

Report 2007
URBAN ECOSYSTEM EUROPE

***An integrated assessment on the sustainability of
32 European cities***



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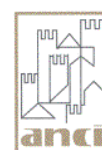
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1 INTRODUCTION

1.1 Aims, actors, policy framework

The UEE - Urban Ecosystem Europe - Report provides an integrated assessment of the urban environment in the main and bigger European cities and focuses on their local responses capacity and needs.

Many of the data used refers to 2006 – 07, thanks to the fact that the main source of data have been cities, actively involved in the data collection and quality check process.

The focus of the 2006 – 07 survey has been clearly addressed to the environmental sustainability dimension, with climate change as core issue. Meanwhile part of the analysis in the Report tries to integrate city environmental performances with their other social and economic characters and phenomena.

The survey results help to better understand strengths and weaknesses of the main EU cities. It could be used as a reference point to discuss the urban policy priorities and agenda at EU, national or local level. It could be a Baseline review, useful also for EU or for local target-setting practices.

The UEE - Urban Ecosystem Europe - survey has been financed – for the 2006 and 2007 yearly editions - by Dexia Group, an international banking group, world leader in funding sustainable development projects in the local public sector. The Report has been prepared by the Research Institute Ambiente Italia, in cooperation with Legambiente (Italian Ngo) and has been endorsed by EU City Networks such as ICLEI, Union of Baltic Cities, MEDCities, Climate Alliance, the French Comité'21, the Italian Agende21 Locali and ANCI. Strong interest in the results has been expressed by the European Environmental Agency, by DG Regio and DG Environment. Thanks should also be expressed to the REC and to the organisers of Sevilla 2007 and GlobalCity2007 Conferences who have invited the Urban Ecosystem Europe authors to present the initiative at relevant public events organised at European level.

The Urban Ecosystem Europe Survey intends to consolidate itself as a periodical reporting system and in so doing, is looking for new participants, new endorsers, partners and sponsors.

The set of indicators has been selected in 2006 focusing to the main scope of the survey (benchmarking EU cities), taking into consideration as much as possible the most valid and recent “common” European local Indicator systems and related research projects (as Urban Audit, ECI, TISSUE, STATUS,...) and the policy framework represented by the Aalborg Commitments, the EU Thematic Strategy on Urban Environment, the Leipzig Chart. The results of the first Survey year round, during 2006, have given important inputs, so the 2007 set has been refined working further on harmonisation, feasibility and relevance of indicators (see below, the indicators list).

1.2 Cities participating and Data collection

The Survey has focused its attention on main cities (capital and medium-big size) from all Member States and over (accession and neighbouring countries).

Cities active participation has been a success, as 32 cities have actively cooperated in the data collection phase (see the table with the cities participating and the year reference for data collection).

City	Country	2006	2007
Antwerpen	Belgium	x	x
Aalborg	Denmark		x
Aarhus	Denmark	x	
Barcelona	Spain	x	x
Berlin	Germany	x	
Bristol	United kingdom	x	x
Bruxelles	Belgium	x	x
Kobenhavn	Denmark	x	x
Dresden	Germany	x	
Durres	Albania		x
Goteborg	Sweden	x	x
Hannover	Germany		x
Heidelberg	Germany	x	x
Helsinki	Finland	x	x
London	United Kingdom	x	x
G.Lyon	France	x	x
Madrid	Spain	x	x
Milano	Italy	x	x
Munchen	Germany		x
Napoli	Italy	x	x
Lefkosia	Cyprus	x	
Paris	France	x	
Patra	Greece		x
Praha	Czech Republic	x	x
Riga	Latvia	x	x
Roma	Italy	x	x
Stockholm	Sweden	x	
Tampere	Finland	x	
Turku	Finland	x	x
Wien	Austria	x	
Oslo	Norway		x
Zaragoza	Spain	x	x

- 26 to the 2006 data collection phase
- 24 to the 2007 data collection phase
- 18 both to the 2006 and 2007 data collection

The participating cities belong to 16 different european countries: 5 cities from Germany; 3 cities from Finland, Denmark, Italy and Spain, 2 cities from France, Belgium, Great Britain and Sweden, 1 city from Latvia, Czech Republic, Austria, Albania, Cyprus and Greece.

In summary, 11 cities belong to northern Europe (including Great Britain), 10 to the central area, 9 to the south and 2 to the east Europe.

12 of the urban areas considered have more than one million inhabitants and 5 of these exceed 2 millions. Also medium sized EU capitals are included, so varying between 150,000 and 750,000 inhabitants. The 2007 Report adapts the comparison and benchmarking exercise to these main differences.

1.3 Data availability after the 2007 collection

Updated data (mainly referring to 2006 and 2007) have been collected – by means of questionnaires and direct e-mail/phone contacts – with the active cooperation of participating cities, involving their high level responsables and internal staff also in the final data quality check.

The 2006 and 2007 data collection exercise has so provided also a lot of useful informations in regard to environmental data availability and quality at urban level in EU (and related needs).

In summary:

- Updated air data (collected in 2007) regarding PM10, NO2 and O3 concentrations was sent by 23 cities.
- Data about wastewater and water consumption (integrating 2006 and 2007 data collection) are available for 30 cities.
- Data on green areas and public transport passengers are available for 26 cities. Moreover 30 cities sent data regarding their cycle network.

- As regards energy data and climate protection policies, 25 cities gave information about solar panels installed on public buildings and the number of inhabitants connected to a district heating system, while less than half of cities sent data on electric consumption and CO2 emission balance.
- Waste production and waste separated collection data are available for all the participants. Moreover about a third of the cities sent data related to their Green Public Purchasing policies.

1.4 Other urban data sources considered

Some other sources have been considered, mainly as a way to cross check the quality of data sent by cities or as a reference for the data interpretation (see the following list). In few cases (named in the Report) some of them have been used to integrate few data missing for some city (e.g. on Air quality):

Air quality: Database of European Topic Centre on Air and Climate Change (ETC/ACC) – Research centre in support of the European Environmental Agency (EEA), which collects data on air quality and emissions of individual member states.

Web site: <http://air-climate.eionet.europa.eu/>

Green areas: European Environmental Agency (EEA): Green urban areas within urban morphological zones – study by the European Environmental Agency on the identification of green areas within artificially arranged urban areas in a continuous manner.

Web site: <http://dataservice.eea.europa.eu/dataservice/metadetails.asp?id=816>

“Urban sprawl in Europe - The ignored challenge (EEA – JRC, 2006)

Mobility: Urban Transport Benchmarking Initiative – European project organized by Transport and Travel Research Ltd (TTR), which compares the data on public transportation relating to a sample of 35-40 European cities.

Web site: <http://www.transportbenchmarks.org>

Waste: Municipal Waste Management Report - Association of Cities and Regions for Recycling and sustainable resource management (ACR+), which compares data on waste management for a number of EU cities.

Socio-economic structural patterns : DG Regio/Eurostat - Urban Audit data base and related publications (as “Key indicators on living conditions in EU Cities” published in 2004 and “State of European Cities Report”, published in 2007). The available data still refer to period 1991 – 2001, but have been used as basis for integrated analysis or as a starting point for the cluster exercise. Some of the Urban Audit social and economic indicators and some of the results of the 2006 opinion survey, have been also included in the Report. .

1.5 The indicator set

The set considers the main socio-economic data as a structural pattern that must be taken into account in interpretations and so the more conventional indicators (as Inhabitants, area, density, GDP, activity rate and unemployment) are used as “identity card” for the single city profile presentations. The UEE indicators set is based on the 10 Aalborg Commitments contents, but have been aggregated in 6 main themes (partially changing the AC order of presentation).

Local Action for Health and Natural common goods

1. Air quality: PM₁₀ concentrations
2. Air quality: NO₂ concentrations
3. Noise map and noise reduction plan
4. Domestic water consumption
5. Inhabitants served by water treatment plants

Responsible consumption and lifestyle choices

6. Electric consumption variation
7. Amount of municipal waste produced
8. Municipal waste processed according to differentiated refuse collection schemes
9. Green public procurement procedures and purchasing

Planning, design and Better mobility, less traffic

10. Passengers travelling on public transport within the urban area
11. Underground and tram lines in the urban area
12. Number of registered cars
13. Cycle paths and lanes availability
14. Public green areas availability

Local to global: Energy and Climate change

15. Setting of an Energy Balance and a CO₂ reduction target
16. Solar power generation in public buildings
17. Inhabitants connected to a district heating system
18. Climate and Energy saving policies

Vibrant, Sustainable Local Economy and Social equity, justice and coesion

19. Demographic and old age dependency
20. Female employment
21. Population qualified at highest level of education

Local Management towards sustainability and Governance

22. EMAS and ISO 14001 certification of public authorities
23. Level of implementation of Agenda 21 processes
24. Electorate voting in city elections
25. City representatives who are women

1.6 The Report structure

The 6 chapters of the Report develop each of the above selected indicators, elaborating comments, data and graphs related to different city performances, organising them with reference to the main issues/commitments engaging European cities, summarising the main messages shown by the data analysis.

The Report is completed by Synthetic Profiles, that give the position of each city with respect to best and median values – for each indicator - registered by the other cities involved in the survey (see below a more detailed Reading guide, that explains how the Synthetic Profiles are structured).

The Synthetic Profiles (2007 update) are reported at the end of this document.

Synthetic Profiles Reading Guide

The synthetic profiles presented below for each of the cities are divided in four parts:

Identity Card - The table indicates the data providing the context for the city: inhabitants, area, density, GDP.

Graph of the environmental performance - The ranking chart (radar graph) illustrates the positioning of the city in terms of 9 of the 14 key indicators considered in the Table of indicators (see below). The values are normalised, in such a way that the far end of each radar corresponds to the best value registered by a city (depending on the specific case, the 5th or the 95th percentile was used as the benchmark). For each of the indicators selected, the city's performance is compared with the median, meaning the value registered by the city found at the mid-point of the distribution.

Indicators Table - For the 14 quantitative key indicators, the table shows the value registered by the city, the best value registered, the median value and the worst value registered.

Policies Table - The table provides predominantly indications (yes/no or the reference year) about the policy measures implemented by the local governments with regard to the following topics: Climate change, Noise pollution, Governance and integrated management.

2 SUMMARY: HOW IS THE SITUATION ? ARE THERE POSITIVE REACTIONS ?

The European Commission since more than 15 years has put in place strategic papers (e.g. the Strategy for Sustainable development, the Thematic Strategy for Urban environment and the Leipzig Chart), binding Directives (e.g. related to air, noise, water), relevant funding programmes, and also voluntary schemes, labels, awards, campaigns. The aim has been to stimulate national and local governments to adopt their own initiatives in a framework of common goals.

The Report and the following selected examples put in evidence the main problems, some of the results, and the different strength and capacity expressed by national and local governments in Europe.

2.1 European citizens are exposed to relevant health risks, due to air pollution. The situation is still over the limit.

In about the 45% of the 32 European cities examined, at least one air monitoring station has registered in the last year a value related to PM₁₀ concentrations exceeding the limit value of 40 µg/m³, defined by WHO as the limit to be respected to protect human health.

The situation is more critical (65%) in the bigger urban areas. In London and Barcelona, in the districts where the traffic is more intense, the limit has been exceeded (more than the double of the limit value). In Milan and Rome the limit has been overcome in the "background" stations sites too.

Health risks are due also to PM₁₀ intense pollution episodes: 35 is the maximum number of days allowed for exceeding the limits of daily concentrations of 50 mg/m³. In this case the EU cities situation is really bad. The 84% of the 32 cities overcomes the limit. In London, Rome, Milan and Madrid for a number of days higher 4 times the limit. Helsinki and Goteborg and other 4 northern cities (the smaller) are the only ones in line with the EU Directive.

Also for NO₂ the situation is critical: the 90% of the 32 cities are really far by the target of 40 µg/m³ to be reached by the 2010 and the 60% doesn't respect the present limit (50 µg/m³ by 2005).

2.2 Car users are invading cities, but local policies could succeed.

All European cities are looking for solutions to face the motorised traffic growth and to avoid its negative effects on the urban quality of life (pollution, noise, public spaces occupation, waste of time ...) and on climate changes.

One of the main local responses is the development of collective transport ways able to compete with the private car use. This is already a reality in Prague, city where are registered 718 passengers/inhab/year and where workers use public transport (58%) more than cars (27%): Many passengers also in Rome, Wien and Milan, with 400 - 500 pass/inhab/year. The public transport system use is less polluting in Wien (by bus only the 15%, by underground and tram the other 85%) than in Rome (by bus the 74%). About 350 pass/inhab/year also in Berlin and Madrid, where tram and metro are well developed.

Another important alternative to car use inside a city is the bicycle, if integrated to public transport use and protected by cycle lanes. Smaller cities (less than 300.000 inhab.) as Turku, Aalborg, Tampere and Aarhus offering a cycling network of about 300 km achieved the result to convince many citizens to use the bicycle also for home-to-work trips (in Aalborg and Aarhus about the 20%). Also medium sized cities as Helsinki (more than 1.500 km of lines), Stockholm and Hannover (about 750 km) offer a focused policy. Hannover and Kobenhavn implemented also speed reduction on a significant part of their roads (660 and 117 km respectively) and now register the maximum use of bicycle in home-to-work trips (29%. In Kobenhavn). Among bigger

cities the best are Wien and Munchen. At the bottom of the rank are the southern cities, as Rome, Milan, Madrid, Naples, Zaragoza, Patrasso.

Thanks to the combined use of the bicycle for short medium trips and public transport for longer trips, Wien, Goteborg, Helsinki, Hannover, Kobenhavn and Stockholm achieved the goal to maintain below 50% the use of car for home to work trips.

Italian cities (where car is used up to 70% for home to work trips) and Belgian too, are at the worst level for the number of circulating cars (or – if not circulating - taking public spaces): Naples and Milan exceed 60 cars every 100 inhabitants and Rome even reaches 70 cars, really a lot compared with Paris (26), Berlin and London (30), Riga and Kobenhavn (20).

2.3 Municipal waste are wasting of energy and materials, but local policies and life styles can make the difference.

Waste production is growing almost in every european cities. Only Dresden citizens are able to limit the production under 1 kilo a day (334 kg/inhab/year) as the target that 5 years ago was set up by European policies. All the others cities produce more then 400kg/year and some up to 700 kg.

But some administrations, thanks to good separated collection policies and rate (in some cases over 50%), are able to reduce the amount of residual waste to be disposed. Aalborg, the city with the highest per capita waste production (680 kg/inh) manages to reduce the residual waste to 250 kg/inh, thanks to a very high separated collection rate (62%). Dresden and Munchen under 200kg/inhab and Berlin, Goteborg, Kobenhavn and Antwerpen under 300 kg/inh.

In the South cities as Naples, Rome, Patra and Lefkosia register more then 500kg/inhab/year as the amount of residual waste to be disposed.

2.4 Risks due to climate changes could be avoided also thanks to local administrations, but now it's time to act.

A good majority (21) of the 32 cities has adopted local CO2 reduction targets, in some cases higher then the national ones set up to respect the Kyoto Protocol. Many of them is also strongly acting to achieve them: Barcellona, Hannover, Munchen, Oslo, Zaragoza, Prague and Rome have defined very innovative local regulations to improve energy efficiency in their building stocks.

Solar panel diffusion, to produce thermal or electric energy in public buildings, is growing in Central and Southern cities. Some of them have really overcome all the others. Wien is the best for thermal panels (about 13.000 m²). Good also Barcelona and Lyon (4.300 m² and 3.500 m²). Munchen is the absolute winner for photovoltaic panels on public buildings (more then 4.000 kW), well higher then the second and the third in the rank (Barcellona and Rome). German cities as Heidelberg, Helsinki and Dresda are the best also among smaller sized cities.

2.5 Is there any ideal sustainable city ?

It could be if

- The air quality standard are respected as in Goteborg (and Helsinki).
- Water consumptions are under 100 litri/inhab, as in Dresden (and Heidelberg) and the 100% of inhabitants are served by water treatment (as most european cities, but not all).
- Waste production is mantained under 334kg/inhabitants/year as in Dresden, or at least waste not differentiated are under 250kg/inhabitants/year as in Munchen and Antwerp, thanks to separate collection up to 62% as in Allborg or up to 50% as in Helsinki.
- Public procurements are extensively green as in Kobenhavn and electric consumptions in the last 5 years are in reduction (-26%), as in Oslo.

- The public transport is used as in Prague, Stockholm and Wien (58, 47 and 45% of home to work trips) and citizens are satisfied of its quality as in Wien, Munchen and Berlin.
- Car is used very less then other ways, as in Barcelona and Madrid (35% of the total home to work trips) and its ownership is a “past life style” as in Kobenhavn and Riga (20 cars/100 inhab) or as in Berlin, London, and Paris (30-26).
- Bicycle is the transport mean of the future as in Copenaghen (29%) also thanks to a wide bike network as in Helsinki (1.500 km), in Stockholm and in Hannover (about 750 km).
- Citizens have more then 200sq each of green areas (of which more then 40sq/inhab of urban parks), as in Oslo and in Goteborg.
- A large number of public buildings use solar panels to produce hot water or electricity as in Wien, Munchen and Barcelona or have been audited and retrofitted to improve their energy efficiency as the 80% of them in Oslo.
- More then 93% of the population is served by distrct heating as in Helsinki and in Kobenhavn or more of 25% is served by green energy as in Oslo and Heidelberg. .
- Integrated environmental management schemes (ISO or EMAS) are applied to improve the efficiency of the public administrations as in Kobenhavn, Bristol and Oslo or Agenda 21 participated processes are well developed as in Aalborg, Hannover, Munchen and Stockholm.
- The city environment is friendly for children and attractive for young people as in Kobenhavn, Munchen, Berlin and citizens have very high educational level as in Dresden, Prague and the other german cities.
- Women role is promoted (> 70% activity rate in the labour market) as in all nordic and german cities and is recognised (>50% of elected representatives in the municipality) as in Stockholm.
- Citizens participate to local election (>80%) as in Riga and in all the Danish, Belgian and Italian cities.

Is it a dream? The following chapters will provide you all the details to better understand the feasibility (and the difficulties) of this perspective.

3 LOCAL ACTION FOR HEALTH AND NATURAL COMMON GOODS

- Air quality: PM₁₀ concentrations
- Air quality: NO₂ concentrations
- Noise map of the municipal area and noise reduction plan
- Domestic water consumption
- Inhabitants served by wastewater treatment plants

3.1 Air quality: PM₁₀ concentrations

People living in densely populated urban areas are exposed to growing concentrations of air pollutants and the limits of the air quality fixed by the EU Commission for protecting the health are often exceeded. Fine particulate matter (PM₁₀) – originated from traffic, domestic heating and industrial plants is currently the most critical pollutant for many of these areas. Breathing the particulate matter could be very dangerous for our health because it absorbs cancerogenous chemical substances.

The reported values, even if they are not exhaustive, allow a rather homogeneous benchmark among cities. The hot spots (most critical situations) have been highlighted, taking into account both the traffic areas and the background ones. In fact, data are referred to the worst values registered by a “traffic station” and the worst values registered by a “background station”¹.

Referring to data evaluation, we have to take into account that, on the basis of the WHO - World Health Organization recommendations, directive 1999/30/EC provides that the annual mean of PM₁₀ concentrations had to respect a limit value of 40 µg/m³ by 2005 and a lower limit value of 20 µg/m³ must be reached progressively by 2010.

Data collected, mainly related to 2006 and 2005², show a widespread criticality. 45% of cities exceed – at least in one monitoring station - the human health protection limit of 40 µg/m³. The percentage raise to 65% if we consider the big urban areas.

In 9 big cities at least one traffic station registered annual mean concentrations higher than the limit value; in Milano and Roma the value of 40 µg/m³ has been exceeded in background stations too. London and Barcelona present hot spot related to very critical traffic point where the annual mean is 50% over the limit value.

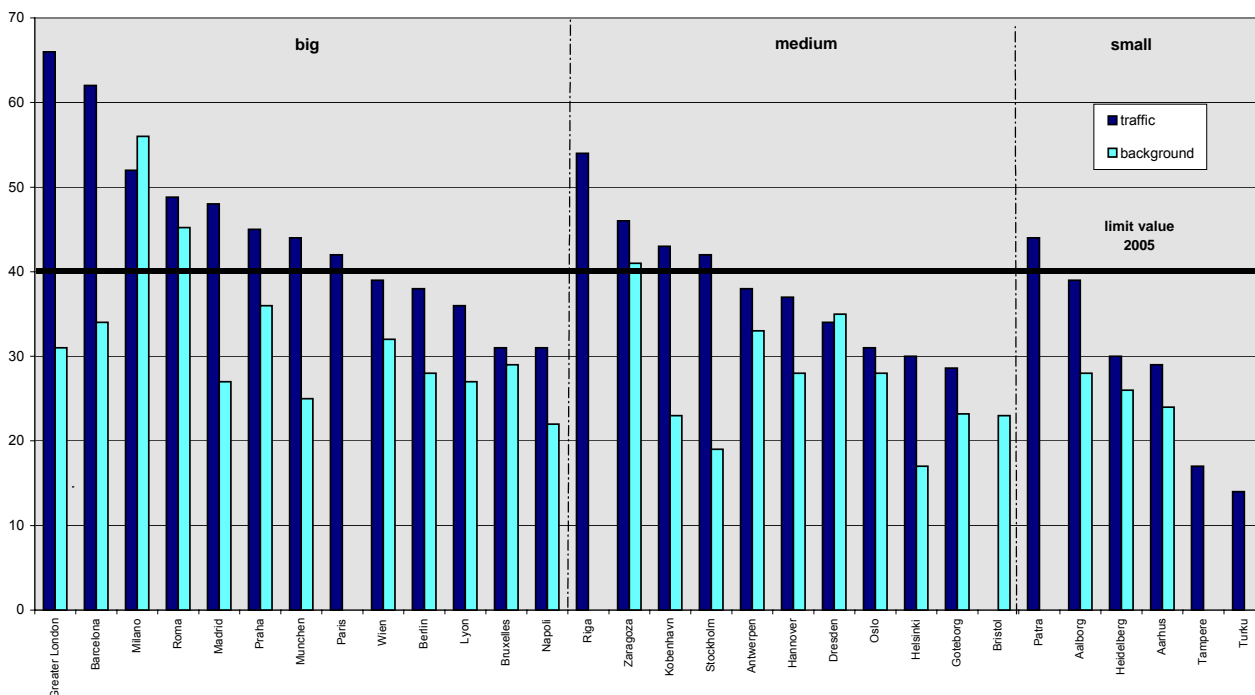
PM₁₀ concentrations get better in medium and small cities, even if some medium cities as Saragoza (both traffic and background stations), Kobenhavn and Stockholm exceed the annual mean of 40 µg/m³. Patra is the small city that exceeds the limit value.

Referring to the 2010 target of 20 µg /m³ all the cities – with the exception of Turku and Tampere – have a sampling point where this target has not been reached yet.

¹ The measured value could be strongly affected by the placement of monitoring station, even if the monitoring station have to be placed according to the criteria fixed by the EU directives and it may be assumed that in large cities, at least this type of monitoring systems, are located in areas with similar conditions.

² Data refer to 2006, with the exception of: Stockholm, Wien, Berlin, Dresden, Aarhus and Tampere (ETC/ACC 2005); Antwerpen, Kobenhavn and Napoli (2005); Praha (2003/05).

PM₁₀ concentrations: highest annual means (µg/mc)



Directive 1999/30/EC provides also human health protection limits which are referred to a maximum number of intense pollution episodes: starting from 2005, 35 is the maximum number of days allowed for exceeding the limits of daily concentrations of 50 mg/m³.

In this case, the situation gets decidedly worse: 84% of the cities are not in compliance with the directive. Only two small northern cities registered less than 35 days with daily concentrations higher than 50 mg/m³.

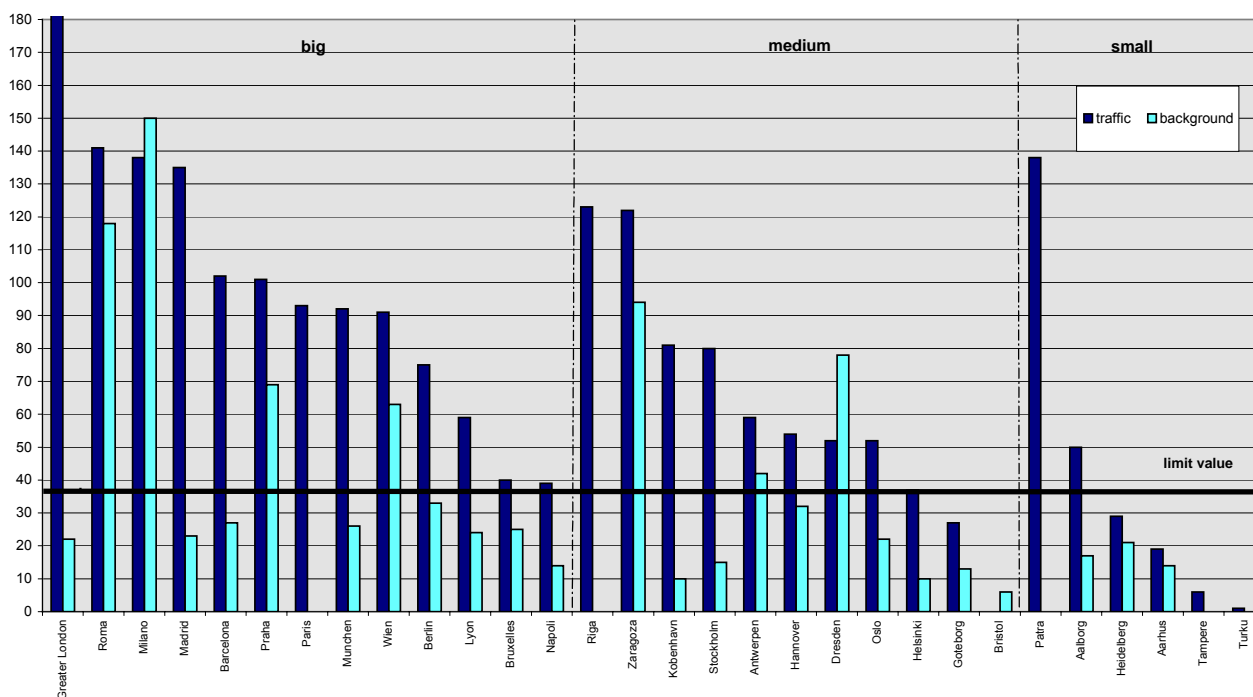
All the big cities have - at least - a traffic station which does not comply with this limit value and in many of the sampling points the number of days recording a daily mean higher than 50 mg/m³ is more than double of the 35 days allowed. In London, Roma, Milano and Madrid it is more than four times. Roma and Milano, together with Praha and Wien, exceed the limits also in background stations.

Saragoza and Riga are the medium sized cities which score the highest concentrations, but also city with low background values – like Kobenhavn or Stockholm – show critical traffic points registering a number of days of exceedances which is two times the allowed one.

Dresden and Antwerpen exceed the 35 days both in traffic and background stations, while Helsinki and Goteborg are the only ones complying with the limits³. There are also 4 small northern cities with less than 35 days: Aalborg, Aarhus, Tampere e Turku. Conversely, Patra shows 130 days over 50 mg/m³, a situation which is very similar to bigger cities like Madrid, Milano or Roma.

³ Bristol does not have values related to traffic stations

PM10 concentrations: number of daily means exceeding 50 µg/mc (highest values)



3.2 Air quality: NO₂ concentrations

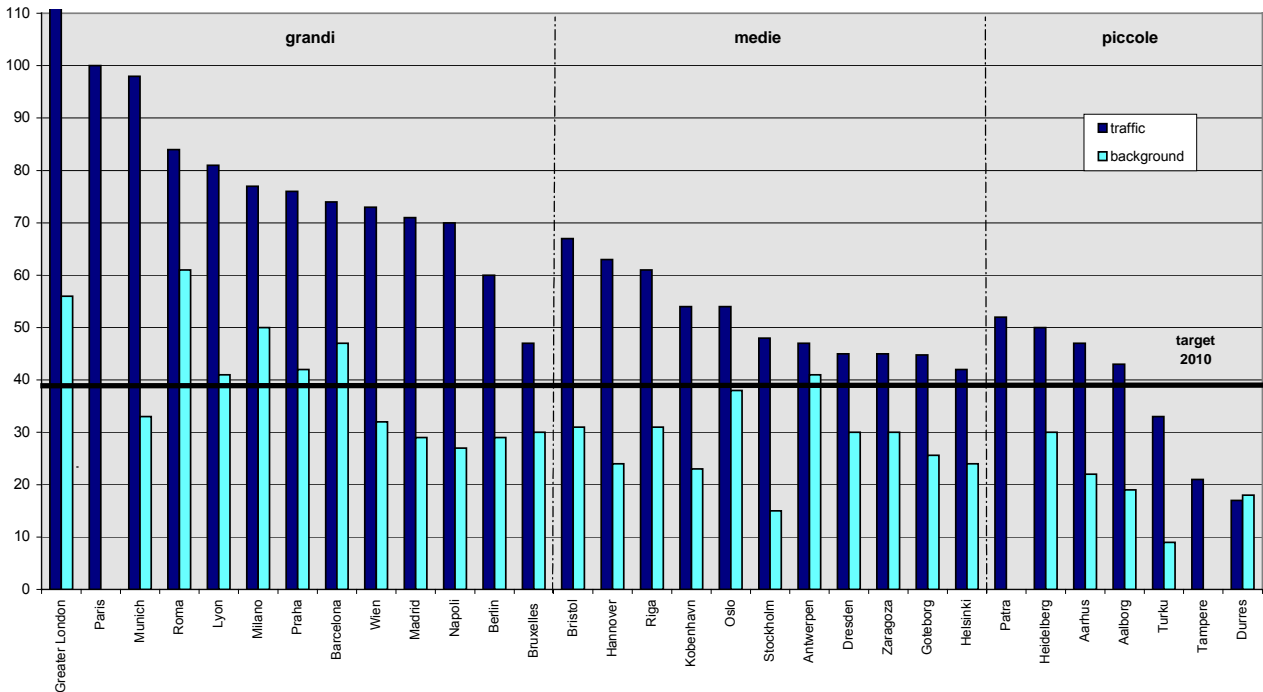
The nitrogen oxide (NO₂), another substance coming from combustion processes, is one of the most dangerous pollutants. In spite of the fact that emissions have decreased by approximately 25% compared to 1980, thanks in particular to the introduction of catalytic converters, the EEA estimated that approximately 30% of urban population live in cities with basic concentrations exceeding the NO₂ limit of 40 µg/m³ (annual mean concentration), target value for the protection of human health to be achieved in 2010, as by directive 1999/30/EC.

Also in cities where concentrations are currently below the limit values, it is very likely to find some “hot spots” - in particular in the areas with a lot of traffic – where these limits are exceeded. 90% of the 32 participating cities have a traffic station where the annual mean is still far from the target value of 40 µg/m³ and 60% of them do not comply with the limit value of 50 µg/m³ set for 2005 (target value plus a decreasing tolerance).

All the big cities, with the exception of Bruxelles, are over the legislative threshold and the target value, and five of them – London, Paris, Munchen, Roma and Lyon - show values which are more than two times the 2010 target. London, Roma, Milano, Praha e Barcelona exceed 40 µg/m³ in background stations too.

Half of the medium sized cities, although they exceed the 2010 target value, complies with the limit value of 50 µg/m³ set for 2005, also in traffic stations. The situation is better in the seven smaller cities, especially the northern ones. Tampere, Turku and Durres still comply with the 2010 target, while only the traffic station of Patra exceeds 50 µg/m³.

NO2: highest annual means ($\mu\text{g}/\text{mc}$)



3.3 Noise map of the municipal area and noise reduction plan

The effects of noise on the health of a person can vary considerably, depending on the individual being considered, and can include sleep disturbances, negative repercussions on hearing and on certain physiological functions (generally of cardiovascular nature). A study by the WHO ("Community Noise - Environmental Health Criteria" - 1996) indicated that average levels greater than 40 dB(A) have an influence on the overall quality of life, while average values greater than 60 dB(A) can ultimately have physical and psychological effects on the individuals involved. Further studies carried out on the consequences of noise on human health indicate that the noise level outside of buildings should not exceed a Leq – the equivalent level of sound pressure – of 65 dB(A), a threshold of exposure at which serious consequences for health can already be noted.

In 2002 the European Commission issued a Directive (2002/49/EC) on assessment and management of environmental noise, with the aim to define a common approach to "avoiding, preventing or reducing the harmful effects of exposure to environmental noise". In essence, it was suggested to carry out noise mapping in order to identify the most critical situations, to inform the population on the results obtained and to implement noise management plans at local level.

The noise map has become a widespread instrument among European cities: half of the 32 participating cities just drew up and approved a noise map of their municipal area and 10 more cities are going to approve it (six of them by the end of 2007). At the same time, only a quarter of the cities faced up the further step approving a noise reduction plan; 7 administrations are going to approve it very soon (four of them are expecting to approve the plan in 2008).

Barcelona, Heidelberg and Turku have been the first cities drawing up a noise map (1997 and 1998). Barcelona's noise reduction plan has been in force since 2000; the Heidelberg's one since 2003. Other two cities which approved some years ago their noise reduction plan (before elaborating a noise map) are Bruxelles (1997) and Madrid (2001).

Nevertheless the growing diffusion of these mapping and planning instruments, only six cities, according to the noise directive 2002/49/EC, have been able to send data about the population exposed to the different day and night noise levels.

	Noise map		Action plan to reduce noise	
	adoption	year	adoption	year
Aalborg	approved	2006	no	
Aarhus	approved	nd	approved	nd
Antwerpen	no		no	
Barcelona	approved	1997	approved	2000
Berlin	approved	nd	approved	nd
Bristol	na		na	
Bruxelles	approved	2004	approved	1997
Kobenhavn	to be approved	2007	no	
Dresden	to be approved		no	
Durres	no		no	
Goteborg	to be approved	2007	to be approved	2008
Hannover	approved	2000	no	
Heidelberg	approved	1998	approved	2003
Helsinki	approved	2007	to be approved	2008
London	approved	2004	approved	2004
Lyon	to be approved	2007	to be approved	2008
Madrid	to be approved	2007	approved	2001
Milano	to be approved	nd	to be approved	
Munchen	to be approved	2007	to be approved	2008
Napoli	approved	nd	to be approved	nd
Lefkosia	no		no	
Oslo	to be approved	2007	to be approved	2008
Paris	approved	nd	approved	nd
Patra	no		no	
Praha	approved	2006	no	
Riga	no		no	
Roma	approved	nd	to be approved	
Stockholm	approved	nd	to be approved	
Tampere	approved	nd	to be approved	
Turku	approved	1998	no	
Wien	to be approved	nd	to be approved	
Zaragoza	approved	2004	no	

3.4 Domestic water consumption

Water is a precious resource, but has been subject to increasing human pressures in the last few years. The sustainability of the water resource is threatened in many European regions, due to the lowering and salination of groundwater aquifers, reduction of the flows of surface waters and widespread pollution.

The Framework Directive on Water (2000/60/EC) requires that the member countries promote a sustainable utilization of water resources on the basis of a long-term protection policy and ensure a

balance between extraction and recharge of groundwater for the purpose of achieving a good condition within 2015.

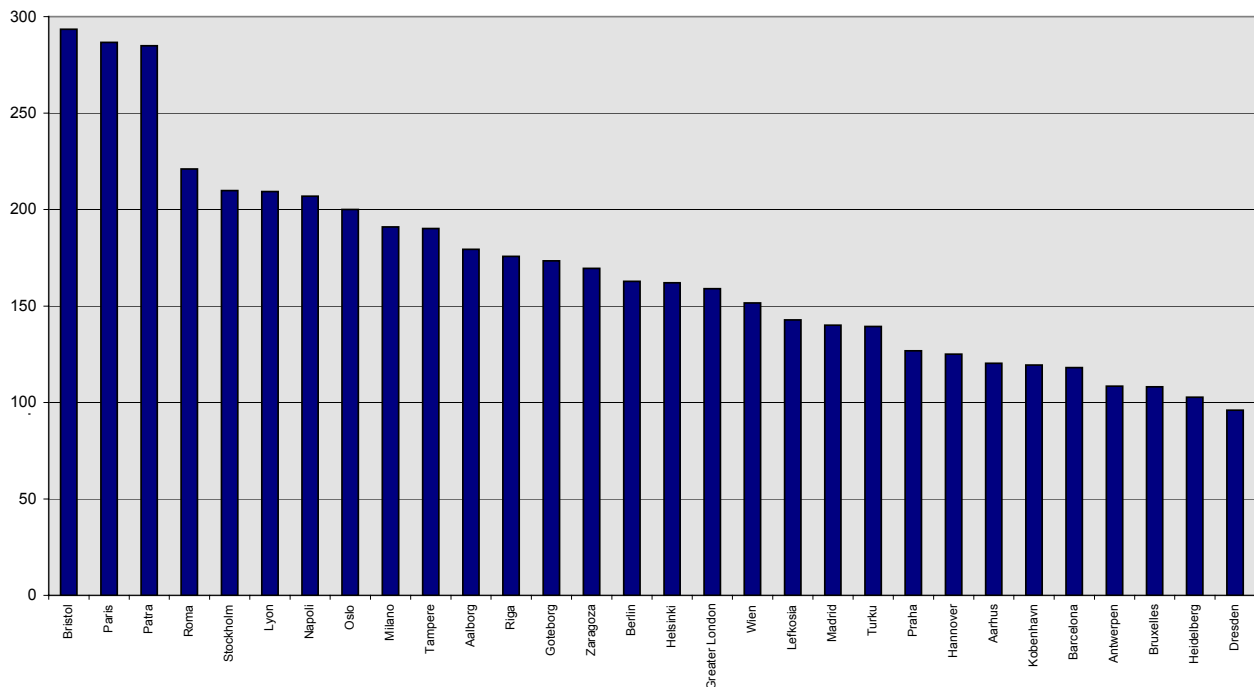
In 2003 in Europe urban water consumptions represented 18% of the total, preceded by energy consumptions (33%) and agricultural consumptions (37%). In 2003, approximately 40% of urban water consumptions were concentrated in the countries of southern Europe, followed by those of central Europe and northern Europe (35%), whilst incoming countries weighted in whole for 23%.

In the 31 European cities taken into consideration, the per capita water consumption goes from 100 litres per day recorded in Dresden and Heidelberg to 300 litres per day in Milan. These are data whose variability is due to water management policies, individual behaviours and life styles, the economic structure of the city and the presence or not of large tourist flows. High water consumptions are often also a cause of further energy consumptions due to collection, pumping, treatment, etc.

Most of the cities (77%) show values ranging from 120 to 220 litres/inhabitant/day. Under 120 litres/inhabitants there are only two Belgian cities - Bruxelles and Antwerpen - together with the German ones. On the contrary, Bristol, Paris and Patra have higher values than the average, exceeding 280 litres/inhabitants.

Excluding these “extreme” values - what’s more, referred to cities differing a lot one each other, both for dimensional and geographical aspects – we can notice that cities from Central Europe show average values (123 l/inh daily) which are lower than the northern ones (167 l/inh daily) and the southern ones (168 l/inh daily). The size factor seems not to be very important, even if smaller cities – on average - tend to record lower consumption (about 145 l/inh daily) than the bigger ones (about 160 l/inh daily) .

Domestic water consumption (l/inh/day)



3.5 Inhabitants served by wastewater treatment plants

Another important pressure on water resources in urban areas is undoubtedly the large volume of sewage water produced, one of the main causes of eutrophication and pollution of surface waters.

The EU countries, which first engaged in policies for reducing eutrophication and improving the quality of waters are those in the north. In these countries, the largest part of the population is now connected to a treatment plant whilst only half of the population in southern and eastern countries is currently connected to a treatment plant.

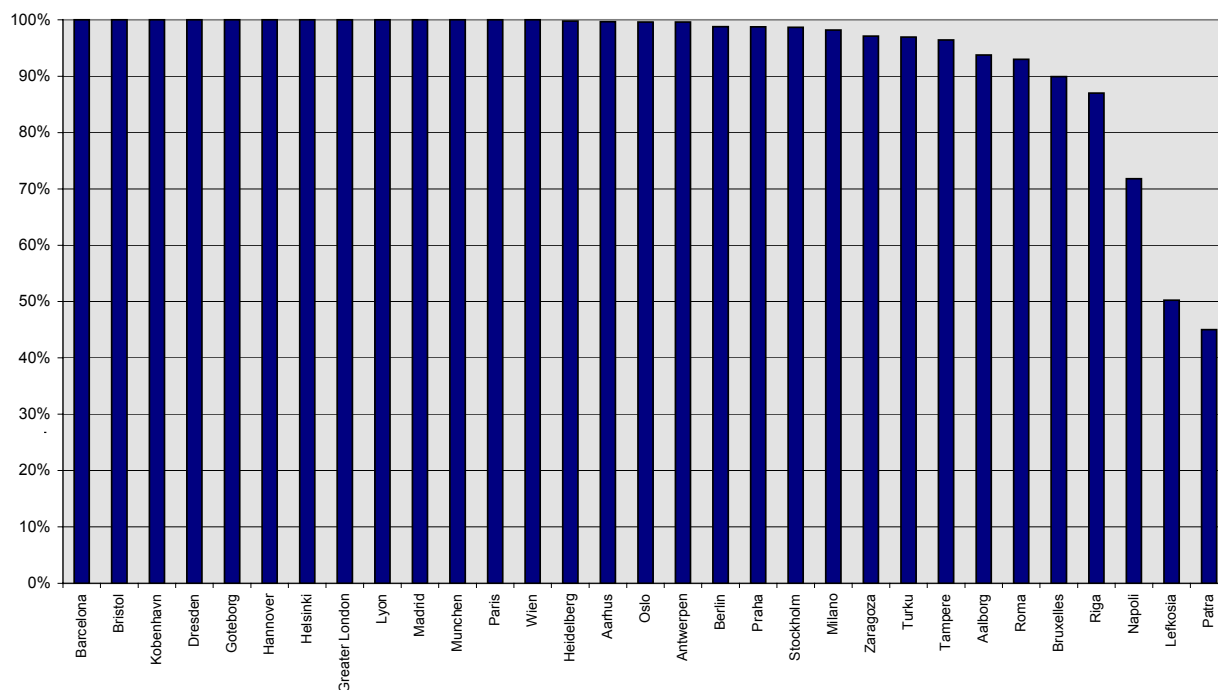
The picture arising from our 32 cities is definitely better: quite all their inhabitants are connected to a wastewater treatment plant, even if some differences in the kind of treatment to which the sewage is subject, still remain. More than a half of the cities (17) have all the population connected and 7 more cities exceed 95%. The three cities with lowest values are all from the south: Napoli (72%), Lefkosia (50%) and Patra (45%).

The plants may be differentiated depending on the treatment to which the sewage is subject; there are primary treatment plants which have the objective of removing suspended solids, secondary treatment plants which, in addition to the above, permit the removal of the organic biodegradable substances and separate non-subsiding solids and, finally, there are plants with tertiary treatment, which add to the preceding phases also a reduction in the load of nutrients, such as phosphorous and nitrogen, which contribute to the eutrophication of waters.

Among the cities with more than 95% of population connected, 20 use exclusively or prevalingly tertiary treatment plants and 6 use secondary treatment plants (London, Praha, Barcelona e Zaragoza, Turku and Tampere)⁴.

The re-use of treated water is not widespread yet: only Milano (37%), Aalborg (1%), Madrid (1%) and Antwerpen use the waters coming out of treatment plants for agricultural or industrial purposes or to wash the streets.

Inhabitants connected to a wastewater treatment plant (%)



⁴ No data for Helsinki.

4 RESPONSIBLE CONSUMPTION AND LIFESTYLE CHOICES

- Electric consumption variation
- Amount of municipal waste produced
- Municipal waste processed according to differentiated refuse collection schemes
- Green public procurement procedures and purchasing

4.1 Electric consumption variation

In Europe there are noteworthy variations in the electric energy consumption per capita in the different countries. Available data related to the per capita values registered in a specific year differ a lot⁵. In the north (Iceland, Finland, Norway and Sweden) higher levels of per capita consumption could often be related to the fact that electricity (produced in those countries mainly by hydroelectric plants) is promoted as CO₂ free and as local production. For this reason we have considered as more relevant indicator the variation (during the period 2000-2005) of the electric domestic consumption in the 32 participant cities.

The collected data (sent by 11 cities)⁶ show a general stability of electric domestic consumption, both in northern (Aalborg, Kobenhavn) and southern (Milano, Napoli) cities. Oslo is the only city showing a strong reduction (-26%), even if Oslo still remain the city with the highest per capita level. On the other side, the highest rates of growth are those of Praha (+21%) and Barcelona (+26%). Barcelona at the moment is one of the city showing the lowest per capita consumptions (less than 1.000 kWh in a year), together with Hannover and Kobenhavn.

4.2 Amount of municipal waste produced

The production of waste is the one environmental pressure that has registered, in recent decades, the highest growth rates, due to a steady population growth and a rise in living standards, based on an ever-increasing consumption.

Municipal waste production does not consider only the waste produced by households, but also the quantities generated by other urban and similar activities. The individual behaviours of private citizens, together with the implementation (or not) of policies regarding the correct management and disposal of waste produced by commercial enterprises (starting with packaging), are thus two factors that play a fundamental role in determining total quantities.

The data published by the EEA show that the desired decrease in the quantity of waste disposed in landfills has still not taken place, seeing that, as mentioned earlier, the production of waste grows without interruption. The new EU Strategy on waste prevention and recycling [COM (2005) 666] is no longer based on the per capita objective of 300 kg set by the past 5th Action Program, maybe cause this target has been reached by only a few countries in the East Eu, while the countries with the most advanced economies badly missed the target.

⁵ Data sent differ a lot and need a further investigation. They range from a yearly per capita value of 1.000 kWh (Barcelona, Kobenhavn and Hannover) to 2.500 kWh (Helsinki and Turku) and over 5.000 kWh (Oslo).

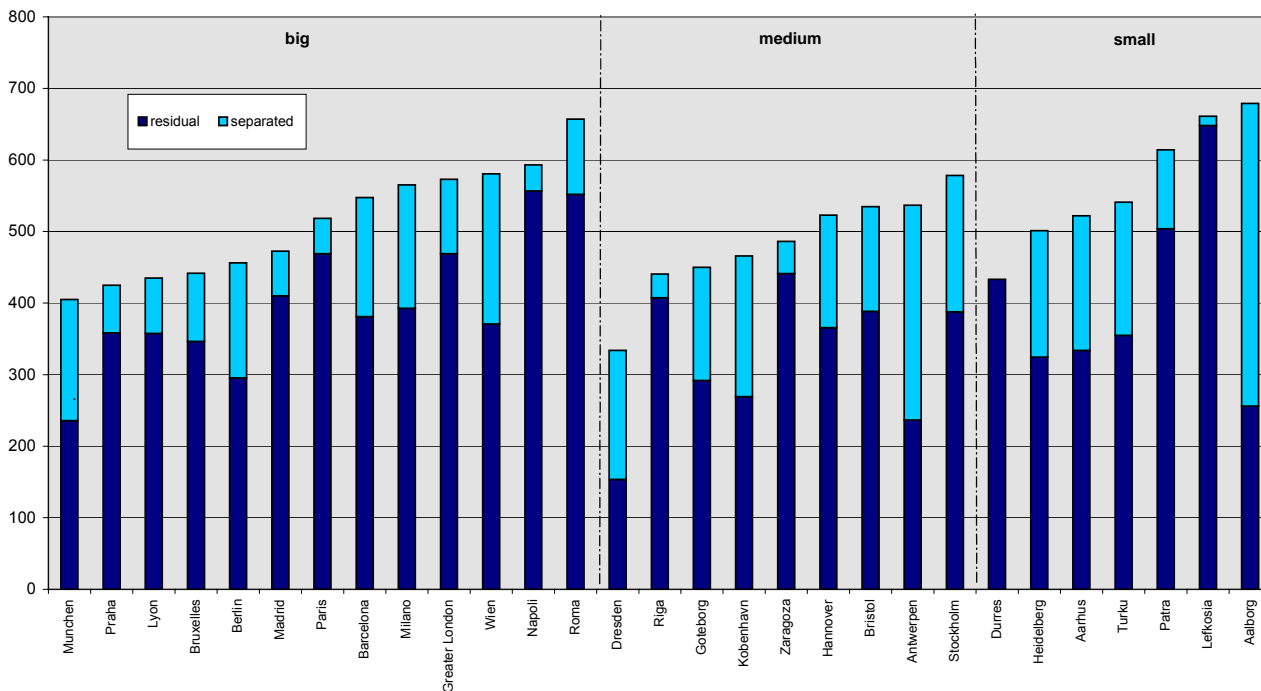
⁶ Barcelona's variation is referred to the years 1999-2004. In order to make cities comparable, all the other values reported in the graph have been referred the period 2000-2005, making an evaluation for those values related to other different period of time, in particular Hannover (1997-2005) and Madrid (2003-2006).

Data referred to 29 European cities confirm this is a still faraway target: only Dresden (334 kg/inh year) is able to produce less than 1 kg per inhabitants daily, while in the other cities the municipal waste production ranges from 400 to 700 kg/inhabitant⁷. Munchen, Praha, Lyon, Bruxelles and Berlin are the big cities which succeeded in containing the annual production between 400 and 450 kg/inh, while Napoli and Roma are the ones with the highest per capita production.

Rather all medium sized cities range from 450 to 550 kg/inh. Stockholm reaches 580 kg/inh. Smaller cities, both southern and northern ones, have – on average – a highest production. Durres is the only city showing a value under 500 kg/inh while Patra, Lefkosia and Aalborg exceed 600 kg/inh.

Dresden and Munchen produce less waste than the other cities and, at the same time, have a lower amount of residual waste to be disposed thanks to a good separated collection rate. Despite their higher production, Berlin, Goteborg, Kobenhavn and Antwerpen have been able to contain the waste to be disposed under 300 kg/inh. In particular, Aalborg, the city with the highest per capita waste production (680 kg/inh) manages to reduce the residual waste to 250 kg/inh, thanks to a very high separated collection rate.

Per capita urban waste production (kg/inh year)



The difference in the level of economic development definitely underlies the fact that are the cities of Eastern Europe which show the lowest levels of per capita waste production: Dresden (former East Germany) shows the lowest value, followed by Riga, Praha and Durres. The same levels of production have also been reached by Munchen, Berlin, Lyon, Bruxelles and Goteborg, cities characterized by a longer tradition for educational campaigns in the field of waste reduction and recycling.

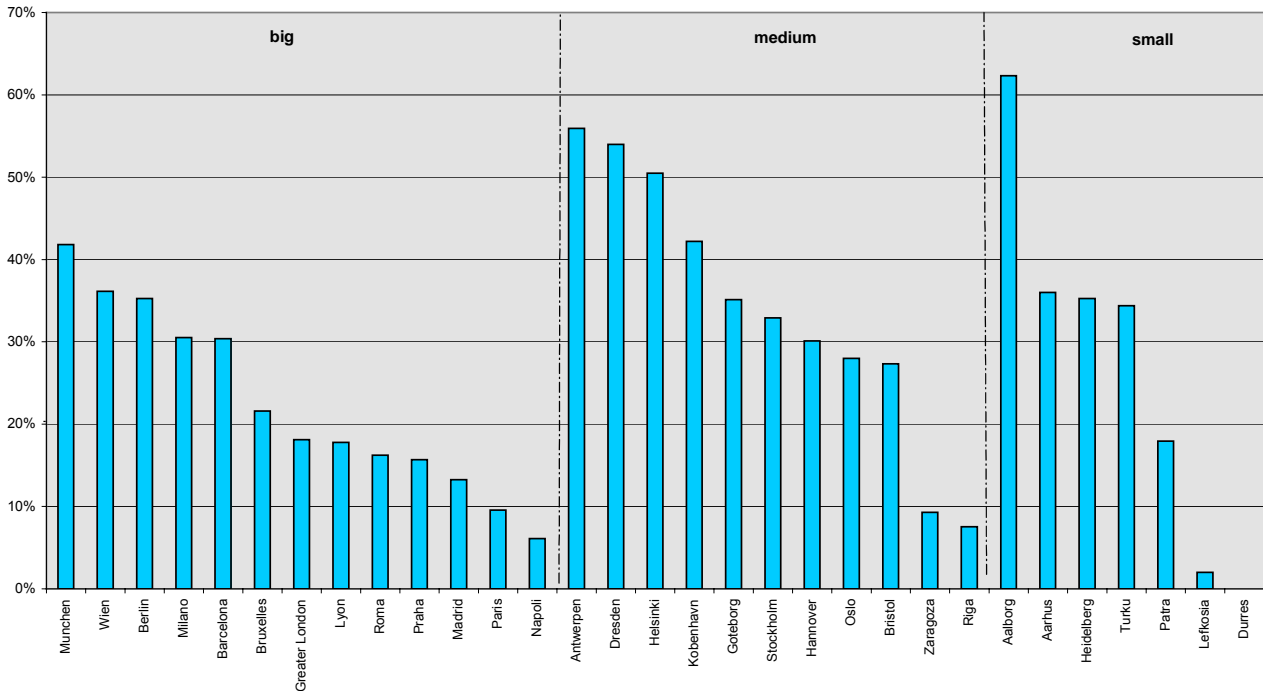
⁷ Oslo (406 kg/inh) and Helsinki (734 kg/inh) data have not been reported. The Oslo value is referred only to household, while Helsinki have included waste collected by private companies, showing a value which completely differs from the one sent in the previous edition of the report (546 kg/inh).

4.3 Municipal waste processed according to differentiated refuse collection schemes

Differentiated refuse collection schemes have been well developed in some northern cities, especially in the small and medium sized ones.

Helsinki, Dresden and Antwerpen achieve the 50%, while Aalborg reaches the 62%. Among cities showing the highest separated collection rates there are also Kobenhavn and Munchen (42%).

Separately collected fraction of urban waste (%)



Medium sized cities are all over 25%, with the exception of Zaragoza and Riga which are still under 10%. Other three small sized cities, together with Aalborg, have reached 35%, while a differentiated refuse collection scheme is still missing in Durres and Lefkosia. Especially in big cities, the separated collection of waste has not been developed enough. Only five administrations, Munchen included, achieved 30%, while many big cities do not reach 20%. Paris and Naples remain, respectively, at 10% and 6%.

Countries with a higher consideration for the environment and sustainability issues (Northern and Central Europe) register not only the highest level of separated waste collection, but also the best public purchasing policies of recycled paper too. More than 90% of the paper purchased by the public administrations of Munchen, Wien, Antwerpen, Kobehavn, Goteborg, Aalborg, Hannover and Zaragoza is recycled or eco-labelled paper. With the exception of Zaragoza, all these cities have separated collection rate of municipal waste which are over 30-35%.

4.4 Green public procurement procedures and purchasing

The purchase of environmentally-friendly products is one of the strategies most frequently employed in attempts to reduce waste production. Similar efforts being carried out at present by administrative bodies are still relatively episodic in nature and, in the majority of the cases, lack a truly systematic approach. A far-reaching green public purchasing procedure, regarding different categories of goods and not limiting itself to mere recommendations, and thus including also obligatory criteria, exists only in a few European cities (once again, especially in the central-northern regions, with a few exceptions).

According to our data, the best green public purchasing policies are those of Aalborg, Kobenhavn, Goteborg, Hannover and Heidelberg, even if good signals are also coming from Wien and Lyon and from southern cities like Roma and Barcelona. Kobenhavn, in particular, is the public administration where the green public purchasing policies reached the widespread diffusion. In Kobenhavn there are binding purchasing procedures that are related to the main categories of product: printers and photocopiers, office furniture, cleaning detergents and building materials. The 45% of meals served in public canteens uses, unless partially, organic products and the offices of the public administration are used to buy only recycled paper.

	GPP policies	GPP photocopiers printers	GPP cleaning detergents	GPP building materials	GPP office furniture	GPP organic food	% organic meals canteens	% recycled paper offices
Aalborg	yes	usually	usually	rarely	rarely	yes	5%	99%
Aarhus	yes	na	na	na	na	na	na	na
Antwerpen	partly	usually	usually	rarely	never	no	0%	100%
Barcelona	yes	usually	usually	rarely	rarely	no	0%	51%
Berlin	na	na	na	na	na	na	na	na
Bristol	yes	na	na	na	na	na	na	50%
Bruxelles	partly	never	usually	never	usually	na	na	na
Kobenhavn	yes	usually	usually	usually	usually	yes	45%	100%
Dresden	no	na	na	na	na	no	0%	0%
Durres	no	never	never	never	never	no	0%	4%
Goteborg	yes	usually	usually	rarely	usually	yes	10%	100%
Hannover	yes	usually	usually	usually	usually	no	0%	90%
Heidelberg	partly	usually	usually	usually	usually	no	0%	100%
Helsinki	partly	rarely	rarely	rarely	rarely	yes	2%	na
Lyon	yes	usually	usually	usually	usually	na	na	0%
Greater London	partly	na	na	na	na	yes	na	na
Madrid	yes	never	rarely	never	never	na	na	69%
Milano	na	na	na	na	na	yes	na	25%
Munchen	na	usually	usually	never	never	na	na	95%
Napoli	na	na	na	na	na	yes	25%	na
Lefkosia	no	na	na	na	na	no	0%	na
Oslo	partly	rarely	rarely	rarely	rarely	na	na	na
Paris	partly	na	na	na	na	na	na	50%
Patra	partly	never	never	never	never	no	0%	na
Praha	no	usually	usually	never	rarely	no	0%	0%
Riga	no	never	never	never	never	no	0%	na
Roma	partly	rarely	rarely	rarely	rarely	yes	100%	na
Stockholm	partly	na	na	na	na	na	na	na
Tampere	yes	na	na	na	na	no	0%	na
Turku	no	never	usually	never	rarely	yes	na	na
Wien	yes	na	na	na	na	yes	50%	100%
Zaragoza	partly	na	na	na	na	na	na	100%

In general, about a third of the surveyed cities adopted binding public purchasing procedures with obligatory criteria to promote sustainable products. The products generally more considered are cleaning detergents and printer/photocopier machines, while less than 20% of public administrations are used to apply sustainable criteria also for building materials and office furnitures. We noticed that 9 public administrations (of the 20 ones which sent data) uses more than 90% of recycled paper, while the use of organic food in public canteens is less widespread. In

Wien and Kobenhavn half of the meals served in a year have been made, at least partially, with organic food and Rome is the only administration reaching 100%.

5 PLANNING, DESIGN AND BETTER MOBILITY, LESS TRAFFIC

- Passengers travelling on public transport within the urban area
- Underground and tram lines in the urban area
- Number of registered cars
- Cycle paths and lanes availability
- Public green areas availability

5.1 Passengers travelling on public transport within the urban area

In urban areas, public transport and cycling are the two main alternatives to private motorised mobility.

As regards the demand for public transportation, data have been collected about the total number of passengers who, in the course of the year, have travelled on buses, subways, tramcars, cable-buses and trains that provide service in an urban setting.

Especially in big urban areas, the “potential” number of passengers of public transport does not correspond to the resident population only, because the local public transport network tends to serve a bigger area. This difference, in some cases, could be very high, influencing the per capita value of passengers per inhabitants⁸.

Due to the fact that the indicators on public transportation are more sensitive than others to the effect of the size of the city, it was decided to present the data on the basis of four clusters: metropolitan areas, big cities, medium-sized cities and small cities.

Metropolitan areas are: Paris-Ile de France (11 million inhabitants), Big London (7,5 million inhabitants) and Barcelona Region (5 million inhabitants). London shows the highest value (378 passengers pro capita), registering 59% of total trips by bus and 31% by subway. The lower figures of Paris (237 pass/inh) and Barcelona (147 pass/inh) are due to the fact that part of the considered public transport network and population refers to a demand/offer scheme more close to the extra-urban transport model. This is partially described by corresponding figures provided for rail: 22% in Barcelona, 29% in Paris, only 9% in London.

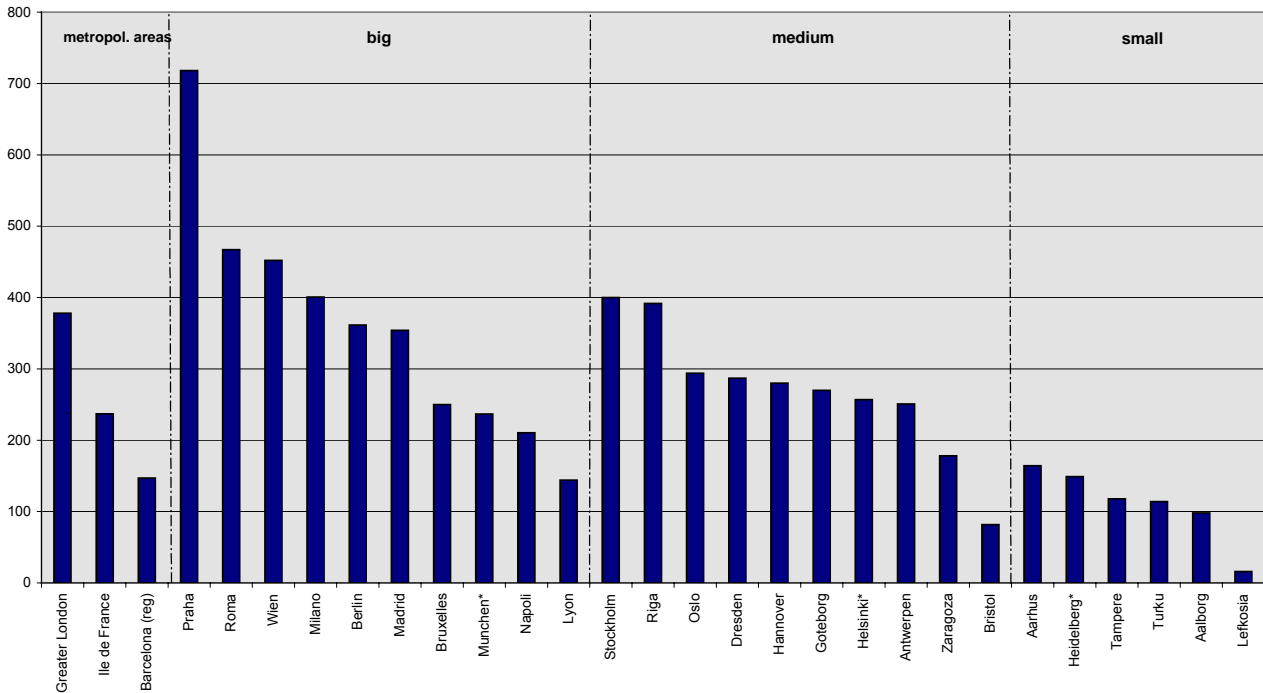
Praha urban area (1,7 million inhabitants) registers the best public transport use among the major cities: 718 passengers per inhabitant. In Praha public transport means are the most used for home-to-work trips (58% of the total trips, while 27% use cars)⁹. Rome, Wien and Milan follow, with values between 400 and 500 pass/inh. 74% of Rome passengers travel by bus, while in Wien the percentage falls to 15% advantaging underground (57%) and tram (28%). Milan splitted figure is not available. Daily home-to-work trips values result very different: 45% of Wien inhabitants say they use public transport to go to work, as many as those who say to use cars or bikes; in Milan the corresponding percentage drops to 32% (compared to 51% of cars and bikes); in Rome 22% (69% for cars and bikes). Berlin and Madrid register good values of public transport use (approx. 350 pass/inhab). In Berlin 67% of passengers travel by rail compared to 33% by bus; in Madrid the corresponding percentages are 59% (90% of them travelling by underground) and 41%. Half of

⁸ It is necessary to consider that the passenger/inhabitants indicator is “conditioned” by the way of determining public transport users pool: while in many cases it corresponds to the resident population, sometimes the pool is significantly wider. For example, Heidelberg, Helsinki and Munchen show a double value, while Hannover and Praha refers 50% more.

⁹ Urban Audit database is the source of home-to-work trips figures (years 2000-2001)

Madrid inhabitants (56%) say they use public transport for daily home-to-work trips, while 36% use cars or bikes.¹⁰

Passengers of public transport (pass/inh)



Among the medium-size cities Stockholm and Riga show values comparable with the best big cities (400 pass/inh), followed by Oslo and Dresda (slightly less than 300 pass/inh). In Stockholm and Riga rail transport is more used than bus; 62% of Riga passengers choose tram, while half of Stockholm passengers use the underground. The good public transport use in Stockholm is confirmed by 47% of people declaring to go to work by underground and/or bus, in comparison with 38% choosing car or bike¹¹.

All the small-size cities present results lower than 200 pass/inh, with only Aarhus (164 pass/inh) and Heidelberg (149 pass/inh) registering figures comparable with those of the major cities; in Nicosia public transportation is restricted to the category of a residual alternative. Both Aalborg and Aarhus - the two small cities where information on home-to-work trips are available – confirm a quite limited public transport use (approx. 10% of total trips), in comparison with 60% who use private car.

It is worth mentioning that Munchen, Helsinki and Heidelberg figures – like in Paris and Barcelona – refer to a public transport network serving a user pool twice the amount of the urban population, so acting partially as extra-urban network.

Finally, among the bigger cities, the best public transport popularity rating¹² is registered in Munchen, together with Wien and Berlin,; 52% of the citizens say to be very satisfied and 36% rather satisfied. On the other hand, the majority of Rome and Naples citizens declare to be

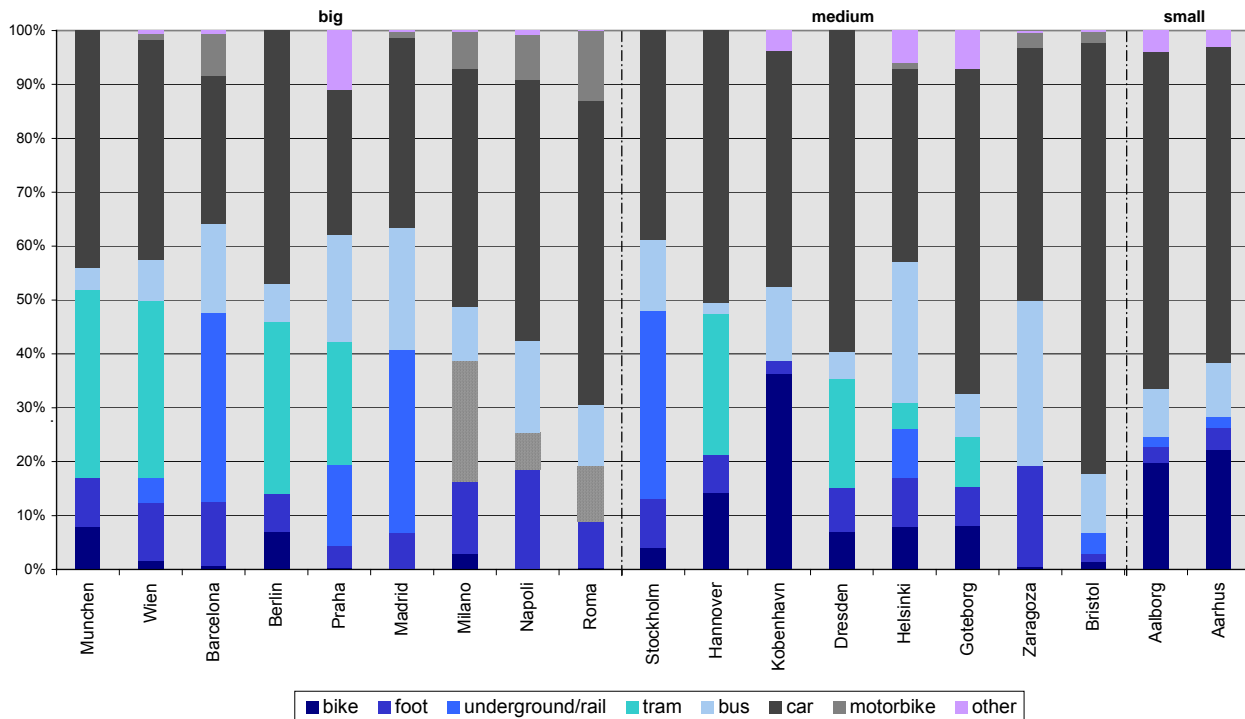
¹⁰ Berlin home-to-work trips figures do not record the percentage of underground users.

¹¹ Riga home-to-work trips figure is not available.

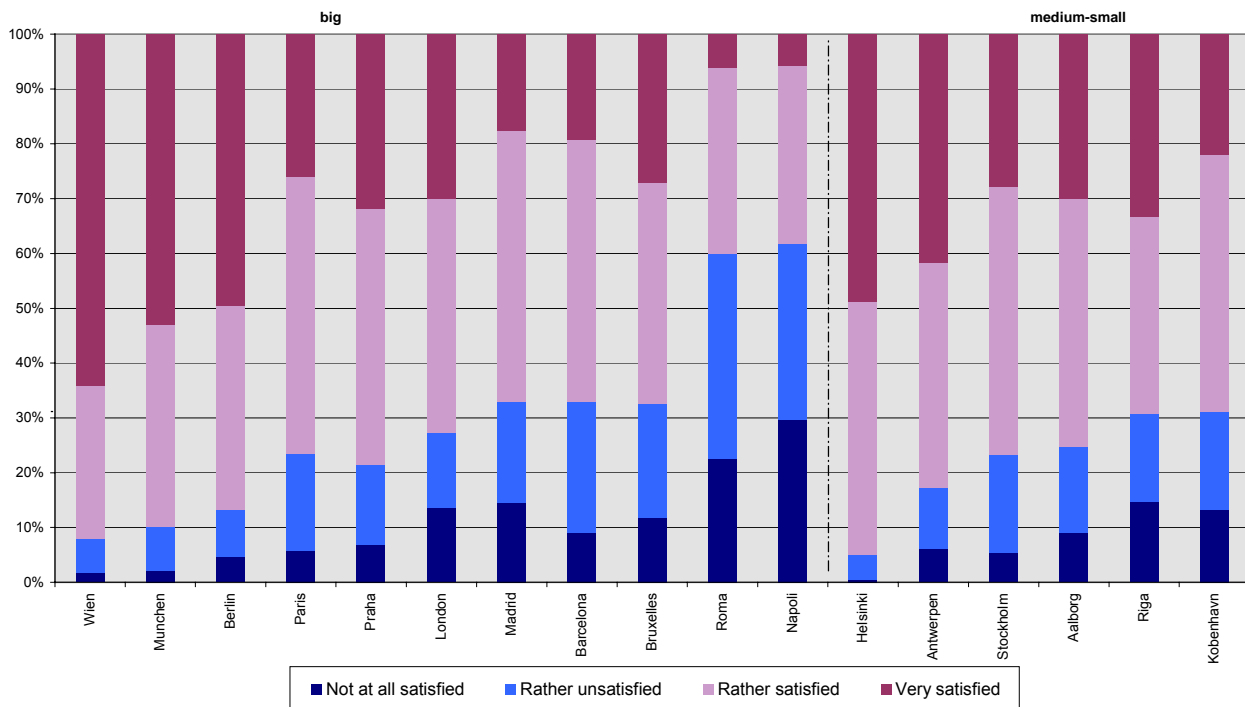
¹² Survey on quality of life in 70 European Cities. Eurostat-Urban Audit, June 2007

unsatisfied of their own city public transport. Among the medium-size and small cities Helsinki registers the best satisfaction value (more than 90% of agreements).

Percentage of journeys to work (%)



Level of satisfaction: public transport (% of inh)

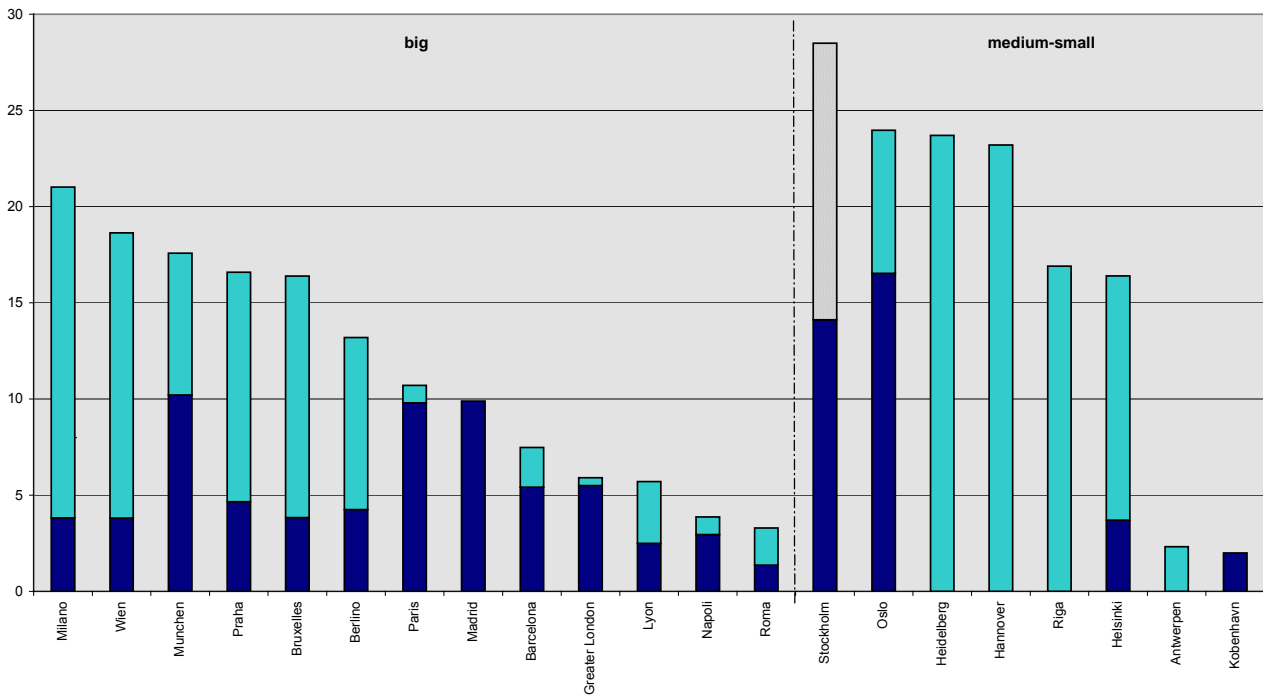


5.2 Underground and tram lines in the urban area

While the previous data – on demand figures - regard all the passengers transported by all forms of public transport, the following comparative analysis focuses on the supply side, measured in term of length of rail lines, meaning underground and tramcars, the less polluting public transport way.

London and Madrid are the urban areas provided with the most extended underground network (408 and 317 km respectively), followed by Paris, Berlin and Munchen (all between 100 and 200 km). Among the medium-size areas, Stockholm (108 km) and Oslo (89 km) show the biggest effort to invest in underground lines. These two cities register nearly 15 meters of lines for 100 inhabitants, 50% more than Madrid, Munchen and Paris¹³, the big cities with the best underground offer per capita (almost 10 m/100inh).

Urban rail lines: underground and tram (m/100 inh)



Berlin is the big city with the most extended tram lines network (300 km) followed by Wien (241 km) and Milan (225 km). Among the small cities, only Riga and Hannover exceed 100 km¹⁴. Hannover and Heidelberg show the best offer per inhabitant (nearly 23 meters/100 inh), followed by Milan and Riga (17 meters/100 inh).

A comparison of urban rail is more difficult to perform as only half of the cities provided these data; moreover not in all cases it was possible to distinguish lines (and passengers) serving exclusively urban areas¹⁵.

¹³ This figure was estimated for the 2 millions inhabitants of Paris city and not for the 11 millions of Ile de France.

¹⁴ Stockholm declares 110 km, including also urban rail.

¹⁵ Provided figures show a varied situation. For example, urban lines in Ile de France metropolitan area are meant to be three times longer than Big London ones (1.400 e 440 km respectively) and meanwhile equivalent to those of a much smaller area as Wien. Three German cities of different size - Berlin, Hannover and Heidelberg – show a similar extension, between 250 and 320 km.

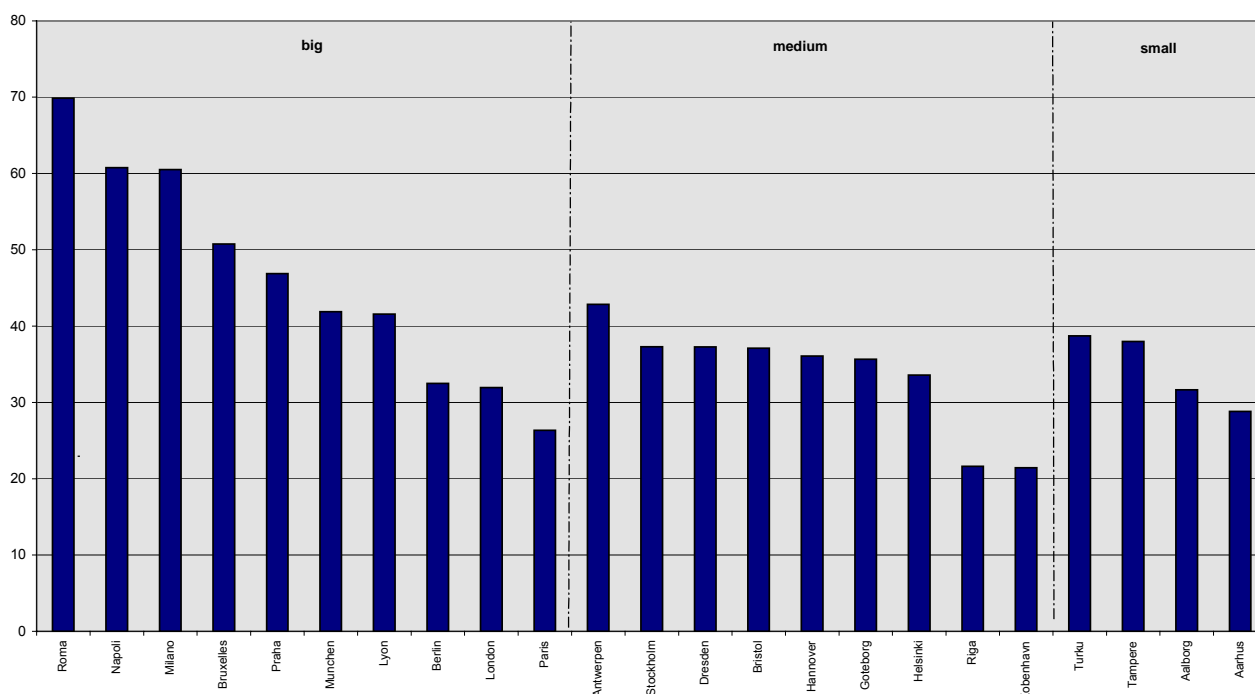
5.3 Number of registered cars

The number of circulating cars is a significant indicator to show human pressure on urban environment, both on congestion and traffic pollution side and on urban soil occupation. Mainly in the major urban areas the decision of buying a car is linked to existence of valid transport alternatives and of policy measures to decrease car ownership convenience.

In fact many cities implementing strong investments in public transport, cycling, road and park pricing, succeeded in reducing the number of circulating cars. In Berlin and London circulating cars are slightly more than 30 for 100 inhabitants; in Paris this figure falls to 26. Medium-size cities as Riga and Kobenhavn succed in reducing this figure to a little more than 20 cars for 100 inhabitants.

On the other hand, car density is still very high in Belgian cities and above all in Italian cities. Naples and Milan exceed 60 cars every 100 inhabitants and Rome even reaches 70 cars, almost 3 times the Paris figure.

Registered cars (car/100 inh)



5.4 Cycle paths and lanes availability

The other major alternative to the use of the private car in cities is undoubtedly the bicycle. Taken by itself, a far-reaching, highly developed network of bicycle paths is not enough to convince people to leave their cars at home (pricing leave and educational efforts remain a key factor), but it definitely represents an indispensable precondition to rendering the bicycle a widespread, viable alternative. The figures for the different cities show that the spread of bicycle paths is, first and foremost, a cultural factor, regardless of climate conditions.

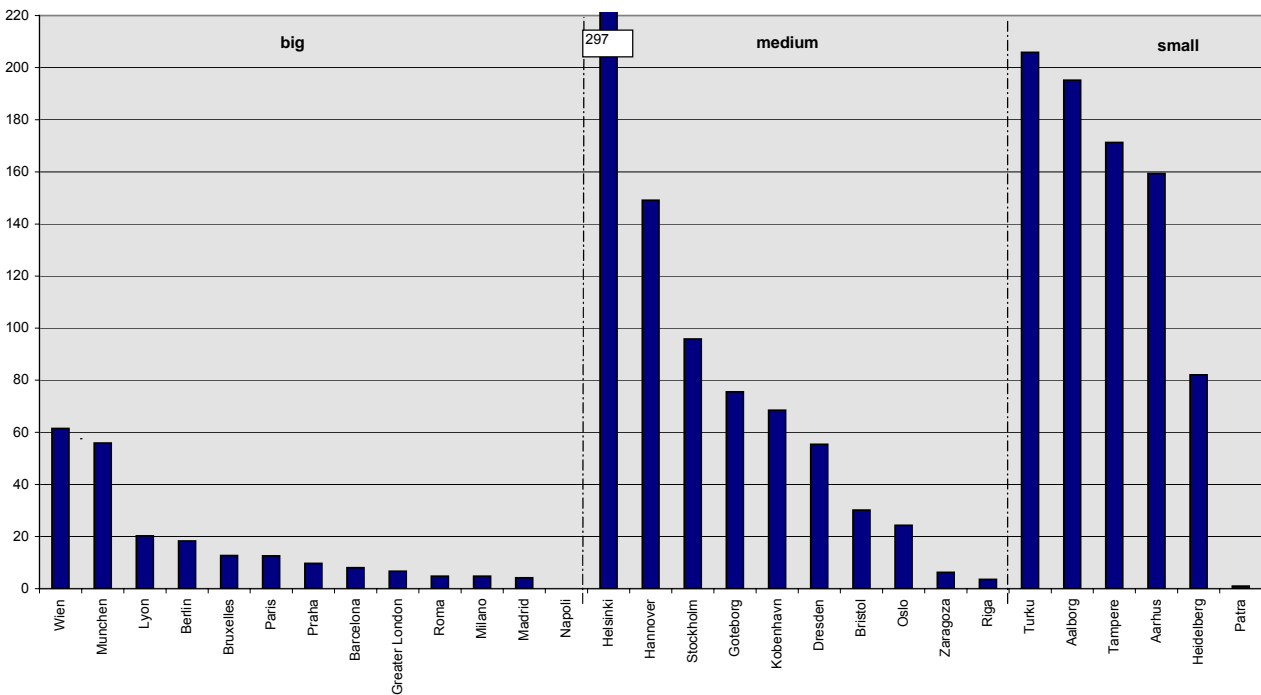
Many small Northern cities are first in the offer (and use) of cycle paths: Turku, Aalborg, Tampere and Aarhus implemented a network whose total extension is wider than 300 km. If referred to the resident population this figure means 160-200 meters every 100 inhabitants. Particularly Aalborg

and Aarhus confirm this vocation to cycling not only in supplying cycle paths but also on the side of users: one inhabitant out of five daily chooses to go to work by bicycle¹⁶.

Among the medium-size cities, Helsinki register the more extended network (more than 1.500 km) followed by Stockholm and Hannover (almost 750 km). Goteborg and Kobenhavn show a good cycle paths supply (nearly 350 km) as well. With refer to the supply for 100 inhabitants, Helsinki is first (300 meters), followed by Hannover and Stockholm (150 and 95 meters). In addition to cycle paths Hannover and Kobenhavn implemented traffic regulation measures – mainly by speed reduction¹⁷ - on a significant part of their roads (660 and 117 km respectively). These two cities register the maximum use of bicycle in home-to-work trips. Particularly in Kobenhavn the figure reaches the highest value in whole Europe: 29%.

The cycle paths supply for inhabitant and the percentage of use showed for the medium-small cities significantly fall in the major cities, but Wien and Munchen can stand the comparison. In Wien 1.000 km of cycle paths correspond to 62 meters every 100 inhabitants; this figure may become twice as big if including roads where traffic regulation measures are active. Munchen, even having a slightly inferior supply as lenght (750 km, 56 m/100 inh) and regulated traffic roads (450 km, 34 m/100 inh), is the big city where the percentage of bicycle regular users in home-to-work trips is higher (8%).

Cycle paths and lanes (m/100 inh)



The sharp difference between Northern continental countries and Southern-Eastern countries appears with evidence looking at the bottom of the list, as well. Rome, Milan, Madrid and Naples are among the major cities with less than 5 m/100 inh, while Zaragoza, Riga and Patrasso are placed at the end of the medium-small cities list.

¹⁶ Urban Audit database is the source of the home-to-work trips figures (years 2000-2001). Tampere and Turku values are not mentioned as referred to 1996

¹⁷ For example residential areas where speed limit is 30 km/h

5.5 Public green areas availability

The urban green has a fundamental role in qualifying big artificial areas as cities are: car free areas where people could relax, meet each other and enjoy themselves.

Green urban areas have different characteristics from one another, and are not always classified in the same way by the individual cities. On account of these potential differences and of the main scientific literature, we have defined four categories of green areas:

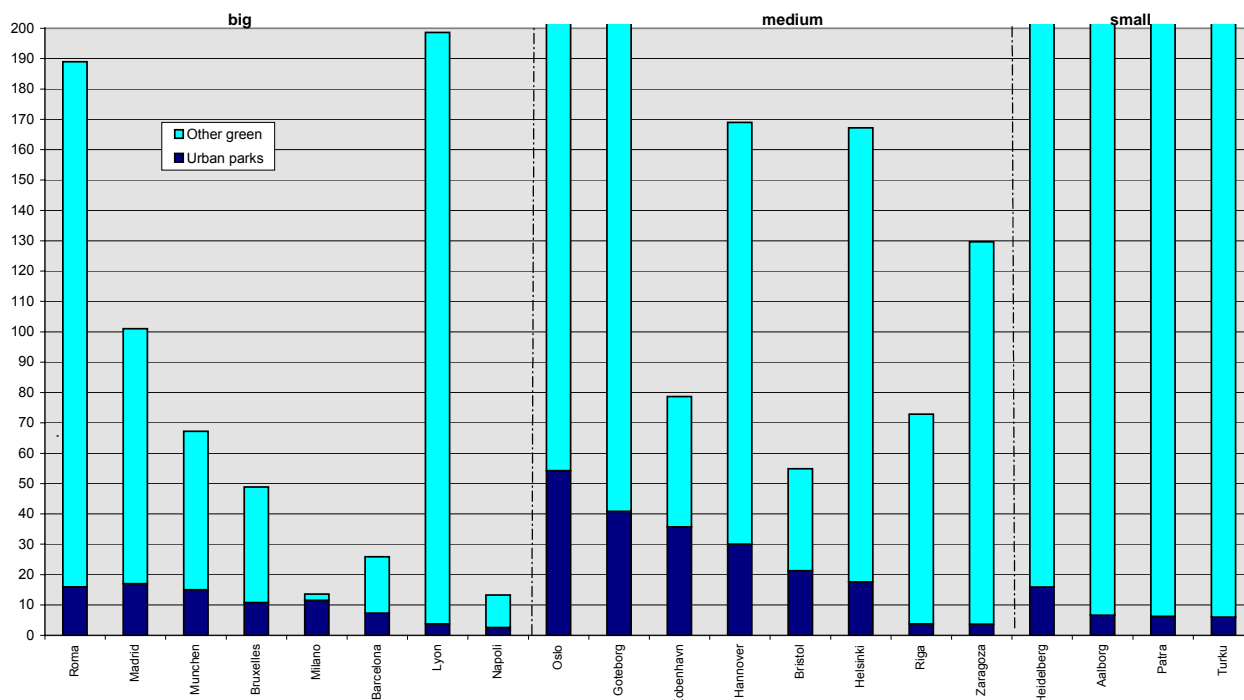
- *Urban parks* - Spaces with a small surface area (a few dozen or hundred hectares), located within the urban centre. The vegetation is very artificial; the main use corresponds to leisure (they are accessible to the public free of charge), as well as other functions which may be present (biodiversity...).
- *Peripheral parks* – Vast spaces (sometimes hundreds of hectares) on the periphery of cities that may be used for sports and leisure (they are accessible to the public free of charge). After some years, the biodiversity value is often taken into account, but in a relatively marginal way.
- *Protected areas* – Spaces (generally small areas) that may be strictly protected (limited access for the public) because of the biodiversity or other functions (supply of drinking water, military activities).
- *Woods and agricultural spaces* – Vast natural and agricultural spaces (some hundreds to dozens of thousands of hectares) that are often on the limits of an urban area even if, sometimes, they can be near the urban centre. Unlike the three earlier types, the land of these “parks” often belongs to private owners. The park is often governed by a specific set of regulations, depending on the national or regional legislation. The actions of the authorities in charge of promoting the balanced development of these lands range between the preservation of the biodiversity, maintenance of traditional activities, and making accessible the spaces for the public.

Collected data result strongly affected by the interpretation pattern used by the cities to analyse these four categories; splitted figures are not available everywhere. Where possible data were processed distinguishing only two categories: urban parks on one side, and external green areas on the whole on the other side¹⁸. Apart from the different adopted classification¹⁹, a better green supply in small-medium sized Northern cities clearly appears. Oslo, Goteborg, Kobenhavn and Hannover (nearly 500.000 inhabitants each) have more than 30 sq/inh of parks within the urban centres. Oslo and Goteborg are among the cities provided with the wider extension per capita of “external” green areas (630 and 320 sq/inh respectively). Bristol and Helsinki show a good urban green supply as well (approx. 20 sq/inh). In small cities park supply per capita result more restricted, while peripheric green areas are wider: from 400 sq/inh in Patraso, to 700 sq/inh or even more in Aalborg and Turku. Among the major cities, Rome, Madrid and Munchen have to be pointed out because of their better park supply per capita (more than 15 sq/inh) and peripheric green as well, particularly in the case of Rome (173 sq/inh).

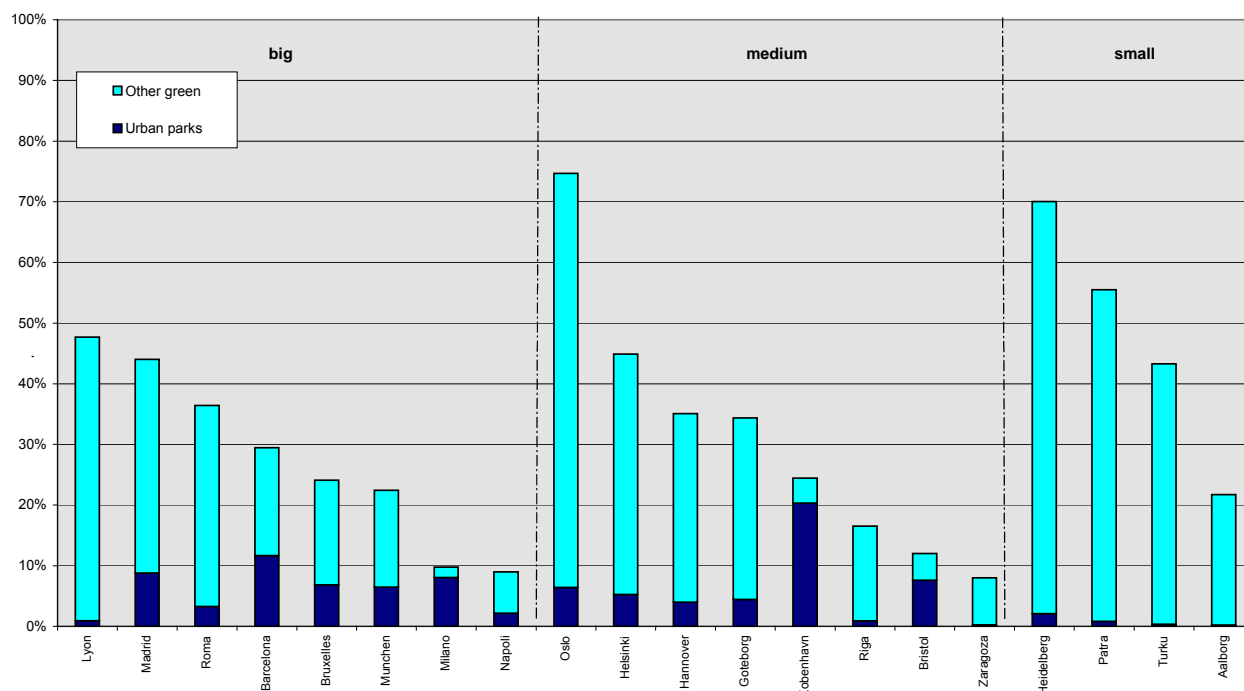
¹⁸ Sum of peripheric parks, protected areas and agricultural areas or forests. Italian cities figures are taken by Italian Urban Ecosystem and do not include the category “agricultural parks and forests” because the cities were not able to provide demanded data following this classification.

¹⁹ For example in Northern countries the urban areas and surrounding forests – in fact considered as public parks and so used by the population – result not separated but linked by a sort of urban “continuum”.

Parks and gardens (m²/inh)



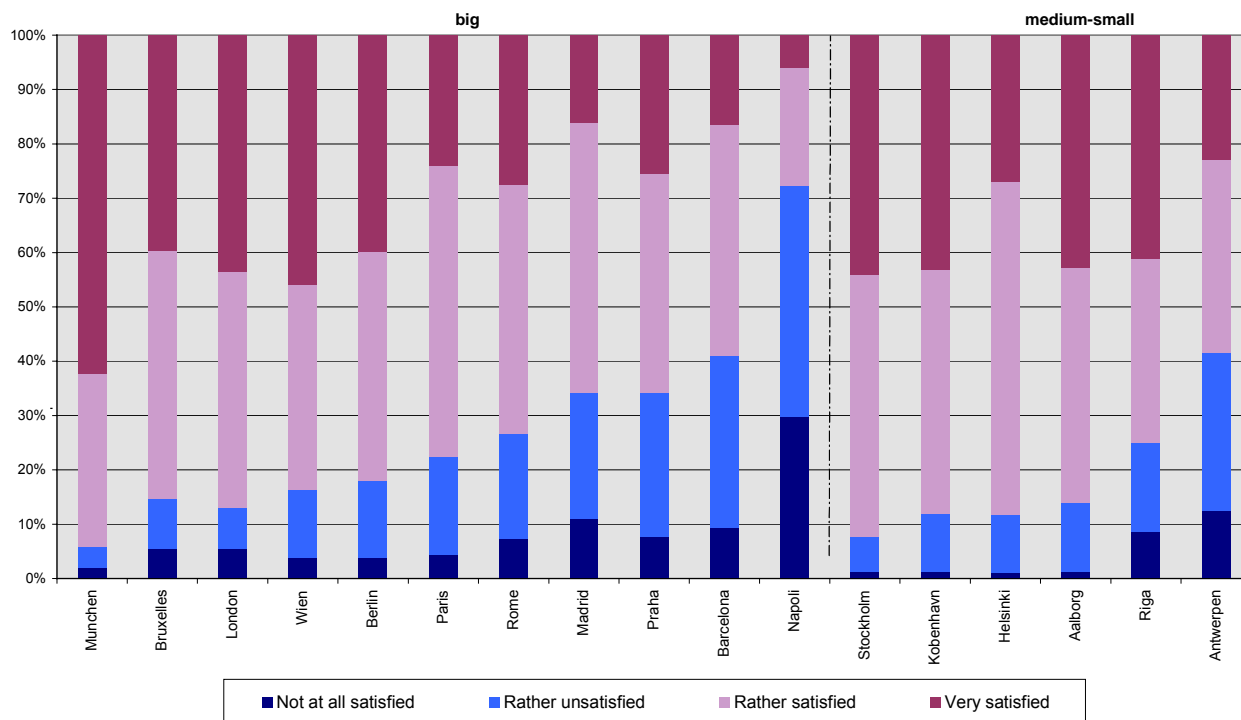
Green areas as a percentage of total municipal areas



If green areas figure is examined not as supply per capita but as a percentage of the occupied municipal land, some differences may be pointed out. In general, differences among medium-small cities and major ones – mainly those with high population density – diminish, even if the smallest cities and some medium ones register the highest values. Oslo and Heidelberg show green areas

on 70% of land, followed by Patrasso, Helsinki and Turku having more than 40%. Kobenhavn figure is worth mentioning, where urban green areas alone occupy one fifth of the municipal land. Among the major cities, Lyon and Madrid exceed 40% followed by Rome (36%), while Barcelona has the highest urban green areas percentage, that is 12% of total land (nearly half of Kobenhavn figure).

Level of satisfaction: green spaces such as public parks and gardens (% of inh)



The survey on the citizens satisfaction level on green areas²⁰ shows Munchen and Stockholm at the top, with 90% of the people saying to be rather or very satisfied, followed by Kobenhavn and Helsinki. Particularly in Munchen 62% of citizens say to be very satisfied. On the other hand Naples is the city with the majority of unsatisfied people (72%), followed by Anversa and Barcelona (40%).

Satisfaction figures, affected by subjective factors as expectations and perception of areas quality, not always correspond exactly to the quantitative values, but in many cases the good level of satisfaction remarked by the citizens corresponds to good “quantitative” green areas supplies (Munchen, Kobenhavn, Helsinki and Aalborg) or, on the other hand, in the worst cases as Naples.

²⁰ Perception survey on quality of life in 70 European Cities. Eurostat-Urban Audit, June 2007

6 LOCAL TO GLOBAL: ENERGY AND CLIMATE CHANGE

- Setting of an Energy Balance and a CO₂ reduction target
- Solar power generation in public buildings
- Inhabitants connected to a district heating system
- Climate and Energy saving policies

6.1 Setting of an Energy Balance and a CO₂ reduction target

From 2001 to 2006 the majority (24) of the examined 32 European local authorities drew an energy balance sheet and then 13 out of them are able to provide emissions data per capita. This value, not always comparable as processed with different methods²¹, differs: from 2-3 tons of CO₂ for inhabitant in Zaragoza, Barcelona and Oslo, to 8 tons in Munchen and Aalborg, until 11 ton/inh in Turku. These differences are also due to “objective” factors as different local conditions (bigger or smaller consumptions depending on climate) and national energy mix (available renewable energies production).

Otherwise local policies oriented to CO₂ reduction can really promote different trends. Many cities (21) set infact clear CO₂ reduction targets, in some cases (7) more ambitious than 2008-2012 Kyoto targets set in their own country.

Berlin envisages to reach 25% reduction by 2010, while the national target is 21% reduction compared with 1990 values; Hannover committed to reach the same quantitative target by 2005. Kobenhavn adopted 35% reduction by 2010, that is 14 percentage points more than Denmark national target (21%). The Big London urban area set 20% reduction target while the correspondent national target is 12,5% reduction. Some Scandinavian cities set reduction targets although their countries only decided to contain the emissions increase. Stockholm experimented an ambitious emissions reduction project: 25% reduction in five years (2000-2005) while the national aim is to contain the increase (not more than 4%). A similar committment was undertaken by some Spanish cities adopting reduction policies although the national target was to contain the growth (not more than 15%): Barcelona envisages 1% CO₂ emissions reduction every year in the period 2000-2010; Zaragoza committed to undertake 10% reduction by 2010 and 30% by 2030.

Other five cities together with Turku and Zaragoza committed to implement long term policies with targets exceeding Kyoto schedule, e.g. Madrid envisaged 20% emissions reduction in the period 2004-2020. Milan set 15% reduction target in the period 2000-2012 as a first step towards 20% total reduction in comparison to 1990 values. Munchen programmes are even more ambitious (-10% every 5 years from 2005), as Bristol's (-60% in the period 2000-2050) and Oslo's (-50% in the period 1990-2030 and -80% by 2050).

The following table summarizes the collected data. The indication “nd” means that the city did not provide the information requested.

²¹ Depending on accounting or not some local emissions sources sometimes due to non local consumptions as energy production emissions, airports emissions, etc.

	Energy balance	Per capita emission CO ₂	CO ₂ reduction target		National target
	year	ton/ab	yes/no	description	var 1990-2008/2012
Aalborg	2002	8,0	yes	National target	-21%
Aarhus	2001	na	no		-21%
Antwerpen	no	na	yes	National target	-7,5%
Barcelona	2004	3,1	yes	The annual average increase of emissions between 2000 and 2010 shouldn't be greater than 1%	15%
Berlin	2003	na	yes	25 % reduction from 1990 figure by 2010	-21%
Bristol	2004	3,9	yes	National target + 60% reduction by 2050 (from 2000 figure)	-12,5%
Bruxelles	2004	4,2	yes	4.224 ktCO ₂ eq by 2008-2012	-7,5%
Kobenhavn	no	na	yes	35 % reduction from 1990 figure by 2010	-21%
Dresden	2004	na	yes	50 % reduction from 1987 figure by 2010	-21%
Durres	no	na	no		
Goteborg	no	7,0	yes	The average emissions for 2008-2012 shall be at least 4 % lower than the emissions for year 1990.	4%
Hannover	2005	11,8	yes	25 % reduction from 1990 figure by 2005	-21%
Heidelberg	2002	na	yes	20 % reduction from 1987 figure by 2015	-21%
Helsinki	2005	6,5	yes	Decrease down below 1990 level	0%
Greater london	2003	na	yes	20% reduction from 1990 figure by 2010	-12,5%
Lyon	2001	6,7	no		0%
Madrid	2003	3,1- 5	yes	20 % reduction from 2004 figure by 2020	15%
Milano	2003	na	yes	15 % reduction from 2000 figure by 2012 and 20% reduction from 1990 figure by 2020	-6,5%
Munchen	2004	7,7	yes	10 % reduction every 5 years beginning in 2005	-21%
Napoli	na	na	no		-6,5%
Lefkosia	no	na	no		no
Oslo	2006	2,8	yes	50% reduction from 1991 figure by 2030, 80 % by 2050	1%
Paris	2005	na	na		0%
Patra	2002	4,2	no		25%
Praha	2005	na	no		-8%
Riga	no	4,1	no		-8%
Roma	2004	6,1	yes	National target	-6,5%
Stockholm	2003	na	yes	25 % reduction from 2000 figure by 2005	4%
Tampere	2003	na	no		0%
Turku	2003	10,9	yes	20 % reduction from 1990 figure by 2020	0%
Wien	2003	na	yes	14 % reduction from 1990 figure by 2010	-13%
Zaragoza	no	2,4	yes	10% reduction by 2010 and 30% reduction by 2015	15%

6.2 Solar power generation in public buildings

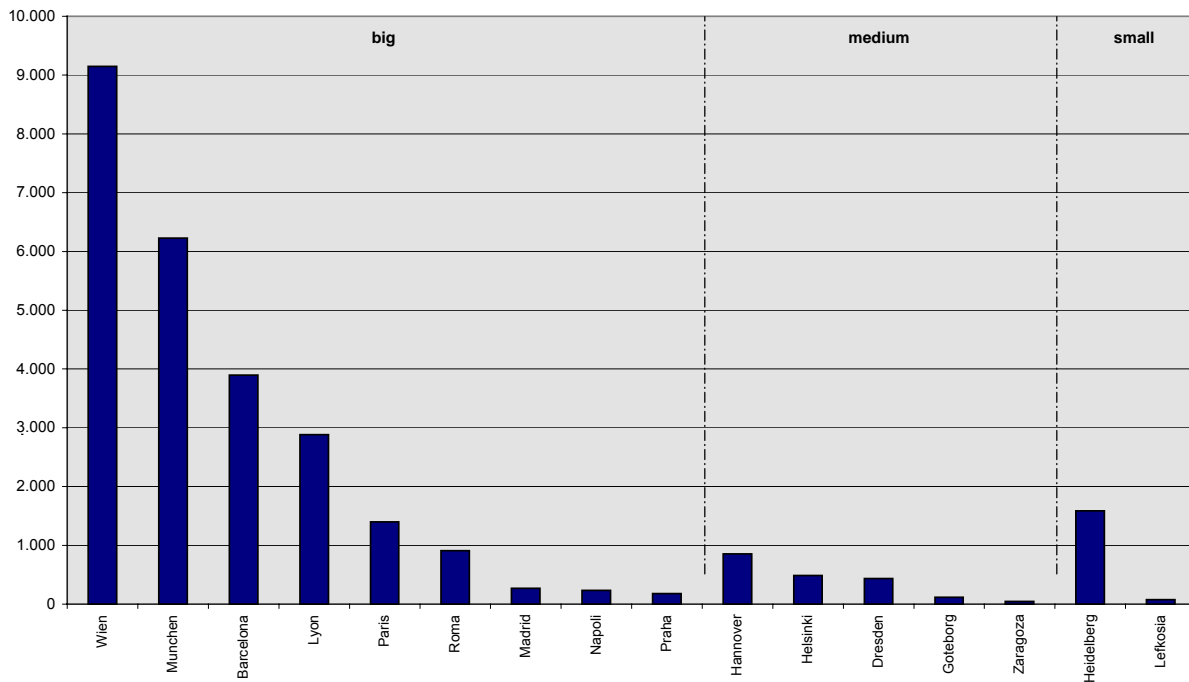
The data in our possession on the spread of solar plants within municipal territories is limited to plants installed on buildings owned by the municipal administrations, due to the fact that many cities still lack registration of all the installations within their municipal boundaries. The number of solar plants for the production of thermal and photovoltaic energy in public buildings has reached especially noteworthy levels both in German and Austrian cities and in some southern cities.

Among the big cities, Wien has the best solar thermal panels supply (approx. 13.000 sq m installed²²), followed by Barcelona and Lyon (4.300 sq m e 3.500 sq m respectively). On this point of view Heidelberg is the best among medium-small municipalities (1.400 sq m).

Munchen is remarkable among the major cities for installed photovoltaic in public buildings (more than 4.000 kW, that is 6 times Barcelona and 19 times Rome supply). Two German cities - Hannover e Heidelberg – are at the top of small-medium cities as well.

The diagram reports the total installed power, including solar thermal and photovoltaic electric panels.

Solar thermal and PV plants on public buildings (kW)



Solar thermal panels, thanks to lower costs, is more used than photovoltaic: the survey results report that the answering cities provide 2,4 kw by installed solar thermal panels in public buildings compared to 1 kw by photovoltaic. German cities are an exception, as since many years they have been providing incentives on every kW produced by photovoltaic panels so that this technology is becoming more and more competitive.

6.3 Inhabitants connected to a district heating system

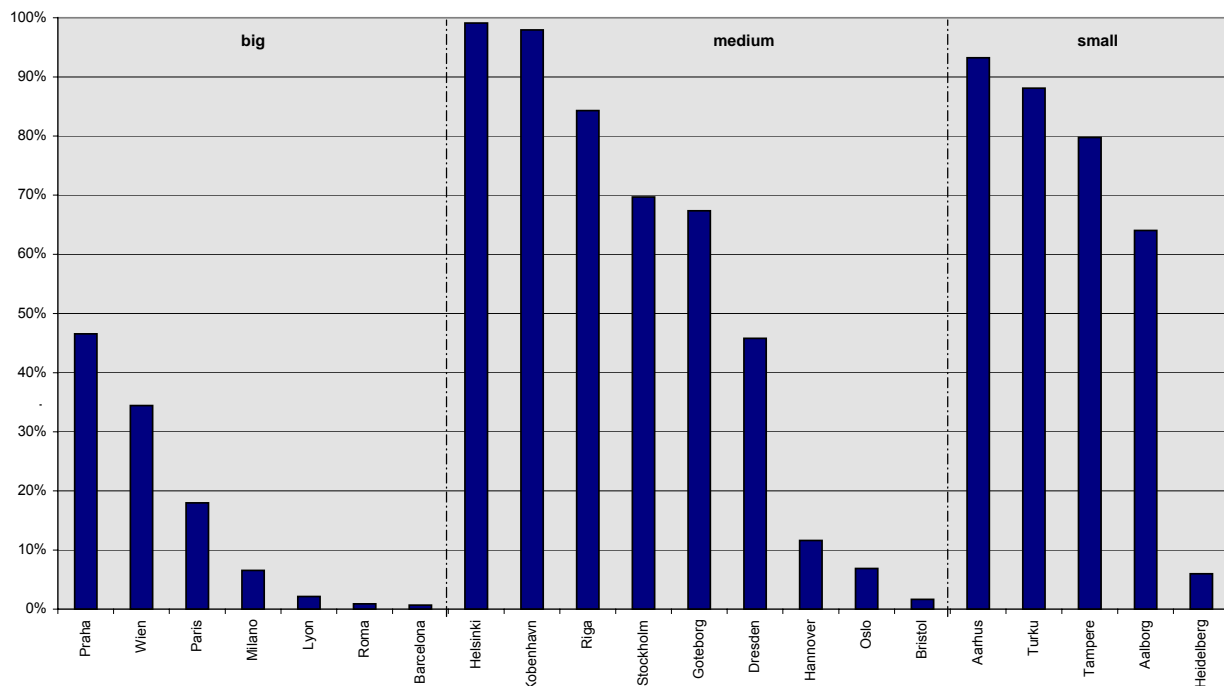
The large-scale use of district heating, on the other hand, is an energy-saving measure which continues to be concentrated primarily in the northern countries.

²² Data provided in 2006, still not verified or updated in 2007.

District heating serves one third of Wien inhabitants and nearly half of Praha's. Paris has a good share as well (18%), while Milan, Lyon, Rome and Barcelona experience the technology only in a few city areas.

Among Northern medium cities: Helsinki and Kobenhavn use almost exclusively district heating; Riga, Stockholm and Goteborg exceed 50% of connected inhabitants. Among small cities: Aarhus, Turku and Tampere are at the top, between 80% and 90%.

Inhabitants connected to a district heating system (% pop)



6.4 Climate and Energy saving policies

Barcelona, Hannover, Munchen, Oslo, Zaragoza, Praha and Rome are the European cities having issued local orders and/or decrees improving energy standards of private buildings which are more efficient than the national ones.

The number of cities increases up to 19 considering those with local regulations as well, even if these ones are not more ambitious than regional or national ones. Aalborg, Barcelona, Dresda, Nicosia and Tampere adopted local orders since 1999; all the other cities implemented (or updated) them in the last two years.

17 out of 32 cities say they performed energy audits of some public buildings; 22 cities state to have implemented energy saving actions.

In cities like Turku, Tampere, Hannover and Kobenhavn the first audits of public buildings were made in the second half of the nineties. Helsinki already performed energy audits in 80% of its buildings.

Bristol, Goteborg, Heidelberg, Oslo, Turku and Rome (this one not specifying the quantity) are the European local authorities declaring to have purchased "green" electric energy (produced by renewable sources²³) during 2006: Goteborg, Oslo and Turku purchased over 100 GWh; Bristol

²³ Certified green electricity - Electricity produced with renewable sources (solar, eolic, biomass, micro hydro (< 10 MW), geotermic, etc.) according to a certification system like RECS (Renewable Energy Certificate System) or a greenlabel.

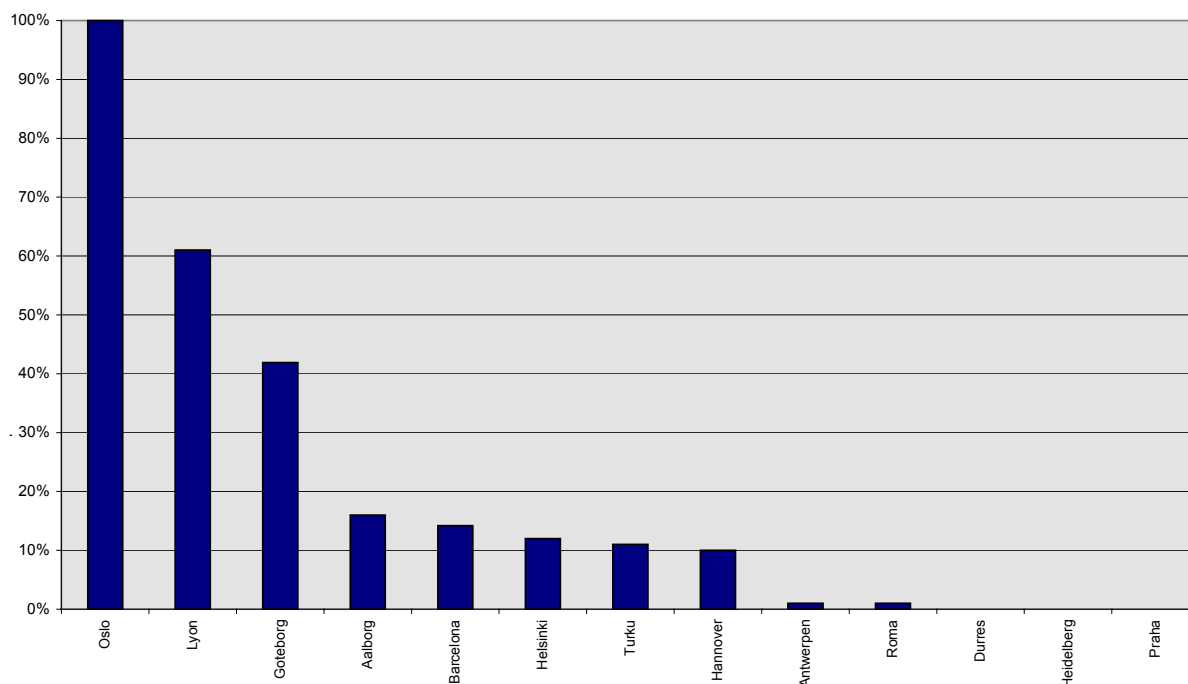
and Heidelberg nearly 5 GWh. The purchased "green" energy share is approx. 25% of total electric consumptions of Oslo and Heidelberg municipalities.

	District heating connected inhabitants	Public purchasing "green energy"	Solar heating panels installed in public buildings	Solar PV panels installed in public buildings	Traffic lights LED	Energy audit public buildings	Retrofitting measures public buildings	Public "green car" (natural gas; LPG; electric...)
	%	kWh	m ²	kW	%	year	year	%
Aalborg	64%	na	0	0	16%	2006	yes	1%
Aarhus	93%	na	0	0	na	na	na	na
Antwerpen	na	na	na	4	1%	2004	2000	na
Barcelona	1%	na	4.341	857	14%	2006	2006	na
Bristol	2%	5.658.693	na	na	na	2000	2001	15%
Bruxelles	0%	na	na	na	na	2005	2005	20%**
Kobenhavn	98%	0	na	100	na	1998	1998	na
Dresden	46%	na	250	260	na	no	no	na
Durres	na	0	na	na	0%	2006	2006	na
Goteborg	67%	117.000.000	na	115	42%	partially	partially	na
Hannover	12%	na	206	711	10%	1995	1996	1%
Heidelberg	6%	5.656.607	1.400	607	0%	2006	2006	1%
Helsinki	99%	na	650	30	12%	2006	2006	na
Lyon	2%	0	3.504	431	61%	2000	2005	17%
Madrid	na	0	384	na	na	na	na	na
Milano	7%	0	na	na	na	no	yes	na
Munchen	na	na	2.120	4.743	na	2007	2007	4%
Napoli	0%	0	0	233	na	na	yes	10%
Lefkosia	0%	na	na	75	na	na	2004	na
Oslo	7%	135.700.000	0	0	100%	2001	2001	na
Paris	18%	na	2.000	na	na	na	2003	na
Patra	na	na	na	na	na	na	na	na
Praha	47%	na	200	40	0%	2003-2005	2006	0%
Riga	84%	0	0	0	na	na	na	na
Roma	1%	yes	930	256	1%	no	no	21%
Tampere	80%	na	0	0	na	na	1995	na
Turku	88%	138.300.000	0	0	11%	1998	1998	na
Wien	34%	na	13.000	50	na	na	na	na
Zaragoza	0%	0	64	3	na	2007	2007	0%

* Only Environmental department

About 10 European cities provided data on gas oil and petrol vehicles reconversion: Rome, Naples, Lyon and Bristol are at the top on the investments. While Rome, Lyon and Bristol decided to direct public funding almost exclusively to LPG means of transport (15-20% of the whole fleet²⁴), in Naples gas and electric vehicles reach approx. 10% on total.

Traffic lights using LED (%)



Since a few years several local authorities are being implementing LED electronic devices in traffic lights instead of traditional incandescent lamps, with significant better light efficiency performance, and very much better reliability and duration²⁵. 10 out of the 32 cities experimented this technology on their plants, with different amounts of invested resources. Actually Rome and Anversa are experimenting the first applications (only 1% of traffic lights has LED), while Goteborg and Lyon use LED in almost half of their traffic light network (42% and 61% respectively), and Oslo implemented this technology in every traffic light.

²⁴ Brussels figure is comparable with these three cities' one, but it is referred only to environmental service and not to the whole car fleet.

²⁵ LED have one colour light emission and very low energy absorption; single traffic lamp equipped with LED consumes 10 to 20 W, with 70% (sometimes 80%) energy saving. Furthermore these devices have an enormously longer "lifetime" compared to incandescent lamps (up to 10 years).

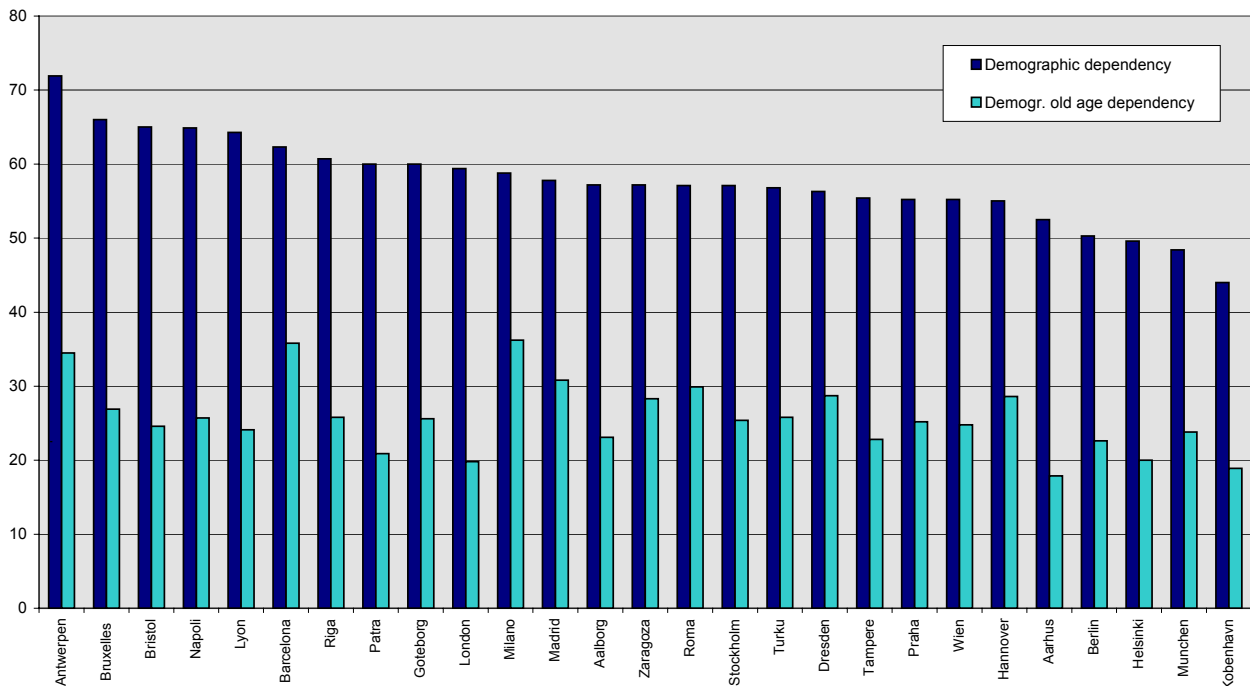
7 VIBRANT, SUSTAINABLE LOCAL ECONOMY AND SOCIAL EQUITY, JUSTICE AND COESION

- Demographic and old age dependency
- Female employment
- Population qualified at highest level of education

7.1 Demographic and old age dependency

Demographic trends are among the most important factors to be faced by local sustainability policies. More precisely, the distribution of population basically determines long and medium term socio-economic trends. Dependency index is able to provide a concise quantity measurement of this point of view. Dependency index is expressed by the ratio, with base 100, between out of labour market population (young people < 20 and old people > 64) and work-age population (20-64). A long-term sustainable welfare system needs a working class able to financially support the social services demand coming from “weaker” population.

Demographic dependency (% index)



A high dependency index can be due both to the young people (now out of the labour market but going to be part of it in the future) and to the old people (definitely out of the labour market). Therefore it is important to analyse the relations between these two factors highlighting the more relevant in a future perspective, the so called “old age dependency index” given by the ratio between over 64 population and 20-64 class.

Quite high dependency index can be remarked in the 27 European cities whose data have been provided²⁶. On average, every 100 working age people, 58 are non-active young and old people, and one third of the cities exceed 60 on 100. Only four cities – Berlin, Helsinki, Munchen and Kobenhavn – are below 50. In general the number of old people is lower than the number of youngs, except for some Italian, Spanish and German cases. In Milan and Barcelona over 64 years old population is 60% of the non-active population, while in London, Patra and Aarhus is only 35%.

7.2 Female employment

Lisbon strategy strongly pointed out the need to reach a full time working level, able to provide better and various working opportunities. To this regard a preliminary target is the increase of the number of people asking to take part of the labour market, particularly the female component.

Activity rate is expressed by the percentage of working-age people really working or asking to work even if not working now²⁷. So female activity rate is an important indicator showing the women will to enter the labour market and, above all, the available opportunities to do it. Female unemployment rate is another basic indicator as well, able to point out the labour market capacity to absorb the increased offer.

Female activity rate is lower than male one in all EU25 countries²⁸; only in some Scandinavian countries the difference doesn't exist. Female unemployment rate shows a slightly different trend: in many European countries it is like male rate or even lower, even if on average it remains 2 percentage points higher than male rate.

Participant cities figures²⁹ show female activity rates higher than European average, but significant differences can be remarked in the single areas. In the majority of the cities women asking to enter the labour market are more than 60 out of 100; in 12 cities (all sited in the North-Centre) this figure reaches or exceeds 70. Italian, Greek and Belgian cities show the lowest activity rate, in some cases much lower than European average as in Naples and Patrasso.

Frequently the cities showing the lowest activity rate have significant female unemployment problems (Patrasso and Brussels around 20%, Naples almost 40%). On the other hand, where female unemployment is lower than 10%, female activity rate exceeds 70% pointing out a high participation level to the labour market.

Hannover, Milan, London and Bristol labour markets are worth to be noticed as female work offer seems to meet the demand and unemployment rate doesn't exceed 6-7% even if the activity rate is not so high (60-65%).

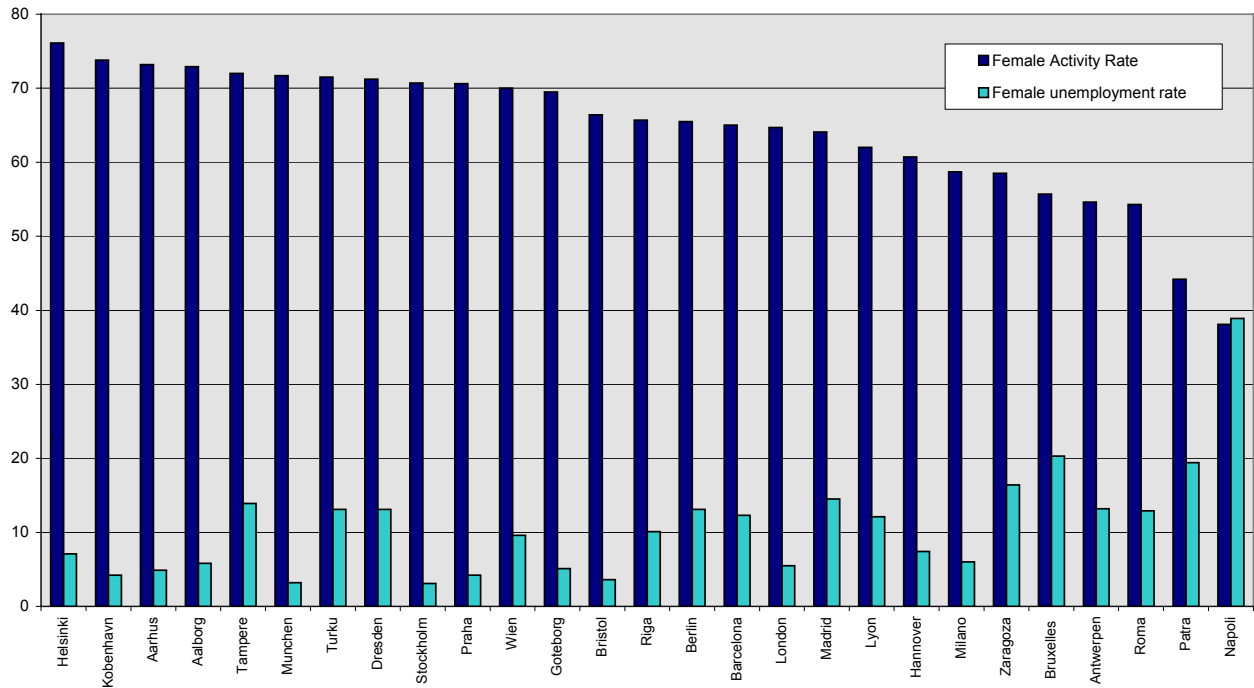
²⁶ Urban Audit 2001

²⁷ Working-age people studying or retiring or disabled or dedicated to homework and children etc. can be considered "non active".

²⁸ EU25 average in the last survey (2005) reported 71% male activity rate compared to 56% female, and 7,9% male unemployment rate compared to 9,9% female.

²⁹ Urban Audit 2001

Female activity and unemployment rates (% index)

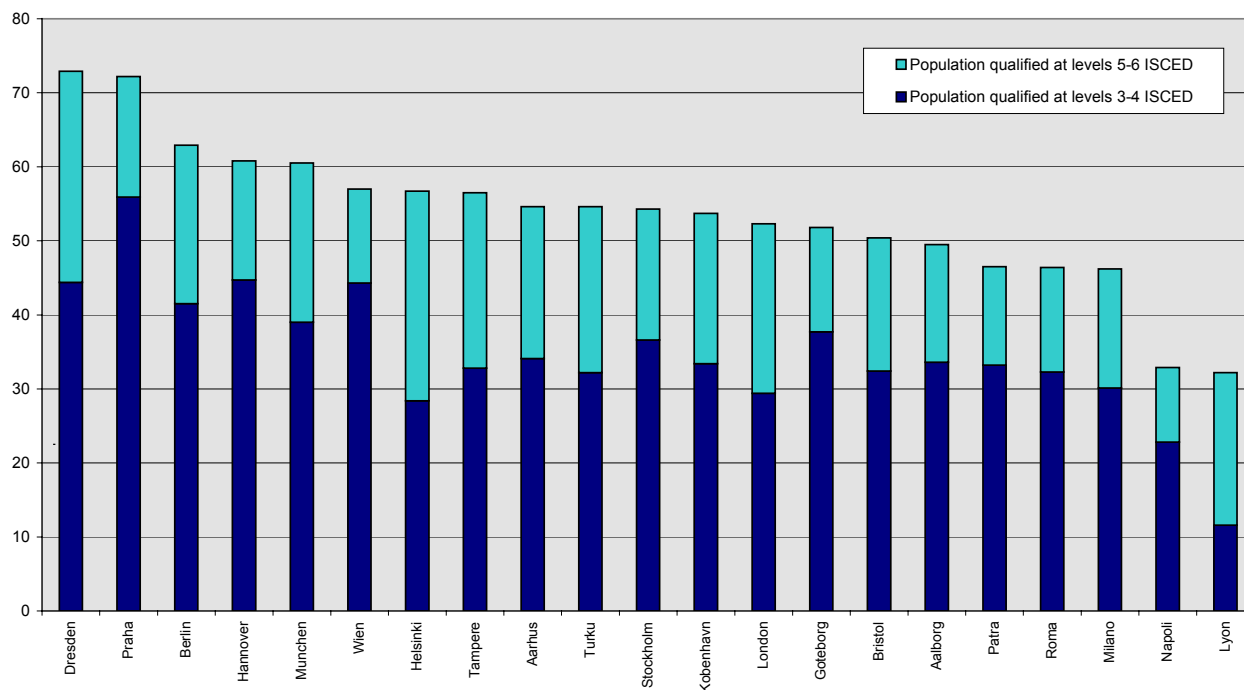


7.3 Population qualified at highest level of education

Urban population education level is an important social cohesion and territorial competitiveness factor. Education level is classified following ISCED (International Standard Classification of Education) with classes from 1 to 6. Class 3 and 4 correspond to high school, class 5 and 6 refer to graduate or master degree.

In 14 cities out of 21 more than 50% of the inhabitants has a high school degree; in 10 of them graduates are 20% to 30% of the total population. The four German cities and Praha are at the top as education level. Dresda is the best for both qualified (44%) and graduated people (29%). In London and in the three Finnish cities almost one fourth of the population has graduated. On the other hand many Southern cities, particularly the Italian, are placed at the bottom of the list.

Population qualified at highest level of instruction (%)



8 LOCAL MANAGEMENT TOWARDS SUSTAINABILITY AND GOVERNANCE

- EMAS and ISO 14001 certification of public authorities
- Level of implementation of Agenda 21 processes
- Electorate voting in city elections
- City representatives who are women

8.1 EMAS and ISO 14001 certification of public authorities

The implementation of an environmental management system and its certification by an international certification standards is becoming a quite common practice in many organisations operating in a given local area. The main existing international certification standards of environmental management systems are the ISO 14001 and EMAS (n. 761/2001) systems. These standards of certification, with slightly different formulations, both pursue the objective of validating and confirming the implementation of a system of management that takes into consideration all the direct and indirect impacts that the activities of any organisation can have on the different environmental components.

The dissemination of environmental management systems within the public authorities, mainly in Southern and Eastern countries, is still delayed: 15 authorities out of 30 - all of them from North-Centre Europe except for Barcelona, Madrid and Milan - have a certified EMAS or ISO 14001 department or unit.

Among the public authorities EMAS and ISO 14001 certifications have the same share: five of them decided for ISO 14001, four German cities adopted EMAS; Bristol, Kobenhavn, Goteborg, Hannover and Madrid have both ISO and EMAS certified units and/or departments. Kobenhavn, Bristol and Oslo³⁰ performed the best dissemination of environmental management systems.

	ISO 14001		EMAS	
	Municipal departments certified	Public companies certified	Municipal departments certified	Public companies certified
Aalborg	0	3	0	0
Aarhus	0	0	0	0
Antwerpen	0	0	0	0
Barcelona	2	2	0	1

³⁰ Oslo has approximately 700 separate administrative units. They include major departments like Planning and building department, Fire department etc. They also include smaller administrative units like daycare facilities, schools, care for the elderly etc. Of these 700 administrative units, 170 have implemented certified environmental management systems. Oslo adopted two different certification patterns:

ISO 14001 – used by the most important city departments with extensive environmental aspects

“Environmental Lighthouse” – used by smaller administrative units like schools and entities with non extensive environmental aspects (such as the city legal advisory office, city auditor office etc.)

Environmental Lighthouse has strict environmental management requirements (67) based on different sorts of commercial activities and work areas. The management system provides environmental quality comparable to ISO 14001 without imposing the burden of environmental analysis on units lacking the time and expertise needed to carry out difficult analysis procedures.

Berlin	nd	nd	2	nd
Bristol	5	nd	4	0
Bruxelles	nd	nd	0	6
Dresden	0	2	1	0
Goteborg	3	7	1	1
Hannover	3	3	1	nd
Heidelberg	nd	nd	1	4
Helsinki	1	2	0	0
Kobenhavn	60	4	3	2
Lefkosia	0	0	0	0
Lyon	nd	0	0	0
Madrid	1	0	1	0
Milano	0	1	0	0
Munchen	nd	nd	12	5
Napoli	0	0	0	0
Oslo	170	6	0	0
Paris	3	1	0	0
Patra	0	0	0	0
Praha	0	2	0	0
Riga	0	1	0	0
Roma	0	0	0	0
Stockholm	0	5	0	0
Tampere	0	5	0	0
Turku	0	3	0	0
Wien	0	0	0	1
Zaragoza	0	1	0	0

21 authorities hold a partnership share of at least one utility/company with certified environmental management system. Among the companies with public share ISO certifications are prevalent (48 compared to 20 EMAS), mainly in the Scandinavian cities. Half of the 48 ISO 14001 certified companies hold shares of Goteborg, Oslo, Stockholm and Tampere authorities. On the other hand 75% of the 20 EMAS certified companies are sited in Brussels, Heidelberg and Munchen.

8.2 Level of implementation of Agenda 21 processes

The establishment of a model of sustainable development calls for a joint effort from sides of all the social actors. One of the fundamental concepts is to shift the decision-making axis downwards, utilising a bottom-up structure that makes possible effective participation on the part of civil society, together with all those involved in the decision-making processes. Ever since the World Conference on the Environment held in Rio de Janeiro in 1992, there has been increasingly widespread implementation of the Local Agenda 21 processes. These are decision-making processes structured according to a model that calls for the joint participation of local authorities and stakeholders affected by decisions regarding the government of the community and its resources.

Local Agenda 21 processes, though they employ methods that can differ from one another, constitute an experience that has been undertaking – or is currently being undertaken – by the great majority of the municipal administrations which have committed themselves in the field of sustainability. In our sample group of 32 cities as well, there are only five municipal administrations that have yet to deal with a process of this type. The first experiences with a Local Agenda 21

began in the 90's (Aalborg, Hannover, Munchen and Stockholm) but they were most widespread in the years between 1997 and 2002.

	A21 process	Consultative process	Environment sustainability report	Target setting process	Local action plan	Monitoring system
	year	year	year		year	
Aalborg	1994	no	2005	yes	2003	yes
Aarhus	no	na	no	na	yes	na
Antwerpen	2001	no	no	yes	2001	yes
Barcelona	1998	yes	2007	yes	2006	no
Berlin	2000	na	na	na	2004	na
Bristol	1998	yes	2006	yes	1999	yes
Bruxelles	2003	no	2007	na	2002	yes
Dresden	1998	na	2004	na	no	na
Durres	no	no	no	no	no	no
Goteborg	yes	no	2005	yes	no	na
Greater London	no	na	2003	na	no	na
Hannover	1995	yes	from 1992	yes	1997	no
Heidelberg	1997	yes	2005	yes	1997	yes
Helsinki	1998-2002	yes	2006	yes	2002	yes
Kobenhavn	2005	yes	2005	yes	2005	yes
Lefkosia	no	na	no	na	no	na
Lyon	2001	yes	2004	yes	2005	yes
Madrid	2001	yes	2004	yes	2007	yes
Milano	2001	yes	2003	na	no	no
Munchen	1995	no	2006	yes	1999	no
Napoli	2002	yes	no	na	yes	no
Oslo	1998	yes	2006	yes	2002	yes
Paris	2005	na	2004	na	no	na
Patra	2005	no	2005	no	no	no
Praha	no	no	from 1990	na	no	no
Riga	2000	no	2004	yes	2002	yes
Roma	1997	yes	2005	na	2005	yes
Stockholm	1994	na	2004	na	no	na
Tampere	1997-99	na	2002	na	1999	na
Turku	1997	no	from 1989	yes	from 2001	no
Wien	1998	na	2002-03	na	no	na
Zaragoza	2001-2007	yes	2001	yes	2005	yes

Each city follows a procedure that differs in terms of both the progress made and, above all, the amount of time employed. In cases such as Bruxelles, Copenhagen and Heidelberg a participatory plan of action was approved in the same year the A21 process started, while other cities took decidedly longer to do so. In London and Prague, though a wide-ranging Local Agenda 21 process has yet to get underway, a Report on the State of the Environment has been drawn up, while other cities, such as Turku, Bristol and Bruxelles had already set up their reporting system, even before the Agenda 21 process began.

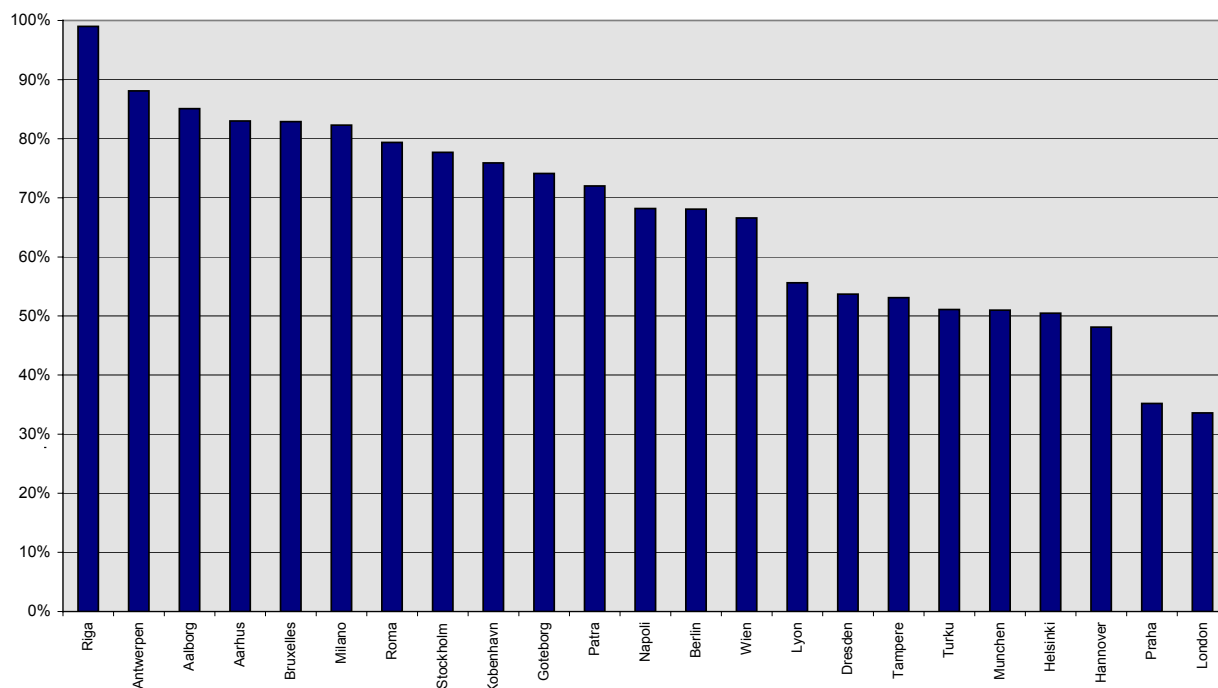
It can be noted that 80% of the cities have taken the first step, by drawing up a Report on the State of the Environment, while only 2/3 of those that have begun the Agenda 21 process have managed to conclude the initial cycle with the approval of a specific Action Plan. The 68% of the Action Plans provides for a target setting and a specific monitoring system. As regards citizens' participation, half of the 27 cities that have been implementing an Agenda 21 have set a permanent consultative forum involving the local stakeholders.

8.3 Electorate voting in city elections

The percentage of voting citizens³¹ is an indicator of the participation to the city policy life. More than two third of the electorate voted in 60% of 23 examined cities, while only half of them did it in the remaining 30%.

The highest voting electorate percentage is registered in Riga and other six cities (Danish, Belgian and Italian): between 80% and 90%. The Finnish and German cities are around 50%, while in Praha and London voting population is approx. one third of total.

Proportion of registered electorate voting in city elections



7. 4 City representatives who are women

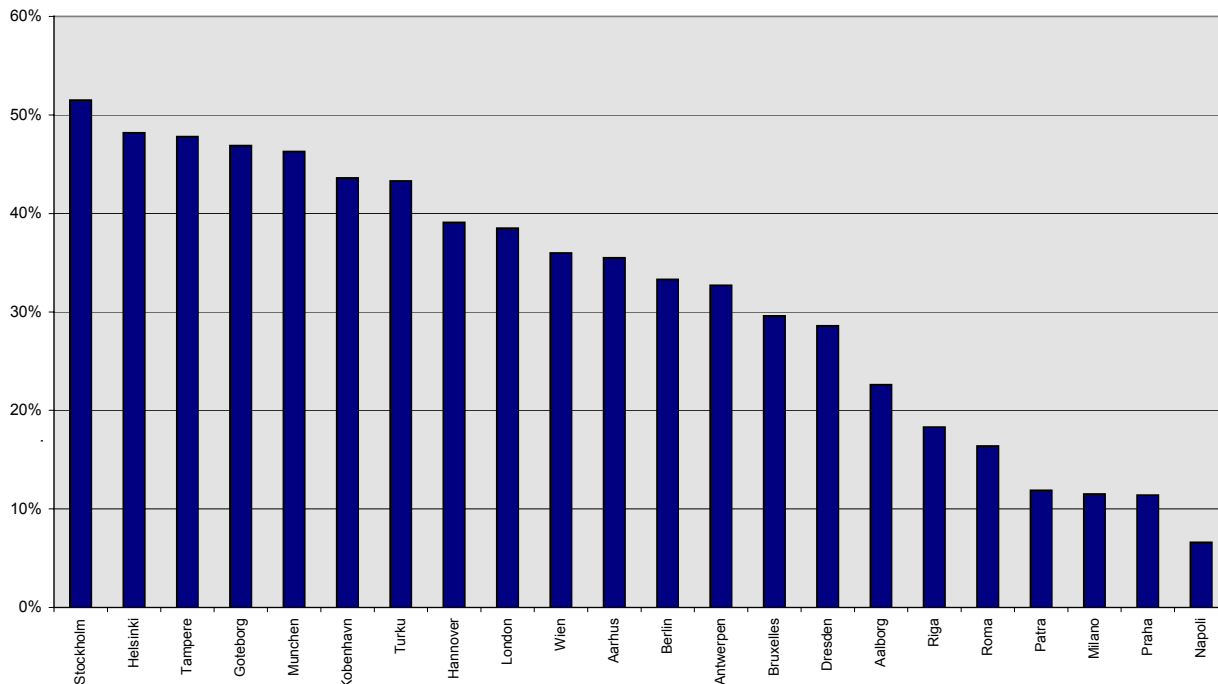
Gender equality among elected representatives in local authorities is still a quite distant goal in many European countries.

The number of the elected women exceeds the men only in Stockholm and it is above 40% in 5 cities, all of them in the North except for Munchen. In the cities of the continental Europe the

³¹ Urban Audit 2000-2002

elected women are between 30 and 40%, the bottom of the list still remaining occupied by the Southern and Eastern European cities, where women representatives do not exceed 10-15%.

Percentage of elected city representatives who are women



9 SYNTHETIC PROFILES

The synthetic profiles presented below for each of the cities are divided in four parts: Identity card; Graph of the environmental performance; Indicators table; policies table.

Identity card

The table indicates the data providing the context for the city: inhabitants, area, density, GDP, activity rate and unemployment.

Graph of the environmental performance

The ranking chart (radar graph) illustrates the positioning of the city in terms of 9 of the 14 key indicators considered in the Table of indicators (see below). The values are normalised, in such a way that the far end of each radar corresponds to the best value registered by a city (depending on the specific case, the 5th or the 95th percentile was used as the benchmark). For each of the indicators selected, the city's performance is compared with the median, meaning the value registered by the city found at the mid-point of the distribution.

Indicators table

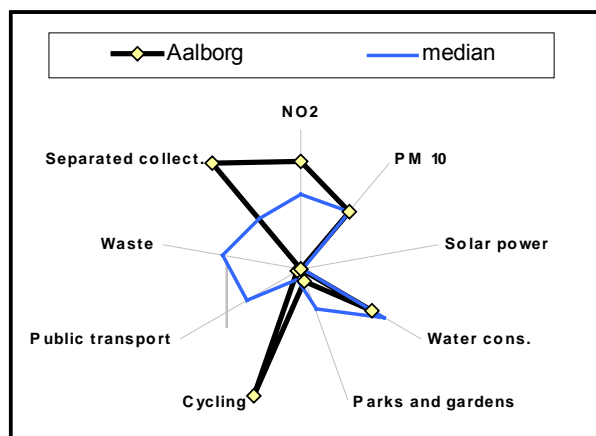
For the 14 quantitative key indicators, the table shows the value registered by the city, the best value registered, the median value and the worst value registered.

Policies table

The table provides predominantly indications (yes/no or the reference year) about the policy measures implemented by the local governments with regard to the following topics: Climate change, Noise pollution, Governance and integrated management.

Urban Ecosystem Europe 2007

City	Aalborg
Country	Denmark
Inhabitants	163.952
Area (km²)	560
Density (inh/km²)	293
GDP (euro/inh)	32.600



KEY INDICATORS	Aalborg	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	43	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	39	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	94%	100%	100%	45%
Household water consumption (l/inh day)	179	96	162	294
Public parks and gardens (m ² /inh)	7	54	16	3
Cycle paths and lanes (m/100 inh)	1,95	2,97	0,13	0
Public transport passengers (pass/inh year)	98	718	263	16
Lines of public transport by rail (m/100 inh)	0	28	9	0
Electric consumption (2000-2005 % variation)	0%	-26%	8%	26%
Solar plants in public buildings (kW)	0	9.150	115	0
Inhabitants connected to a district heating network (%)	64%	99%	7%	0%
Municipal waste production (kg/inh year)	679	334	501	734
Separated collection of municipal waste (%)	62%	56%	27%	0%
Use of recycled paper in offices (%)	99%	100%	60%	0%

CLIMATE CHANGE POLICIES

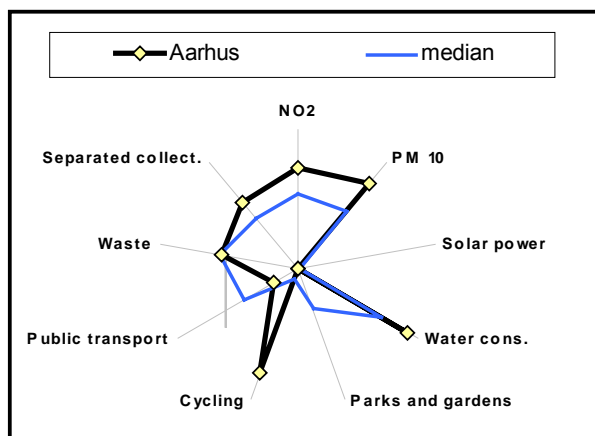
Energy balance	2002
CO2 reduction target setting	YES
Air quality plan	NO
Energy standards for private buildings	YES
More efficient energy standards for private buildings	NO
Energy audit/database of public buildings	YES
Retrofitting measures for public buildings	YES
Percentage of traffic lights having installed LED	16%
Public purchase of energy saving printers/photocop.	usually
Public purchase of green electricity	NA

NOISE POLLUTION POLICIES

Noise map	2006
Noise management plan	NO
GOVERNANCE/MANAGEMENT	
Local Agenda 21 process	1994
Permanent consultative process	NO
State of the Environment report	2005
Target setting	YES
Local Agenda 21 Action Plan	2003
Monitoring system of the action plan	YES
Offices/departments adopting a EMS	0

Urban Ecosystem Europe 2007

City	Aarhus
Country	Denmark
Inhabitants	294.954
Area (km ²)	468
Density (inh/km ²)	630
GDP (euro/inh)	30.500



KEY INDICATORS	Aarhus	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	47	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	29	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	100%	100%	100%	45%
Household water consumption (l/inh day)	120	96	162	294
Public parks and gardens (m ² /inh)	na	54	16	3
Cycle paths and lanes (m/100 inh)	1,59	2,97	0,13	0
Public transport passengers (pass/inh year)	164	718	263	16
Lines of public transport by rail (m/100 inh)	na	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	0	9.150	115	0
Inhabitants connected to a district heating network (%)	93%	99%	7%	0%
Municipal waste production (kg/inh year)	522	334	501	734
Separated collection of municipal waste (%)	36%	56%	27%	0%
Use of recycled paper in offices (%)	na	100%	60%	0%

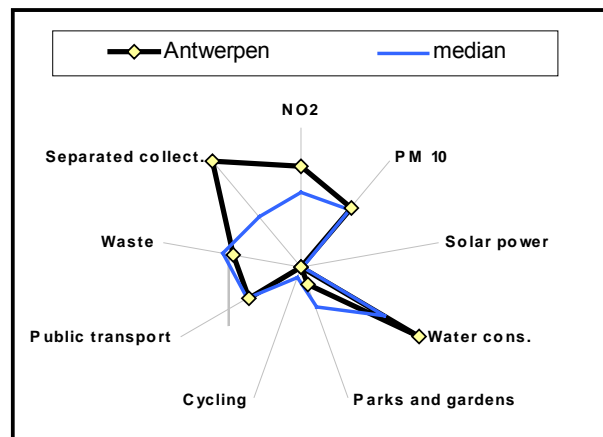
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	2001	Noise map	YES
CO2 reduction target setting	NO	Noise management plan	YES
Air quality plan	NA	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	NO	Local Agenda 21 process	NO
More efficient energy standards for private buildings	NA	Permanent consultative process	NA
Energy audit/database of public buildings	NA	State of the Environment report	NO
Retrofitting measures for public buildings	NA	Target setting	NA
Percentage of traffic lights having installed LED	NA	Local Agenda 21 Action Plan	YES
Public purchase of energy saving printers/photocop.	NA	Monitoring system of the action plan	NA
Public purchase of green electricity	NA	Offices/departments adopting a EMS	0

Urban Ecosystem Europe 2007

City	Antwerpen
Country	Belgium
Inhabitants	473.265
Area (km²)	204
Density (inh/km²)	2.320
GDP (euro/inh)	30.706



KEY INDICATORS	Antwerpen	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	47	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	38	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	100%	100%	100%	45%
Household water consumption (l/inh day)	108	96	162	294
Public parks and gardens (m ² /inh)	8	54	16	3
Cycle paths and lanes (m/100 inh)	0,00	2,97	0,13	0
Public transport passengers (pass/inh year)	251	718	263	16
Lines of public transport by rail (m/100 inh)	2	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	4	9.150	115	0
Inhabitants connected to a district heating network (%)	na	99%	7%	0%
Municipal waste production (kg/inh year)	537	334	501	734
Separated collection of municipal waste (%)	56%	56%	27%	0%
Use of recycled paper in offices (%)	100%	100%	60%	0%

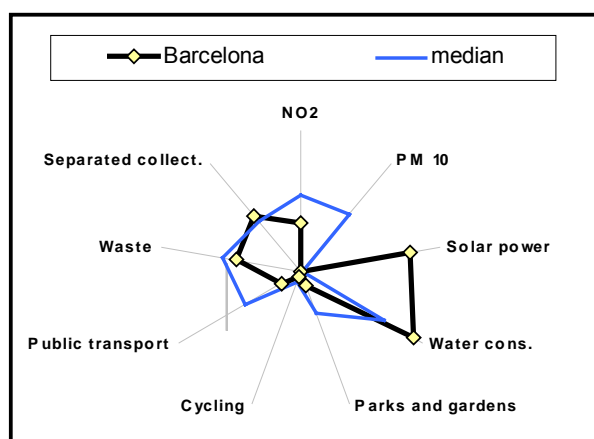
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	NO	Noise map	NO
CO2 reduction target setting	YES	Noise management plan	NO
Air quality plan	2004	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	NA	Local Agenda 21 process	2001
More efficient energy standards for private buildings	NA	Permanent consultative process	NO
Energy audit/database of public buildings	YES	State of the Environment report	NO
Retrofitting measures for public buildings	YES	Target setting	YES
Percentage of traffic lights having installed LED	1%	Local Agenda 21 Action Plan	2001
Public purchase of energy saving printers/photocop.	usually	Monitoring system of the action plan	YES
Public purchase of green electricity	NA	Offices/departments adopting a EMS	0

Urban Ecosystem Europe 2007

City	Barcelona
Country	Spain
Inhabitants	1.605.602
Area (km²)	101
Density (inh/km²)	15.897
GDP (euro/inh)	28.816



KEY INDICATORS	Barcelona	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	74	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	62	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	100%	100%	100%	45%
Household water consumption (l/inh day)	118	96	162	294
Public parks and gardens (m ² /inh)	7	54	16	3
Cycle paths and lanes (m/100 inh)	0,08	2,97	0,13	0
Public transport passengers (pass/inh year)	147	718	263	16
Lines of public transport by rail (m/100 inh)	2	28	9	0
Electric consumption (2000-2005 % variation)	26%	-26%	8%	26%
Solar plants in public buildings (kW)	3.896	9.150	115	0
Inhabitants connected to a district heating network (%)	1%	99%	7%	0%
Municipal waste production (kg/inh year)	548	334	501	734
Separated collection of municipal waste (%)	30%	56%	27%	0%
Use of recycled paper in offices (%)	51%	100%	60%	0%

CLIMATE CHANGE POLICIES

Energy balance	2004
CO2 reduction target setting	YES
Air quality plan	2007
Energy standards for private buildings	YES
More efficient energy standards for private buildings	YES
Energy audit/database of public buildings	YES
Retrofitting measures for public buildings	YES
Percentage of traffic lights having installed LED	14%
Public purchase of energy saving printers/photocop.	usually
Public purchase of green electricity	NA

NOISE POLLUTION POLICIES

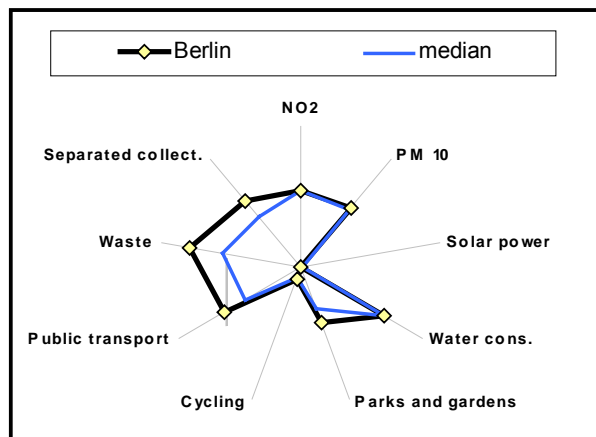
Noise map	1997
Noise management plan	2000

GOVERNANCE/MANAGEMENT

Local Agenda 21 process	1998
Permanent consultative process	YES
State of the Environment report	2007
Target setting	YES
Local Agenda 21 Action Plan	2006
Monitoring system of the action plan	NO
Offices/departments adopting a EMS	2

Urban Ecosystem Europe 2007

City	Berlin
Country	Germany
Inhabitants	3.395.189
Area (km²)	891
Density (inh/km²)	3.811
GDP (euro/inh)	na



KEY INDICATORS	Berlin	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	60	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	38	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	99%	100%	100%	45%
Household water consumption (l/inh day)	163	96	162	294
Public parks and gardens (m ² /inh)	19	54	16	3
Cycle paths and lanes (m/100 inh)	0,18	2,97	0,13	0
Public transport passengers (pass/inh year)	322	718	263	16
Lines of public transport by rail (m/100 inh)	13	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	0	9.150	115	0
Inhabitants connected to a district heating network (%)	na	99%	7%	0%
Municipal waste production (kg/inh year)	456	334	501	734
Separated collection of municipal waste (%)	35%	56%	27%	0%
Use of recycled paper in offices (%)	na	100%	60%	0%

CLIMATE CHANGE POLICIES

Energy balance	2003
CO ₂ reduction target setting	YES
Air quality plan	YES
Energy standards for private buildings	NA
More efficient energy standards for private buildings	NA
Energy audit/database of public buildings	NA
Retrofitting measures for public buildings	NA
Percentage of traffic lights having installed LED	NA
Public purchase of energy saving printers/photocop.	NA
Public purchase of green electricity	NA

NOISE POLLUTION POLICIES

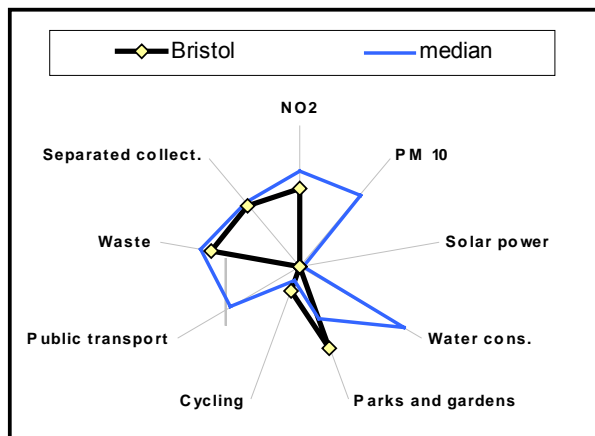
Noise map	YES
Noise management plan	YES

GOVERNANCE/MANAGEMENT

Local Agenda 21 process	2000
Permanent consultative process	NA
State of the Environment report	NA
Target setting	NA
Local Agenda 21 Action Plan	2004
Monitoring system of the action plan	NA
Offices/departments adopting a EMS	2

Urban Ecosystem Europe 2007

City	Bristol
Country	United kingdom
Inhabitants	393.900
Area (km²)	110
Density (inh/km²)	3.581
GDP (euro/inh)	30.834



KEY INDICATORS	Bristol	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	67	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	na	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	100%	100%	100%	45%
Household water consumption (l/inh day)	294	96	162	294
Public parks and gardens (m ² /inh)	21	54	16	3
Cycle paths and lanes (m/100 inh)	0,30	2,97	0,13	0
Public transport passengers (pass/inh year)	82	718	263	16
Lines of public transport by rail (m/100 inh)	0	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	0	9.150	115	0
Inhabitants connected to a district heating network (%)	2%	99%	7%	0%
Municipal waste production (kg/inh year)	535	334	501	734
Separated collection of municipal waste (%)	27%	56%	27%	0%
Use of recycled paper in offices (%)	na	100%	60%	0%

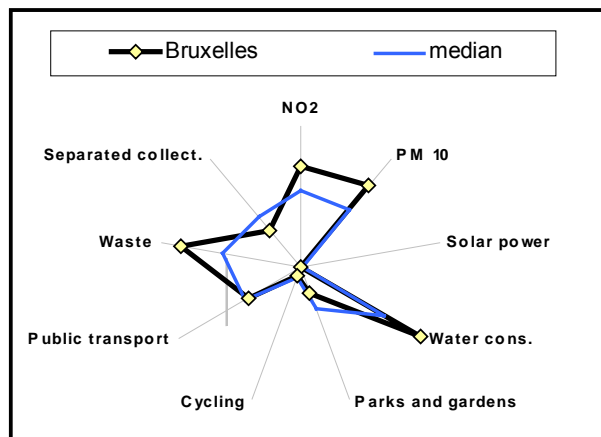
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	2004	Noise map	NA
CO2 reduction target setting	YES	Noise management plan	NA
Air quality plan	2004	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	NA	Local Agenda 21 process	1998
More efficient energy standards for private buildings	NA	Permanent consultative process	YES
Energy audit/database of public buildings	YES	State of the Environment report	2006
Retrofitting measures for public buildings	YES	Target setting	YES
Percentage of traffic lights having installed LED	NA	Local Agenda 21 Action Plan	1999
Public purchase of energy saving printers/photocop.	NA	Monitoring system of the action plan	YES
Public purchase of green electricity	YES	Offices/departments adopting a EMS	9

Urban Ecosystem Europe 2007

City	Bruxelles
Country	Belgium
Inhabitants	1.018.804
Area (km²)	161
Density (inh/km²)	6.328
GDP (euro/inh)	55.441



KEY INDICATORS	Bruxelles	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	47	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	31	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	90%	100%	100%	45%
Household water consumption (l/inh day)	108	96	162	294
Public parks and gardens (m ² /inh)	11	54	16	3
Cycle paths and lanes (m/100 inh)	0,13	2,97	0,13	0
Public transport passengers (pass/inh year)	250	718	263	16
Lines of public transport by rail (m/100 inh)	16	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	0	9.150	115	0
Inhabitants connected to a district heating network (%)	0%	99%	7%	0%
Municipal waste production (kg/inh year)	442	334	501	734
Separated collection of municipal waste (%)	22%	56%	27%	0%
Use of recycled paper in offices (%)	na	100%	60%	0%

CLIMATE CHANGE POLICIES

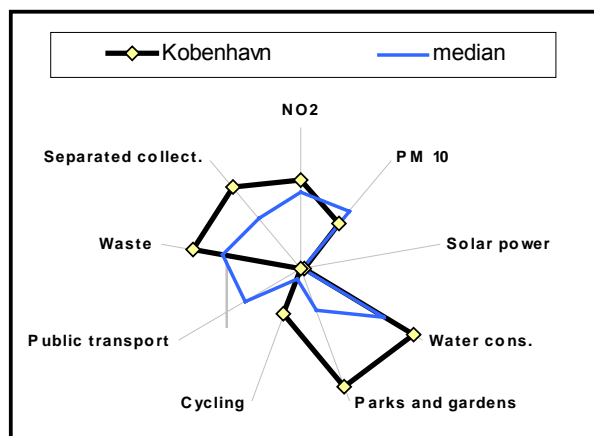
Energy balance	2004
CO2 reduction target setting	YES
Air quality plan	2002
Energy standards for private buildings	YES
More efficient energy standards for private buildings	YES
Energy audit/database of public buildings	YES
Retrofitting measures for public buildings	YES
Percentage of traffic lights having installed LED	NA
Public purchase of energy saving printers/photocop.	never
Public purchase of green electricity	NA

NOISE POLLUTION POLICIES

Noise map	2004
Noise management plan	1997
GOVERNANCE/MANAGEMENT	
Local Agenda 21 process	2003
Permanent consultative process	NO
State of the Environment report	2007
Target setting	NA
Local Agenda 21 Action Plan	2002
Monitoring system of the action plan	YES
Offices/departments adopting a EMS	0

Urban Ecosystem Europe 2007

City	Kobenhavn
Country	Denmark
Inhabitants	501.158
Area (km ²)	88
Density (inh/km ²)	5.695
GDP (euro/inh)	56.510



KEY INDICATORS	Kobenhavn	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	54	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	43	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	100%	100%	100%	45%
Household water consumption (l/inh day)	119	96	162	294
Public parks and gardens (m ² /inh)	36	54	16	3
Cycle paths and lanes (m/100 inh)	0,68	2,97	0,13	0
Public transport passengers (pass/inh year)	na	718	263	16
Lines of public transport by rail (m/100 inh)	2	28	9	0
Electric consumption (2000-2005 % variation)	3%	-26%	8%	26%
Solar plants in public buildings (kW)	100	9.150	115	0
Inhabitants connected to a district heating network (%)	98%	99%	7%	0%
Municipal waste production (kg/inh year)	466	334	501	734
Separated collection of municipal waste (%)	42%	56%	27%	0%
Use of recycled paper in offices (%)	100%	100%	60%	0%

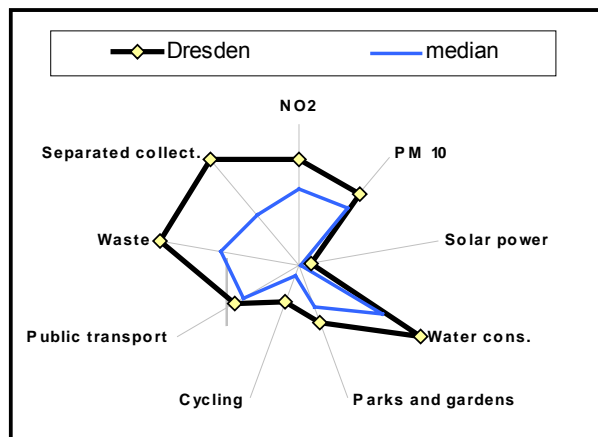
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	NO	Noise map	to be appr.
CO2 reduction target setting	YES	Noise management plan	NO
Air quality plan	NO	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	NO	Local Agenda 21 process	2005
More efficient energy standards for private buildings	NO	Permanent consultative process	YES
Energy audit/database of public buildings	YES	State of the Environment report	2005
Retrofitting measures for public buildings	YES	Target setting	YES
Percentage of traffic lights having installed LED	NA	Local Agenda 21 Action Plan	2005
Public purchase of energy saving printers/photocop.	usually	Monitoring system of the action plan	YES
Public purchase of green electricity	NO	Offices/departments adopting a EMS	63

Urban Ecosystem Europe 2007

City	Dresden
Country	Germany
Inhabitants	480.347
Area (km²)	328
Density (inh/km²)	1.464
GDP (euro/inh)	22.340



KEY INDICATORS	Dresden	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	45	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	34	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	100%	100%	100%	45%
Household water consumption (l/inh day)	96	96	162	294
Public parks and gardens (m ² /inh)	19	54	16	3
Cycle paths and lanes (m/100 inh)	0,55	2,97	0,13	0
Public transport passengers (pass/inh year)	287	718	263	16
Lines of public transport by rail (m/100 inh)	na	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	435	9.150	115	0
Inhabitants connected to a district heating network (%)	46%	99%	7%	0%
Municipal waste production (kg/inh year)	334	334	501	734
Separated collection of municipal waste (%)	54%	56%	27%	0%
Use of recycled paper in offices (%)	0%	100%	60%	0%

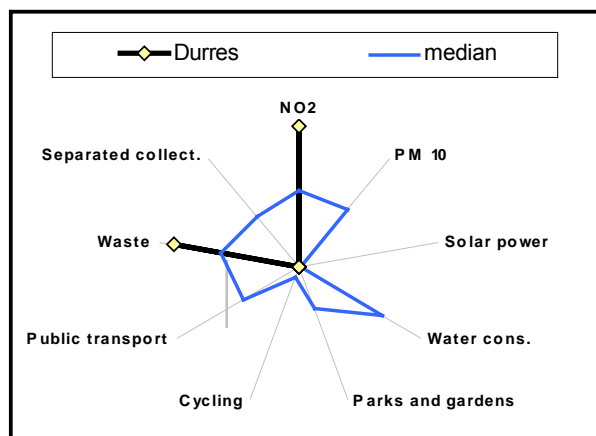
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	2004	Noise map	to be appr.
CO2 reduction target setting	YES	Noise management plan	NO
Air quality plan	to be appr.	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	YES	Local Agenda 21 process	1998
More efficient energy standards for private buildings	NA	Permanent consultative process	NA
Energy audit/database of public buildings	NA	State of the Environment report	2004
Retrofitting measures for public buildings	NA	Target setting	NA
Percentage of traffic lights having installed LED	NA	Local Agenda 21 Action Plan	NO
Public purchase of energy saving printers/photocop.	NA	Monitoring system of the action plan	NA
Public purchase of green electricity	NA	Offices/departments adopting a EMS	1

Urban Ecosystem Europe 2007

City	Durres
Country	Albania
Inhabitants	195.135
Area (km²)	200
Density (inh/km²)	976
GDP (euro/inh)	na



KEY INDICATORS	Durres	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	17	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	na	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	na	100%	100%	45%
Household water consumption (l/inh day)	na	96	162	294
Public parks and gardens (m ² /inh)	na	54	16	3
Cycle paths and lanes (m/100 inh)	0,00	2,97	0,13	0
Public transport passengers (pass/inh year)	na	718	263	16
Lines of public transport by rail (m/100 inh)	na	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	0	9.150	115	0
Inhabitants connected to a district heating network (%)	na	99%	7%	0%
Municipal waste production (kg/inh year)	433	334	501	734
Separated collection of municipal waste (%)	0%	56%	27%	0%
Use of recycled paper in offices (%)	4%	100%	60%	0%

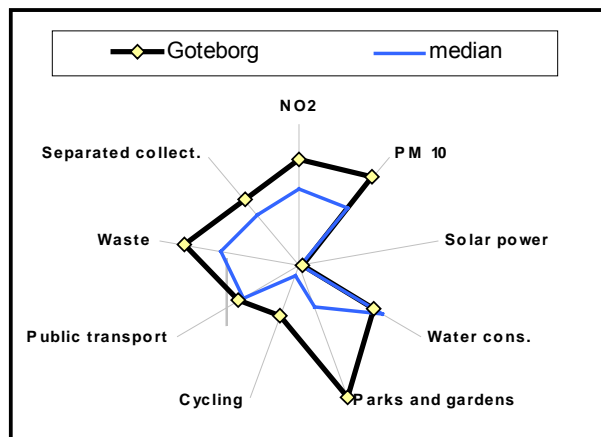
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	NO	Noise map	NO
CO2 reduction target setting	NO	Noise management plan	NO
Air quality plan	NO	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	NO	Local Agenda 21 process	NO
More efficient energy standards for private buildings	NO	Permanent consultative process	NO
Energy audit/database of public buildings	YES	State of the Environment report	NO
Retrofitting measures for public buildings	YES	Target setting	NO
Percentage of traffic lights having installed LED	0%	Local Agenda 21 Action Plan	NO
Public purchase of energy saving printers/photocop.	never	Monitoring system of the action plan	NO
Public purchase of green electricity	NO	Offices/departments adopting a EMS	0

Urban Ecosystem Europe 2007

City	Goteborg
Country	Sweden
Inhabitants	489.797
Area (km²)	450
Density (inh/km²)	1.088
GDP (euro/inh)	31.900



KEY INDICATORS	Goteborg	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	45	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	29	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	100%	100%	100%	45%
Household water consumption (l/inh day)	173	96	162	294
Public parks and gardens (m ² /inh)	41	54	16	3
Cycle paths and lanes (m/100 inh)	0,76	2,97	0,13	0
Public transport passengers (pass/inh year)	270	718	263	16
Lines of public transport by rail (m/100 inh)	na	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	115	9.150	115	0
Inhabitants connected to a district heating network (%)	67%	99%	7%	0%
Municipal waste production (kg/inh year)	450	334	501	734
Separated collection of municipal waste (%)	35%	56%	27%	0%
Use of recycled paper in offices (%)	100%	100%	60%	0%

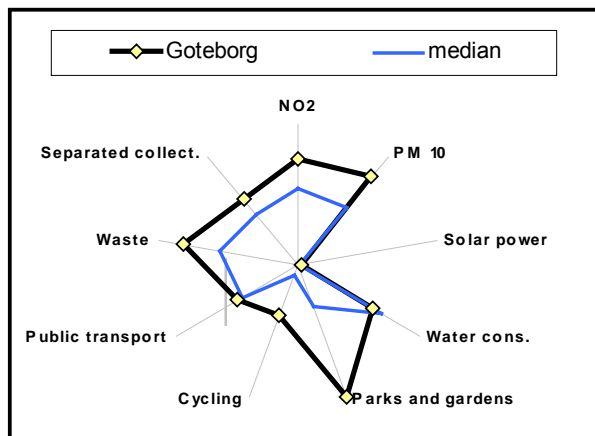
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	NO	Noise map	to be appr.
CO2 reduction target setting	YES	Noise management plan	to be appr.
Air quality plan	2004	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	NO	Local Agenda 21 process	YES
More efficient energy standards for private buildings	NO	Permanent consultative process	NO
Energy audit/database of public buildings	YES	State of the Environment report	2005
Retrofitting measures for public buildings	YES	Target setting	YES
Percentage of traffic lights having installed LED	42%	Local Agenda 21 Action Plan	NO
Public purchase of energy saving printers/photocop.	usually	Monitoring system of the action plan	NA
Public purchase of green electricity	YES	Offices/departments adopting a EMS	4

Urban Ecosystem Europe 2007

City	Goteborg
Country	Sweden
Inhabitants	489.797
Area (km²)	450
Density (inh/km²)	1.088
GDP (euro/inh)	31.900



KEY INDICATORS	Goteborg	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	45	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	29	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	100%	100%	100%	45%
Household water consumption (l/inh day)	173	96	162	294
Public parks and gardens (m ² /inh)	41	54	16	3
Cycle paths and lanes (m/100 inh)	0,76	2,97	0,13	0
Public transport passengers (pass/inh year)	270	718	263	16
Lines of public transport by rail (m/100 inh)	na	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	115	9.150	115	0
Inhabitants connected to a district heating network (%)	67%	99%	7%	0%
Municipal waste production (kg/inh year)	450	334	501	734
Separated collection of municipal waste (%)	35%	56%	27%	0%
Use of recycled paper in offices (%)	100%	100%	60%	0%

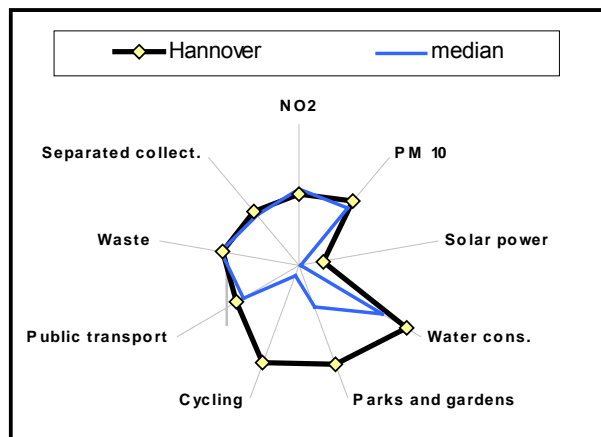
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	NO	Noise map	to be appr.
CO2 reduction target setting	YES	Noise management plan	to be appr.
Air quality plan	2004	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	NO	Local Agenda 21 process	YES
More efficient energy standards for private buildings	NO	Permanent consultative process	NO
Energy audit/database of public buildings	YES	State of the Environment report	2005
Retrofitting measures for public buildings	YES	Target setting	YES
Percentage of traffic lights having installed LED	42%	Local Agenda 21 Action Plan	NO
Public purchase of energy saving printers/photocop.	usually	Monitoring system of the action plan	NA
Public purchase of green electricity	YES	Offices/departments adopting a EMS	4

Urban Ecosystem Europe 2007

City	Hannover
Country	Germany
Inhabitants	516.631
Area (km²)	204
Density (inh/km²)	2.533
GDP (euro/inh)	41.682



KEY INDICATORS	Hannover	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	63	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	37	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	100%	100%	100%	45%
Household water consumption (l/inh day)	125	96	162	294
Public parks and gardens (m ² /inh)	30	54	16	3
Cycle paths and lanes (m/100 inh)	1,49	2,97	0,13	0
Public transport passengers (pass/inh year)	280	718	263	16
Lines of public transport by rail (m/100 inh)	na	28	9	0
Electric consumption (2000-2005 % variation)	15%	-26%	8%	26%
Solar plants in public buildings (kW)	855	9.150	115	0
Inhabitants connected to a district heating network (%)	12%	99%	7%	0%
Municipal waste production (kg/inh year)	523	334	501	734
Separated collection of municipal waste (%)	30%	56%	27%	0%
Use of recycled paper in offices (%)	90%	100%	60%	0%

CLIMATE CHANGE POLICIES

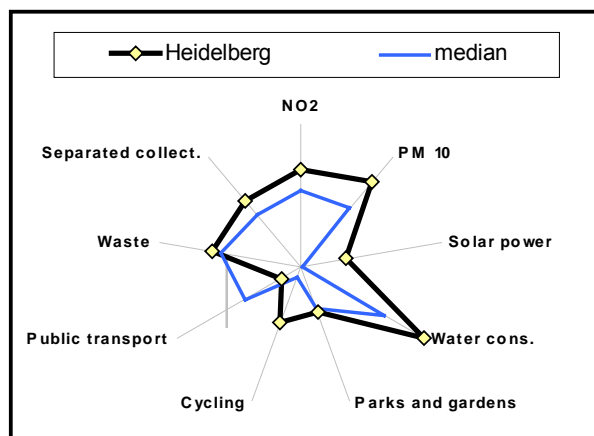
Energy balance	2005
CO2 reduction target setting	YES
Air quality plan	2007
Energy standards for private buildings	YES
More efficient energy standards for private buildings	YES
Energy audit/database of public buildings	YES
Retrofitting measures for public buildings	YES
Percentage of traffic lights having installed LED	10%
Public purchase of energy saving printers/photocop.	usually
Public purchase of green electricity	NA

NOISE POLLUTION POLICIES

Noise map	2000
Noise management plan	NO
GOVERNANCE/MANAGEMENT	
Local Agenda 21 process	1995
Permanent consultative process	YES
State of the Environment report	since 1992
Target setting	YES
Local Agenda 21 Action Plan	1997
Monitoring system of the action plan	NO
Offices/departments adopting a EMS	4

Urban Ecosystem Europe 2007

City	Heidelberg
Country	Germany
Inhabitants	143.750
Area (km²)	109
Density (inh/km²)	1.319
GDP (euro/inh)	37.245



KEY INDICATORS	Heidelberg	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	50	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	30	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	100%	100%	100%	45%
Household water consumption (l/inh day)	103	96	162	294
Public parks and gardens (m ² /inh)	16	54	16	3
Cycle paths and lanes (m/100 inh)	0,82	2,97	0,13	0
Public transport passengers (pass/inh year)	149	718	263	16
Lines of public transport by rail (m/100 inh)	11	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	1.587	9.150	115	0
Inhabitants connected to a district heating network (%)	6%	99%	7%	0%
Municipal waste production (kg/inh year)	501	334	501	734
Separated collection of municipal waste (%)	35%	56%	27%	0%
Use of recycled paper in offices (%)	100%	100%	60%	0%

CLIMATE CHANGE POLICIES

Energy balance	2002
CO2 reduction target setting	YES
Air quality plan	2006
Energy standards for private buildings	YES
More efficient energy standards for private buildings	NA
Energy audit/database of public buildings	YES
Retrofitting measures for public buildings	YES
Percentage of traffic lights having installed LED	0%
Public purchase of energy saving printers/photocop.	usually
Public purchase of green electricity	YES

NOISE POLLUTION POLICIES

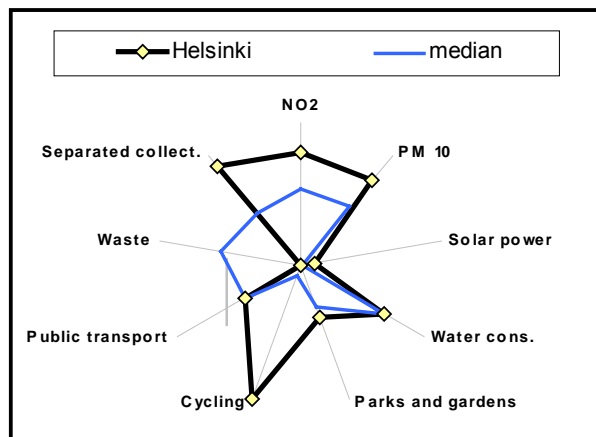
Noise map	1998
Noise management plan	2003

GOVERNANCE/MANAGEMENT

Local Agenda 21 process	1997
Permanent consultative process	YES
State of the Environment report	2005
Target setting	YES
Local Agenda 21 Action Plan	1997
Monitoring system of the action plan	YES
Offices/departments adopting a EMS	1

Urban Ecosystem Europe 2007

City	Helsinki
Country	Finland
Inhabitants	561.000
Area (km²)	187
Density (inh/km²)	3.000
GDP (euro/inh)	49.971



KEY INDICATORS	Helsinki	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	42	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	30	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	100%	100%	100%	45%
Household water consumption (l/inh day)	162	96	162	294
Public parks and gardens (m ² /inh)	18	54	16	3
Cycle paths and lanes (m/100 inh)	2,97	2,97	0,13	0
Public transport passengers (pass/inh year)	257	718	263	16
Lines of public transport by rail (m/100 inh)	9	28	9	0
Electric consumption (2000-2005 % variation)	11%	-26%	8%	26%
Solar plants in public buildings (kW)	485	9.150	115	0
Inhabitants connected to a district heating network (%)	99%	99%	7%	0%
Municipal waste production (kg/inh year)	734	334	501	734
Separated collection of municipal waste (%)	50%	56%	27%	0%
Use of recycled paper in offices (%)	na	100%	60%	0%

CLIMATE CHANGE POLICIES

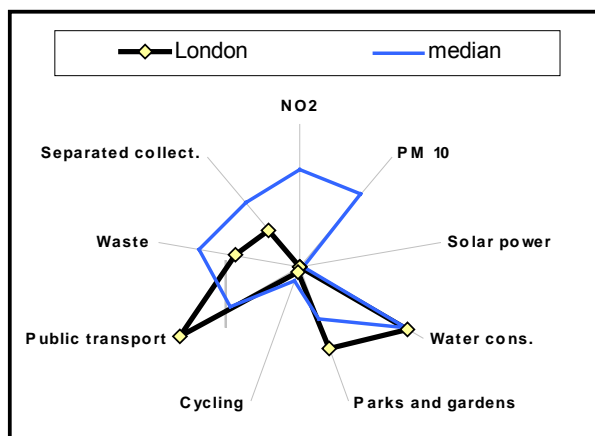
Energy balance	2005
CO2 reduction target setting	YES
Air quality plan	to be appr.
Energy standards for private buildings	YES
More efficient energy standards for private buildings	NO
Energy audit/database of public buildings	YES
Retrofitting measures for public buildings	YES
Percentage of traffic lights having installed LED	12%
Public purchase of energy saving printers/photocop.	rarely
Public purchase of green electricity	NA

NOISE POLLUTION POLICIES

Noise map	2007
Noise management plan	to be appr.
GOVERNANCE/MANAGEMENT	
Local Agenda 21 process	1998-2002
Permanent consultative process	YES
State of the Environment report	2006
Target setting	YES
Local Agenda 21 Action Plan	2002
Monitoring system of the action plan	YES
Offices/departments adopting a EMS	1

Urban Ecosystem Europe 2007

City	London
Country	United Kingdom
Inhabitants	7.428.590
Area (km²)	1.595
Density (inh/km²)	4.657
GDP (euro/inh)	40.402



KEY INDICATORS	London	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	112	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	66	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	100%	100%	100%	45%
Household water consumption (l/inh day)	159	96	162	294
Public parks and gardens (m ² /inh)	21	54	16	3
Cycle paths and lanes (m/100 inh)	0,07	2,97	0,13	0
Public transport passengers (pass/inh year)	378	718	263	16
Lines of public transport by rail (m/100 inh)	6	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	0	9.150	115	0
Inhabitants connected to a district heating network (%)	na	99%	7%	0%
Municipal waste production (kg/inh year)	573	334	501	734
Separated collection of municipal waste (%)	18%	56%	27%	0%
Use of recycled paper in offices (%)	na	100%	60%	0%

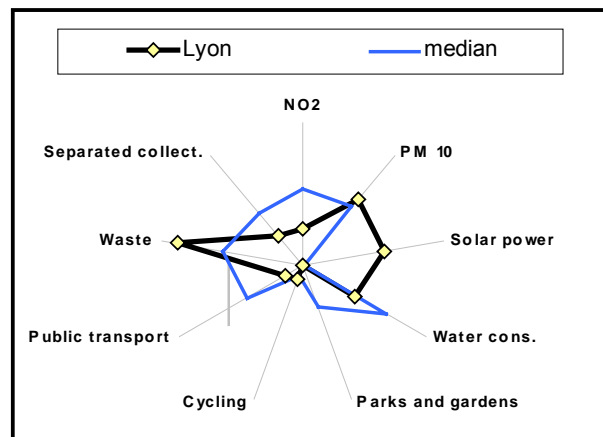
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	2003	Noise map	2004
CO2 reduction target setting	YES	Noise management plan	2004
Air quality plan	2002	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	NA	Local Agenda 21 process	NO
More efficient energy standards for private buildings	NA	Permanent consultative process	NA
Energy audit/database of public buildings	NA	State of the Environment report	2003
Retrofitting measures for public buildings	NA	Target setting	NA
Percentage of traffic lights having installed LED	NA	Local Agenda 21 Action Plan	NO
Public purchase of energy saving printers/photocop.	NA	Monitoring system of the action plan	NA
Public purchase of green electricity	NA	Offices/departments adopting a EMS	0

Urban Ecosystem Europe 2007

City	Lyon
Country	France
Inhabitants	1.260.000
Area (km²)	515
Density (inh/km²)	2.447
GDP (euro/inh)	30.000



KEY INDICATORS	Lyon	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	81	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	36	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	100%	100%	100%	45%
Household water consumption (l/inh day)	209	96	162	294
Public parks and gardens (m ² /inh)	4	54	16	3
Cycle paths and lanes (m/100 inh)	0,20	2,97	0,13	0
Public transport passengers (pass/inh year)	144	718	263	16
Lines of public transport by rail (m/100 inh)	6	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	2.884	9.150	115	0
Inhabitants connected to a district heating network (%)	2%	99%	7%	0%
Municipal waste production (kg/inh year)	435	334	501	734
Separated collection of municipal waste (%)	18%	56%	27%	0%
Use of recycled paper in offices (%)	0%	100%	60%	0%

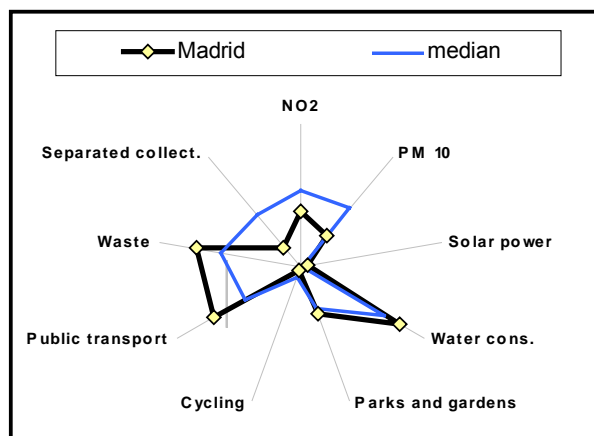
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	2001	Noise map	to be appr.
CO2 reduction target setting	NO	Noise management plan	to be appr.
Air quality plan	to be appr.	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	YES	Local Agenda 21 process	2001
More efficient energy standards for private buildings	NO	Permanent consultative process	YES
Energy audit/database of public buildings	YES	State of the Environment report	2004
Retrofitting measures for public buildings	YES	Target setting	YES
Percentage of traffic lights having installed LED	61%	Local Agenda 21 Action Plan	2005
Public purchase of energy saving printers/photocop.	usually	Monitoring system of the action plan	YES
Public purchase of green electricity	NO	Offices/departments adopting a EMS	0

Urban Ecosystem Europe 2007

City	Madrid
Country	Spain
Inhabitants	3.205.334
Area (km²)	604
Density (inh/km²)	5.307
GDP (euro/inh)	27.279



KEY INDICATORS	Madrid	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	71	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	48	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	100%	100%	100%	45%
Household water consumption (l/inh day)	140	96	162	294
Public parks and gardens (m ² /inh)	17	54	16	3
Cycle paths and lanes (m/100 inh)	0,04	2,97	0,13	0
Public transport passengers (pass/inh year)	354	718	263	16
Lines of public transport by rail (m/100 inh)	10	28	9	0
Electric consumption (2000-2005 % variation)	6%	-26%	8%	26%
Solar plants in public buildings (kW)	269	9.150	115	0
Inhabitants connected to a district heating network (%)	na	99%	7%	0%
Municipal waste production (kg/inh year)	473	334	501	734
Separated collection of municipal waste (%)	13%	56%	27%	0%
Use of recycled paper in offices (%)	69%	100%	60%	0%

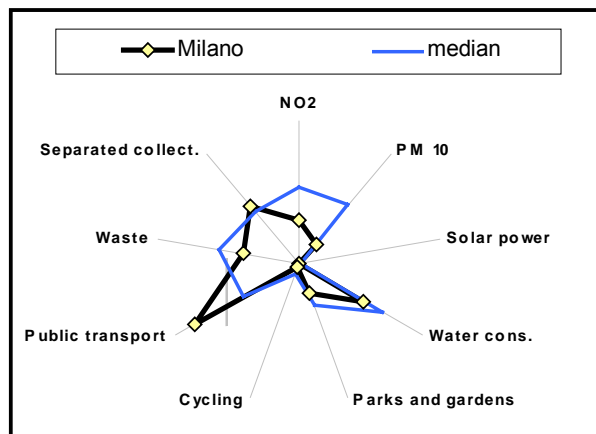
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	2003	Noise map	to be appr.
CO2 reduction target setting	YES	Noise management plan	2001
Air quality plan	2006	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	NA	Local Agenda 21 process	2001
More efficient energy standards for private buildings	NA	Permanent consultative process	YES
Energy audit/database of public buildings	NA	State of the Environment report	2004
Retrofitting measures for public buildings	NA	Target setting	YES
Percentage of traffic lights having installed LED	NA	Local Agenda 21 Action Plan	2007
Public purchase of energy saving printers/photocop.	never	Monitoring system of the action plan	YES
Public purchase of green electricity	NO	Offices/departments adopting a EMS	2

Urban Ecosystem Europe 2007

City	Milano
Country	Italy
Inhabitants	1.303.437
Area (km²)	182
Density (inh/km²)	7.162
GDP (euro/inh)	32.419



KEY INDICATORS	Milano	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	77	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	52	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	98%	100%	100%	45%
Household water consumption (l/inh day)	191	96	162	294
Public parks and gardens (m ² /inh)	12	54	16	3
Cycle paths and lanes (m/100 inh)	0,05	2,97	0,13	0
Public transport passengers (pass/inh year)	402	718	263	16
Lines of public transport by rail (m/100 inh)	21	28	9	0
Electric consumption (2000-2005 % variation)	2%	-26%	8%	26%
Solar plants in public buildings (kW)	0	9.150	115	0
Inhabitants connected to a district heating network (%)	7%	99%	7%	0%
Municipal waste production (kg/inh year)	565	334	501	734
Separated collection of municipal waste (%)	31%	56%	27%	0%
Use of recycled paper in offices (%)	25%	100%	60%	0%

CLIMATE CHANGE POLICIES

Energy balance	2003
CO2 reduction target setting	YES
Air quality plan	NA
Energy standards for private buildings	NO
More efficient energy standards for private buildings	NO
Energy audit/database of public buildings	NO
Retrofitting measures for public buildings	YES
Percentage of traffic lights having installed LED	NA
Public purchase of energy saving printers/photocop.	NA
Public purchase of green electricity	NO

NOISE POLLUTION POLICIES

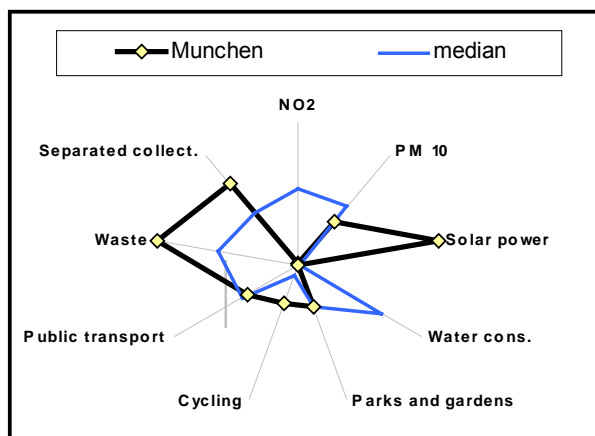
Noise map	to be appr.
Noise management plan	to be appr.

GOVERNANCE/MANAGEMENT

Local Agenda 21 process	2001
Permanent consultative process	YES
State of the Environment report	2003
Target setting	NA
Local Agenda 21 Action Plan	NO
Monitoring system of the action plan	NO
Offices/departments adopting a EMS	2

Urban Ecosystem Europe 2007

City	Munchen
Country	Germany
Inhabitants	1.331.445
Area (km²)	310
Density (inh/km²)	4.295
GDP (euro/inh)	53.000



KEY INDICATORS	Munchen	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	98	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	44	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	100%	100%	100%	45%
Household water consumption (l/inh day)	na	96	162	294
Public parks and gardens (m ² /inh)	15	54	16	3
Cycle paths and lanes (m/100 inh)	0,56	2,97	0,13	0
Public transport passengers (pass/inh year)	237	718	263	16
Lines of public transport by rail (m/100 inh)	9	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	6.227	9.150	115	0
Inhabitants connected to a district heating network (%)	na	99%	7%	0%
Municipal waste production (kg/inh year)	405	334	501	734
Separated collection of municipal waste (%)	42%	56%	27%	0%
Use of recycled paper in offices (%)	95%	100%	60%	0%

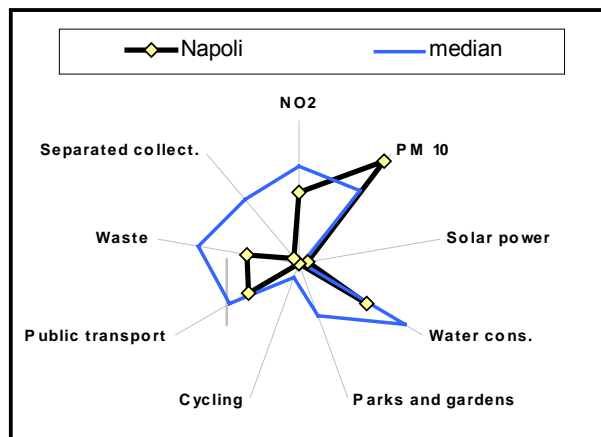
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	2004	Noise map	to be appr.
CO2 reduction target setting	YES	Noise management plan	to be appr.
Air quality plan	2004	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	YES	Local Agenda 21 process	1995
More efficient energy standards for private buildings	YES	Permanent consultative process	NO
Energy audit/database of public buildings	YES	State of the Environment report	2006
Retrofitting measures for public buildings	YES	Target setting	YES
Percentage of traffic lights having installed LED	NA	Local Agenda 21 Action Plan	1999
Public purchase of energy saving printers/photocop.	usually	Monitoring system of the action plan	NO
Public purchase of green electricity	NA	Offices/departments adopting a EMS	12

Urban Ecosystem Europe 2007

City	Napoli
Country	Italy
Inhabitants	975.139
Area (km²)	117
Density (inh/km²)	8.315
GDP (euro/inh)	14.000



KEY INDICATORS	Napoli	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	70	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	31	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	72%	100%	100%	45%
Household water consumption (l/inh day)	207	96	162	294
Public parks and gardens (m ² /inh)	3	54	16	3
Cycle paths and lanes (m/100 inh)	0,00	2,97	0,13	0
Public transport passengers (pass/inh year)	212	718	263	16
Lines of public transport by rail (m/100 inh)	4	28	9	0
Electric consumption (2000-2005 % variation)	4%	-26%	8%	26%
Solar plants in public buildings (kW)	233	9.150	115	0
Inhabitants connected to a district heating network (%)	0%	99%	7%	0%
Municipal waste production (kg/inh year)	593	334	501	734
Separated collection of municipal waste (%)	6%	56%	27%	0%
Use of recycled paper in offices (%)	na	100%	60%	0%

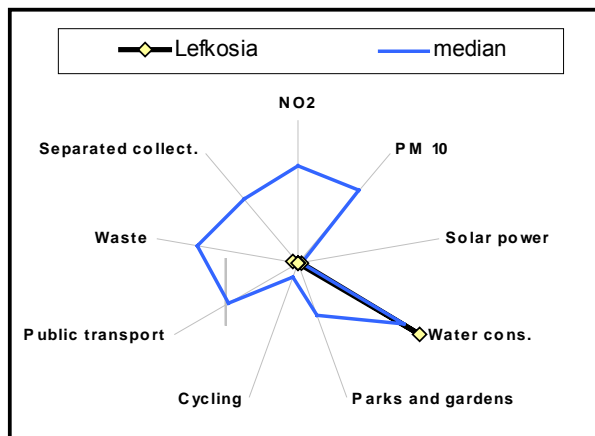
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	NA	Noise map	NO
CO2 reduction target setting	NA	Noise management plan	to be appr.
Air quality plan	NA	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	NO	Local Agenda 21 process	2002
More efficient energy standards for private buildings	NO	Permanent consultative process	YES
Energy audit/database of public buildings	NA	State of the Environment report	NO
Retrofitting measures for public buildings	YES	Target setting	NA
Percentage of traffic lights having installed LED	NA	Local Agenda 21 Action Plan	YES
Public purchase of energy saving printers/photocop.	NA	Monitoring system of the action plan	NO
Public purchase of green electricity	NO	Offices/departments adopting a EMS	0

Urban Ecosystem Europe 2007

City	Lefkosia
Country	Cyprus
Inhabitants	219.000
Area (km²)	190
Density (inh/km²)	1.153
GDP (euro/inh)	na



KEY INDICATORS	Lefkosia	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	na	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	na	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	50%	100%	100%	45%
Household water consumption (l/inh day)	143	96	162	294
Public parks and gardens (m ² /inh)	na	54	16	3
Cycle paths and lanes (m/100 inh)	0,00	2,97	0,13	0
Public transport passengers (pass/inh year)	16	718	263	16
Lines of public transport by rail (m/100 inh)	na	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	75	9.150	115	0
Inhabitants connected to a district heating network (%)	0%	99%	7%	0%
Municipal waste production (kg/inh year)	662	334	501	734
Separated collection of municipal waste (%)	2%	56%	27%	0%
Use of recycled paper in offices (%)	na	100%	60%	0%

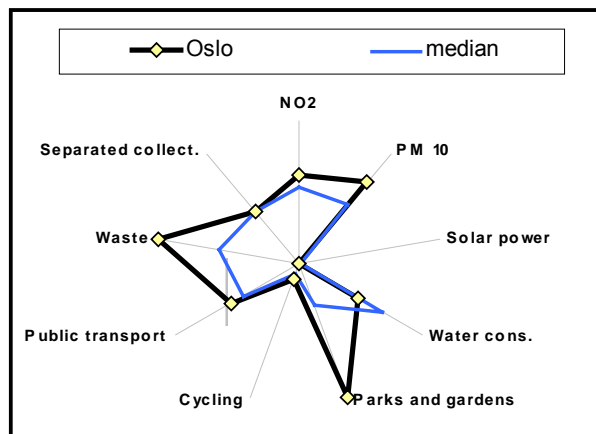
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	NO	Noise map	NO
CO2 reduction target setting	NO	Noise management plan	NO
Air quality plan	to be appr.	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	YES	Local Agenda 21 process	NO
More efficient energy standards for private buildings	NA	Permanent consultative process	NA
Energy audit/database of public buildings	NA	State of the Environment report	NO
Retrofitting measures for public buildings	NA	Target setting	NA
Percentage of traffic lights having installed LED	NA	Local Agenda 21 Action Plan	NO
Public purchase of energy saving printers/photocop.	NA	Monitoring system of the action plan	NA
Public purchase of green electricity	NA	Offices/departments adopting a EMS	0

Urban Ecosystem Europe 2007

City	Oslo
Country	Norway
Inhabitants	538.411
Area (km²)	454
Density (inh/km²)	1.186
GDP (euro/inh)	51.424



KEY INDICATORS	Oslo	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	54	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	31	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	100%	100%	100%	45%
Household water consumption (l/inh day)	200	96	162	294
Public parks and gardens (m ² /inh)	54	54	16	3
Cycle paths and lanes (m/100 inh)	0,24	2,97	0,13	0
Public transport passengers (pass/inh year)	294	718	263	16
Lines of public transport by rail (m/100 inh)	24	28	9	0
Electric consumption (2000-2005 % variation)	-26%	-26%	8%	26%
Solar plants in public buildings (kW)	0	9.150	115	0
Inhabitants connected to a district heating network (%)	7%	99%	7%	0%
Municipal waste production (kg/inh year)	406	334	501	734
Separated collection of municipal waste (%)	28%	56%	27%	0%
Use of recycled paper in offices (%)	na	100%	60%	0%

CLIMATE CHANGE POLICIES

Energy balance	2006
CO2 reduction target setting	YES
Air quality plan	2005
Energy standards for private buildings	YES
More efficient energy standards for private buildings	YES
Energy audit/database of public buildings	YES
Retrofitting measures for public buildings	YES
Percentage of traffic lights having installed LED	100%
Public purchase of energy saving printers/photocop.	rarely
Public purchase of green electricity	YES

NOISE POLLUTION POLICIES

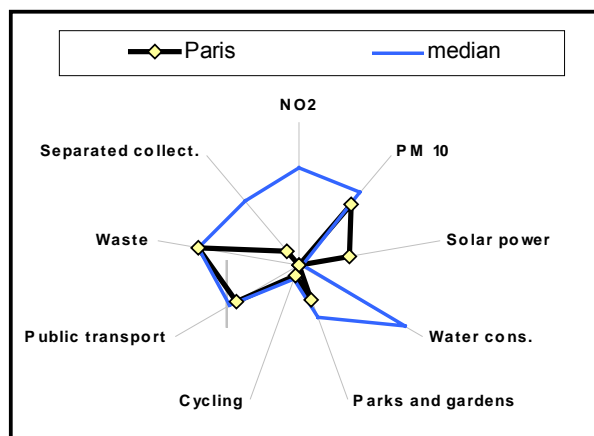
Noise map	to be appr.
Noise management plan	to be appr.

GOVERNANCE/MANAGEMENT

Local Agenda 21 process	1998
Permanent consultative process	YES
State of the Environment report	2006
Target setting	YES
Local Agenda 21 Action Plan	2002
Monitoring system of the action plan	YES
Offices/departments adopting a EMS	170

Urban Ecosystem Europe 2007

City	Paris
Country	France
Inhabitants	2.144.700
Area (km²)	105
Density (inh/km²)	20.426
GDP (euro/inh)	39.924



KEY INDICATORS	Paris	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	100	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	42	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	100%	100%	100%	45%
Household water consumption (l/inh day)	287	96	162	294
Public parks and gardens (m ² /inh)	11	54	16	3
Cycle paths and lanes (m/100 inh)	0,13	2,97	0,13	0
Public transport passengers (pass/inh year)	237	718	263	16
Lines of public transport by rail (m/100 inh)	2	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	1.400	9.150	115	0
Inhabitants connected to a district heating network (%)	18%	99%	7%	0%
Municipal waste production (kg/inh year)	518	334	501	734
Separated collection of municipal waste (%)	10%	56%	27%	0%
Use of recycled paper in offices (%)	50%	100%	60%	0%

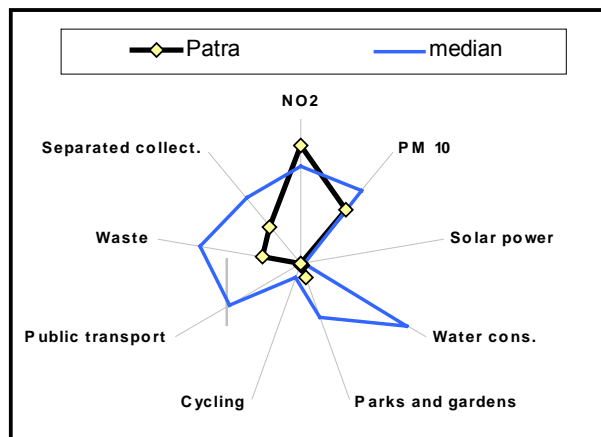
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	2005	Noise map	YES
CO2 reduction target setting	NA	Noise management plan	YES
Air quality plan	YES	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	YES	Local Agenda 21 process	2005
More efficient energy standards for private buildings	NA	Permanent consultative process	NA
Energy audit/database of public buildings	NA	State of the Environment report	2004
Retrofitting measures for public buildings	NA	Target setting	NA
Percentage of traffic lights having installed LED	NA	Local Agenda 21 Action Plan	NO
Public purchase of energy saving printers/photocop.	NA	Monitoring system of the action plan	NA
Public purchase of green electricity	NA	Offices/departments adopting a EMS	3

Urban Ecosystem Europe 2007

City	Patra
Country	Greece
Inhabitants	200.000
Area (km²)	150
Density (inh/km²)	1.333
GDP (euro/inh)	13.090



KEY INDICATORS	Patra	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	52	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	44	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	45%	100%	100%	45%
Household water consumption (l/inh day)	285	96	162	294
Public parks and gardens (m ² /inh)	6	54	16	3
Cycle paths and lanes (m/100 inh)	0,01	2,97	0,13	0
Public transport passengers (pass/inh year)	na	718	263	16
Lines of public transport by rail (m/100 inh)	na	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	0	9.150	115	0
Inhabitants connected to a district heating network (%)	na	99%	7%	0%
Municipal waste production (kg/inh year)	614	334	501	734
Separated collection of municipal waste (%)	18%	56%	27%	0%
Use of recycled paper in offices (%)	na	100%	60%	0%

CLIMATE CHANGE POLICIES

Energy balance	2002
CO2 reduction target setting	NA
Air quality plan	NO
Energy standards for private buildings	NA
More efficient energy standards for private buildings	NA
Energy audit/database of public buildings	NA
Retrofitting measures for public buildings	NA
Percentage of traffic lights having installed LED	NA
Public purchase of energy saving printers/photocop.	never
Public purchase of green electricity	NA

NOISE POLLUTION POLICIES

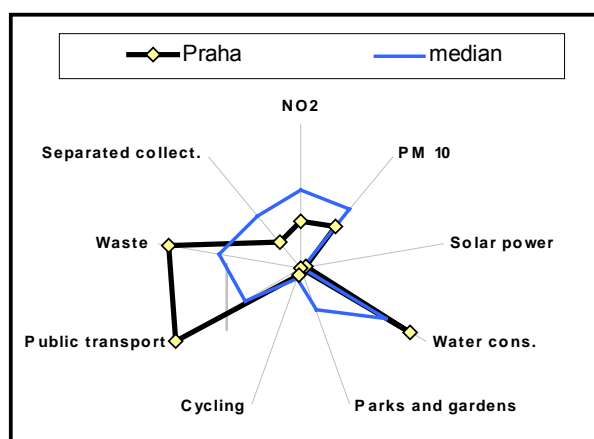
Noise map	NO
Noise management plan	NO

GOVERNANCE/MANAGEMENT

Local Agenda 21 process	2005
Permanent consultative process	NO
State of the Environment report	2005
Target setting	NO
Local Agenda 21 Action Plan	NO
Monitoring system of the action plan	NO
Offices/departments adopting a EMS	0

Urban Ecosystem Europe 2007

City	Praha
Country	Czech Republic
Inhabitants	1.181.610
Area (km²)	496
Density (inh/km²)	2.382
GDP (euro/inh)	20.379



KEY INDICATORS	Praha	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	76	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	45	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	99%	100%	100%	45%
Household water consumption (l/inh day)	127	96	162	294
Public parks and gardens (m ² /inh)	na	54	16	3
Cycle paths and lanes (m/100 inh)	0,10	2,97	0,13	0
Public transport passengers (pass/inh year)	718	718	263	16
Lines of public transport by rail (m/100 inh)	12	28	9	0
Electric consumption (2000-2005 % variation)	21%	-26%	8%	26%
Solar plants in public buildings (kW)	180	9.150	115	0
Inhabitants connected to a district heating network (%)	47%	99%	7%	0%
Municipal waste production (kg/inh year)	425	334	501	734
Separated collection of municipal waste (%)	16%	56%	27%	0%
Use of recycled paper in offices (%)	0%	100%	60%	0%

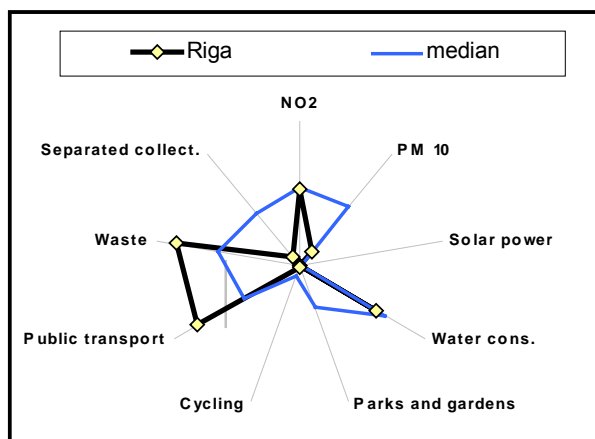
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	2005	Noise map	2006
CO2 reduction target setting	NO	Noise management plan	NO
Air quality plan	2006	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	YES	Local Agenda 21 process	NO
More efficient energy standards for private buildings	YES	Permanent consultative process	NO
Energy audit/database of public buildings	YES	State of the Environment report	since1990
Retrofitting measures for public buildings	YES	Target setting	NA
Percentage of traffic lights having installed LED	0%	Local Agenda 21 Action Plan	NO
Public purchase of energy saving printers/photocop.	usually	Monitoring system of the action plan	NO
Public purchase of green electricity	NA	Offices/departments adopting a EMS	0

Urban Ecosystem Europe 2007

City	Riga
Country	Latvia
Inhabitants	727.578
Area (km²)	305
Density (inh/km²)	2.389
GDP (euro/inh)	8.368



KEY INDICATORS	Riga	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	61	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	54	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	87%	100%	100%	45%
Household water consumption (l/inh day)	176	96	162	294
Public parks and gardens (m ² /inh)	4	54	16	3
Cycle paths and lanes (m/100 inh)	0,04	2,97	0,13	0
Public transport passengers (pass/inh year)	392	718	263	16
Lines of public transport by rail (m/100 inh)	17	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	0	9.150	115	0
Inhabitants connected to a district heating network (%)	84%	99%	7%	0%
Municipal waste production (kg/inh year)	441	334	501	734
Separated collection of municipal waste (%)	8%	56%	27%	0%
Use of recycled paper in offices (%)	na	100%	60%	0%

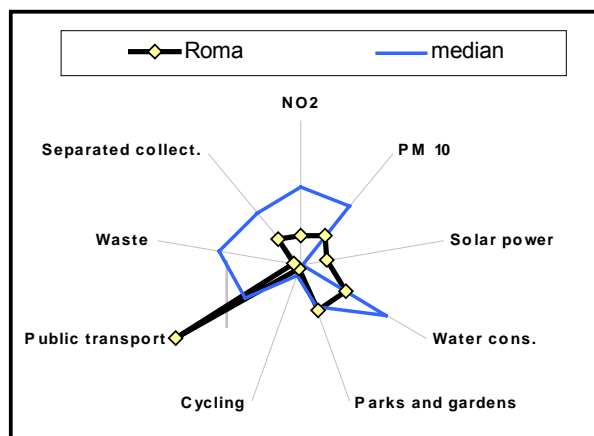
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	NO	Noise map	NO
CO2 reduction target setting	NO	Noise management plan	NO
Air quality plan	2004	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	NA	Local Agenda 21 process	2000
More efficient energy standards for private buildings	NA	Permanent consultative process	NO
Energy audit/database of public buildings	NA	State of the Environment report	2004
Retrofitting measures for public buildings	NA	Target setting	YES
Percentage of traffic lights having installed LED	NA	Local Agenda 21 Action Plan	2002
Public purchase of energy saving printers/photocop.	never	Monitoring system of the action plan	YES
Public purchase of green electricity	NO	Offices/departments adopting a EMS	0

Urban Ecosystem Europe 2007

City	Roma
Country	Italy
Inhabitants	2.705.603
Area (km ²)	1.285
Density (inh/km ²)	2.105
GDP (euro/inh)	27.553



KEY INDICATORS	Roma	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	84	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	49	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	93%	100%	100%	45%
Household water consumption (l/inh day)	221	96	162	294
Public parks and gardens (m ² /inh)	16	54	16	3
Cycle paths and lanes (m/100 inh)	0,05	2,97	0,13	0
Public transport passengers (pass/inh year)	467	718	263	16
Lines of public transport by rail (m/100 inh)	3	28	9	0
Electric consumption (2000-2005 % variation)	12%	-26%	8%	26%
Solar plants in public buildings (kW)	907	9.150	115	0
Inhabitants connected to a district heating network (%)	1%	99%	7%	0%
Municipal waste production (kg/inh year)	657	334	501	734
Separated collection of municipal waste (%)	16%	56%	27%	0%
Use of recycled paper in offices (%)	na	100%	60%	0%

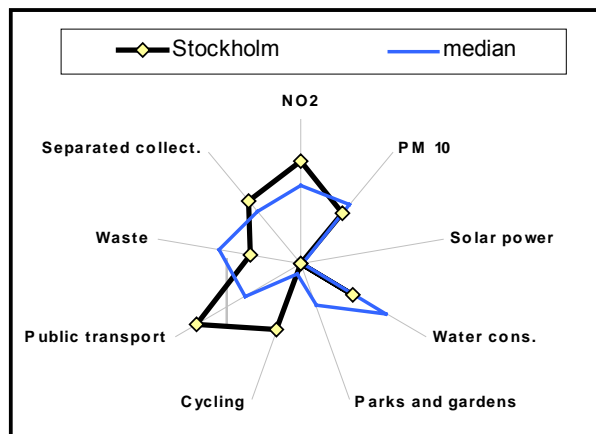
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	2004	Noise map	YES
CO2 reduction target setting	YES	Noise management plan	to be appr.
Air quality plan	NA	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	YES	Local Agenda 21 process	1997
More efficient energy standards for private buildings	YES	Permanent consultative process	YES
Energy audit/database of public buildings	NO	State of the Environment report	2005
Retrofitting measures for public buildings	NO	Target setting	NA
Percentage of traffic lights having installed LED	1%	Local Agenda 21 Action Plan	2005
Public purchase of energy saving printers/photocop.	rarely	Monitoring system of the action plan	YES
Public purchase of green electricity	YES	Offices/departments adopting a EMS	0

Urban Ecosystem Europe 2007

City	Stockholm
Country	Sweden
Inhabitants	765.044
Area (km²)	188
Density (inh/km²)	4.069
GDP (euro/inh)	38.930



KEY INDICATORS	Stockholm	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	48	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	42	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	99%	100%	100%	45%
Household water consumption (l/inh day)	210	96	162	294
Public parks and gardens (m ² /inh)	na	54	16	3
Cycle paths and lanes (m/100 inh)	0,96	2,97	0,13	0
Public transport passengers (pass/inh year)	400	718	263	16
Lines of public transport by rail (m/100 inh)	28	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	0	9.150	115	0
Inhabitants connected to a district heating network (%)	70%	99%	7%	0%
Municipal waste production (kg/inh year)	578	334	501	734
Separated collection of municipal waste (%)	33%	56%	27%	0%
Use of recycled paper in offices (%)	na	100%	60%	0%

CLIMATE CHANGE POLICIES

Energy balance	2003
CO2 reduction target setting	YES
Air quality plan	NO
Energy standards for private buildings	YES
More efficient energy standards for private buildings	NA
Energy audit/database of public buildings	NA
Retrofitting measures for public buildings	NA
Percentage of traffic lights having installed LED	NA
Public purchase of energy saving printers/photocop.	NA
Public purchase of green electricity	NA

NOISE POLLUTION POLICIES

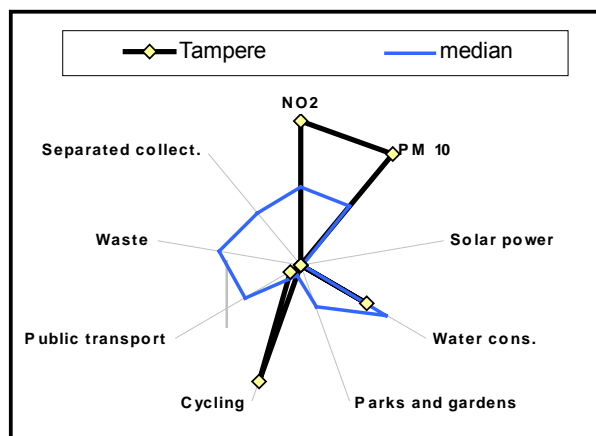
Noise map	YES
Noise management plan	to be appr.

GOVERNANCE/MANAGEMENT

Local Agenda 21 process	1994
Permanent consultative process	NA
State of the Environment report	2004
Target setting	NA
Local Agenda 21 Action Plan	NO
Monitoring system of the action plan	NA
Offices/departments adopting a EMS	0

Urban Ecosystem Europe 2007

City	Tampere
Country	Finland
Inhabitants	204.337
Area (km²)	691
Density (inh/km²)	296
GDP (euro/inh)	25.767



KEY INDICATORS	Tampere	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	21	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	17	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	96%	100%	100%	45%
Household water consumption (l/inh day)	190	96	162	294
Public parks and gardens (m ² /inh)	na	54	16	3
Cycle paths and lanes (m/100 inh)	1,71	2,97	0,13	0
Public transport passengers (pass/inh year)	118	718	263	16
Lines of public transport by rail (m/100 inh)	na	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	0	9.150	115	0
Inhabitants connected to a district heating network (%)	80%	99%	7%	0%
Municipal waste production (kg/inh year)	na	334	501	734
Separated collection of municipal waste (%)	na	56%	27%	0%
Use of recycled paper in offices (%)	na	100%	60%	0%

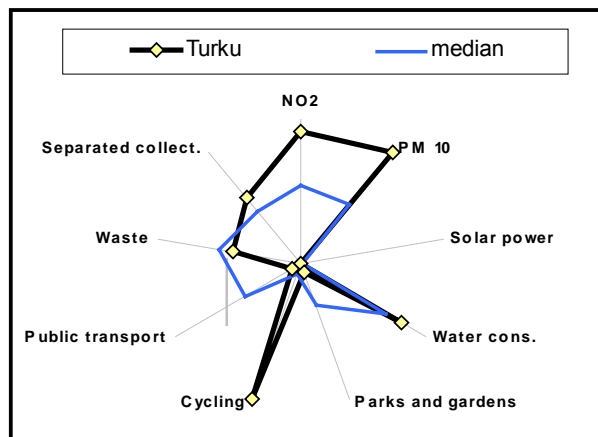
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	2003	Noise map	YES
CO2 reduction target setting	NO	Noise management plan	to be appr.
Air quality plan	NO	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	YES	Local Agenda 21 process	1997-99
More efficient energy standards for private buildings	NA	Permanent consultative process	NA
Energy audit/database of public buildings	NA	State of the Environment report	2002
Retrofitting measures for public buildings	NA	Target setting	NA
Percentage of traffic lights having installed LED	NA	Local Agenda 21 Action Plan	1999
Public purchase of energy saving printers/photocop.	NA	Monitoring system of the action plan	NA
Public purchase of green electricity	NA	Offices/departments adopting a EMS	0

Urban Ecosystem Europe 2007

City	Turku
Country	Finland
Inhabitants	175.354
Area (km²)	306
Density (inh/km²)	573
GDP (euro/inh)	25.580



KEY INDICATORS	Turku	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	33	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	14	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	97%	100%	100%	45%
Household water consumption (l/inh day)	139	96	162	294
Public parks and gardens (m ² /inh)	6	54	16	3
Cycle paths and lanes (m/100 inh)	2,06	2,97	0,13	0
Public transport passengers (pass/inh year)	114	718	263	16
Lines of public transport by rail (m/100 inh)	0	28	9	0
Electric consumption (2000-2005 % variation)	14%	-26%	8%	26%
Solar plants in public buildings (kW)	0	9.150	115	0
Inhabitants connected to a district heating network (%)	88%	99%	7%	0%
Municipal waste production (kg/inh year)	542	334	501	734
Separated collection of municipal waste (%)	34%	56%	27%	0%
Use of recycled paper in offices (%)	na	100%	60%	0%

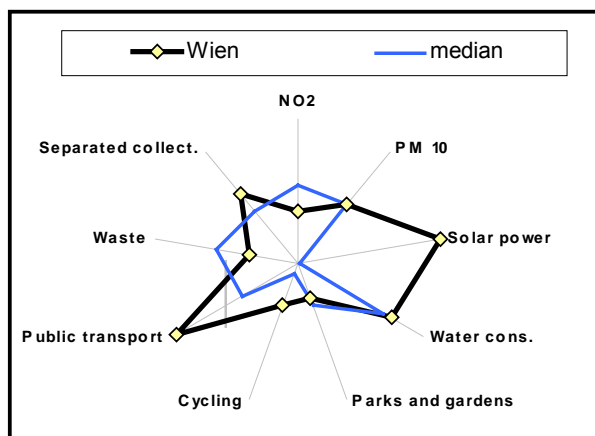
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	2003	Noise map	1998
CO2 reduction target setting	YES	Noise management plan	NO
Air quality plan	NO	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	NO	Local Agenda 21 process	1997
More efficient energy standards for private buildings	NO	Permanent consultative process	NO
Energy audit/database of public buildings	YES	State of the Environment report	since 1989
Retrofitting measures for public buildings	YES	Target setting	YES
Percentage of traffic lights having installed LED	11%	Local Agenda 21 Action Plan	since 2001
Public purchase of energy saving printers/photocop.	never	Monitoring system of the action plan	NO
Public purchase of green electricity	YES	Offices/departments adopting a EMS	0

Urban Ecosystem Europe 2007

City	Wien
Country	Austria
Inhabitants	1.626.440
Area (km²)	415
Density (inh/km²)	3.919
GDP (euro/inh)	39.500



KEY INDICATORS	Wien	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	73	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	39	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	100%	100%	100%	45%
Household water consumption (l/inh day)	152	96	162	294
Public parks and gardens (m ² /inh)	13	54	16	3
Cycle paths and lanes (m/100 inh)	0,61	2,97	0,13	0
Public transport passengers (pass/inh year)	452	718	263	16
Lines of public transport by rail (m/100 inh)	19	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	9.150	9.150	115	0
Inhabitants connected to a district heating network (%)	34%	99%	7%	0%
Municipal waste production (kg/inh year)	581	334	501	734
Separated collection of municipal waste (%)	36%	56%	27%	0%
Use of recycled paper in offices (%)	100%	100%	60%	0%

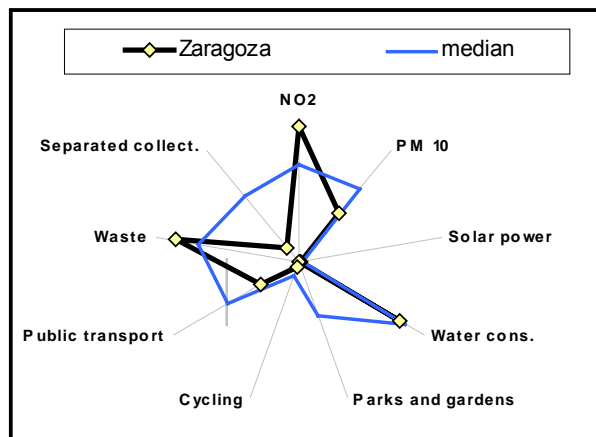
CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	2003	Noise map	to be appr.
CO2 reduction target setting	YES	Noise management plan	to be appr.
Air quality plan	NO	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	YES	Local Agenda 21 process	1998
More efficient energy standards for private buildings	NA	Permanent consultative process	NA
Energy audit/database of public buildings	NA	State of the Environment report	2002-03
Retrofitting measures for public buildings	NA	Target setting	NA
Percentage of traffic lights having installed LED	NA	Local Agenda 21 Action Plan	NO
Public purchase of energy saving printers/photocop.	NA	Monitoring system of the action plan	NA
Public purchase of green electricity	NA	Offices/departments adopting a EMS	0

Urban Ecosystem Europe 2007

City	Zaragoza
Country	Spain
Inhabitants	667.034
Area (km²)	1.050
Density (inh/km²)	635
GDP (euro/inh)	23.786



KEY INDICATORS	Zaragoza	Best value	Median value	Worst value
Annual mean concentration NO ₂ (µg/m ³) - hot spot	45	17	60	112
Annual mean concentration PM ₁₀ (µg/m ³) - hot spot	46	14	39	66
Inhabitants connected to a wastewater treatment plant (%)	97%	100%	100%	45%
Household water consumption (l/inh day)	169	96	162	294
Public parks and gardens (m ² /inh)	4	54	16	3
Cycle paths and lanes (m/100 inh)	0,06	2,97	0,13	0
Public transport passengers (pass/inh year)	178	718	263	16
Lines of public transport by rail (m/100 inh)	0	28	9	0
Electric consumption (2000-2005 % variation)	na	-26%	8%	26%
Solar plants in public buildings (kW)	48	9.150	115	0
Inhabitants connected to a district heating network (%)	0%	99%	7%	0%
Municipal waste production (kg/inh year)	486	334	501	734
Separated collection of municipal waste (%)	9%	56%	27%	0%
Use of recycled paper in offices (%)	100%	100%	60%	0%

CLIMATE CHANGE POLICIES

NOISE POLLUTION POLICIES

Energy balance	NO	Noise map	2004
CO2 reduction target setting	YES	Noise management plan	NO
Air quality plan	to be appr.	GOVERNANCE/MANAGEMENT	
Energy standards for private buildings	YES	Local Agenda 21 process	2001-2007
More efficient energy standards for private buildings	YES	Permanent consultative process	YES
Energy audit/database of public buildings	YES	State of the Environment report	2001
Retrofitting measures for public buildings	YES	Target setting	YES
Percentage of traffic lights having installed LED	NA	Local Agenda 21 Action Plan	2005
Public purchase of energy saving printers/photocop.	NA	Monitoring system of the action plan	YES
Public purchase of green electricity	NO	Offices/departments adopting a EMS	0