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Urban Resource Efficiency: The Case of Budapest

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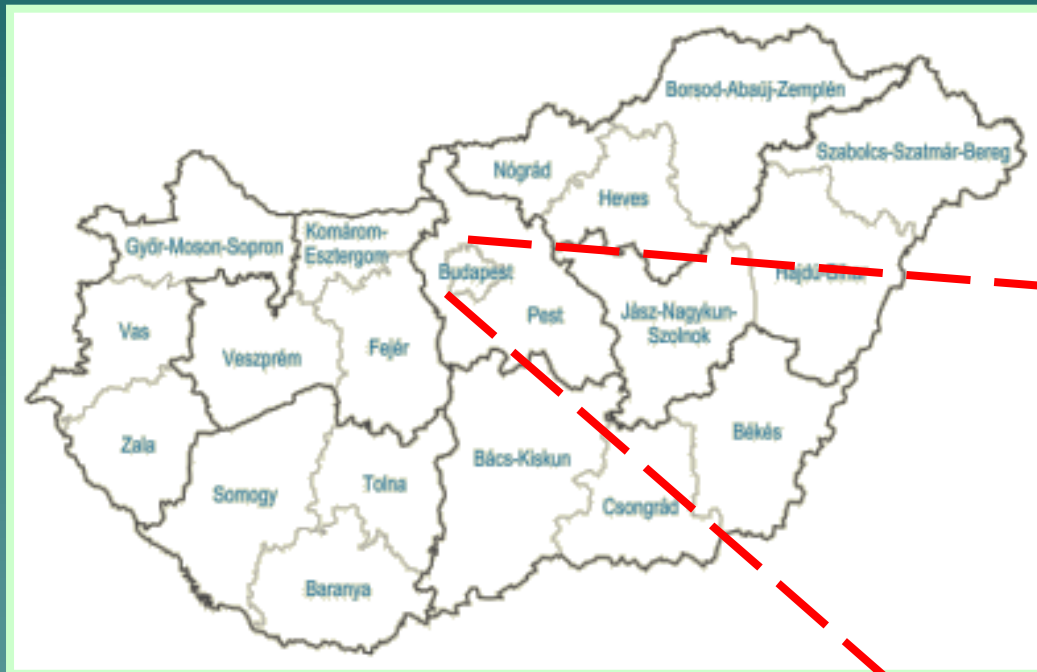
Ministry of Environment and Water
Hungary



Studies on metabolism of cities:

- Tokyo (Hanya, Ambe 1976)
- Brussels (Duvigneaud, Denaeyer-De Smet 1977)
- Hong Kong (Newcomb et al. 1979; Warren-Rhodes, Koenig 2001)
- Prague (Stanners, Bourdeau 1995)
- Vienna (Daxbeck et al 1996; Obernosterer et al. 1998; Hendriks et al 2000)
- Sydney (Newman 1996, 1999)
- Taipei (Huang 1998)
- Shenzhen (Yan et al 1998; Yan, Zhifeng 2007)
- Amsterdam (Gorree et al. 2001)
- Ann Arbor (Melaina, Keoleian 2001)
- London (Chartered Institute of Wastes Management 2002)
- Cape Town (Gasson 2002)
- Hamburg (Hammer et al. 2003)
- Toronto (Sahely et al. 2003)
- Nantong (Yu, Huang 2005)
- Budapest (Pomázi, Szabó 2008)

Hungary



Budapest



Main characteristics of Budapest

Geographical features: territory: 525 km²

Social context:

Total population: 1.7 million

Population density: 3238 cap per km²

Economic context:

GDP: 40 per cent of country's total GDP

Passenger cars: 28.5 per 100 cap.

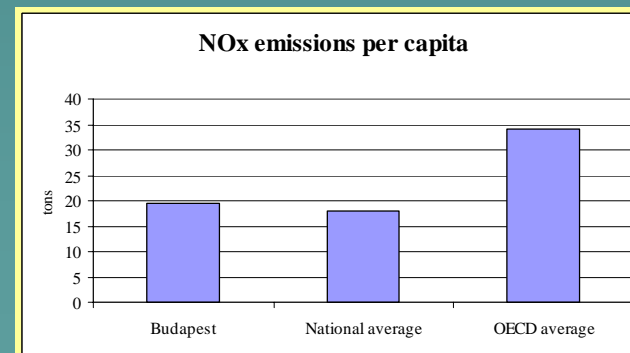
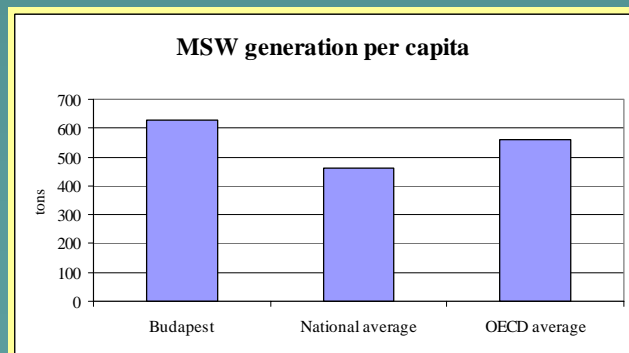
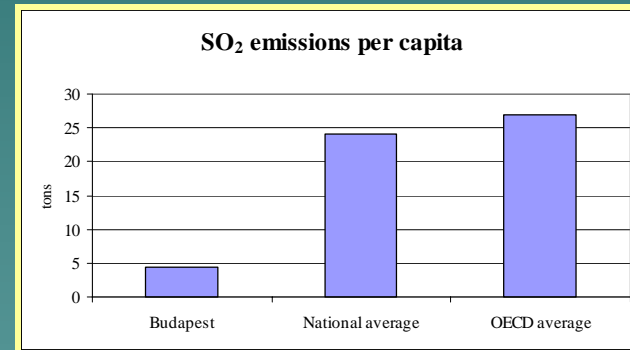
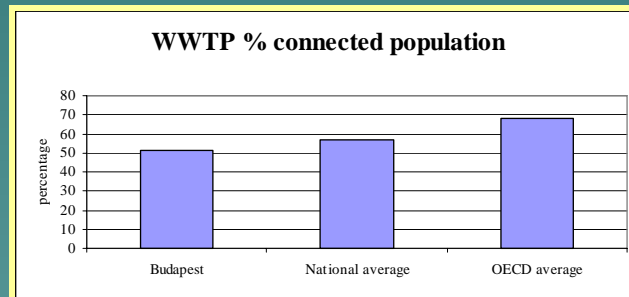
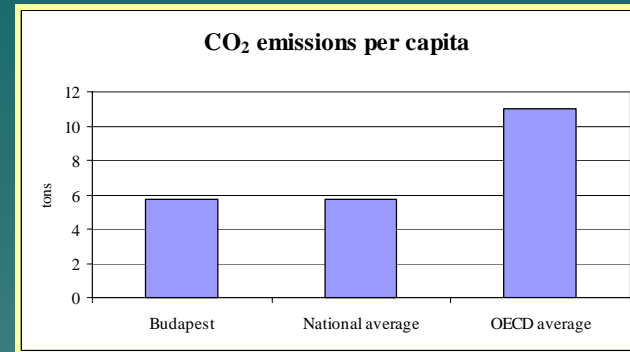
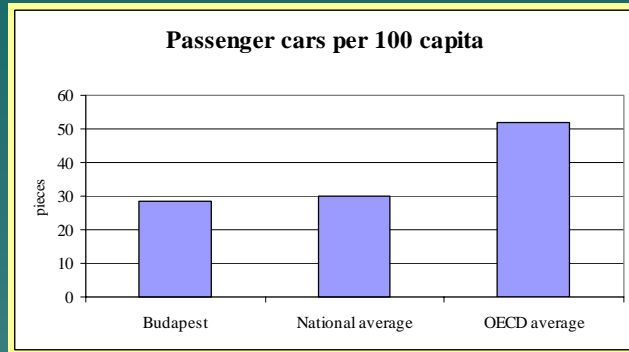
Environmental context:

Green areas: 9.9 m² per cap.

Annual municipal waste generation: 630 kg per cap.

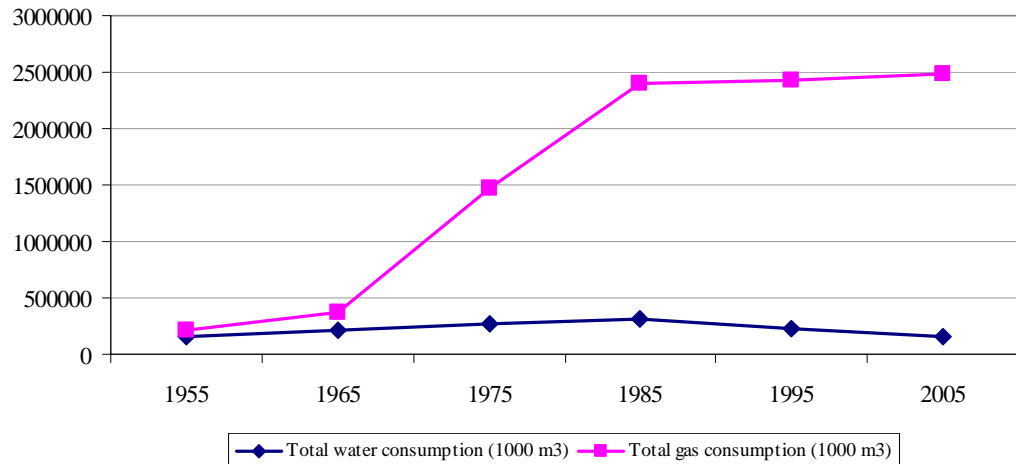
Annual CO₂ emissions: 5,7 t per cap.

Comparison of selected indicators



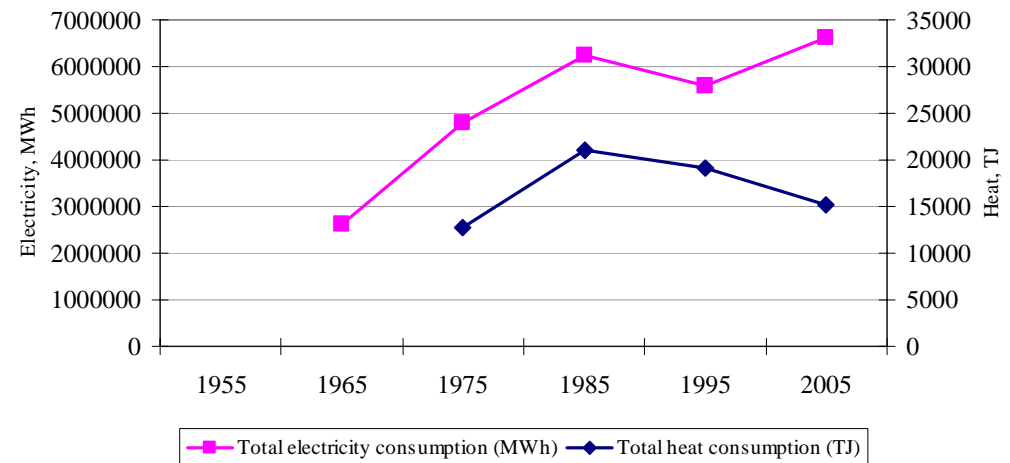
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Total water and gas consumption, 1955-2005



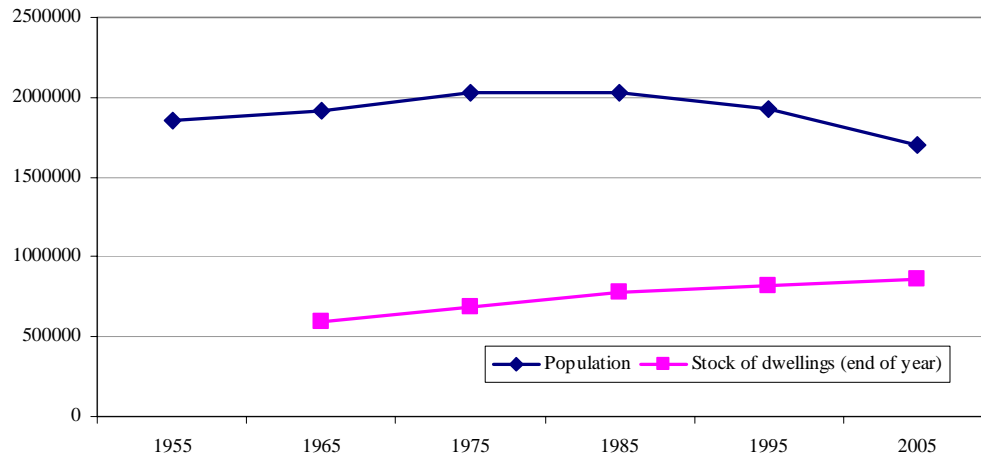
Changing urban metabolism – resource use (inputs)

Total electricity and heat consumption, 1965-2005



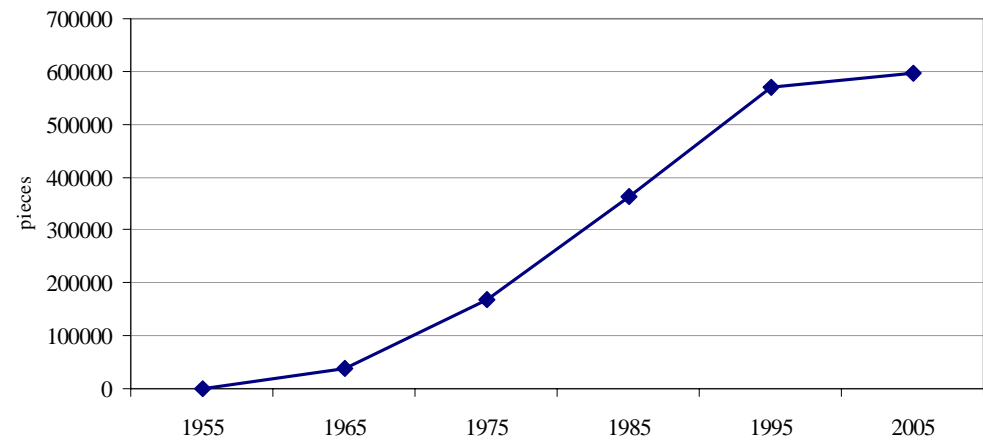
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Population and building stock, 1955-2005



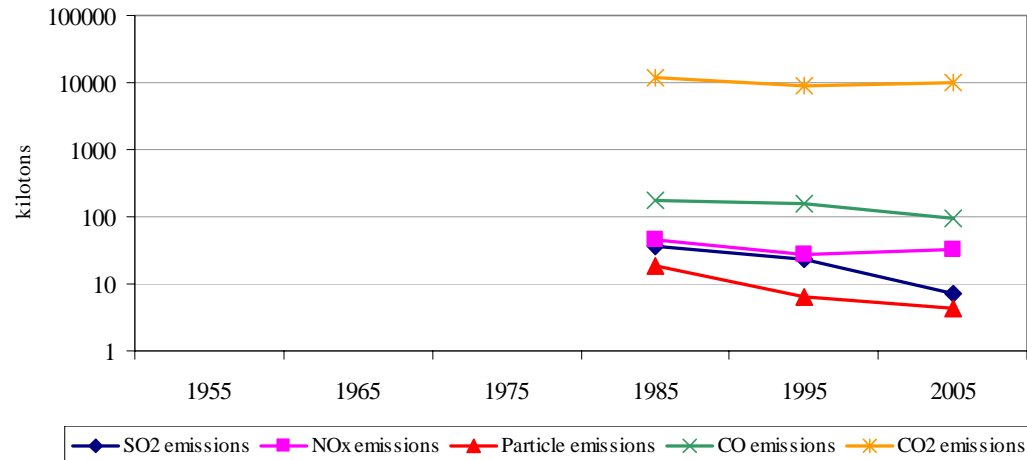
Changing urban metabolism – stocks

Stock of passenger cars, 1955-2005



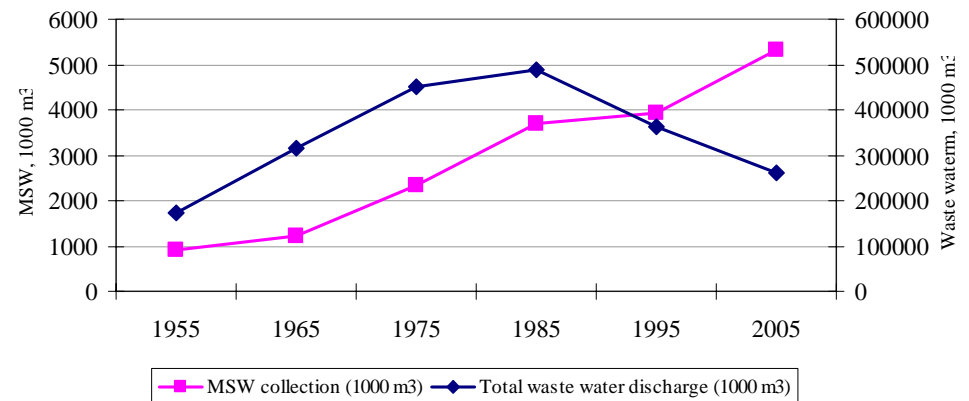
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Emissions of air pollutants, 1985-2005

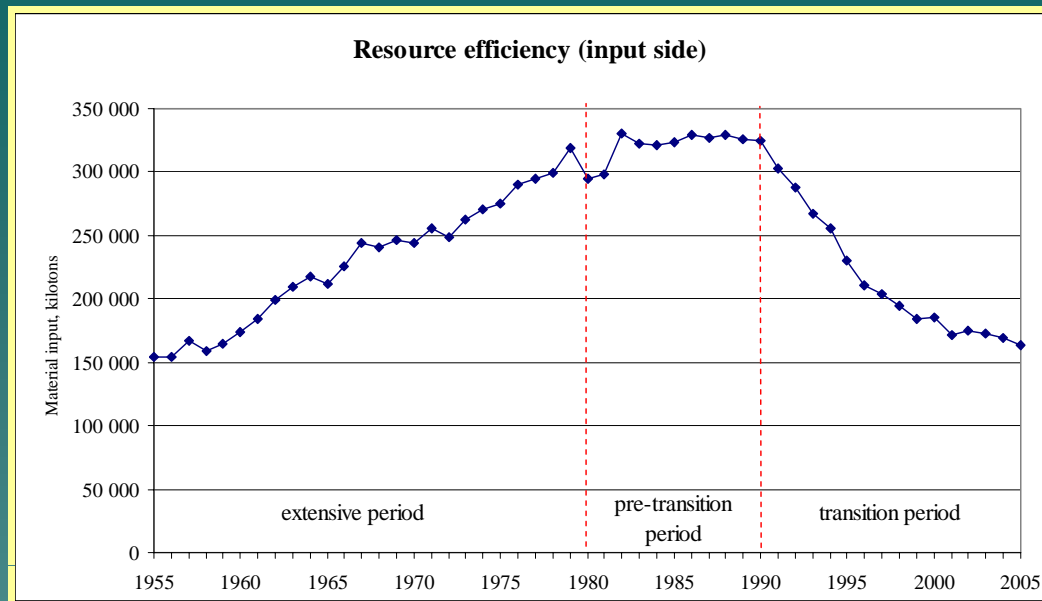


Changing urban metabolism –
environmental impacts (outputs)

Municipal solid waste collection and waste water discharge, 1955-2005



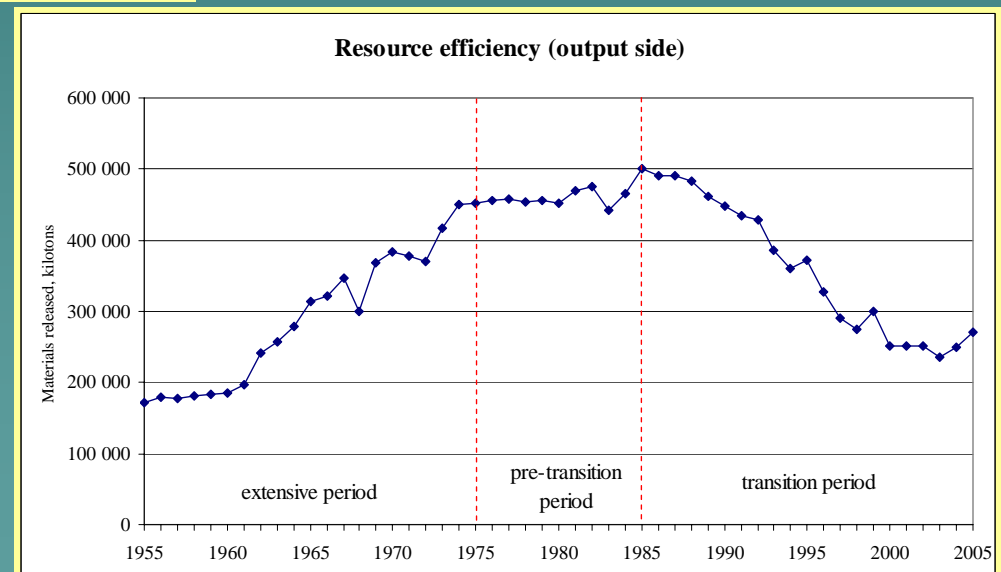
Urban Resource Efficiency: The Case of Budapest



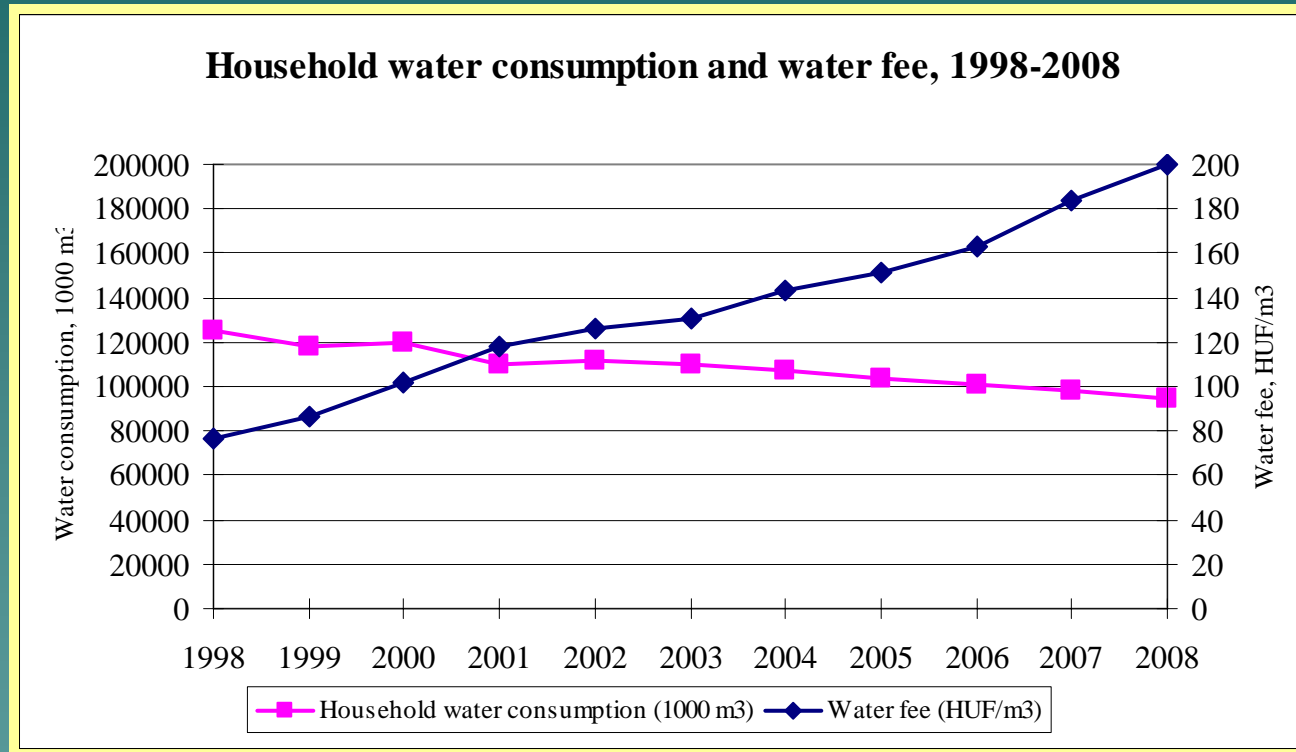
Evolution of urban metabolism in historical perspective, 1955-2005

Input

Output



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Selected resource-related targets from Budapest Environmental Programme 2008-2013 (approved in November 2007)

Energy

1. Total energy consumption is reduced by 10 % by 2013 (insulation, individual heat metering and regulation).
2. Energy consumption of city-owned public institutions is reduced by 10 % by 2013.
3. Share of renewable energy use is 5 %.

Green areas

1. Green areas coverage is stabilized at 2005 level (48.7 %).
2. Per capita green area exceeds the 2005 level (6.2 m²/cap).

Municipal waste management

1. Per capita municipal waste generation is reduced from 580 kg/cap in 2006 to 540 kg/cap in 2013 (500 kg/cap by 2020).
2. Selective waste collection is increased from 30% in 2006 to 35% in 2013, biologically degradable organic waste from 4 to 25 %, packaging waste from 50 to 60 %.

Waste water treatment

For waste water treatment there are no concrete targets.

Danube is still the major sink (only 51 % of waste water is treated biologically).

OECD Recommendations

- ***OECD Council Recommendation on Material Flows and Resource Productivity C(2004)79***

- ***Draft OECD Council Recommendation on Resource Productivity***

„II. Take appropriate actions...by encouraging effective and economically efficient uses of natural resources and materials at the macro, sectoral and micro levels...”

„1.Consider the use of information...for planning purposes,... for target setting...”

...

„5. Contribute to the establishment of framework conditions that improve resource productivity through economic instruments.”

Conclusions and recommendations

- **Policy relevance of material flows related information should always be taken into consideration**
- **The OECD recommendations are very useful instruments to measure resource productivity at micro level including cities**
- **Analysis of urban metabolism/efficiency can contribute to sustainable city planning**
- **Data gaps in time series strongly limit overall calculations of aggregated material flow indicators and without careful consideration this can easily lead to misinterpretation**
- **Data quality and quantity on outputs should be improved in comparison with input side data**
- **Disaggregated information could provide much more relevant messages for policy-makers than highly aggregated indices at micro level**
- **Better exploration of dissipative resource flows (e.g. loss of water, heat and hazardous substances) can underpin resource efficiency measures**

Thank you for your attention!