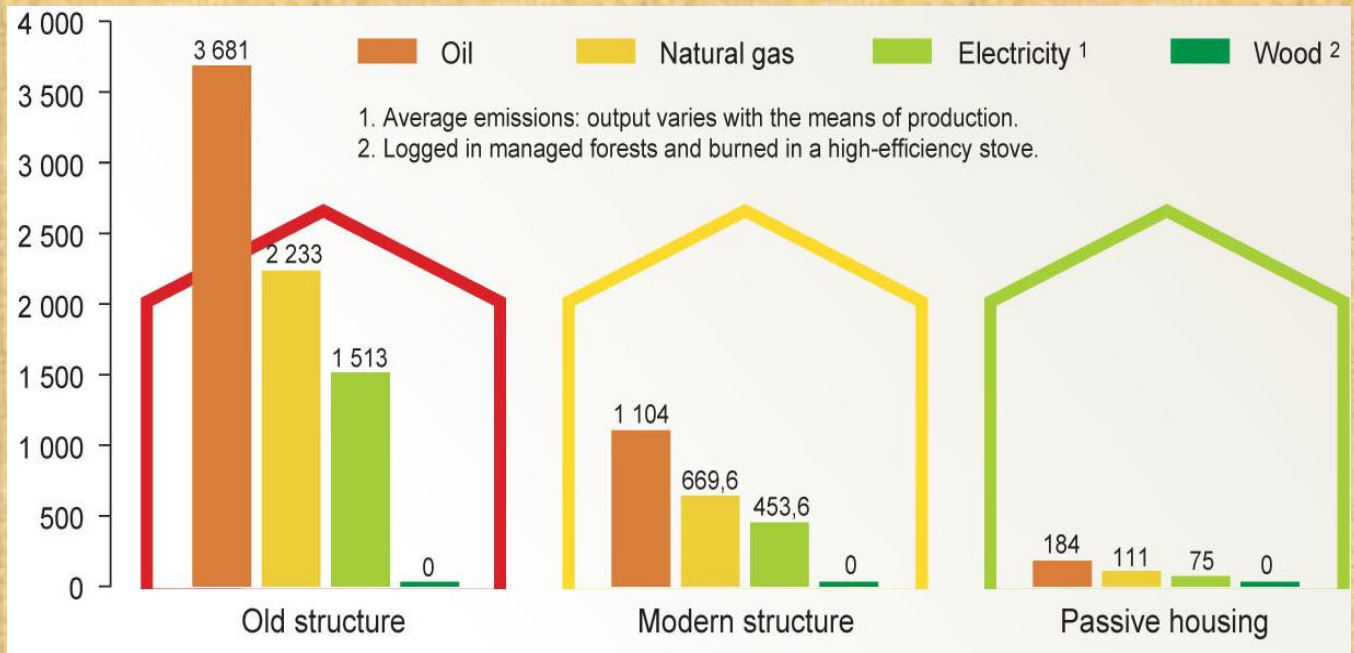
Elements of sustainable urbanisation

Preserving energy!
Reduce energy consumption and CO_2 emissions from buildings

kWh/m2/year



Kg CO2 eqv/100m2/year



Source: Atlas Environnement du Monde Diplomatique 2007

Passive house Fiskarhedenvillan in Upplands Väsby

Elements of sustainable urbanisation

Preserving energy!
Reduce energy consumption and CO_2 emissions from traffic

New streetcars in Marseille

Hermann Knoflacher
TU Wien

Built environment influences behaviour

Examples of sustainable urbanisation

- Gårdsten, Gothenburg

Green Buildings Are More Ecological And Cost-Effective

https://youmatter.world/en/green-buildings-are-more-ecological-and-cost-effective/

Green spaces play an important role in sustainable development.

https://www.mondomacchina.it/en/large-green-spaces-function-management-and-maintenance-c1793

Conclusions:
A sustainable city has to

- Be fairly dense
- Be fairly green
- Have good transport infrastructure
- Have good materials recycling
- Be well managed
- …….
- A vision: the 15 minutes city!

Cities and towns are today
in the forefront in the fight against
climate change and global warming!

Urban Management

Conditions for effective urban management – three competences

- Legal competence – planning monopoly
- Economic competence – local taxation
- Sustainability competence – knowledge

The city is

a system

questions have to be treated together

The system ”city” can be treated as five resources

1. **Material resources** – all material flows in the city
2. **Urban planning resources** – all surface area in the city
3. **Human resources** – all inhabitants in the city
4. **Societal resources** – the city and all its functions and institutions
5. **Economic resources** – companies and all other economic units

These resources are not inter-changable and are all limited

Sustainable development in cities are best understood as careful management of limited resources

How to work with material resources

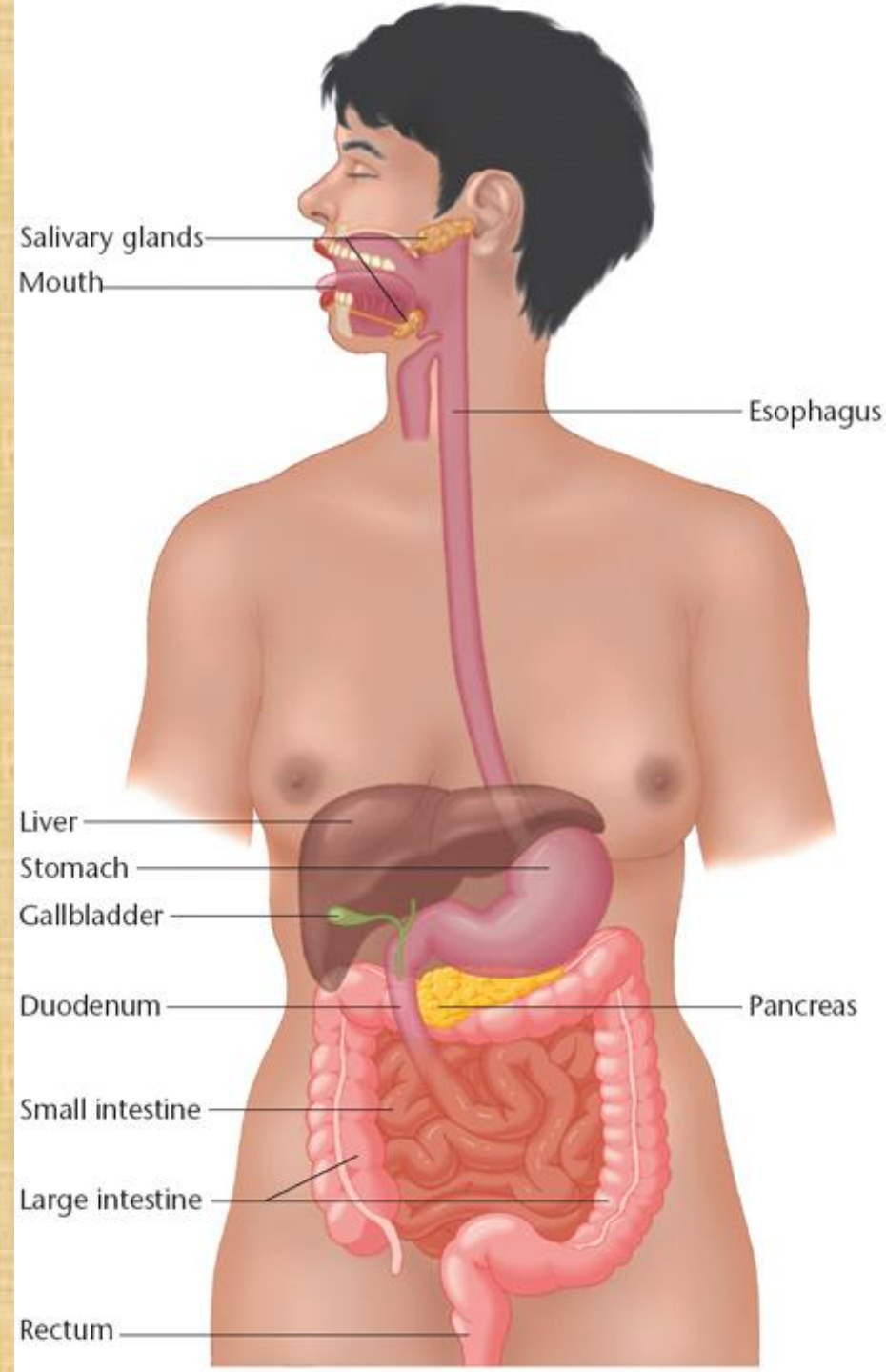
Energy-Water-Waste

Integrated material flows Energy-Water-Waste

Metabolism of the city

Energy, water and solid materials enter;
Waste leaves;
Energy is carried by solid resources.

It is one system.



The resource efficient society

- **Is energy efficient**
- **Save water**
- **Take care of waste (recycling)**

Integrated Management is key to achieve sustainable development

1. Systems description
2. Visioning
3. Monitoring and indicators
4. Management systems
5. Projects

Visioning

What would you like your city to look like 50 or so years into the future?

Case Göteborg – Göteborg 2050

Visioning was carried out in five main areas

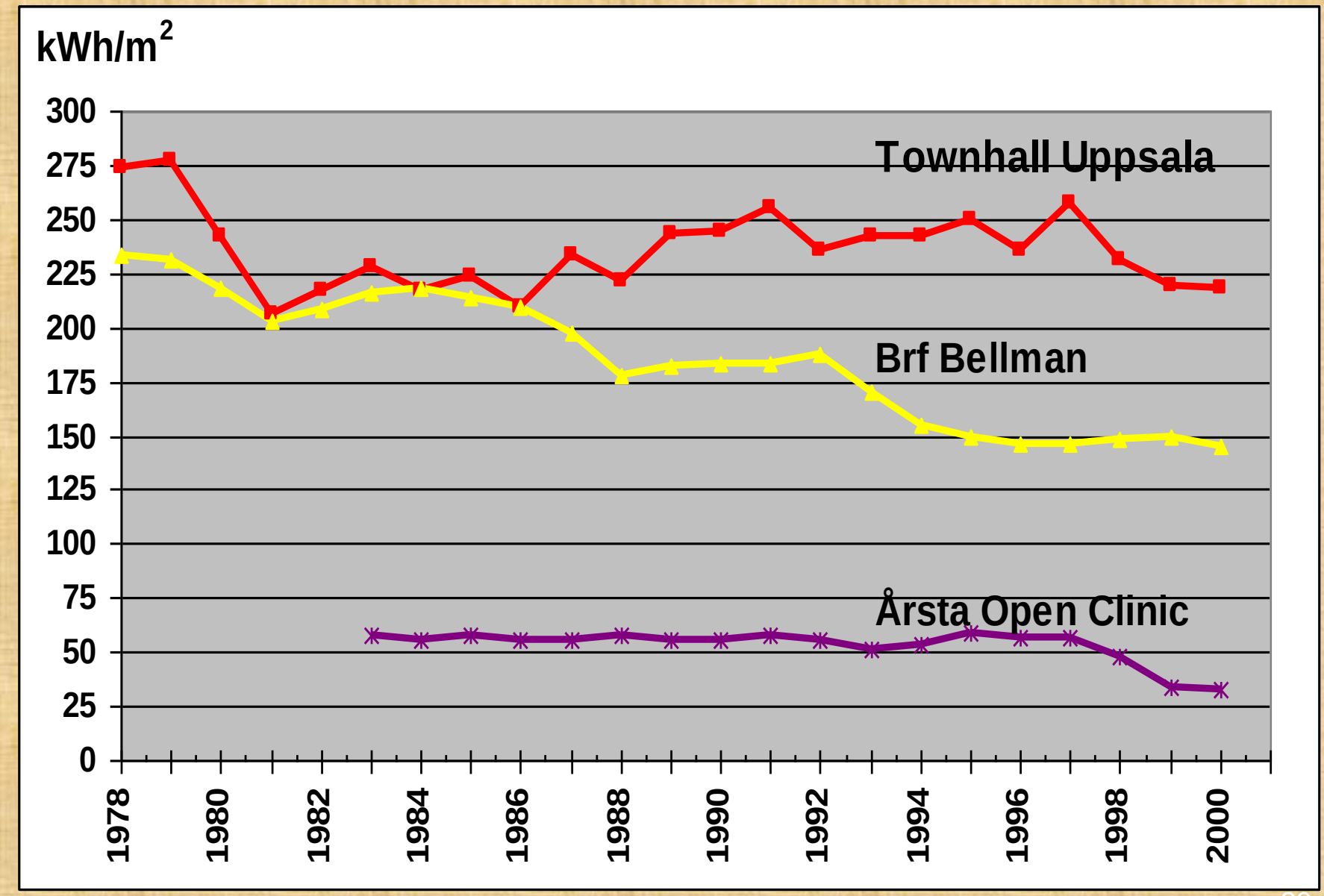
1. **Sun city** (energy)
2. **Urban structure** (includes green areas)
3. **Transport**
4. **Food** (e.g. includes health)
5. **Recycling** (includes waste management)

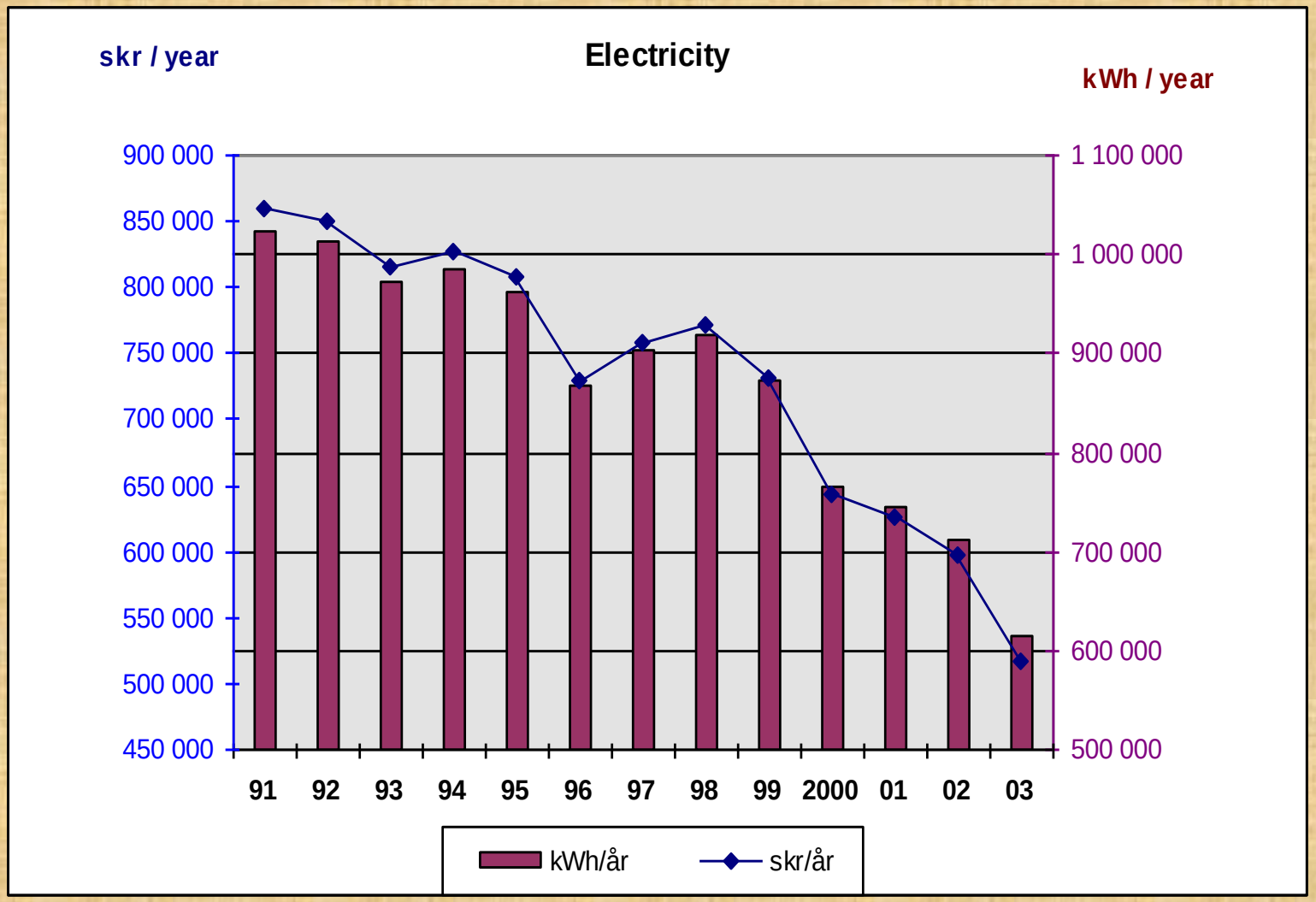
Indicators

allows you to follow the development of a city or part of it like a building

This project is part-financed by the European Union (European Regional Development Fund) within the BSR INTERREG IIIB Neighbourhood Programme, TACIS, Finnish Ministry of Environment and the partner cities.

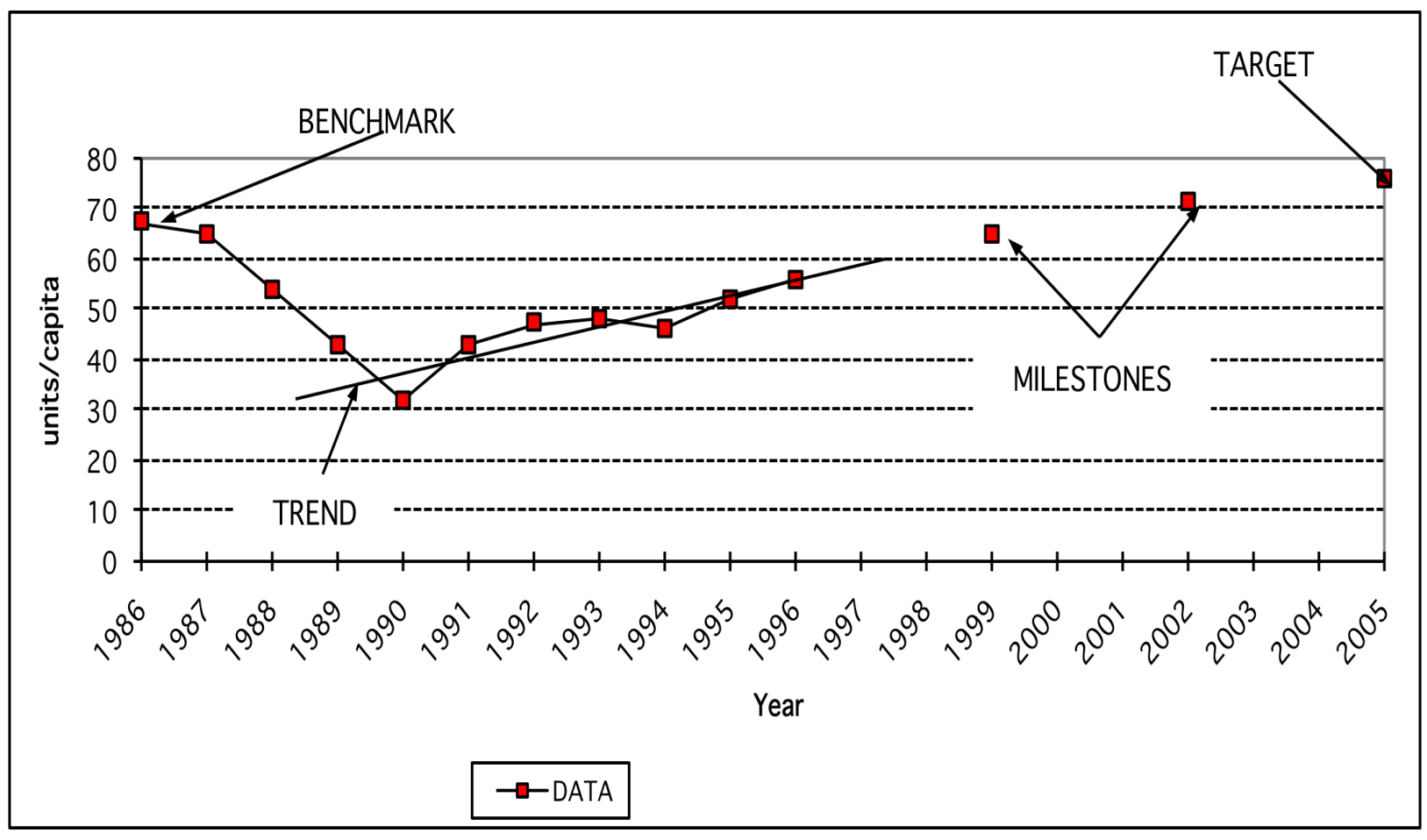
Energy use (heat) 1978-2000




skr / year
Electricity
kWh / year
900 000
850 000
800 000
750 000
700 000
650 000
600 000
550 000
500 000
450 000
1 100 000
1 000 000
900 000
800 000
700 000
600 000
500 000
91
92
93
94
95
96
97
98
99
2000
01
02
03
kWh/år
skr/år

Indicator Anatomy

Indicators should have a target or if it is not possible a benchmark. To follow an indicator from future milestones to the present is back-casting.



How to choose indicators

- Of course **choice of indicators** is a very serious question. You want to spend your time on something which is important and meaningful.
- **Some examples** in medicine and healthcare: We choose body temperature, not body height; We choose red blood cell count, not colour of the skin.
- In resource management: **ecological footprint**; this is monitored according to an established method. There is an understanding what the sustainability value is. (1.8 ha/cap) Values for cities are worked on by many cities. For social aspect of SD: Human development index (0.8) according to UN.
- These are ***composite indices***, composed of several indicators. We need both them and special indicators, to be able to work with projects

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Indicators and descriptors

1. Distinguish between indicators and descriptors.
2. **Descriptors** describe an activity, but can not be given a value for sustainability
3. **Indicators** Select a few of interest**.**
4. Discuss or decide on sustainability targets.
5. Estimate the sustainability gaps.
6. Discuss what to do with the gap.

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City Indicators – reports from the Sustainment project

1. Most city reports included a list of indicators, They were often around 50-60
2. Indicators were based on the political decisions. Targets were often politically decided (e.g. 40 % reduction)
3. Indicators were often for project follow-up descriptions
4. In several cases universities were involved in monitoring and collecting data
5. Some provided indicator values, best over a time period, but most not.

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Why "absolute" sustainability targets?

- Basic – otherwise we do not know what is sustainable.
- Compare with a doctor responsible for the health of a patient; The City council is working with the sustainability (health) of the city.
- It is more straightforward with an indicator in the environmental field.
- For social indicators targets are related to human resource development and benchmarking.
- One learns much by analysing this question – a qualified discussion is requested.

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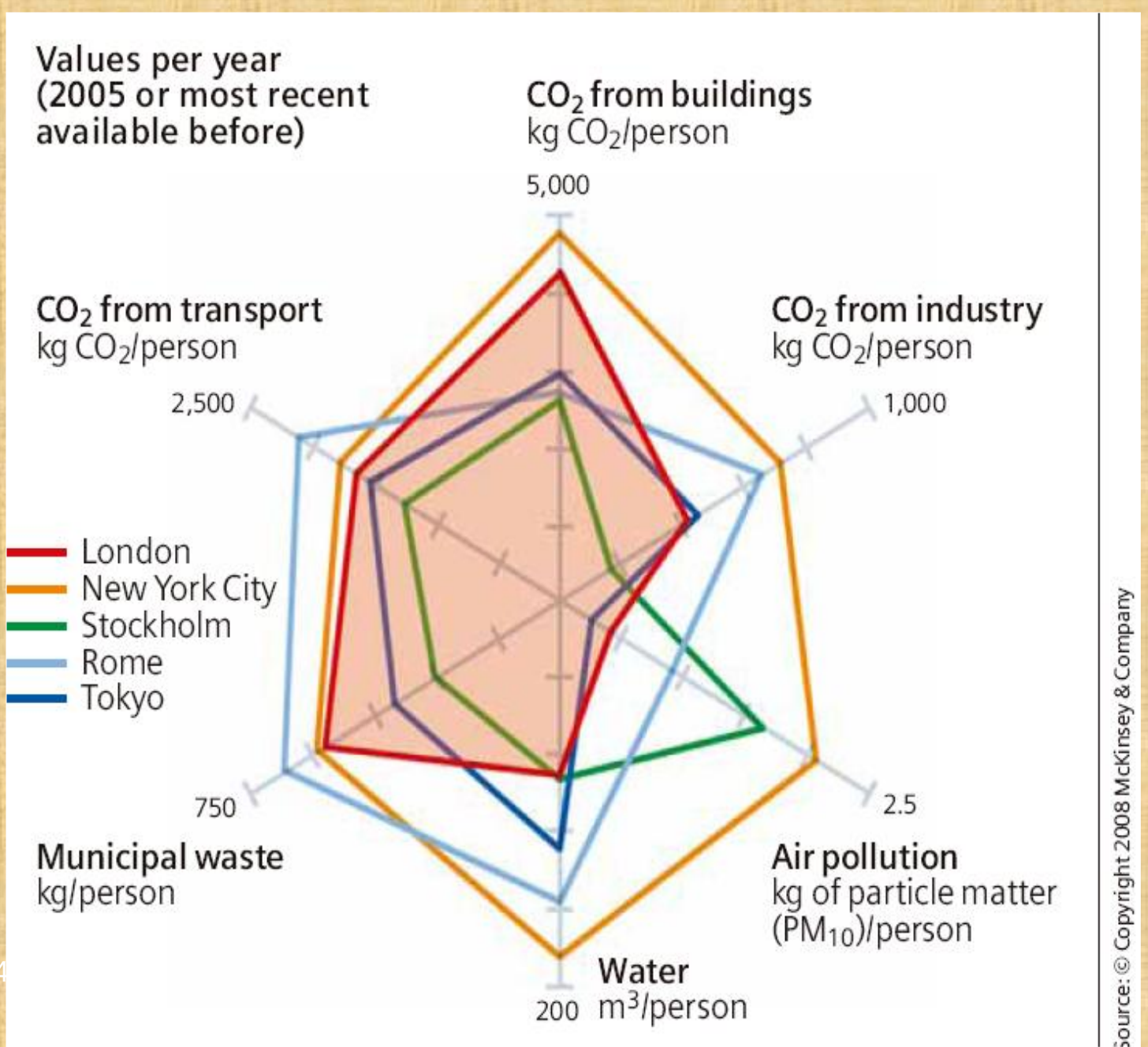
Urban environmental indicators (examples)



In economics many indicators are reported everyday !

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Ten Milestones for a Better Climate in Uppsala

In the Environmental and Climate Programme ten milestones are set for the Municipality's climate action. The milestones shall act as a driving force for a rapid development into a sustainable society and in the long run make it possible to reach Uppsala's long term climate goals.

https://www.uppsala.se/contentassets/5d36faebce83404888c3a4677bad5584/environment-and-climate-programme.pdf

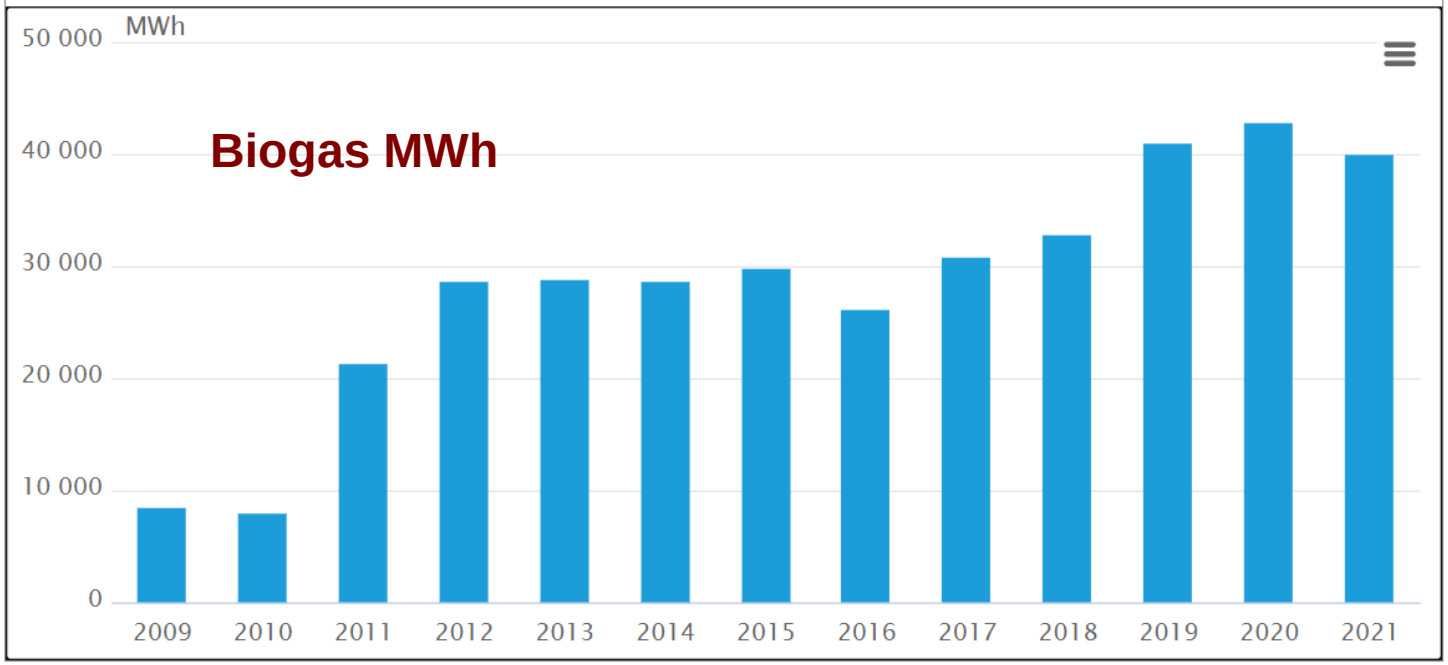
Uppsala Municipality's milestones

1. **100 MW of solar energy** by the year 2030. Municipal properties will have solar cells on their roofs by 2025.
2. Vehicles, machines and contracted **transportation will be fossil fuel-free** by 2027.
3. Energy efficiency to ensure **climate-neutrality by 2030**.
4. Reduce environmentally and health-hazardous substances.
5. 75 per cent organic **food** by 2030. No more than 1.25 kg of CO2e per kg of food by 2030.
6. Only recycled or **renewable plastic** by 2030.
7. Completed **construction projects will climate-neutral** by 2030.

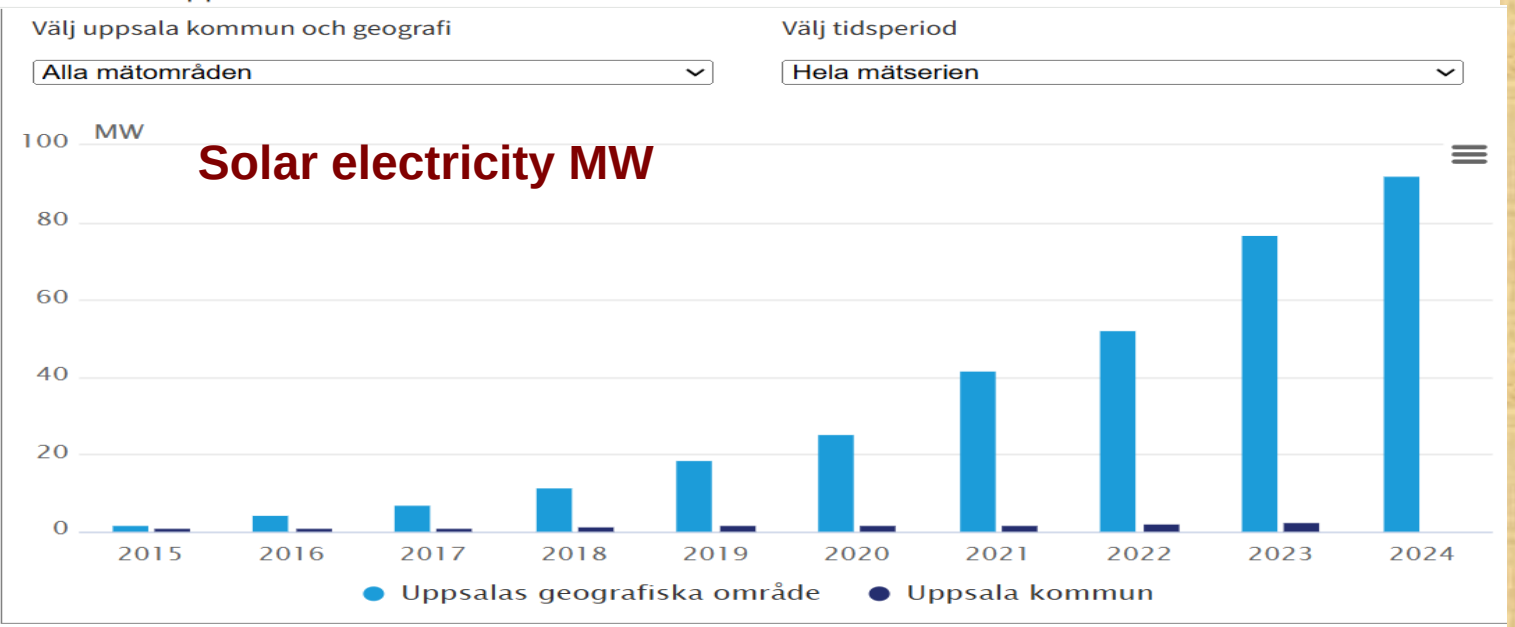
Investments for more sustainability in Uppsala

- **Biogas** production from organic waste and city buses run on biogas
- **District heating** and cooling
- **Bicycle paths** for bikers
- Houses built from **wood**
- **Solar cells** on roofs
- City park and many **green areas**
- **Car free centre**

Examples of Indicators Uppsala Municipality



Datakälla: Uppsala Vatten och Avfall AB

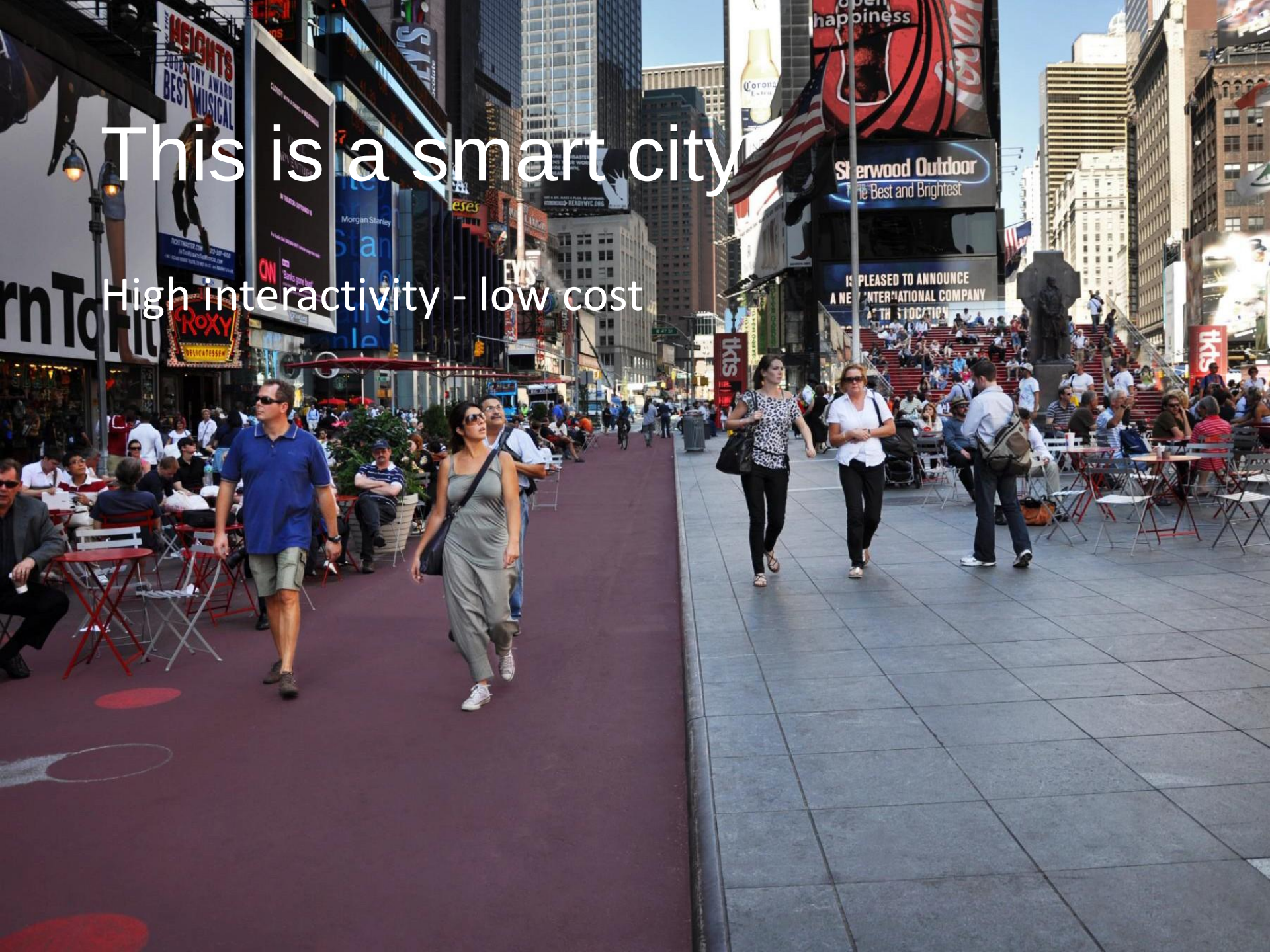


Datakälla: SCB/Energimyndigheten, Energikontoret i Mälardalen, Uppsala kommun

Break

- Discuss which problems you have in your living area.
- Discuss which resources you have in your living area.
- Discuss how you can improve your living area.

Urban Networks for Sustainable Development


This is a smart city
High interactivity - low cost
Sherwood Outdoor
The Best and Brightest
ROXY
Morgan Stanley
CNN
tkts

Tools and resources

- C40 cities

- C40 is a group of the world's largest cities committed to tackling climate change.
- www.c40cities.org
- C40 has 97 member cities in 2025

Tools and resources

Sustainable urban development network

UN-HABITAT

A network of global partners to promote a multi-lateral and inter-disciplinary approach to sustainable urban development.

www.unhabitat.org/

The second session of the United Nations Habitat Assembly will be held from 29 - 30 May 2025, at the UN-Habitat Headquarters in Nairobi.

Achieving SDGs in times of global crisis


UN HABITAT
FOR A BETTER URBAN FUTURE

Tools and resources –
Sustainable urban development organisations

- ICLEI, Germany (earlier Local Agenda 21 now sustainable local muncipalities), Aalborg Commitments
- Sustainable Cities and Towns Campaign, EU
- UBC, Finland, Union of Baltic Cities
- GCI, USA, Global Community Initiatives
- The Natural Step Foundation, Sweden
- BUUF, Baltic University Urban Forum
- Forum for the Future, UK

The European Sustainable Cities and Towns Campaign

Get to learn more about how to achieve your local sustainability targets. Read the news, follow the debate and check the events.

The partners of the ESCTC provide you with practical guidance, project ideas and tools, showcased in the Sustainability Kit and in the linked partners' websites.

To mainstream local sustainability throughout Europe, the Campaign fosters the implementation of the 'Aalborg Commitments'. You can follow their structure throughout many of the items on this site.

Enjoy browsing around and become part of the biggest movement for local sustainability across Europe!

ICLEI - Local Governments for Sustainability is an international association of more than 2500 local governments as well as national and regional local government organizations that have made a commitment to sustainable development.

ICLEI provides technical consulting, training, and information services to build capacity, share knowledge, and support local government in the implementation of sustainable development at the local level. Our basic premise is that locally designed initiatives can provide an effective and cost-efficient way to achieve local, national, and global sustainability objectives.

https://iclei.org/our_network/

ICLEI Cities in Uzbekistan:
Navoi
Kattakurgan
Gijduvan district

Lecture 10
to read

1. Building Sustainable Societies, Chapter 7. *Spatial Planning and Development.* pp 94-110.

2. Building Sustainable Societies, Chapter 9. *Green Structures in Sustainable City Development.* pp 130-149.