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European Common Indicators

Towards a Local Sustainability Profile

AMBIENTEITALIA
Istituto di Ricerche

European Common Indicators

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European Common Indicators (ECI)

Final Project Report
Development, Refinement, Management
and Evaluation of
European Common Indicators Project (ECI)
Grant Agreement: Subv. 00/294518

Prepared by
Ambiente Italia Research Institute, Milano, Italy
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Executive Editor
Valentina Tarzia, Ambiente Italia Research Institute,
Milano, Italy

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For any inquiry related to the project, please contact:
Ambiente Italia
Via C. Poerio 39, 20129 Milano - Italy
Tel +39 02 277 44 228
Fax + 39 02 277 44 222
e-mail: ecip@ambienteitalia.it
or visit: http://www.sustainable-cities.org/indicators

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Partners in the ECI project

- The ECI Project has been co-ordinated and managed by Ambiente Italia Research Institute.
- Partners in the ECI Project have been Eurocities and Legambiente (Italy).
- The financial support has been provided by the European Commission - DG Environment, the Italian Ministry of Environment and Territory and the Italian National Environmental Protection Agency (APAT).

Many other actors have played an important role in the development of the project (as described in more details in this Report):

- the Expert Group on Urban Environment (by setting up in 1999 the Working Group on Sustainable Indicators);
- the 1999 Working Group on Sustainable Indicators chairperson and members;
- the Networks members of the ESC&TC - European Sustainable Cities and Towns Campaign's Steering Committee (Association of Cities and Regions for Recycling, Climate Alliance, Council of European Municipalities and Regions, Energie-Cités, Eurocities, ICLEI, Medcities, UBC, UTO, WHO, Italian LA21 Network);
- the European Sustainable Cities and Towns Campaign's office in Brussels (ESC&TC);
- others networks and research centres (REC - the Regional Environmental Centre for Eastern and Central Europe);
- EU Institutions (JRC, IPTS, EEA);
- national institutions (UK Audit Commission, …);
- local government associations (in England and Wales).

The main role has been undertaken of course by the 144 ECI Project signatories and by 42 ECI data respondents, that have voluntary taken the decision to participate and contribute in the Project (see Chapter 2 and 3).

Authors of this report

The ECI Final Report has been prepared by the ECI Team:

- Maria Berrini (Ambiente Italia Research Institute)
- Lorenzo Bono (Ambiente Italia Research Institute)
- Giulia Ferrari (Ambiente Italia Research Institute)
- Valentina Tarzia (Ambiente Italia Research Institute)
- Michele Merola (Ambiente Italia Research Institute)

With the contribution of:

- The Centre for Environment and Planning, Faculty of the Built Environment at the University of the West of England, Bristol, (David Ludlow Clare Mitchell, Mark Webster), authors of the Findings of the quantitative aspects of the Web Survey responses and responsible for the project website management (see Chapter 2 and 4);
- The Sustainable Cities Research Institute, Northumbria University (Sara Lilley and Kate Theobald) authors of Findings of the interview case studies and the qualitative aspects of the web surveys responses (see Chapter 4);
- Best Foot Forward, UK (Craig Simmons) and others experts (see Chapter 2, Pilot activities on ecological footprint) for collaboration in the Ecological Footprint Pilot action development.

The Ambiente Italia experts staff (Duccio Bianchi, Giulio Conte, Chiara Lazzari, Rodolfo Pasinetti, Teresa Santos, Mario Zambrini) have contributed during all the 2001-2002 ECI process, supporting the ECI Team for methodologies development and data assessment.

European common indicators (ECI) towards local sustainable profile

Mile steps

- Started off in May 1999, with the setting up of a Working Group (for initiative of and under the supervision of the Expert Group on the Urban Environment);
- launched by the Environment Commissioner Margot Wallström at the 3rd European Conference on Sustainable Cities (2000, Hanover);
- promoted since January 2001 to February 2003, providing services to participating authorities within a two-year testing project.

Results and added value

- Indicator system based on a limited number of themes/headline indicators (11) selected in an integrated way, complementary to existing local, national and sectoral indicators;
- results of extensive consultation, and so perceived as a "shared system of indicators";
- perceived by local users as "informing decision-making processes" tool, and "able to compare municipalities across Europe with the aim of establishing good practices for sustainability";
- with strict reference to the 4 Priority areas and the information needs of the TS-UE (Thematic Strategy for Urban Environment);
- good representativeness (42 respondents from 14 EU countries) of different trends and "sustainability patterns" in differently sized European cities (including wider areas, as Provinces);
- good potential for an increase in the number of future users (most of the 144 signatories, 22 countries, are engaged in collecting data);
- high efficiency (low costs compared with results achieved) mainly due to the ECI project voluntary approach, and the good users sense of ownership.

Problems encountered

Need of dedicated time and resources, further methodological refinement, local data accessibility.

Policy recommendations emerging from the data

In general, the analysis of data collected through ECI confirm that:

- the sustainable management of Urban Mobility, Urban Design, Land Use and Building Sector should represent the main priorities of European (and national-local) strategies for the Urban Environment;
- new themes also emerged, such as the Environmental and energy efficiency of production processes and products and the Sustainable management of private/public sector and services.

The ECI Final Report recommendations refer to:

1. specific measures promoting a radical change in the modal distribution of urban displacements (mobility plans, demand management, sustainable and collective modes of transport);
2. specific measures promoting a better and healthier quality of life (air and noise pollution action plans);
3. specific measures promoting a more sustainable management of environmental resources (CO_2 emissions reduction in energy uses, environmental innovation in processes, services and products);
4. specific measures promoting the improvement of urban quality and limitation of land use for urbanisation purposes (green areas and brownfield use, settlements models);
5. specific measures promoting the improvement of citizens' satisfaction levels.

Recommendations for "supporting actions in the implementation of ECI"

In order to fully benefit from the investment made and the bottom up support achieved, the ECI Final Report recommendations refer to:

1. re-launch ECI support structures (promotional campaign, networking, partnerships, methodological refinement, testing phase, …) with dedicated resources;
2. involve/enhance national institutions role (propose the ECI common data standards to national statistical offices);
3. keep (and widen the scope of) data collecting, processing and regularly publishing;
4. consider the present set as the basic framework, but extend it to other indicators, improve compatibility/synergies with similar systems, co-ordinate it with other National and EU Initiatives;
5. use ECIs as support of and integration with EU policies.

1 European Common Indicators (ECI): background and context

1.1 Indicators as a tool for sustainable policy making- the urban/local perspective

A prerequisite on the way towards sustainability is the need to measure impacts of urban activities and monitor progress on Local Agenda 21 (as an important component of the UN Summit in Rio and in Johannesburg follow-up[1]).

The 1994 Aalborg Charter (and its re-launch in the 1996 Lisbon Plan[2]) reflects these needs, by committing the signatory local authorities (now more than 1,860), to the use of indicators as a supporting tool for policy-making, useful to describe and monitor current state and progress.

Extract from the Aalborg Charter:

Instruments and tools for urban management towards sustainability

…. We know that we must base our policy-making and controlling efforts, in particular our environmental monitoring, auditing, impact assessment, accounting, balancing and reporting systems, on different types of indicators, including those of urban environmental quality, urban flows, urban patterns, and, most importantly, indicators of an urban systems sustainability

Signed by 1,860 EU local authorities (last updating: April 2003)

The Aalborg Charter launched also a challenge related to "indicators of urban systems sustainability" and the European Sustainable Cities Report (Expert Group on Urban Environment, 1996) also moved in this direction promoting the use of indicators "to measure progress towards sustainability", emphasising the need to focus not only on indicators of physical sustainability, but also on working towards the development of indicators of sustainable lifestyle options, in order to reconcile physical sustainability with social welfare.

Through the "Communication on Sustainable Urban Development in the European Union: a Framework for Action" (COM (1998) 605), the European Commission signalled the importance of properly evaluating existing and planned activities to support local sustainability and the need to explore methods of monitoring progress on Local Agenda 21. Furthermore, the Communication identified the reduction of the Ecological Footprint of urban activities as an overall policy objective, implying a need for finding ways to measure footprints and connecting the reduction of environmental impacts to Local Agenda 21 processes.

[1] UNCED Conferences held in Rio (1992) and Johannesburg (2002).
[2] Promoted by the European Sustainable Cities and Towns Campaign.

1.2 Ongoing efforts in developing urban/local indicators

Measurement tools focused on measuring and evaluating progress towards sustainability have been developed on an international scale, after UNCED 1992, and are in progress on an European scale. Some efforts have been developed in the past years with regard to the "local scale":

- some European institutions (e.g. European Environment Agency, DG Regio/EUROSTAT) are committed in defining and collecting data on some urban environmental issues (EEA Environmental Indicators, Urban Audit);
- indicators for local sustainability have been a field for EU funded researches in terms of conceptual and methods definition, and some researches have analysed the success and the failure of local implementations (e.g. under the 5th research programme: PASTILLE, IANUS, ECOPADEV, PROPOLIS);
- some regional/national level institutions, NGOs or groups of local authorities have engaged themselves in the definition and in the concrete implementation of an "indicators set" able to represent their urban/local specificity (e.g. Audit Commission action in UK, Ecosistema Urbano in Italy, a group of Nordic cities, two networks of Spanish cities in the Departments of Barcelona and Bizkaia, some regional/national initiatives in Belgium, Sweden, Norway, Germany and The Netherlands, …);
- some European networks have provided information or supported cities in sharing their own experience (e.g. the UBC and the REC actions related to ECI, the ICLEI - Ecobudget project, the WHO - Healthy Cities Indicators, the Climate Alliance initiative on CO_2, the ELTIS Benchmarking on local transport initiative, some projects launched under LIFE funds).

Additional information is available by means of some indicators inventory available on the Internet (e.g. the IISD Compendium[3] or the inventory commissioned by the Commission to the Manchester University, UK[4]) and directly on the web sites of the main institutions/bodies mentioned above.

1.3 Towards the Thematic Strategy on the Urban Environment

More recently the European Commission has developed the EU Sustainable Development Strategy and the 6th Environment Action Programme (EAP). Both the documents highlight priority issues for the urban environment. The White Paper on Governance underlines the indicators role as a tool for policy, monitoring, transparency and communication.

In particular, in order to safeguard a rapid and efficient implementation of the 6th EAP, the European Parliament, included in it an obligation to the Commission to develop Thematic Strategies (TS), which cover each of the main aims of the EAP. The Thematic Strategy on the Urban Environment is one of the strategies to be developed under the 6th EAP. The Strategies will include the practical steps in form of proposals required to reach the objectives of the EAP, and qualitative and quantitative targets and timetables against which the progress can be measured and evaluated.

[3] http://iisd1.iisd.ca/measure/compindex.asp
[4] http://www.art.man.uk/PLANNING/cure/PDF/2inventory.pdf

In the 6th EAP the following themes have been identified as building blocks for the Thematic Strategy on the Urban Environment:

- promotion of LA21;
- de-couple transport and GDP growth;
- increase share of public transport, rail, walking, cycling;
- promote use of low emission vehicles;
- urban environment indicators.

In order to fulfil the mandate of setting up the Thematic Strategy on the Urban Environment, DG Environment has convened four working groups which will support the formulation of the strategy. The themes of the working groups are:

- Sustainable Urban Transport;
- Sustainable Urban Design - Land use, Regeneration, Retrofit;
- Sustainable Urban Construction;
- Sustainable Urban Management.

Some of the preparatory documents developed by DG Environment gave a common framework for the working group work, underlining the need of:

- maximising the environmental efficiency and quality of individual urban areas;
- effectively mitigating the impacts of urban areas on their natural support systems and human health;
- strategically managing the process and broader impacts of urbanisation.

1.4 The ECI initiative: 1999 preparatory process

All the above described background and context represent the reason why the ECI initiative has been launched and the basis on which ECI has been built up since 1999. The recent efforts towards the Thematic Strategy on Urban Environment are the policy framework taken into account in the final ECI project phase.

The ECI initiative was started off in May 1999 with the setting up of a Working Group on Sustainable Indicators (for initiative of and under the supervision of the Expert Group on the Urban Environment and led by the French Environmental Ministry) with the task to develop common (harmonised) indicators for local sustainability, in close collaboration with a wider Group of Local Authorities.

Since the beginning, the aim of the initiative has been to develop and test indicators reflecting local actions towards sustainability in as much an integrated way as possible. The outcome of the initial phase (and in some sense, the ECI "unique and specific value") was a proposal, suggesting a set of indicators on a limited number of themes, in order to allow the strengthening of some core methodologies through effective implementation. The set is however intended to remain flexible and open to include other relevant topics.

Further, ECI is characterised by a good level of complementarity with respect to existing local, national and sectoral indicators' sets, since it was not defined to displace or compete with any local/national priority therein reflected. In fact, the ECIs aim at representing local action towards sustainability in as much an integrated way as possible.

Indicators have been developed according to a bottom up approach since the very beginning of the project, involving local authorities as main actors in the process and improving synergies with existing indicators sets. This shows, on the one hand, to what extent its ethos is actually based upon understanding the real needs of municipalities, and on the other, the possibilities of achievement of policy objectives from actions that bridge more than one level of governance.

If, on the one hand, the ECIs scope is to fulfil the requirements of indicators envisaged in the current EU policy perspective - in as much as they intend to promote an integrated and harmonised approach across community policies - on the other, they aim to ensure local appropriateness, valuing local and lay knowledge and the principle of subsidiarity.

Both aspects can be traced back to the six Sustainability Principles permeating the indicators (see below). To qualify into the set, an indicator had to address at least three of them (= integration requirement). Over 1,000 indicators were analysed both against this requirement and against a list of general criteria. The most important, well-established indicators systems have served as a source of inspiration, as building blocks for the creation of a new system.

The outcome of the numerous and extensive consultation rounds with towns and cities, was the agreement on a list of 10 common issues/indicators (in the Project web site http://www.sustainable-cities.org/sub12a.html are stored all the documents produced in this process, including the lists of indicators analysed by the Working Group on Sustainable Indicators and submitted to various rounds of discussion, and how the Working Group on Sustainable Indicators, with a step by step selection, starting from a "Long List" - 18 themes, more then 100 sub indicators - then from a First proposal - 18 themes, about 30 sub indicators - arrived to the Final Proposal of 10 Issues/Indicators).

Towards a Local Sustainability Profile European Common Indicators		**Principle n°**					
n°	**Issue/Indicator**	**1**	**2**	**3**	**4**	**5**	**6**
1	Citizens' Satisfaction with the Local Community	✔	✔		✔	✔	✔
2	Local Contribution to Global Climate Change (and/or local Ecological Footprint)	✔		✔	✔	✔	
3	Local Mobility and Passenger Transportation	✔		✔	✔	✔	✔
4	Availability of Local Public Open Areas and Services	✔		✔		✔	✔
5	Quality of Local Air	✔				✔	✔
6	Children's Journeys to and from School	✔		✔	✔	✔	
7	Sustainable Management of the Local Authority and Local Businesses			✔	✔	✔	
8	Noise Pollution	✔				✔	✔
9	Sustainable Land Use	✔		✔		✔	✔
10	Products Promoting Sustainability	✔		✔	✔	✔	

Sustainability Concerns forming the basis for the indicators' selection (extract from "Checklist"):

1. **equality and social inclusion** (access for all to adequate and affordable basic services, e.g. education, employment, energy, health, housing, training, transport);
2. **local governance/empowerment/democracy** (participation of all sectors of the local community in local planning and decision making processes);
3. **local/global relationship** (meeting local needs locally, from production to consumption and disposal, meeting needs that cannot be met locally in a more sustainable way);
4. **local economy** (matching local skills and needs with employment availability and other facilities, in a way that poses minimum threat to natural resources and the environment);
5. **environmental protection** (adopting an eco-systems approach, minimising use of natural resources and land, generation of waste and emission of pollutants, enhancing bio-diversity);
6. **cultural heritage/quality of the built environment** (protection, preservation and rehabilitation of historic, cultural and architectural values, including buildings, monuments, events, enhancing and safeguarding attractiveness and functionality of spaces and buildings).

1.5 The ECI initiative: 2000 launching process

Environment Commissioner Margot Wallström launched the initiative at the 3rd European Conference on Sustainable Cities (9-12 February 2000, Hanover, Germany), inviting local and regional authorities from across Europe to participate. Participation is based on signing the voluntary adoption agreement. The following activities have been carried out since the launch (up to January 2001):

- a survey was carried out by Eurocities in the summer of year 2000, to get a first idea of if and how participating local authorities were implementing the European Common Indicators;
- a first technical workshop for the mutual exchange of experiences took place in October 2000 in Seville (promoted by the Municipality, IPTS, Eurocities), to discuss in particular the initiative needs, in terms of methods for data collection and calculation;
- following the Seville workshop, 10 indicator-based working groups (IBGs) were set up, one group per indicator, with the responsibility of defining the methodologies.

The ECI project: 2001-2002 testing and supporting phases

2

2.1 ECI Team partners: main actors

Since January 2001 to February 2003, support services have been provided to participating authorities within a two-year testing project. The project has been funded by the European Commission, the Italian Ministry of Environment and Territory and the Italian National Environmental Protection Agency (APAT). Project partners included Ambiente Italia, Eurocities and Legambiente. Ambiente Italia has carried out the project management (setting up the "ECI Team" and activating some external collaborations) and has been responsible for the support activities. Many other actors have been involved also during this 2001-2003 phase (*see in Acknowledgement*).

2.2 Terms of reference

The general objectives of the EC funded support project ("Development, refinement, management and evaluation of the European Common Indicators initiative") were (Grant Agreement Subv. 00/294518):

1. promoting the use of the *European Common Indicators* at the local level, as a supporting tool for the implementation of environmental legislation at the local level through Local Agenda 21 and for the integration of sustainability into local land use and environmental planning, and for featuring and reducing the Ecological Footprint urban areas;
2. supporting the use of the *European Common Indicators*, creating better conditions for the positive engagement of a wide number of participants in the initiative, through activities including *helpdesk*, pilot actions, networking, indicator-based subgroups, guidelines, …;
3. further development of the *European Common Indicators,* through the active involvement of a significant number of local authorities, with the aim of improving and implementing the system and enabling it to be fully integrated into municipal management systems;
4. ensuring a wide dissemination of the experience gained by local authorities in using the *European Common Indicators*, through assessment of the initiative and preparation of good practice information, with the aim of illustrating to local decision-makers the positive interface between sustainability monitoring and implementation.

2.3 2001-2002 phase: main activities

The 2001-2002 testing phase aimed at promoting and refining the monitoring initiative on the basis of practical experience. The 2001-2002 phase main activities included:

1. technical support and methodological development;
2. pilot activities on Ecological Footprint;
3. promotional/dissemination actions and signatories increasing;
4. data collection and data analysis;
5. evaluation of the ECI initiative based on interviews and on a survey on actual and potential users (and on analysis of ECI implementation good practices);
6. development of conclusions and recommendations.

2.4 Technical support and methodological development

Technical support and methodological development has been provided by means of the following steps/actions:

- the 10 indicator-based groups (IBGs, involving about 25 local authorities and agencies) have developed detailed methodology sheets[5] for each indicator. In doing so, they have benefited from the scientific assistance of the ECI Team support services, who opened the consultation round to all ECIP participants;
- a workshop on ECI 2 "Local contribution to global climatic change" was held in October 2001, gathering the key players in CO_2 emission calculations (invitations were sent to Climate Alliance, ICLEI, Fedarene, EEA, Eurostat, ANPA (today APAT), Birmingham, Bristol and Stockholm) and achieving further agreements on a standardised methodology (documentation and details are available on the web and on request);
- a workshop on ECI 4 and 9 "Availability of local public open areas and services" and "Sustainable land use" took place in November 2001, held jointly by the ECI Team and EC/JRC – Ispra, gathering some of the ECI participants and experts and achieving further agreements on a standardised methodology (documentation and details are available on the web and on request);
- a first data submission round has been concluded in November 2001; indicators have been calculated and a comparative analysis has been conducted. Results have been reported in the Interim Report, delivered to the Commission in April 2002 (available on the web);
- a technical workshop has been organised in Brussels in June 2002, in order to discuss results contained in the Interim Report with all respondents and the DG Environment;
- on the basis of suggestions and proposals coming from ECIP participants, a document with all methodology refinements has been draft and subjected to the approval of the members of the relevant indicator-based group. Changes approved have then been included in the methodology sheets and circulated among all signatories;
- in order to meet some participants' need to have a single parameter for each of the 10 ECI, 10 headline indicators have been chosen. Also these 10 headline indicators have been subjected to the approval of the relevant indicator-based group;
- the survey methodology related to indicators 1, 3, 6 and 10 has been revised with the technical assistance of Abacus (an Italian opinion polls research institute); this revise has considered both technical aspects related to the sampling methodology and the drafting of a logbook containing questions to be asked;
- an Excel spreadsheet for data collection have been built in order to make this process more user-friendly and to help the ECI Team in managing the database; this tool also allows to have an immediate control on errors that may have been done in the phase of data inputting (it contains automatic calculation tests that alert the user if there is an error, e.g. in the percentage distribution);
- a helpdesk has been maintained during all the period to manage all questions and technical support needs (ecip@ambienteitalia.it).

[5] The methodology sheets are available on the website at http:\\www.sustainable-cities.org\indicators

2.5 Pilot activities on Ecological Footprint

An additional result of the 2001-2002 ECI phase is that the Ecological Footprint Index has been included in the ECI set, as asked by the Expert Group from 1999. The choice of putting the Ecological Footprint in the wider ECI set has been done in order to prevent the Ecological Footprint from "loosing information on internal issues", linking global concerns (represented also by the Indicator 2 on Climate Change) with local issues (represented by all the other 9 indicators).

In the framework of the ECI supporting project, a team of experts, representing almost all the EU experiences in this field and in strict contact with the "father" of the methodology Mathis Wackernagel, has been set up. After an in deep investigation (also funded by DG Environment), scientific criteria to be used for an adaptation of the "national" methodology at the more complex local level have been chosen.

A user friendly spreadsheet, already filled in with a large amount of the locally needed data, has been finalised and is now available to all ECI signatories; this allows to overcome many of the computational obstacles (data availability, theoretical algorithms) that are considered as main responsible for a not widespread implementation of the Ecological Footprint.

The activities carried out are described below.

2.5.1 The Ecological Footprint in the framework of ECI: developing a common methodology

As a part of the support services provided by Ambiente Italia to the ECI initiative, work has started on piloting the Ecological Footprint (EF). The Working Group on Sustainable Indicators that originally developed the ten indicators, recommended that the EF would replace the CO_2 emission indicator (indicator 2), once a simplified methodology had been developed for the EF.

During the months of March and April 2001, Ambiente Italia began to investigate the feasibility of this recommendation. A first workshop on the topic was held on 18th May 2001 at the ANPA (today APAT) offices in Rome. The workshop brought together the lead cities of the indicator-based groups (IBGs) as well as experts in the field of EF research and development at a local level. These presentations outlined the state-of-the-art in applying the EF to the local level, highlighting problem areas and open questions, and experiences of linking the EF to local policy making. It was agreed that due to its integrated nature and its suitability for awareness raising and scenario evaluation, the EF should be incorporated into the European Common Indicators.

It was also agreed that the EF should not replace the CO_2 emissions indicator as originally foreseen, but that it should be used as an umbrella indicator over and above the ten current ECIs. The EF will therefore be offered to the towns and cities as the eleventh indicator.

The methods used in the current state-of-the-art applications has been further investigated, and a SWOT (*Strengths, Weaknesses, Opportunities, Treats*) analysis of the different methods has been prepared, as a basis for developing a practical hybrid method for calculating the local EF using a combination of calculations and survey data that have been discussed in a second Ecological Footprint workshop organised within the framework of the ECI initiative, to take forward the recommendations of the pre-

Works on EF at local level presented and discussed in Rome (May 2001):

FINLAND •	The Association of Finnish Local and Regional Authorities (AFLRA) has made a free of charge calculation programme for Finnish municipalities to figure out their EFs. So far they have results from ten municipalities.
ITALY •	Ambiente Italia has directly managed the application of the EF at the city of Torino and has implemented it to the wider area of Provincia di Torino too.
THE NETHERLANDS •	A pilot project involving eight municipalities has been carried out together by: Foundation Boog, The Hague (mainly communication), De Kleine Aarde (The Small Earth), Boxtel (project management), Thijs de la Court, Haarlem (model development), Van Hall Institute (calculations and model development).
NORWAY •	The application of the EF in the City of Stavanger, Kristiansand and Oslo has been carried out by the Western Norway Research Institute (WNRI), in co-ordination with the Program for Research and Documentation for a Sustainable Society (ProSus) University of Oslo. The city of Stavanger has been the focus of several projects which integrate this methodology, and footprint calculations have been carried out at three different levels: the city, household and individual level.
SPAIN •	The estimation of the EF on the local level has been carried out in the municipality of Tudela. This project has been developed within the framework of the objectives of the Department of the Environment, Territory and Housing of the Regional Government by whom the Local Agenda 21 process is promoted in co-operation with the local administration of the region.
SWEDEN •	The national EF in Sweden has been used for calculation of the EF of the populations in the 33 municipalities of the administrative county of Skane in the South and in six more municipalities in other parts of the country. The EF was also calculated for the former southernmost administrative county of Malmohus and for one of the northernmost counties, Vasterbotten (in progress). Moreover the EF was calculated for a river drainage area in southernmost Sweden, the Kavlinge river.
UK •	The main experiences has been carried out by Best Foot Forward, which developed the EF calculation of the Oxfordshire Region (1999) a nd the Isle of Wight (2000).

vious workshop on the basis of the study and the discussion paper prepared during the summer.
This second workshop was held on 24-26 August 2001, hosted by the City of Oslo, and was jointly organised by ProSus, the Western Norway Research Institute, the European Network for Sustainable Urban and Regional Development and Ambiente Italia. The workshop brought together the main European experts in Ecological Footprinting as well as representatives from the cities of Bristol, Ferrara, Modena, Oslo, Southwark and Stockholm (the cities of the ECI initiative that by 15thJuly had expressed an interest in being an Ecological Footprint pilot city). A couple of non-ECI cities also attended: Vantaa and Vienna, both with past experience in Ecological Footprinting.

The workshop focused on the main functions of the Ecological Footprint, how the Ecological Footprint approach can be incorporated into sustainable development strategies, and on how to find a consensus method for the Ecological Footprint at the local level and as part of the European Common Indicators initiative.

Based on a discussion paper prepared by Lillemor Lewan (University of Lund) and Craig Simmons (Best Foot Forward, UK)[6], the participants discussed the pros and cons of the different methods available and agreed on three key questions, as follows:

- rather than measuring the economic activity within a geographical area, the EF as applied within the ECI initiative will measure the final consumption attributable to the residents of that area, whether or not the impacts of that consumption occur inside or outside the boundaries of that area;
- for ECI reporting purposes, the EF will not be compared with biocapacity, whether at local, national or global levels, due to the conflicting/confusing messages that such a comparison gives - however, it was agreed that it will be necessary to give guidance and interpretation on biocapacity, for local use;
- the methodology used in the Footprint of Nations/Living Planet Report will be used as a basis for calculating the EF within the ECI initiative, but with modifications, in particular as regards sea area, forest component (including fire woods), waste, nuclear power, carbon cycle and yield factors - it was agreed that these modifications will be done in co-operation and consensus with the leading international EF experts (responsible for the above mentioned initiatives).

During the debate one of the main point highlighted was the importance of setting out a common and shared simplified EF calculation methodology to give a concrete tool to the cites interested in the EF implementation. In order to give an answer to this need, a small technical experts group, co-ordinated by Ambiente Italia, met together on 22nd November in Brussels, hosted by DG Environment.

The need for changes in the methodology used in the Footprint of Nations/Living Planet Report and the need for a tool that could enable technicians to easily calculate the EF of their local communities has been expressed by many ECI participants.

In the framework of ECI project, in May 2002 Craig Simmons (Best Foot Forward, UK) has taken charge of developing a sub-national geographical area (SGA) Ecological Footprint Tool - SGA Tool - for the EU (plus Norway) under a specific service contract with DG Environment B4-3-5-/2002/336545/MAR/B3.

[6] Lewan & Simmons (2001), The use of Ecological Footprint and Biocapacity Analyses as Sustainability Indicators for Sub-national Geographical Areas: A Recommended Way Forward. This document can be downloaded from:
http://www.sustainable-cities.org/indicators/use of ef for sga - main report.doc
http://www.sustainable-cities.org/indicators/Use of EF for Subnational regions - Annexes.doc

2.5.2 Development of the SGA Tool

A key step in the methodology development process has been the consultation that the project contractor, Craig Simmons (Best Foot Forward, UK), had with leading EU Footprint practitioners, in order to expound theoretical assumptions and to review the methodology. This has been the main reason for the following meetings to be held in July-August 2002:

- July 23rd Utrecht, The Netherlands: Jan Juffermans (De Kleine Aarde, The Netherlands), Hugo Schonbeck (Van Hall Institute, The Netherlands), Robrecht Cardyn (Ecolife, Belgium), Craig Simmons (Best Foot Forward, UK);
- July 26th Leikanger, Norway: Carlo Aall (WNRI, Norway), Craig Simmons (Best Foot Forward, UK);
- July 29th Stockhom, Sweden: Lillemor Lewan (Lund University, Sweden), Craig Simmons (Best Foot Forward, UK);
- August 9th Helsinki, Finland: Maija Hakanen (The Association of Finnish Local and Regional Authorities),Craig Simmons (Best Foot Forward, UK);
- August 13th Pisa, Italy: Lorenzo Bono (Ambiente Italia), Craig Simmons (Best Foot Forward, UK).

A total of 39 unique action points arose from the above meetings. Of these, most were fed back into improving the SGA Tool development. Outstanding issues included:

- to develop a set of education resources to complement the Ecological Footprint methodology and SGA Tool;
- further enhancements to the SGA Tool which went beyond the scope of the work developed in 2001-2002;
- ongoing support and maintenance for SGA Tool. It was stressed that to be useful in the long term, the data underlying the Tool needs to be regularly updated (at least on an annual basis as new Eurostat data are published);
- solution search for lack of Eurostat data for Ireland, Luxembourg, Norway and the Netherlands;
- quality check of Eurostat wood consumption data and CORINE land survey data.

2.5.3 The SGA Tool: structure of the Excel spreadsheet

The SGA Tool is produced as an Excel spreadsheet and consists of 6 pages:

1. Introduction: the first page you see when you start the spreadsheet;
2. Help: the page that gives you basic information about the tool;
3. Front: the main page where you enter and interact with your regional data;
4. Assumptions: a page for experts to modify some of the assumptions underlying the footprint analysis;

5. Country EF Defaults: the country-specific data sets used in the footprint analysis (mainly referred to 1999);

6. Sources: a list of references used.

The SGA Tool is structured by Footprint components:

- Nourishment - deals with animal and plant-based food and related energy.
- Shelter - deals with domestic energy consumption, housing land, domestic timber and fuelwood use, and construction energy.
- Mobility - deals with transport-related energy by mode and the built land associated with these transport modes.
- Goods and services - deals with energy impacts related to industrial production, imports/exports, service delivery and the use of plant, animal, wood and paper products.

The SGA Tool facilitates the calculation of the Ecological Footprint of a sub-national geographical area in a manner which is consistent - both methodologically and numerically - with the latest Living Planet Report (Loh *et al.* 2002).

The tool takes as its starting point the disaggregated Ecological Footprint areas for each country provided by the Living Planet Report 2002. It also relies for some data on the individual country spreadsheets prepared by Mathis Wackernagel, Chad Monfreda and their team. Most other data are supplied by Eurostat to ensure - as far as possible - that the data used is methodologically consistent.

For each country the Eurostat and extracted Living Planet Report data are used to construct a National Grid, which apportions the main Living Planet Report footprint areas to four different consumption categories (nourishment, shelter, mobility, goods and services). Each of these categories is broken down into sub-categories.

The SGA Footprint is derived by applying one - or more - modifiers to each cell within the National Grid based on percentage difference in SGA consumption from the national average. For example, if the region records 10% more car passenger-km than the national average, then a modifier of 110% is applied to the grid cell pertaining to car travel.

As well as the consumption/behaviour-based modifiers on the 'Front' sheet, there are also modifiers that relate to efficiency (given on the 'Assumptions' page). In the car example given earlier, it is possible to change not only distance travelled but also the CO_2 emissions per passenger-km. Default values are given for assumptions based on available EU data. Typically, the defaults are initially the same for each country.

The following table contains the 'Front' and 'Assumptions' modifiers for each data cell, disaggregated by each EF component: energy land, crop, pasture, forest, built land and fishing.

Cell Contents (EF values)	Modifier 1 (Front page)	Modifier 2 (Assumptions page)
ENERGY LAND		
Nourishment	Food consumption	Energy coefficient
Food embodied energy	kg/cap	GJ/ton
		Carbon intensity
		ton C/GJ
Shelter	Energy consumption	Carbon intensity
Domestic electricity	kWh/cap	kg C/kWh
Domestic natural gas & LPG	kWh/cap	kg C/kWh
Domestic oil	kWh/cap	kg C/kWh
District heating	kWh/cap	kg C/kWh
Domestic Coal	kWh/cap	kg C/kWh
Renewable (wood excluded)	kWh/cap	kg C/kWh
Other domestic	kWh/cap	kg C/kWh
Mobility	Distance covered	CO_2 emissions
Car	passenger-km/cap	kg CO_2/ passenger-km
Bus & coach	passenger-km/cap	kg CO_2/ passenger-km
Rail, tram, metro	passenger-km/cap	kg CO_2/ passenger-km
Waterborne	passenger-km/cap	kg CO_2/ passenger-km
Air	passenger-km/cap (intra EU only*)	kg CO_2/ passenger-km
Motorbike/scooters	passenger-km/cap	kg CO_2/ passenger-km
Goods & Services	Domestic waste	
Net traded goods	kg/cap (landfill and incinerated)	
Local goods	kg/cap (landfill and incinerated)	
	Services spending	
Hotels & restaurants	Euro/cap	
Community, social, personal	Euro/cap	
Offices & admin	Euro/cap	
Commerce	Euro/cap	
Other services	Euro/cap	
Education & health	None	

Cell Contents (EF values)	Modifier 1 (Front page)	Modifier 2 (Assumptions page)
CROP		
Nourishment Animal-based	Food consumption kg/cap	Kind of diet Proportion of animal products in diet (difference from national average)
Plant-based	kg/cap	Proportion of plant-based products in diet (difference from national average)
Goods & services	Domestic waste kg/cap (landfill and incinerated)	
PASTURE		
Nourishment Animal-based	Food consumption kg/cap	Kind of diet Proportion of animal products in diet (difference from national average)
Goods & services	Domestic waste kg/cap (landfill and incinerated)	
FOREST		
Shelter	Fuelwood consumption m^3/cap	
Goods & services	Wood products consumption m^3/cap	
BUILT LAND		
Shelter	Housing land Actual area (ha)	
Mobility	Land for infrastructures	
Road	Road land – actual area (ha)	
Rail	Rail land – actual area (ha)	
Air	Airport land – actual area (ha)	
Ports	Sea ports land – actual area (ha)	
Goods & Services	Land used Goods & services land (including Hydro) – actual area (ha)	
FISHING		
Nourishment	Food consumption kg/cap	Kind of diet Proportion of animal products in diet (difference from national average)
Goods & Services	Domestic waste kg/cap (landfill and incinerated)	

2.5.4 The SGA Tool: data sources

All data used in the calculations is listed on the 'country's EF defaults' page. Each country is represented with a row of data. Each data item is cross-referenced to one of the references listed on the 'sources' page. As expected, there were gaps in the data sources obtained from Eurostat. Data gaps were filled with the best available data. In summary, the following data issues arose:

- access to data - Eurostat charge for custom data analysis;
- food embodied energy - assumed that the figures for the embodied energy of food (same sources used by the Living Planet Report) includes transport;
- domestic energy data - 'Country Pictures' (EU SAVE programme) data used for energy end use is not consistently available for all countries and is not annually updated, though this seems to be the best available data;
- air travel - no country data available for international air travel (extra-EU). Intra-EU figures were adjusted to estimate combined intra and extra-EU travel;
- passenger-km CO_2 figures - currently based on UK Department of Environment, Transport and the Regions (DETR) figures. Not aware of any EU-wide estimates;
- built land - there are sometimes significant variations between GAEZ and CORINE study estimates of built land. CORINE used where available as likely to be more accurate but, unlike GAEZ is not a global database and therefore not compatible with Living Planet Report 2002;
- data sources - some of the sources used are not updated annually.

2.5.5 Dissemination of the SGA Tool

A first prototype of the SGA Tool has been presented in a special workshop held as part of the ECIP/Pastille Conference in London on 12/13 September 2002. Then, the prototype SGA Model has been finalised by Best Foot Forward, announced as available and distributed by Ambiente Italia from the 15th December 2002.

The ECI helpdesk have sent the SGA Tool to 30 ECI participants that asked for it, declaring their interest in using it (15 Italian, 5 Finnish, 4 Spanish, 3 Sweden, 2 British, 1 Portuguese and 1 Ukraine). Considering support requested to the ECI helpdesk (Ambiente Italia), it is believed that 12 ECI participants are effectively using the SGA Tool. These are:

- 5 Finnish urban areas: Lahti, Tampere, Pori, Haemeenlinna and Turku (all them will end their test before the end of March);
- 4 Italian urban areas: Modena, Ferrara, Provincia di Torino, Provincia di Bologna;
- 3 Spanish urban areas: Bizkaia, Pamplona and Gobierno de Navarra;
- 1 English urban area: Bristol;
- 1 Portuguese urban area: Almada.

The 4 municipalities of Ancona and Mantova (Italy) and Helsingborg and Stockholm (Sweden) have already sent to Ambiente Italia the preliminary calculation of their footprint.

2.6 Promotional/dissemination actions and signatories increasing

The project website

The ECIP website [http://www.sustainable-cities.org/indicators], developed by the University of West England, is divided into six major sections, each holding categorised documents from different aspects of the project. These sections are:

1. Home: gives a description of the project, highlighting the focus on sustainability and also the relationship of project to the many local and regional authorities that are involved. It gives contact details for visitors who wish to join the project and have two dynamic media elements: an alert message, which highlights nearing deadlines in the project, and a scrolling news bar which contains links to the most recent updates to the website.

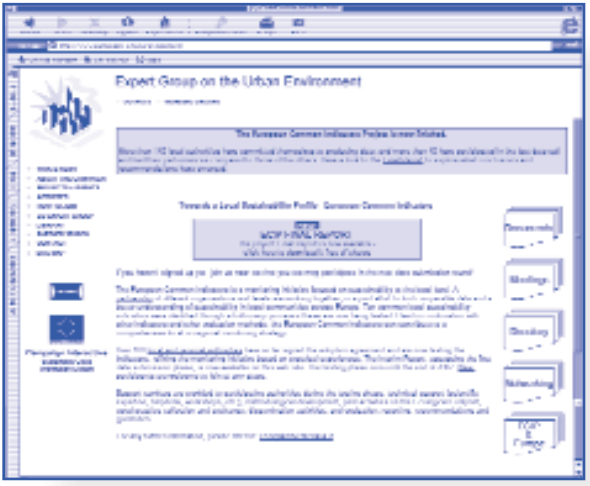
2. Documents: contains a list of hyperlinks to categories of documents that relate to the project.

3. Meetings: contains a tabulated list of hyperlinks to the documents that relate to individual meetings held about the ECIP project.

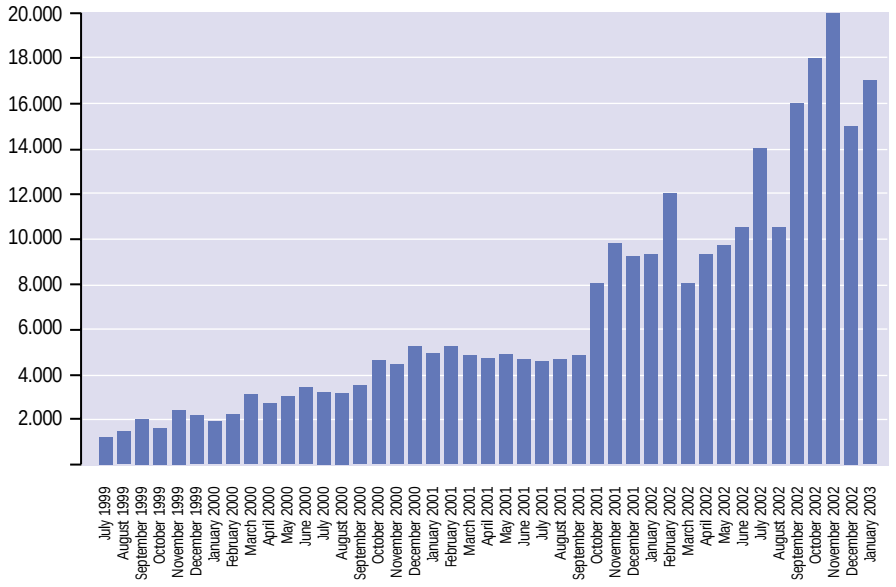
4. Directory: contains a tabulated list of hyperlinks to HTML pages containing listings of the participants and/or members of particular aspects of the project.

5. Networking: contains a debating forum, which allows any interested party to discuss specific parts of the project and also raise questions, and a section of networking resources for each of the 10 indicators, comprising of mailing lists of respondents and a FAQ (frequently asked questions) resource.

6. ECIP & Europe: contains hyperlinks to the websites of the major contributors and welcomes contributions from any interested parties.



Monthly page request totals



Elaborated by University of West England on behalf of ECI

Website usage

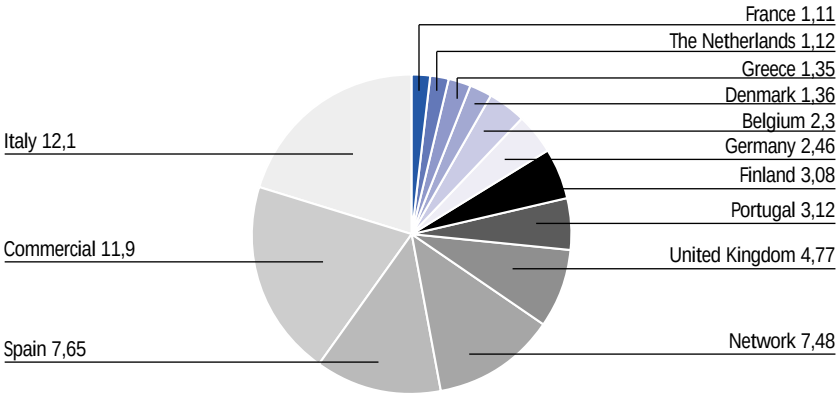
The overall trend for usage of the ECIP website is a steady increase since it was first developed in July 1999. There are expected seasonal variations such as lower usage at Christmas and Easter time. Local peaks in activity are typically seen during and after ECIP meetings (e.g.: website usage jumps by twenty five percent after the June 2002 Interim Report meeting in Brussels. This increase in activity can probably be attributed to the visitors to the online document repository related to this meeting).

Visitor breakdown by country

When the number of visitors is broken down by country, it can be shown that the greatest percentage of verifiable visitors have come from Southern European nations such as Italy, Spain and Portugal (approximately twenty percent of all users of the ECIP website).

Note: The pie chart above only shows visits to the site which can be traced to a particular country and which represent a figure of one percent or greater. The greatest percentage of visitors could not be traced to a particular country and this figure is not shown. The "Commercial" and "Network" segments of the chart are visitors from the non-geographical domains: .com and .net. It is probable that the Commercial and Network segments can be split roughly evenly between all the other segments.

Web request breakdown by nation



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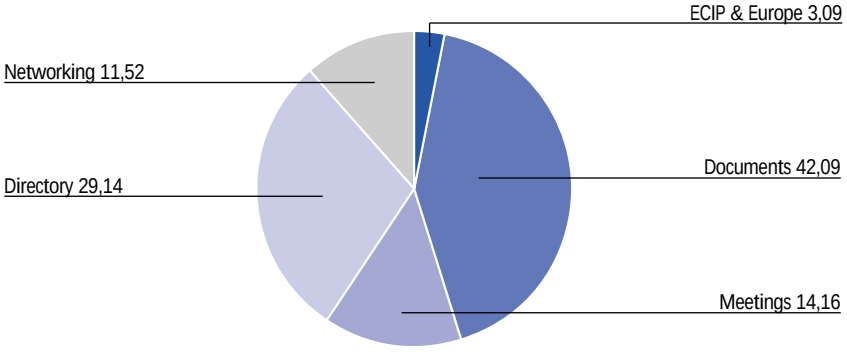
Visitor breakdown by section

The ECIP website is broken down into six major sections including the homepage. All visitors to the site will see the homepage but it is possible to give a breakdown of the number of visitors to each individual section of the site. The chart below shows the percentage of visitors to each section of the site.

As the chart shows, the majority of visitors to the site visit the Documents section. This would be expected as the site serves mainly as a repository for project documentation.

Site statistics breakdown by section



Elaborated by University of West England on behalf of ECI

2.7 Actions aimed at promoting a wider dissemination

Actions aimed at promoting a wider dissemination in European countries have been carried out, also thanks to other actors. Main steps could be summed up in the following lines.

Participation of ECI Team as speakers in European wide conferences:

- Eurocities has invited the ECI Team for presentation in its latest Environmental Committee Meetings in 2002 (Sevilla, March and Copenhagen, October).
- The Belgium Platform on Indicators for Sustainable Development (in which the Task Force for Sustainable Development of the Federal Planning Office is involved) has invited the ECI Team for the presentation of the initiative at their conference (*Sustainable Development Indicators, what direction for Belgium*, November 2002).
- ICLEI has invited the ECI Team to make a presentation of the project in its latest Conventions (Oslo 2002) and in the Kolding Conference (*Johannesburg+Europe*, November 2002).
- A member of the ECI team has taken part to a Conference Press held by the Diputación Foral de Bizkaia on sustainable indicators (November 2002).
- The ECI team has just participate at the international conference organised in the framework of the HQE2R project in Copenhagen (*Methods and Tools for the Development of Sustainable Neighbourhoods*, March 2003).
- ECI has been invited by the Diputación Foral de Bizkaia to the Conference on the results obtained by implementing the ECI set that has been held in Bilbao (March 2003).

Articles and leaflets:

- The European Sustainable Cities and Towns Campaign disseminated a wide variety of information by means of articles in the Campaign Newsletter.
- In order to better disseminate basic information related to the ECI initiative, a new leaflet with updated content (i.e. data submission deadline, countries of signatories) has been designed. This leaflet has been printed in the number of 2,600 copies and distributed in main events where the ECI team has been invited, such as the conferences listed above.

  This document has been circulated by the European Sustainable Cities and Town Campaign, by Eurocities and by the Union of Baltic Cities among their participants and others. Also the Italian version of the leaflet has been circulated among local authorities through the Italian LA 21 Network mailing list and in other public events, such as the Conference organised by ECIP and Ecosistema Urbano in Ferrara (*Towards More Sustainable Cities, Indicators Strategies and Results*, December 2002) and the National Conference organised by the Italian LA 21 Network in Ancona (*Sustainable Cities in Italy after Johannesburg*, January 2003).

Focus on targeted regions:

- A specific focus on Italy has been defined and various activities are being carried out, under the sponsorship of the Italian Ministry of Environment and Territory and the Italian National Environmental Protection Agency and in strict co-operation with the Italian LA 21 Network (e.g. website, participation in workshops and conferences, brochures, ...).

- Not as direct initiative of the ECI Team, but in strict relationship with it, a specific focus on Central and Eastern European cities has been launched on initiative of the Union of Baltic Cities and by the Regional Environmental Centre (Hungary). Translation of the Technical Report and the methodology sheets into 12 Eastern countries languages, dissemination activities and technical assistance have been carried out.

Conferences:

- A Conference (**London**, September 2002) has been organised by ECI in collaboration with the London Borough of Southwark (on behalf of the Project "*PASTILLE, Promoting Sustainability Through Indicators at the Local Level in Europe*"). This conference, held at the London School of Economics, has seen the active role of many ECIP participants and allowed information exchange, methodologies explanation and a wider and collective meditation of local sustainability issues in general. ECIP participants gave their contribution as speakers in 4 out of the 6 workshops organised (Data Collection; Ecological Footprint; Levels, Scales and Borders; Indicators and Policy Decisions) and all conference proceedings and presentation have then been circulated among all signatories.

- Another ECI conference has been organised in collaboration with Legambiente and the Italian LA 21 Network with the aim to specifically focussing on Italian participants in the project (**Ferrara**, December 2002). Organised in connection with the presentation of Ecosistema Urbano results (the yearly competition on sustainability issues for Italian urban areas developed by Legambiente), the Conference has seen the participation of the DG Environment and the Joint Research Centre of the European Commission, the European Sustainable Cities and Towns Campaign and Craig Simmons of Best Foot Forward (UK). Contribution have also been given by a few of the European ECI respondents, those that have obtained good results in the implementation of the ECI project and as good practices, such as Oslo, Bizkaia and Bristol.

2.8 The signatories to the agreement

Thanks to the launch of the ECI initiative, supported by the EU Environment Commissioner Margot Wallström, on February 2000 in the Hanover Conference, 80 local authorities signed the "Agreement on the adoption of Towards a Sustainability Profile - European Common Indicators". Signing the Agreement they committed themselves to:

- using these European Common Indicators in the monitoring of progress towards sustainability and with a view to developing local processes and initiatives to promote sustainability;

- reporting back to the European level, with the understanding that the results will be used sensitively with a view to highlighting achievements and developing community policy and instruments;

- actively taking part in the testing phase and process that will commence after adoption, aiming at developing and helping build this new monitoring tool on the basis of practical experiences of using this first generation of European Common Indicators.

After the beginning of the Supporting Services Phase - 2001, the signatories list has been revised: 12 of the year 2000 signatories, being union and not single municipalities, have been transformed in 2 signatories, so reducing the starting total to 70. After that reference point, the number of signatories has continuously increased: to 87 (September 2001), 127 (December 2002), 144 (February 2003).

The following table reports names and geographical distribution of signatories. Some of them are Unions, Provinces or Regions in some cases participating also with a role of co-ordination and support to those local authorities whose territory is under their administrative competence.

Signatories (144)		
Albania (1)	Municipality of Shkodra	
Austria (1)	Municipality of Klagenfurt	
Bulgaria (6)	Municipality of Blagoevgrad Municipality of Elena Municipality of Mezdra	Municipality of Bourgas, Municipality of Glavinitza, Municipality of Varshetz
Croatia (4)	Municipality of Novi Vindolski Municipality of Varazdinske Toplice	Municipality of Rijeka, Municipality of Zagreb
Denmark (1)	Municipality of Aarhus	
Finland (6)	City of Haemeenlinna City of Pori City of Turku	City of Helsinki City of Tampere Kouvola Region
France (2)	City of Angers	City of Dunkerque
Greece (21)	Municipality of Agia Paraskevi Municipality of Emmanouil Pappas Municipality of Georgioupolis Municipalità dell'isola di Ios Municipality of Kalllithea (Thessaloniki) Municipality of Lavrion Municipality of Lefkonas Municipality of Moydroy Municipality of Nomos Seron Municipality of Velo Union of local authorities of Thesprotia (8 local authorities)	Municipality of Amaroussion, Municipality of Florina Municipality of Igoumenitsa, Municipality of Ithaca Municipality of Kifissia Municipality of Lefkada Municipality of Livathus Municipality of Mykonos Municipality of North Kynourias Municipality of Vohas (Nome Corinthias)
Italy (49)	Municipality of Acqui Terme Municipality of Ancona Municipality of Bolzano Municipality of Castrovillari Municipality of Celle Ligure Municipality of Cortale Municipality of Ferrara Municipality of Foggia Municipality of Imperia Municipality of Mantova Municipality of Melito di Porto Salvo Municipality of Napoli Municipality of Pavia Municipality of Reggio Calabria Municipality of Roma Municipality of San Benedetto del Tronto Municipality of Savona Municipality of Sondrio Municipality of Torino	Municipality of Alessandria Municipality of Asti Municipality of Caltanissetta Municipality of Catania Municipality of Collegno Municipality of Cuneo Municipality of Firenze Municipality of Frosinone Municipality of Lodi Municipality of Massa Municipality of Modena Municipality of Parma Municipality of Ravenna Municipality of Reggio Emilia Municipality of Salerno Municipality of San Biagio della Cima Municipality of Siena Municipality of Termoli Municipality of Udine

Signatories		
	Municipality of Venezia	Municipality of Verbania
	Municipality of Vibo Valentia	Mountain Community of Giovo
	Municipio Roma XIII	
	Nord Milano:	Municipality of Bresso
	Municipality of Cinisello Balsamo	Municipality of Cologno Monzese
	Municipality of Sesto San Giovanni	
	Province of Bologna	Province of Genova
	Province of Torino	Province of Teramo
	Toscana Region	
Hungary (2)	Municipality of Aba	Municipality of Tapolca
Latvia (1)	City of Liepaja	
Norway (1)	City of Oslo	
Poland (1)	Municipality of Gdansk	
Portugal (3)	Municipality of Almada	Municipality of Faro
	Municipality of Lisbona	
Rumania (6)	Municipality of Bistrita	Municipality of Fetesti
	Municipality of Giurgiu	Municipality of Oradea
	Municipality of Suceava	Municipality of Vulcan
Slovakia (1)	Municipality of Puchov	
Slovenia (2)	Municipality of Ljubljana	Municipality of Maribor
Spain (23)	Diputación Foral de Bizkaia (on behalf of provincial council and 111 municipal councils)	
	Gobierno de Navarra	Municipality of A Coruna
	Municipality of Bailen	Municipality of Barcelona
	Municipality of Burgos	Municipality of Cassà de la Selva
	Municipality of Castellar del Vallés	Municipality of Ibarrangelu
	Municipality of l'Eliana	Municipality of Marbella
	Municipality of Pamplona	Municipality of Roses
	Municipality of Sant Cugat del Vallès	Municipality of Sant Llorenc Savall
	Municipality of Sant Quirze del Vallés	Municipality of Sentmenat
	Municipality of Sevilla	Municipality of Terrassa
	Municipality of Viladecans	Municipality of Vilanova i la Geltru
	Municipality of Vitoria-Gasteiz	Municipality of Zaragoza
Sweden(4)	City of Helsingborg	City of Malmoe
	City of Stockholm	City of Vaxjo
The Netherlands (1)	Municipality of Den Haag	
Ukraine (1)	Municipality of Nikolaev	
United Kingdom (7)	City of Birmingham	City of Bristol
	City of Edinburg	City of Plymouth
	London Borough of Lambeth	London Borough of Southwark
	Metropolitan Borough of Wirral	

3.1 Extent of participation and data coverage

3.1.1 Data submission

Data submission on the part of ECI participants started in October 2001. 25 participants have sent data or information during the first data collection round (October 2001 - February 2002). The second data call started in November 2002 and ended in January 2003. During this period 14 cities participating to the first data collection round have sent additional data and 17 new respondents have submitted data for the first time. In total, data and information coming from 42 urban areas have been processed (in February 2003) and are now reported and discussed in the next paragraphs.

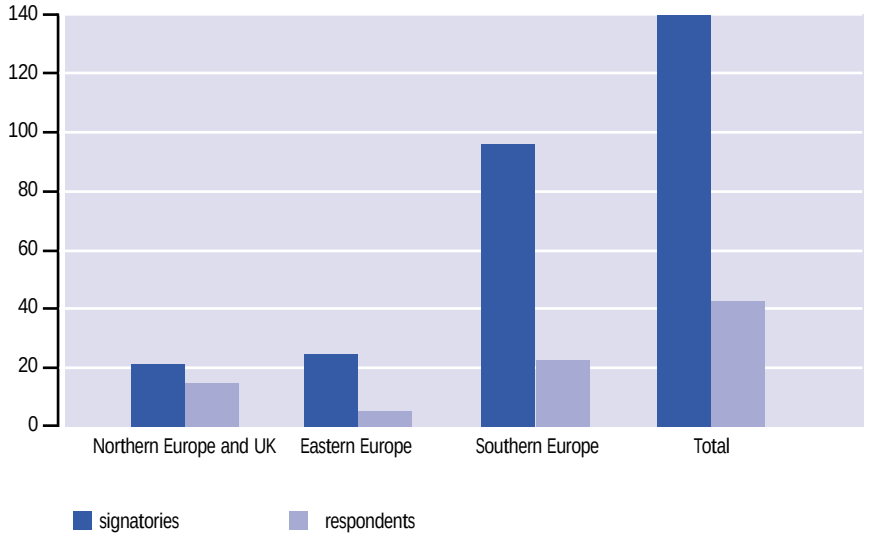
It should be borne in mind that the group of respondents only includes those administrations that have sent their data to the ECI Team with the declared intention to have them included in the "Assessment Phase". It is however true that European Common Indicators are included, at least in part, in the reporting systems of a far larger number of local contexts (e.g. the 7 largest cities in northern countries, see Chapter 4 and 5, that are working together to report 11 indicators mostly based on ECI set; the 90 UK municipalities implementing the six European Common Indicators now adopted by the UK Audit Commission within its voluntary "Quality of life indicators").

3.1.2 Extent of participation

The 42 "respondents" represent 29% of 144 total signatories (the term "respondents" indicates participants that have sent data classified as coherent - to a greater or lesser extent - with the ECI methodologies. In this report only data with a good level of coherence have been processed with comparison aims). The above-mentioned 29% accounts for 15,249,751 inhabitants.

Further considerations on the extent of participation and the difference between number of signatories and respondents are better discussed in Chapter 4 - ECI Initiative Evaluation. Anyway, it should be considered above all that about 52 signatories have signed the ECI agreement (committing themselves in testing ECIs and sharing results) only during 2002. This probably means they are still in the process of collecting data.

Number of signatories/respondents



Elaborated by Ambiente Italia on behalf of ECI

Respondents' distribution - geographical and dimensional

There is a wider involvement of respondents from southern countries (21 from Spain and Italy and 1 from Portugal), and from northern ones (11 from Denmark, Finland, Norway, Sweden, The Netherlands) and the United Kingdom (4).

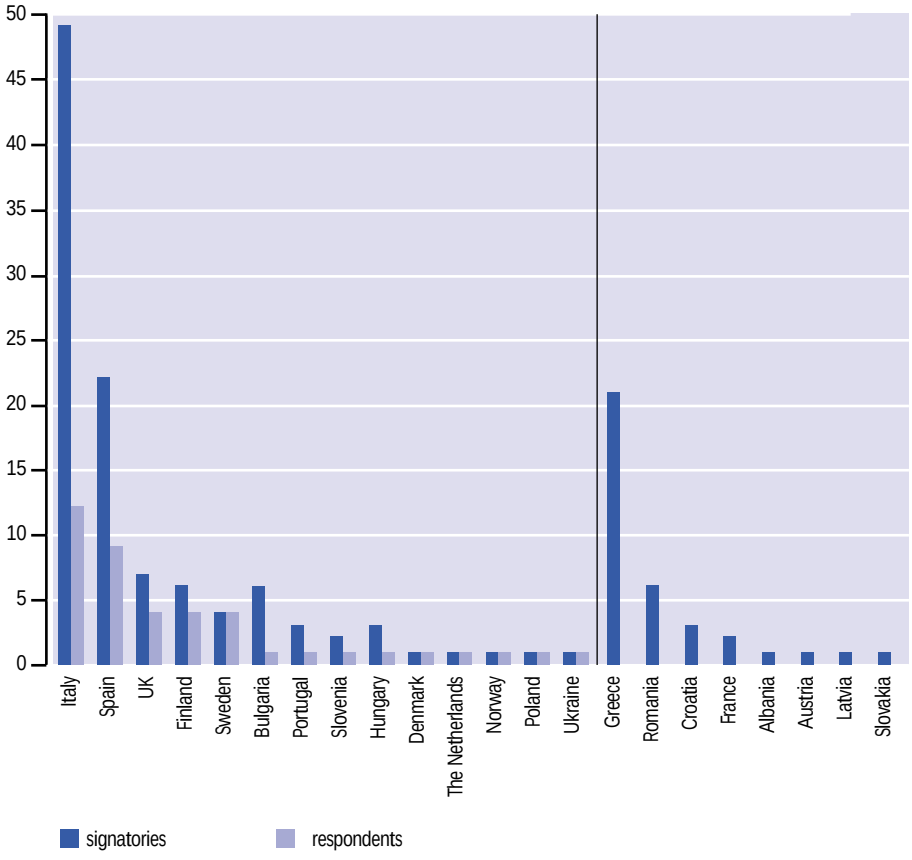
It should be noticed an interesting participation from eastern Europe (5 from Bulgaria, Hungary, Poland, Slovenia and Ukraine), but it is evident the absence of some big "central" European nations (chapter 5 suggests solutions to this problem).

The distribution of involved inhabitants is: 60% living in the South, 32% in the North and UK and 8% in the East.

All classes of urban dimension are represented (cities or aggregations of cities): 13 large (population > 350,000), 18 medium-sized (100,000 < population < 350,000), 11 small (population < 100,000).

Considerations on some regional and dimensional variations with regard to ECI participation are discussed in Chapter 4 - ECI Initiative Evaluation.

Number of signatories/respondents per nation

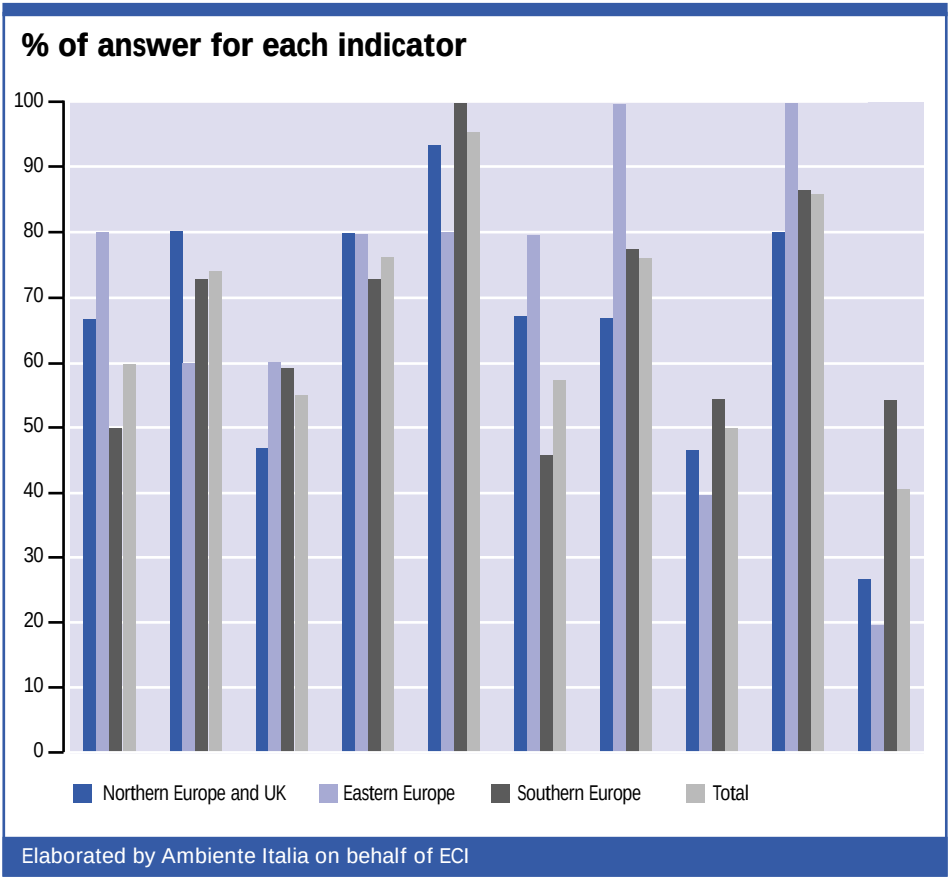


Elaborated by Ambiente Italia on behalf of ECI

3.1.3 Extent of indicators "coverage"

On average, respondents have "answered" (covered with more or less methodologically coherent data) to 6.7 of total 10 indicators.

Large urban areas have submitted the highest percentage of relevant data, covering 7.7 indicator (medium-sized 6.7 and small 5.5). From a geographical point of view, it should be noticed that the 5 eastern respondents have recorded the highest response rate 70% (northern countries and UK have recorded a 65% rate, southern ones 67%).



Elaborated by Ambiente Italia on behalf of ECI

The indicators to have received more answers are n.5 "Quality of the Air" (95%), followed by n.9 "Sustainable Land Use" (86%), n.4 "Availability of Local Public Open Areas and Services" (76%), n.7 "Sustainable Management of the Local Authority and Local Enterprises" (76%) and n.2 "Local Contribution to Global Climate Change" (74%). The lowest number of answers has been recorded for indicator n.10 "Products Promoting Sustainability" (40%) and n.8 "Noise Pollution" (50%).

Respondents from Southern Europe		
	Population	% of answers
Zaragoza (Spain)	604,631	100%
Ferrara (Italy)	131,794	100%
Vitoria-Gasteiz (Spain)	217,358	90%
Parma (Italy)	168,717	90%
A Coruna (Spain)	1,107,708	80%
Modena (Italy)	175,442	80%
Nord Milano (4 municipalities, Italy)	233,143	80%
Ancona (Italy)	100,410	80%
Barcelona (Spain)	1,496,266	70%
Diputación Foral de Bizkaia (111 municipalities and provincial council, Spain)	1,132,723	70%
Provincia di Torino (315 municipalities, Italy)	2,214,934	70%
Reggio Emilia (Italy)	141,383	70%
Viladecans (Spain)	58,562	60%
Pamplona (Spain)	182,666	60%
Catania (Italy)	306,464	60%
Acqui Terme (Italy)	20,043	60%
Pavia (Italy)	71,074	50%
Verbania (Italy)	30,079	50%
Vilanova i la Geltrù (Spain)	52,389	40%
Burgos (Spain)	168,155	40%
Lisboa (Portugal)	565,000	40%
Mantova (Italy)	46,372	40%
Total	9,225,313	67%

Elaborated by Ambiente Italia on behalf of ECI

Respondents from Northern Europe and UK		
	Population	% of answers
Oslo (Norway)	508,726	100%
Bristol (UK)	380,600	100%
Tampere (Finland)	195,468	90%
Stockholm (Sweden)	743,703	90%
Birmingham (UK)	1,017,300	90%
Aarhus (Denmark)	286,858	80%
Den Haag (The Netherlands)	441,094	70%
Pori (Finland)	76,253	70%
Turku (Finland)	172,000	70%
Haemeenlinna (Finland)	46,108	70%
Malmoe (Sweden)	256,771	60%
Helsingborg (Sweden)	118,510	40%
Vaxjo (Sweden)	73,770	30%
Lambeth (London Borough, UK)	275,800	10%
Southwark (London Borough, UK)	238,700	10%
Total	4,855,621	65%

Elaborated by Ambiente Italia on behalf of ECI

Respondents from Eastern Europe		
	Population	% of answers
Blagoevgrad (Bulgaria)	78,818	100%
Maribor (Slovenia)	115,532	90%
Nikolaev (Ukraine)	512,300	60%
Gdansk (Poland)	457,937	60%
Aba (Hungary)	4,230	40%
Total	1,168,817	70%

Elaborated by Ambiente Italia on behalf of ECI

A large majority of respondents (31, the 74%) has answered to more than half the indicators, but only 5 of them (12%) have answered to all 10 indicators.

Except Zaragoza and A Coruna (large sized), the 8 southern urban areas (36% of southern respondents) which have sent data/information regarding at least 8 indicators, are medium-sized urban areas. On the other hand, 4 urban areas of the 6 northern ones (40% of northern respondents) which have sent data/information regarding at least 8 indicators, are large sized. Small urban areas, especially the southern ones, record lower percentages of answers.

Elaborated by Ambiente Italia on behalf of ECI

3.2 Data processing and reporting

3.2.1 Data processing: quality check, cluster and comparison analysis limitations

The analysis of each indicator considers all urban areas submitting data but, when making comparison, a data quality assessment selects only those with a good level of coherence with the ECI methodology. Nevertheless, data which are not completely comparable with the other ones are reported too.

Moreover, when data have been sent incomplete or greatly differ from those supposed to be similar, they have been validated checking them directly with the qualified offices. At the end of this phase, the Final Report draft has been circulated to all 42 respondents, who have been asked to inform the ECI Team with regard to any significant revision of their own data. 14[7] respondents have sent comments or corrections, that have been integrated in this definitive version of the Final Report.

Due to the differences typical of the various European urban patterns (dimensions, climate, habits, …), in some cases data have been interpreted highlighting two variables: regional location and city size. The sample size is too limited for a cluster analysis, nonetheless, it is probable that variations due to these

[7] Aarhus, Ancona, Barcelona, Birmingham, Blagoevgrad, Bristol, Haemeenlinna, Helsingborg, Malmoe, Nikolaev, Oslo, Pamplona, Stockholm, Zaragoza.

two variables may be the most comprehensive currently available and should therefore be examined with great interest. Far from being deterministic, we should examine these results as an opportunity to gain deeper insights into the ECI data and with some confidence that this analysis offers a meaningful way forward.

Moreover, it's clear that data should be considered and interpreted mainly in the local context and, only under certain condition, as a benchmarking at European level. The "comparison exercise" has been, in fact, developed with great caution, but also taking into consideration that the ECI value as an opportunity to "compare each other" has been emphasised and requested by a large number of cities (see Chapter 4).

3.2.2 Structure of the data reporting

The following paragraphs report the data processing and analysis carried out on the information submitted by the 42 respondents. Each paragraph has been organised as follows:

- Definition: reporting a brief summary of the methodology and highlighting the headline indicator.
- Extent of participation and response: containing a quantitative analysis on the response level. The response level is analysed classifying respondents according to the country of origin, population size and the degree of data coherence with the methodology.
- General overview: containing specific analysis on the data submitted by participants.

The paragraphs correspond each to one of the 10 indicators listed below.

The European Common Indicators

1. Citizens' satisfaction with the local community
   Headline indicator: Average satisfaction with the local community (overall and mean)
2. Local contribution to global climate change
   Headline indicator: CO_2 emission per capita
3. Local mobility and passenger transportation
   Headline indicator: Percentage of trips by motorized private transport
4. Availability of local public open areas and services
   Headline indicator: Percentage of citizens living within 300 metres from public open areas >5000 m^2
5. Quality of the air
   Headline indicator: Number of PM_{10} net overcomings
6. Children's journeys to and from school
   Headline indicator: Percentage of children going to school by car
7. Sustainable management of the local authority and local enterprises
   Headline indicator: Percentage of environmental certifications on total enterprises
8. Noise pollution
   Headline indicator: Percentage of population exposed to L_{night} >55 dB(A)
9. Sustainable land use
   Headline indicator: Percentage of protected area
10. Products promoting sustainability
    Headline indicator: Percentage of people buying sustainable products

3.3 Indicator 1 Citizens' satisfaction with the local community

3.3.1 Definition

Indicator 1 analyses the general well-being of citizens. It reports different levels of satisfaction (very satisfied; fairly satisfied; fairly dissatisfied; very dissatisfied; no answer). The indicator investigates in general terms: overall citizens' satisfaction with the municipality as a place to live and work.

With respect to specific aspects, the level of satisfaction is analysed with regard to various specific features, in particular:

- standard of housing and its availability and affordability;
- employment opportunities;
- quality and amount of natural environment;
- quality of built environment;
- level of social and health services;
- level of cultural, recreational and leisure services;
- standard of schools;
- level of public transport services;
- opportunities to participate in local planning and decision-making processes;
- level of personal safety experienced.

In 2002, participants suggested to modify the methodology, so that the list of local features has been slightly modified (and it has also included a weighing system), as follows:

- level of social relationships;
- opportunities to do hobbies and enjoy leisure;
- level of basic services (health and social services, schools, public transport);
- natural and built environments;
- employment opportunities;
- opportunities to participate in local planning processes.

Headline indicator: average level of citizens' satisfaction (overall level and average of opinions expressed for the various features)[8].

[8] The choice of evaluating citizens' satisfaction both as overall level and as the average of opinions expressed for the various features has been done to meet the concern (expressed by participants in the Brussels and London meetings and by experts appropriately surveyed) that the overall satisfaction level, although significant, could result too abstract and therefore unable to reveal a more objective perception of the reality.

The choice of calculating the arithmetic mean of the opinions expressed for the features considered has been done considering that a set of weights could difficulty consider all social and cultural differences existing between different European countries. In any case, it is believed that the choice of this weights for the single features has to be done through a participative process involving all ECI participants.

3.3.2 Extent of participation and response

25 respondent local authorities out of 42 have sent data on this indicator.

The survey methodology has been changed during the last phase of indicators refinement and only the city of Oslo had time and resources enough to change the survey according to the new methodology; the new results obtained by Oslo have been discussed separately, while those sent by that city during the last data collection round have been discussed together with those of other cities.

Data have been provided by 11 southern European cities (in particular 5 from Italy, 5 from Spain and 1 from Portugal), by 10 northern European cities (3 from the United Kingdom, 3 from Finland and 1 from The Netherlands, Sweden and Norway) and by 4 eastern European cities (Bulgaria, Poland, Slovenia and Ukraine).

As far as dimensional representativity is concerned, data have been provided by 11 large cities, with a population of more than 350,000 inhabitants (5 northern European cities, 4 southern ones and 2 eastern one), by 11 medium-sized cities, with a population ranging from 100,000 to 350,000 (7 southern European cities, 3 northern ones and 1 eastern) and by 3 small cities (2 northern European cities and 1 eastern one).

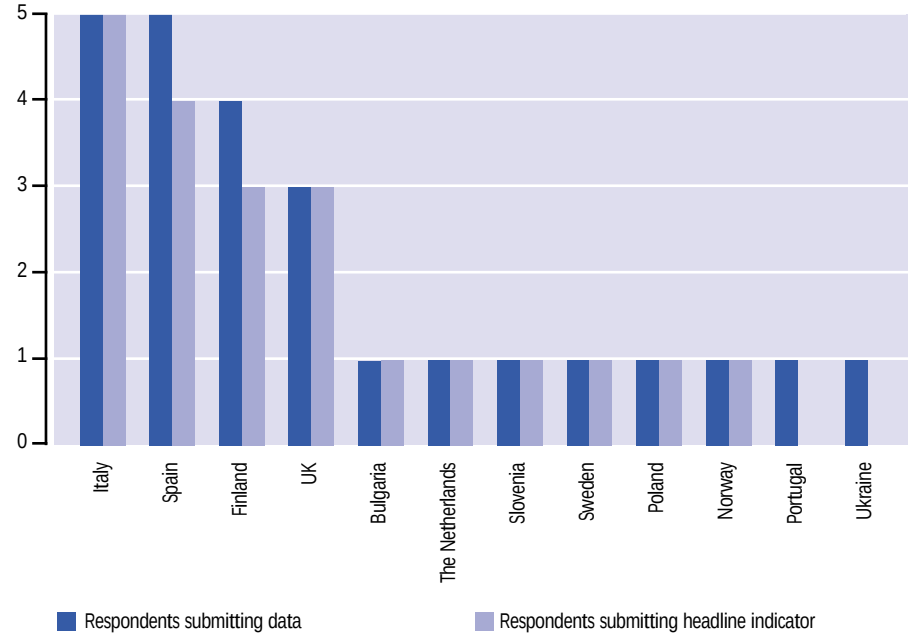
On the whole, the percentage of answers received is satisfying.

Data sent by Lisboa and Nikolaev are, in fact, the only ones that have not been analysed, because in the first case data have been collected with different methodologies, and therefore are not directly comparable with those of other cities, and in the second case data have been collected according to the new methodology but they are rather incomplete.

Regarding other data, as a matter of fact, apart from three respondent cities that answered on general satisfaction only (Birmingham, Gdansk and Turku) and from one respondent that sent data on the satisfaction with respect to only two features (Pori), nine cities answered to all of the 11 questions suggested, three respondents answered to 10 questions, two respondents answered to 9 questions, two respondents answered to 8, one respondent answered to 7 and two respondents answered to 6 questions only.

It is interesting to remark that the two out of the three eastern European cities which evaluated this indicator, have sent complete data and that the other cities to have sent complete data are all in South Europe (with the exception of Bristol) and mainly medium-sized cities (with the exception of Bristol and Zaragoza).

Respondents per country - indicator 1



Elaborated by Ambiente Italia on behalf of ECI

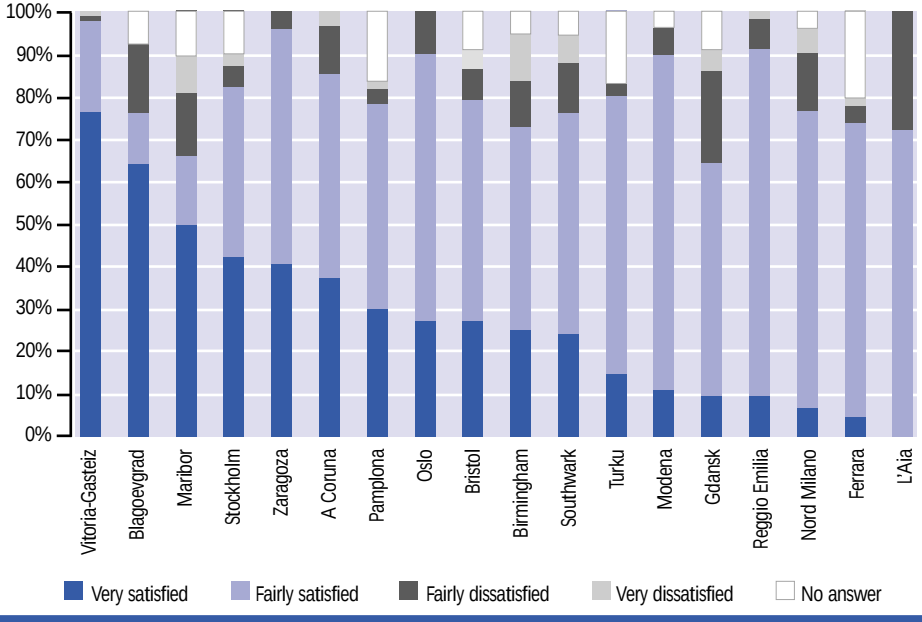
3.3.3 General overview

Headline indicator: overall level of citizens' satisfaction
18 local authorities sent data on the synthetic indicator concerning citizens' satisfaction level with the municipality as a place to live and work.

From a first analysis emerges that only in three of these cities more than 50% of the population declared itself very satisfied: Vitoria-Gasteiz (76%), Blagoevgrad (64%) and Maribor (50%).

The percentage of population who declared itself very satisfied is definitely lower (< 25%) in medium-sized cities, except Gdansk, while it seems to be higher (between 25% and 50%) in large ones.

Level of citizens' satisfaction with the local community



Elaborated by Ambiente Italia on behalf of ECI

If we consider together the people who declared themselves very satisfied as well as fairly satisfied, the situation changes significantly. First of all, percentages are very high and always higher than 50%, ranging from 98% to 66%. The highest values have been recorded in southern European cities.

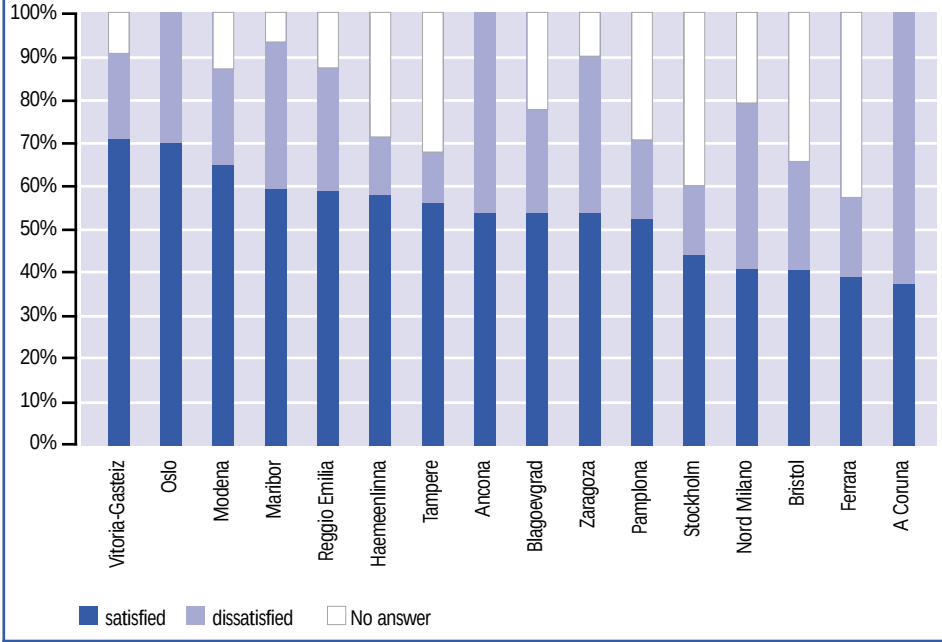
It is noticeable that the two eastern European cities (Blagoevgrad and Maribor) that recorded high percentages of very satisfied citizens, show different results if we consider both levels of satisfaction; as a matter of fact, the high percentage of people who declared to be very satisfied do not tally with an equivalent high percentage of people who declared to be fairly satisfied. This could be due to a misunderstanding of the question, which leads results towards a unique category of answers, or by actual different life conditions among the various social segments.

Headline indicator: average citizens' satisfaction
(average of opinions expressed for the various features)
16 cities sent sufficient data to evaluate the headline indicator as the average of opinions expressed for the various features; that is they provided more than 6 answers to the questions on the various local features (this requirement was necessary for the reliability of the mean)[9].

The analysis of satisfaction levels calculated in this way should be done bearing in mind that the results are strongly affected by the fact that some cities have submitted data related only to people satisfied or not satisfied (Oslo, Ancona and A Coruna), while other cities have submitted also data related to people that preferred not to answer to these questions and in many cases (1/3) they account for 30% (in Stockholm and Ferrara even more than 40%).

On the whole, the best results have been gained by small and medium-sized cities; as a matter of fact, values higher than 60% have been recorded in Vitoria-Gasteiz, Oslo and Modena, while Nord Milano and large urban areas such as A Coruna, Bristol and Zaragoza recorded high percentages of dissatisfaction (not considering the "no answer" figure).

Average citizens' satisfaction with the local community
(average opinions expressed for the various features)



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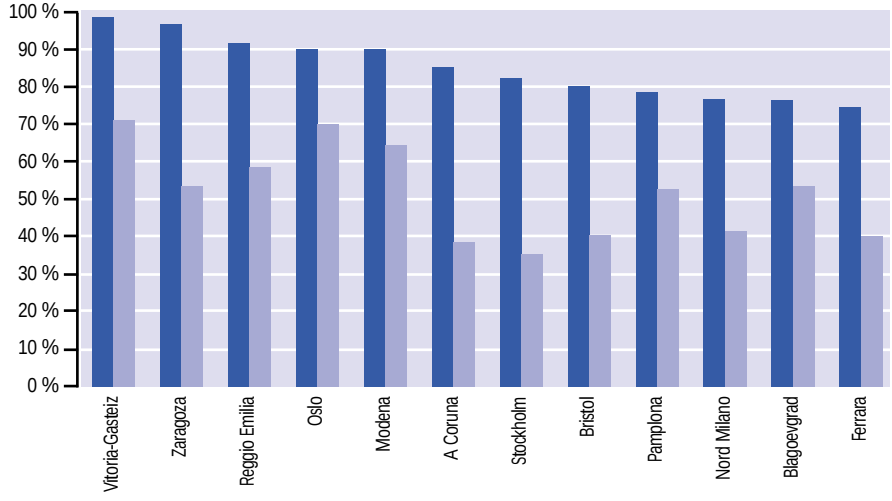
[9] A Coruna and Tampere have submitted data related to 9 features, Ferrara and Haemeenlinna related to 8 and Stockholm related to 7. All other 11 cities have submitted data related to all 10 features. A direct correlation between those that have submitted data related to a lower number of features and lower citizens' satisfaction levels cannot be proved.

Although bearing in mind the different influence that the percentage of "no answer" has in some cases, it is interesting to point out the difference among the levels of satisfaction obtained by estimating the average of the various features answers and the levels of satisfaction obtained by an overall 'synthetic' comment on the local community expressed by the population.

Respondent cities tend to express more positive comments answering to general questions than to more specific ones. Therefore, it is deducible that interviewees tend to answer more objectively, if not critically, to questions on single features, whereas answers requiring a synthetic comment may be affected by personal and subjective factors (affections, professional satisfaction, ...). Moreover, it has to be noticed that the bigger the cities, the bigger the difference between the two comments and the more positive the 'synthetic' comment.

Level of satisfaction: overall 'synthetic' comment and average of answers on different features



	Vitoria-Gasteiz	Zaragoza	Reggio Emilia	Oslo	Modena	A Coruna	Stockholm	Bristol	Pamplona	Nord Milano	Blagoevgrad	Ferrara
synthetic	98%	96%	91%	90%	90%	85%	82%	79%	79%	77%	76%	74%
average	71%	53%	58%	69%	64%	38%	35%	40%	53%	42%	53%	40%

Elaborated by Ambiente Italia on behalf of ECI

Satisfaction with regard to single features

The analysis of 'average comments' (estimated on the basis of the comments provided by respondent cities) expressed with regard to single features of the local community, highlights some interesting differences.

The highest level of satisfaction is presented by the quality of natural environment (64%); 23% of citizens is indeed very satisfied with the quality of natural environment and 41% is fairly satisfied. The percentage of dissatisfied population is equal to 25%, of which only 6% is very dissatisfied.

Data related to personal safety and cultural, recreational and leisure services show that in both cases 57% of the population is satisfied (16% very satisfied for both features), with a higher percentage of dissatisfied for personal safety (32% versus 21%) and, therefore, a higher percentage of people that did not answer for services (22%).

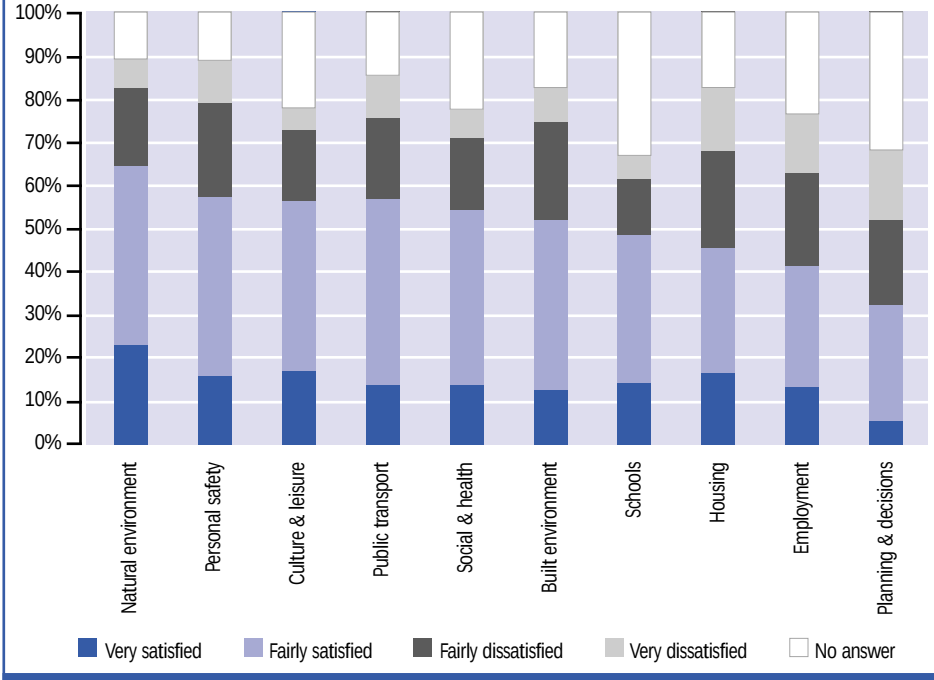
Following, data regarding the level of satisfaction on public transport and the level of social and health services register similar levels of satisfaction (56% and 54% respectively) with the same distribution of very satisfied (14%), though public transport records a higher dissatisfaction (29% versus 23%); no answers have been 15% for transports and 23% for services.

Lower values are recorded for the quality of built environment (51%), where the total satisfaction results from the sum of 12% of very satisfied and 39% of fairly satisfied; the quota of dissatisfied population is 31% (8% of which is very dissatisfied).

The other features, public schools (49%), housing and its availability and affordability (45%), employment opportunities (42%) and opportunities to participate in local planning and decision-making processes (32%), satisfy not even half of the population.

As for the following analysis, it has to be taken into account that a high percentage of 'no answer' makes extremely difficult the definition of random relations between the levels of satisfaction and dimensional or geographical features of respondents. In particular, the incidence of 'no answer' mainly concerns the question on the satisfaction of the opportunities to participate in local planning and decision-making processes (31%), and the question on public schools (32%).

Level of citizens' satisfaction with the single parameters



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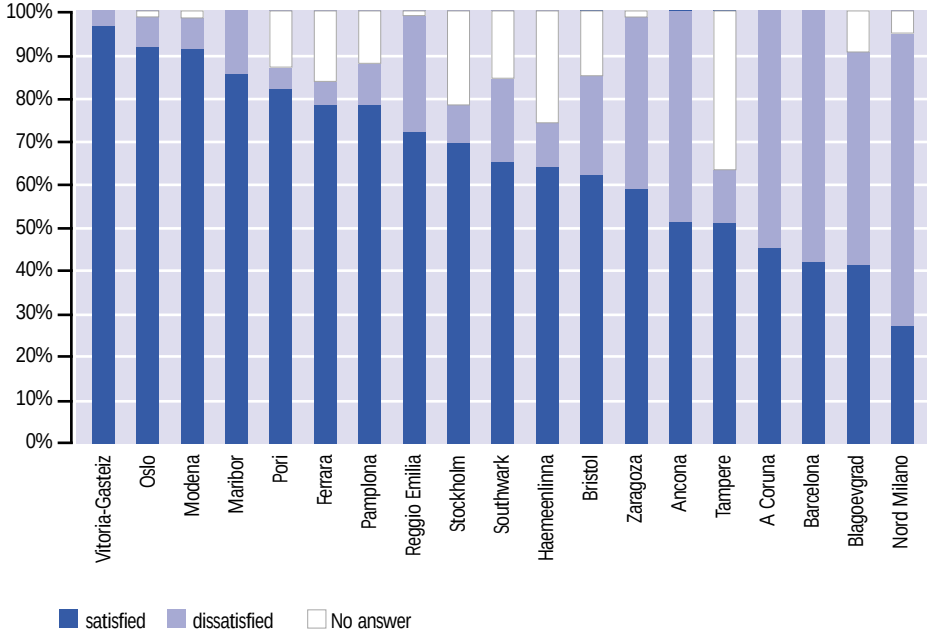
Furthermore, it has to be highlighted that some cities, using the suggestion included into the new methodology sheets, did not consider 'no answers' when evaluating percentages (it is the case of Ancona, A Coruna and perhaps of Oslo). As a consequence, the comparison among the cities turns to be complicated because these cities tend to be 'penalized' by an increased quota of dissatisfied citizens.

Satisfaction with regard to the quality of natural environment
In 15 cities out of 19 respondents (10 from the South, 7 from the North and 2 from the East), more than 50% of the population declared itself satisfied.

Percentages higher than 70% have been recorded in 8 cities equally distributed between the North and the South (half of the cities which sent data from those areas) and mainly medium-sized cities (6).

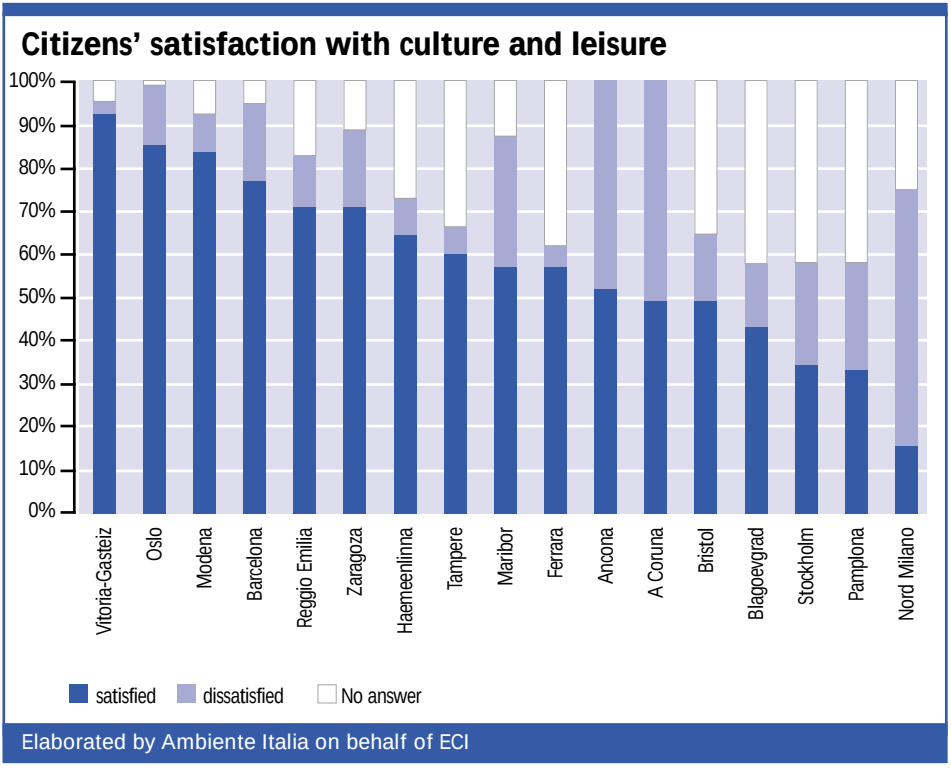
Citizens' satisfaction with the natural environment



Elaborated by Ambiente Italia on behalf of ECI

Satisfaction with regard to cultural, recreational and leisure services

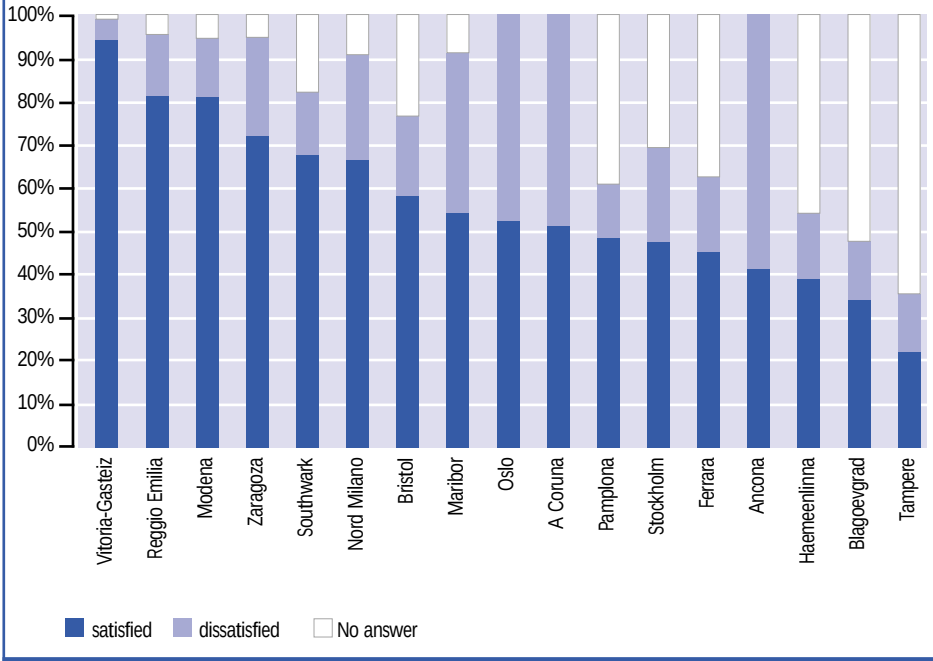
17 cities (10 from the South, 6 from the North and 1 from the East) have sent data; more than 50% of the population declared itself satisfied in as many as 11 of them, 6 gained positive results with more than 70% of the population which turned out to be satisfied. The highest, higher than 77%, percentages are recorded in Vitoria-Gasteiz, Oslo, Modena and Barcelona.



Satisfaction with regard to social and health services

Information has been provided by 17 cities (8 from the South, 7 from the North and 2 from the East). In general, since these services are considered fundamental, results are not very good; only in 10 cities more than 50% of the population declared itself satisfied with the offer and accessibility of these services, and in only 4 cities, nearly all from southern Europe, such a percentage is higher than 70%.

Citizens' satisfaction with social and health services



Elaborated by Ambiente Italia on behalf of ECI

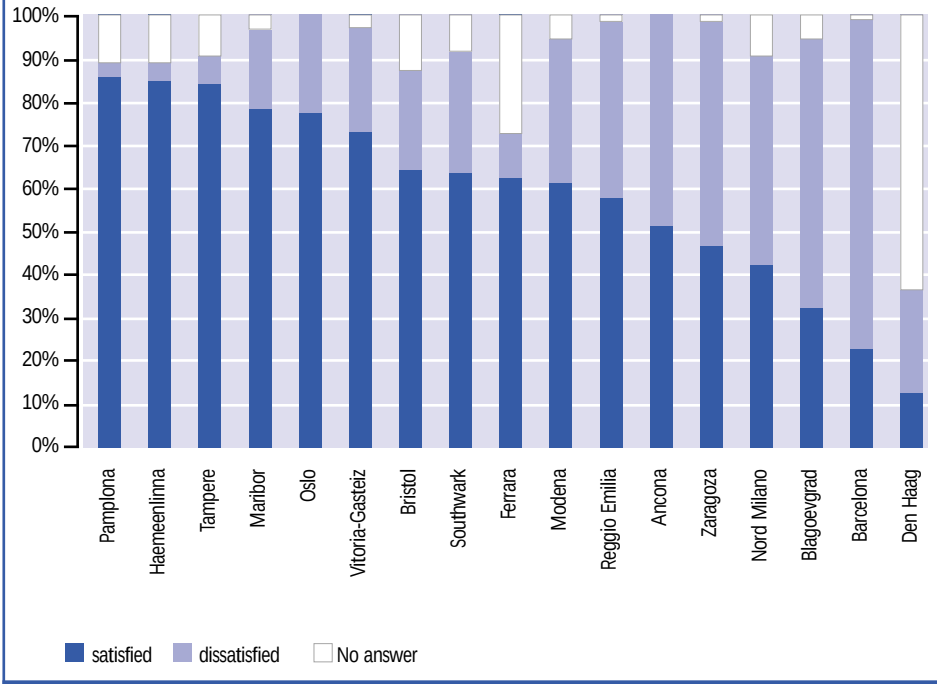
Satisfaction with regard to personal safety
17 local authorities have sent data (9 from the South, 6 from the North and 2 from the East).

In 12 of the respondent cities, more than 50% of the population declared itself satisfied and in only 6 cities this percentage is higher than 70%.

The highest values have been recorded in Pamplona and Haemeenlinna, in both cities 85% of the population declared to be satisfied, followed by Tampere, Maribor, Oslo and Vitoria-Gasteiz.

The sample is probably too small to allow the estimation of univocal correlation, but it may be noticed that while the only two big northern cities which provided data show satisfying results (Oslo 78% and Bristol 64%), the data provided by the two big southern European cities are lower (Zaragoza 46% and Barcelona 23%).

Citizens' satisfaction with personal safety



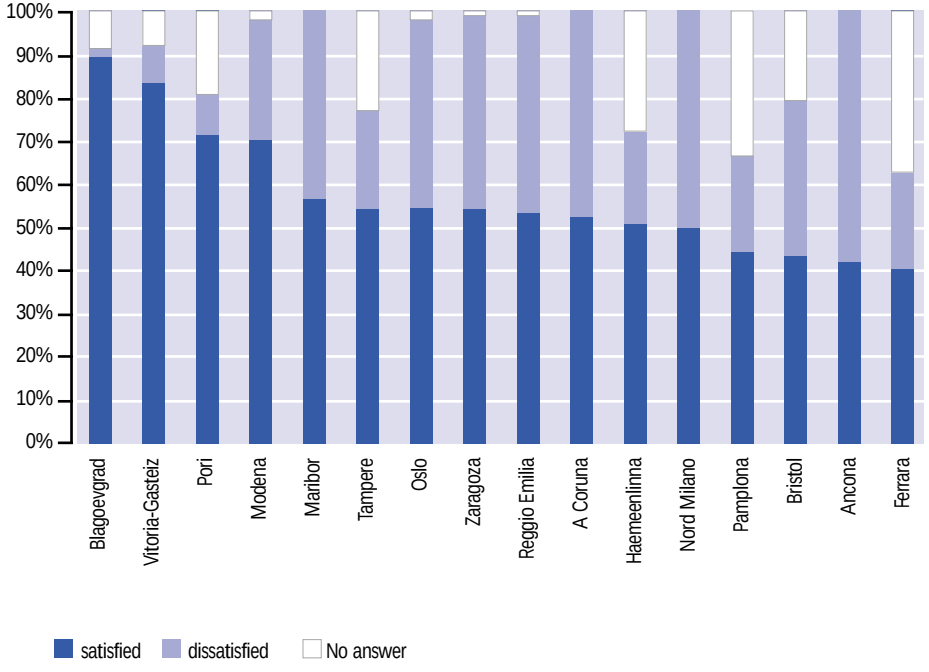
Elaborated by Ambiente Italia on behalf of ECI

Satisfaction with regard to built environment
Of all the 16 cities which sent data (9 from the South, 5 from the North and 2 from the East), 11 record a percentage higher than 50% and 4 higher than 70%.

The Bulgarian city (Blagoevgrad) stands out as the one which records the highest consent among its citizens (90%).

Positive results have been also obtained in Vitoria-Gasteiz (83%) and in Pori (71%). Of the 5 cities where such a percentage is lower than 50%, 4 are medium-sized cities from the South of Europe (Nord Milano, Pamplona, Ancona and Ferrara).

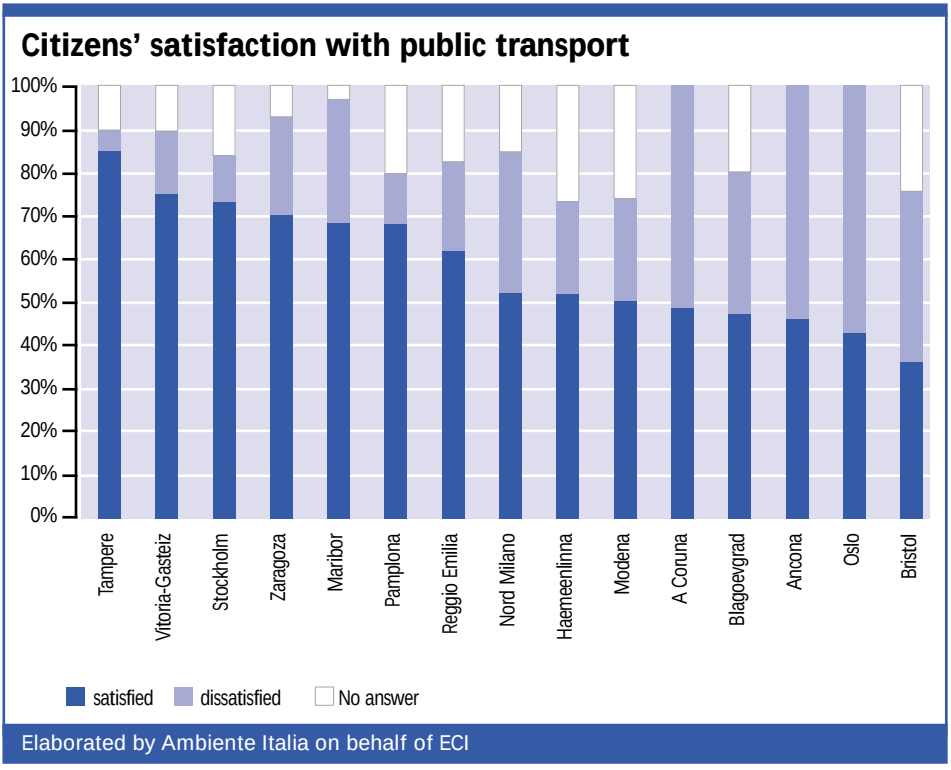
Citizens' satisfaction with the built environment



Elaborated by Ambiente Italia on behalf of ECI

Satisfaction with regard to public transport
In 10 out of 15 cities (8 from the South, 5 from the North and 2 from the East) which sent data, more than 50% of the citizens declared themselves satisfied with this feature, but only in 4 cities (Tampere, Vitoria-Gasteiz, Stockholm and Zaragoza) such a percentage is higher than 70%.

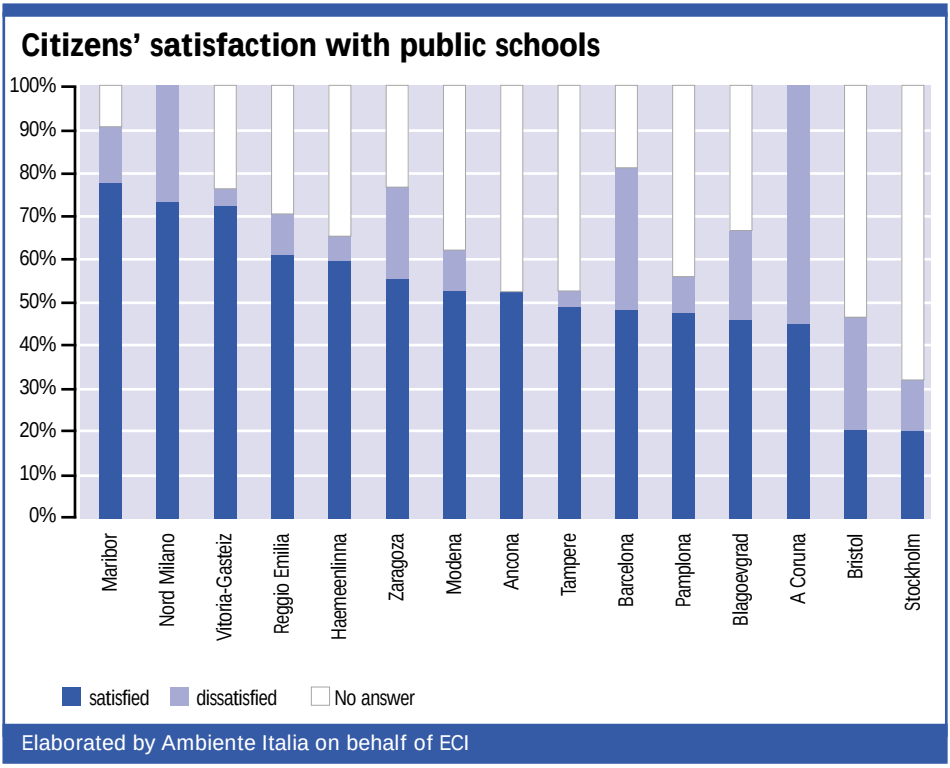
The scanty results obtained in large northern European cities (Oslo and Bristol), where the percentages of citizens who declared themselves satisfied are slightly higher than 40%, are definitely impressive.



Elaborated by Ambiente Italia on behalf of ECI

Satisfaction with regard to public schools
Data have been provided by 15 cities (9 from the South, 4 from the North and 2 from the East).

On the whole, the figure is affected by a high incidence of 'no answer'. However, no high pick of satisfaction has been recorded (3 cities record percentages higher than 70%; Maribor records the highest percentage equal to 78%, followed by Nord Milano and Vitoria-Gasteiz with a percentage equal to 73%). Only 8 cities record more than 50% of satisfaction.

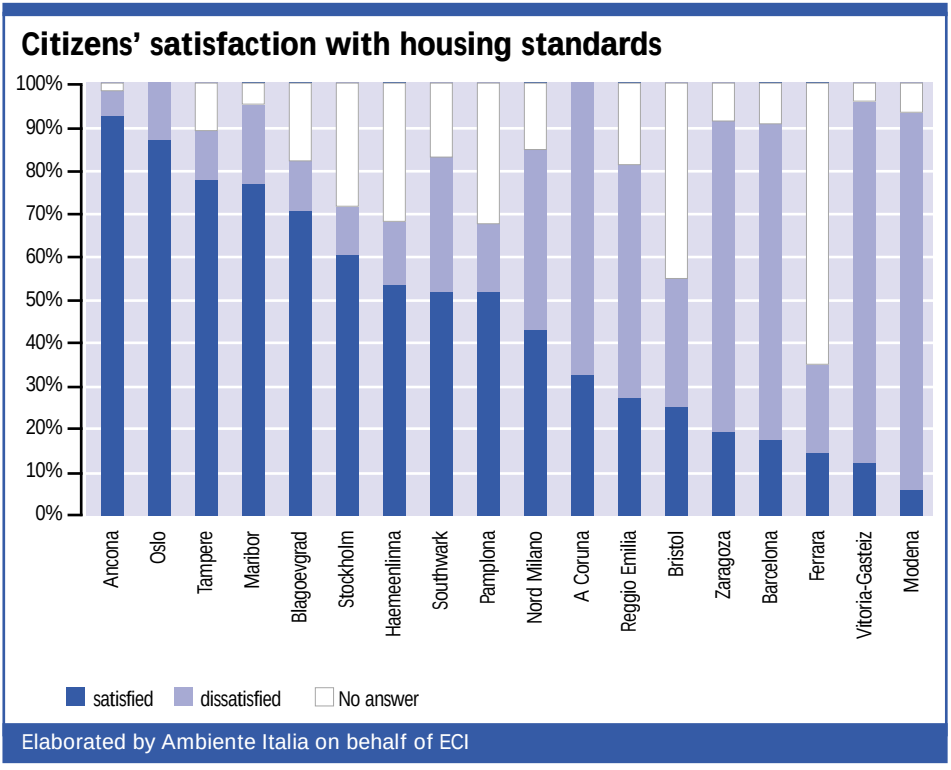


Satisfaction with regard to housing standards
Only 9 out of 18 cities which sent data (10 from the South, 6 from the North and 2 from the East), have obtained positive answers from more than 50% of the interviewees, and only 5 cities record percentages higher than 70%.

A first interpretation of these results seems to show a certain discrepancy between northern European cities, where the percentages of citizens satisfied with this feature are higher, and southern European cities which show lower percentages.

The only two exceptions are represented by Ancona, which reported the best result, and Bristol, though its figure cannot be considered reliable because of the high incidence of 'no answer' reported by the survey (46% of the interviewees did not express any comments on the matter).

The level of satisfaction with regard to this feature in eastern European cities is good for both cities where percentages are higher than 70%.

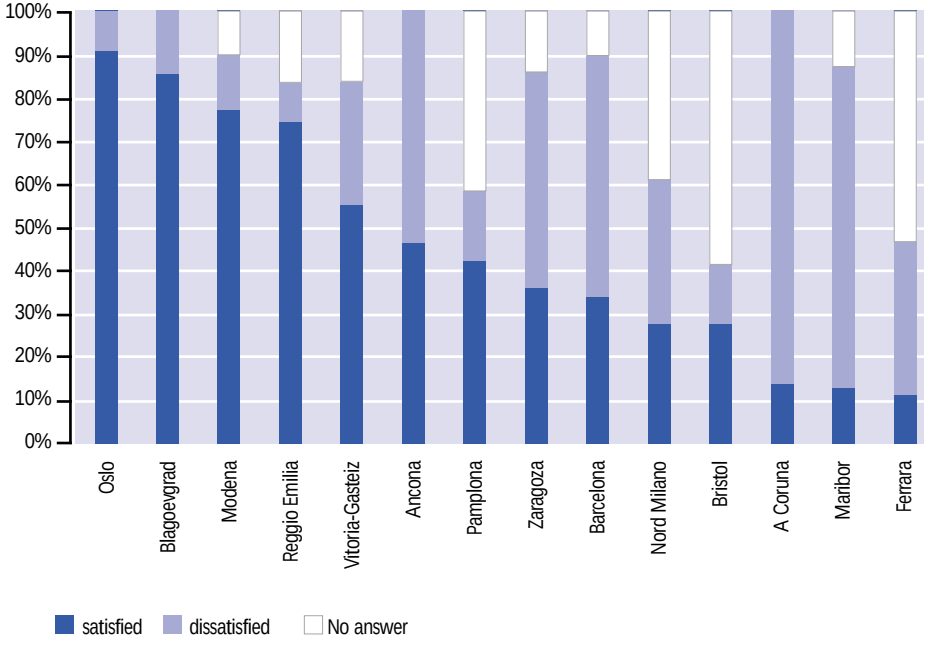


Satisfaction with regard to employment opportunities
Data have been provided by 14 cities (10 from the South, 2 from the North and 2 from the East).

The city which recorded the highest level of satisfaction is Oslo (large, North). The data provided by Bristol are difficult to interpret as they record a low percentage of satisfaction (27%), as well as a low percentage of dissatisfaction (14%) and a very high number of 'no answer' too.

The data sent by the two eastern European cities are opposite: Blagoevgrad recorded a percentage of satisfied citizens higher than 80% while Maribor's percentage is equal to 12% (75% of dissatisfied citizens).

Citizens' satisfaction with employment opportunities



Elaborated by Ambiente Italia on behalf of ECI

Satisfaction with regard to the opportunities to participate in local planning and decision-making processes

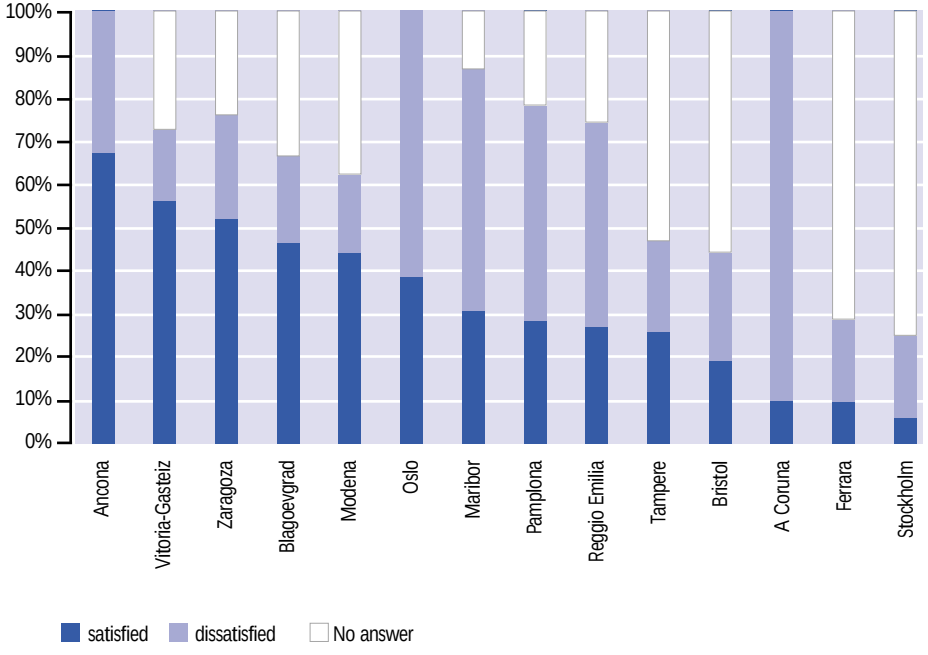
Data have been provided by 14 cities (8 from the South, 4 from the North and 2 from the East), and they show the worst performances.

These data are on the whole difficult to interpret because of high percentages of 'no answer' (in as many as 6 cities more than 30% of interviewees gave no answer).

The levels of satisfaction are higher than 50% in 3 cities only: Ancona records the highest value equal to 67%, followed by Vitoria-Gasteiz with 56% and by Zaragoza with 52%. In 8 cities the percentage of satisfaction is lower than 30% and the high percentages of 'no answer' seem to suggest that the question has been misunderstood by the interviewees.

High percentages of dissatisfaction have been recorded in A Coruna (90%), Oslo (63%), Maribor (56%) and Pamplona (50%).

Citizens' satisfaction with participation in planning and decision-making



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3.3.4 Indicator calculation according to the new methodology

The city of Oslo in 2002 has conducted a survey according to the new methodology on a sample of 1,000 persons.

The headline indicator is the percentage of citizens that is very satisfied with the local community as a place to live and work; the result obtained by Oslo is 33%. If we sum this percentage and that of people that are fairly satisfied, 59%, the result is a value, 92%, that, compared to the 'synthetic' headline indicator defined in the old methodology, is one of the highest obtained (after Vitoria-Gasteiz and Zaragoza). The interviewees are then required to assign a percentage score, between 0 and 100, to the satisfaction with different features (social relations, opportunities to practice hobbies, basic services offered, quality of surrounding environment, employment opportunities and opportunities to participate in local planning and decision-making) and to rank them according to their personal judgement value.

The table shows that the aspect considered as the most important in influencing quality of life is the quality of social relations and that Oslo's citizens expressed for this aspect not only a high level of satisfaction (84%), but the highest at all. Good results have been obtained also by the aspect indicated as the second most important, the quality of surrounding environment, which has been attributed the second highest value; at the third position, there is the quality of basic services that does not satisfy the sample interviewed.

	Satisfaction	Ranking	Weighed value
social relations	84%	1	84%
surrounding environment	80%	2	40%
basic services	56%	3	19%
hobbies	79%	4	20%
employment opportunities	75%	4	19%
local planning and decision making	52%	6	9%

Elaborated by Ambiente Italia on behalf of ECI

The survey then asks the interviewees first to evaluate different aspects of each features and then to indicate the two of these aspects that are considered as the most important in affecting the quality of life, but this second information has not been asked in Oslo. See the following table for the results obtained in Oslo.

	% score
How safe is to	
be at home with the door unlocked during the day	na
be at home with the windows open during the night	62%
walk in main streets at night	46%
walk in public open areas at night	46%

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	% score
Quality of following services	
sport facilities	81%
theatres and cinemas	79%
museums and exhibitions	74%
cultural associations	71%
libraries	74%
Accessibility of following basic services	
general practitioners	63%
hospitals	53%
social assistance to the underprivileged	40%
council housing	28%
policing	na
public schools	62%
public transport	78%
Quality of the following	
public parks and gardens and greenery in general	71%
built environment	59%
waste collection and street cleaning	54%
air quality	37%
noise level at night	46%
noise level in the daytime	29%
Your opinion on the following	
professional training opportunities	78%
incentives to start-ups	78%
level of unemployment in your municipality	22%
distribution of wealth within your municipality	na
local reinvestment of the wealth produced by the municipality	na
Effectiveness of the following in influencing local decision-making	
participating in local (e.g. municipal, district level, …) consultation processes	36%
being a member of an interest group (e.g. environmental and consumers associations)	48%
submitting direct requests/claims to municipal relation offices	42%
voting in local elections/referendums	47%
organising/participating in spontaneous demonstrations aimed at raising awareness on specific issues	39%

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3.4 Indicator 2 – Local contribution to global climate change

3.4.1 Definition

Indicator 2 requires the following information:

- annual tons of CO_2 equivalent emissions: refers to anthropogenic emissions of carbon dioxide differentiated by sector - residential, industry, tertiary and transport - and energy vector; and to methane emissions from waste reported in terms of CO_2 equivalent emissions.

The calculation method bears particular relevance in this case, since it is aimed not only at highlighting emission quantities, but also the relevant sources (sectors and vectors) of CO_2 emissions. Emissions are allocated according to a "responsibility principle": once the inventory of activities located in the urban area considered has been carried out, normal procedure requires relevant emissions be calculated, including not only the emissions generated in the area, but also those generated outside the area itself, wherever they are, so long as they can be traced back to the activities listed.

Headline indicator: annual CO_2 per capita emissions.

3.4.2 Extent of participation and response

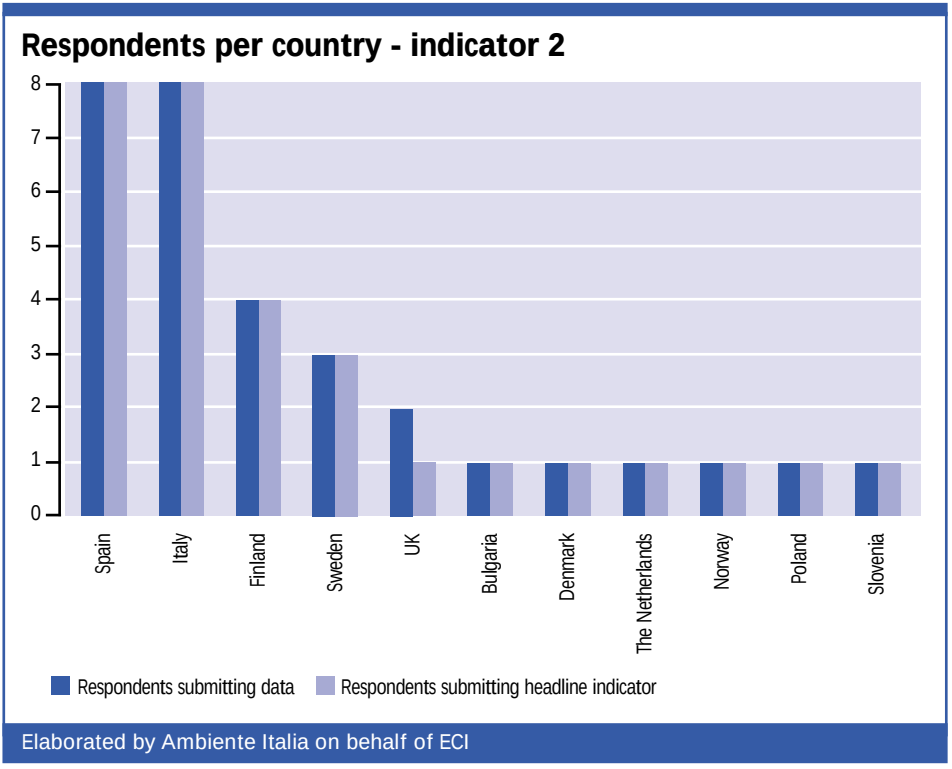
31 of the total 42 respondents have populated indicator 2. The rate of response (74%) is higher than average. Given the indicator's complexity, this is more than satisfactory, although it should be noticed that the data submitted show varying levels of details and accuracy across responses. 19 respondents have calculated CO_2 emissions breaking them up by energy vector and economic sector, while 9 have only recorded either a sectoral or vectoral decomposition and 2 only submitted total aggregate emissions (Birmingham only submitted gas consumption data).

Data were collected between 1998 and 2001, in most cases, except for Ferrara (1997), Zaragoza (1996), Catania (1995) and Gdansk (not indicated).

Southern countries are the most represented recording 16 respondents, 8 Italian and 8 Spanish (but only 4 record sufficiently disaggregated and comparable data). Northern countries are represented by 12 respondents and Eastern countries by 3 respondents. Scandinavian cities record the highest rate of response with respect to this indicator: 9 cities (4 Finnish, 3 Swedish 1 Danish and 1 Norwegian) out of 10 total Scandinavian respondents have submitted CO_2 emissions data.

In general, large urban areas record the highest response rate (10 out of the 13 total respondents), although only 6 of them – and mostly large northern European cities – have sent data that can effectively be used for comparative analysis. On average, the level of detail of the data supplied by 11 medium-sized cities (out of 18 medium-sized total respondents) proved more satisfactory. On the other hand, 4 small towns have engaged in calculating CO_2 emissions.

Among eastern cities, varying in dimensions, Blagoevgrad is the only one to have supplied exhaustive data, while Maribor and Gdansk have estimated emissions, obtaining only partial disaggregations.



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3.4.3 General overview

In the first place it should be stressed that the urban areas considered lie in different geographical contexts, with differing climatic patterns, housing structures and so on. This implies that each area is characterised by its peculiar energy needs and subsequent infrastructure. Furthermore, comparisons among individual cities or groups thereof may not always prove reliable where only aggregate data were submitted, (e.g. Diputación Foral de Bizkaia, Burgos, A Coruna, Maribor e Gdansk) or consumption of specific energy vectors/economic sectors is lacking.

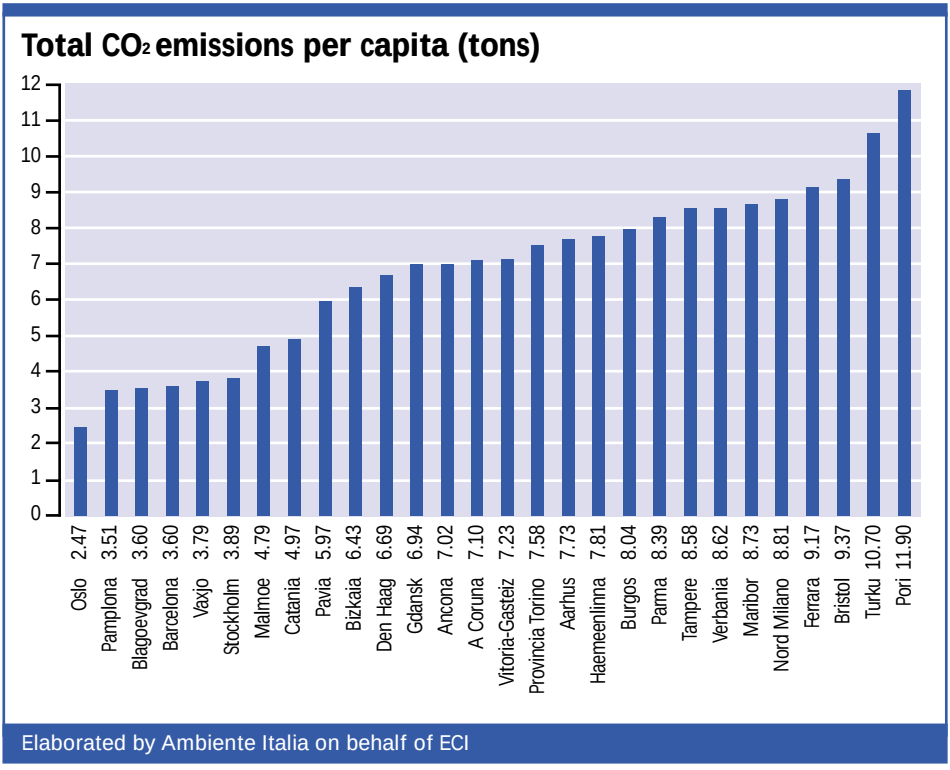
The comparison is based on a homogeneous conversion criterion[11], based on absolute quantities consumed, as declared by respondents. Such substitution resolves those cases of possibly incorrect implementation of the methodology, in turn connected with its originality compared to more traditional methods. Last, but not least, original coefficients have been substituted with standard ones only in very few cases. This substitution has not, in general, implied substantial variations and has rather allowed a distinction between the local and external coefficients, where a unified coefficient was originally submitted.

[11] For more comparability, the relevant coefficients submitted by the various respondents have been substituted with those indicated in the "Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories" as far as local coefficients are concerned. As regards external coefficients, on the other hand, AIRES coefficients, where existing, have been considered (AIRES is the software designed by Ambiente Italia and validated by ICLEI and the Italian Ministry of Environment).

Total per capita emissions

The four urban areas where per capita CO_2 emissions are higher than 9 tons are Pori, Turku, Bristol and Ferrara. Although Pori's residential emissions are lower than those of other Finnish cities, due to a widespread use of a vector with zero emission (wood, accounting for more or less 30% of residential energy consumption), this city has very high industrial emissions that represent nearly a quarter of the total (11.9 tons) emissions.

On the contrary, Turku records high residential (together with Tampere, it is the only one whose figure is higher than 3 tons per capita) and transport consumption; Bristol records values of consumption higher than the average value for all sectors and, for the transport sector, the highest in absolute terms. The city of Ferrara is characterised by high industrial consumption and by a tertiary consumption that is much below the average value. There are two Italian cities, Parma and Verbania, whose emissions, both higher than 8 tons per capita, are strongly affected by industrial consumption, too.



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Spanish and Swedish respondents plus Blagoevgrad and Oslo (the latter recording the lowest value of 2.47 tons[12]) seem to have better performances than the rest of the respondents, recording per capita emissions values lower than the average value of 6.78 tons.

[12] The very latest data submitted from Oslo (that are related to 2000) show a slight increase in CO_2 per capita emissions, that would result in 2.67 tons.

It should be noticed that Scandinavian cities such as Stockholm, Vaxjo and Oslo, in spite of their low temperatures, also record low emission values. This could be due in part, to the fact that the main energy vector in Sweden and Norway, but not in Finland, is hydroelectric energy. Moreover, in the city of Stockholm, additional energy saving is allowed by the widespread use of district heating, accounting for a share of 32% of total energy consumption, while in the city of Vaxjo wood (a zero emission energy vector, according to the methodology) represents a share of 27% of total energy consumption (50% of the residential consumption). Figures for Oslo show that only 30% of total energy consumption consists of fossil fuels, and 2/3 of this 30% are used by private motorised transport.

The low values showed by a few Spanish cities (Pamplona, Viladecans, Zaragoza and Barcelona) do not seem to be due only to favourable climatic conditions. While it is not possible to formulate any hypothesis for Pamplona, due to lack of disaggregated data, the low values recorded by Viladecans (2.9 tons) may be due to the partial lack of data on electricity consumption and to the absence of tertiary consumption data. Zaragoza (1.7 tons) does not report data for electricity and the tertiary sector.

Figures for Barcelona are lower than the average in all four sectors considered[13]. Low data for residential emissions (and for part of the tertiary ones) is coherent with the favourable weather conditions and with the widespread use of natural gas (60% of this sector consumption), while the low value for industrial emissions (0.39 tons per capita, while the average is 1.85 tons) could be due to the fact that calculations were made using an average emission coefficient, because real energy vectors have not been identified.

Moreover, the emissions figure is strongly affected by per capita transport consumption, half of those recorded in other large European cities (1.04 instead of 2.11 tons); this hypothesis is confirmed by the mobility data (see indicator 3), according to which only 22% of the population declared to use the private car for daily displacements.

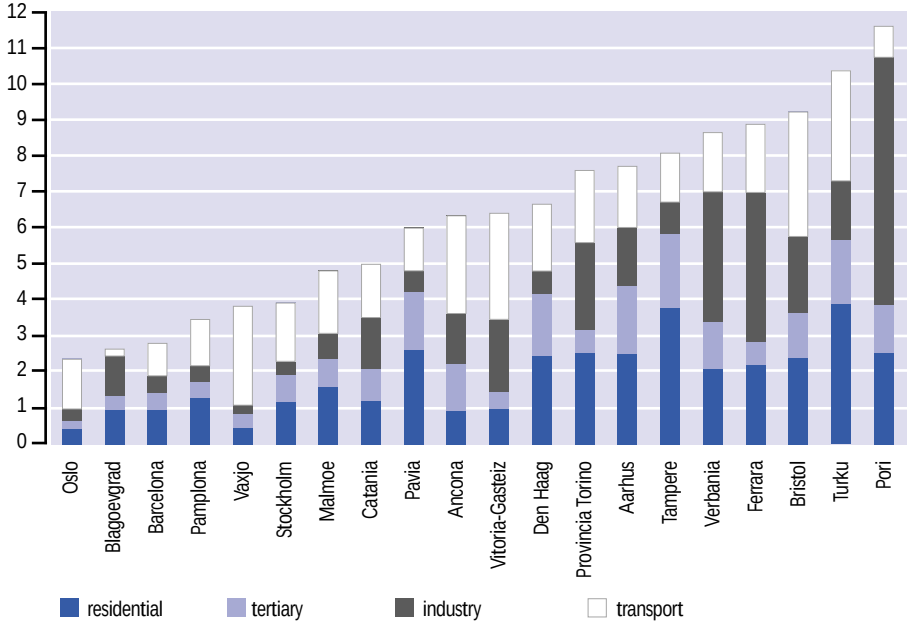
Sectoral per capita emissions

Considering that data sets are not always complete, the residential sector is the most relevant source of local emissions in many urban areas (2.06 tons), followed by the transport sector (1.90 tons) and by the industrial sector (1.85 tons), whose role varies in different contexts, depending on its presence within the municipal territory. On the other hand, the impact of the tertiary sector seems lower (1.07 tons).

In particular, residential consumption is necessarily affected by weather conditions. Northern cities, such as Pori, Turku, Tampere, Bristol, Aarhus, Haemeenlinna and Den Haag, have an average emission value of 2.74 tons per capita, while Spanish cities and those in central and southern Italy (Barcelona, Vitoria-Gasteiz, Pamplona, Ancona and Catania) record values of 1.02 tons. This, however, does not mean that a policy strongly oriented to energy saving and renewable resources development, facilitated by morphological characteristics for Sweden and Norway, could not lead to great emission reductions. Oslo, Malmoe, Stockholm and Vaxjo record an average residential emission value of 0.86 tons, even lower than southern urban areas.

[13] Values are partially influenced, except for the transport sector, by the fact that the emission coefficient is determined by the energy import mix (34 ton/TJ). The only countries to have a higher coefficient are Sweden and Norway.

Total CO_2 emissions (excluding waste) per capita (tons)



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Transport emissions, though still significant, vary less than other sectoral emissions across respondents; this happens despite the fact that the methodologies used are much more complex and vary more across urban areas than those used for calculation related to other sectors. In fact, excluding outliers, values range from 3 tons per capita (Turku and Vitoria-Gasteiz) to less than half this amount (Pamplona, Oslo and Pavia).

Looking at both data on transport sector performances and residents' displacement modes (indicator 3), it is evident that the high consumption levels recorded by Bristol and Ancona, and partially by Nord Milano and Torino, are supported by the data on the high incidence of private motorised transport. Similarly, Barcelona's modal distribution seems to corroborate its low emission values (only 22% of the residents drives a car).

Unlike Barcelona, the modal distribution in Vitoria-Gasteiz does not seem to bear on the high emission values recorded: only 21% of the population uses the car. On the other hand, as regards Oslo and Malmoe, the former records lower emissions than the latter (1.47 versus 1.78 tons), although displacements by car in the first one are twice as frequent as in Malmoe.

Data on industrial energy consumption depend both on the most common vector and on the plants' location within or outside municipal borders. In fact, although on average this sector weighs less, (1.85 tons), the areas characterised by relevant industrial activity (see Pori, Ferrara, Verbania and Parma, for example) record a significant positive contribution to total per capita emissions for this sector.

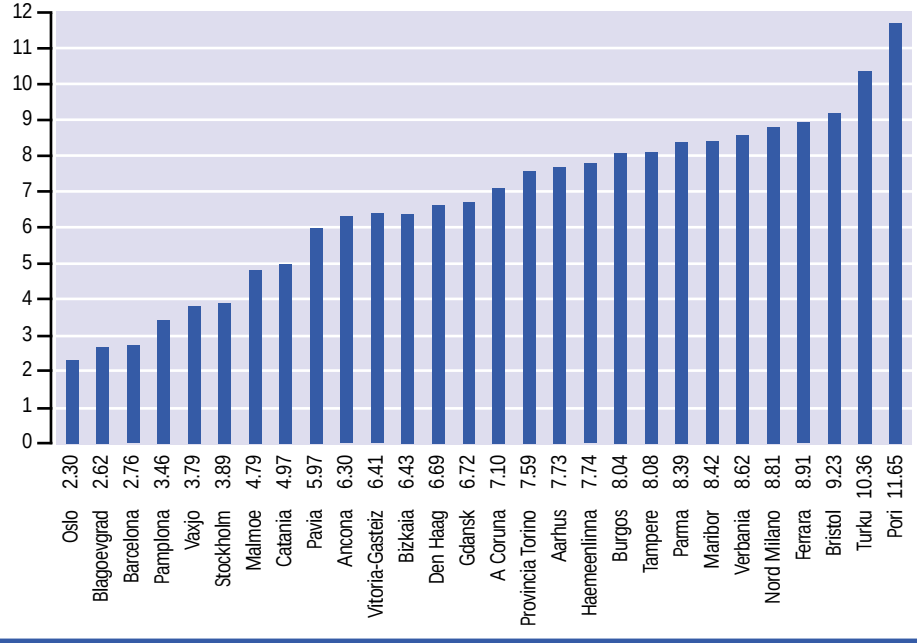
Waste

The urban areas that have estimated CH_4 emissions (and relevant CO_2 equivalent emissions) from landfill waste disposal are Aarhus, Ancona, Barcelona, Blagoevgrad, Bristol, Catania, Ferrara, Gdansk, Haemeenlinna, Maribor, Oslo[14], Pori, Tampere, Turku and Vitoria-Gasteiz. In all those cases where the data are missing, it is not clear whether this is due to recycling and/or incineration activities (Malmoe is among the few to have sent information to this regard).

On average, this specific form of CO_2 equivalent emissions contributes approximately 0.4 per capita tons, equal to 6% of total emissions. Analysing each case separately, though, some considerable variations may be noticed, in terms both of quantity of waste contributed to landfills (ranging from 60 kg per capita in Aarhus to 600 in Tampere) and of the average emission coefficient – kg of CH_4 per ton of landfill waste – which generally halves where systems for the collection and recycling of biogas are in place (Ancona, Barcelona and Vitoria-Gasteiz record between 70 and 80 kg, while Pori, Tampere and Maribor use 35 kg).

Only half of the respondents have included the waste component in their calculations and in some instances emissions from landfill account for more than 10% of total emissions (Ancona, Barcelona, Blagoevgrad and Vitoria-Gasteiz); therefore, the graph shows total per capita emissions excluding those deriving from waste.

Total CO_2 emissions (excluding waste) per capita (tons)



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[14] Oslo, on the contrary, records emissions from waste incineration, too. These are equal to slightly more than half of CO_2 equivalent emissions from landfills, and are not considered here to avoid double counting.

Intensity of emission

If we refer to the actual amount of energy consumption and compare it to the total amount of CO_2 emissions (excluding emissions deriving from waste disposal), it is possible to calculate an index which can highlight a sort of "intensity of emission". The distribution varies from 40 tons CO_2/TJ in the Swedish cities, to 100 tons CO_2/TJ in Catania and Nord Milano, recording a median value equal to 75 tons CO_2/TJ.

	tons CO_2 (per capita)	MJ (per capita)	tons CO_2/TJ
Vaxjo	3.8	101.8	37
Stockholm	3.9	95.9	41
Malmoe	4.9	105.0	46
Vitoria-Gasteiz	6.4	102.0	63
Bizkaia	6.4	101.2	64
Pori	11.7	165.7	70
Burgos	8.0	115.0	70
Barcelona	2.8	38.6	71
Parma	8.4	103.6	81
Pavia	6.0	71.2	84
Tampere	8.1	94.8	85
Ancona	6.3	73.1	86
Aarhus	7.7	88.9	87
Provincia Torino	7.6	87.1	87
Verbania	8.6	97.1	89
Maribor	8.4	93.7	90
Nord Milano	8.8	89.8	98
Catania	5.0	49.9	100
Blagoevgrad	3.6	30.5	118

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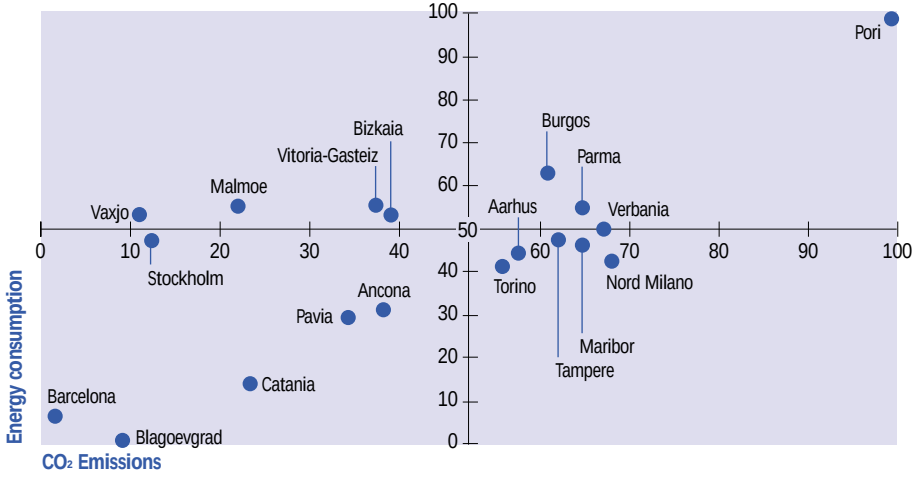
The graph illustrates the values of tons of CO_2 emissions (abscissa) and the respective per capita values of energy consumption (ordinates), both normalised according to the distance from respective average values. First of all, we may notice that, with the exception of Pori (whose emissions are mostly due to high energy consumption), urban areas reporting amounts of emission higher than the average all have rather similar energy consumption, higher than the average even if not far distant from it. In all those cities the amount of consumption is rather high and energy policies now in progress cannot contain the intensities of emission.

On the other hand, if we observe the left part of the graph (cities reporting values of emission lower than the average) the situations are particularly different. Blagoevgrad, Barcelona and Catania show the lowest values of CO_2 emissions (three of the urban areas reporting the lowest energy consumption values) as well as Stockholm, Vaxjo and Malmoe, which, though they report values of consumption above the average, they manage to reduce their emissions by using hydroelectric power and district heating. Furthermore, it may be interesting to notice how Vitoria-Gasteiz, the Diputación Foral Bizkaia, Ancona and Pavia have similar per capita emissions, notwithstanding their very different amounts of energy consumption.

Energy consumptions and related CO_2 emissions



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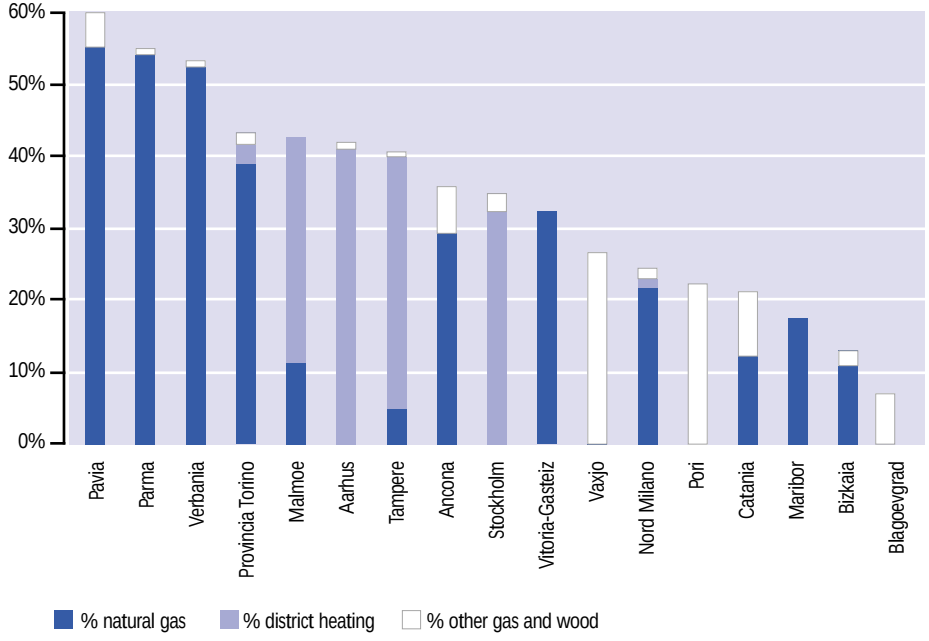
Good practices in the use of energy vectors

The use of methane is extremely widespread in Italy, where it accounts for more than 50% of total consumption in Verbania, Pavia and Parma, reaching 80% in the residential sector. In Verbania and Parma, where total per capita emissions are higher than 8 tons, due to high industrial consumption, residential emissions are close to the general average value of 3.18 tons and below those of a geographically similar area such as Nord Milano (4.56 tons), where natural gas weighs approximately 40% on total consumption.

Natural gas and district heating diffusion (%)



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District heating is mostly relevant in four northern European cities: Stockholm, Malmoe, Aarhus and Tampere. Widespread use of district heating in the residential sector is undoubtedly one of the key factors influencing the low emission values in the residential and tertiary sectors of urban areas like Stockholm and Malmoe (1.11 and 1.55 tons per capita). Although in Swedish urban areas CO_2 emissions are influenced by the savings achieved through the implementation of hydroelectric power, energy consumption accounts for only 20% in the residential sectors of Malmoe and Stockholm, while district heating accounts for approximately 50-60%. If we attributed to both cities the European energy mix coefficient, Malmoe's residential emissions would sum up to 2.27 and Stockholm's to 1.80. These figures would still remain below those of all northern urban areas.

Aarhus itself, where 77% of the residential sector uses district heating, keeps emissions down at 2.47 tons, although showing a higher energy mix coefficient than that of many other European cities. On the other hand, as the data from Tampere – another Nordic city using a high quota of district heating (accounting for 35% of total energy consumption) – are not broken down by sector, it is not possible to identify the most energy saving sector in this case. However, total emissions (8,58 tons) are remarkably lower than in the two other Finnish cities[15].

[15] Only Haemeenlina, the fourth Finnish city, records a lower value (7.81 tons). It is however impossible to analyse this data, as it is only broken down by sector, and not by vector.

3.5 Indicator 3 – Local mobility and passenger transportation

3.5.1 Definition

Indicator 3 investigates and represents the mobility of citizens living within urban areas. The different aspects that contribute to defining the general mobility pattern of each citizen include:

a) the number of trips that, on average, each citizen makes during the day, where 'trip' indicates a displacement with a starting-point and a destination (number of daily trips per capita);

b) the reason for the trips and their regularity during the week, allowing for the trips to be classified as either 'systematic' or 'unsystematic'[16] (% of systematic trips compared with the unsystematic ones);

c) the average distance covered by each citizen during the day (km/per capita);

d) the time taken by each citizen for his/her trips (minutes taken for the trips);

e) modes of transport used for the trips and/or for the different distances associated with each trip (% relating to the different modes of transport considered);

f) analysis of trips taken by private car: kind of car park used, number of passengers transported and reason for the choice;

g) qualitative level of the systematic trips.

Headline indicator: Percentage of trips by private motorised transport.

3.5.2 Extent of participation and response

23 out of 42 respondents have sent data concerning indicator 3. Half the data were collected by means of surveys carried out in the last two years with the ECI methodology, while the other half was provided mainly by fairly recent surveys, carried out between 1997 and 2001, whose results have been adapted to the methodology. In particular, 20 of them allowed an estimation of the percentages relevant to the modes of transportation used, whereas 19 of them provided data relevant to the number of daily per capita trips, with quite different levels of detail. 13 urban areas have sent data on the average time spent on displacements and on the average distance covered; only 8 out of 13 have also indicated the modes and the reasons for the displacements. Finally, only Ferrara, Oslo, Reggio Emilia, Turku, and in part Provincia di Torino, have investigated more closely the trips made by private car.

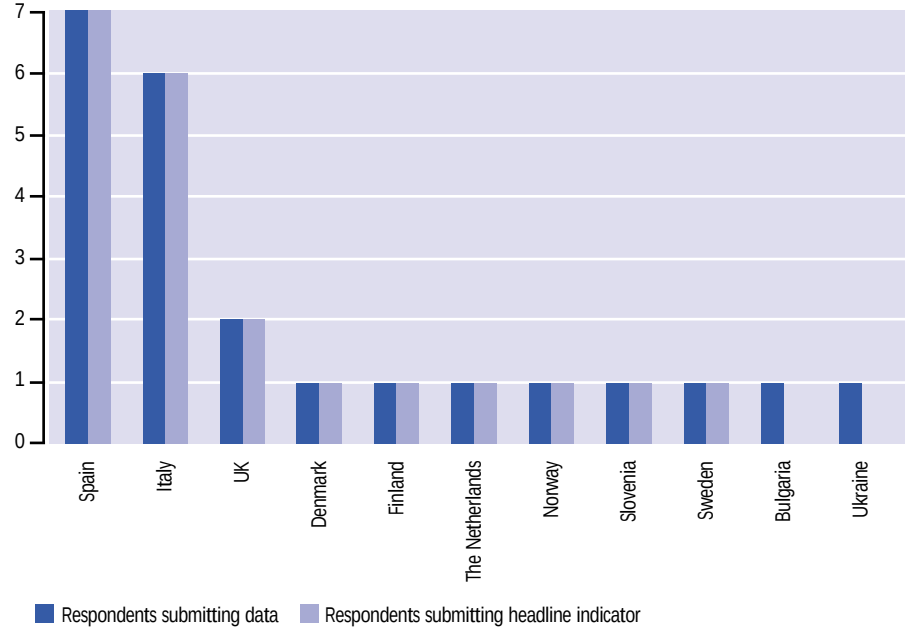
From an aggregate perspective, southern Europe records the highest number of respondents to have sent data (though answers are sometimes incomplete): 7 Spanish respondents out of 9 and 6 Italian respondents out of 12 answered to this indicator.

[16] "Systematic trips" are the daily displacements to/from work/school. "Non systematic" or "unsystematic" are the ones made for all other reasons, for example, to go shopping and for social or recreational reasons.

As for northern Europe, data have been sent from Sweden, Norway, Denmark, The Netherlands, Finland and the United Kingdom; each country records one respondent, with only the United Kingdom registering two respondents. The level of detail of the answers varies considerably. As far as the 3 eastern European respondents are concerned, Maribor is the only city recording values which can somehow be compared to other cities.

If we classify respondents according to population size, we notice that the indicator was populated mostly by large urban areas (as many as 10 respondents out of 13), though 4 of them (A Coruna, Zaragoza, Den Haag and Nikolaev) mainly provided aggregate data, only partially comparable to other cities. The level of participation of medium-sized cities was also quite good, 11 out of 18, of which 5 were Italian, while the only two small respondents are in eastern Europe (Blagoevgrad) and in southern Europe (Vilanova i la Geltrù) respectively.

Respondents per country - indicator 3



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3.5.3 General overview

Modal distribution

In order to make all the data sets comparable and to simplify data interpretation, the classifications related to the reasons for displacements and the means of transport used have been aggregated into new ones, reporting non-aggregated data only with respect to specific detailed analysis.

Reason for displacements:

- systematic displacements (school and work);
- unsystematic displacements (shopping, recreation and personal reasons).

Means of transport used:

- public motorised transport (taxi, collective and combined);
- private motorised transport (motorbikes and cars);
- non-motorised transport (walking and cycling).

The modal distribution of overall displacements clearly shows that Italian local authorities record the highest percentage related to the use of private cars. In Ancona, Ferrara, Nord Milano, Reggio Emilia, and Provincia di Torino[17] this data are more than 50%, as well as Bristol and Aarhus, where the latter reported data from a national survey reporting the average value for Danish local authorities. While in Ancona and Nord Milano the rest of the mobility mainly uses public transports, in the other four urban areas people prefer non-motorised transports in general, recording a considerable percentage of cycling in Ferrara (27%), Aarhus (18%) and Reggio Emilia (15%).

Cycling, bad weather conditions notwithstanding, is the most widely used means of transport in Den Haag (34%) and one of the most common in Malmoe (23%). This, coupled with one of the highest shares of public transport (almost 30%), make it possible for the two northern European cities to reduce the use of private cars down to a level that only Spanish urban areas can reach.

A preponderance of non-motorised trips, nearly all on foot, is recorded in Spain, where they represent over 40% of overall displacements; in particular, in Vitoria-Gasteiz and in A Coruna where they actually account for the absolute majority[18] of displacements. These two cities also record the lowest rate in public transport use (less than 10%).

[17] Overestimation may have occurred for Ancona, as data only refers to systematic trips. Moreover, it is important to highlight that the data sent by Parma, the only Italian city to show a percentage lower than 40%, refer to a survey based on a sample of women.
[18] Vitoria-Gasteiz shows the highest percentage of 'non systematic' trips (67%).

	Car	Motorbike	Public transport[19]	Cycling	Walking
Ancona	62.1%	5.7%	18.3%	0.1%	13.8%
Provincia Torino	56.7%		16.7%	26.7%	
Nord Milano	56.0%	3.5%	28.9%	2.0%	9.7%
Aarhus	55.7%	0.0%	13.8%	18.2%	12.4%
Bristol	54.9%	0.0%	13.4%	4.9%	26.8%
Reggio Emilia	53.9%	5.0%	11.5%	15.2%	14.5%
Ferrara	51.2%	4.9%	3.4%	27.6%	13.0%
Oslo[20]	48.7%	na	30.5%	1.0%	19.8%
Maribor	44.5%		18.5%	37.0%	
Birmingham	43.1%	0.3%	32.4%	1.1%	23.1%
Turku	41.3%	0.1%	16.2%	11.3%	31.2%
Pamplona	37.0%		19.6%	43.5%	
Parma	35.6%	3.0%	24.1%	21.1%	16.1%
Vilanova i la Geltrù	32.8%	6.3%	20.7%	1.2%	39.0%
Bizkaia	29.1%	0.4%	26.8%	0.1%	43.6%
Zaragoza	28%	na	na	na	na
A Coruna	27.6%	0.3%	6.9%	0.2%	64.9%
Malmoe	24.0%	1.1%	31.3%	23.2%	20.5%
Den Haag	23.0%	0.0%	31.0%	34.0%	11.8%
Barcelona	21.9%	4.8%	28.8%	0.3%	44.1%
Vitoria-Gasteiz	20.7%	0.5%	7.8%	1.4%	69.6%

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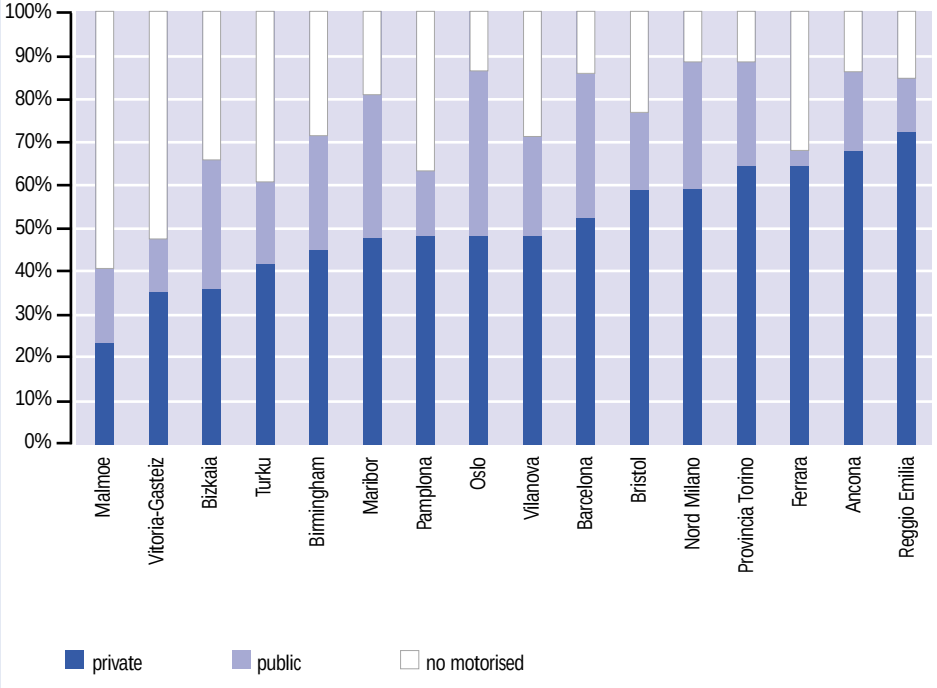
[19] Public transport comprises taxis and the collective and combined modes.

[20] Data for Oslo have been collected in winter; the figure of 1% cycling is strongly affected by the season, in fact the yearly average is 4% and in months April-October it raises up to 7%.

If systematic displacements (home-school and home-work) are considered separately, it may be noticed that trips by car increase on average by 10%, to the detriment of non-motorised displacements. Italian cities still rank first, together with Bristol, and percentages rise significantly in particular for Vilanova i la Geltrù and Barcelona (both of about 50%). Malmoe and Vitoria-Gasteiz, on the other hand, maintain the high aggregate values for non-motorised systematic displacements (still higher than 50%).

Oslo (38%) and Barcelona (34%) maintain a widespread use of public means of transport, which further affects systematic mobility. Maribor approximately reaches Barcelona's values, though the figure on overall displacements shows a definitely lower average weight for public transport. The urban area with the most uniform modal distribution is the Diputación Foral de Bizkaia, with approximately the same portion of trips for each mode.

Systematic trips, modal split (%)



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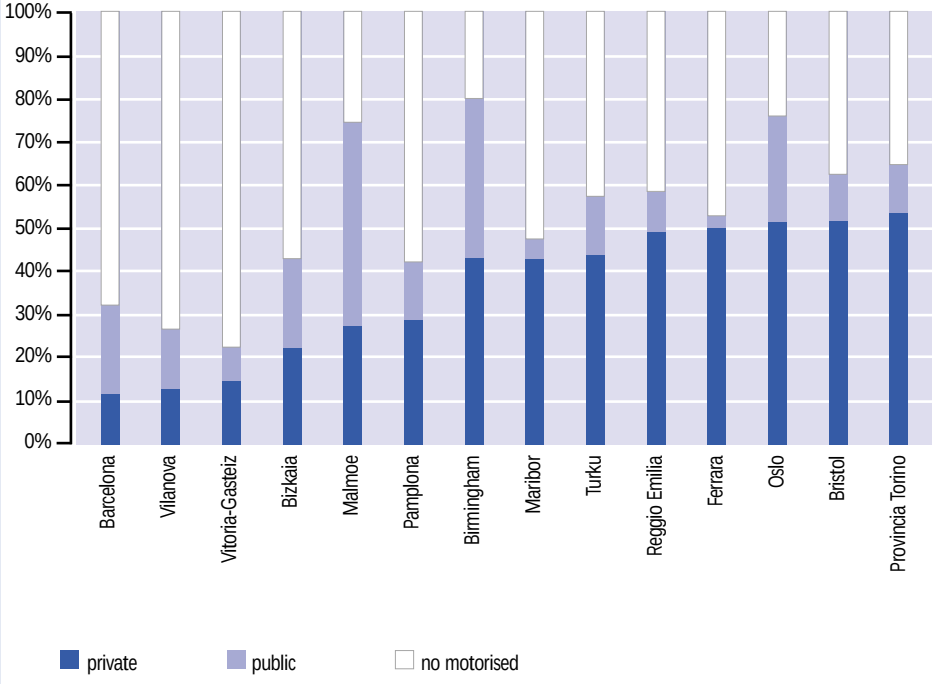
On the contrary, if we consider unsystematic mobility (recreation and shopping), displacements on foot and by bike show a significant average increase, from 37% up to 49%. In particular, rates of increase range from Oslo and Bristol's 20% to over 40% in Reggio Emilia and Maribor. In particular, all Spanish respondents - including cities such as Barcelona, Vilanova i la Geltrù and Pamplona, where systematic mobility shows the prevailing use of private cars - lie between 60% and 80%. Malmoe and Birmingham, where public transport records indeed far greater percentage, are in contrast with the general pattern.

Unsystematic trips, modal split (%)



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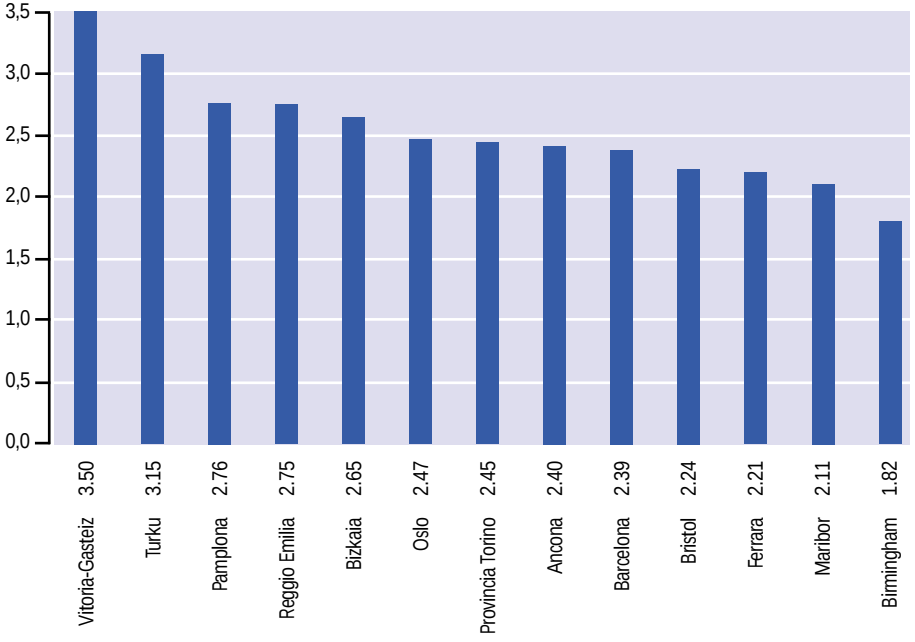
Per capita displacements

Only 13 respondents out of 23 estimated the total amount of daily per capita displacements, recording return trips separately as indicated by the methodology (except Birmingham). The figure regarding the amount of per capita displacements has therefore been considered from an aggregate perspective and only for those areas that provided complete data.

Number of per capita trips



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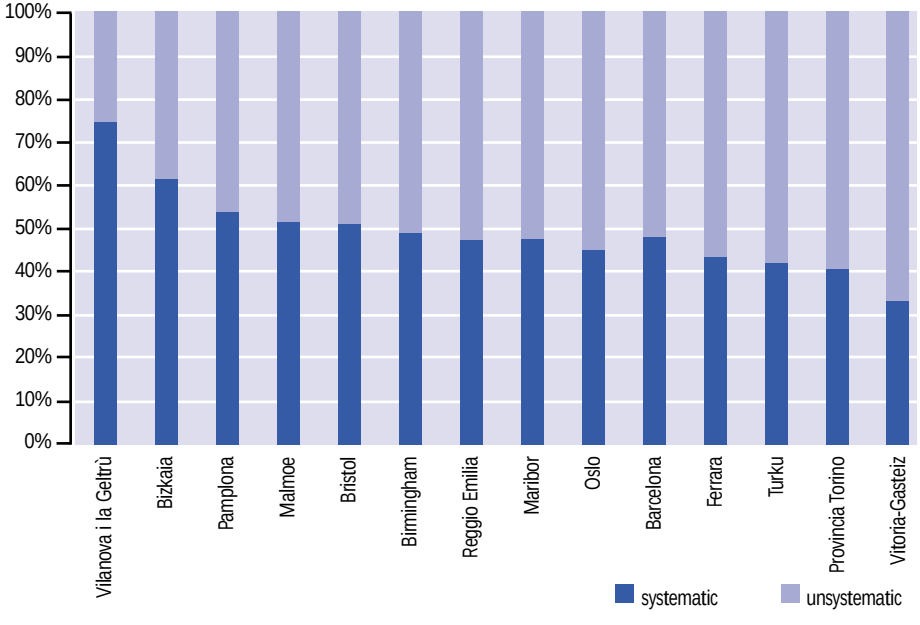
Vitoria-Gasteiz and Turku record the highest number of daily per capita trips (3.5 and 3.15 respectively), while the average value is 2.53. Both cities report some of the highest percentages of displacements for shopping or recreational purposes, mainly carried out on foot or by bike in Vitoria-Gasteiz, while Turku reports a higher component of motorised transport, both public and private. Except Birmingham (1.85)[21] and Maribor (2.11), the other respondents are distributed close to the median value, though they show different features. On the whole it seems that, geographical location notwithstanding, the number of displacements is higher in medium-sized cities, while large urban areas (Oslo, Barcelona, Bristol and Birmingham) all record a value lower than the average.

Systematic and unsystematic trips



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Furthermore, displacements appear fairly evenly distributed across systematic and unsystematic reasons in most municipalities, when compared directly. The figures for Vitoria-Gasteiz and for Provincia di Torino, where unsystematic displacements definitely prevail (67% and 60% respectively), probably reflect a consolidating European trend, while systematic trips (taken more for work reasons than for school reasons) are still preponderant in Vilanova i la Geltrù (70%) and in Diputación Foral de Bizkaia (61%). Of all the types of displacements, trips to/from work are still the most recurrent (32%), immediately followed by trips for leisure and for personal reasons in general (28%). School-age children mobility patterns are however investigated in indicator 6.

[21]Results may be influenced by the fact that Birmingham does not report return trips separately, using a methodology according to which "outward trips are recorded on the database and return trips generated automatically if exactly the same as the outward ones". Furthermore, if the return trip was different in any way from the outward one, each stage back to origin is counted as a separate journey. Similarly for outward trips: where journeys have more than one destination (e.g. taking children to school on the way to work), each destination is counted as a separate journey.

Time and distance

From a comparison of only those respondents that have sent all relevant data (number of displacements, time taken and distance covered), different 'models of mobility' emerge. In the first place, it should be borne in mind that discrepancies in the data on time spent and distance covered on trips may be explained not only in terms of speed of displacement, but also in terms of people's differing perceptions of the daily distances covered, especially as far as unsystematic trips are concerned.

	Number of trips	Average time (minutes)	Average distance (km)
Vitoria-Gasteiz	3.50	22.29	5.21
Turku	3.15	16.78	3.11
Pamplona	2.76	16.90	na
Reggio Emilia	2.75	11.79	4.25
Bizkaia	2.65	na	6.85
Oslo	2.47	28.20	12.00
Provincia Torino	2.45	27.50	na
Ancona	2.40	8.93	4.23
Barcelona	2.39	19.14	6.51
Zaragoza	2.32	na	2.23
Bristol	2.24	20.00	5.76
Ferrara	2.21	11.22	3.24
Maribor	2.11	25.07	7.04
Aarhus	1.96*	na	10.02
Birmingham	1.82	25.36	6.70
Parma	0.99	21.60	na
Vilanova i la Geltrù	0.96*	16.13	3.73
Blagoevgrad	na	7.25	1.39
Nord Milano	na	18.33	10.60

* return trips are not reported

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Among large urban areas, all reporting similar numbers of per capita displacements, Oslo records the longest time per trip (together with Provincia di Torino), especially due to definitely longer distances with respect to all other cities. Oslo is followed by Birmingham, Bristol and Barcelona, where trips similar in length and duration (about 6 km in 20-25 minutes) are carried out on completely different means of transport. In the two English cities, motorised transport clearly prevails (with Birmingham's rate of use double that of Bristol) while in Barcelona people mainly walk. A similar difference in habits (this time distances are about 3-4 km long) is even more evident if we compare the Italian cities of Ancona, Ferrara and Reggio Emilia – where the average length of trips by car is 10 minutes for most people – to Vila-

nova i la Geltrù and Turku, where non-motorised displacements are the most popular, even on 16 minutes trips. Of the small- to medium-sized cities with a 'reduced scale' mobility pattern (shorter and quicker displacements), Blagoevgrad is the one where displacements takes the shortest time, although it should not be forgotten that the distance covered is definitely shorter than in all other areas.

Looking more closely at the time dimension, it may be observed that in large urban areas as Birmingham, Oslo and Provincia di Torino, displacements by public means of transport take more than 40 minutes, while trips by private car take more than 10 minutes less. In general, even after considering the different distances covered, displacement by public transport is – or is perceived as – approximately 5-10 km/h slower than car displacements. Birmingham and Reggio Emilia represent an exception: they are the only two cities where trip time on public transport seems competitive with respect to private cars. It is also interesting to notice that, though they have similar performances, the rate of use of public transports in Reggio Emilia (11%) is equal to about one third of the English one. The other big city, Barcelona, is more similar to a medium-sized city, where trip time tends to be similar across the spectrum of means of transport and is never more than 30 minutes. Finally, it is interesting to mention the cases of Vitoria-Gasteiz and Parma[22], where people walk or ride bicycles even on 20-25 minutes long displacements.

	Walking (minutes)	Bike (minutes)	Motorcycle (minutes)	Car (minutes)	Collective (minutes)
Barcelona	15.57	17.88	15.79	23.24	26.21
Pamplona	15.18	na	na	15.80	22.56
Vilanova i la Geltrù	16.61	10.84	11.68	14.30	25.33
Vitoria-Gasteiz	22.04	23.37	23.11	21.95	21.22
Ancona	8.50	10.50	9.50	13.00	21.00
Ferrara	11.31	13.28	12.22	15.59	20.36
Parma	25.00	21.00	17.00	23.00	na
Reggio Emilia	10.12	11.92	12.35	19.04	19.25
Provincia Torino	15.54	na	26.04	na	41.50
Bristol	15.00	15.00	na	18.75	31.25
Birmingham	17.13	23.24	17.36	23.67	42.25
Oslo	18.10	47.00	na	27,50	33.40
Turku	14.65	14.21	12.30	15.59	25.80

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[22] Only women surveyed.

As far as distances covered are concerned, referring in particular to systematic displacements, small cities as Vilanova i la Geltrù and Turku record the shortest home-school and home-work trips. The gap between large and small to medium-sized urban areas still remains, also with regard to displacements for recreational reasons. On the other hand, the widespread commercial distribution tends to even out displacements for shopping purposes. In Reggio Emilia the length of unsystematic displacements is twice as short as in other areas, while in Birmingham people cover longer distances for recreational reasons than for trips to/from work or to/from school. Oslo remains the city where displacements are the longest.

	km school	km work	km recreation	km shopping
Vilanova i la Geltrù	3.4	4.3	3.6	3.5
Vitoria-Gasteiz	5.5	4.9	6.4	3.0
Ferrara	5.5	4.4	3.7	2.5
Reggio Emilia	6.0	5.5	3.0	2.6
Bristol	7.4	7.5	5.9	3.6
Birmingham	5.7	7.9	9.1	4.2
Oslo	6.4	14.8	11.1	14.8
Turku	3.5	2.9	3.0	2.9

Elaborated by Ambiente Italia on behalf of ECI

3.6 Indicator 4 – Availability of public open areas and services

3.6.1 Definition

Indicator 4 relates to the percentage of people living within 300 metres of a public open area or other basic services.

Public open areas are defined as:
- public parks, gardens or open spaces, for the exclusive use of pedestrians and cyclists, except green traffic islands or dividers, graveyards (unless the local authority recognises their recreational function or natural, historical or cultural importance);
- open-air sports facilities, accessible to the public free of charge;
- private areas (agricultural areas, private parks), accessible to the public free of charge.

To allow a more complete data analysis, the indicator must be calculated twice: firstly, relating to areas greater than 5,000 m^2, and secondly for all areas used by the public for leisure and open air activities, regardless of their size.

Basic services are defined as:
- primary public health services (general practitioners, hospitals, first-aid posts, family advice bureaux or other public centres supplying medical services, such as diagnosis or specialist examinations);
- collective transport routes that, at least for part of a normal business day, have a minimum frequency (half-hourly service);
- public schools (compulsory attendance schools + kindergartens);
- bakeries and greengroceries;
- recycling facilities or services for solid waste (including recycling bins).

Headline indicator: percentage of people living within 300 metres of a public open area greater than 5,000 m^2.

3.6.2 Extent of participation and response

Of the 42 respondents, 32 replied to indicator 4, but only 5 cities supplied all the data requested (Acqui Terme, Bristol, Ferrara, Haemeelinna and Modena), while the others sent incomplete information.

As far as the open areas are concerned, 21 cities sent data regarding the two sizes requested, while 8 supplied incomplete data (only relating to one of the two types of area) and the others did not supply any data relating to open spaces.

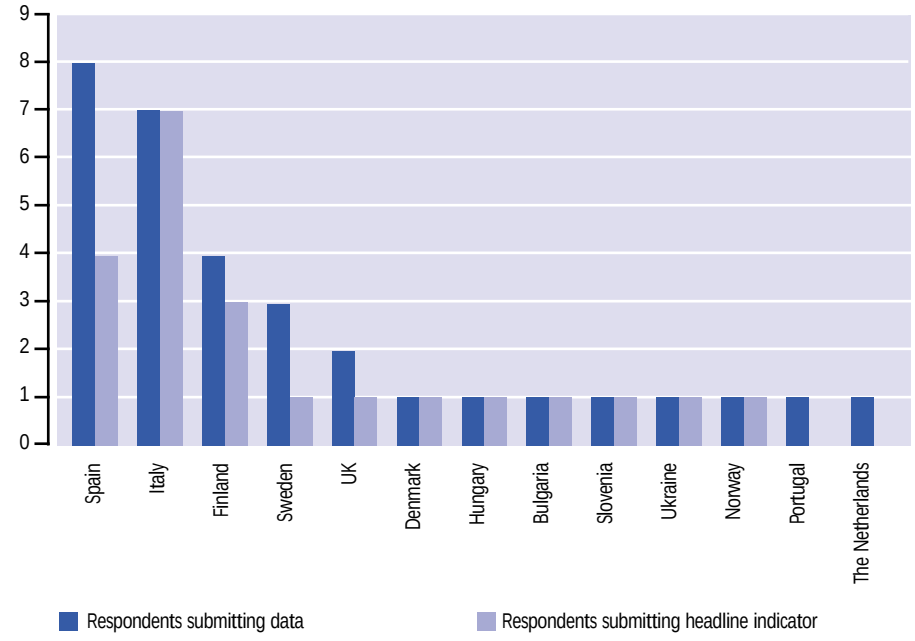
As far as accessibility to the various services is concerned, only 7 cities supplied all the data requested, while 3 did not supply any; the other cities supplied incomplete information.

The data regarding the school population living within 300 metres of a school are another matter; these data, in fact, were only supplied by 8 cities and this is probably due to the lack of information relating to the distribution of families with children attending compulsory schools.

Information sent by Lisboa and Den Haag have not been analysed because not comparable with the other ones, as they have been collected with different methodologies (in the case of Den Haag with a survey). The greatest quantity of data comes from southern European cities (16 respondents); this is followed by the data regarding cities in northern European countries (12), while 4 cities in eastern Europe supplied this information.

As far as size is concerned, medium-sized cities (between 100,000 and 350,000 inhabitants) are the most frequent, with 14 respondents (8 of which in southern Europe), followed by large ones (more than 350,000 inhabitants) with 12 respondents (4 of which are in southern Europe); the smaller cities (less than 100,000 inhabitants) are the ones for which there are fewer data, with only 6 respondents (2 of which are in eastern Europe).

Respondents per country - indicator 4



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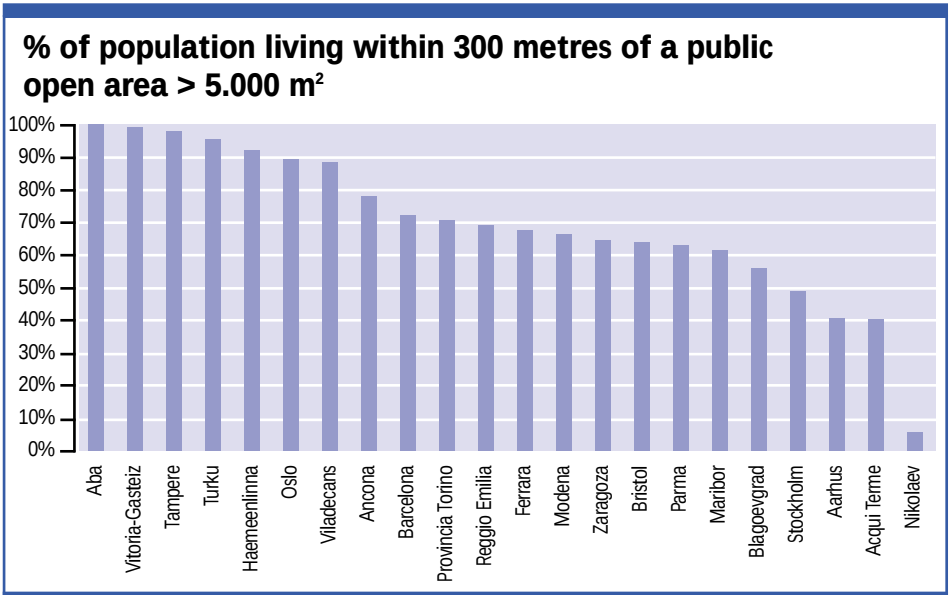
3.6.3 General overview

The data regarding the percentage of the population living within 300 metres of open areas over 5,000 m² in size - in other words, the main indicator - were supplied by 22 cities (4 in eastern Europe, 11 in southern Europe, 7 in northern Europe[23]), while those relating to open spaces of any size were supplied by 29 cities (4 in eastern Europe, 15 in southern Europe, 10 in northern Europe).

If the average of the results obtained from all the cities considered is calculated, it will be seen that 69% of the population of these 22 cities lives within 300 metres of a public open area of more than 5,000 m² and that 78% lives within the same distance of an open area in general, whatever size this may be.

In fact, in the majority of them (18 out of 22) more than half the population has easy access to an open area of more than 5.000 m² and in 10 of them this percentage exceeds 70% (98% in Tampere, 99% in Vitoria-Gasteiz and 100% in Aba).

Obviously, there is greater accessibility to public open areas of any size[24].



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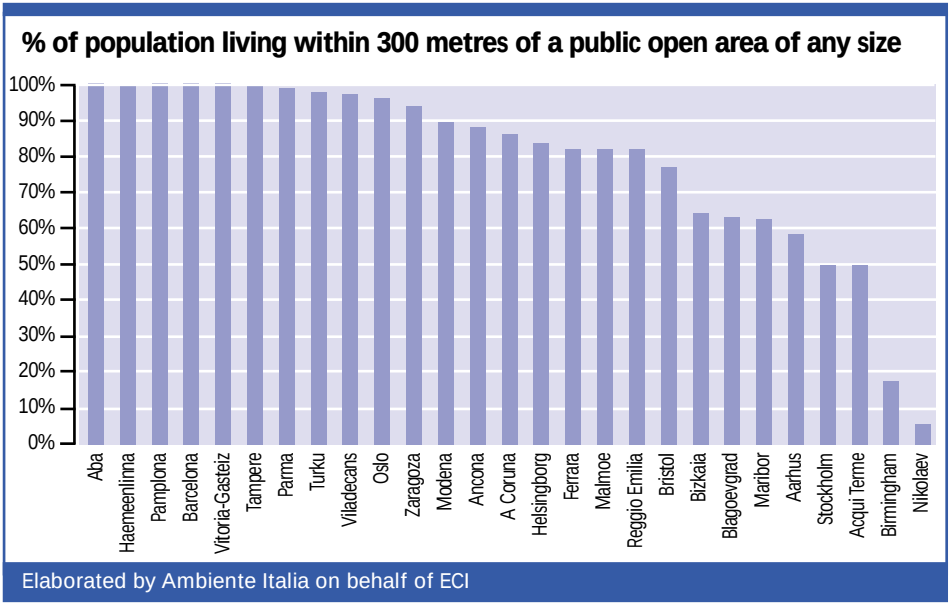
Of the 28 cities that have supplied these data, in two-thirds the percentage of the population having easy access to these areas is over 80%, while in more than a third it is over 90% (97% in Viladecans and Turku, 98% in Parma, 99% in Tampere and 100% in Aba, Barcelona Haemeenlinna, Pamplona and Vitoria-Gasteiz). Data submitted by Burgos (figure of 95%) has not been considered because not obtained using a Geographical Information System.

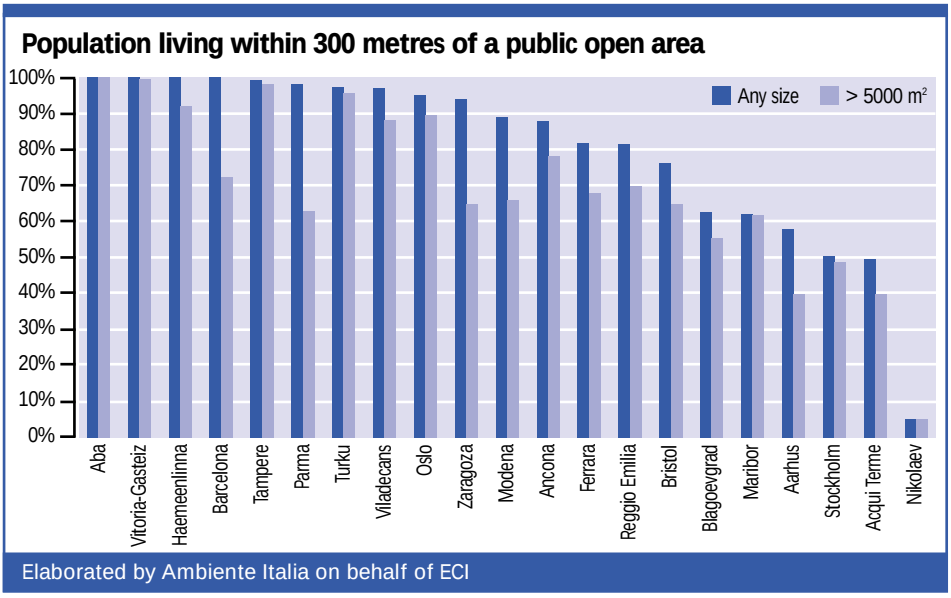
[23] Please note that data regarding Oslo refers to population living within 300 metres of open areas over 10,000 m².

[24] Some cities, such as Barcelona, have expressed the need for further refinement of this indicator, particularly regarding the choice of considering public open areas of any size because "it does not discriminate between cities due to most municipalities have public open areas of any size in a distance of 300 metres, whereas in the category of areas larger than 5000 m² the percentages go down notably; the latter indicator is in this sense more ambitious and informative".

To sum up, out of a total of 28 cities, 100% of the population in 5 cities, over 95% in 9 cities, more than 75% in 19 cities and more than 50% in 24 cities has easy access to public open areas. The lowest levels are to be found in Birmingham (17%) and Nikolaev (5%).



The following graph relates only to the cities that have supplied both types of data.

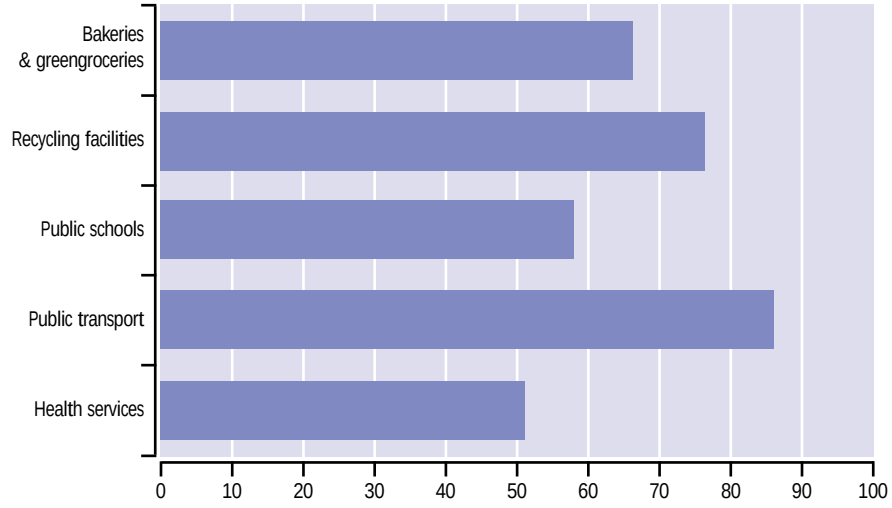


If, on the other hand, an analysis is made of the average situation in the cities that have allowed the calculation of the indicator with regard to the various basic services considered, low levels of accessibility to social and health services and to public schools will be noted; in the first case, in fact, the average percentage of the population living within 300 metres is just over 50%, while, in the second case, it is below 60%.

But, while the data relating to the schools need to be analysed more completely with reference to the distribution of school population (although requested, these data were supplied by very few cities), information regarding the distribution of social and health services is of critical importance, especially in view of the variety of services that have been taken into consideration (general practitioners, hospitals, first-aid posts, family advice bureaux or other public centres supplying medical services, such as diagnosis or specialist examinations).

It is interesting to note the relatively high level of the accessibility to recycling facilities or services for solid waste (including recycling bins); in fact, since this type of service has only recently been provided in many cities and the legislation regarding it varies a great deal in different countries, an average level over 75% is considered to be a good result, although it is necessary to analyse the individual situations for a more detailed evaluation.

Average percentage of population living within 300 metres of various basic services



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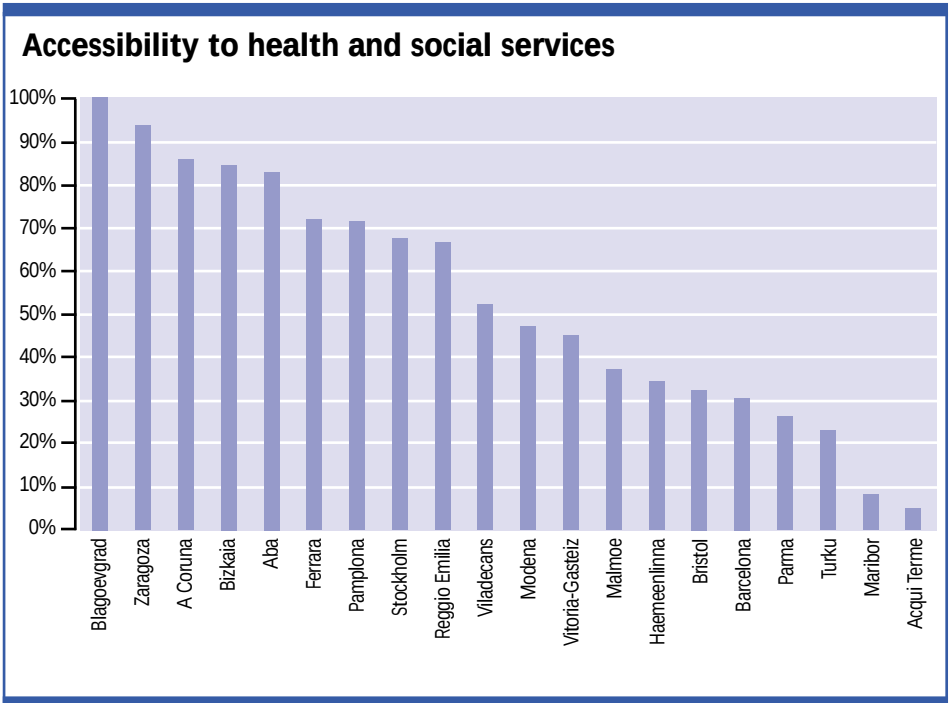
Accessibility to social and health services

Information regarding the percentage of the population living within 300 metres of a social or basic public health service (general practitioners, hospitals, first-aid posts, family advice bureaux, ...) was supplied by 20 cities (3 in eastern Europe, 12 in southern Europe, 5 in northern Europe).

The analysis of these data shows the excellent results obtained by the two small cities in eastern Europe, which both have percentages of the population over 80%; Blagoevgrad even reaches the maximum level with 100% of the population living within 300 metres of a service of this type.

The highest levels have been obtained by cities with similar characteristics: they are cities in southern European countries, mainly Spain, two of which are large, and one, Diputación Foral de Bizkaia, which has the average data regarding small cities. They are followed by the levels obtained by medium-sized cities, also in southern Europe (Ferrara and Pamplona).

It is, however, more difficult to identify characteristics common to the cities having a low level of accessibility to these services; percentages below 30% are found in 2 cities in southern Europe (1 small and 1 medium-sized), in 1 in northern Europe (medium-sized) and in a medium-sized city in eastern Europe.



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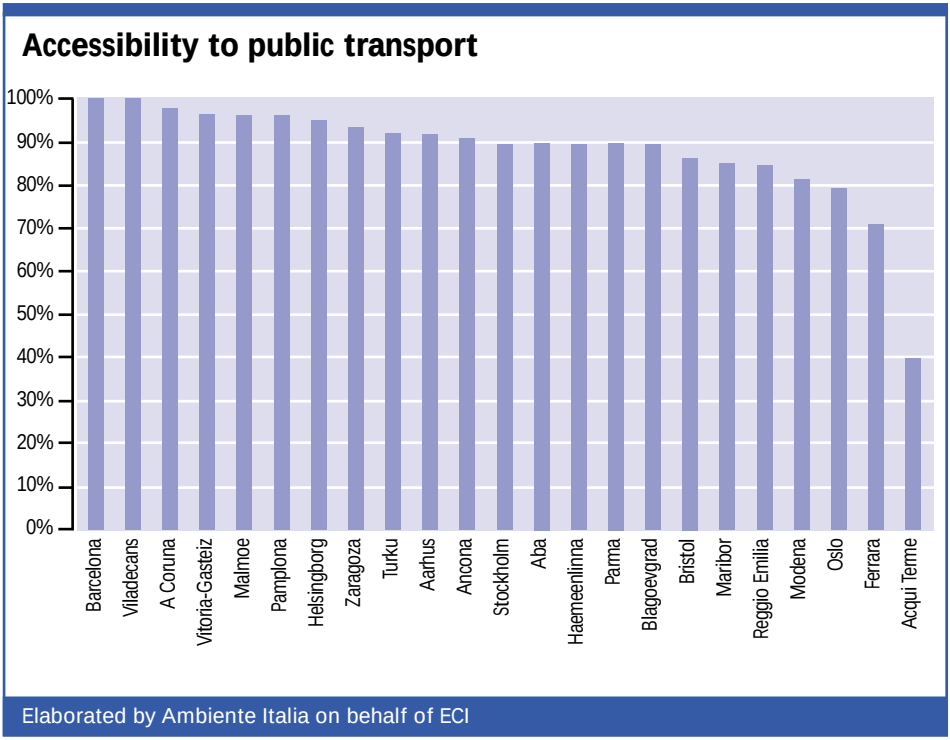
Accessibility to public transport

The data relating to accessibility to public transport show that the services are very well developed in all the cities participating in this stage of the survey.

In almost all the 23 cities that have sent data (3 in eastern Europe, 12 in southern Europe, 8 in northern Europe) - that is, in 20 of them - more than 80% of the population lives within less than 300 metres of a stop served every 30 minutes on normal working days, and in 15 of these cities the percentage is equal or over 90%.

The only data differing from this regard a small Italian city, Acqui Terme, where only 40% of the inhabitants live within 300 metres of a public transport stop.

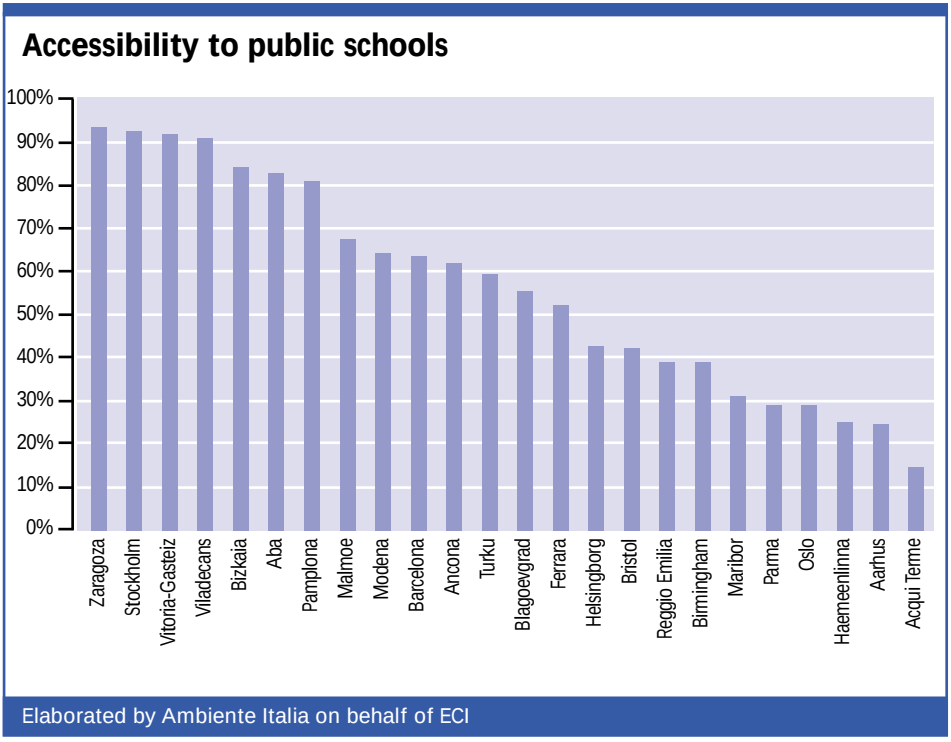


Accessibility to public schools

Data regarding the distance of the homes from public schools were sent by 24 cities (3 in eastern Europe, 12 in southern Europe, 9 in northern Europe).

It is interesting to note that of the 7 cities where over 80% of the population lives within 300 metres of the schools, the majority are located in southern European countries (5 cities in southern Europe and only 1 in eastern Europe and 1 in northern Europe); on the basis of the data available, this distribution does not seem to depend on the size of the city.

It should be noted, however, that, with the exception of Stockholm, which has the second best figure (92%), all the other large cities in northern Europe have fairly low percentages (all less than 50%).

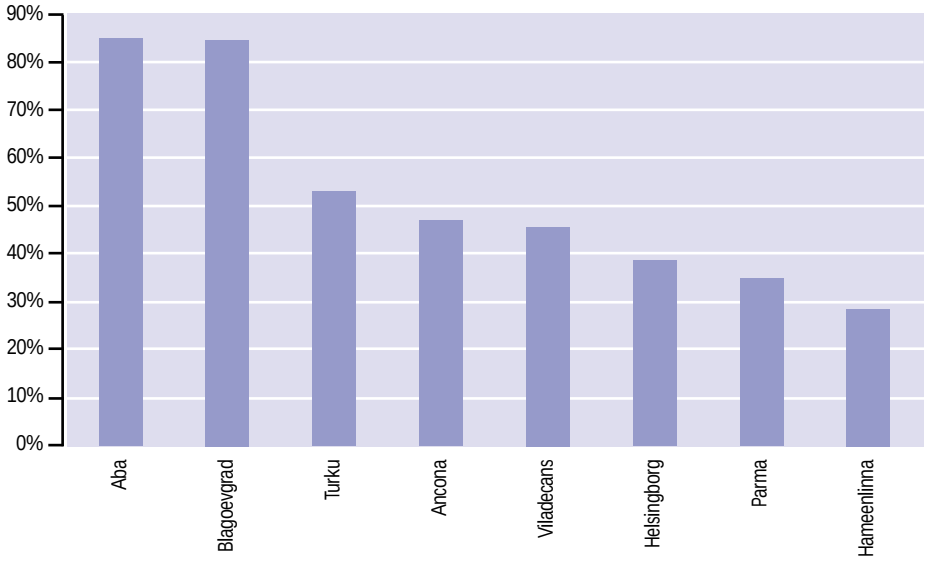


Few data have been received regarding the accessibility of public schools calculated on the basis of the school population instead of the total population.

Of the 8 cities supplying this information, only in the two in eastern European countries - Aba and Blagoevgrad, both of them small - does a high percentage of the school population live within 300 metres of a compulsory school (respectively 85% and 84%).

The other cities have lower percentages: Turku, 53%; Ancona, 47%; Viladecans, 46%; Helsingbor, 39%; Parma, 35%; and Haemeenlinna, 28%.

Accessibility of school population to public schools



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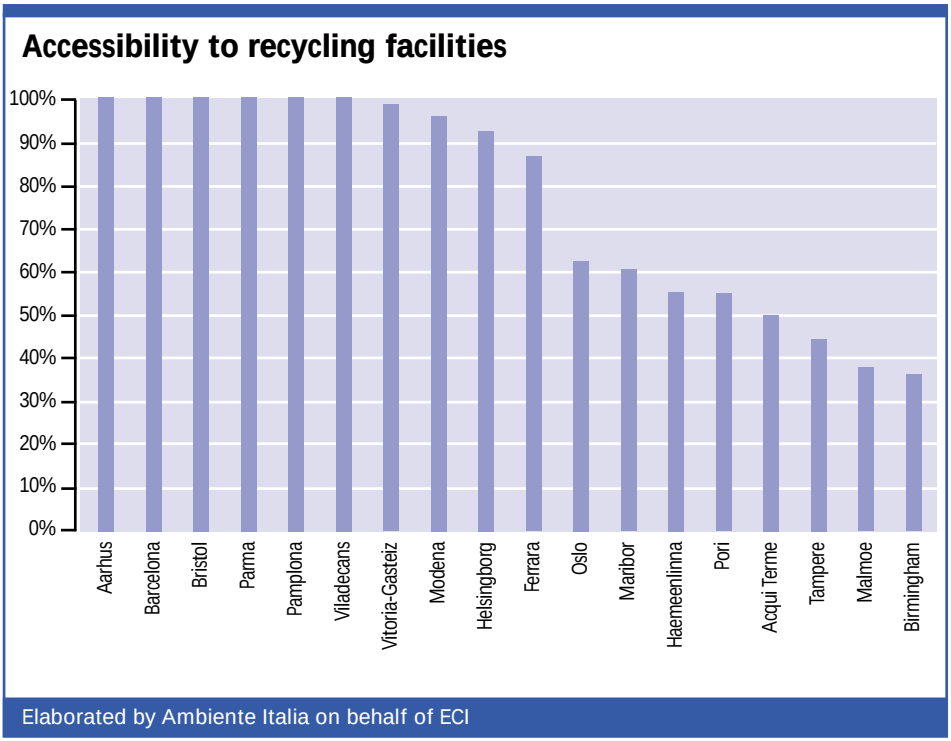
Accessibility to the recycling facilities or services for solid waste (including recycling bins)
As far as the distribution of recycling facilities or services for solid waste is concerned in relation to the distribution of the population, the 18 cities that have sent data (1 in eastern Europe, 8 in southern Europe, 9 in northern Europe) may be divided into three main groups.

The first group comprises 10 cities in which more than 80% of the inhabitants has easy access to these facilities. With the exception of Viladecans, these are medium-sized and large cities, and they are mainly located in southern European countries: in fact, in this group, only two cities (Aarhus and Helsingborg) are in northern Europe.

There is then an intermediate group in which the percentage of the population living within 300 metres of these facilities is between 62% and 50%. It comprises four cities of different sizes, three small, one medium-sized and one large, three of which are in northern, one in southern and one in eastern Europe.

Lastly, the worst figures, with less than 50% of the population having access to recycling facilities or services for solid waste, regard 3 cities (1 large and 2 medium-sized), all located in northern European countries.

In the future it might be worth gathering data regarding the quantity of waste collected separately in order to find out whether there is a relationship between this data and the accessibility of the recycling facilities or services for solid waste.



Accessibility to bakeries and greengroceries

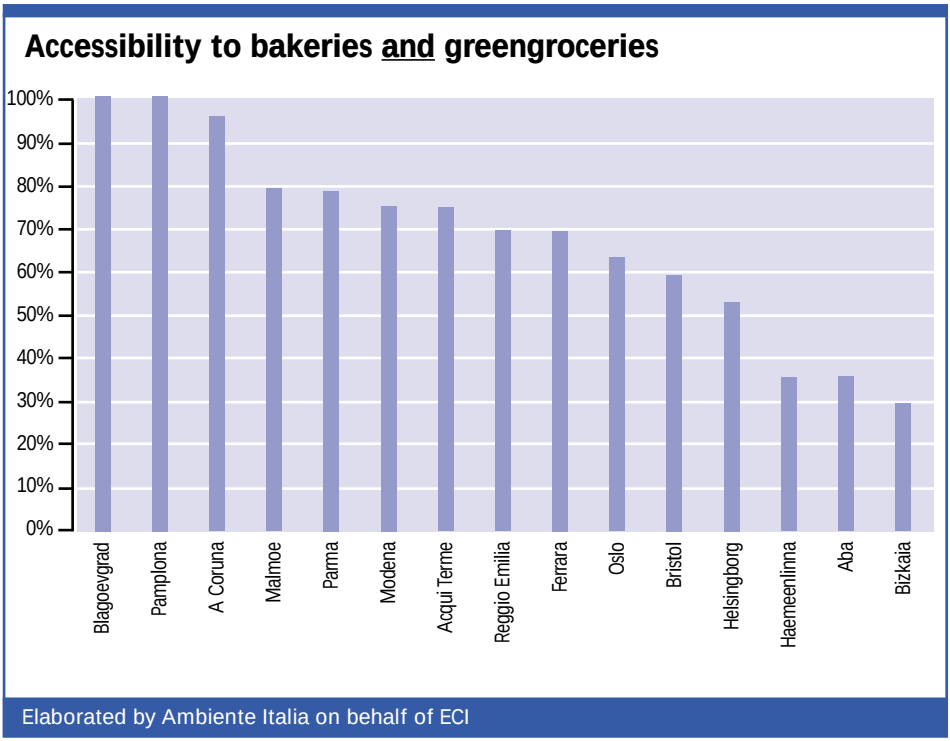
The analysis of the data regarding accessibility to bakeries and greengroceries supplied by 15 cities (2 in eastern Europe, 8 in southern Europe, 5 in northern Europe) shows considerable variations in the results obtained.

There are, in fact, cities where the whole population lives less than 300 metres from both these types of shop (Blagoevgrad and Pamplona) and urban areas where less than 30% of the population has easy access to these services (Diputación Foral de Bizkaia).

It does not seem that the size of the city being considered has a significant influence on the data. Probably the distribution of this type of shop depends more on the rules of the market economy and entrepreneurship than on planning related to the size of the city.

It should be noted, however, that the three municipalities that have the lowest percentages, although in three different geographical areas, all relate to small urban areas: Haemeenlinna, Aba and Diputación Foral de Bizkaia (which has supplied the average figures for a group of small villages, and this should be taken into consideration in the analysis of this indicator).

However, there seems to be a clear difference between cities in southern European countries and cities in northern European ones. The latter, in fact, with the exception of Malmoe, have the lowest figures, while the cities of southern Europe, apart from Diputación Foral de Bizkaia which has the lowest figure, have percentages of over 70%.



Elaborated by Ambiente Italia on behalf of ECI

The following table summarises all the data sent by the various cities.

	Social and health services	Public transport	Public schools	Public schools (% of school population)	Recycling facilities	Bakeries and greengroceries
A Coruna	86%	98%	na	na	na	95%
Aarhus	na	92%	24%	na	100%	na
Aba	83%	90%	83%	85%	na	35%
Acqui Terme	5%	40%	15%	na	50%	75%
Ancona	na	90%	62%	47%	na	na
Barcelona	30%	100%	64%	na	100%	na
Birmingham	na	na	39%	na	36%	na
Bizkaia	84%	na	84%	na	na	29%
Blagoevgrad	100%	89%	55%	84%	na	100%
Bristol	32%	86%	42%	na	100%	60%
Burgos	na	na	na	na	na	na
Ferrara	72%	71%	52%	na	87%	70%
Haemeenlinna	34%	90%	25%	28%	55%	36%
Helsingborg	1%	95%	43%	39%	93%	53%
Malmoe	37%	96%	68%	na	37%	80%
Maribor	8%	85%	31%	na	60%	na
Modena	47%	81%	64%	na	96%	75%
Nikolaev	na	na	na	na	na	na
Oslo	na	79%	29%	na	62%	63%
Pamplona	71%	95%	81%	na	100%	100%
Parma	26%	90%	29%	35%	100%	78%
Pori	na	na	na	na	55%	na
Provincia Torino	na	na	na	na	na	na
Reggio Emilia	66%	84%	39%	na	na	70%
Stockholm	68%	90%	92%	na	na	na
Tampere	na	na	na	na	44%	na
Turku	23%	92%	60%	53%	na	na
Viladecans	52%	100%	90%	46%	100%	na
Vitoria-Gasteiz	45%	96%	92%	na	99%	na
Zaragoza	93%	93%	93%	na	na	na

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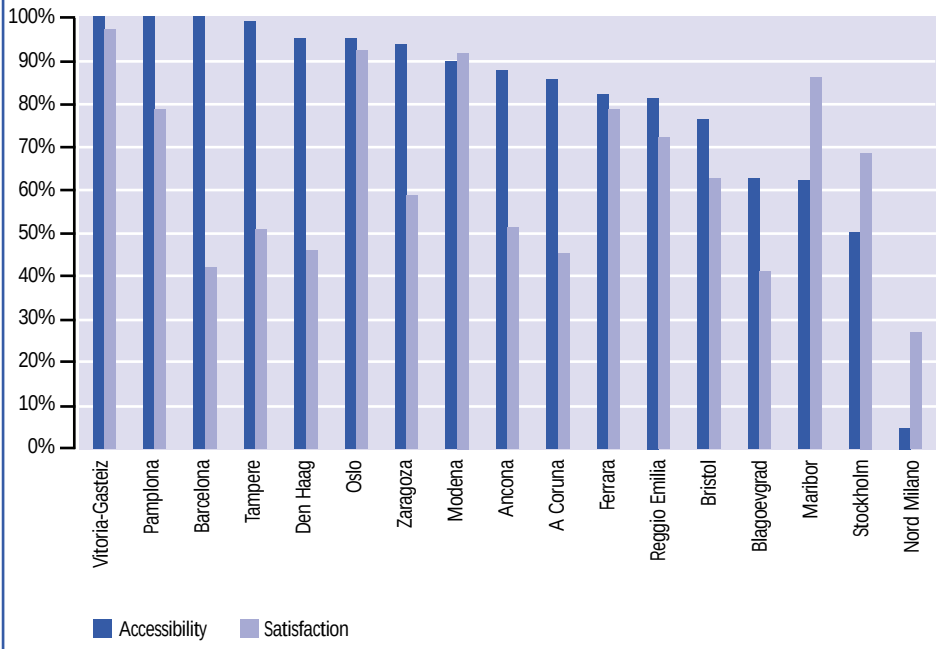
3.6.4 Comparison between the results of the indicators 1 (level of satisfaction) and 4 (accessibility)

The comparative analysis of the results obtained in the surveys of citizens' satisfaction with certain characteristics and those regarding accessibility to the place and the service being considered (defined as the shortest distance from the home, or at the most 300 metres) is highlighted in the following graphs. In fact they highlight that for social and health services and public schools it is not only the availability - that is, the presence and accessibility - that helps to determine satisfaction, but that an important role is also played by the quality of the place or service in question or by other factors influencing the way in which it is perceived.

On the contrary, the graphs show a more direct relationship (except for specific cases) between availability and satisfaction in the case of public transport and public open areas.

Public open areas

Accessibility of public open areas and citizens' satisfaction with the natural environment



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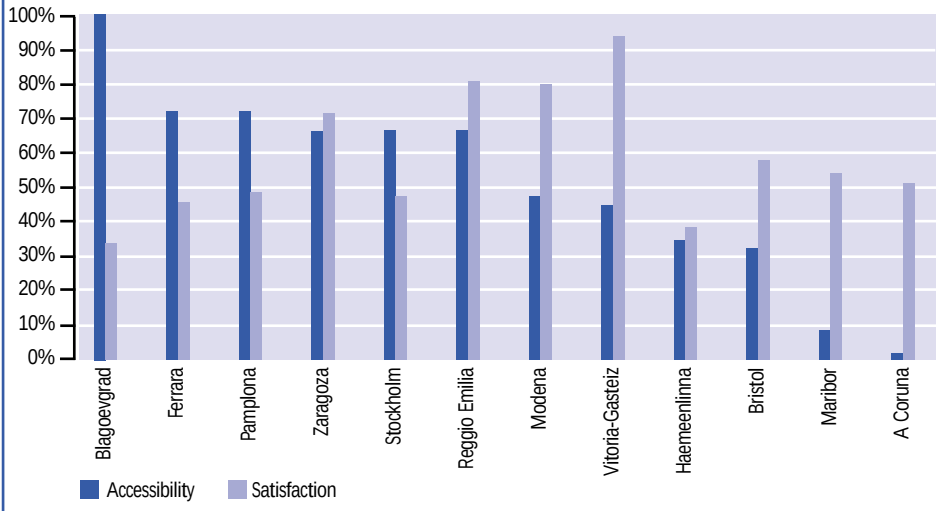
Social and health services

Accessibility to health and social services and relevant citizens' satisfaction



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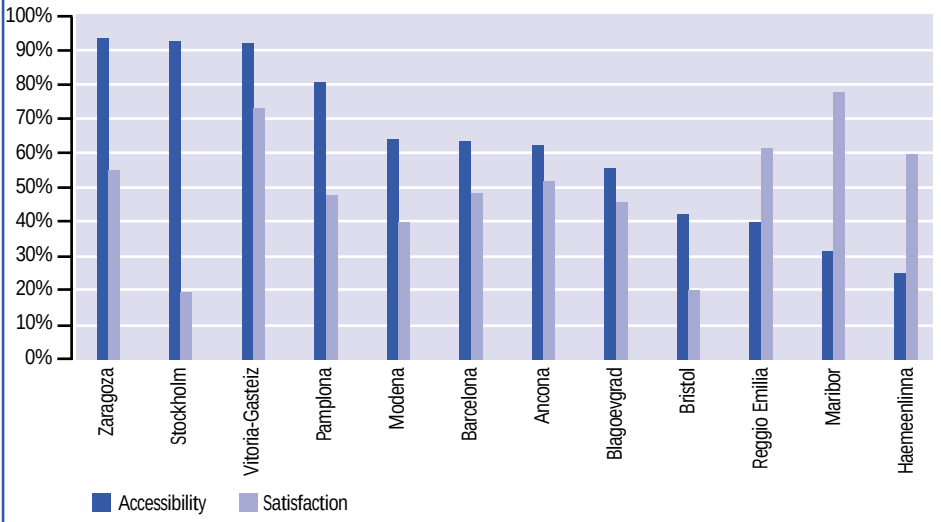
Public schools

Accessibility to public schools and relevant citizens' satisfaction



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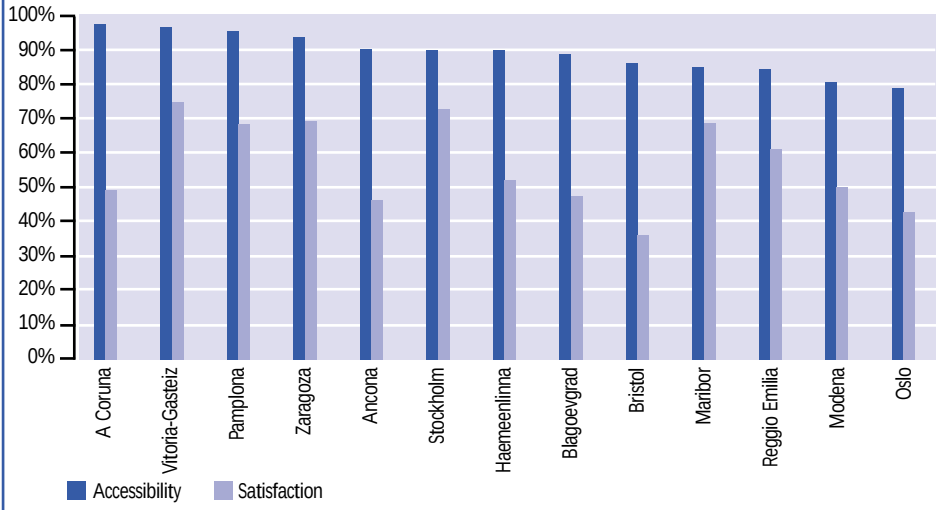
Public transport

Accessibility to public transport and relevant citizens' satisfaction



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3.7 Indicator 5 – Quality of the air

3.7.1 Definition

Indicator 5 analyses the "quality of the ambient air", as it is defined by the Community Framework Directive on the Quality of the Ambient Air (96/62/EC) and subsequent "daughter directives", in order to avoid, prevent or reduce the negative repercussions on people's health and the environment taken as a whole. For the calculation of the indicator 5 the following parameters have been taken into consideration:

- the number of times the limit value is exceeded for the following air pollutants: sulphur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter (PM_{10}), carbon monoxide (CO) and ozone (O_3);
- the existence and level of implementation of the plan for the improvement/ management of the quality of the air.

The limit values considered are those fixed by the directives (for each pollutant, they define specific limit values or objectives to be achieved by 2005/2010).

European directives 1999/30/EC, 2000/69/EC and 2002/3/EC[25]

Pollutant	Average period	Air quality standards and objectives	Date by which limit value is to be attained	Data: minimum capture of measurement and uncertainty	Legal status
SO_2	24 hours	125 µg/m^3 not to be exceeded more than 3 times a year (concentration equivalent to WHO guide value)	1st January 2005	90% 15%	1
NO_2	1 hour	200 µg/m^3 not to be exceeded more than 18 times a calendar year (concentration equivalent to WHO guide value)	1st January 2010	90% 15%	1
PM_{10}	24 hours	50 µg/m^3 not to be exceeded more than 35 times a calendar year	1st January 2005	90% 25%	1

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[25] Considering only the pollutants for which limit values are fixed for daily, 8-hour periods or hourly concentration.

European directives 1999/30/EC, 2000/69/EC and 2002/3/EC

Pollutant	Average period	Air quality standards and objectives	Date by which limit value is to be attained	Data: minimum capture of measurement and uncertainty	Legal status
CO	max daily 8-hour mean concentration	10 mg/m^3 (concentration equivalent to WHO guide value)	1st January 2005	90% 15%	2
Ozone[26]	max daily 8-hour mean concentration	120 µg/m^3 not to be exceeded more than 25 days per calendar year (concentration equivalent to WHO guide value)	2010	90% (summer) 75% (winter) 15%	3

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Thus by "number of times the limit is exceeded" is meant the number of times the limit value is exceeded for each pollutant selected, minus the number of times permitted by the daughter directives of Directive 96/62/EC (i.e. the net figure). This number is calculated according to the reference period established by the directive: daily, 8 hours and hourly according to the different parameters. When the number of times the limit is exceeded is less than that permitted by the directive, it is considered to be equal to zero.

Headline indicator: the number of times the limit of PM_{10} permitted by the directive is exceeded.

3.7.2 Extent of participation and response

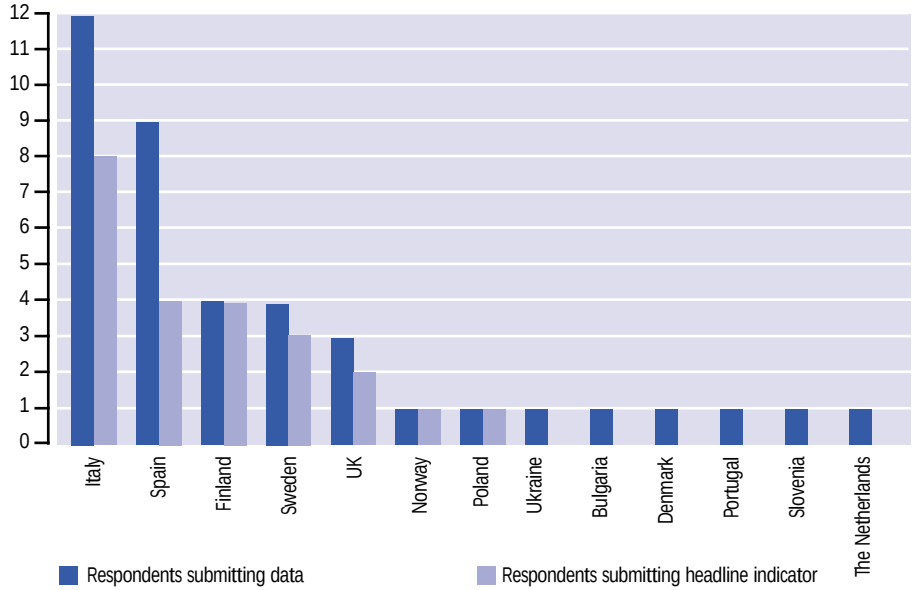
The indicator on the quality of ambient air is the one that received the largest number of replies: 40 participants (95% of the total respondents) sent data or comments relating to this question. Of these 40, no less than 35 supplied comparative data referring to at least 1 of 5 of the selected pollutants. Aarhus, Burgos, Lambeth, Lisboa and Vilanova i la Geltrù supplied data not comparable with that of the other cities, generally because they refer to the limits fixed by national laws or because they were produced with monitoring systems not consistent with the European standards; in other cases, even though data supplied were referred to national limit values, it has been possible to calculate exceedances of European limits because the latter were less strict than the former: this is the case of Nikolaev and Den Haag.

The majority of the data relate to 2001, although Acqui Terme and Ancona were able to process the data for 2002; the data for Barcelona, Diputación Foral de Bizkaia, Den Haag, Maribor, Nord Milano, Pamplona and Vitoria-Gasteiz, however, relate to 2000. Lastly, it should also be noted that some cities did not indicate the year when the data were gathered.

Of the 40 respondents, 23 monitored at least 4 pollutants and 19 all five of them. The main indicator was used by 23 local authorities (58% of the respondents).

[26] For ozone, it is foreseen that there will be a target value rather than a limit value.

Respondents per country - indicator 5



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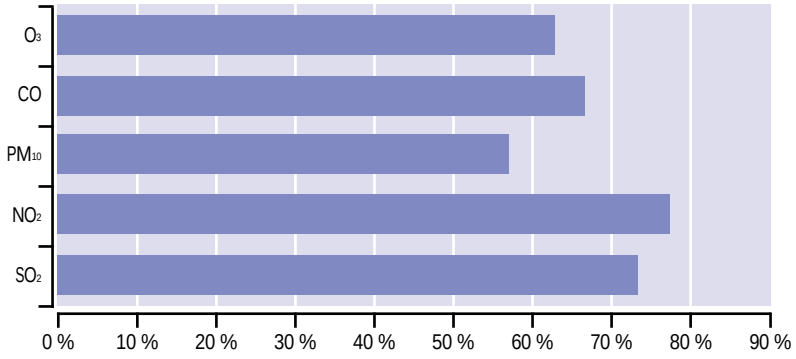
If the number of respondents that have sent sufficient data for at least four pollutants is analysed, it will be noted that 62% are located in northern Europe, 64% in southern Europe and one only (Gdansk) in eastern Europe. The capacity to respond decreases progressively with the decrease in size of the city (62% of the largest local authorities responded, as against 40% of the small ones).

Available data



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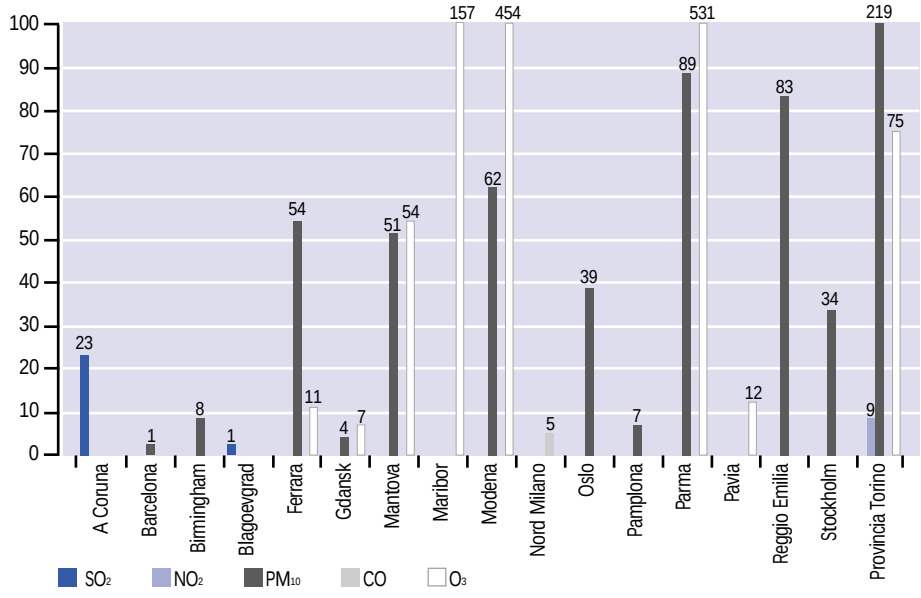
The highest percentage of data available - and effectively comparable - refers to NO_2 (nitrogen dioxide, 78%), followed by SO_2 (sulphur dioxide, 75%) and CO (carbon monoxide, 65%). The lowest percentages regard the urban pollutants that, as we shall see later, are most problematic: ozone (O_3), with regard to which 63% of the respondents supplied data, and particulate matter (PM_{10}), for which only 58% supplied data.

3.7.3 General overview

Only in four areas were the net limits for SO_2 and NO_2 exceeded. A Coruna exceeded the limit of 125 µg/m³ per day for SO_2 23 times more than the 3 allowed, Blagoevgrad once. In the Provincia di Torino, the concentration per hour of 200 µg/m³ of NO_2 was exceeded 9 times more than the 18 allowed in the directive. The area of Nord Milano is the only one where the CO limit value of 10 mg/m³ was exceeded (5 times).

Exceedances of limit values for each pollutant



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As may be seen in the above graph, the situation regarding ozone and particulate matter is much more serious, as the limits were exceeded in, respectively, 8 and 12 of the situations monitored.

PM_{10} emerges as the most serious urban pollutant: 12 of the 23 local authorities with data available exceeded the net limit values relating to the daily mean of 50 µg/m³. The Provincia di Torino has by far the highest value (219 times), followed by Parma (89 times), Reggio Emilia (83 times) and Modena (62 times). Of the 12 cities that exceeded the limits, the 6 with the highest values are all Italian (6 out of the 8 Italian cities that supplied data). Of the remaining cities, 4 are in northern Europe and 2 in Spain, but all exceeded the limit less than 10 times, except Stockholm, which exceeded it 34 times.

Bearing in mind that the limits for PM_{10} will become mandatory on 1st January 2005, these figures are a cause for concern. This is even more evident if the trends for the cities that sent data for the previous years are compared: while the cities of northern Europe appear to be progressively approaching the permitted limits (for example, the figure for Oslo has fallen from 17 to 4 times), the Italian cities are still far above the limits (the figure for the Provincia di Torino has fallen, but only from 229 to 219).

If the data are analysed with regard to the size of the urban areas, it emerges that the number of times the limit for PM_{10} has been exceeded mainly concerns the large areas (6) and medium-sized ones (5). Of the small cities, only Mantova has problems with this pollutant.

With regard to ozone, of the 25 areas supplying valid data concerning this pollutant, 8 exceed the value of 120 $\mu g/m^3$ more than the 25 times permitted. The most critical situations appear to be those of Parma (531 times), Modena (454) and Maribor (157) and, more generally, in this case too, those of the Italian cities as a whole (6 of the 9 Italian cities that supplied data).

The cities that exceeded the limits for ozone concentration are: 2 large, 4 medium-sized and 2 small. Lastly, it should be pointed out that, of the 19 cities that supplied homogeneous data for all 5 of the pollutants, 8 are ones that have not recorded values over the limits. Of these 8, 6 are in northern

City	SO_2	NO_2	PM_{10}	CO	O_3
A Coruna	23	0	na	na	na
Acqui Terme	na	na	na	na	0
Ancona	na	0	0	0	0
Barcelona	0	0	1	0	0
Birmingham	0	0	8	na	na
Bizkaia	0	0	na	0	0
Blagoevgrad	1	0	na	na	na
Bristol	0	0	0	0	0
Catania	0	0	0	0	0
Den Haag	na	0	na	0	na
Ferrara	0	0	54	0	11
Gdansk	0	0	4	0	7
Haemeenlinna	0	0	0	0	0
Helsingborg	0	0	0	na	a
Malmoe	0	0	0	0	0
Mantova	0	0	51	0	54

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City	SO_2	NO_2	PM_{10}	CO	O_3
Maribor	0	0	na	na	157
Modena	0	0	62	0	454
Nikolaev	0	na	na	na	na
Nord Milano	na	0	na	5	na
Oslo	0	0	4	0	0
Pamplona	0	0	7	0	0
Parma	0	0	89	0	531
Pavia	0	0	na	0	12
Pori	0	0	0	0	0
Provincia Torino	0	9	219	0	75
Reggio Emilia	0	0	83	0	na
Stockholm	0	0	34	0	0
Tampere	0	0	0	0	0
Turku	0	0	0	0	0
Vaxjo	0	0	na	na	0
Verbania	na	na	na	0	na
Viladecans	0	na	0	na	na
Vitoria-Gasteiz	0	0	na	0	0
Zaragoza	0	0	0	0	0

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Europe, the other 2 (Catania and Zaragoza) in southern Europe. Particularly notable among these 19 urban areas is the Provincia di Torino, where the limit of 3 different pollutants was exceeded, although there was an improvement on the previous year because the limit for nitrogen dioxide was no longer exceeded.

A complementary indicator regards the existence and level of implementation (%) of a plan/programme for the management of air quality.

Among the respondents that supplied these data there are 11 urban areas that have a plan for the management of air quality and 15 that have not yet adopted one (14 did not reply). Rather than a plan as such, some of these local authorities have, in fact, adopted a number of measures forming part of administrative tools. None specified the extent to which these measures have been implemented, if any.

3.8 Indicator 6 – Children's journeys to and from school

3.8.1 Definition

Indicator 6 reports the % of children travelling between home and school by the following modes of transport:

- walking;
- cycling;
- collective transport[27];
- private car[28];
- other.

The indicator must be determined with reference to the 'most commonly used form of transport', which may be defined as the mean of transport used for at least 50% of the school days in a year (or else with reference to a specific date, the same for all children, to be established when data are collected).

Headline indicator: Percentage of children going to school by car.

3.8.2 Extent of participation and response

Twenty-four urban areas (57% of total respondents) have sent data related to this indicator, all collected between 2000 and 2002, except for Aarhus (1994), Turku (1997) and Tampere (1999), while Haemeenlinna and Gdansk did not state the reference year.

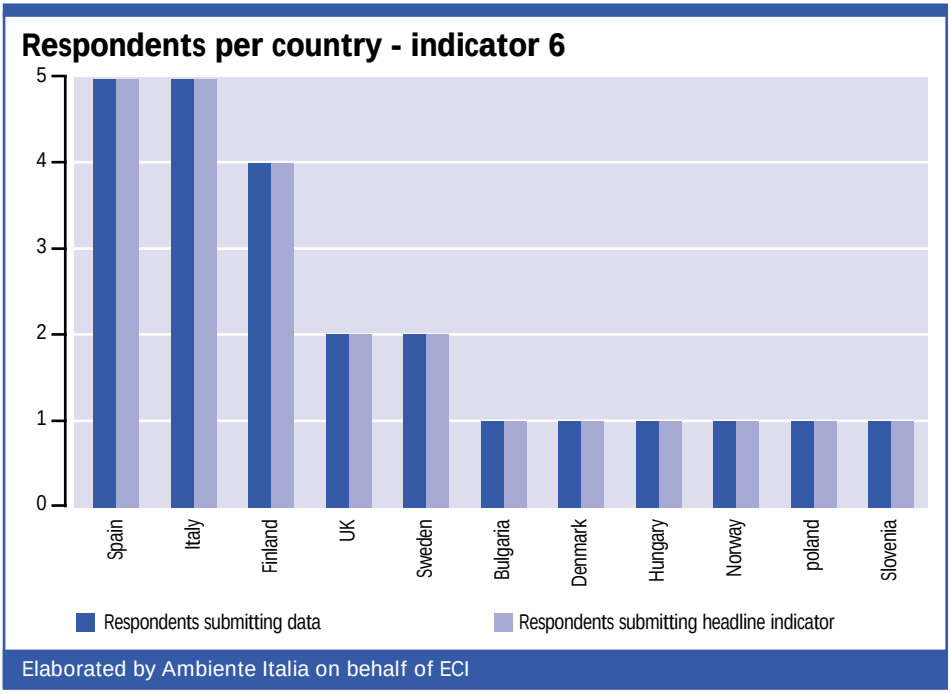
In particular, all 4 Finnish, 5 Italians (out of 12 respondents) and 5 Spanish (out of 9) urban areas have answered to this indicator.

Even though the rate of response is one of the lowest, it is interesting to underline that each of the 24 data sets received can be considered comparable with the others, except for that submitted by Parma, which contains only the headline indicator and does not specify other modes of transport.

Northern and southern countries are represented by 10 urban areas each, with a rate of response of 66% for the first and 44% for the second, whereas 4 out of 5 eastern cities have submitted data.

Overall, it seems that cities' dimension does not influence the rate of response. In fact, data have been sent by 10 medium-sized, 8 large and 6 small urban areas; geographical distribution, as seen, is more or less equal.

[27] 'Collective transport' refers to a school bus or private car giving a lift to more than 2 children.
[28] 'Private car' refers to a private car giving a lift to 2 or less children.



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3.8.3 General overview

Aggregating all percentages for the 24 areas considered to obtain an overall average figure (which, as discussed later on, is not really representative because of the wide differences registered between data of different contexts), it appears that almost 50% of the children goes to school on foot and that 10% rides a bicycle, while 16% uses collective transport and 22% private cars.

The analysis of the data submitted by all urban areas identifies several behavioural patterns, only partially reflecting the information highlighted by the mobility indicator (see indicator 3).

The use of private car is equal or less than 15% in more than 50% of the areas considered and the car is the least frequently used mode of transport in 6 of these cities. Displacements by non motorised modes are more than 70% both in small cities (Aba, Blagoevgrad and Haemeenlinna) and in large cities in northern (Oslo) and southern (Zaragoza) European countries.

Driving to and from school is less frequent than driving for all other purposes (work, leisure, ...) in almost all urban areas, with very different percentages in different places. In Aarhus and Oslo, where mobility by private car is rather widespread (more or less 50%), driving between home and school records an 80% decrease; while in Nord Milano, Ferrara and Birmingham (recording similar percentages for this mode) the reduction is less than a third. Also Barcelona and Zaragoza, where transport by private car is only 20-30% of the total, these percentages show a 70-80% decrease. Vitoria-Gasteiz reports constant values, around approximately 20%.

	Walking	Cycling	Collective transport	Other	Private car	Private car (other reasons)
Modena	14%	3%	4%	0%	78%	na
Acqui Terme	24%	2%	25%	0%	49%	na
Nord Milano	52%	1%	8%	0%	39%	56%
Ferrara	18%	20%	19%	1%	42%	50%
Gdansk	24%	1%	34%	5%	36%	na
Birmingham	57%	0%	9%	0%	33%	43%
Parma	0%	0%	0%	68%	32%	35% (*)
Bristol	54%	1%	11%	4%	31%	54%
Maribor	56%	2%	19%	0%	22%	44%
Vitoria-Gasteiz	67%	0%	11%	0%	22%	20%
Viladecans	79%	0%	1%	0%	22%	na
Turku	38%	13%	32%	2%	15%	41%
Stockholm	52%	10%	22%	2%	15%	na
Helsingborg	27%	28%	11%	22%	13%	na
Bizkaia	51%	0%	36%	0%	13%	29%
Aarhus	29%	30%	11%	18%	12%	55%
Pori	24%	49%	10%	2%	11%	na
Oslo	78%	2%[29]	9%	1%	10%	48%
Barcelona	65%	0%	27%	0%	8%	21%
Haemeenlinna	48%	35%	10%	0%	8%	na
Blagoevgrad	82%	0%	8%	1%	8%	na
Zaragoza	70%	0%	24%	0%	6%	28%
Tampere	70%	13%	14%	0%	3%	na
Aba	30%	45%	23%	0%	2%	na

(*) only women

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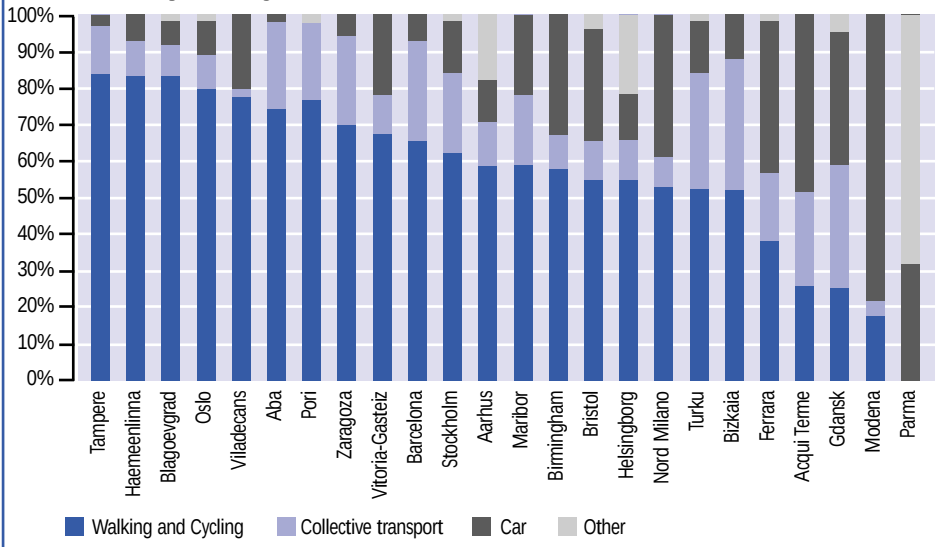
[29] This figure is artificially low because came out from a survey conducted in December 2002, which is the darkest and coldest month of the year. In fact, surveys conducted by the municipality in other contexts show an average of 8% cycling in general and the percentage is probably much higher for school children during the spring-summer-autumn seasons.

The analysis of the data for the other modes of transport identifies very different behavioural patterns as well. In Spanish cities, such as Barcelona, Zaragoza, Viladecans and Vitoria-Gasteiz, more than 65% of the children goes to school on foot. The same behaviour is observed in colder cities, such as Tampere and Oslo in the North and Blagoevgrad in the East. The use of bicycle, not very popular in Spain, is the most common mode of transport (28-49%) to travel to school in three northern cities (Pori, Aarhus e Helsingborg) and in one eastern city (Aba). Moreover, in the cities of Barcelona, Zaragoza and Aba there is a considerable use of collective transport (between 23% and 27%), while the use of private car is less than 10%.

Italian cities and part of the English ones show a completely different pattern. In all the Italian cities that have sent data, private car is the most commonly used mode of transport (39% in Nord Milano, 49% in Acqui Terme, 78% in Modena). In the area of Nord Milano most of the children that are not taken to school by private car, go to school on foot (52%), as also happens in Bristol and Birmingham. Ferrara has the highest share of children that use the bicycle as an alternative to the car (20%).

Children's journeys to and from school



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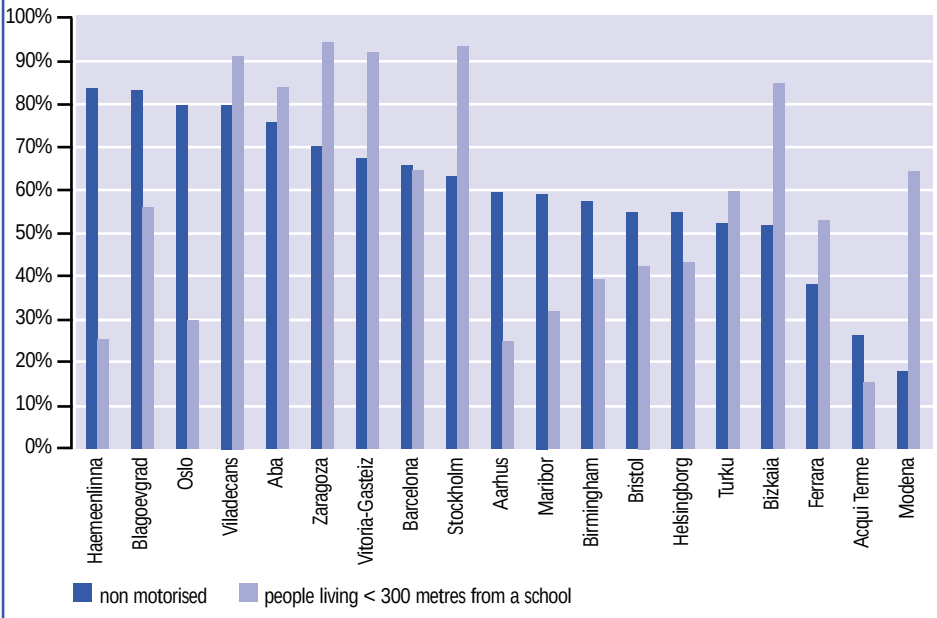
Even though the distribution of school buildings has a certain influence on the mode of transport used, the use of non motorised modes of transport and the proximity of school buildings do not seem to be strictly correlated. Haemeenlinna and Oslo, on one side, and Modena, on the other, are a clear example of the role that social and cultural elements may play in the choice of the means of transport.

In Oslo and Haemeenlinna - where 20-30% of the population lives within 300 metres of a public school - 80% of the children goes to school on foot or by bicycle. On the other hand, in Modena, even though more than 60% of the population lives very close to public schools, only 17% of the children uses non motorised modes and 78% of them is taken to school by private car.

It should further be noticed that, in the seven cities where the share of children's non motorised journeys is between 50% and 60%, the distribution of scholastic buildings within the administrative area varies considerably (from 25% at Aarhus to 85% at Diputación Foral de Bizkaia).

However, it is believed that a widespread distribution of scholastic buildings remains a key factor in reducing the use of motorised modes. Of the first 9 cities where more than 60% of the children go to school on foot or by bicycle, 6 record more than 60% of the population as living within 300 metres of a public school.

Non motorised means of transport and schools distribution



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Private car

The indicator requires a deep investigation of the reasons determining the choice of the private car. 11 out of 24 urban areas have submitted complete questionnaires, while data submitted by Modena, Vitoria-Gasteiz and Acqui Terme are not complete and not significant[30]. Lack of time and/or the length of the journey to school seem to be the main reasons for using the private car in many cases (33%) even in those cities - such as Viladecans and Stockholm - where almost 90% of the population lives within 300 metres of a public school.

Successively, the greater safety guaranteed by driving seems to be a relevant reason for choosing this means of transport (17%), and this is particularly true for the city of Acqui Terme and then for Oslo

[30] None of these two cities have filled in all the questionnaire, while the sample of the survey conducted in Acqui Terme consists in only 27 children and, therefore, may be considered not significant.

and Blagoevgrad. Unfavourable weather conditions is the main reason (11% the average calculated on all data received) for using the car in Tampere (25%), while the lack of alternative modes lies behind this choice in Blagoevgrad (38%).

It is then important to highlight the remarkably high share recorded for the item 'other' (36%), sometimes higher than 50% (Nord Milano, Haemeenlinna and Zaragoza). This may be explained by the fact that no answer considering parents' mobility to job places is provided in the questionnaire (in the survey conducted in the area of Nord Milano, this answer received 37% of the total preferences).

	No other form of transport available	Length of journey/Lack of time available	Unfavourable weather conditions	Greater safety	Other
Acqui Terme[30]	19%	30%	0%	52%	0%
Blagoevgrad	38%	20%	6%	20%	15%
Haemeenlinna	5%	16%	10%	13%	56%
Modena[30]	18%	26%	na	10%	na
Nord Milano	na	37%	na	11%	52%
Oslo	7%	41%	2%	23%	27%
Stockholm	3%	42%	9%	15%	31%
Tampere	5%	19%	25%	13%	38%
Viladecans	1%	61%	1%	1%	36%
Vitoria-Gasteiz[30]	na	60%	40%	na	na
Zaragoza	8%	9%	2%	7%	73%

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3.9 Indicator 7 – Sustainable management of the local authority and local enterprises

3.9.1 Definition

Indicator 7 investigates the extent to which "local enterprises, organisations and authorities are managing resource consumption, environmental protection and social issues by adopting recognised procedures" and therefore attempts to determine the "share of public and private organisations (large, small and medium enterprises) adopting and using environmental and social management procedures".

The main information requirements for indicator 7 are:

- % of organisations that have adopted environmental management procedures;
- % of organisations that have adopted social management procedures;
- % of organisations that have adopted environmental and social management procedures.

A detailed analysis is also required of the following:

- % of total number of large enterprises that have adopted environmental and/or social management procedures, classified according to the NACE code[31];
- % of total number of small and medium sized enterprises that have adopted environmental and/or social management procedures, classified according to the NACE code and the 3 categories of SMEs;
- % of total number of public organisations that have adopted environmental and/or social management procedures;
- % of total number of non-governmental organisations that have adopted environmental and/or social management procedures, broken down, if appropriate, into different types of organisations: e.g. NGOs, charities.

Environmental management procedures refer to EMAS and ISO 14001 certifications, while social management procedures refer to SA8000, AA1000, SIGMA certifications.

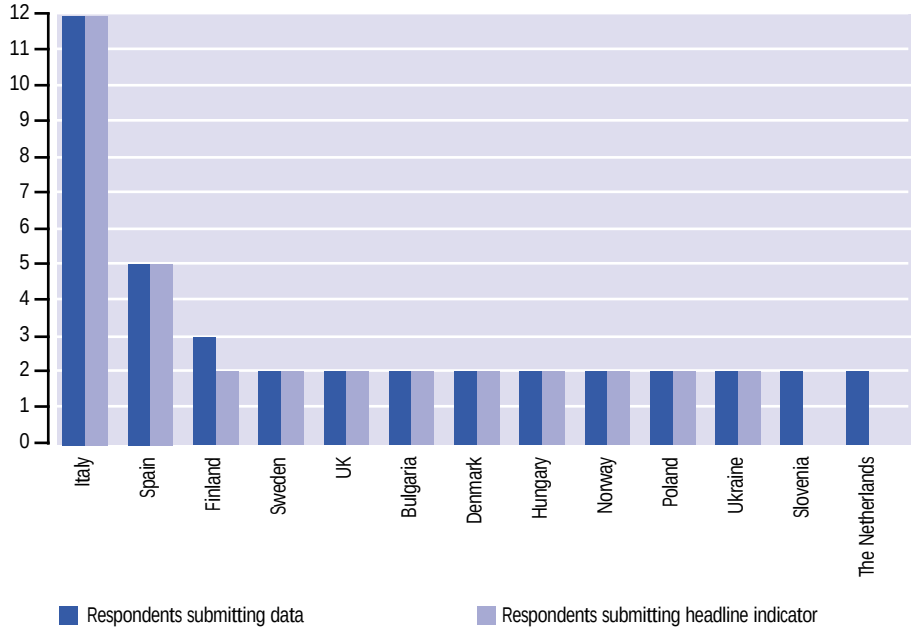
Headline indicator: % of organisations that have adopted environmental management procedures.

3.9.2 Extent of participation and response

Of the 42 respondents, no fewer than 32 sent data relating to indicator 7, with a response level of 76%, which is higher than average. On the whole, the level of comparability may be considered satisfactory in view of the fact that 28 local authorities out of 32 supplied complete data regarding the main indicator. The level of detail and completeness regarding the other information required by the indicator is, however, less adequate. In particular:

- 15 urban areas sent data broken down into sectors of activity (NACE code) and/or size;
- 15 sent information on public and non-governmental organisations.

[31] Official European nomenclature for economic activities.



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Of the 32 respondents, 17 are local authorities in southern Europe (no fewer than 12 in Italy), 10 in northern Europe (3 in Finland) and 5 in eastern Europe. It should, however, be noted that, while all the urban areas in eastern Europe replied, only 77% replied in southern Europe (100% of the Italian authorities) and 67% in northern Europe.

As far as the representativeness of the size is concerned, a substantial balance may be noted: in fact, 11 large local authorities, 12 medium-sized ones and 9 small ones replied with regard to this indicator. In this case, too, it should be noted that, while the figure is similar for the large urban areas (85%) and the small ones (82%), only 67% of the medium-sized cities replied.

3.9.3 General overview

In the first place, it should be stressed that the data received regard almost exclusively organisations with environmental certifications, since only Birmingham recorded data regarding social certifications, reporting a enterprise and a NGO with both certifications.

Comparable data regarding public organisations and NGOs are hard to come by and, in general, it emerges that certifications in these sectors are scarce. It has, therefore, been decided to concentrate the analysis mainly on the diffusion of environmental certification among private enterprises.

Private enterprises
The following table shows the number of certified enterprises reported by each respondent.

local authorities	n° certified enterprises	local authorities	n° certified enterprises
Stockholm	179	Haemeenlinna	11
Provincia Torino	132	Modena	11
Bizkaia	93	Catania	8
Malmoe	79	Maribor	8
Zaragoza	65	Mantova	7
Birmingham	59	Reggio Emilia	7
Oslo	46	Ferrara	6
A Coruna	37	Verbania	4
Tampere	34	Parma	2
Aarhus	32	Vilanova i la Geltrú	2
Bristol	22	Aba	1
Vitoria-Gasteiz	19	Ancona	1
Pori	15	Blagoevgrad	0
Gdansk	14	Nikolaev	0
Nord Milano	14	Acqui Terme	0
Pavia	0		

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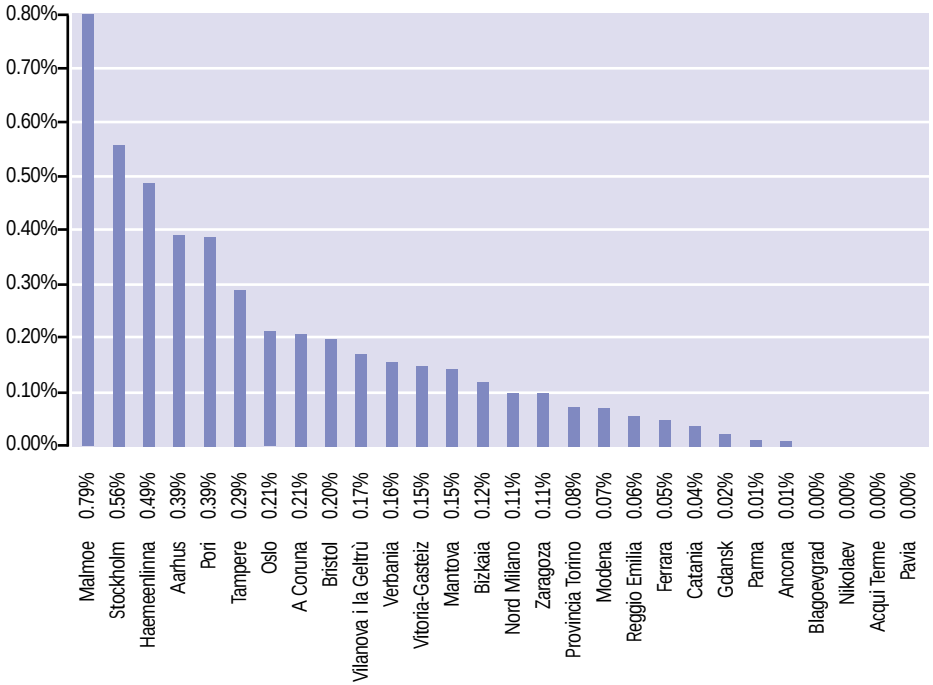
The city of Stockholm has by far the highest number of certified enterprises, even higher than the larger administrative areas, the Diputación Foral de Bizkaia (111 municipalities) and the Provincia di Torino (315 municipalities). In four cities (Acqui Terme, Blagoevgrad, Nikolaev and Pavia) there are no certified enterprises. The ten cities above the mean are mainly in northern Europe or Spain. It appears that the cities of eastern Europe and most of the Italian ones are lagging behind in this respect.

In order to make a more significant comparison, the data should be analysed on a percentage basis (% of certified enterprises out of the total of enterprises present in the various areas), although it is necessary to be careful when interpreting figures relating to areas in which the total number of enterprises is extremely small. A good example of this is represented by Aba, where the only certified enterprise constitutes no less than 4.35% of the total of 23 enterprises reported in the area.

Percentage of environmentally certified enterprises



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Malmoe has the highest percentage (0.79%), followed by Stockholm (0.56%), Haemeenlinna (0.49%) and Aarhus and Pori (both 0.39%)[32].

Provincia di Torino and the Diputación Foral de Bizkaia (second and third in terms of total numbers) have very low percentages, respectively 0.08% and 0.12%.

Polarisation between the different geographical areas is immediately evident. Regardless of their size, all the cities in the first seven places are urban areas in northern Europe, especially in Sweden and Finland. Their average (0.45%) is five times greater than that of southern Europe, which is penalised by the poor performance of the Italian cities. Among the cities of southern Europe, in fact, there are 9 Italian respondents out of 12 that have less than 0.09%, while the average figure for the country as a whole is around 0.06% compared with 0.15% for Spain. Although the first positive signs are visible, the diffusion of certifications in eastern Europe is still very limited.

[32] Please, note that the percentage of Aarhus is slightly underestimated because the total number of enterprises considered in the percentage calculation includes also NGOs and public owned enterprises (that could not have been separated because registered together at national level).

If the data are analysed with regard to the size of the responding local authorities, it emerges that the distribution is substantially homogeneous compared to the European average. In the case of respondents with a population of over 350,000 inhabitants, 0.17% of the enterprises are certified; for medium-sized cities the figure is 0.18%; for those small it is 0.17%, although three of these do not have any certified enterprises.

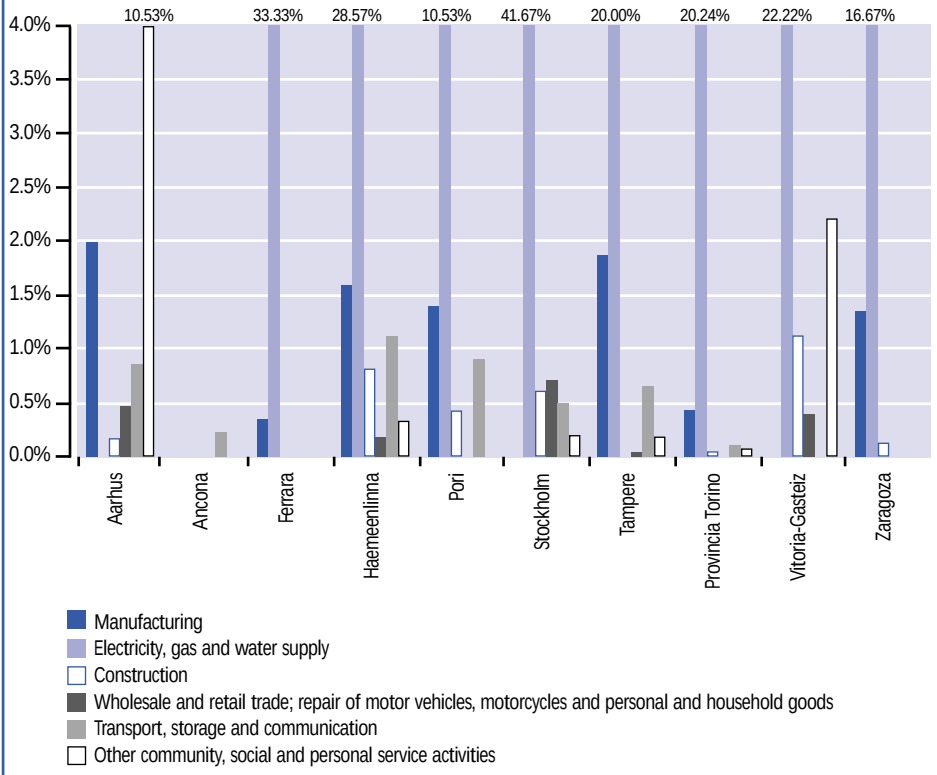
Sector of activity

Further analysis has been carried out with regard to private enterprises, comparing the percentage of certified enterprises by sector of activity (NACE).

Of the 15 urban areas that provided data relating to this aspect, only 10 can be compared with each other, because they supplied figures showing the number of certified enterprises as a percentage of the overall number of enterprises, divided according to the NACE codes.

Of the NACE sectors investigated, the six showing the most significant number of certified enterprises have been selected.

Percentage of enterprises certified in each sector



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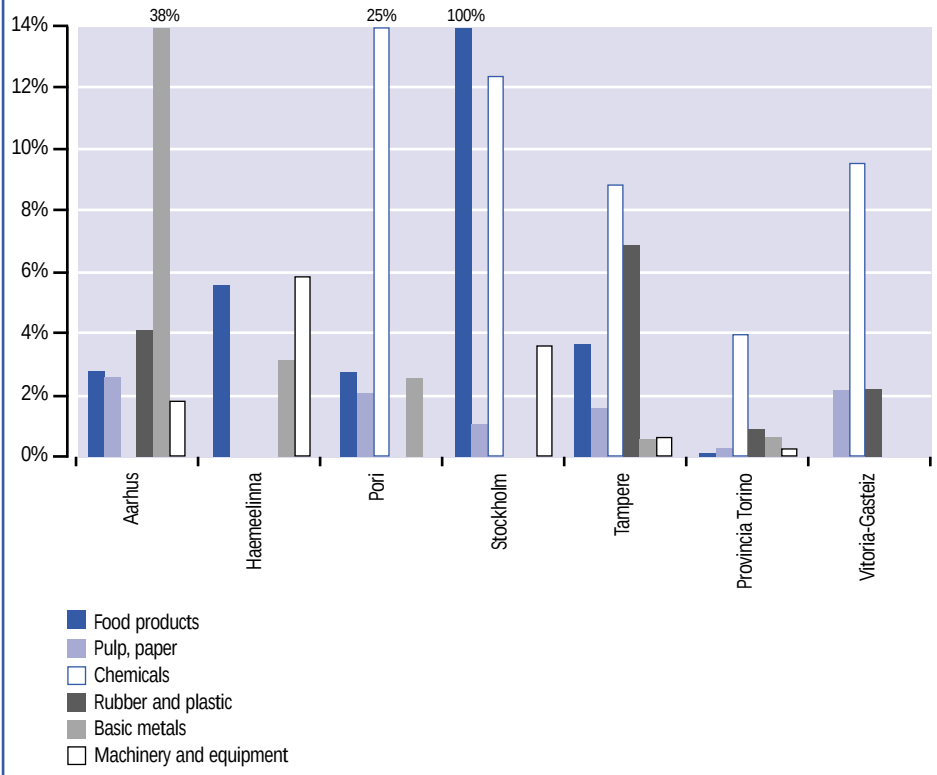
If the disaggregated figures are examined, it will be seen that in the 4 urban areas of northern Europe (Aarhus, Haemeenlinna, Stockholm and Pori) in which environmental certification is most widespread, this is no longer limited to the industrial sectors, but - albeit with varying percentages - has begun to spread to sectors that have previously been excluded, such as services and transport.

In the energy sector in all the areas where at least one certified enterprise is present, the percentages immediately rise to an average of 19%, with a peak of 40% in Stockholm; this is due to the fact that there is a limited number of enterprises of this type and therefore small absolute numbers become more significant if the percentages are calculated. As far as the other sectors are concerned, the manufacturing sector is still the one in which environmental certification is by far the most widespread (1.12%), followed by transport (0.49%) and construction (0.33%). The diffusion of certification in the public, social and personal services - which is generally absent or limited - shows two peaks, which are, in fact, rather different, in Aarhus and Vitoria-Gasteiz.

In the food sector there are particularly high levels, 14.3%, with the peak recorded in Stockholm where the only two enterprises present are both certified (resulting in the level of 100%). The level of certifi-

Percentage of enterprises certified in each manufacturing sector



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cation is high also in the manufacturing sector, around an average of 6.6% in chemical firms (25% in Pori, 12.5 % in Stockholm, 9.5% in Vitoria-Gasteiz, 8.9% in Tampere). The figure relating to the metallurgical sector, which has on average lower percentages than the others, is particularly high in Aarhus (3 firms out of 8 are certified).

The following graph shows the sectors of manufacturing industry in which environmental certification is most widespread.

Even if the data available are very limited (only four respondents have given the percentage of the certified enterprises compared with their size), they confirm the tendency, already noted on a larger scale, for the larger enterprises to take more interest in environmental certification. In fact, because there are fewer certified large enterprises in a given area, the percentage of them varies from 7% to 20%, while the medium-sized and small ones do not reach 0.5%. The figures relating to the Provincia di Torino are particularly worth noting: in line with the other three cities in northern Italy as far as the large enterprises are concerned, they are about seven times smaller for the medium-sized and small ones.

	Large enterprises	Small/Medium enterprises
Pori	20.00%	0.34%
Stockholm	18.78%	0.44%
Haemeenlinna	16.67%	0.45%
Provincia Torino	14.01%	0.06%
Aarhus	7.02%	0.35%

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Public organisations and NGOs

As has already been mentioned, there is a lack of data regarding these two sectors. Of the 15 respondents, 4 supplied the number of certified public organisations: Den Haag (9), Malmoe (4), Provincia di Torino (1) and Pori (1). Oslo only gave the percentage figure, 0.5%, while Bristol and Nikolaev confined themselves to reporting the presence of certified offices and departments, without supplying further details regarding the total number or type of certification. In the case of the other 8 respondents, there do not appear to be certified public organisations.

As far as the NGOs are concerned, only the previously mentioned NGO in Birmingham is certified (both environmentally and socially).

3.10 Indicator 8 – Noise pollution

3.10.1 Definition

The indicator analyses noise pollution such as defined by the European Directive (2002/49/EC). The following items are to be considered for the calculation of the indicator:

- the estimated number of people living in dwellings exposed to each of the following bands of values of L_{den} in dB(A): 55-59, 60-64, 65-69, 70-74, >75 separately for road, rail and air traffic noise and noise from industrial sources;
- the estimated total number of people living in dwellings exposed to each of the following bands of values of L_{night} in dB(A): 50-54, 55-59, 60-64, 65-69, >70 separately for road, rail and air traffic noise and noise from industrial sources;
- the proportion of measurements corresponding to each of the above mentioned value bands of L_{den} and L_{night}, and the total number of measurements taken;
- existence and figures corresponding to the percentage implementation for each single measure/action identified in the action plan/programme.

The calculation of the share of the population exposed to environmental noise during the 24 hours, even thought this is a parameter required by the European Directive (2002/49/EC), is not standardised. In some cases respondents have sent data already available, measured according to their national legislation making difficult to compare them.

Headline indicator: share of the population exposed to night noise levels higher than 55 dB(A).

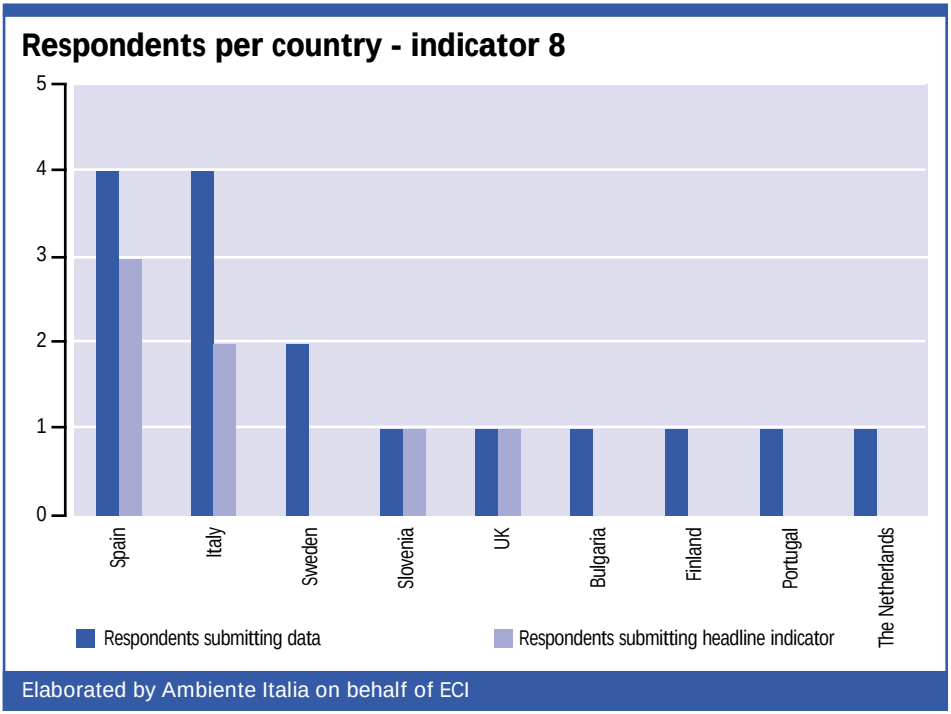
3.10.2 Extent of participation and response

21 respondent local authorities out of 42 answered on indicator 8.

Data have been provided by 12 southern European cities (5 from Spain, 6 from Italy and 1 from Portugal), by 7 northern European cities (2 from Sweden and the United Kingdom and 1 from The Netherlands, Finland and Norway) and by 2 eastern European cities (Bulgaria and Romania).

As far as dimensional representativity is concerned, cities to be mostly represented are medium-sized cities (with a population ranging from 100,000 and 350,000 inhabitants) counting 11 respondents, followed by large cities (population of more than 350,000 inhabitants) counting 9 respondents; only one small city has answered to this indicator.

On the whole, data are not complete; as a matter of fact, only 7 cities have sent all the information required for the calculation of the headline indicator.



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3.10.3 General overview

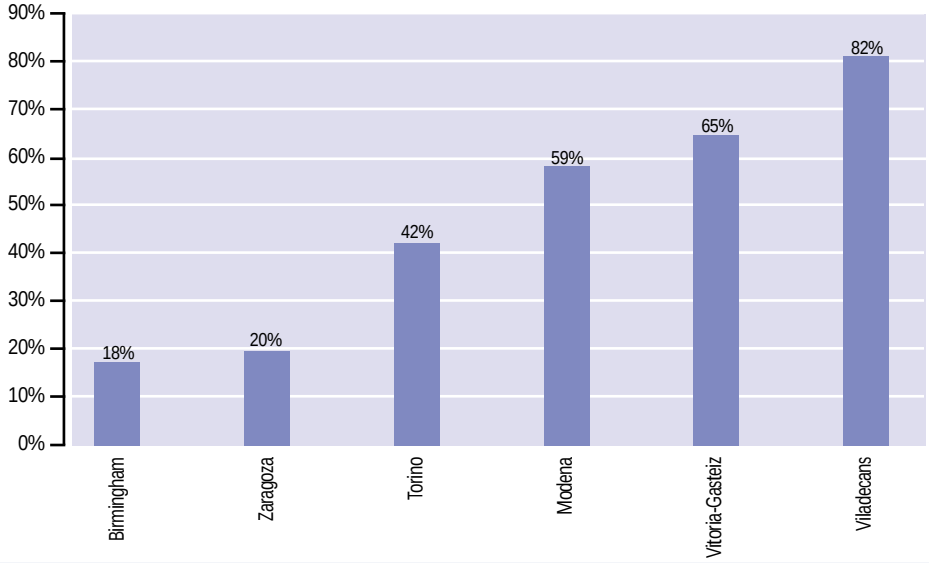
The figure regarding the headline indicator (share of the population exposed to night noise levels higher than 55 dB(A)) has been sent by 7 cities; of these, though, the figure provided by Maribor has not been considered significant as it indicates that 4% of the population is exposed to noise levels ranging from 55 to 59 dB(A), but it does not provide any information on the rest of the population.

Data are yet too little to be considered representative of some European trends or to allow significant correlations, we shall therefore confine ourselves to a mere observation of the data. Besides, we have to bear in mind that since the monitoring of noise pollution is not a custom yet, data reported by respondents may be characterised by a significant variability.

As for the headline indicator, for instance, the share of the population exposed to night noise levels higher than 55 dB(A) varies from 18% to 92%, probably due to the different methodologies of measurement which have been used; such fluctuation has been reported both for the methods of calculation or estimation of the population exposed as well as for the scale used for the identification of a correspondence in territorial zoning.

Data related to the headline indicator are shown in the following graph.

Percentage of population exposed at night to noise levels > 55 dB(A)



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Some cities have sent information about the percentages of population exposed, in the space of 24 hours, to given bands of values of L_{den}. The analysis of these data have been affected by some interpretative problems due to the fact that in the spreadsheet the band value < 55 dB(A) was missing by mistake.

Notwithstanding the differences highlighted in the methodology in use and in the representativity of the samples considered for the estimation, we show the data reported, though also in this case they are characterised by a significant variability.

L_{den}	55-59 dB(A)	60-64 dB(A)	65-69 dB(A)	70-74 dB(A)	≥ 75 dB(A)
Tampere[33]	97%	0%	3%	0%	0%
Blagoevgrad	87%	2%	2%	7%	2%
Stockholm[33]	80%	0%	20%	0%	0%
Helsingborg[33]	53%	35%	12%	0%	0%
Torino	40%	31%	20%	8%	1%
Aarhus[33]	38%	31%	23%	8%	0%
Modena	24%	25%	33%	15%	2%
Vitoria-Gasteiz	16%	18%	30%	29%	7%
Viladecans	11%	37%	34%	16%	2%

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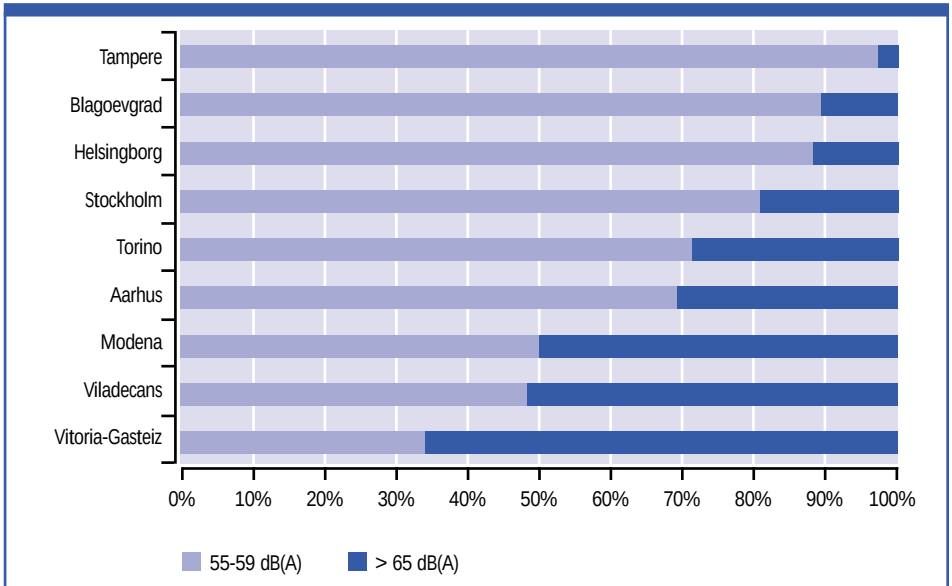
If we aggregate the percentages in two bands of level, fixing a threshold level equal to L_{den} in 65 dB(A), as suggested by the literature which define such threshold as critical in order to calculate the percentage of population seriously disturbed[34], we obtain the following data distribution:



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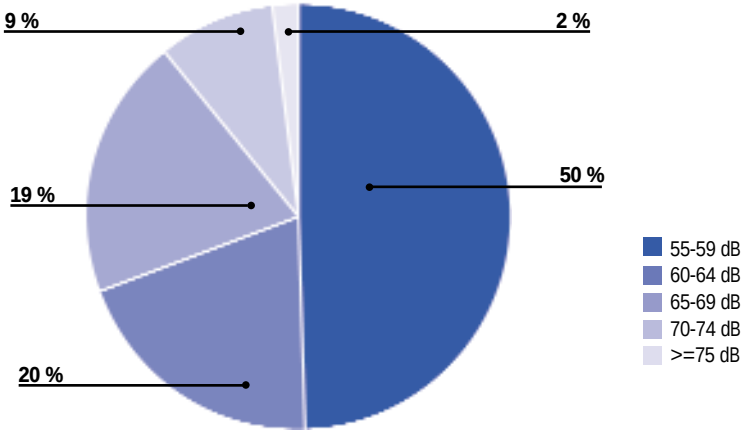
[33] These cities have considered only a sample of the total population and the percentage of population exposed calculated on the basis of this sample have been extended to the whole population.

[34] Danish Environmental Protection Agency, 'Recommended noise limits' (http://www.mst.dk/homepage/).

Average percentage of population exposed to different noise bands (L_{den})



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If we should aggregate in a single average figure all the percentages obtained in these 10 cities, (and taking into account the scanty representativity of the sample with respect to the total amount of European cities), we would notice that half of the total population (50%) is exposed to level of L_{den} ranging between 55 and 59 dB(A); 20% of the population is exposed to levels ranging between 60 and 65 dB(A) and another 20% to level ranging between 65 and 70 dB(A) respectively, while the other 11% is exposed to levels higher than 70 dB(A).

The city of Barcelona has sent data on percentage of population exposed to each of the above mentioned value band for day noise pollution.

L_{day}	50-55 dB (A)	55-59 dB (A)	60-64 dB (A)	65-69 dB (A)	70-74 dB (A)	≥ 75 dB (A)
Barcelona	11%	24%	30%	20%	12%	3%

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Of all respondents, 4 have sent information on the measurements they carried out. The following schedule illustrates the details regarding the amount of measurements corresponding to the bands of noise levels considered.

	45-49 dB(A)	50-54 dB(A)	55-59 dB(A)	60-64 dB(A)	65-69 dB(A)	70-74 dB(A)	≥ 75 dB(A)	Total measurements
Catania								
L_{day} in zone A	3				9			12
L_{day} in zone B	1			4				5
L_{day} external	2					0		2
Blagoevgrad								
L_{day}	4		2	1	1	3	11	22
L_{night}	4	2	1	1	3	11		22
Pamplona								
L_{day}	6	35	83	210	169	25	120	648
Parma								
L_{day}	6				21	18	1	46

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The cities of Ferrara and Bristol, though they did not provide methodologically coherent data, have both sent information on this subject providing data obtained from a general survey about noise satisfaction. As far as Ferrara is concerned, the results of the survey carried out in July 2002, show that 65% of the population declares to be satisfied (of this, 15% very satisfied), 15% declares to be neither satisfied nor dissatisfied, and 18% declares dissatisfaction (8% very dissatisfied). The percentage of the sample which gave no answer is equal to 2%. In Bristol, on the contrary, the survey carried out in 2001 highlighted that 20% of the interviewees declared they consider noise - caused by road traffic for 43% of the sample - as a problem.

Data provided by Nord Milano have not been analysed (this city has only provided its territorial acoustic map) nor data provided by Oslo (this city has calculated a level of noise pollution with regard to a space of 24 hours by using a different methodology).

In order to obtain a more complete estimation of the sustainability of noise pollution, the survey also required information on possible measures or actions adopted for the reduction of acoustic emission levels or for citizens' protection against such emissions.

The fact that nearly none of the cities answered to this question could be seen as indicative of the uncertainty which still rests on the policies and actions of restoration and protection against noise pollution.

As a matter of fact, as far as the elaboration of acoustic maps and acoustic zoning instruments to support planning is concerned, which constitutes the first step towards a coherent and valid strategy, we notice that in Zaragoza, for example, such instruments cover nowadays 54% of the territory, while in the Provincia di Torino 9%.

The only cities to have sent information on specific actions are Viladecans, which also registers the highest values with regard to noise pollution, and Barcelona. In the first one, indeed, with regard to a zoning which produced a territorial acoustic map in 1997 and now under up-dating phase, the local authority has approved a municipal policy with regard to noise pollution where actions have been implemented by 50%. In Barcelona the municipality has developed an Action Frame Programme to reduce acoustic contamination and, nowadays, many actions are on a high level of implementation.

3.11 Indicator 9 – Sustainable land use

3.11.1 Definition

Indicator 9 is concerned with a variety of themes that are very different from each other, but all relating to the way the land is used. The main data required for the calculation of the indicator are as follows:

a) urbanised or artificially modelled land: the size of the artificially modelled area as a percentage of the total municipal area;

b) derelict or contaminated land: the size of the derelict or contaminated area (m^2);

c) intensity of use: number of inhabitants per km^2 of the area classified as "urbanised land";

d) new development: new building on virgin area (greenfield sites) and new building on contaminated or derelict area (brownfield sites) compared to the total area (%);

e) restoration of urban areas:
- **1.** renovation and conversion of derelict buildings (total number);
- **2.** renovation and conversion of derelict buildings (total of m^2 of each floor);
- **3.** redevelopment of derelict areas for new uses, including public open spaces (area in m^2);
- **4.** cleansing of contaminated land (area in m^2).

f) protected areas: size of the protected area as a percentage of the total municipal area.

Headline indicator: protected areas as a percentage of the total municipal area.

3.11.2 Extent of participation and response

A total of 36 respondents sent data regarding indicator 9, with a response rate of 86%, which is above average calculated on all 10 indicators.

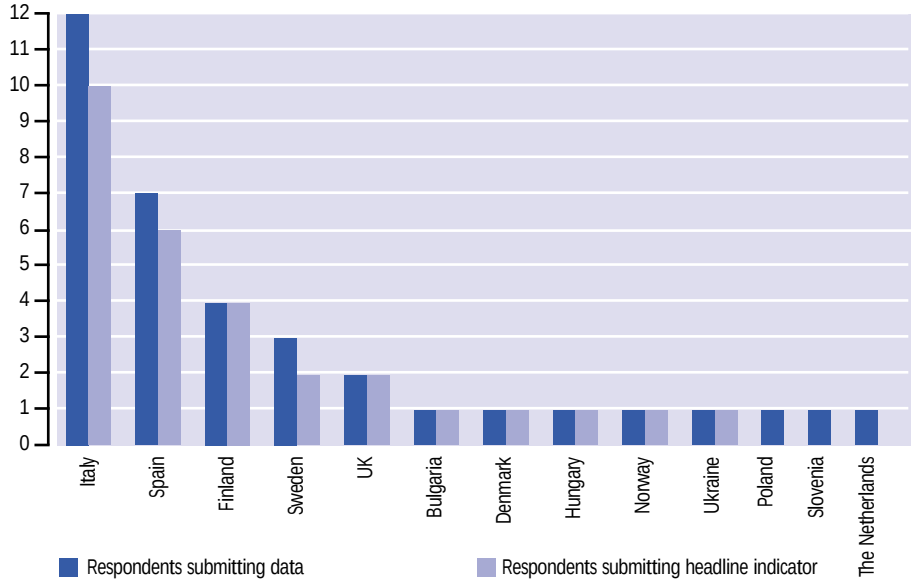
A total of 81% (29 municipalities out of 36) of the respondents sent data regarding the main indicator, although it should be noted that the interpretation of the term "protected areas" was not always homogeneous and so areas with different types of protection were considered.

The rate of response, the degree of detail and the completeness of the data varied considerably. Large numbers of respondents also sent data regarding two other sub-indicators:

- the area of the artificially modelled surface as a percentage of the total municipal area (31 respondents);
- the number of inhabitants per hectare of the urbanised land (31 respondents).

The response rates regarding the other sub-indicators were considerably lower, varying between 6% and 33%.

The city of Den Haag has sent data, but these are not directly comparable to those of other cities.



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Generally speaking, the data related to 2001, although not all the respondents indicated the year to which the figures refer.

Of the 36 respondents, 19 were local authorities in southern Europe (of these no less than 12 were Italian and 7 Spanish, which together constitute over half of the respondents), 12 in northern Europe and 5 in eastern Europe. In percentage terms, however, it should be noted that, while 100% of the local authorities in eastern Europe replied, this figure fell to 86% in southern Europe (including the Italian authorities) and 80% in northern Europe.

With regard to the degree to which the sizes were representative, there was basically a balance: in fact, 11 large local authorities, 14 medium-sized ones and 11 small ones replied to this indicator. In percentage terms, all the small authorities, 85% of the large ones and 78% of the medium-sized ones replied.

3.11.3 General overview

It was decided to focus the analysis and comparison of the data on the three sub-indicators that had the highest rate of response:

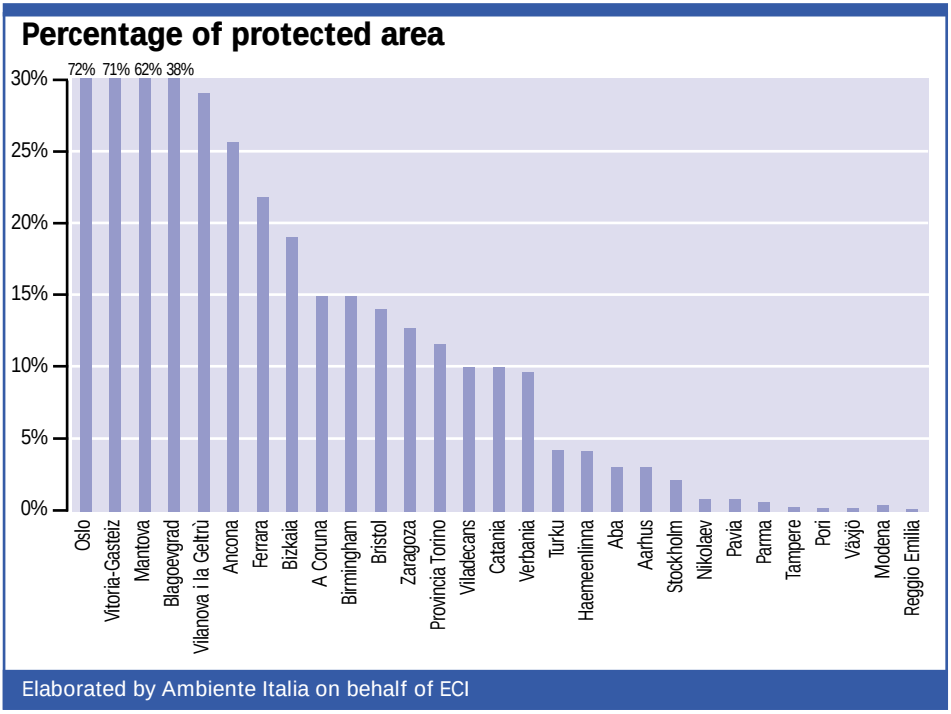
- the size of the protected areas as a percentage of the total municipal area;
- the size of the artificially modelled surfaces as a percentage of the total municipal area;
- the number of inhabitants per hectare of the urbanised land.

Protected areas as a percentage of the total area administered by the local authority
As has already been mentioned, the term "protected areas" was not always interpreted in the same way, with the result that the various local authorities included areas subject to different types of protection[35] .

Where disaggregated figures were supplied with regard to the protected areas, an attempt was made to render them as compatible as possible with the proposed methodology, but the result probably cannot be used for a more significant comparison.

Oslo and Vitoria-Gasteiz had the highest percentages of protected areas, with over 70% of the total area, followed by Mantova with 62% and Blagoevgrad with 38%, which, however, also included protected agricultural areas. All the other local authorities supplied figures that were considerably lower: all had less than 30% of their total area protected, 22 had less than 20% and no fewer than 8 less than 1%.

Nonetheless, these data are interesting (when they are compared with the following ones on the percentage of urbanised land), because they highlight the authorities that, not having yet completely urbanised the areas they administer, have developed adequate strategies for the protection of the unbuilt areas.



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[35] In the case of Nikolaev, for example, the protected areas are a mere 1% of the total area because only open spaces with a particularly high value, subject to special protection, were taken into consideration and the other protected areas (open spaces, coastal areas, forests) totalling 1,000 hectares, or 5% of the municipal area, were excluded from the calculation.
Haemeenlinna included in this category only nature conservation areas while, Zaragoza all the areas on which the local authority had not planned to build according to the most recent town plan.
Blagoevgrad included the protected agricultural areas, Mantova included the surface area of its lakes and Oslo all the open spaces with any type of state or municipal protection.

Artificially modelled surface of the total municipal area
With regard to the urbanised area as a percentage of the total area administered by the local authority, the data supplied highlight the existence of situations that are completely different from each other.

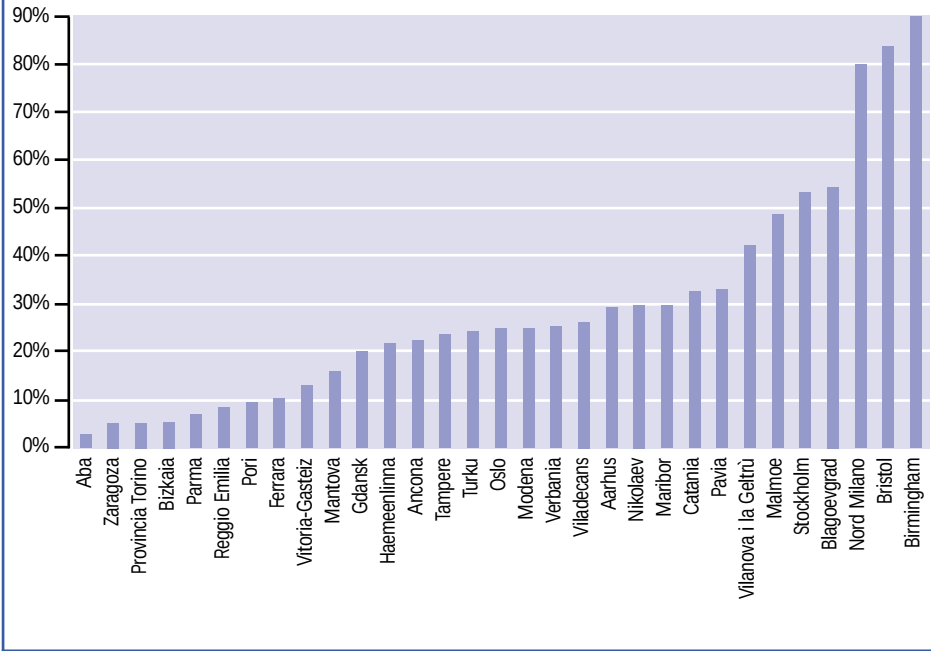
The urbanised areas vary, in fact, from 3% to 90%.

While in 5 cities more than 50% of the surface area is urbanised, with the peaks of Birmingham, Bristol and Nord Milano, which reach 80%, in 8 cities the urbanised area is close to, or less than, 10%. Almost half the respondents are, however, concentrated around the level of 20-30%.

Obviously, these data should be seen in relation to the trends of previous years (according to an EEA study of 25 European urban areas, in the last 40 years there have been rates of expansion of the urbanised areas varying from 35% to 270%), in order to understand better whether the phenomenon is still to be considered as a growing one or whether it has stabilised. If a comparison is made with the previous data regarding the protected areas where there is a rate of expansion of over 40-50% (or a strong trend towards growth), this may help to draw attention to the areas with an inadequate level of protection from future growth.

These figures must also be analysed together with the following data (number of inhabitants per hectare of urbanised area) in order to spotlight the different models of urban growth (saturation, compact, low intensity of use).

Artificially modelled surface of the total municipal area



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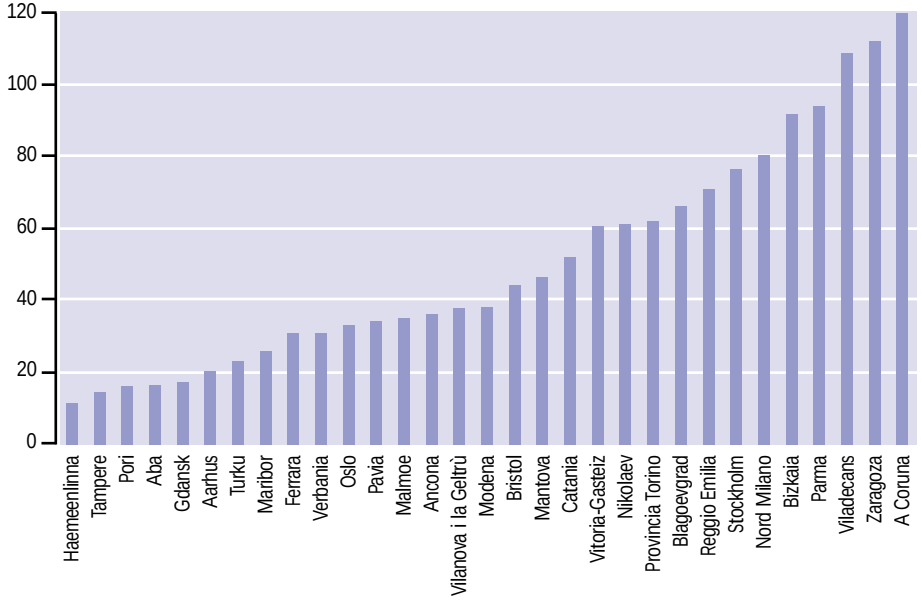
Inhabitants per hectare of urbanised land

As far as the intensity of use of the land (number of inhabitants per hectare of urbanised land), this ranges from 12 inhabitants per hectare in Haemeenlinna to 115 per hectare in A Coruna. Also Zaragoza and Viladecans have densities of over 100 inhabitants per hectare. By contrast, there are a number of Scandinavian cities (and Gdansk) with fewer than 30 inhabitants per hectare, while the average figure is around 55 inhabitants per hectare of urbanised land.

In this group of urban areas, three basic types emerge:

1. *"compact and dense areas"*, with a large unbuilt area and high density of the built-up area, e.g. Zaragoza (5% land use and 112 inhab/ha), Bizkaia (6% and 92 inhab/ha), Parma (7% and 94 inhab/ha), Reggio Emilia (9% and 71 inhab/ha);
2. areas with *"low or medium intensity"* of land use, e.g. Pori (10% land use and 16 inhab/ha), Ferrara (10% and 31 inhab/ha), Haemeenlinna (22% and 12 inhab/ha), Tampere (24% and 15 inhab/ha), Gdansk (20% and 17 inhab/ha);
3. areas of *"high or medium saturation"*, e.g. Nord Milano, with land use of 80% and a density of 80 inhab/ha, Blagoevgrad and Stockholm with 54-53% land use and 66-76 inhab/ha.

Inhabitants per hectare of urbanised land



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Derelict and contaminated land

As far as derelict and contaminated land is concerned, the aim of the indicator was to estimate how many of these areas had been restored. In general, however, it proved to be difficult to obtain detailed data regarding derelict or contaminated land, new building and the process of restoration and reuse of urban land. In many cases there was a lack of a systematic - or at least homogeneous - survey of these aspects[36] .

Only 6 cities sent data, although only partial, regarding both the presence of these areas and their restoration. Blagoevgrad has restored all its 3,000 m^2 of contaminated land, Modena 8,430 m^2 out of 22,150 m^2 (38% of the total), Mantova 15,000 m^2 out of 3,466,000 m^2 of derelict land (0,43% of the total). Aba and Nikolaev have not restored any of these areas; lastly, Tampere stated it did not have any derelict areas.

14 cities supplied data regarding the surface area of derelict land and/or those regarding contaminated land. The figures for Mantova comprise both contaminated and derelict land, while those for Malmoe include land that is potentially contaminated.

A total of 15 respondents sent data regarding the cleansing of the land while only Ancona specified the cost of the work: 2,634,000 Euros.

	Derelict land		Contaminated land		Total municipal area
	m^2	%	m^2	%	Hectares
Aba	100,000	0.12%	20,000	0.02%	8,040
Acqui Terme	1,300,000	0.39%	na	na	33,420
Birmingham	1,621,000	na	na	na	na
Blagoevgrad	na	na	3,000	0.01%	2,194
Malmoe	na	na	8,000,000	5.19%	15,400
Mantova	3,466,000	5.42%	na	na	6,395
Maribor	na	na	699,521	0.48%	14,700
Modena	28,633	0.02%	22,150	0.01%	18,274
Nikolaev	0	0%	220,000	0.08%	27,300
Pori	20,000	0.004%	50,000	0.01%	50,300
Tampere	0	0%	na	na	52,270
Viladecans	na	na	1,402,000	6.88%	2,038
Vitoria-Gasteiz	124,293	0.04%	493,609	0.18%	27,800
Zaragoza	9,402,600	0.89%	na	na	105,772

Elaborated by Ambiente Italia on behalf of ECI

[36] Birmingham, for example, decided to state that the information was "not available", in order to avoid supplying figures that, although available, in the future might have proved to be an underestimate.

	Redevelopment of derelict land (m²)	Cleansing of contaminated land (m²)	Total administrative area (hectares)
A Coruna	1,274,003	571,570	3,684
Aba	0	0	8,040
Ancona	160,000	8,000	12,460
Bizkaia	1,245,200	na	221,787
Blagoevgrad	na	3,000	2,194
Den Haag	na	726	na
Ferrara	30,000	0	40,453
Mantova	15,000	na	6,395
Modena	na	8,430	18,274
Nikolaev	0	0	27,300
Parma	56,700	10,000	26,057
Pavia	0	37,500	6,286
Reggio Emilia	100,000	90,000	23,159
Tampere	0	na	52,270
Vilanova i la Geltrù	na	130,000	na

Elaborated by Ambiente Italia on behalf of ECI

New buildings

With regard to the amount of new buildings on the virgin land, or on derelict or contaminated land, the local authorities were asked to submit the data directly in percentages[37]. This request was, however, ignored by many respondents, and only 6 urban areas provided the information as required.

In this case, too, there are considerable differences between the various cities. New buildings on contaminated or derelict land was over 80% of the total in Bristol and Stockholm, and 30% in Saragoza, while in Acqui Terme and Modena 100% of new buildings was on virgin land.

Lastly, five respondents sent data regarding the renovation of derelict buildings: about 15,000 m² in Tampere, 9,000 m² in Vitoria-Gasteiz, 3,000 m² in Acqui Terme and 1,600 m² in Nikolaev. On the other hand, the city of Aba reported that there was no renovation of derelict buildings in its area.

	Built on virgin land	Built on derelict/ contaminated land
Bristol	11%	89%
Stockholm	17%	83%
Zaragoza	70%	30%
Viladecans	77%	23%
Acqui Terme	100%	0%
Modena	100%	0%

Elaborated by Ambiente Italia on behalf of ECI

[37] It has frequently been pointed out that it is necessary to have a more precise definition of "new buildings" on virgin or contaminated land and, in particular, of the period of time to which the indicator refers. According to Oslo, in view of the fact that, to date, a systematic survey is lacking in almost all countries, a reply can be given to this question only after a second phase in the gathering of data, when information is available regarding the changes that have taken place in the intervening period of time. Zaragoza, however, interpreted the concept differently, giving the estimated figure for new buildings shown in its town plan for 2001.

3.12 Indicator 10 – Products promoting sustainability

3.12.1 Definition

Indicator 10 investigates the number of families and organisations, including public administrations, that purchase products promoting sustainability of consumption. "Sustainable products" - eco-labelled, organic, energy-efficient, certified timber or fair trade products - involve the adoption of environmentally and socially sound solutions in farming, forestry, food industries and in other production processes.

In particular, the three aspects which have been investigated are:

a) consumption
- percentage of families buying 'sustainable products' (per category and per given product) out of total number of families;
- percentage of families usually buying 'sustainable products' (per category and per given product) out of families buying 'sustainable products';

b) availability
- availability of 'sustainable products' (number of retail outlets offering them and number of consumers daily served) and percentage of certified products (per type of retail outlet and per given product) out of total products sold;
- number of specialised store (e.g. fair trade stores, organic stores, …) per 10,000 inhabitants;

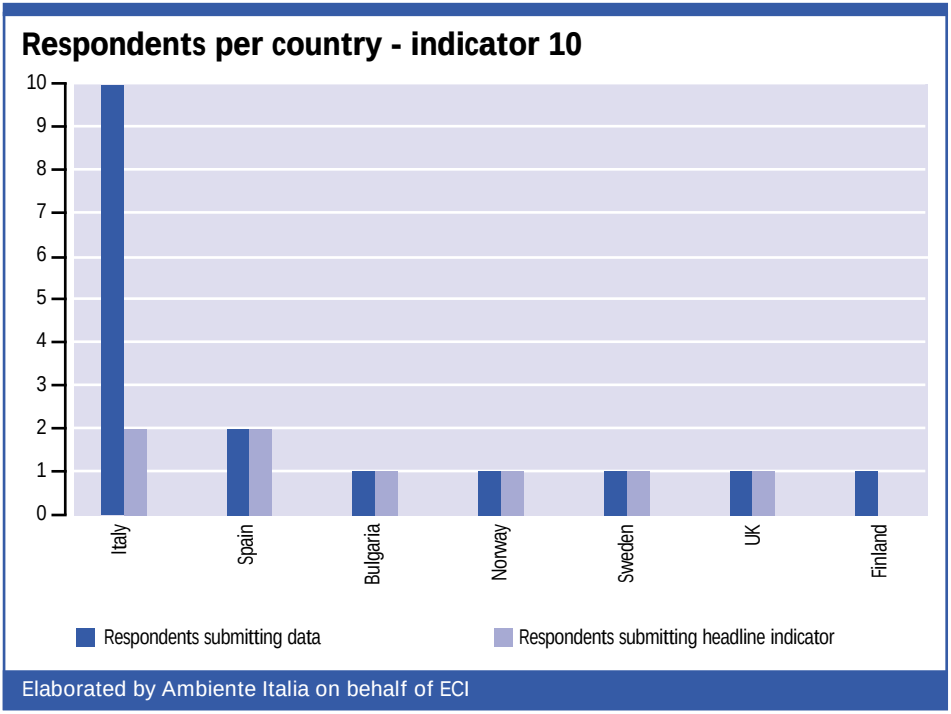
c) green purchasing of local authority
- existence of procedures that encourage purchases of eco-labelled, organic, energy-efficient, certified timber and fair-trade products and public canteens that serve organic food;
- use of recycled paper in local authority's offices.

Headline indicator: Percentage of people buying "sustainable products".

3.12.2 Extent of participation and response

17 urban areas (40% of respondents) have sent data on sustainable products consumption. Of these 16, 7 Italian cities provided data produced by a specific survey carried out on a national level[38] and therefore refer to 'green purchasing' of public administrations only. Consequently, if we refer to the headline indicator (percentage of people buying "sustainable products"), data at disposal are drastically reduced; as a matter of fact, only 8 cities sent data on this indicator, mainly collected between 2000 and 2002: Acqui Terme, Blagoevgrad, Bristol, Ferrara, A Coruna, Oslo, Zaragoza and Stockholm. Beside, only Tampere and Acqui Terme have provided information regarding the distribution net.

[38] Rapporto Ecosistema Urbano 2003.



Elaborated by Ambiente Italia on behalf of ECI

The general lack of data is mainly referable to the originality of the subject: though the market of 'sustainable products' is expanding, information on consumption and distribution of such products is still very little indeed and not standardised at all.

3.12.3 General overview

In 4 cities out of 8 most of the interviewees declared to buy sustainable products (Bristol, Oslo[39], Stockholm and Zaragoza). In A Coruna and in Blagoevgrad the number of those who declared not to buy such products is slightly higher than the number of those who declared to buy them, whereas in Ferrara sustainable products' buyers represent the majority. The feature of Acqui Terme, on the other hand, has not been considered significant as it exclusively comes from interviews made to customers of sustainable products stores (93% of the interviewees declared to buy sustainable products).

If we consider data in details, data provided by Zaragoza show an extremely unusual trend as the number of interviewees who declare to buy sustainable products is higher (by 20%) than the number of those who say to be interested in such products. This could depend on the fact that sometimes the reason why people buy such products is not their sustainability. For example, certain organic products are bought only because people think they are healthier than other products, and not because their production have less impacts on the natural environment.

As for Blagoevgrad, the most significant issue is that out of a sample of 350 people, only 84 of them answered. Most interviewees found it difficult to answer to the questions as they could not identify either a generic 'sustainable products' typology nor single product categories, obviously unknown and/or available in that area. In confirmation of this, as much as 48% of those who declare not to buy any sustainable product, do not give special reasons (prices, availability, …) for not buying but generally refer to different habits of doing shopping. As for the reasons regarding the lack of interest in buying sustainable products, the sample of interviewees in Blagoevgrad and Zaragoza have declared they do not know this type of products (90%), while in Oslo interviewees have given different answers thus not allowing to identify a common reason.

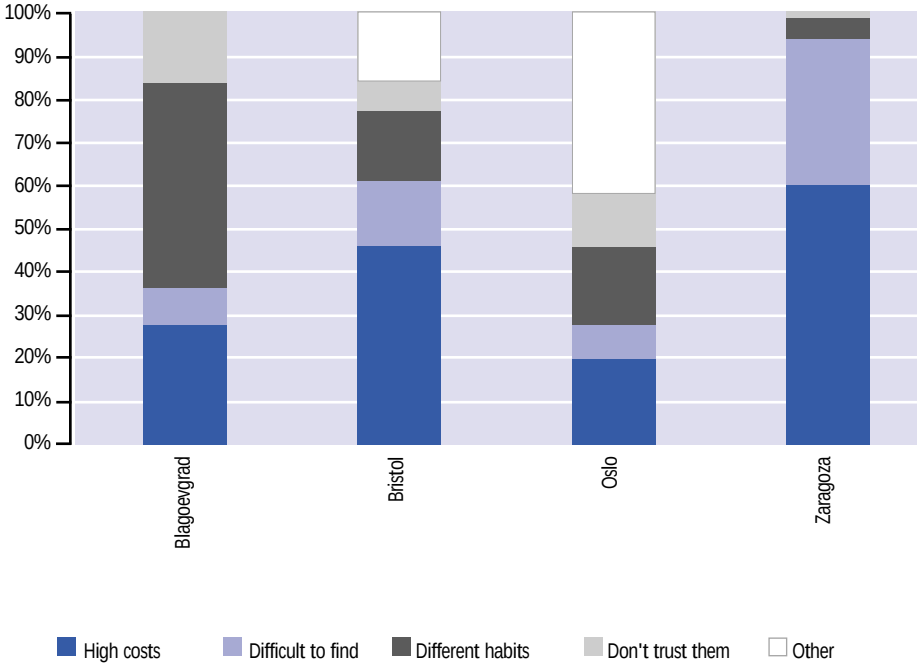
As for not-buying people, most interviewees in all the cities declared that they do not buy sustainable products mainly because they are too expensive (highest values have been recorded in Zaragoza and Bristol); on the other hand, the reason that does not seem to have a significant influence is the lack of confidence in such products, since lack of confidence has been given as reason for not buying by low percentages of people in all the cities which have been considered.

	People		People	
	Interested	Not interested	Buying	Not buying
A Coruna[40]	na	na	44%	56%
Blagoevgrad	79%	21%	45%	55%
Bristol[40]	na	na	71%	29%
Oslo[39]	78%	17%	77%	19%
Stockholm	na	na	65%	35%
Ferrara[40]	na	na	24%	76%
Zaragoza	68%	32%	88%	12%

Elaborated by Ambiente Italia on behalf of ECI

[39] For the city of Oslo, people declared to be interested in buying sustainable products.
[40] A Coruna, Bristol and Ferrara have obtained these data as the average of declarations on single products or categories of product and, therefore, the percentage of people that does not buy sustainable products could be underestimated in respect to that of people that buy at least one product of those considered as sustainable.

Reasons for not buying sustainable products



Elaborated by Ambiente Italia on behalf of ECI

If we analyse how purchases split up among the different product categories, we notice that the most commonly purchased products are high energy-efficiency products, followed by organic food products. Fair trade products and responsibly managed timber and wood products (Forest Stewardship Council certified timber) seem to have a lower diffusion.

In the city of Oslo, 93% of interviewees declare to buy high energy-efficiency products in general, but the specific figure regarding people who buy long-life and expensive high efficiency products (refrigerators and washing machines) is significantly lower and equal to 27%. As for eco-labelled and organic food products, data show a similar trend, even if these two categories are usually bought by a lower percentage of people (ranging from 94% to 18% for the former and from 87% to 19% for the latter).

In Bristol, more than 50% of citizens who buy high energy-efficient products, buy them regularly. The percentage of regular purchasing of fair trade and organic food products lie also far above 30%.

On less 'mature' markets, such as those of A Coruna and, especially, of Ferrara, organic products are those to have conquered first a chunk of the market, while fair trade products have a more limited diffusion.

People buying sustainable products	Usually	Rarely	Never
Ecolabel			
A Coruna	12%	25%	63%
Ferrara	3%	11%	85%
Oslo	18%	76%	6%
Organic			
A Coruna	14%	30%	56%
Ferrara	6%	18%	76%
Oslo	19%	68%	13%
Bristol	32%	32%	37%
Energy efficient			
Ferrara	1%	19%	80%
Oslo	27%	66%	7%
Bristol	55%	12%	34%
Fair trade			
A Coruna	4%	28%	69%
Bristol	36%	38%	25%
Ferrara	0%	10%	89%
Oslo	9%	52%	39%
FSC certified timber			
Oslo	17%	36%	47%
Bristol	22%	22%	57%

Elaborated by Ambiente Italia on behalf of ECI

Among high energy-efficiency products, both in Oslo and in Zaragoza, light bulbs are the mostly purchased product.

In Bristol, the purchasing of light bulbs have been investigated according to a set of questions a part; people have been asked whether they had ever used any energy-efficiency measure in their home allowing them to save money, and 55% of interviewees answered 'yes'. This percentage is obviously underestimated with respect to the others, because it refers to an entire sample and not only to single people who declared to buy sustainable products. In this city, on the other hand, the number of people who buy eco-labelled or high energy-efficiency washing machines and refrigerators is very high.

In the two Scandinavian cities (Oslo and Stockholm), eco-labelled toilet paper and detergents are nowadays regularly bought by 60% of those who declare to buy sustainable products in general.

Among foodstuffs, milk, fruit and vegetables are the most frequently purchased products in all the four cities.

People buying sustainable products	BRISTOL		OSLO		STOCKHOLM		ZARAGOZA	
	usually	rarely	usually	rarely	usually	rarely	usually	rarely
washing machines	54%	12%	34%		na	na	14%	58%
refrigerators	51%	9%	22%		na	na	13%	16%
light-bulbs	55%		38%	43%	na	na	62%	15%
washing/cleaning detergent	na	na	na	na	55%	0%	12%	10%
toilet/household paper	na	na	62%	29%	62%	4%	na	na
coffee/tea	32%	29%	8%	39%	20%	34%	4%	13%
cocoa/chocolate	na	na	1%	16%	na	na	7%	25%
fruit juices	27%	32%	6%	46%	na	na	na	na
fruit/vegetables	45%	30%	13%	68%	33%	52%	6%	13%
milk	37%	28%	13%	44%	47%	34%	10%	27%

Elaborated by Ambiente Italia on behalf of ECI

Only Tampere and Acqui Terme have sent information on sustainable products' distribution.

Tampere, in particular, analyses the availability of sustainable products in the various distribution chains. The percentage of sustainable products out of the total amount of available products is on average equal to 15% in hyper-markets, to 11% in supermarkets and to 8% in small shops. The highest values (70% and 80%) refer to high energy-efficiency or eco-labelled washing machines and refrigerators, nearly exclusively purchased in hyper-markets, toilet paper and light bulbs. The values registered for the category of food products, where the mostly purchased products are milk, fruit and vegetables, lie not far above 10% of displayed products.

Of all the cities which have sent information on the diffusion of "green purchasing" procedures undertaken by public administrations, Bristol is the only one which declares to implement procedures to support the purchasing of high energy-efficiency and eco-labelled products, as well as to use organic food products in municipality canteens and to use mainly recycled paper in public offices. In particular, the Council aims at supporting, promoting and using independently certified and responsibly managed timber and wood products, such as those certified by the Forest Stewardship Council. Furthermore, the use of fair trade tea and coffee in municipal buildings, facilities and offices is encouraged and a new guidance for sheltered housing schemes and schools will encourage the installation of energy efficient products (e.g. dishwashers used by nursery schools and washing machines for residential uses).

The City Council of Stockholm has recently decided to implement the new Environment Programme 2003-2006; one of its goals is to reach, by 2006, a purchasing of 15% organic food out of the total bought by the city administration. Procedures on how to achieve this goal are being developed.

On the contrary, "green purchasing" procedures are not widespread among Italian cities. The one to stand out is Reggio Emilia, the only municipality where all the policies listed in the table below are being implemented, except for those that encourage purchases of fair trade products.

Green purchasing of:	energy efficient products	ecolabel products	fair trade products	organic food in canteens	Use of recycled paper
Catania	yes	no	na	no	in minimum part (0%-10%)
Mantova	no	no	na	yes	in minimum part (0%-10%)
Modena	no	no	na	yes	not at all
Parma	no	no	na	yes	in minimum part (0%-10%)
Pavia	yes	no	na	yes	partly (10%-50%)
Reggio Emilia	yes	yes	na	yes	prevailingly (50%-90%)
Verbania	yes	no	na	yes	na
Ferrara	no	yes	na	yes	partly (10%-50%)
Bristol	yes	yes	yes	yes	prevailingly (50%-90%)

Elaborated by Ambiente Italia on behalf of ECI

4 ECI initiative evaluation: interview case studies and web survey responses analisys

4.1 Scope and methodology of the evaluation

The scope of the evaluation is to identify the experiences of the monitoring process conducted by using the ECI, and in addition analyse the interface between the monitoring process and the local policy processes.
The following analysis, conducted by Sustainable Cities Research Institute, Northumbria University, allowed also to identify the benefits and difficulties experienced with regard to ECI initiative by cities participating in the European Sustainable Cities & Town Campaign.
This chapter will now discuss the findings of the 10 interview case studies and the qualitative and quantitative aspects of the web survey responses with respect to the scope of the evaluation, identifying also the synergies of the research findings of the interview case studies and the web survey.

4.1.1 Interview case studies - methodology

Twenty-two interviews were undertaken, in ten European cities:

- Bristol (United Kingdom),
- Oslo (Norway),
- Stockholm (Sweden),
- Diputación Foral de Bizkaia, Zaragoza, Vitoria-Gasteiz, Barcelona (Spain),
- Ferrara (Italy),
- Tampere (Finland),
- Gdansk (Poland).

The interviews conducted were face-to-face, semi-structured interviews with both local government officers and local politicians from municipalities in predominantly European Union (EU) countries, but also from candidate countries. The interviews were carried out by Ambiente Italia in December 2002 and January 2003. The purpose of the interviews was to determine the role that the ECIs are playing in those European cities currently participating in the ECIP and to identify the contexts within which the ECIs have been adopted and utilised. The interview questions were therefore of a qualitative nature so that municipalities' experiences of using the ECIs could be explored in depth. The interview respondents were mainly from the Environment Departments in the local authority – job titles of respondents included Political Advisers, LA21 Co-ordinators, Head of the Environmental Monitoring Unit and Environmental Officer (see below for further details of the interviewees).

Details of the local authorities involved and the names of those interviewed

Bristol (United Kingdom)

Individual interview:	Martin Fodor	Policy development co-ordinator in sustainable city team within the sustainable development department
Group interview:	Sarah McMahon	Senior scientific officer
	Dave Tuffery	Senior scientific officer
	Sandra Fryer	Head of sustainable development group
	Richard Dawson	Policy officer in sustainable city team

Gdansk (Poland)		
Group interview:	■ Jadwiga Kopeck	Director of the environmental protection department
	■ Aleksandra Dijakiewicz	Inspector in ecological policy implementation division
Oslo (Norway)		
Individual interview:	■ Signe Nyhuus	Environmental affairs department statistical advisor
	■ Erik Lund	Political adviser to the environmental affairs and transportation councillor
	■ Guttorm Grundt	Environmental affairs and LA21 co-ordinator
Stockholm (Sweden)		
Individual interview:	■ Michael Sillen	External free lance consultant
	■ Jon Moller	Head of environmental monitoring unit within the environment and health protection administration
Ferrara (Italy)		
Individual interview:	■ Michele Ferrari	LA21 Co-ordinator
	■ Giovanna Rio	Data collection and processing for LA21 office
	■ Alessandro Bratti	Councillor for the environment
Barcelona (Spain)		
Individual interview:	■ Mireia de Mingo	Co-ordinator of the environmental plan
	■ Txema Castiella	LA21 co-ordinator
	■ Margarita Parés i Rifá	Environmental monitoring department
Diputación Foral de Bizkaia (Spain)		
Group interview:	■ Maria Esther Solabarrieta	Councillor of territorial action and environment
	■ Marta Barco Mondragon	Director of territorial action
	■ Marisal Bijando	Head of municipal studies
	■ Iciar Montejo	Technical assistant (external consultant)
Zaragoza (Spain)		
Group interview:	■ Javier Celma	Head of the environmental department of Zaragoza city council and LA21 co-ordinator
	■ Carmen Cebrian	Head of the unit of pollution monitoring within the environmental department and assistant to LA21 co-ordinator
Vitoria-Gasteiz (Spain)		
Individual interview:	■ Andres Fernandez Perez	Councillor's assessor and manager of the environmental press office
	■ Ane Itziar Velasco	Environmental studies area
	■ Juan Carlos Escuerdo Achiaga	Manager of IT
Tampere (Finland)		
Individual interview:		
	■ Antonia Sucksdorff	Environmental planner
	■ Outi Teittinen	Promoter of sustainable development within the city
	■ Vesa-Matti Kangas	Financial planner
	■ Jukka Jarvinen	Environmental councillor, head of environmental committee

4.1.2 The web survey - methodology

The web survey questionnaire was written in October 2002 by the ECI Project Manager with assistance from the University of the West of England.

The decision to host the questionnaire on the web[42] was made so that all municipalities in Europe could complete it without having to request a paper copy. The web link was promoted on the Campaign Interactive website, in newsletters and at European conferences. The questionnaire was targeted at all municipalities, and not just at those taking part in the ECI Project. The questionnaire was available on the website from the first week in November 2002. This report analyses the responses received on or before the 10th February 2003.

To increase the response rate a database of geographically representative contacts was compiled from a combination of known local authorities contacts and networks across Europe. A target of 100 responses was set. Using an approach based on the population size of EU member countries and accession countries, the number of responses required from each country was calculated (section 4.3.1). Over a 2-week period (involving 3 days of telephone calls), this approach increased the number of responses, with a much greater coverage across Europe.

Analysis of questionnaire responses
Both quantitative and qualitative analysis were used, providing different types of data. Basic statistical methods were used. A number of the questions ask respondents to rank options. A mean rank is calculated by adding all the rank scores together and dividing by the number of respondents. The mode ranks were also calculated to identify if the mean was appropriate to the most common ranking. Quartile analysis (middle quartile) and standard deviation were also calculated. Only where the quartile or standard deviation results suggest differences to the mean and mode results are they referred to in the analysis.

The sample has been split into cluster groups for greater depth of analysis. Appendix 2 shows the make up of these groups.

A number of the questions gave an option for comments or further elaboration. Significant trends from the quantitative and qualitative aspects have been identified and have been included in the web survey analysis.

Limitations
The cluster analysis relates to two variables, regional location and city size. These have certain scientific validity, with the only caveat that the sample size is obviously limited. Nonetheless, it is probable that this evidence may be the most comprehensive currently available and should therefore be examined with great interest.

[42]The questionnaire was hosted on the Campaign Interactive website in the ECIP domain:
http://www.sustainable-cities.org/indicators/

4.2 Findings of the interview case studies and the qualitative aspects of the web survey responses[43]

4.2.1 The management of the ECIs by the municipalities

In the majority of the respondent municipalities taking part in the interviews the Environment Department took responsibility for using the ECIs. However, other Departments and Divisions linked with Environment, Transport and Land Use were involved.

In most of the 10 case studies the responsible for the integration/adoption of the ECIs have been two or three persons, often supported by colleagues in other Departments in the local authority (e.g. from the Planning and Building Departments and also the Finance Department), and this was perceived as a positive development, as it involved the contribution of other Departments in the data collection. The data used for the indicators has also been taken from data used in past reports, for example a Report on the Environment, data is collected and processed by external institutions, the team working on the ECIs then took the data from this report. In addition, external consultants were also used on issues for which the municipality lacked expertise in, for example to conduct large scale surveys of the general public's views or concerns on local authority policies.

The majority of the municipalities stated that the ECIs were linked to or integrated within both national indicator systems and local indicator systems (e.g. Local Agenda 21 indicators).

4.2.2 Communication of the ECIs

In the web survey, (section 4.3.4), when the respondents were asked to indicate the potential positive impacts of the ECIs, 'raising awareness of the relevant issues among citizens and stakeholders' and 'improving the effectiveness of public communication on sustainability' and 'engaging stakeholders in sustainability issues' were ranked after 'offering a rational basis for sustainability priorities in the decision-making process' and 'supporting the integration of sustainability issues with other policy priorities' (ranked 1st and 2nd).

In the interview case studies there were notable examples of the various external communication activities already undertaken by the municipalities.

Inclusion in municipal reports/publications
A number of the municipalities stated that the ECIs were communicated in publicly available reports, the indicators having been mentioned within the context of their usage in policy processes. These reports are generally available for any member of the public to look at. Examples include:

- a yearly "Quality of Life Report", including details of Local Agenda 21 activities, for distribution to schools, libraries, ... The report feedback forms are received from individuals through environmental organisations and are used to enhance 'better decision-making'. This is compiled on a yearly basis in Bristol (UK), and information can be found on the website http://www.bristol-city.gov.uk;
- a "State of the Environment Report"; one section is on sustainability indicators and includes the ECIs, this is in Gdansk (Poland) and information can be found on the website http://www.gdansk.gda.pl;

[43] Authors: The Sustainable Cities Research Institute, Northumbria University (Sara Lilley and Kate Theobald).

- an intended "Local Sustainability Report", to communicate how sustainability goals have been fulfilled in departmental sustainability strategies and householder "Social Reports", sent to all households, including ECIs (Ferrara, Italy);
- leaflets illustrating the role of the ECIs have been disseminated (Zaragoza, Spain).

Direct stakeholder discussions
These occurred through a number of mechanisms including:

- public debates/focus groups/citizens panels where the use of ECIs to appraise the actions of a municipality and their integration with municipal sustainability policies was discussed;
- presentations to various groups e.g. Neighbourhood Associations; this resulted in the adoption of a noise indicator in Zaragoza (Spain);
- conferences: a conference was held in Torino (Italy), and Oslo (Norway) was invited to present on its car tolling systems; the ECIs were integrated into the discussion;
- pro-active integration of the use of ECIs during official public occasions where appropriate. In Oslo (Norway), for example, when the Councillor speaks in public on official occasions, the results of the ECIs for Oslo are used; in Vitoria-Gasteiz (Spain), the ECIP and interim results were presented on 10th January, within the weekly press conference of the Mayor.

Utilisation of world wide web
Most of the respondent municipalities were using, or in the process of developing, municipal website activities for public dissemination of their usage of ECIs. Examples include:

- use of web sites to link relevant indicators with specific municipal project activities and display the results;
- explanation of their use via Local Agenda 21 web sites.

Direct mailings to stakeholders – citizens and businesses
Three municipalities used direct mailings which were either information or feedback-orientated, for example:

- local agenda 'Citizen Folder' packs, which includes all publications in relation to the LA21 process, and the publications focused on the ECIs. These are distributed to all citizens for information (Zaragoza, Spain);
- industry questionnaires. In Gdansk (Poland) a questionnaire is sent to the 40 biggest enterprises in the industry requiring information on environmental issues: emissions, solid waste, discharges into water, new investments aimed at improving the environment and information on air pollutant emissions. This relates to the ECIs and existing indicators.

Media/press
Many municipalities took the opportunity to raise the profile of the general ECI project in addition to specific linked activities within their municipality. This was done by a variety of media such as local newspapers, leaflets publicising programmes and local television. A notable example is from Vitoria-Gasteiz (Spain), this involves the dissemination via a bi-monthly digital Local Agenda 21 news bulletin. This shows how indicators change from year to year and devotes a full section to the use of the ECIs.

4.2.3 The experience of monitoring

This report will now discuss the benefits associated with the ECIs and the monitoring process as identified in the interview case studies and the web survey.

Potential benefits of ECIs
The municipalities were asked to state their main reasons for participation in ECIP. A range of reasons was cited. The first potential benefit was that ECIP was important for raising the profile of cities, which are actively promoting and working towards sustainable development policies. In addition ECIP enables

the spreading of good practice for local sustainable development between municipalities in different countries.

The ECIP permits comparisons between municipalities, based on ECIs - in the web survey, Bristol (UK) stated that the main reason for ECIs is to enable 'cross border' comparisons. ECIP has been perceived to permit synergy of the ECIs with other local/regional/national indicator systems, therefore enabling the recognition of potentially relevant local indicators where these are lacking.

In addition, in the web survey, (section 4.3.4) 'raising the awareness of the relevant issues among citizens and stakeholders', 'supporting the integration of sustainability issues with other policy priorities' and 'offering a rational basis for sustainability priorities in the decision making process' were ranked as 3rd, 2nd and 1st potential benefits of the ECIP (again it is important to note that the respondents were given a list of potential benefits to rank by importance, the respondents did not identify these as answers themselves).

The benefits of participating in ECIP

The municipalities were asked to contextualise their local involvement in the ECI project within a wider European perspective and to highlight any associated benefits of being involved in a Europe-wide project. The general view of the municipalities involved was that a proportion of the ECIs were of relevance to local policies and service provision, and a range of benefits were highlighted as described below.

Development of networks

Networking activities have helped to develop beneficial contacts with many municipalities both within and outside the ECI project. In one example, Bristol City Council was invited to participate in an Adriatic Cities Network (ACN) InterReg 3c bid, which aims to build upon the experiences of the ECI project. Other municipalities noted that there were instances of improved intra-municipal networks.

The ECIs are a tool within the LA21 process and they play a role in the restructuring of the LA21 process.

> *'At the moment, in the light of the renewed relevance acquired by LA21 in the new political setting, LA21 strategies are being redefined and ECIs play an important role in this process' (Jon Moller LA21 Co-ordinator).*

A Nordic Network of cities monitoring sustainability is being formed; their indicators system will adopt some of the ECIs, which have also influenced its creation (Jon Moller, Stockholm, and Guttorm Grundt, Oslo). The respondents generally felt that the contacts with cities within the countries were in some cases improved more than the contact with other European cities, outside of their own country.

In addition, in the web survey (section 4.3.8) Birmingham perceived the ECIP as a good networking exercise between cities to access methodologies, ECIP was described as:

> *'…raising Birmingham's profile participating with other local authorities networking and importantly access to robust scientifically sound methodologies'.*

Encouragement of shared knowledge

Sharing data on the indicators with other municipalities has provided beneficial comparisons between cities in individual countries, and with other European cities. This was reinforced by the web survey findings (section 4.3.8) as a perceived advantage of participating in the ECI project was stated as the 'shared and common system of European indicators', this was ranked as 1st as an advantage, when the respondents were asked to rank a list of advantages. In addition the respondents perceived that it was important to have a 'common pool of data that could then be of use to compare good practices' - this was jointly ranked as 1st as an advantage.

The project has enabled the municipalities to compare and evaluate their contexts with other cities, and therefore implement new solutions to issues in relation to sustainability. Subsequently the project has provided the opportunity for municipalities to gain expert advice within the ECI network.

Munich (Germany) stated that:

> *'ECI will enable a Europe-wide discussion on an innovative topic. ECIP initiates and promotes the discussion on sustainable development in Europe. ECI will tap the full methodological potential of the instrument sustainability indicator'.*

Overall, the European Common Indicator project has enabled increased access to information between municipalities in Europe, for example in Bristol (UK) it was found beneficial to share information with experts on the climate protection and Ecological Footprint.

It was suggested by some interviewees that, as the project progresses, knowledge of the city 'deepens' and new perspectives are recognised and explored.

Raising the awareness of sustainability
Raising the awareness of sustainability within the municipality was an important issue in relation to the indicators. ECIP was described as:

> *'… an opportunity for other departments to understand the policy process relating to sustainability' Oslo (Norway).*

In addition, between the interviewees there was a perception that the ECIs have increased the relevance of the sustainability and of indicators in general within the municipalities. One of the municipalities also stated that the ECI network will offer possibilities to receive updates on the latest European perspectives and being part of the ECI network will enable exchanges of examples of best practices.

This could provide a stimulus to develop new and innovative projects in the future and it was felt that these issues all contribute to raising the profile of sustainable development.

In addition, the respondents in the web survey (section 4.3.8) stated that an advantage of participating in the ECI project was 'to represent a set of indicators that may offer appropriate support to unified sustainability policies'. From the list of advantages identified for the respondents this was ranked as the 3rd most important advantage.

Comparative evaluation
Cross-comparison of the ECIs was being used by municipalities, enabling the sharing of good practices; in the web survey (section 4.3.8) this was reinforced as an advantage of participating in the ECI project. When asked to rank a list of advantages 'a common pool of data that could be of use to compare good practices' was ranked as 1st as an advantage of participating in ECIP.

Enhanced communication pathways
Improved internal communication between different departments within a municipality may assist the development of cross-departmental linkages in policy making. For example, Bristol (UK) stated that indicator 4 requires the most networking across departments, i.e. Health Department, Waste Department. In addition the "Quality of Life Report" contains questions from across all of the Departments in the municipality. In the Diputación Foral de Bizkaia (Spain) the two Departments of Urban Planning and Transport have integrated more with the Environmental Department, for the exchange of data. In Ferrara they have created a unique Department linking together the main sectors (Mobility, Land use and Environment).

4.2.4 The interface between monitoring and the policy process

Outputs of the ECIs
The 10 case studies municipalities were asked (in the interview case studies) to identify the outcomes and outputs of the European Common Indicators. Examples of specific outputs of the indicators are as follows:

- indicator 4 highlighted missing structures in relation to services and specifically the public transport system. This was demonstrated in Oslo (Norway), where the Waste Agency saw the results for the mapping of recycling services, and noticed that some areas did not have recycling points and are now working to cover these areas;

- indicator 7 has raised awareness of issues in relation to environmental management that were not previously explored. This was demonstrated in Oslo (Norway), where all agencies within the city council will have to apply environmental management systems and this will be measured by the ECIs. This was demonstrated with the launch of 'Green Wave';

- indicator 10 has spurred interest into the development of sustainable products. In Stockholm (Sweden), indicator 10 acted as a stimulant to carry out a specific investigation on this issue. In addition this was demonstrated in Oslo (Norway) with the launch of 'Green Wave'.

The impact of ECIs on the policy process
The majority of the interviewed municipalities concluded that it was too early to see clear evidence of an impact on policies through the adoption of ECIs. However, in general it was felt that the ECIs could in the future have considerable positive impacts on policy processes. This was reinforced in the web survey (section 4.3.8) as an advantage of participating in the ECI project - the statement that ECIs 'represent a set of indicators that may offer appropriate support to unified sustainability polices', was ranked 3rd by the respondents.

Indicators and policy documents
Some of the indicators have been incorporated into policy documents and subsequent initiatives within the majority of the respondent municipalities; the indicators are assisting the municipalities to use comparative data from other municipalities, improving the profile of these policy documents. The ECIs enable the municipalities to regularly monitor current policies and the indicators also raise awareness on areas for future policy making. It was also recognised that the results of the indicators are already influencing decision-making processes and the data collected has helped to support the policies developed by the Environment Departments, especially when these may be in conflict with policies of other Departments.

Reports that have incorporated the European Common Indicators include:

- the "Community Strategy Report", Bristol (UK);
- the "White Paper - Strategy for a Sustainable Development"; ECIs are being used jointly with Nordic indicators, Oslo (Norway);
- the ECIs constitute the basis of the Environmental Policy, embedded in the Sustainability Strategy, Oslo (Norway);
- in Ferrara (Italy), the "Local Sustainability Report" links into all of the ECIs.

Indicators influencing Local Agenda 21 processes
The ECIs have been integrated into the Local Agenda 21 (LA21) process in many of the municipalities. In Stockholm (Sweden), for example, ECIs are one of a number of tools within the LA21 process. Strategies regarding LA21 are being redefined and ECIs play a role in this restructuring.
In Bristol (UK), the ECIs are feeding into LA21, and this will be presented to the Local Strategic Partnership to contribute to the development of the Bristol Community Strategy. This will take into account the prior-

ities that are suggested by the ECIs. In addition, in Barcelona (Spain), it is thought that the ECIs have helped to inspire the LA21 indicators, so that they are adapted to the local context, and that are tools to monitor progress towards the ten sustainability targets defined within the framework of LA21.

In the Diputación Foral de Bizkaia (Spain), it was noted that:

> *'The fact that the LA21 process and the indicators will form part of the next commitment before the legislature will offer wide scope for the introduction of significant changes'.*

Raising credibility

The data from the indicators have raised the credibility of the Environmental Departments in tackling the requirements of sustainability. In Bristol (UK), for example, data reports are regarded as useful by other Departments and stakeholder organisations, and this has raised the credibility of the Sustainability Team. The data produced for the indicators calculation could be communicated to the public as one approach to improving the understanding of sustainability. Wider benefits were perceived through the evaluation and comparison of the data across municipalities, locally and at a European level and:

> *'… this is expected to change the political process, in as far as it will imply greater empowerment of municipalities' Diputación Foral de Bizkaia (Spain).*

It was suggested that this data could be used to support requests to higher tiers of government therefore influencing decision making. This was reinforced by the web survey (see section 4.3.4), in which it was suggested that the ECIs are currently seen as relevant in helping internal policy processes - in response to the statement that ECIs are 'offering a rational basis for sustainability priorities in the decision-making process' and 'supporting the integration of sustainability issues with other policy priorities', these were ranked 1st and 2nd respectively out of five potential impacts.

4.2.5 Future use of the indicators

The ECIs will be regularly measured by the interviewed municipalities and then evaluated for their usefulness and significance in relation to policy development for sustainability. The ECIs will provide data for the production of monitoring reports over the next years, and, the detection of any trends may provide the material for strategies to be revised to tackle key sustainability issues. In the web survey (see section 4.3.7), respondents showed how strongly they feel and how important it is to continue to develop the ECIP.

4.2.6 Problems encountered

A range of obstacles have become apparent in this pilot stage of the ECIs project. The following are problems that were encountered, although it is important to emphasise that these are a inevitable part of a new monitoring systems construction process, and are perceived rather as obstacles that can be overcome.

- **Time and resources** The indicators required a large amount of time and resources to compile the data, for example, the cost of city-wide surveys for some data is expensive. In the web survey, (see section 4.3.5) 'lack of fund' and 'lack of time' were ranked as the 1st or 2nd most important problem experienced during the participation in the ECI project, in the south and the eastern regions of Europe.
- **Methodological problems** In some municipalities the methodology was thought to be ambitious as a number of indicators requires a high level of expertise for the collection of data, for instance those that require GIS. Some municipalities found co-operation with external agencies beneficial, as this provided an expert training not available within their municipality. The methodological complexity made the availability of data for comparisons with other European cities difficult in some instances. One suggestion - made by 8 cities in the web survey - was to apply greater flexibility in the way that municipalities can adopt the indicators.

- **Lack of data** Some indicators are new, for example indicator 4 for Oslo (Norway) and indicator 10 for Gdansk (Poland), and therefore the municipalities lacked data for these areas. However, a number of the municipalities were now addressing the issue and were in the process of collecting the relevant data. In the web survey (see section 4.3.5) issues around data collection and processing appear as the next most significant problem experienced in the ECIP, ranking 3rd, 4th and 5th respectively.

- **Software tools** One concern was the lack of availability of software tools to calculate indicators. Software tools (GIS) for indicator 4 and 9 are not available to all municipalities in Italy.

- **Indicators are too broad** It was suggested by some cities that some indicators seemed too broad and too general and offer a fragmented picture. It is also difficult for some cities to see the links between the data and the process behind them, showing a specific situation but not giving operational information. The indicators should show causal links and effects between the data and an initiative (politicians need tools that are able to show causal relationships and the effectiveness of their policies).

However, it should be stressed that during the last phase of ECIP, a list of 11 headline indicators, more focused and able to show causal links have been identified. Therefore, the bottom-up process has produced an improvement in the ECI set.

4.3 Findings of the quantitative aspects of web survey responses[44]

The questionnaire survey aims at identifying the benefits and difficulties experienced by cities participating in the ECI project, and also at identifying the reasons why some other cities chose not to become involved in the project. The aim is therefore to continue to improve the set of indicators so that they respond more effectively to the diverse needs of the user municipalities throughout Europe. The web survey methodology has been described in details at the beginning of this chapter.

4.3.1 Q1. Respondents' details

There have been 78 respondents to the web based survey.
Column E in table 1 shows respondent distribution across the EU (including accession countries). A target of achieving 100 responses had been set. In order to achieve a degree of representativeness across Europe a target for each country (column D) was also set based on population sizes (column B).

As the table shows, a good distribution of respondents from across Europe was achieved. However, it is not possible to assert that this is necessarily representative. There are some significant gaps, e.g. no responses from France. It is similarly not possible to assert that the responses from the individual countries are representative of that country. The sample size is not large enough. This inhibits our ability to split the data and explore trends within it (for example, how do responses from Italy correlate to responses from eastern European countries).

Given the above, although one cannot be deterministic about the analysis, nonetheless we should examine these results as an opportunity to gain deeper insights into the functioning of ECI and with some confidence that this analysis offers a meaningful way forward.

[44] Authors: The Centre for Environment and Planning, Faculty of the Built Environment, University of the West of England, Bristol (David Ludlow, Clare Mitchell, Mark Webster).

Table 1: Geographical distribution of respondents

A Country	B Population[45]	C % of EU population (including accession countries)	D Targeted number of responses	E Achieved number of responses
Austria	8,000,000	1.77	2	1
Belgium	10,000,000	2.21	2	2
Cyprus	800,000	0.18	0	0
Czech Republic	10,500,000	2.32	2	0
Denmark	5,300,000	1.17	1	1
Estonia	1,400,000	0.31	0	2
Finland	5,000,000	1.11	1	1
France	59,000,000	13.04	13	0
Germany	82,000,000	18.13	18	7
Greece	11,000,000	2.43	2	1
Hungary	10,200,000	2.25	2	1
Ireland	3,900,000	0.86	1	1
Italy	57,500,000	12.71	13	22
Latvia	2,400,000	0.53	1	0
Lithuania	3,700,000	0.82	1	1
Luxembourg	425,000	0.09	0	0
Malta	380,000	0.08	0	0
Netherlands	16,000,000	3.54	4	3
Poland	39,000,000	8.62	9	3
Portugal	10,000,000	2.21	2	1
Slovakia	5,400,000	1.19	1	0
Slovenia	2,000,000	0.44	0	1
Spain	40,500,000	8.95	9	9
Sweden	9,000,000	1.99	2	2
United Kingdom	59,000,000	13.04	13	12
Total	452,405,000	100.00	100	71

EU Members Accession Countries

A further 7 responses have been received from non-EU Member Countries / Accession Countries (Moldova 1, Norway 3, Romania 2, Ukraine 1), bringing the total to 78 completed questionnaires.

[45]Figures collected January 2003 from http://news.bbc.co.uk/1/shared/bsp/hi/country_profiles/html/default.stm.

4.3.2 Q2. Where did you hear about the project?

Table 2: Sources for finding out about the ECI project

Have you ever heard of the European Common Indicators Project?	Yes 82% No 18%
If Yes, how did you become aware?	
Sustainable Cities & Town Campaign Newsletter	48%
Conferences	34%
Sustainable Cities & Town Campaign Networks	27%
ECIP web page	27%
Other sources	23%
Environmental Institutions in your country	17%
Colleagues	16%
EC web page	11%
Articles	6%
Local Networks	6%
NGOs	6%

A large majority of respondents (82%) had heard of the ECI project. This shows a good success of the ECI promotional/dissemination action (see chapter 2) considering that it was expressly targeted to Sustainable Cities & Town Campaign (SC&TC) members. The figures for where respondents found out about the ECIP do not add up to 100%. This is because many respondents ticked more than one box, indicating that they heard about the project from numerous sources.

The figures indicate that the 'Sustainable Cities & Town Campaign Newsletter' was the most common place for hearing about the project. A newsletter is sent regularly to all members of the Sustainable Cities and Towns Campaign, containing information on initiatives carried out within the framework of the campaign and related events. Several announcements regarding the ECI Project have been communicated through the newsletter.

The other most common places for hearing about the ECIP were 'Conferences', 'Sustainable Cities & Town Campaign Networks' and the 'ECIP web page'. 'Conferences' refers to the ones that have been organised or participated by the ECI Team, as part of the ECI promotional/dissemination action (see chapter 2). 'Sustainable Cities & Town Campaign Networks' are all the networks of local authorities within the Campaign (e.g. Climate Alliance, WHO, Energy Cities), servicing member cities and focusing on a variety of issues. Some of these networks have actively promoted ECIs among of their cities members (e.g. EUROCITIES, UBC, ICLEI). The 'ECIP web page' refers to the "main" ECI web page, hosted in the Campaign web page, permanently updated and rich in documents and information.

The 'EC web page' refers to the official web page on the European Commission DG Environment web site where the ECI Project is briefly presented and which contains certain documents of the project. 'Articles' refers to any kind of article where they may have come across the ECI Project. Where respondents indicated that they had become aware of the project through 'other sources', the most significant organisations named were the sustainability networks of PRESUD (another European funded sustainability project), Eurocities, Corso Formez, Ambiente Italia, Legambiente and the Regional Environmental Centre for Eastern and Central Europe. The remaining sources in the list are self-explanatory.

This illustrates the effective impact of the promotional/dissemination action (see chapter 2) mainly based on conferences and ECIP web site. The role played by the Sustainable Cities & Town Campaign and its Networks, although not formally engaged in promoting ECI, may represent a good starting point for future development (see chapter 5).

4.3.3 Q3. Did you take part in the project?

Table 3: Level of participation in the ECI project

Have you taken part in the project?	49%
If yes, which of the following apply to your municipality?	
Signed the voluntary agreement	82%
Collected data for the indicators	71%
Designated a person/office/department responsible for data collection	53%
Submitted data for the project	53%
Designated a person/office/department responsible for management of ECIs	50%
Intend to submit data for the upcoming deadline (31st October)	50%

Of the 78 respondents, 49% have declared they are actually taking part in the ECI project. The level of involvement of the respondents is indicated in the furthest right column.

82% of those taking part had signed the voluntary agreement. The Voluntary Agreement is the formal document cities sign and send to ECIP in order to become members of the Project[46] . This data seem to show that a part of those declaring they are taking part are still reluctant to sign the agreement. One reason for this could be that some do not want to engage themselves in sharing their data for comparison and this, of course, could represent an obstacle for full development of the initiative. A second reason could be that some of the cities are not ready to start submitting their data. 71% of those declaring that they are taking part have collected data for the indicators, but only 53% have submitted data.

A 'designated person/office/department responsible for data collection' refers to the contact person for the project in each city, usually indicated in the Voluntary Agreement. This is the person to whom the information is sent, who co-ordinates the team working on the project in his/her municipality. The survey results show that 53% of participating municipalities had a designated person/office/department and this percentage is equal to that of municipalities that have submitted data. A 'designated person/office/department responsible for management of ECIs' is either a person or a department or an office within the municipality who is responsible for managing the indicators' implementation (collecting data, quantifying indicators, introducing them in the policy process and all related activities).

Factual and more detailed data on level of participation are presented in the chapter dedicated to respondents and data analysis, where the negative "gaps" showed by the survey are confirmed by the reality that not all the signatories have been able "to respect the agreement" as they have failed to submit their data. It clearly emerges that some of the signatories have dedicated little attention to the practical commitment related to the signature.

Another reason, which is highlighted by the interviews, is the fact that the time available for data collec-

[46] An electronic copy of the Voluntary Agreement is available on the project web site in the 'Documents' section.

tion could have not been enough for the majority of the signatories, in particular for those that have signed the agreement in 2002-2003. A final probable reason, similar to that determining the gap between Aalborg signatories and Agenda 21 effective implementations, could be that a part of the signatories have been involved in changes due to political elections, turn over in the local organisation and have probably "lost the way" towards ECI implementation.

The respondents who had taken part in the project were also invited to supply any additional comments. A few municipalities indicated that although they had taken part in the project, they had only monitored some of the indicators: Mantova and Reggio Emilia (Italy), Seville (Spain), Vaxjo (Sweden).

4.3.4 Q4. Potential impact of ECIs

Respondents were asked:

> 'Please rank the following potential impacts of ECIs in increasing the effectiveness of sustainability policies for your municipality (1= most important, 5= least important)'

Note: The question quite specifically refers to the potential impacts of the ECIs. However, as all the responses for this question are from municipalities who took part in the project, it is reasonable to assume that some of the impacts have been realised, and are not just 'potential'. It is important to note though that the question did not ask 'what are the actual impacts' so we cannot assert that the responses given are actual impacts.

Table 4: Potential impact of the ECIs

(Rank the following 1-5, 1 most significant)	Mean	Mode	Ranking
Offering a rational basis for sustainability priorities in the decision-making process	2.8	2	1
Supporting the integration of sustainability issues with other policy priorities	2.8	3	2
Raising awareness of the relevant issues among citizens and stakeholders	3.1	3	3
Improving the effectiveness of public communication on sustainability issues	3.2	5	4
Engaging stakeholders in sustainability issues	3.7	5	5

Table 4a: Analysis of question 4 based on population size

	Pop < 100,000		100,000 < Pop < 400,000		Pop > 400,000	
	Mean	Mode	Mean	Mode	Mean	Mode
Offering a rational basis for sustainability priorities in the decision-making process	2.67	2	2.43	2	2.58	2
Supporting the integration of sustainability issues with other policy priorities	2.83	1	3.29	4	2.25	3
Raising awareness of the relevant issues among citizens and stakeholders	3.33	4	3.00	3	3.25	3
Improving the effectiveness of public communication on sustainability issues	2.33	1	4.29	5	3.42	2
Engaging stakeholders in sustainability issues	4.17	5	3.29	3	3.75	5

Table 4a shows differences between small municipalities, that rank the potential to 'improve the effectiveness of public communication on sustainability issues' as the most significant benefit of the ECIP, and medium-sized municipalities, that rank this as the least significant.

Although the results in table 4 indicate that the options referring to stakeholders and communication with the public are ranked 3rd, 4th and 5th, this does not necessarily indicate that they are not useful, but perhaps that cities see the other attributes as more relevant at this period in time. In fact, table 4 suggests that the ECIs are currently seen more importantly to help internal policy processes, 'offering a rational basis for sustainability priorities in the decision making process' and 'supporting the integration of sustainability issues with other policy priorities'. These were ranked 1st and 2nd respectively.

Consideration must be given to the fact the ECIs are still in the early stages of development and the potential impact might not be completely clear at this stage.

4.3.5 Q5. Barriers to participation of those taking part

The question asked

> 'If you wish to participate in the project, which of the following would you consider as the more significant barriers to your involvement (1= most significant, 8= least significant)'

Considering that the question was only open to those who have taken part in the ECI project, the question should be rephrased and read as 'What problems have you experienced during your involvement in the project'.

Table 5 shows that the 'lack of funds' and 'lack of time' were regarded and the most significant barriers to involvement, receiving the lowest mean scores and a mode score of 1.

The 2001-2002 ECI project were launched with the aim to promote ECI (web, conferences, …) and to offer a concrete support to all ECI participants in terms of networking, good practices exchanges, methodology refinements. The voluntary based approach means that each participants has to dedicate its own resources to the local implementation (data collection, surveys, data processing,…). Considering the amount of data produced and collected in such a way (see chapter 3), it means that an added value of the ECI project is also its cost/effectiveness. But the survey shows that 'the lack of funds at local level' issue still remain a problem that could represent a serious obstacle for the ECI future development. With regard to the 'lack of time' issue, the survey (and mainly the interview) shows that the amount of time (by the end of 2002 for producing the data) envisaged for participating were probably underestimated.

Table 5: Problems experienced during participation in the ECI project

(Rank the following 1-8, 1 most significant)	Mean	Mode	Ranking
Lack of funds	2.78	1	1
Lack of time	2.84	1	2
Problems with gaining access to raw data	3.35	1	3
Problems with technical aspects in the collection phase	3.81	6	4
Problems with processing activity	4.30	3	5
Lack of skills	5.08	5	6
Lack of interest or support from your municipality	5.22	8	7
Difficulties in communicating your results to stakeholders	5.81	8	8

Table 5a: Regional analysis of question 5

	Southern		Northern		Central and Western		Eastern	
	Mean	Mode	Mean	Mode	Mean	Mode	Mean	Mode
Lack of funds	2.5	1	3.8	na	3.5	3	2.3	1
Lack of time	3.2	2	2.5	na	1.0	1	3.4	1
Problems with gaining access to raw data	4.5	5	3.3	2	4.0	5	3.9	4
Problems with technical aspects in the collection phase	5.1	8	4.8	na	4.5	na	3.4	3
Problems with processing activity	3.2	3	6.3	5	4.8	na	3.6	2
Lack of skills	3.8	5	6.3	6	6.3	8	5.4	5
Lack of interest or support from your municipality	4.2	3	5.3	8	3.7	2	7.1	8
Difficulties in communicating your results to stakeholders	5.7	7	7.8	8	5.8	8	5.3	7

note: na indicates that there was not a mode figure, i.e., no ranking was repeated.
note: Sample sizes are small: Southern Europe 21 (weighted towards Italy 12/21) Central and Western Europe 6
Northern Europe 4 Eastern Europe 7

Table 5a shows that 'lack of funds' are seen as the 1st or 2nd most important barrier in all regions of Europe apart from northern and central and western Europe.

Table 5 shows that issues around data access, collection and processing appear as the next most significant, ranking 3rd, 4th and 5th respectively. Given that the project is focused on the use of indicators and monitoring, it is not surprising that attention is given to these areas.

It could be of concern for the project that data problems are ranked so highly as barriers during the project, but has to be also considered that one of the specific aims of the project was precisely that of stimulating the collection of new data. It was felt that local relevant data were often lacking and the project aimed at starting up a virtuous cycle in this respect. Further the integrated methodolo-

Table 5b: Analysis of question 5 based on population size

	Pop < 100,000		100,000 < Pop < 400,000		Pop > 400,000	
	Mean	Mode	Mean	Mode	Mean	Mode
Lack of funds	2.00	1	2.57	1	3.17	3
Lack of time	2.67	1	2.71	1	2.42	1
Problems with gaining access to raw data	2.33	3	3.86	1	3.00	4
Problems with technical aspects in the collection phase	4.33	6	2.57	1	3.75	3
Problems with processing activity	3.50	2	3.14	3	4.58	5
Lack of skills	4.17	3	5.29	5	5.00	5
Lack of interest or support from your municipality	5.33	8	5.14	8	4.42	2
Difficulties in communicating your results to stakeholders	5.17	7	4.14	2	6.17	8

gies require often scattered data to be collected together and such difficulties are therefore an unavoidable consequence of new methodologies being introduced in older processes.

Table 5b shows some interesting differences between different sized municipalities. 'Lack of time' appears to have been a greater problem for large municipalities. Whilst 'lack of funds' is a significant issue for all groups, the data indicates that it becomes more of an issue the smaller the municipality - indicated by the decreasing mean.

It is encouraging that in table 5 'lack of support from your municipality' is ranked as low as 6th, with a mode score of 8, indicating that many respondents did not experience a lack of support. However, table 5a shows that in southern and central and western Europe this is the 4th and 3rd highest ranking reason respectively for not taking part.

Interestingly, issues around stakeholders again rank very low, 8th place in table 5. Merging the results from Q4 and Q5 it is possible to assert that municipalities feel confident that they are able to communicate with stakeholders, as communication is not ranked as a problem.

4.3.6 Q6. Barriers preventing those not taking part

The question asked was

> 'If you have not taken part in the project, please rank the following reasons for not participating (1= most significant, 8= least significant)'

Table 6 shows that 'lack of time' is ranked as the most significant barrier. However, using quartile analysis (middle 50%), the highest ranking reason for not taking part is being 'not aware of the project's existence' showing a need for further promotional actions. The 8 placed ranking of 'not interested in issues raised' is encouraging, indicating that the ECI project is addressing issues relevant to European municipalities.

Table 6b shows a few interesting differences between municipalities of different size. For large municipalities the highest ranked reason for not participating was the fact that 'other systems were already in place' (mean 1.5, mode 1), whereas for medium-sized and small municipalities this was rated the least, or second least, important factor, with a mode of 8.

Another difference is for being 'not aware of the ECIP project's existence', for large municipalities this was not ranked highly as a factor (mode of 8), but for small and medium-sized municipalities this appears to be a factor, with a mode score of 1.

Table 6: Barriers preventing municipalities joining the ECI project

(Rank the following 1-8, 1 most significant)	Mean	Ranking
Lack of time	3.73	1
Not aware of the project's existence	3.85	2
Lack of funds	4.13	3
Lack of interest or support from your municipality	4.55	4
Other systems already in place	4.65	5
Stalling of policy process	4.98	6
Lack of skills	5.23	7
Not interested in issues raised	6.30	8

Table 6a: Regional analysis of question 6

	Southern		Northern		Central and Western		Eastern	
	Mean	Mode	Mean	Mode	Mean	Mode	Mean	Mode
Lack of time	4.0	8	4.3	na	4.0	1	2.4	2
Not aware of the project's existence	3.5	1	3.3	1.0	4.5	8	3.8	1
Lack of funds	5.7	8	5.3	na	4.0	1	1.8	1
Lack of interest or support from your municipality	4.2	5	6.7	8	4.9	8	5.0	4
Other systems already in place	7.6	8	7.7	8	4.0	8	5.4	8
Stalling of policy process	4.8	8	6.0	8	5.5	8	4.6	6
Lack of skills	4.1	1	4.3	na	6.1	8	5.4	7
Not interested in issues raised	6.4	8	7.3	8	7.0	8	5.6	5

Table 6b: Analysis of question 6 based on population size

	Pop < 100,000		100,000 < Pop < 400,000		Pop > 400,000	
	Mean	Mode	Mean	Mode	Mean	Mode
Lack of time	1.40	1	3.92	3	3.25	1
Not aware of the project's existence	4.40	1	3.54	1	5.75	8
Lack of funds	3.60	3	3.62	1	4.00	1
Lack of interest or support from your municipality	4.60	4	4.38	3	5.13	8
Other systems already in place	6.00	8	5.38	8	1.50	1
Stalling of policy process	3.80	2	4.69	6	5.25	5
Lack of skills	5.20	na	4.54	7	6.25	8
Not interested in issues raised	6.20	7	6.54	8	5.75	8

'Lack of time' is ranked highly by all 3 groups, however small municipalities gave this a mean score of 1.4, a very low mean.

The respondents were also invited to supply any additional comments.

Seventeen municipalities responded. A significant number (9: Antwerp, Wuppertal, Dresden, Saarbruecken, Leipzig, London Barnet, Aberdeen, Cambridge, Nottingham) of municipalities commented that the key problem regarding the project was the difficulty in combining local issues and local aims with common indicators. They suggested developing more detailed and complete indicators that incorporated local issues. Three municipalities indicated that they would like to know more about the project (Ungheni, Aretxabaleta and Agaete). Seven municipalities mentioned that they had not taken part in the project as they were already involved in other indicator projects. Germany use indicators included in the "Ecobudget System"; London Barnet those of "Best Value Performance Indicators" (authority's own sustainability indicators); Cambridge the "LGA Indicators Group", Nottingham the "UK Audit Commission Quality of Life Indicators". It is noticeable that some of these systems have already adopted some of the ECIs.

4.3.7 Q7. Should the ECI project continue to be developed?

The question was answered by all respondents completing the questionnaire.

The question asked was:

"On a scale of 0-10, how important is it to continue to develop the ECI Project within the European context?"

Table 8b shows an interesting trend. The data indicates that, whilst all groups rank highly the importance of continuing the ECIP, support increases as the size of the municipality diminishes, as indicated by the increasing means and modes.

The results in table 7 show strongly that respondents feel that it is important to continue to develop the ECI project. It is worth noting that the mean score for respondents who have not taken part in the ECIP project was slightly higher (column E - 8.1) than the mean score for respondents who had taken part (column D - 7.2).

Table 8 indicates in more detail the distribution of scores from all respondents. The further analysis in table 8a shows that opinion appears divided across the 4 regions of Europe. Southern and eastern Europe give a mean score of 8.2 and 8 respectively, whereas central and western Europe give a mean of 6.9 (and a mode of just 5).

Table 7: Should the ECI project continue to be developed?

A	B	C	D	E
	All Mean	All mode	ECI mean	Non ECI Mean
On a scale of 0-10, how important is it to continue to develop the ECI Project within the European context?	7.4	8.0	7.2	8.1

Table 8: Distribution of rankings for question 7

Ranking Given	% of respondents giving this ranking
1 to 4	5%
5 to 7	31%
8 to 10	64%

Table 8a: Further analysis of question 7

Southern		Northern		Central and Western		Eastern	
Mean	Mode	Mean	Mode	Mean	Mode	Mean	Mode
8.2	10	7.7	8	6.9	5	8	8

Table 8b: Analysis of question 7 based on population size

How important is it to continue development of ECIP		
Pop < 100,000	100,000 < Pop < 400,000	Pop > 400,000
8.82	8.08	7.20
10	8	7

4.3.8 Q8. Advantages of participating in the ECI project

Table 9b identifies two significant variation between municipalities based on their size. The usefulness of the ECIs to 'represent a set of indicators that may offer appropriate support to unified sustainability policies' appears to diminish as the size of the municipality increases, as indicated by the rising mean and mode. Table 9b also indicates that the ability of the ECIs to 'build and improve skills for the implementation of sustainability indicators' appears to increase as the size of the municipality increases, as indicated by the decreasing mean and mode.

Table 9 shows that for all of the four options given in the question, the mean ranks were extremely similar. It is only really possible to separate them by using the mode rankings. Using quartile analysis (middle 50%), all four options had an equal score of 2, suggesting that all four options were equally important. Therefore, we can say that of the municipalities that responded all for the options were seen as advantages of the ECI project.

Table 9: The advantages of taking part in the ECI project

	Mean	Mode	Ranking
Shared and common system of European indicators	2.3	1	1
Common pool of data that could then be of use to compare good practices	2.3	1	1
Represent a set of indicators that may offer appropriate support to unified sustainability policies	2.4	2	3
Build and improve skills for the implementation of sustainability indicators	2.4	2	3

Table 9a: Regional analysis of question 8

	Southern	Northern	Central & Western	Eastern
Shared and common system of European indicators	2	1.9	2.4	2.5
Common pool of data that could then be of use to compare good practices	2.6	2.3	2.3	2.2
Represent a set of indicators that may offer appropriate support to unified sustainability policies	2.6	3	2.7	1.8
Build and improve skills for the implementation of sustainability indicators	2.6	2.9	2.6	2.3

Table 9b: Analysis of question 8 based on population size

	Pop < 100,000		100,000 < Pop < 400,000		Pop > 400,000	
	Mean	Mode	Mean	Mode	Mean	Mode
Shared and common system of European indicators	2.00	3	1.90	1	2.20	1
Common pool of data that could then be of use to compare good practices	2.82	4	2.10	2	2.60	3
Represent a set of indicators that may offer appropriate support to unified sustainability policies	1.64	2	2.65	3	2.90	4
Build and improve skills for the implementation of sustainability indicators	2.73	4	2.70	3	2.45	2

Table 9a gives additional depth into Q8. Two significant variations are observed. 'Represent a set of indicators that may offer appropriate support to unified sustainability policies' is ranked least important by all regions except eastern Europe, where it is ranked most important. Similarly, 'shared and common system of European indicators' is ranked least important by eastern Europe, but most important by the other regions.

The respondents were also invited to supply any additional comments regarding the advantages of their municipality participating in the project. Oslo commented that all points were very relevant and the answer would depend on what context the points were put in. Seville, Plymouth, Leipzig and Agaete referred to the importance of the shared and common system of European indicators to make cross border comparisons. Birmingham commented that their involvement was not anything to do the named advantages, the most important advantage for them being "the raising of Birmingham's profile, participating with other local authorities, networking and importantly to access scientifically sound methodologies". This qualitative comments represents an "added value" to ECI.

4.3.9 Q9. Actions for the European Commission

The respondents were requested to identify specific actions that the European Commission and member countries should take into account in order to continue and to improve the ECI Initiative. There were 39 responses to this question. Four common areas of action were identified:

■ **Indicators** Seven municipalities (from Belgium, Denmark, Finland, Germany, The Netherlands and United Kingdom) expressed concern regarding the comparability of data. A common suggestion was to strength the setting of common methodologies, standards, definitions and indicator values.
Nine municipalities (from Denmark, Germany, Italy, Romania, Slovenia, Spain and The Netherlands) suggested to add to main indicators (as a frame) some additional indicators to enable cities to characterise their individual situation and local priorities. Genova commented that it would be interesting to analyse the extension of the ECIs to wider areas than municipalities and the relevant problems.
Ravenna suggested linking the ECIs to new tools such as environmental accounting and eco-budgets.
Oslo suggested: 'Continue to refine methodology; get more cities to submit data; publish a report with best practices (where to learn about what); include themes like waste biodiversity and water; use ECIP results as basis for the European Sustainable City Award 2004'. Elblag also commented on more information concerning the progress of works.

■ **Education** Six municipalities (from Italy and Spain) made a common suggestion for further workshops within countries to share their experiences. Seven Municipalities (from Italy, Romania and United Kingdom) referred to increasing the awareness of the public to the project. Suggestions included television, newspaper and environmental central authorities.

■ **Funding** Twelve municipalities (from Finland, Germany, Greece, Italy, Poland, Romania, Slovenia, United Kingdom and Ukraine) referred to the issue of additional funding from the European Commission. Suggestions included increasing EC funding to those who supported the European Common Indicator Initiative (Greece and Italy).

■ **Directives** Two municipalities (from Germany and United Kingdom) recommended that the European Commission use the European Common Indicators to monitor the implementation of Directives.

4.4 Examples of good practice[47]

This section will identify general examples of good practice or interesting aspects that have developed as a consequence of the ECIs, as identified in the interviews with the municipalities and in the web survey. The examples of good practice are discussed in themes:
■Policy integration. ■ Participatory approaches. ■ Development of new techniques.

4.4.1 Policy integration

Bristol (UK)
The ECIs are used to highlight, monitor and improve on themes that have local relevance. They are feeding into Local Agenda 21 and will be presented to the new Bristol partnership (the key Local Strategic Partnership (LSP)) to help to develop the Bristol Community Strategy (a statutory requirement is that Community Strategies contributes to sustainable development in the UK). Receiving the information on the ECIs, taking into account priorities suggested by ECIs will support the Local Strategic Partnership in developing a more relevant Community Strategy. According to an officer at Bristol, this type of information, together with data on crime, drug consumption and other issues, is being increasingly used by the LSP to inform decision-making (Martin Fodor, Policy Development Co-ordinator in Sustainable City Team within the Sustainable Development Department, Bristol, UK). In addition, ECIs are integrated into the Quality of Life Report, thus integrating sustainability indicators into other fields. The LA21 group defined land use in a similar way to ECI 4, and data for ECI 4 was then used. The LA21 group looked into whether the city was sustainable in economic terms, for example whether its neighbourhoods are too densely populated to guarantee citizens a better quality of life. All of this information was put together; i.e. that on services from ECI 4 and on population density, employment density from LA21 indicator on land use. The outcome was a series of ward maps containing extremely useful information for urban planning, and this has been fed into the community strategy.

Diputación Foral de Bizkaia (Spain)
The ECIs contribute to the integration between policy areas, and the Urban Planning Department and the Transport Department are intending to integrate more with the Environment Department. They are aware that the Environment Department holds data also relevant to their work and that therefore there is an increase in credibility due to having tangible data. This may provide greater opportunities to influence the policy process.

Barcelona (Spain)
The 'Commitment towards sustainability' is signed by all stakeholders within the Council, and the ECIs are one of the tools to monitor the trends towards the targets set within the process. The ECI programme therefore helps to monitor progress toward sustainability within the LA21 process.

Ferrara (Italy)
The fact that ECIs are included in CLEAR, this is the Environmental Budget, submitted to the Municipal Council together with the Financial Budget contributes to them gaining the highest status possible within a municipal context (within Italy). This may have significant repercussions on the policy processes related to sustainability (Michele Ferrari, Ferrara). The integration of ECIs in town planning schemes means that the ECIs are one of the decision-making tools used in the municipality, and they have been instrumental in introducing sustainability into urban planning and management at all levels.

Stockholm (Sweden)
The ECIs play a key role in the development of LA21 strategies.

> *'At the moment, in the light of the renewed relevance acquired by LA21 in the new political setting, LA21 strategies are being redefined and ECIs play an important role in this process' (Jon Moller LA21 Co-ordinator).*

Recently a Nordic Network of cities monitoring sustainability has been formed; their indicators system will adopt some of the ECIs, which have also influenced its creation (Jon Moller, Stockholm, and Guttorm Grundt, Oslo).

Oslo (Norway)

> *'There were no urban sustainability indicators in Norway, until a few years ago. Thus, Oslo adopted ECIs and has subsequently contributed to the definition of the national set of indicators with the ECI methodology' (Guttorm Grundt, Oslo).*

The "White Paper - Strategy for a Sustainable Development" will be influenced specifically by the ECIs. 'The ECIs will contribute to shaping the structure of the document' (Guttorm Grundt, LA21 Co-ordinator, Oslo).

[47] Authors: The Sustainable Cities Research Institute, Northumbria University (Sara Lilley and Kate Theobald)

The Urban Ecology Programme in the White Paper will be in place for four years, and the ECIs will be used jointly with Nordic indicators once these will be defined.

'The ECIs determined an increase in the relevance of some sustainability themes already dealt with by the municipality. Further, they have raised awareness on the issues of environmental management (ECI 7) and ecolabelled goods used by the administration (ECI 10), with new surveys and activities being carried out following data collection for the indicators' (Signe Nyhuus, Statistical advisor, Oslo).

Tampere (Finland)

'The Environmental Protection and the Planning and Financial Department share the management of the indicators, mainly on the basis of their respective competence. However, the definition of the role for a Promoter of Sustainable Development within the City Central Administration, who is also the current manager of the ECI Project, indicates the Municipality's attempt to fully integrate sustainability concerns – and ECIs with them – at all levels of the policy process' (Outi Teittinen and Antonia Sucksdorff, Tampere).

Zaragoza (Spain)

'Transparency has always inspired the municipality in the field of sustainability. Universities and business organisations have been involved in the work on ECIs and this has eliminated credibility problems with other departments and associations' (Javier Celma, Zaragoza).

4.4.2 Participatory approaches

Bristol (UK)

The ECIs have enabled Bristol to compare wards within Bristol, and to compare itself as a whole with other cities in Europe. Networking activities have helped to develop beneficial contacts with many municipalities both within and outside the ECI project. In one example, Bristol City Council was invited to participate in an Adriatic Cities Network (ACN) InterReg 3c bid, which aims to build upon the experiences of the ECI project.

Diputación Foral de Bizkaia (Spain)

Data on mobility (ECI 3) has demonstrated to be relevant to the Transport Department and as a consequence, the Environmental Department has taken part in interdepartmental meetings on transport issues.

Gdansk (Poland)

In the presentation of the "State of the Environment Report" to the media, there is mention of sustainability indicators including the ECIs. Feedback from this was presented to the public.

Barcelona (Spain)

'The People's Commitment toward Sustainability', Barcelona LA21 Document, contains most of the ECIs in their relevance to the local context; these indicators have been submitted to all the stakeholders represented within the Forum, who have also committed themselves to effective data collection' (Barcelona, Group Interview).

Oslo (Norway)

The ECIs are used in public debates within the municipality. The mobility indicator (ECI 3) has been used in the debate on public transport in Oslo, and its data were used in all communications to the general public. ECI 7 and ECI 10 have contributed to the launch of 'Green Wave', the aim of which is to raise awareness on environmental management and sustainable products.

Stockholm (Sweden)

The ECI results have helped connecting different processes across areas in the administration. This has influenced other departments in the municipality to think about issues relating to sustainability.

Zaragoza (Spain)

'Leaflets illustrating the ECIs role within the LA21 process have been distributed. Furthermore, a substantial number of the publications for the "LA21 citizen folder" published by the municipality, were

focused on the ECIs; the folder builds up as the LA21 process continues. All these documents are also made public in the newly built Cultural Centre on Water and the Environment and have been presented to neighbourhood associations. Feedback is still of a general nature, but has encouraged continued implementation of the indicators' (Javier Celma, Zaragoza).

4.4.3 Development of new techniques

Diputación Foral de Bizkaia (Spain)

'A pilot study to realise an acoustic map according to the latest European Directive on noise, as also reflected in indicator 8, is now being undertaken in one of the municipalities. If the study proves successful, the technique will be transferred to all municipalities, which will thus be able to collect the appropriate data for indicator 8 by approximately 2004' (Diputación Foral de Bizkaia, group interview).

Ferrara (Italy)

'The Territorial Department (including the Urban Ecology, Public Works, Urban Planning) is a new operative department, that has been created ad hoc to use sustainability indicators in the definition of all management documents, such as CLEAR and the town-planning scheme' (Ferrara, Italy).

Vitoria-Gasteiz (Spain)

There is dissemination of the ECIs via a bi-monthly digital Local Agenda 21 news bulletin. This shows how the ECIs have changed from year to year and devotes a full section to the use of the ECIs. In addition ECIs have contributed to the consolidation of the SI@M initiative (Sistema de Informacion Ambiental). This is an environmental information system, situated in the IT department and builds on a GIS system to support planning and other decisions at municipal level. This system is then used to disseminate information to the general public.

'The ECIs have represented a further stimulus to develop it and have effectively shown that all the efforts made throughout the years to collect data served an important purpose' (Juan Carlos Escudero Achiaga, Vitoria-Gasteiz).

Gdansk (Poland)

Under a new environmental law, which is complying Poland with EU regulations, Gdansk will focus on noise policy to ensure this conforms to European standards. A new acoustic map will be prepared and the methodology of indicator 8 will be taken into account as an alternative to that actually in use.

Oslo (Norway)

ECIs have initiated awareness of a lack of research in certain areas, therefore encouraging further investigations. As an example, the Waste Agency saw the results for the mapping of recycling services for ECI 4, and it noticed that some areas of the city did not have recycling points and are now working to cover these areas. No national indicators existed previously in Oslo. The national indicators are now being developed and these draw upon the ECIs.

'Citizens were unsatisfied with the quality of the environment in the city area and the need arose for indicators to allow the municipality to monitor the situation, now ECIs enable this' (Guttorm Grundt, Oslo).

Stockholm (Sweden)

ECI 10 triggered a pilot survey on the consumption of products promoting sustainability.
In addition, the Urban Planning Department hired an engineer to research the use of GIS for the calculation of indicator 4.

Zaragoza (Spain)

The adoption of ECIs has encouraged co-operation between municipalities and universities. After quantifying ECI 4, the university realised the importance of the information collected and intends to carry on refining calculation techniques on behalf of the municipality.

Ferrara (Italy)

The ECIs have acted as a catalyst to improving data processing skills. It was suggested that the ability to use a GIS is a new skill acquired in the process of quantifying ECI 4. This was in co-operation with external experts.

5 Conclusions

5.1 Value of the ECI project and reasons for continuing and improving it: the point of view of end user local authorities

On the basis of the findings (reported in details in the previous Chapter) of the 22 interviews/10 case studies (10 cities implementing the ECIs) and of the qualitative aspects of the 78 web survey responses (ESC&TC members), the authors of the evaluation (The Sustainable Cities Research Institute, Northumbria University) have developed the following synthesised conclusions:

1. The regular monitoring of local sustainability processes and policies, through comparative evaluation, is one approach to supporting local authorities in their work towards sustainability and to providing comparable information on their progress towards sustainability. The European Common Indicators Project has established a shared system of indicators, which enables municipalities across Europe to compare themselves with each other with the aim of establishing good practice for sustainability.

2. The European Common Indicators (ECIs) have contributed to raising the awareness of sustainability within the municipalities, through the exchange of data across Departments. The communication of the results of the indicators with external stakeholders is one way in which awareness of sustainability could be improved; the municipalities have identified numerous examples of this, as has been discussed.

3. The ECIs have, in some cases, been integrated into influential policy documents, however it is not yet possible to comment on the impact of the ECIs on policy outcomes. Nevertheless the indicators are already perceived as informing decision-making processes, and providing the municipalities with the data to enable comparisons against other cities. This in itself can help to support arguments for changing and improving policies. The ECIs have been described as: *'ultimately representing a good starting point for debate and policy and action'* and in addition *'ECIs have been a relevant factor in defining the political party assigned to policy areas in relation to sustainability' (*Oslo, Norway).

4. It is important therefore, as identified in the interview case studies and also in the web survey, that the municipalities continue participating in ECIP, and adopt the indicators over a period of time, so that the trends can be established. This will then show the impact that the ECIs can have on policy processes, as currently ECIP is in the early stages for the municipalities. Overall, the ECIP has provided numerous advantages for the municipalities and was seen as a beneficial process for them.

On the basis of the findings of the quantitative aspects of the 78 web survey responses (as reported in details in the previous chapter), the authors of the evaluation (The Centre for Environment and Planning of University of the West of England) have developed the following synthesised conclusion:

Although it is not possible to confidently assert that the findings of the web survey responses are fully representative of the 'European View', the data does come from 78 different municipalities in 22 different countries across Europe. Findings are encouraging for the future of the ECIP. Respondents overwhelmingly wish to see the project continue (Question 7) and support the suggested advantages of the project (Question 8).

Synthesised comments and conclusions have been expressed also by some "key actors", mainly cities Networks, representing a large number of cities in Europe.

The members of the ESC&TC - European Sustainable Cities and Towns Campaign's Steering Committee[48] have developed an internal work and debate about monitoring and evaluation mechanisms (Integrated Thematic Working Session on Evaluation). The 2002 final paper, summarising the common vision on the subject, has underlined the positive role played by the ECI Project and has recommended the European Commission to continue ECI and to integrate it with other evaluation mechanisms (more aimed to monitor the qualitative aspects of the Local Agenda 21 implementation, as LASALA). Asked for a more detailed comments about 'reasons for the interest in the ECIs', they stated that the Campaign:

- supports the European Common Indicators project and recommends their continued development as one tool for the monitoring of sustainable development at the local level within the European context;
- also considers it essential that the European Common Indicators become integrated into other evaluation mechanisms, rather than being developed purely as a one off initiative;
- is prepared to continue working the ECIs and encourages Campaign signatories of the Aalborg Charter to sign up to them and use them as a complementary tool to the many already existing evaluation and indicator systems that have been developed at the local level.

The REC - the Regional Environmental Centre for Eastern and Central Europe, in the framework of a PHARE Project titled "Support to local administrations" has developed a specific sub-task with the objective to support local authorities from the Candidate Countries participating in the European Common Indicators Initiative. The Project Final Report (January 2002) stated that:

- adoption of the European Common Indicators in the Candidate Countries can help local authorities participate in the accession process, provided national language support is available. It is a tool that they can use to work towards sustainability and to improve compliance with environmental legislation;
- given the slow start of the ECI initiative in both member and candidate countries, additional incentives and support will be needed in order to maintain the momentum begun in this project.

The 7 largest cities of the Nordic countries (Stockholm, Göteborg, Malmoe, Copenhagen, Oslo, Helsinki and Reykjavik) are working together, since 2002, with the goal of reporting 11 environmental indicators (to be presented in August 2003 during the annual meeting involving city environmental directors and politicians). These countries are working on the definition of a common methodology to adopt, using ECI as the model to be simplified and adjusted according to Nordic cities specific conditions. In particular, they will adapt some methodologies and they will integrate the current ECI set with issues as Ocean Pollution, Energy Use, Household Waste. They also aim at *"reporting to the ECI initiative as an input on how to use the ECI methodology and knowledge gained from a dialogue between experts in different cities, inspired by the ECI workshops and exchanges"* (Jon Moller, Stockholm). During one of their last meetings, 7th February 2003, they stated that: *"In general there is a positive feeling working with the ECI and it is felt that a continuation would be preferable"* and *"the cities at the meeting felt that some of the indicators has been very inspiring to work with and has given positive side effects in the cities administration. Other indicators has been more difficult for the cities to obtain data for… The indicators can be used in different ways: internal comparison and comparison with other countries. The internal comparison and cross departmental work can sometimes be the greatest benefit of the work done".*

The Conference Report prepared by ICLEI after the 'Johannesburg+Europe, Follow up' Conference (organised by City of Kolding, other Danish partners and ICLEI in Kolding, Denmark, 4-5 November 2002) stated the "10 Kolding Key Political Reflections".

The description of one of the 10 Points (n. 3: "Local sustainability strategies for Europe rely on European and national support for LA21 and require good governance at local level") contains the following: *"Participants*

[48]Made up of: ACRR, Climate Alliance, CEMR, Energie-Cités, Eurocities, ICLEI, Medcities, UBC, UTO, WHO, Italian association for LAG21

agreed that numerous examples and tools are available at the local level within Europe that could have an increased impact, for example, sustainability reporting, indicator initiatives such as ECI, …".

ICLEI has been developing from many years a specific action in the field of local indicators (by means of the Ecobudget Project, in fact, ICLEI supports cities in working together with a common method, integrating local indicators with targets and using them as a tool in policy decisions) and in the field of evaluation mechanisms (by means of LASALA, a self-assessment methodology on Local Agenda 21 mainly based on qualitative aspects). Considering this specific experience and its territorial diffusion, ICLEI's point of view represents another key factor for the future development of ECIs. This is specially valid considering the priority to involve German cities, currently engaged with their own systems or with Ecobudget (in the web survey responses, the existence of other monitoring systems is ranked quite highly as a factor inhibiting involvement in the ECI project). A concerted action with ICLEI could address cities to strength synergies with ECI set.

ICLEI has never been officially involved in the development of the ECI programme and has left to its members discretion the choice to join or not the ECI project. Nevertheless, ICLEI have *"followed with interest the development and achievements obtained since their launch in Hannover, as ECI represents one of possible operating models in terms of sustainability indicators".* Moreover *"as it coincides very well with the LASALA on line kick off, ICLEI appreciates very much the work that has been done in the field of ECI, and welcomes the evaluation that is being carried out currently as it will help it to define further action"* (Gino van Begin, ICLEI).

5.2 Value of the ECI project: main signals emerging from 2001-2002 data collection and processing phase

Data collected by means of ECI Project, coming from 42 ECI respondents in 14 countries, if not exhaustive for a complete EU level assessment is already a good representation of different "sustainability patterns" in small, medium-sized and big European cities (including wider areas as Provinces) in different regional areas.

If it's true that the "comparison exercise" must be developed with great caution, far from being deterministic, we should anyway examine these results as an opportunity to gain deeper insights into the ECI data and with some confidence this analysis offers a meaningful way forward, also taking into consideration that the ECI value as an opportunity to "compare each other" has been emphasised and requested by a large number of cities (see chapter 4). Moreover it's clear that data should be considered and interpreted mainly in the local context and, only under certain condition, as a benchmarking at European level.

Chapter 3 contains the detailed analysis of the data on the 10 indicators. The following is a critical synopsis intended to outline the main phenomena and signals to be inferred from the analysis, which in turn could form the main focus of development for European policies, both national and local. Recommendations to this respect are also to be found in chapter 6.

A greater amount of data and a more profound knowledge of the various local contexts and policies would possibly give the analysis deeper insights (and avoid oversimplifications); however, the data collected through ECI confirm that Urban Transport and Urban Design, Land Use and Urban Construction represent the main priorities of European and Local Policies for the Urban Environment.

New themes also emerge, such as the environmental and energy efficiency of production processes and products and the sustainable management of private/public sector.

A first indication is to be found in the data on Indicator 5 (Quality of the air), showing the criticality of air pollution: 12 (out of 23) urban areas have exceeded (often for a considerable number of times) the PM_{10} limit value to become binding Europe-wide as from 1st January 2005. A similar level of criticality applies to Ozone: 8 urban areas out of 25 have recorded exceedances (mostly in Italy). Data on Indicator 8 (Noise pollution), though little (10 urban areas), also suggest a very critical situation; aggregate average values show that respectively 21% and 20% of the population are exposed to noise levels between 60-65 dB(A) and 65-70 dB(A), and that 12% is exposed to a level of noise greater than 70 dB(A).

The data on urban pollution also show the delay and the weaknesses of urban areas with respect to the upcoming implementation requirements of both the European Directives on air (criticalities notwithstanding, the local authorities to have adopted a plan for the management of air quality are very few) and on noise (data are few and subject to considerable variability, possibly due to the little homogeneity of the methodologies adopted).

The key factor to target with specific actions is clearly (on the basis of the results of Indicator 3 - Local mobility and passenger transportation) the uneven modal distribution of urban displacements, still too much characterised by the use of the private mode: of the 16 urban areas that submitted data on systematic displacements (home-work), 13 record more than 40% of displacements by car (and 7 more than 50%).

The positive role played by national and local policies is however clear if behavioural differences across cities are observed: clear predominance of private vehicles (50-55%) in several Italian cities and Bristol; predominance of non-motorised or collective transport (approximately 70%) in the average Spanish urban area, Malmoe and Den Haag. The results concerning the existence of pro-bicycle policies in Den Haag (34%) and Ferrara (27%); of policies favouring pedestrians in Spanish urban areas (40-70%), and favouring public transport in Malmoe, Maribor, Oslo and Nord Milano (approximately 30%) are also interesting.

The reliance on the private vehicle is also evident from the results of Indicator 6 (Children's journeys to and from school), recording an average of 22% of children going to school by car (as opposed to 50% on foot, 10% by bicycle and 16% by collective transport). The significance of these data becomes clearer when one considers the short distance of school-home displacements (urban areas that compiled Indicator 4 – Availability of public open areas and services, record 60% to 80% of the population as living within 300 metres from schools). If parents' time constraints and lack of safety for children were effectively to be confirmed as the main reasons behind driving for these displacements, then there would be scope to define specific local policies. However, this behavioural pattern, too, varies widely across Europe, as trips by car range from 78% to 2% of total trips to take children to school; with Italy once more holding the negative primacy.

Demand for urban mobility however, in so much as it is systematic, is probably best suited to becoming the target of focused action of European and local policies, all the more so if these are to be defined on the basis of a thorough analysis of the demand, in order to be able to adapt to its specificities (demand-side management) and thereby offering more flexible solutions than mere public transport (e.g. car pooling, shuttle buses, shared paths for pedestrians and cyclists, ...). An analysis of the number, distance and duration of displacements in fact outlines different mobility patterns (the number of displacements is higher in medium-sized urban areas, whilst distance and duration increase in larger ones) and different behaviours, suggesting that the modal choice is not only determined by distance, but also by cultural variables and by the quality of alternative offers to automobiles.

As regards collective public transport - one of the main solutions put forward in European Policies and the Thematic Strategy on Urban Environment - a few slight variations in the frequency of use should be highlighted: in the urban areas where it represents the main alternative to the car - for the most part medium-sized urban areas - its share oscillates between 10% and 30% of displacements. It is clearly much less used in smaller urban area and, more generally, in those areas where the alternative is represented by both cycling and

walking (as it is in some Spanish, Dutch and British urban areas). On the other hand, the levels of satisfaction with public transport record much wider variations across urban areas (see Indicator 1 - Citizens' satisfaction with the local community): it is greater than 70% in Tampere, Zaragoza and Vitoria-Gasteiz, while considerably less than 50% in large cities such as Bristol and Oslo (where frequency of use is medium to high).

Lower satisfaction levels also tend to coincide in almost all instances with a lower accessibility to the public transport network, although these data (Indicator 4 - Availability of public open areas and services, i.e. % of the population living within less than 300 metres of a stop served every 30 minutes on normal working days) is greater than 80% in almost all urban areas (it is greater than 90% in 15 of them). Satisfaction levels may decrease if, rather than the whole urban area, only the higher frequency stops were to be considered.

The effective success factors (in terms of use) for the collective transport system (see the higher percentages of Birmingham, Malmoe, Maribor and Oslo) seem to depend on other measures, too (in some instances they may depend on the quality, frequency and diversification of the service); in Oslo the introduction of a toll system for cars has provided both the most significant disincentive to private transport and at the same time the best incentive to use public transport.

Finally, mobility not only causes local environmental pollution problems (air and noise) and determines the congestion and occupation of public areas, but it also significantly affects more global issues, such as climate change. In view of the variation in contexts and the partial completeness of the data, the analysis on Indicator 2 (Local contribution to global climate change) suggests not to force comparisons across urban areas. It is suggested to reserve comparisons to the future analysis of improvements in terms of per capita and total emissions reductions. The data however point out the relevance intervention may assume in this field: CO_2 per capita emissions in the urban areas analysed are on average equal to 6.78 tons and exceed 9 tons in some areas. The Building sector contributes on average 2.06 per capita tons, followed by Mobility (1.90), Industry (1.85, this weight however varies considerably, according to the structure of the industry in the urban area considered) and Services (1.07 tons).

In this case, too, a more detailed analysis highlights the positive role to be played by local policies, if supported. They in fact already influence performance in the various contexts: car control policies reduce total energy consumption (e.g. Barcelona or Pavia), distribution of natural gas (greater than 50-60% in various Italian urban areas and in Barcelona) and of district heating (e.g. Stockholm, Malmoe, Aarhus and Tampere) improves the emission intensity of the residential sector; the use of renewable resources (hydroelectric power in Swedish cities and in Oslo) reduces the amount of emissions imputable to electricity consumption.

The analysis of greenhouse gases emissions indicates efficiency improvements in industrial contexts recording high intensity of emissions as a further area of intervention (e.g. Pori, Ferrara and other Italian urban areas). More generally, the capacity of environmental innovation on the part of enterprises, assessed on the basis of the data on Indicator 7 (Sustainable management of the local authority and local businesses) seems not consolidated and shows a clear geographical differentiation. The first seven areas, though varying in size, are all located in northern Europe, particularly Finland and Sweden. Their average performance (0.41%) is fivefold that of southern Europe, penalised by the unsatisfactory performances of the Italians. Among southern urban areas, in fact, 9 out of 12 Italian respondents record a value lower than 0.09% - while the national average is 0.06% - opposed to Spain's 0.15%. Finally, it should be noticed that the adoption of environmental certification is still scarce in eastern Europe, but some positive signs in this direction have been recorded.

The scarce environmental innovation in processes and management systems is thus also reflected in the delay in product innovation. Data on Indicator 10 (Products promoting sustainability) is still too little, though sufficient to highlight the greater propensity to purchase sustainable products on the part of individuals and the public administration in northern Europe.

As already illustrated, individual behaviour (e.g. in terms of mobility and purchasing preferences) is extremely varied and significantly influenced by the quality and availability of sustainable alternatives. Within this framework a relevant role is played by the indications emerging from the citizens' satisfaction surveys (Indicator 1 – Citizens' satisfaction with the local community, both on general and specific issues).

These results are to be interpreted and used mainly at the local level, possibly coupled with deeper investigations into the success factors or the reasons for dissatisfaction with respect to specific characteristics. Overall, satisfaction levels seem fairly high everywhere: 69% in eastern, 80% in northern and 86% in southern urban areas in terms of overall satisfaction (decreasing to 56%, 54% and 53% respectively for satisfaction calculated as an average). However, surveys record different results for local characteristics: remarkable geographical differences (and more critical results in larger urban areas) are recorded for personal safety, while average to high levels of satisfaction with the quality of the natural and built environment, social and cultural services, health services and public schools are recorded almost everywhere; standard of housing and employment opportunities (especially in Spanish and Italian urban areas) record high dissatisfaction.

Finally, a clear priority emerges, that may be of interest to recent European policies on governance: the level of satisfaction with the opportunities to participate in local planning and decision making records a very low score (31%) and, above all, a very high number of "no answer", suggesting low awareness among citizens as to their rights to participation.

A comparative analysis of the data on citizens' satisfaction and on accessibility (Indicator 4 - Availability of public open areas and services) reveals a low correlation between the respective results on health and social services and cultural services and public schools, thus suggesting that it is not only their territorial distribution (i.e. accessibility in terms of distance), that determines satisfaction, but that a relevant role is played by the quality of the service. Average accessibility is approximately 50% for services and 80% for schools. In this case, too, great disparities among the various European cities should be noticed (ranging from the peaks of 100-80% in eastern and Spanish urban areas, to values of 20-5%). Southern European urban areas show a better level of accessibility, also in terms of recycling facilities, recording values greater than 80% in 10 southern areas, while in three northern cities, it drops to 50%.

Separate consideration is to be reserved to the accessibility to public open areas: this is on average equal to 69% (for green areas greater than 5,000 m^2), but records considerable differences across urban areas (from 100-98% to 20-5%, even when smaller areas are also considered). Aspects concerning the quality and sustainability of land use are also well illustrated by the data collected for Indicator 9 - Sustainable land use.

The data on the % of protected areas records remarkable variations (from a value of 70% in Oslo and Vitoria-Gasteiz to 1% in the last 8 urban areas). This is however due to a non-homogeneous interpretation of the expression "protected areas" on the part of respondents. In any case, almost all local authorities record values lower that 30-20%: for 25 of them less than 30% of their territory is protected; of these, 22 record values lower than 20% and as many as 8 less than 1%. This indicator is all the more interesting if compared to the other ones, as it highlights those instances where local authorities, whose territory is not completely urbanised, have also defined good strategies for the protections of freely accessible areas.

Urbanised areas in fact vary considerably, from 3% to 90%: 5 urban areas record more that 50% of their territory as being urbanised, with Birmingham, Bristol and Nord Milano recording a value as high as 80%; on the contrary, 8 areas are close to or below 10%. Almost half of respondents is however concentrated in the interval between 20-30%.
Also, as regards the intensity of land use (number of inhabitants per hectare of urbanised land) results vary considerably: from 12 inhabitants/ha in Haemeenlinna to 115 inhabitants/ha in A Coruna. The avera-

ge is approximately 51 inhabitants per hectare of urbanised land.
Within this set of urban areas the following three typologies may be defined:

1. "compact and dense" areas, characterised by a considerable quota of free territory and high inhabitant density, such as Zaragoza (5% and 112 inhab/ha), Bizkaia (6% and 92 inhab/ha), Parma (7% and 94 inhab/ha) and Reggio Emilia (9% and 71 inhab/ha);
2. areas with "low or medium intensity" of land use, such as Pori (10% and 16 inhab/ha), Ferrara (10% and 31 inhab/ha), Haemeelinna (22% and 12 inhab/ha), Tampere (24% and 15 inhab/ha) and Gdansk (20% and 17 inhab/ha);
3. areas of "medium to high saturation", such as Nord Milano, recording 80% of land use, Blagoevgrad and Stockholm with 54-53% and 66-76 inhab/ha

If one then considers that for the past 40 years, land use growth rates have oscillated between 35% and 270% (EEA), the most critical situations are determined by those contexts showing strong growth dynamics (or those recording a level of urbanisation already above 40-50% of the territory), which have not yet adopted "sufficient" protection levels and compact settlement models.

The criticality connected to local policies emerges also from the data on the varying "sustainability" of the new buildings development: out of the 6 respondents, Bristol and Stockholm have realised 80% of the new buildings on brownfield sites, while Acqui Terme and Modena 100% in greenfield areas

5.3 Value of the ECI Project in the framework of the Thematic Strategy on Urban Environment perspectives and needs

5.3.1 The Thematic Strategy on Urban Environment perspectives and needs

The urban indicators as a priority theme for the Thematic Strategy on Urban Environment (TS-UE) has been endorsed by the Council and Parliament, when the 6th Environment Action Programme has been adopted.

An explicit reference to ECI as a building block for TS-UE development has been done by DG Environment and by the Expert Group on Urban Environment during their 2001 and 2002 meetings (and also during the seminary held on the premises of the JRC in Ispra in November 2001).

A specific reference to ECI role is also included in the terms of reference of the FP6, Research Programme (Task 1. Indicators in support of the EU Thematic Strategy on Sustainable Development of the Urban Environment). In fact, the Thematic Strategy needs and asks for "appropriate monitoring tools to assess the effectiveness of the strategy (in particular indicators)".

Considering the work currently in progress towards the TS-UE and the available papers (as produced by DG Environment, the Expert Group on Urban Environment and the 4 working groups set up at this specific scope), it's possible to summarise that the TS-UE needs indicators that allow to assess its effectiveness particularly with regard to the following:

TS – UE spatial scale and objectives

- Maximise the environmental efficiency and quality of individual urban areas;
- effectively mitigate the impacts of urban areas on their natural support systems and human health;
- strategically manage the process and broader impacts of urbanisation.

TS – UE main priority areas (for the initial phase of the strategy)

The main issues in support of TS-UE development submitted to the 4 working groups established by DG Environment and by the Expert Group on Urban Environment are:

1. Sustainable Urban Transport;
2. Sustainable Urban Design - Land use, Regeneration, Retrofit;
3. Sustainable Urban Construction;
4. Sustainable Urban Management.

With this conceptual framework as reference, consideration could be given to whether information from ECIs will be adequate to monitor the Strategy and whether and which further indicators should be developed.

In particular, considering the European Commission needs as defined in the cited above FP6 - Research Programme Project specification, it's possible to start with a preliminary "self - assessment" with regard if and how the ECIs:

a) are able to provide the information needed to monitor developments at the local level on the main trends that should be measured to properly determine progress towards sustainable development of the urban environment at local level. The identification of the relevant trends should be done bearing in mind TS-UE contents and in consultation with the Commission and all the actors involved in TS-UE development. But here we will consider as the starting point the general framework already defined by the above detailed TS-UE spatial scale-objective-main priorities areas and further specification included in the cited above Research Programme, Project specification, that specifies that these trends *"should relate to the urban fabric, the urban utilities as well as to the ambient environment including air quality and noise"*;

b) can be used to assess these trends at EU-level;

c) are balanced concerning their ability to monitor the trends compared to costs and other resources needed to collect and process the indicators.

It is then possible to anticipate some ideas with regard to:

- definition of any gaps to be filled and the definition of indicators to fill such gaps;
- recommendations for further research.

5.3.2 The ECIs potential role as supporting tool for the EU Thematic Strategy on Urban Environment (preliminary assessment)

Some main questions could summarise what is the added value of ECI from the point of view of the Commission.

- Are ECIs able to provide the information needed to monitor developments at the local level on the main trends?

The 10 European Common Indicators + the eleventh ECI "umbrella" indicator (Ecological Footprint) are focussed on Urban Environment, related to the 3 scales (urban areas, supporting systems and broader impacts) and to the main trends (urban fabric, urban utilities, ambient environment including air quality and noise) as indicated by the Commission for the TS-UE development.

All the 11 ECIs are strictly connected with the 4 priority areas the TS-UE working groups are working on. In particular a direct relationship could be showed with:

- Sustainable Urban Transport (Indicators 2, 3, 5, 6 and 8);
- Sustainable Urban Design - Land use, Regeneration, Retrofit (Indicators 4 and 9);
- Sustainable Urban Construction (Indicators 7 and 9);
- Sustainable Urban Management (Indicators 1, 7, 10 and 11).

It is therefore possible to state that, at least in general terms, ECIs fit into the TS-UE framework information needs. A gap that should be filled could regard the field of Sustainable Construction (e.g. if trends should refer to buildings energy/environment efficiency or to specific further policy action) and interesting proposals (that could be easily included in the ECI set) have already been presented as a results of some EU Research Projects (e.g. CRISP or HQ2R) and are already in use in some EU countries (e.g. Denmark and The Netherlands). Other gaps that should be filled have been individuated during the ECI project, and many participants have recommended to include in the ECI set also indicators regarding waste, water, economic and ecological efficiency in resources use, as expected to be in the Nordic Cities Indicators Project (see Chapter 6).

Finally, the 2-year practical experience (and the ECI web survey and case studies) shows that efforts are still needed to further develop local level sustainability indicators, both from the content point of view (as summarised in Chapter 6 that proposes some new fields for ECI development) and also from the effectiveness point of view (enforcing integration in decisional process). The methodological debate with local authorities and in the scientific community should continue.

An additional result of the 2001-2002 ECI phase is the fact that the Ecological Footprint Index has been included in the ECI set, as asked by the Expert Group on Urban Environment in 1999. In the framework of the ECI supporting project, a group of experts, representing quite all the EU experiences in this field and in strict contact with the "father" of the methodology Mathis Wackernagel, has been set up. After an in deep research work (funded by DG Environment) a scientific agreement with reference to criteria to be used for an adaptation of the "national" methodology at the more complex local level has been reached. A user friendly spreadsheet, already filled in with a large amount of locally needed data, has been finalised and is now in use for testing by some ECI signatories, overcoming in such a way many of the computational obstacles (data availability, theoretical algorithms) to a local implementation of the Ecological Footprint.

The choice to strictly integrate the Ecological Footprint in the wider ECI set has been also a way to avoid the Ecological Footprint risk of "loosing information on internal issues" linking global concerns (represented also by the Indicator n.2 on Climate Change) with local issues (represented by all the other 9 indicators).

The European Common Indicators

1. **Citizen satisfaction with the local community**
   Headline indicator: Average satisfaction with the local community
2. **Local contribution to global climate change**
   Headline indicator: CO_2 emission per capita
3. **Local mobility and passenger transportation**
   Headline indicator: Percentage of trips by motorized private transport
4. **Availability of local public open areas and services**
   Headline indicator: Percentage of citizens living within 300m from public open areas>5,000 m^2
5. **Quality of local air**
   Headline indicator: Number of PM_{10} net overcomings
6. **Children's journeys to and from school**
   Headline indicator: Percentage of children going to school by car
7. **Sustainable management of the local authority and local businesses**
   Headline indicator: Percentage of environmental certifications on total enterprises
8. **Noise pollution**
   Headline indicator: Percentage of population exposed to L_{night} > 55 dB(A)
9. **Sustainable land use**
   Headline indicator: Percentage of protected area
10. **Products promoting sustainability**
    Headline indicator: Percentage of people buying "sustainable products"

- Can ECIs be used to assess these trends at EU-level?
- Are they balanced concerning their ability to monitor the trends (compared to costs and other resources needed to collect and process the indicators)?

These questions need a more detailed analysis and answers, but, in general terms, is possible to underline that:

- ECIs have been defined with reference to all the EU urban areas and have received a general consensus from local authorities in many EU countries (including Candidates);
- trends assessment criteria (e.g. variations in space and in time, distance from target, policy performance, ...) should be defined by the TS-UE, but ECIs present a great potential from this point of view;
- current response rate and geographical distribution of ECIs respondents (42 respondents from 14 countries including UK, northern, southern, eastern Europe and Candidate countries and representing urban areas of all dimensions) if not exhaustive for a complete EU level assessment is in any case a good representation of different "sustainability patterns" in small, medium-sized and large European cities (including wider areas, as Provinces);
- in the future, a wider database will be available (144 signatories, 22 countries). The web survey revealed that a good number of signatories that is not already able to send data, is however collecting them and has designated a person/office for this purpose. It should be positively noticed the interesting participation from eastern and southern countries, traditionally not able to produce environmental data, and the growing interest from non UE countries (e.g. Norway) and from many Candidate countries. The lack of participation from some western/central countries (essentially Germany and France;

not from UK) is a gap that should be filled and an additional political engagement by the Commission and further partnership with the main networks (e.g. ICLEI) could overcome this obstacle, considering that these countries/cities traditionally offer a good response rate when asked for environmental data and that many of them are already engaged on compatible systems (e.g. Ecobudget of ICLEI);

- efficiency (cost/results) of collecting and processing ECIs could be estimated comparing the results (collection and process of 42 urban areas data) of the 2001-2002 phase, with funds invested by the Commission and other ECI co-funders in the testing phase of the ECI Project. It should be considered that a part of the costs were investments, being dedicated to start up the ECI process (conferences, workshops, research, engaging signatories, ...) and only a small part was dedicated to data collection and process. Comparing the ECI costs with other similar European wide monitoring initiatives, it is evident that the high efficiency (low costs in respect of achieved results) is mainly due to the ECI project voluntary approach, one of its main "added value". ECI participants, in fact, have voluntarily dedicated their own local resources to produce and forward data to the ECI Team. Meantime, for a future ECI development it should be considered that, by means of the web survey responses, funding has been identified as a barrier to participating in the project (Q6), a problem during the project (Q5) and identified as an area that the European Commission should address to improve the ECI project (Q9).

- Should indicators be themselves a recommendation of the TS-UE?

Urban indicators have been indicated as a priority themes for the TS-UE and they should themselves be developed as recommendation for the Strategy by the working group engaged with Sustainable Urban Management.

This report provides also information with regard to the 4 questions the working group are working on (What is the state of the art in this theme? What are the barriers to doing things in this way? What are the specific actions and recommendations that can overcome these barriers? Which of these specific actions and recommendations are appropriate for action at the EU level?).

Specific recommendations focused on "How to strength and improve ECI initiative", developed on the basis of the thoughts of many ECIP participants and networks, are summarised in chapter 6.

Recommendations

6

Most of the following recommendations address issues where co-operation between the European Commission, Member States and regional/local authorities is needed.

Considering the fact that the Commission is engaged in the definition of the Thematic Strategy on Urban Environment (TS-UE), the following recommendations have been conceived as a potential contribution to this policy process. They emerge from the assessment of the ECI partnership process and relevant data developed and collected in a 2-year Europe-wide project (described in Chapter 2), expressly promoted by the Commission and the Expert Group on Urban Environment, and involving many key actors (cities, networks of local authorities, Member States, experts and academia, listed in Acknowledgement).

6.1 Policy recommendations emerging from the data

A greater amount of data and a more profound knowledge of the various local contexts and policies would possibly give the analysis deeper insights (and avoid oversimplifications).

However, on the basis of the data reported in chapter 3 and of the conclusions summarised in paragraph 5.3, it is possible to individuate some specific recommendations.

In general, the data collected through ECI confirm that:

- the sustainable management of Urban Mobility, Urban Design, Land Use and Building Sector should represent the main priorities of European (and national-local) strategies for the Urban Environment;
- new themes also emerge, such as the environmental and energy efficiency of production processes and products and the sustainable management of private/public sector and services.

More specifically, is important to support and stimulate national and urban areas authorities in the development of:

1 Specific measures promoting a radical change in the modal distribution of urban displacements

In particular:

- "Demand side mobility management plans" (Sustainable Urban Mobility Plans), particularly dedicated to systematic urban mobility, as pro-bicycle and pedestrians actions (e.g. traffic calming or limitations, pedestrian areas and cycle paths, …), favouring innovative management of collective modes of transport (e.g. better accessibility and quality of public transport, road and park pricing, car pooling, collective taxi, shuttle buses, ...), designing land use and urban functions distributions with the aim to reduce the demand of mobility by car.
  Target: reducing the use of the private mode and increasing the use of more sustainable modes of displacements.
- Improvement in the supply of public transport (e.g. dedicate funds, extend networks, increase frequencies, provide more articulate tariffs, reduce functional, economic and timetable barriers at modal exchange structures, …).
  Target: increase investment effectiveness in and the use of collective public transport.

- Dedicated strategies (where needed) aimed at favouring a shift in perceptions and in the behaviour of parents, with regard to the choice of the mode of transport used in home-school displacements of school children (e.g. improving city and street safety, launching educational campaign, offering alternative modes).
  Target: reduce the percentage of children going to school by car.

2 Specific measures promoting a better and healthier quality of life

In particular:

- Local Air Quality Action Plans (where needed) as defined by the EU Directive (Ambient air quality, 96/62/EC).
  Target: respect of the limit values defined by the Directive.
- Local Acoustic Action Plans and noise data collection based on harmonised methodologies (strategic noise map), coherent with the EU Directive (Noise, 2002/49/EC).
  Target: reduce the percentage of people exposed to level > 65 dB(A).

3 Specific measures promoting a more sustainable management of environmental resources

In particular:

- Dedicated strategies for environmental efficiency of energy production and uses, with particular attention to the residential and building sectors (e.g. dissemination of solar energy and natural gas, district heating, innovative building techniques, educational campaign, ...) also with the explicit aim of reducing the local contribution to climatic change.
  Target: reduce CO_2 per capita emissions.
- Dedicated strategies (where needed) for the environmental innovation of production processes and products, involving private-public management systems (e.g. EMAS/ISO, dissemination of green purchasing, …) and consumers' behaviour (e.g. Ecolabel promotional campaign, …).
  Target: increase the number and widen the geographical distribution of environmental certification and sustainable products consumption.

4 Specific measures promoting the improvement of urban quality and limitation of land use for urbanisation purposes

In particular:

- Strategies to promote wider availability and accessibility of green areas in the urban contexts.
- Strategies to promote stronger greenfield protection and the renewal of brownfield areas.
- Strategies to promote compact and multifunctional settlement models.
  Target: reduce percentage of urbanised area, increase the accessibility of green areas and the percentage of protected areas, reduce the use of greenfield areas, increase the regeneration of brownfields.

5 Specific measures promoting the improvement of citizens' satisfaction levels

In particular:

- Dedicated strategies (where needed) to improve living standards and employment opportunities.
  Target: increase the satisfaction levels with these 2 issues.
- Specific awareness-raising campaigns among citizens as to their rights to participation.
  Target: increase citizens' awareness and satisfaction with regard to the opportunities to participate in local planning and decision making.

6.2 Recommendations for "supporting actions in the implementation of the ECIs"

The following list of recommendations for "supporting actions in the implementation of ECI", combines the different (more than 100) comments collected by the ECI Team by means of the web survey, the interviews and direct contacts with several key actors (e.g. European networks, ECI participants, …).

The following recommendations are directed mainly to the Commission, as the main "promoter" of the ECI initiative.

It should be noticed that Member States, too, could play an important role in the future implementation of the indicators. The recommended supporting actions may in fact only be implemented by increased budgetary support and "political" engagement.

The ECI initiative "mechanism" has been put in place and is already working. It now needs to be maintained for the future, in order to fully benefit from the investment made and the bottom up support achieved.

1 Keeping and relaunching ECI support activities

- Keep, support and animate the exchanges among participants (e.g. helpdesk; meetings, web site, update notes):
  - assist participants in the concrete implementation of the indicators;
  - maintain agreements reached as regards to the methodological refinements and standards;
  - exchange good practices, to allow continued training/guidance required.
- Keep and re-launch the promotional campaign:
  - towards citizens, to increase the visibility of ECI (marketing by means of TV, media, …);
  - towards EU Sustainable Cities & Town Campaign members (also stressing the potential complementarity of ECI with other systems), in order to increase the number of subscriptions and geographical representativeness;
  - towards ECI signatories, stimulating them to continue collecting data and sharing results.
- Maintain the positive links with the EU Sustainable Cities & Town Campaign and Networks, with the aim to strengthen co-operation (e.g. include ECI in the possible future Aalborg+10 event; involve networks in the promotional action in some priority regions).
- Supply financial or technical resources (in terms of a dedicated portion of the budget and of current funding programmes) to maintain the ECI initiative services and to support ECI participants (e.g. free consultancy to Accession countries and small municipalities, in order to help them produce the missing data).

2 Enhance the role of national organisations

- Involve national institutions (agencies and ministries, expert groups) in:
  - ECI supporting activities (as above, point 1);
  - adopting ECI common standards and having statistical offices in Europe adopt them (including ECIs in national reporting systems);
  - guaranteeing accessibility of local data (energy data in particular become more and more difficult to obtain - due to the ongoing process of privatisation of energy utilities; this is particularly true for sector/vector disaggregated data, as required by the indicator on local CO_2 emissions).

3 Keep (and widen the scope of) data collection and processing

- Keep collecting, processing and regularly publishing the data collected by ECI participants, continue to measure the indicators and analyse the full impact of monitoring on policy and produce reports to establish trends over a number of years.
- Widen the scope of related activities and make them more accessible, by continuing to collect, process and regularly publish also:
  - local data produced according to alternative, but homogeneous methodologies to ECIs, even if by means of alternative tools and systems labelled differently;
  - local data produced within the framework of local systems, tackling the ECIs themes, even if according to non-homogeneous methods (e.g. ICLEI – EcoBudget).
- Refine the data analysis, supporting it:
  - with information on the policies and good practices adopted by cities (e.g. integrating ECI with LA-SALA and PRESUD approaches);
  - by increasing the effective comparability of results (e.g. improve analysis criteria for different geographical and dimensional clusters, cities and wider areas, …);
  - by producing "city profiles" assessment, useful to compare the various cities, underlining strengths and weaknesses, …

4 Extend the set, further refine methodologies, enhance synergies and compatibilities

- Consider the present set as the basic framework, but extend it to other indicators, too. In particular, the following issues should be tackled:
  - waste, water and bio-diversity;
  - sustainable construction (building energy and environmental efficiency);
  - social and economic dimensions (e.g. GDP and employment, resources use and emissions).
- Further refine data collection and data processing-reporting methodologies in order to:
  - simplify them, and make them easier to be implemented;
  - improve compatibility with similar systems;
  - optimise the way and frequency of data collection (and thereby costs);
  - improve public and stakeholder participation.
- Further refine methods or complete the testing phase for:
  - Ecological Footprint Index: the SGA Tool still needs assistance to participants (helpdesk, technical manual for data input, guidelines for data communication), cities' feedback, data and results assessment.
  - **Indicator 1** - Satisfaction: the new 2002 survey methodology needs wider testing, also to improve data processing methods (the introduction of a weighing system may be advisable).
  - **Indicator 2** - CO_2 emissions: the methodology is already consolidated but the calculation spreadsheet could be further improved to increase its user-friendly approach.
  - **Indicator 3** - Mobility: the methodology is already consolidated, but participants could be involved for a final agreement with regard to some technical improvement, with the aim to harmonising and simplifing its implementation.
  - **Indicator 4** - Accessibility to open areas and services: the methodology is already consolidated, but its implementation could be improved with more explicit definitions referred to open areas and separate waste collection. GIS should be available at local level.

- **Indicator 5** - Air quality: the methodology is already consolidated, but its implementation could be improved with more explicit definitions referred to "net overcome" and "European limit value".
- **Indicator 6** - Children mobility: the methodology is already consolidated, but it should be further harmonised and integrated in Indicator 3; the analysis could consider some relevant age differences.
- **Indicator 7** - Environmental management: the methodology is already consolidated, but to avoid possible confusion, the definition of "total organisations" needs to be further clarified to end-users. Local level data on enterprise dimension/sector should be available.
- **Indicator 8** - Noise: the methodology is already consolidated (and coherent with the data requirements as expressed in the relevant Directive), but it is evident that local authorities are still not prepared for the implementation and need specific support (technical and financial resources, good practices exchange).
- **Indicator 9** - Land use: the methodology is already consolidated but there is a need to strengthen and organise data collection at the local level, in particular with reference to harmonised definitions of "protected areas" and "new development".
- **Indicator 10** - Sustainable products: the methodologies are still very varied. They should be finalised with the involvement of participants for a final assessment and agreement.

- Introduce, where possible, common ECI targets for each indicator, as the basis for a common assessment of trends (as in the Italian "Ecosistema Urbano" system or in the Ecobudget approach).
- Keep ties with related European initiatives in the indicators field, in order to reduce overlap and enhance synergies (see a preliminary list in Chapter 1).
- Keep ties with the EU Commission services responsible for rural/mountain environments, with the aim to stimulate them to develop a similar initiative, in response to the need (expressed by many local authorities interested in ECI) of a Common European Indicators initiative for such kind of environments/areas (not reflected in ECIs).

5 Use the ECIs as support of and integration with EU policies

In particular:

- to monitor effectiveness of policies and actions, compliance with regulations, project evaluation;
- as a prerequisite or rewarding factor as regards access to funds or awards;
- as a source of information in support of European (e.g. UE-TS) and National strategies.

Methodology sheets

Indicator n° 1 - Revised version

Citizens' satisfaction with the local community

Headline indicator: Average satisfaction with the local community
Measurement: Level of citizen satisfaction (in general and with regard to specific features in the municipality)

1. Definition

"Citizens" refer to the people living within the administrative borders of the municipality. If the local authorities so wish (and if additional resources are available), the survey could be extended to other subjects (e.g. commuters or tourists), but this data must be interpreted separately from the main results (i.e. those regarding the citizens).
'Satisfaction' is graded into different levels, from 0 to 100.
The different "features" to cover in the survey are defined in: "Survey Methodology – Indicators 1, 3, 6 and 10".
"Local community" refers to the geographical area administered by the municipality. If the area considered for certain aspects (e.g. satisfaction with regard to the natural environment, employment, ...) only refers to the immediate neighbourhood or, to an area larger than the municipality, this must be specified in the questionnaire and explained in the reporting.

2. Question

- How satisfied are citizens with the municipality as a place to live and work
- How satisfied are citizens with various features in the municipality
- How citizens evaluate various features in the municipality and which of these features are considered as the most important for the quality of their life

3. Context

An important component of a sustainable society is the general well-being of its citizens. This means being able to live in conditions that include safe and affordable housing, the availability of basic services (such as school, health, culture, ...), interesting and fulfilling work, a good quality environment (both natural and built) and real opportunities to participate in local planning and decision-making processes. The opinion of citizens on these issues is an important measure of overall satisfaction with the locality, and so it is a relevant indicator of local sustainability.
Obviously these aspects do not cover all the issues of well-being and satisfaction (e.g. satisfaction related to a sense of community, human relationships, personal quality of life, ...), but it is important to consider the conditions for well-being that could be directly influenced by local, national and/or European policies.
The general well-being and satisfaction of the citizens are looser terms that tend to function as general objectives framing individual policies.
Sustainability principles covered: 1, 2, 4, 5, 6

4. Targets

There are no recognised targets for this indicator, simply a general recognition that the well-being of citizens and their satisfaction with the locality are important elements of sustainability.

5. Unit of measurement

- % distribution (net value unit for reporting over a period of time) of different satisfaction levels
- percentage score of satisfaction related to different features weighed with the importance attributed to them
- percentage score attributed to different aspects of each of the feature considered

6. Frequency of measurement

Biennial

7. Data collection method and sources

The survey methodology (e.g. sampling, data collection, questionnaire) is fully described in: "Survey Methodology – Indicators 1, 3, 6 and 10".
Information useful for the calculation and the evaluation of indicator 1 can be found at the beginning of the section relevant to indicator 1 – e.g. sex, age, employment condition (employed, unemployed, retired, student).

8. Form of reporting/presentation

a) for reporting at European level

I. Satisfaction in general/overall:
a table showing the different % for each of the 7 possible answers; a general comment on the main results (the distribution of the percentages compared, if similar surveys are available, with similar cities).

II. Satisfaction with single features:
a table showing the different % scores weighed with the importance attributed to them; a general comment on the main results (the differences of scores attributed to each features in different municipalities).

III. Evaluation of single aspects of each feature considered:
a table showing the different % scores attributed to

different aspects of each feature considered; a general comment on the main results (the differences of scores attributed to each aspects in different municipalities).

b) for reporting at local level

If the survey has collected complementary data too (as proposed in " Survey Methodology – Indicators 1, 3, 6 and 10"), it is important to produce tables and comments providing useful information for local planning or the Agenda 21 process. It is very important to explain (with tables and written comments) why people are not satisfied (specific written comments about the answers given to the open questions about the reasons for dissatisfaction with each feature) and show who is dissatisfied, with reference to their age and income and gender, if the survey is conducted with this aim (separate tables showing links between age, social-economic status, gender and satisfaction levels).

9. Examples of similar application

Variations of this indicator have been used in a number of initiatives. Leicester (UK) measures overall satisfaction with the neighbourhood on the basis of the answer to a single question asked in local surveys. The indicator is reported in the form of a net value that is the % of respondents that answer either "very satisfied" or "fairly satisfied" minus the % that answer either "very dissatisfied" or "fairly dissatisfied". Apart from the answers mentioned already, the respondents can also reply "neither satisfied nor dissatisfied". The latter answer does not contribute to the net value.

10. Questions to address/Future developments

A number of unresolved questions have emerged from the analysis of the first surveys.

1. In the survey it might be useful to include additional features affecting the level of well-being in the community[1].
2. With regard to a number of features, the area to be considered could be different from that of the local community[2].
3. In a number of instances, certain types of services may be excluded from the survey, which could instead focus more on services intended for the population as a whole; alternatively, these surveys may be carried out (as in-depth studies) on sub-samples of actual and potential users[3].

During the consultation process that took place in April and May, participants raised new issues, such as:

- "basic" question: could we consider "reliable as Indicator" a result produced by a survey on public perception about an argument so "variable" and influenced by many different "external factors" (e.g. political opinion, …) ?
- alternative proposal: instead of using a scale from 0 to 100, use a numerical scale from 0 to 10;
- request to consider only potential users for "natural areas".

Future discussion and methodological refinement could also take some other approaches into consideration (at the moment very different by the one proposed by this indicator) as the ones used for the 31st Indicator of the TERM project promoted by the EEA (awareness and attitude towards environmental threats brought about by the transport sector) and for the EUROBAROMETER survey (DG Environment) ("Reasons for complaining about local environment" considering "the amount of traffic" as a possible answer).

11. Keywords

satisfaction, local community/municipality, housing, employment, natural environment, built environment, services, participation/citizen involvement, personal safety

Indicator n° 1 - First version

Citizens' satisfaction with the local community

Headline indicator: Average satisfaction with the local community

Measurement: Level of citizen satisfaction in general and with regard to specific features in the municipality

1. Definition

"Citizens" refer to the people living within the administrative borders of the municipality. If the local authorities so wish (and if additional resources are available), the survey could be extended to other subjects (e.g. commuters or tourists), but this data must be interpre-

[1] Previous surveys in this field have highlighted the importance of the level of satisfaction regarding social relationships within the local community (strength, quality, ...). Also of relevance with regard to the perception of well-being within a community is the availability of a network of associations (formal and informal) offering support, socialisation and services (both public and private). The testing phase (in which the interviewees may also indicate other features) may provide interesting answers to this question.

[2] This is the case with the availability and quality of the natural resources (which, probably, are commonly perceived as concerning a larger area) and employment opportunities (at least, in the case of communities belonging to large conurbation). In these cases, it might be useful (also with regard to the differences in context) to specify, when formulating the questions, to which area reference is being made.

[3] With reference especially to those variables relating to services intended for specific social groups (e.g. schools, social services), whether or not the interviewees are users of these services is a condition that has a very important effect on their perception of satisfaction (more than the fact of being a citizen), and thus may notably influence their replies and, consequently, the overall result.

ted separately from the main results (i.e. those regarding the citizens).
'Satisfaction' is graded into different levels, i.e. "satisfied", "fairly satisfied", ...
The different "features" to cover in the survey are defined in section 7.
"Local community" refers to the geographical area administered by the municipality. If the area considered for certain aspects (e.g. satisfaction with regard to the natural environment, employment, ...) only refers to the immediate neighbourhood or, to an area larger than the municipality, this must be specified in the questionnaire and explained in the reporting.

2. Question

- How satisfied, in general, are the citizens with the municipality as a place to live and work?
- How satisfied are the citizens with various features in the municipality?

3. Context

An important component of a sustainable society is the general well-being of its citizens. This means being able to live in conditions that include safe and affordable housing, the availability of basic services (such as school, health, culture, ...), interesting and fulfilling work, a good quality environment (both natural and built) and real opportunities to participate in local planning and decision-making processes. The opinion of citizens on these issues is an important measure of overall satisfaction with the locality, and so it is a relevant indicator of local sustainability. Obviously these aspects do not cover all the issues of well-being and satisfaction (e.g. satisfaction related to a sense of community, human relationships, personal quality of life, …), but it is important to consider the conditions for well-being that could be directly influenced by local, national and/or European policies.
The general well-being and satisfaction of the citizens are looser terms that tend to function as general objectives framing individual policies.
Sustainability principles covered: 1, 2, 4, 5, 6

4. Targets

There are no recognised targets for this indicator, simply a general recognition that the well-being of citizens and their satisfaction with the locality are important elements of sustainability.

5. Unit of measurement

- % distribution (net value unit for reporting over a period of time) of different satisfaction levels, (I) in general and (II) with regard to various specific features in the municipality.

6. Frequency of measurement

Biennial

7. Data collection method and sources

Survey methods

There are various techniques for collecting data; these vary from a low level of citizen involvement to a much higher level, and may also involve integrated methods (e.g. workshops, followed by a survey and then by a focus group on specific issues, ...).
The method hereby suggested (taking the expectations of the European indicator into account) is to carry out a survey on a representative sample, by means of personal interviews (or of telephone interviews). In order to reduce costs, this survey can be linked to those necessary to other indicators (the ones on mobility, accessibility/distance from services and green areas, on consumption, for example). It is anyway very important that the number of questions addressed to the interviewees is defined carefully, reducing it to a minimum.
Interviews should be made personally (or on the telephone) in the late afternoon or in the evening (due to the need to find all members of the family at home). A postal survey may also be carried out, to integrate the data gathered by means of the interviews.
The interviews should be conducted by phone during the late afternoon or evening (due to the need to find all members of the family at home). A postal questionnaire could be used, depending on resource and time available and expected results. The aim of the investigation should be explained clearly. The first question (on "general satisfaction") should only be posed after the second one (satisfaction with specific features), due to the fact that, generally speaking, a respondent is able to give a more complete answer regarding overall satisfaction only after having considered the individual features included in the second question.

Sample

For the purpose of reporting this indicator at the European level, the sample has to be representative of the resident population aged over 16. It could also include commuters and tourists, but this data must be collected (and reported) separately.
The cheapest and easiest way of creating a sample is to build up a "simple random sample". To save time and reduce costs (avoiding the need to search for names in the registry office, with possible breach of privacy laws, or having to find telephone contacts, ...) it is suggested that the sample should be selected with reference to families rather than to individuals. In such a way it is easy to find names and telephone numbers directly from telephone directories. When the survey has been completed, it is important to adjust the results with the aim of represen-

ting the population age and gender distribution correctly. The size of the sample has to be determined, taking into account the need to represent the total number of people to be questioned; the internal variability of the population's characteristics; and the level of reliability of the data.

A suggestion (to be verified if correct in the testing phase) is that in medium-sized cities a sample of citizens could be selected, representing a cross-section of the population and forming at least 0.25% of the total (considering also that this sample should contain not less than 1,000 individuals). If the sample is constructed with reference to families, it could be selected to represent a cross-section of the families and forming at least 1% of the total number in the municipality, so as to obtain at least 1,000 interviews.

The questionnaire/survey should include the following questions:

A) For reporting at European level

I. Do you feel very satisfied, fairly satisfied, fairly dissatisfied or very dissatisfied with the municipality as a place to live and work?

The respondents may also answer "don't know" or "no answer"[4].

II. Do you feel very satisfied, fairly satisfied, fairly dissatisfied or very dissatisfied with the:

- standards of housing and its availability and affordability in your local community?
- employment opportunities available in your local community?
- quality and amount of natural environment (e.g. green areas, rivers, …) in your local community?
- quality of the built environment (e.g. streets, public spaces, the appearance and cleanliness of buildings) in your local community?
- level of social and health services available in your local community?
- level of cultural, recreational and leisure services available in your local community?
- standard of schools available in your local community?
- level of public transport services available in your local community?
- opportunities to participate in local planning and decision-making processes?
- level of personal safety experienced in your local community?

In addition, other services, such as refuse collection, water supply and front desk could also be considered. In this case, the data should be reported separately.

Suggestions: social and health services could be counted separately where one reckons that remarkable differences in the local perception of the 2 categories may exist; complex questions could be divided to facilitate the final answer.

It may be useful to ask interviewees, during the survey, if there is any other aspect that might be a factor influencing citizen satisfaction with the local community.

B) For reporting at local level

If the answer is "fairly dissatisfied" or "very dissatisfied", it is useful for local use, to record the main reasons for the dissatisfaction. For the answer to be investigated in greater detail, it is also important to know the main characteristics of the respondent family:

- gender of the respondent (M/F);
- family composition, age of the members, age and profession of the head of family/respondent/husband/wife;
- data (or the family's perception of this) regarding the income level (3 possible levels) of the family.

8. Form of reporting/presentation

A) For reporting at European level

I. Satisfaction in general/overall:
a table showing the different % for each of the 5 possible answers (see "Data collection"); a general comment regarding the main results (the distribution of the percentages compared, if similar surveys are available, with similar cities).

II. Satisfaction with single features:
a table showing the % of answers with "no answer" or "don't know" (this is important due to the fact that the presence of an higher number of "don't knows" or "no answers" could help in the interpretation of the results, possibly revealing a weakness in the methodology or a low level of comprehension of the issue).
There could also be a comment on the results (the numbers of "no answers" and the reasons for this, the reasons for differences between the different features considered, ...).
A table for each feature showing the % of respondents that answer either "very satisfied" or 'fairly satisfied' and the % that answer either "very dissatisfied" or "fairly dissatisfied". It should be noted that the replies "no answer" or "don't know" do not contribute to the net value. A comment on the results (the distribution of satisfaction levels and the reasons for this, the differences between the features considered, …).

B) For reporting at local level

[4]This category of answer has been introduced instead of 'neither satisfied nor satisfied' to avoid the general tendency of respondents to sit on the fence and to give the survey the chance to record doubt or the lack of an answer. As shown by preliminary experience, the 'no answer' can also have an interesting information content.

If the survey has collected complementary data too (as proposed in "Data collection methods"), it is important to produce tables and comments providing useful information for local planning or the Agenda 21 process. It is very important to explain (with tables and written comments) why people are not satisfied (specific written comments about the answers given to the open questions about the reasons for dissatisfaction with each feature) and show who is dissatisfied, with reference to their age and income and gender, if the survey is conducted with this aim (separate tables showing links between age, social-economic status, gender and satisfaction levels).

9. Examples of similar application

Variations of this indicator have been used in a number of initiatives. Leicester (UK) measures overall satisfaction with the neighbourhood on the basis of the answer to a single question asked in local surveys. The indicator is reported in the form of a net value that is the % of respondents that answer either "very satisfied" or "fairly satisfied" minus the % that answer either "very dissatisfied" or "fairly dissatisfied". Apart from the answers mentioned already, the respondents can also reply "neither satisfied nor dissatisfied". The latter answer does not contribute to the net value.

10. Questions to address/Future developments

A number of unresolved questions have emerged from the analysis of the first surveys.

1. In the survey it might be useful to include additional features affecting the level of well-being in the community .
2. With regard to a number of features, the area to be considered could be different from that of the local community .
3. In a number of instances, certain types of services may be excluded from the survey, which could instead focus more on services intended for the population as a whole; alternatively, these surveys may be carried out (as in-depth studies) on sub-samples of actual and potential users .
4. To identify a system of weighting for the different variables .
5. The net value method (as is the case in Leicester) could be used to calculate the indicator (overall satisfaction and single features indicator) in the case of the analysis of time series .

During the consultation process that took place in April and May, participants raised new issues, such as:

- "basic" question: Could we consider "reliable as Indicator" a result produced by a survey on public perception about an argument so "variable" and influenced by many different "external factors" (e.g. political opinion, …) ?
- alternative proposal: instead of very/fairly satisfied and very/fairly dissatisfied use a numerical scale from 0 to 10.
- criticism about the use of the net value in % and proposal to use a 2 - 10 scale; request for the use a weighting system when considering answers; request to consider only potential users for "natural areas".

Future discussion could also take some other approaches into consideration (at the moment very different by the one proposed by this indicator) as the ones used for the 31st Indicator of the TERM project promoted by the EEA (awareness and attitude towards environmental threats brought about by the transport sector) and for the EUROBAROMETER survey (DG Environment) ("Reasons for complaining about local environment" considering "the amount of traffic" as a possible answer).

11. Keywords

satisfaction, local community/municipality, housing, employment, natural environment, built environment, services, participation/citizen involvement, personal safety

[5] Previous surveys in this field have highlighted the importance of the level of satisfaction regarding social relationships within the local community (strength, quality, ...). Also of relevance with regard to the perception of well-being within a community is the availability of a network of associations (formal and informal) offering support, socialisation and services (both public and private). The testing phase (in which the interviewees may also indicate other features) may provide interesting answers to this question.

[6] This is the case with the availability and quality of the natural resources (which, probably, are commonly perceived as concerning a larger area) and employment opportunities (at least, in the case of communities belonging to large conurbations). In these cases, it might be useful (also with regard to the differences in context) to specify, when formulating the questions, to which area reference is being made.

[7] With reference especially to those variables relating to services intended for specific social groups (e.g. schools, social services), whether or not the interviewees are users of these services is a condition that has a very important effect on their perception of satisfaction (more than the fact of being a citizen), and thus may notably influence their replies and, consequently, the overall result.

[8] Experience of this survey to date has shown (e.g. through the different % of "no answer" relating to the various features considered) that the various features weigh differently in the forming of an overall judgement regarding satisfaction. It may, therefore, also be useful, especially with regard to the use of the results of the surveys for the formulation of local policies, to seek to identify a system of weighting for the different variables. To this end, the interviewees could be asked to place the different features considered in the order of importance; the same task could be carried out more simply by focus groups of citizens.

[9] However, for the presentation of the results regarding a single year, it is proposed to maintain the use of the absolute %. It will be possible to verify this choice more completely during the testing phase.

Indicator n° 2

Local contribution to global climatic change

Headline indicator: CO_2 emission per capita
Measurement: CO_2 equivalent emissions (total value and variation)

1. Definition

- CO_2 equivalents refers to anthropogenic emissions of Carbon Dioxide and Methane. This indicator seeks to measure such emissions within an area of local authority control.
- Local activities to be considered for measurement of such emissions should cover those which include the use of fossil fuels (coal, petroleum, natural gas) for energy purposes (including transport) and local waste management.
- Variation is the CO_2 equivalent emission trend and is calculated on the basis of 1990 figures.

At the Kyoto Conference, 38 industrialised countries signed an agreement prescribing a reduction of 5.2% in six greenhouse gases, including carbon dioxide (the most important greenhouse gas, contributing to 80% of total EU emissions) and methane (contribution approximately 9%) (with respect to 1990 levels) by 2008-2012.

Many sectors are responsible for the emission of greenhouse gases. According to the methodology of the Intergovernmental Panel on Climate Change (IPCC), sectors which must be taken into account in order to arrive at a complete analysis of emissions include the energy sector, industrial processes, the use of solvents, agriculture and waste management as well as the removal ("absorption") of carbon through forest management (also called "carbon sinks").

The Kyoto Protocol covers Carbon Dioxide CO_2, Nitrous Oxide N_2O, Methane CH_4, Sulphur Hexafluoride SF6, Hydrofluorocarbons HFCs and Perfluorocarbons PFCs. These are the gases that we should manage.

CO_2 emissions attributable to the energy sector (including energy production and energy consumption by industry, households, transport, ...) are by far the most important factor responsible for the greenhouse effect (industrialised countries' contribution to total emissions is about 80% of the total). The energy sector, together with the waste management sector, represent the main focus for action by the local authority.

On these grounds, an indicator correlated with CO_2 emissions due to local energy consumption and CH_4 emissions due to local waste management activities, is likely to be the best way of measuring the greenhouse effect at a local level.

Considering "debt emissions" and "credit emissions"

Greenhouse gases do not only have a local effect, but also affect the environment at global level.

Usually, when considering traditional contaminants affecting ambient air quality, the activities responsible for emissions in the area are inventoried and related emissions generated inside the same area calculated.

This approach has some limits when considering greenhouse gas emissions. In this case, the above mentioned inventory of activities still has to be taken, but it is good practice to calculate the related emission, considering not only the ones that actually are generated in the area, but also those generated outside the area itself, wherever they are, so long as they can be traced back to the activities listed.

In other words, the geographical principle is replaced by the responsibility principle.

The responsibility principle requires that emissions deriving from the use of final energy due to the activities located in the selected area shall be considered, be they generated within the area considered or outside its borders.

It is clear that the larger the area, the more the two calculation methodologies are similar. At national level, the difference can be of no importance. Instead, as we move to relatively small areas, as is the case of a city, the difference can be very large.

Some examples are reported that explain the concept:

- the city uses electricity that is produced with fossil fuel outside its boundaries: the emissions related to this production have to be accounted as due to the city itself;
- the city makes use of natural gas that is produced elsewhere and transported up to the end users: the emissions related to the production and transportation activities have to be accounted as due to the city itself;
- the city produces waste that is disposed of in a landfill outside its boundaries: the emissions related to such waste disposal have to be accounted as due to the city itself.

It can be useful to think of external emissions due to the import of energy vectors or to the export of waste as "debt" emissions that have to be added to local emissions.

On the other hand, the city may export energy vectors to and/or import waste from other cities. Thus, emissions related to these activities should be subtracted from total domestic emissions. Again, it can be useful to think of local emissions due to the export of any energy vector or to the import of waste, as "credit" emissions that have to be subtracted from domestic ones.

The concept of "credit" emissions can be pushed a bit further to take all actions performed by the city into account, even if they do not reduce the emissions due to the city itself, but contribute to the reduction of overall

emissions. This is, for example, the case of a city whose electricity consumption is entirely produced by means of renewable primary energy and that performs actions to save electricity. We can suppose that the renewable energy spared can be used in another site, replacing fossil fuel energy. In this case, spared emissions should be deducted from the emission accounting of the city.
This extension of the concept of "credit" is a way to account for actions that otherwise could not be considered in terms of emission reduction.
Summarising, the CO_2 indicator for a city is evaluated considering emissions generated inside its boundaries (like typical national balances), plus "debt" emissions, minus "credit" emissions.
If we limit the analysis to those emissions generated inside city boundaries, the emission accounting can be compared to national emission accounting according to the IPCC methodology, at least for the sectors and greenhouse gases considered here.

Analysis of the variations over time (with reference to 1990)
Following the Kyoto protocol, the political debate concerning greenhouse gases mainly regards the need to adopt and meet certain targets relating to their variation. Naturally, the absolute values (tonnes of emissions, overall or per capita) are important for assessing the European and local dynamics, but the possibility of making a comparison between cities through the quantity of their emissions (for example, annually) should be given serious consideration. There are, in fact, many important conditions for determining the absolute value of the emissions; to a greater or lesser extent, these may or may not depend on local policies (for example, on the existence of such local renewable sources of energy as hydropower, or on climatic conditions). All these external parameters should be considered in order to make a reliable comparison.
The optimal indicator for making comparisons between the cities should, therefore, refer to the comparison between steps actually taken in order to reduce the emissions of greenhouse gases. Thus, rather than venturing a comparison between different cities on the basis of the absolute values of emissions, it is preferable to make a comparison between different cities on the basis of the variation of the indicator over time. The overall calculation of CO_2 equivalents at a local level (as above described) must be calculated with regard to a reference year. According to the Kyoto protocol, the reference year is 1990, but one should bear in mind that, on a local level, data regarding this year may be unavailable.
Disaggregating energy consumption by sector/vector
The starting point to calculate the CO_2 indicator is the analysis of energy consumption. Such data can account for emissions within the city area and due to the city's activities, as well as for "debt" emissions due to the same activities (of course "credit" emission cannot be accounted for by means of consumption data).
Total energy consumption is the result of different activity sectors (e.g. residential, commercial, industrial, transportation, ...). It is very useful, especially in order to give a particular direction to local actions, to analyse the contribution of CO_2 according to this sectorial disaggregation. This allows the behaviour of each sector to be clarified.
The sectorial disaggregation suggested for the CO_2 equivalent indicator in the energy sector is :
- residential;
- commercial;
- industrial;
- transportation.

Another item has to be added to include "credit" emissions. A further disaggregation with reference to the energy vector is a useful information to drive local actions.

2. Question

- To what extent are the local authority and the local community able to reduce the emissions of greenhouse gases as a local contribution to fighting global climatic change?

3. Context

A sustainable community takes responsibility for the welfare of the next generation and contributes to the reduction of global environmental problems. Therefore, it is important to fight global climatic change and to avoid or to reduce the consumption of finite resources. At a local level this means promoting energy saving, the use of renewable, fossil-free energy resources, reducing the use of landfill.
Sustainability principles covered: 1, 3, 4, 5

4. Targets

At the Kyoto Conference 38 industrialised countries signed an agreement envisaging a 5.2% reduction in greenhouse gases (with respect to the 1990 level) by 2008-2012. The European Union agreed on a reduction of 8%. In relation to this, different reduction quotas were defined for each EU member state. Without major new developments in the areas of energy consumption and transportation, worldwide use and combustion of oil, coal and gas will continue to increase, causing emissions of the most important greenhouse gas to rise. In this case, EU CO_2 emissions are expected to show a 4% increase by 2010.
Therefore, in order to achieve the above mentioned percentage reduction successfully, several reduction targets have been drawn up by national and local authorities.

5. Unit of measurement

- tons per year and % variation (with respect to a reference year, preferably 1990).

6. Frequency of measurement
Annual.

7. Form of reporting/presentation
Yearly total emissions, differentiated by sector.
Yearly per capita emissions.

8. Data collection method and sources
Consumption data from the energy sector is essential. Calculations of CO_2 emissions shall make use of the following disaggregation of energy, reflecting end use:
- electricity
- gas
- gasoline
- ……

When performing energy accounting, some data are immediately available with a proper disaggregation level; this is usually the case with electricity, gas and district heating. For other energy vectors, on the contrary, local availability is not always possible. Usually, the availability of such data is possible at a broader territorial level (regional or national). In this case, the use of a top-down approach can help, starting from the upper territorial level and using proxy variables (see examples below). The top-down approach involves disaggregating the territorial superior level of energy consumption at the local level through the use of proportionality indicators for a particular sector/activity occurring in the specified local area as follows:

$C_{loc,I} = C_{up,I} * S_{loc,I}/S_{up,I}$

where:

$C_{loc,I}$ = local consumption amount related to the activity I;
$C_{up,I}$ = upper territorial level consumption amount related to the activity I;
$S_{loc,I}$ = local statistic related to the activity I;
$S_{up,I}$ = upper territorial level statistics related to the activity I.

As regards simple proxy variables for each sector, the following suggestions could be considered:
- residential - number of families;
- commercial - number of employees (further disaggregation into subsectors is suggested according to data availability);
- industrial - number of employees (further disaggregation into subsectors is suggested according to data availability, and also disaggregation into white-collar and blue-collar workers, since very different specific consumption is usually associated with the two kinds of employees);
- transportation - number of kilometres covered by different kinds of vehicles, e.g. private car, motorcycle, collective transport (see indicator 3), scaled by the ratio between the specific consumption (consumption per kilometre and per vehicle) related to the different driving patterns (urban, rural, highway).

It must be borne in mind that the use of proxy variables is necessary when direct data is lacking. If the latter is instead available, the methodology based on proxy variables can be used for comparison.
The CO_2 emission factors (tonnes of CO_2 per unit of energy) can be derived from the IPCC Guidelines and from local and national data (especially for electricity generation). In some countries, software (if scientifically validated) and IPCC emission factors adaptations to the national context are used; which thus allow to consider the specifics of local energy systems and, in some cases, to consider "indirect emissions".
Data regarding waste management (production and disposal) is usually available from the local authority.
Information on emission data and emission factors can be found on http://atc-ae.eionet.eu.int/etc-ae/index.htm (and through the national bodies responsible for producing emissions balance sheets at provincial level every 5 years).
[The spreadsheet contains standard IPCC and AIRES coefficients for the calculation of local and external emissions that are to be used whenever real coefficients – i.e. calculated with respect to your specific context - are not available. In case real coefficients are available with a certain degree of reliability, these have to be used instead of the standard ones].

9. Examples of similar applications
There are several initiatives on an international/national level to reduce CO_2 emissions by the voluntary commitment of member communities. On a local level, the administration needs to work out strategies on the basis of a political decision. In the city of Heidelberg, Germany, for example, the concept of climate protection involves:
- introducing local energy management;
- funding a programme to promote energy conservation by targeting house and apartment owners;
- establishing an "energy round table";
- introducing the Heidelberg heating certificate;
- ecological low energy construction standards for council housing.

10. Questions to address/Future development
The CO_2 indicator is affected by different levels of accuracy depending on the availability of data. For future development it is important to establish systems allowing for a better control on data availability by working together with all the local energy suppliers and the major industrial and commercial energy consumers.
Once a good database is available, the CO_2 equivalent indicator oriented to the energy and waste sectors can be replaced by the CO_2 equivalent indicator covering all sectors and all gases.
Sub indicators related to each sector may prove useful in understanding particular phenomena and especially in understanding the relevance of critical sectors.

11. Keywords
global climatic change, CO_2 emissions, greenhouse gases, fossil fuels

Indicator n° 3

Local mobility and passenger transportation

Headline indicator: Percentage of trips by motorised private transport
Measurement:
a) number of daily trips and time taken per capita by reason for trip and by mode of transport
b) total average daily distance covered per capita by reason for trip and by mode of transport

1. Definition
This indicator investigates and represents the mobility of citizens living within the local authority area. The different aspects (and the related units of measurement) that contribute to defining the general model of mobility of each citizen include:
a) the number of trips that, on average, each citizen makes during the day, where 'trip' indicates a displacement with a starting-point and a destination (number of daily trips per capita);
b) the reason for the trips and their regularity during the week, allowing for the trips to be classified as either 'systematic' or 'unsystematic'[10] (% of systematic trips compared with the unsystematic ones);
c) the average distance covered by each citizen during the day (km/per capita);
d) the time taken by each citizen for his/her trips (minutes taken for the trips);
e) modes of transport used for the trips and/or for the different distances associated with each trip (% relating to the different modes of transport considered).

2. Question
- What is the level of passenger mobility in the municipality?
- Are the distances covered by citizens increasing?
- What modes of transport are used for the daily mobility of citizens?

3. Context
The model of citizens' mobility in an urban context is important with regard to both the quality of life of those directly involved (time devoted to trips, frequency of traffic congestion, costs, ...) and to the level of environmental pressure exerted by mobility. Data emerging from various surveys of urban mobility, highlight developments that have taken place in recent years[11] . There is a close linkage between mobility and other important themes in an urban context, including air quality, carbon dioxide emissions, noise, road safety, space consumption and urban landscape. It is desirable to achieve a progressive reduction in individual motorised mobility and at the same time achieve an increase in the use of alternative modes of transport.
Sustainability principles covered: 1, 3, 4, 5, 6

4. Targets
Even if no specific targets exist, the need to reduce both the demand for mobility and individual motorised mobility is recognised in Europe. The importance of promoting alternative and light modes of transport (such as collective transport or, where feasible, cycling) is also recognised, especially in the urban context, with a view to reducing dependence on the car.

5. Units of measurement
Principal Indicator:
- average number of daily trips per capita (split into reason for trip, if possible also systematic versus unsystematic, and into mode of transport), average time taken for trips.

Supplementary Indicator:
- average distance daily covered per capita (split into each mode and into each reason).

6. Frequency of measurement
Triennial

7. Data collection method and sources
Generally speaking, there is a lack of sufficiently homogeneous and updated data for the calculation of the indicators selected here.
More occasional and heterogeneous surveys may be made available as part of general population censuses

[10] "Systematic trips" are the daily displacements to/from work/school. "Non systematic" or "unsystematic" are the ones made for all other reasons, for example, to go shopping and for social or recreational reasons.

[11] These may be summarised as follows:
• there are only limited variations in the average daily number of trips per capita, even after an interval of years: in general, the number of trips that a citizen makes each day has not varied significantly (obviously, with regard to the same groups: students, workers, pensioners, ...).
• the distances covered for each trip have, however, varied considerably in the last few years and show a general tendency to increase.
• moreover, the changes in the modal split are significant: in general, trips by bicycle or on foot are fewer, while trips using motorised modes of transport have increased, especially individual motorised modes.
• the time taken for single trips change above all as a result of the distance covered: despite this, a number of writers contend that the average time devoted to trips tends to remain constant. Although the time taken is the same, the speed of the journey has increased and, consequently, so has the distance covered.

Trip n°	Reason/ Type*	Mode of transport**	Place of departure	Time of departure	Place of arrival	Time of arrival	Distance covered (km)
1							
2							
N							

(*) Reason for the trip: school, work, recreation/leisure (social relationships, private reasons, errands and other), shopping, return trip.
(**) Mode: walking, cycling, motorcycle or moped, private car (specifying whether as passenger or driver), taxi, collective transport (bus, tram, metro, local railway); combined mode "park & ride" (exclusively in case of the combination of "private car and public transport"). Please note that trips on foot or by bicycle are not to be considered if carried out in combination with other modes; in fact in such cases the trip mode corresponds to the mode identified as the main one on the basis of distance covered.

(e.g. in Italy, every ten years ISTAT (Istituto Nazionale di Statistica) surveys trips to school and work according to mode of transport used and time taken); or as part of specific studies undertaken on a local level for the development of sectoral plans (traffic and urban mobility plans, public transport plans, ...).
Consequently, it is inevitable that use will be made of data obtained directly by means of surveys of statistically significant samples of the population living in the city[12] .
The costs will vary depending on the size of the sample and on the complexity of the data obtained. Costs could be reduced and the communicative effect of the survey could be enhanced by linking data collection (citizens surveys) to a local campaign to promote the 'Car Free Day' or other activities aimed at increasing public awareness ('Mobility Watching Day').

Principal indicator

A simple questionnaire can be used for the calculation of the number of trips (by reason for trip, mode of transport, time taken). The survey is carried out by means of a family logbook on a statistically significant sample of families (that is, a sample of families selected according to criteria of representativeness[13], where individuals sampled shall be older than the age when they are allowed to drive scooters - according to specific national legislation). The survey could be obviously linked to and managed with any other the local authority intends to develop - i.e. the one for indicators 1, 6 and 10, as suggested in the logbook structure; in this case the logbook has to be compiled by each family member.
Information useful for the calculation and the evaluation of indicator 3 can be found at the beginning of the section relevant to indicator 3 – e.g. sex, age, employment condition (employed, unemployed, retired, student). Relevant questions are illustrated in the table below; the information filled in the table shall refer to a given day (e.g. the preceding weekday[14]).

Trip n°	Parking place *	Number of passengers **	Reason for choice ***
1			
2			
N			

(*) Parking place: 1. private parking (toll required); 2. public parking (toll required); 3. toll-free parking.
(**) Number of passengers: during the trip, the private car carried: 1. only the driver; 2. the driver and one passenger; 3. the driver and more than one passenger.
(***): Reason for choice (2 reasons max): 1. higher speed; 2. higher comfort; 3. lower costs; 4. absence of alternatives (absence of acceptable public transport); 5. unfavourable weather conditions; 6. other (to be specified/no answer).

Mode of transport	Length/ Duration										Comfort									
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10

[12] The minimum age of individuals in the sample should be consistent with the one taken as the maximum for the indicator 6 which is the age when one is allowed to drive scooters (according to specific national legislation).

[13] The sampling methodology is illustrated in detail in the logbook methodology sheet.

[14] If the day considered were to prove not statistically significant for the interviewee (ill, not at work, away on business), the last significant day shall be considered.

The following questions – very useful for local purposes – should be asked only to those who answered "private car" or "park & ride" (private car and public transport) to the question on mode of transport.

Only with regard to trips from/to school/work, a question on the quality of the trip shall be asked as follows:
"Please tick as appropriate in the length/duration and comfort cells, to express your judgement on the quality of your trip from/to school or work"
Supplementary indicator
This part requires a more elaborate methodological approach because the distances covered are difficult to quantify reliably by simple interviews. Consequently, the data may be collected in two main ways:

1. a matrix of the starting-point/destination of the chosen sample is constructed, and the interviewees are asked to state the starting-point and destination of each trip; subsequently, the related distances are reconstructed by means of suitable calculations. This method may be adopted on the occasion of general population censuses (e.g., in Italy, every ten years), with the interviewers specifying as appropriate the starting-points and destinations of the citizens' systematic trips.
2. a statistically significant sample of citizens is selected; they are asked to record the distance covered for each trip for a certain period (in a 'logbook').

8. Form of reporting/presentation

The indicators are presented as figures:
a) average number of daily trips per capita;
b) total number of daily trips split into: reason for trip, mode of transport, average time taken for trips (once defined specific duration classes);
c) average distances daily covered per capita: average km covered for reason and for mode of transport;
d) percentage of total trips for reason and length class and percentage of total trips for mode of transport and for length class.

For the first year and for each part (total number of trips, average time spent and average km per capita per day), the results must be presented in a table like the following one:
In the following years, the historical trends could be reported using bar graphs where each bar corresponds to:

- Graph 1. daily average number of trips for a single year split into modes of transport (one bar for each reason);
- Graph 2. daily average time spent for a single year split into modes of transport (one bar for each reason);
- Graph 3. daily average km per capita for a single year split into modes of transport (one bar for each reason).

9. Examples of similar applications

The modal split (%) is widely used in "State of the Environment Reports" (e.g. Bologna and Torino). The supplementary indicator was used by the European Environment Agency (in *Environment in the European Union at the Turn of the Century*, 1999) as 'Passenger transport modal split in the EU (EU averages)' calculated as billions of km travelled by passengers by car, air, rail or bus.
Three European projects, ELTIS (European Local Transportation Information Service, promoted by the DG VII Directorate General for Transport), TERM (Transport and Environment Reporting Mechanism promoted by the European Environment Agency) and Urban Audit (promoted by the DG Regio), make use of similar indicators. The first one uses the % of passenger trips made by private car, public transport, walking, bicycle, powered two

Tab 1. daily total number of trips (and %)	**walking**	**cycling**	**motorcycle or moped**	**private car**	**taxi**	**collective transport**	**combined mode "park & ride"**
Tab 2. per trip average time taken							
Tab 3. per trip average km per capita							
school							
work							
recreation/leisure (social relationships, private reasons, errands and other)							
shopping							
return trip							

wheelers or by "other" modes of transport. The second one uses the total number of passengers by mode and purpose, the total number of passengers per km by mode and purpose, the km-passenger by mode and purpose per capita and the km-passenger by mode and purpose per GDP. Urban Audit uses the Proportion of trips to work by public transport, the Proportion of trips for non-work purposes and the Proportion of trips to work.

10. Questions to address/Future developments

On the basis of survey results it may be useful to make a number of further choices as to which particular aspects of urban mobility to investigate, adapting the methodology accordingly. In particular, the elements requiring clarification include:

a) Trips: number of daily trips per capita. It is necessary to determine if i) the trips should be quantified with reference to the average situation during the year (subjective estimate) or on a specific day; ii) if the trips should be considered singly, or if return trips should be calculated separately.

b) Reasons: % of systematic trips versus % of unsystematic trips. It is necessary to determine whether this level of disaggregation is satisfactory, or whether a more detailed level should be used (e.g. systematic trips: school, work; unsystematic trips: shopping, access to services, social relationships, recreation, ...).

c) Modal split: % of different modes of transport considered. It is necessary to determine: i) if the percentage distribution should refer to the number of trips or to kilometres covered; ii) which modes of transport should be specified: e.g. walking, cycling, motorcycles and mopeds, private car (possibly specifying whether as passenger or driver), taxi, collective transport (bus, tram, metro, local railway), combined mode – park & ride.

11. Keywords

mobility, passenger transportation, mode of transport, private car, motorcycle, moped, collective transport, cycling, walking.

Indicator n° 4

Availability of Local Public Open Areas and Services

Headline indicator: Percentage of citizens living within 300 m from POA > 5,000 m^2

Measurement: Citizen access to nearby public open areas and other basic services

1. Definition

Access is defined as living within 300 m from the open area or the other service[15].

Public open areas are defined as:

- public parks, gardens or open spaces, for the exclusive use of pedestrians and cyclists, except green traffic islands or dividers, graveyards (unless the local authority recognises their recreational function or natural, historical or cultural importance) [16];
- open-air sports facilities, accessible to the public free of charge[17];
- private areas (agricultural areas, private parks), accessible to the public free of charge[18].

To allow a more complete data analysis, the indicator must be calculated twice: first, relating to areas greater than 5,000 m^2, and second for all areas used by the public for leisure and open air activities, regardless of their dimension.

Basic services are defined as:

- primary public health services (general practitioner, hospitals, first-aid posts, family advice bureaux or other public centres supplying medical services, such as diagnosis or specialist examinations);
- collective transport lines that, at least for part of a common business day, have a minimum frequency (half-hourly service);
- public schools (compulsory attendance schools + kindergarten);
- bakeries and greengroceries;
- door to door recycling services and recycling bins[19].

[15] The European Environment Agency, DG Regional Policy and ISTAT (Italian Istituto Nazionale di Statistica) all use the concept 'within 15 minutes' walk' to define accessibility. It may reasonably be assumed that this corresponds to around 500 m on foot for an elderly person, which in turn may be equivalent to 300 m "as the crow flies".

[16] The indicator considers all areas used by the public for leisure and open-air activities. So even paved areas, if used for open air activities (i.e. skating) have to be included; on the contrary, a pedestrian road used for business and commercial activities should not be included.

[17] Sport facilities should be included only if freely accessible to the public and used by common people: football fields or similar professional sport facilities should not be included.

[18] Agricultural areas should be included only if used for leisure and open-air activities by the public. This is the case of farms that did "survive" urban expansion and are close to urban areas. These farms often change their commercial strategies, opening to citizens and schools, selling fruit and other products to the public and offering other services (restaurant, school visits, ...). Agricultural areas can only be included in such cases.

[19] In this case the indicator is calculated by summing the number of citizens served by the door-to-door recycling service and the number of citizens living within 300 m from a recycling bin. In case cities have the possibility of better specifying the indicator they should bear in mind the conclusions reached at the workshop held in Ispra (November 2001): "Since several cities have adopted different collection strategies for different waste fractions, it is suggested to split the indicator in single indicators, one for each fraction, calculating distances from the following collection point: glass and/or metal; plastic; paper; organic waste. Special waste, such as batteries, medical waste, …, shall not be included".

This indicator does not take the quality of the open area or service into account. In other words, it is assumed that the open areas or services perform - all in the same way - the functions for which they are intended. Naturally, this is not always the reality: there are open areas that are more attractive and popular than others, and the same goes for services. This weakness is, however, considered acceptable in the light of the possibility to monitor such level of satisfaction by means of Indicator 1. The geographical level to be considered is the whole administrative area for which the local authority is responsible.

2. Question

- What share of the inhabitants in the municipality lives close to public open areas and other basic services?

3. Context

Access to public open areas and basic services is essential in a sustainable community for the quality of life and the viability of the local economy. Having basic services close to home also reduces the need to travel. If basic requirements of food and health are not met, there is a failure to satisfy social needs. The absence of shops selling fresh fruit and vegetables is an indicator of social exclusion (e.g. in the UK) and a threat to health. Exclusion also occurs when lack of collective transport for those who rely on it is found.
Sustainability principles covered: 1, 3, 4, 5, 6.

4. Targets

There are no known targets or standards for this indicator, but access to open areas and services is recognised as essential for quality of life and local sustainability. Local authorities have an important role in facilitating access to open areas and basic services, for example through the planning process.

5. Unit of measurement

- Number of inhabitants living within 300 m from open areas or services / total number of inhabitants = % of population

6. Frequency of measurement

Biennial, except for indicators concerning food stores, for which a triennial frequency is suggested, due to the fact that data collection costs could be considerable.

7. Data collection method and sources

The most reliable method is based on the use of a Geographical Information System (GIS) to determine the distribution of the data (citizens, open areas, services, according to category). Once the borders of the open areas have been located on the GIS, the areas within a radius of 300 m from the borders are identified. Thus the municipal land will appear to be divided into two areas: the one included in the 300 m belts around the open areas and the one not included.
The GIS is consulted to obtain the number of citizens living within the areas included in the 300 m belts and the % of the total of citizens is calculated. The operation is then repeated for the points (or lines or borders if appropriate) corresponding to the basic services identified.
Data relating to the geographical distribution of the resident population should be available from the municipality or other administrative bodies (province or region) or from national statistical institutions (e.g. in the case of Italy, from ISTAT).
The local authority should also have data regarding the geographical distribution and extent of the open areas and services, in particular:

- public parks and gardens or open spaces, for the exclusive use of pedestrians and cyclists;
- open-air sports facilities, accessible to the public free of charge;
- private areas, accessible to the public free of charge;
- primary public health services;
- collective transport lines with a minimum frequency (half-hourly service);
- public schools (compulsory attendance schools + kindergarten);
- bakeries and greengroceries;
- door to door recycling services and recycling bins.

The distribution and size of parks, gardens and agricultural areas may also be obtained from remote sensing data that can be purchased (i.e. satellite data), although this data must then be verified through the use of maps and on-the-spot inspection.
The availability of data on the geographical distribution of the basic services will vary. Unlike that relating to open areas, this data cannot be obtained by 'remote' methods and requires a special database. Such a database may already be available from the local authority or other public bodies (Chamber of Commerce) or, if necessary, may be purchased from specialised firms (e.g. in Italy, from SEAT [Società Elenchi Abbonati al Telefono]).
An alternative method, should the one suggested above prove inapplicable or too costly, is the collection of data by means of interviewing a representative sample of citizens. A questionnaire must be prepared with a question about each of the services concerned. In this case, the question should relate to walking time (15 minutes) rather than to the distance in metres, as this reduces the risk of mistakes being made in the assessment.

8. Form of reporting/presentation

Public open areas:

- number of inhabitants living within 300 m from the public open areas / total number of inhabitants = % of population (to be presented as a figure); the indi-

cator must be calculated twice: first, relating to areas greater than 5,000 m², and second for all areas.
Basic services:
- number of inhabitants living within 300 m from each single basic service/total number of inhabitants = % of population (to be presented as a figure for each category of service);
- number of children living within 300 m from public schools/total school population[20] = % of school population.

9. Examples of similar applications

In its *State of the Environment Report* (1999), the city of Torino used an indicator based on the % of inhabitants living within 500 m of a green area (defined as a public garden or public park with a surface area greater than 6,000 m²).
Bristol City Council publishes the hectares of public open space and playing fields in every ward of the city each year, and calculates the average area for each of the 35 wards that make up the city for its *Quality of Life Report*. It also publishes the number of shops selling fresh fruit and vegetables in the city as a measure of the city's ability to meet basic needs.

10. Questions to address/Future developments

Further consideration should be given to:
- the maximum distance for access: a more complex indicator concerning different "spatial ranges" (different buffers) from open areas or services is envisaged;
- the minimum size of a recreational area;
- the services for which the indicator is to be calculated.

If differences in terms of quality of the recreational areas and services offered were to be significant, devising indicators based on levels of quality might turn out to be necessary. The quality level could be assigned by a committee of experts representing different interest groups.
It may be useful to ascertain the cost of creating the databases needed for determining the geographical distribution of services.
Basic services: a synthetic, more aggregate indicator regarding the percentage of inhabitants living closer than 300 m from all basic services should be developed.

11. Keywords

access, public open areas, basic services, primary public health services, collective transport, public school (compulsory attendance school), food store, recycling facilities

Indicator n° 5

Quality of local ambient air

Headline indicator: PM_{10} net overcomings
Measurement:
a) Number of times that the limit values for selected air pollutants are exceeded
b) Existence and level of implementation of air quality management plan

1. Definition

Ambient air quality depends on the level of some pollutants (gases or particulate matter) that are known to be hazardous to human health and well being, or to induce adverse effects on natural ecosystems, when exceeding risk or threshold levels. In order to limit the risk of acute episodes of pollution and to reduce long term exposure levels to such pollutants, the World Health Organisation defines and periodically revises recommended guideline values to each pollutant, based on epidemiological and controlled exposure studies. The standards of air quality in terms of levels not to be exceeded are defined in European directives, or by national and/or local bodies. The European directives set out that in zones and agglomerations where one or more pollutants exceed the limit values[21], a plan or programme for attaining such limit values must be prepared. In zones and agglomerations where such limits are not exceeded there is a requirement to maintain air quality.
"Local" refers to the administrative area following within the local authority's competence: municipality.

2. Question

- How many times in a year does the local air quality exceed limit values?
- Has the local authority prepared and implemented an air quality management plan?

3. Context

This indicator focuses on the main sources of air pollution in urban areas, mainly linked with combustion processes in mobility, heating systems and industries. The main pollutants emitted directly or as by-products of successive chemical reactions are sulphur dioxide; nitrogen dioxide; carbon monoxide; volatile organic compounds (benzene, for example); particulate matter, ozone and lead. These have negative impacts on humans, cultural artefacts and

[20] "School population" includes compulsory attendance age children and children attending kindergarten.

[21] The European directive 96/62/EC and related daughter directives define limit values taking into account the margins of tolerance. The margin of tolerance, which has been specified individually for each pollutant, decreases with time, so that by the date when limit values must be attained, the margins of tolerance are zero for all pollutants.

the ecosystem. Breathing polluted air can cause a range of medical problems, from asthma to cancer. Indirectly air pollution causes loss of local work force and increased medical expenditures as well as loss of productive and protected ecosystems. Air quality is therefore an essential aspect of sustainability. In accordance with the European directive 96/62/EC, the management of air quality involves the assessment of ambient air quality and the preparation and implementation of a plan or programme indicating the measures or projects that must be adopted to achieve the limit values for the areas where these are exceeded. The management plan/programme shall include measures for the main pollution sources. They may include measures directly related to mobility management (including measures regarding passengers and goods transportation, individual use of cars, collective transportation, introduction of alternative vehicles), heating systems (promoting, where feasible, alternative energy sources like solar thermal energy or, where possible, the use of district heating) or industrial processes. The management plans/programmes may, depending on the individual case, provide for measures to control and, where necessary, suspend activities, including motor-vehicle traffic, contributing to limit values being exceeded.
Sustainability principles covered: 1, 3, 5, 6

4. Targets

As indicated in the Community Framework Directive on Ambient Air Quality (96/62/EC) the related daughter directives establish limit values intended to avoid, prevent or reduce harmful effects on human health and the environment as a whole. The first daughter directive (1999/30/EC) defined limit values for concentration in ambient air of sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead. Directive 2000/69/EC established limit values for carbon monoxide and benzene and directive 2002/3/EC established limit values for troposphere ozone. As requested by directive 96/62/EC, limit values must also be fixed for poly-aromatic hydrocarbons, cadmium, arsenic, nickel and mercury. The limit values laid down in the above Directives are minimum requirements, allowing Member States the possibility of introducing more stringent protective measures and stricter limit values. The limit values fixed by the daughter directives correspond with the guide values recommended by the WHO[22].
In accordance with directive 96/62/CE (*Annex IV, Information to be included in the Local, Regional or National Programmes for improvement in the Ambient Air Quality*), the management plans/programmes must include, among other things, the details of those measures or projects adopted with a view to reducing pollution, as follows:

a. listing and description of all the measures set out in the project;
b. timetable for implementation;
c. estimate of the improvement of air quality planned and of the expected time required to attain these objectives.

Please note that:
Due to the improving harmonisation of national legislation with the EU directive, in case participants do not have the possibility to report overcomings of EU targets, overcomings of national limits are to be reported (clearly specifying to what specific national limits they are referred to).

5. Unit of measurement

- Number of times that the limit values for selected air pollutants are exceeded: the basic data is the number of times the limit value is exceeded for each selected air pollutant. The number of times is calculated in accordance with the period defined by the limit value: daily (if the limit value is based on daily concentration), 8 hour period (if it is based on 8 hours mean concentration) and hourly (if it is based on 1 hour concentration). Only those fixed sampling points that respect the minimum data capture and the uncertainty of assessment methods laid down by the 96/62/EC daughter directives must be taken into consideration (see section 4 for more details). If more than one fixed sampling point is available for a single pollutant in the same zone or agglomeration, the one that observes, during the year, the highest number of exceedances must be used. Therefore, for each selected air pollutant, the indicator corresponds to the number of times the limit value has been exceeded minus the number of times admitted by the 96/62/EC daughter directives (see section 4 for more details) in the calendar year. In case the number of times that the limit value is exceeded is lower than the number of times allowed, the indicator will be zero.
- Existence (yes/no) and level of implementation of air quality management plan/ programme (%).

6. Frequency of measurement

For a) the selected air pollutants are measured hourly by fixed sampling points and the results are then reported annually. For the first part of b) reporting takes place annually and for the second part of b) every three years.

7. Data collection method and sources

Directive 96/62/EC defined at European level the basic principles of a common strategy that defines objectives

[22] In Guidelines for Air Quality, World Health Organisation, 2000.

European directive, 1999/30/EC, 2000/69/EC and 2002/3/EC [23]

Pollutant	Averaging period	Air quality standards and objectives	Date by which limit value is to be attained	Data: minimum capture of measurement and uncertainty	Legal status
SO_2	24 hours	125 µg/m³ not to be exceeded more than 3 times a year (concentration equivalent to WHO guide value)	1st January 2005	90% 15%	1
NO_2	1 hour	200 µg/m³ not to be exceeded more than 18 times a calendar year concentration equivalent to WHO guide value)	1st January 2010	90% 15%	1
PM_{10}	24 hours	50 µg/m³ not to be exceeded more than 35 times a calendar year	1st January 2005	90% 25%	1
CO	max daily 8-hour mean concentration	10 mg/m³ (concentration equivalent to WHO guide value)	1st January 2005	90% 15%	2
Ozone	max daily 8-hour mean concentration	120 µg/m³ not to be exceeded more than 25 days per calendar year (concentration equivalent to WHO guide value)	2010	75% (18 daily 8-hour means)	3

NOTE: 1) Directive 1999/30/EC of 22 April 1999; 2) Directive 2000/69/EC of 16 November 2000; 3) Directive 2002/3/EC of 12 April 2002.

for ambient air quality in the Community "*designed to avoid, prevent or reduce harmful effects on human health and the environment as a whole*", assesses the ambient air quality on the basis of common methods and criteria, obtains adequate information on ambient air quality and ensures that this is made available to the public and maintains ambient air quality where it is good and improves it in other cases. Different options were defined for assessing the air quality depending on population concentration and/or density and the existing levels of each pollutant[24]. Where pollutants have to be measured, the measurements shall be taken continuously at fixed sites or by random sampling; the number of measurements shall be sufficiently large to enable the levels observed to be determined.

8. Form of reporting/presentation

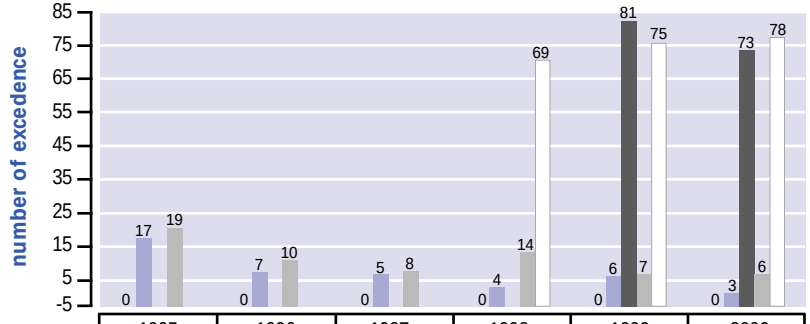
a) Number of times that the limit values for selected air pollutants are exceeded: the data must be reported using bar graph in which each bar corresponds to the number of times limit values have been exceeded (less the number of times allowed by the directives) for a single pollutant over the year. The graphs must be well identified: net number of times limit value is exceeded for each single pollutant (see example below).

b) Existence and level of implementation of air quality management plan/programme: in the first year: "yes, an air quality management plan exists", or, "no, there is no air quality management plan". Then every three years, figures corresponding to the per-

[23] Considering only the pollutants for which limit values are fixed for daily, 8 hour period or hourly concentration.

[24] In brief, the options are:
• the assessment of ambient air quality based on measurement is mandatory in the agglomerations (zone with a population concentration in excess of 250,000 inhabitants or, where the population concentration is 250,000 inhabitants or less, a population density per km_ which for the Member States justifies the need for ambient air quality to be assessed and managed), zones in which levels are between the limit values and the upper assessment threshold, and other zones where levels exceed the limit values;
• a combination of measurements and modelling techniques may be used to assess ambient air quality where the levels over a representative period (at least five years) are below the upper assessment threshold;
• the sole use of modelling or objective estimation techniques for assessing levels shall be possible where for a representative period (at least five years) the levels are below the lower assessment threshold.
Annexes of directives 1999/30/EC, 2000/69/EC and 2002/3/EC specify criteria that are to be used to determine the testing station pattern and criteria for the definition of the necessary minimum sampling points.
The classification of each zone or agglomeration shall be reviewed at least every five years (on the basis of concentrations during the previous five years or on the basis of combined measurement campaigns of short duration with emission inventories and modelling). Classification shall be reviewed earlier in the event of significant changes in activities relevant to ambient concentrations of the pollutants.

Net number of times limit values have been exceeded for each single pollutant, city XX



	1995	1996	1997	1998	1999	2000
SO_2 (days)	0	0	0	0	0	0
NO_2 (hours)	17	7	5	4	6	3
PM_{10} (days)					81	73
CO (8 hours periods)	19	10	8	14	7	6
O_3 (8 hours periods)				69	75	78

centage of the level of implementation for each single measure/project identified in the management plan/programme, using a two-column table:
The method used for assessing the air quality should be described.

Measure/project	Level of implementation (%)
1. …	
2. …	

9. Examples of similar applications

The *Air Management Information System* developed by the WHO Healthy Cities Programme, provides for the exchange of information on air quality management between countries and cities. For example, data collection and publication of conventional pollutants (SO_2, NO_2, CO, O_3, PTS, PM_{10}) is organised by annual mean, number of days on which the WHO air quality guidelines are exceeded and 95th percentile.
The *Urban Audit* (European Commission, Directorate General for Regional Policy) includes three air quality indicators: Winter Smog: number of days SO_2 exceeds 125 µg/m^3 (24 hour averaging time); Summer Smog: number of days Ozone O_3 exceeds 120 µg/m^3 (8 hour averaging time); Number of days per year that NO_2 concentrations exceed 200 mg/m^3 (1 hour averaging time).
The *Transport and Environment Reporting Mechanism* (European Environment Agency and European Commission) and the *European Local Transport Benchmarking Initiative* (European Commission, Directorate General for Transport and Energy) both use exceedance of air quality standards as an indicator at city level. The first measures exceedance of EU air quality standards for benzene, carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3) and particulate matter (PM_{10}).
The *Environmental Headline Indicators* (jointly by the Member States, the European Commission and the European Environment Agency) includes an air quality indicator: "average number of exceedance days for selected air pollutants in urban areas" focusing on PM_{10}, O_3, SO_2 and NO_2.
The *Environmental Signals Report* (European Environmental Agency) on its Air Pollution chapter includes a reference on the number of exceedance days for O_3 and for PM_{10}.

10. Questions to address/Future development

This indicator considers outdoor air quality only; it does not address indoor air quality problems.

11. Keywords

ambient air quality, outdoor air quality, air pollution, risk level, threshold level, limit value, benzene, carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, management plan/programme

Indicator n° 6

Children's Journeys to and from School

Headline indicator: Percentage of children going to school by car
Measurement: Mode of transport used by children to travel between home and school

1. Definition

'Collective transport' refers to a school bus or private car giving a lift to more than 2 children.
'Private car' refers to a private car giving a lift to 2 or less children.
Data must be collected among kindergarten children and above, until the age when they are allowed to drive scooters - according to specific national legislation.
The indicator must be determined with reference to the 'most commonly used form of transport', which may be defined as the means of transport used for at least 50% of the school days of a year (or else with reference to a specific date, the same for all children, to be established when the data are collected).

2. Question

- In the view of parents, how safe and functional is the local community and the collective transport system for young children?
- What kind of transport is used to get schoolchildren to and from school?
- How important is it to teach children to adopt a sustainable lifestyle?

In particular, the indicator is intended to quantify the number of children going to school on foot and/or by bicycle, investigating the reasons for which, if this is not so, they use collective transport or private cars.

3. Context

A sustainable society is one that is safe enough, in terms of both traffic safety and criminality, for parents to feel that their children can use the streets or collective transport services (accompanied or unaccompanied, depending on age). It is also a society in which public services, whether collective transport or primary and secondary schools, are within easy reach by walking or cycling.
A sustainable society is also one where parents take responsibility for teaching their children to adopt a sustainable lifestyle, including teaching them to use collective transportation or proper cycling behaviour. Actions like driving children to school not only contribute to rush hour traffic and related environmental, social (including poor health and level of fitness) and economic problems, but also give the wrong signals to children in terms of environmental awareness and sustainable behaviour.
Sustainability principles covered: 1, 3, 4, 5

4. Targets

There are no recognised targets for this indicator, simply a general recognition that the choice of mode for children's journeys to and from school, a significant proportion of daily mobility, has a considerable effect on congestion and other aspects of sustainability.

5. Unit of measurement

- Percentage of children travelling by each mode.

The indicator is expressed in % value, dividing values by mode and (if available) by the reasons determining the choice of a particular mode of transport.

6. Frequency of measurement

Annual

7. Data collection method and sources

Data are collected by means of a survey carried out on children parents and the questionnaires may be distributed at school or directly to families houses.
In both cases, the set of questions to be asked could be found in the document "Survey Methodology – Indicators 1, 3, 6 and 10" and in the section relevant to indicator 6.
In the first case it is necessary to identify a sample of schools, representative from the point of view of their distribution in the urban and socio-economic context (central, inner suburban, outer suburban areas). The samples should be selected bearing in mind the following parameters and criteria:

- a school for each type of area or, at least, for each decentralized or administrative area (geographical representativeness is the most important criterion to be taken into account, but, depending on financial resources available for the preparation of questionnaires, it is possible to increase the total number of schools up to the level of Bristol, where the survey regarded 50% of the city's primary schools);
- an entire period for each school selected (e.g. a section comprising the five years of a primary school, a section comprising the three years of middle school, or a section comprising the whole period of compulsory attendance from 6 to the age when they are allowed to drive scooters).

In order to guarantee the survey's success, attention must be paid to the fact that the school system has a basic role to play, so it must be adequately motivated and prepared to this end. In other words, the local au-

thority should organise the survey in accord with the school managers and the representatives of teachers and parents.
The questionnaire has to be distributed to parents of children younger of the age when they are allowed to drive scooters and the school has a co-ordinating and organisational function (it distributes the questionnaires, reminds the parents to fill them in and collects them when completed).
This method has good consequences on parents because it helps raising of awareness of their children sustainable mobility issue.
The fixing of a specific date (or two dates, for example in two different periods of the year when the weather is different) for the contemporary distribution and compilation of the questionnaire in class offers an opportunity to combine the operation with other local initiatives aimed at focusing children's attention on the issues involved in urban transport, road safety, ...
In case the municipality decides to use the "family logbook"[25] as a means to carry out a comprehensive survey to investigate residents behaviour, the set of questions includes those relevant to indicator 6.
Sampling methodology and logbook distribution techniques are fully described in the document "Survey Methodology – Indicators 1, 3, 6 and 10"; in this case parents are required to fill in one questionnaire for each child younger than the age when he/she is allowed to drive scooters – according to national legislation.

8. Form of reporting/presentation

A 100% area stacked chart showing the trend of the percentage contributed by each mode of transport. The following chart is based on data relating to a number of years. The data relating to a single year can be represented using a piechart.

In order to complete the information contained in the one above, it is also possible to create other charts showing the different distribution of the modes of transport in relation to children's ages and the reasons given for the use of the private car.
The method of data collection (including sample size and characteristics) should be described.

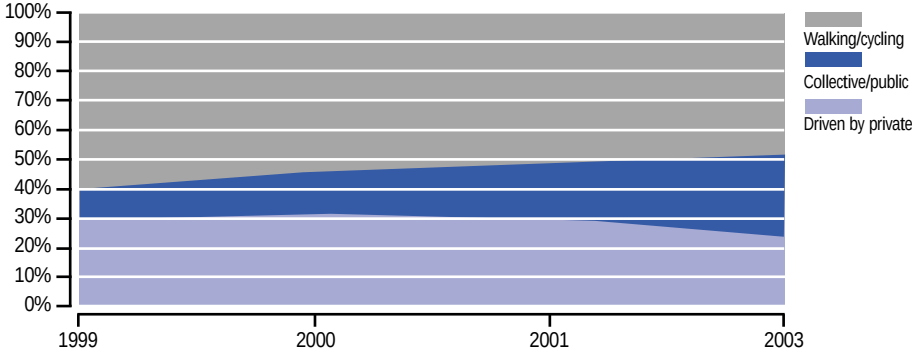
9. Examples of similar applications

This indicator is used in Bristol in the UK, where a survey of 50% of the city's primary schools has been carried out to establish the modal split between walking, bus or car. The results show that 20% of the rush hour traffic is related to children being driven to school.

10. Keywords

mode of transportation, journey to school, children

Percentage contribute of each mode of transport in children's journeys to and from school



[25] A logbook has been prepared and will distributed to signatories together with the final document containing the methodology updates. The logbook is for families to record their satisfaction with the local municipality and their habits with respect to mobility and purchase of sustainable goods. It shall be distributed by post to families selected at random from electoral registers. The logbook is the result of an attempt to allow the municipality to carry out all surveys together and, by so doing to be able to collect data on more indicators, saving a considerable amount of money and time. Furthermore, the logbook is also aimed at showing a significant involvement in sustainability issues on the part of the municipality.

Indicator n° 7

Sustainable Management of the Local Authority and Local Businesses

Headline indicator: Percentage of environmental certifications on total enterprises

Measurement: Share of public and private organisations (large enterprises and SMEs) adopting and using environmental and social management procedures.

1. Definition

Environmental or social management procedures refer to:

- EMAS and ISO 14000/14001 (the EC and ISO recognised environmental management system and standards). For not EU countries some national Scheme exist (e.g. Norway).
- SA8000 (defined by CEPAA - The Council on Economic Priorities Accreditation Agency, international standard focused on workplace conditions in supply chains inspired to ILO - International Labour Organisation).
- AA1000 (defined by the UK based Accountability Foundation, at the moment not positioned as a certifiable standard, but emerging as a possible common European standard for social, ethical and corporate governance activity).
- SIGMA [Sustainable Integrated Guidelines for Management] developed by Forum for the Future, BSI-UK and several international business partners is trying to integrate elements of ISO 14001, AA1000 and any other management tool/system that encompasses good environmental, social and ethical practices.

For further information on the different procedures, see also the web sites suggested in point 7 (Data collection).

- SMEs refer to the definition given in the Commission Recommendation of 3 April 1996 (96/280/EC) summarised as: Number of employees: Micro-enterprise <10; Small enterprise <50; Medium Enterprise <250.
- NACE code: Statistical Classification of Economic Activity.

The EMAS Regulation defines an organisation as "*a company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administrations.*"

The indicator considers as "organisations adopting and using" organisations that have completed the certification process and obtained the certificate. If information is available, organisations that have just undertaken the certification process and are not yet certified could also be considered. Organisations belonging to the two 2 different classes are considered (and counted) separately.

Within Public organisations/administrations, different services, units, public utilities, … could be considered, and counted, as "separate entities" (*e.g. the revised EMAS Regulation will be applicable to the entire organisation and will not be restricted to a specific site, although only certain elements of an organisation can be registered under EMAS. The environmental statement will need to specify what part of the organisation is registered, in order to eliminate a false impression with the public that the entire organisation is registered).*

2. Question

- To what extent are local businesses, organisations and authorities managing resource consumption, environmental protection and social issues by adopting recognised procedures?

3. Context

Recognised and certified environmental and social management, reporting and auditing schemes have been expressly created to promote continuous environmental/social performance improvements of activities by committing the local authority, local businesses and organisations to evaluate and improve their environmental/social performance and provide relevant information to the public. Monitoring the number of actors adopting these tools shows how businesses and public organisations endorse/take responsibility towards/for the environment and the local community. An increase in use also shows, generally speaking, the degree of innovation in management – low-impact technology and savings in processes – at the local level.

EMAS and ISO 14000/14001 are certified, voluntary environmental management tools developed at European and international levels. They are used by businesses as well as local authorities and NGOs (within the United Kingdom, currently some 46 % of local authorities have begun working with LA-EMAS and the complimentary international EMS standard ISO 14001).

Today, several organisations are working on the definition of more appropriate management tools, linking environmental protection to cheaper production processes and social considerations: among them SA8000, defined by CEPAA and focused on workplace conditions in supply chains and AA1000, not yet an official standard, but supported by most stakeholders in the field across Europe and emerging as a possible common European standard for social, ethical and corporate governance.

Sustainability principles covered: 1, 2, 3, 4, 5

4. Targets

There are no known targets, but an upward trend in adoption is desirable for these issues.
In some local situations, specific targets have been defined (number of certifications to be reached by a certain date) thanks to the development of Agenda 21 or the definition of voluntary agreements relating to the theme.

5. Unit of measurement

- % of total number of organisations in the municipality area, separately for environmental and social management procedures, and split into different types and sizes.

6. Frequency of measurement

Annual

7. Data collection method and sources

The breakdown of data about certified enterprises has to be coherent with the NACE classification.
For the acquisition of data relating to EMAS certification:
The EMAS helpdesk at http://europa.eu.int/comm/environment/emas/index.htm provides access to a list of EMAS certificate sites, giving the name of the certified firm, its address, telephone number and NACE code. The helpdesk does not provide data relating to the number of employees for each certified site. This data may be obtained by calling the certified firm or making use of other information from competent bodies (responsible for the registration of EMAS sites in each country, addresses and telephone numbers are available through the above helpdesk), when available, or from industrial and SME unions, workers union, Chambers of Trade and Commerce, National and Regional Environment Agencies and the Local Authority itself. For non EU countries, national statistics exist (e.g. Norway).
For the acquisition of data relating to ISO certification:
The site http://www.iso14000.net/database provides (for a charge) data relating to ISO 14000 certifications in all European countries. In some European countries (e.g. Italy, with http://www.sincert.it) databases with detailed information regarding certified sites within the national territory exist. The site www.iso.ch provides general information on the ISO system and country members.
For the acquisition of data relating to the SA8000 and/or AA1000 certification:
At present no European database relating to this type of procedure seems to be available. General information on this kind of standards could be obtained through http://cepaa.org; http://cei.sund.ac.uk; http://www.accountability.org.uk or through the organisations that are concerned with the development of these systems at a national level.
For the acquisition of data on "organisations adopting/beginning", the use of surveys is suggested.

8. Form of reporting/presentation

The indicator is presented as figures:

nace rev 1,1	Total	nace rev 1,1	Total
A	Agriculture, hunting and forestry	DK	Manufacture of machinery and equipment n.e.c.
B	Fishing	DL	Manufacture of electrical and optical equipment
C	Mining and quarrying	DM	Manufacture of transport equipment
CA	Mining and quarrying of energy producing materials	DN	Manufacturing n.e.c.
CB	Mining and quarrying, except of energy producing materials	E	Electricity, gas and water supply
D	Manufacturing	F	Construction
DA	Manufacture of food products, beverages and tobacco	G	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods
DB	Manufacture of textiles and textile products	H	Hotels and restaurants
DC	Manufacture of leather and leather products	I	Transport, storage and communication
DD	Manufacture of wood and wood products	J	Financial intermediation
DE	Manufacture of pulp, paper and paper products; publishing and printing	K	Real estate, renting and business activities
DF	Manufacture of coke, refined petroleum products and nuclear fuel	L	Public administration and defence; compulsory social security
DG	Manufacture of chemicals, chemical products and man-made fibres	M	Education
DH	Manufacture of rubber and plastic products	N	Health and social work
DI	Manufacture of other non-metallic mineral products	O	Other community, social and personal service activities
DJ	Manufacture of basic metals and fabricated metal products	P	Activities of households
		Q	Extra-territorial organizations and bodies

- percentage of enterprises that have adopted environmental management procedures;
- percentage of enterprises that have adopted social management procedures;
- percentage of enterprises that have adopted both environmental and social management procedures.

It is also required the analysis of:

- percentage of total large enterprises that have adopted environmental and/or social management procedures, classified using the NACE classification;
- percentage of total medium and small enterprises that have adopted environmental and/or social management procedures, classified using the NACE classification;
- percentage of total public organisations that have adopted environmental and/or social management procedures;
- percentage of total non-government organisations that have adopted environmental and/or social management procedures, split, when appropriate, on the basis of different types of organisations (e.g. NGOs and charitable associations).

It is useful to supply further supplementary information, though distinguishing it from the indicator as such, on the existence of voluntary agreements on the basis of which it is possible to determine a target and/or a number of organisations working towards certification, for example.

9. Examples of similar applications

Similar indicators are used in several initiatives, but these focus on the environmental aspects only (e.g. Birmingham, Emilia-Romagna, Haemeenlinna and Den Haag). The city of Bristol and the Provincia di Torino have a "sustainable business" LA21 target to see more SMEs adopting environmental management tools.

10. Questions to address/Future development

The robustness of the indicator is strictly related to the schemes considered. At present, the indicator only illustrates the intention of organisations to have environmentally and socially sound management and not real performance towards sustainability. In the future, when certified performance measures become available, the revised indicator could look into: "The level of successful use of environmental and social management procedures at a local level".

11. Keywords

environmental/social, management/reporting/auditing, procedure/system/scheme

Indicator n° 8

Noise Pollution

Headline indicator: Percentage of population exposed to L_{night} >55 dB(A)

Measurement:

a) Share of population exposed to long-term high level of environmental noise.

b) Noise levels in selected areas of the municipality (*to be used instead of a) where data for a) cannot be obtained*).

c) Existence and level of implementation of a noise action plan.

1. Definition

"Environmental noise" means unwanted or harmful outdoor sound created by human activities, including noise emitted from road traffic, rail traffic and air traffic, and from sites of industrial activity. It does not include noise that is caused by the exposed person himself, noise from domestic activities, noise created by neighbours, noise at work places or noise inside means of transport (Directive 2002/49/EC of the European Parliament and of the Council of 25th June 2002 relating to the assessment and management of environmental noise).

2. Question

- To what extent are citizens exposed to environmental noise from road, rail and air traffic, and from industrial sources in their homes, in public parks and other relatively quiet areas?
- What are the noise levels in selected areas of the municipality?
- Has the local authority prepared and implemented any noise action plan/programme?

3. Context

The impact of environmental noise can have harmful effects on human health and wellbeing. A sustainable society should offer a mix of main urban functions such as housing, work and mobility without exposing citizens to "annoying" noise levels. Although increased mobility increases the chances for noise, this is not necessarily true if the transport mode is not mechanised or if certain forms of collective transportation are involved.

The European Directive[26] 2002/49/EC of 25th June 2002 relating to the assessment and management of environmental noise aims to define a common approach

[26] The full text is available on the Europa web site: http://europa.eu.int/. Follow the steps: Official documents; Eur – lex, European Union Law; Legislation in preparation; Directive of commission proposals; 15. Environment, consumers and health protection; 15.10.20.40 Prevention of noise pollution.

for combating the effects of exposure to environmental noise. It lays down a framework for determining exposure to environmental noise, making information on environmental noise and its effects available to the public, and adopting action plans. The action plans shall address priorities that may be identified by the exceedance of any relevant limit value or by other criteria chosen by the Member States. The actions may for example include traffic planning, land-use planning, technical measures at noise sources, selection of quieter sources, reduction of sound transmission, and regulatory or economic measures or incentives. The objective is to prevent and reduce environmental noise where necessary, and particularly where exposure levels can induce harmful effects on human health, and to preserve environmental noise quality where it is good.
Sustainability principles covered: 1, 5, 6.

4. Targets

The Proposal for the Community Environment Action Programme 2000-2009 includes a target on noise, i.e. reducing the estimated 100 million people regularly affected by long-term high levels of noise during 2000 by 10% within 2010 and by 20% within 2020. The long-term objective is to reduce them to a statistically insignificant number.

5. Unit of measurement

- % of population exposed, broken down into different value bands of L_{den} and L_{night}
  In accordance with the European directive 2002/49/CE, "Common assessment methods for the determination of L_{den} and L_{night} shall be established by the Commission in accordance with the procedure laid down in Article 13(2) through a revision of Annex II. Until these methods are adopted, Member States may use assessment methods adapted in accordance with Annex II and based upon the methods laid down in their own legislation". Therefore, for the ECI project propose and until, if local legislation defines other indicator, for example L_{day} (that could include the evening period), the indicators reported could be the L_{day} and the L_{night}. For each indicator, the period of the day considered must be reported.
- % of measurements corresponding to different value bands of indicators L_{den} and L_{night}
- existence (yes/no) and level of implementation of noise action plan/programme (%)

6. Frequency of measurement

Five-year
Biennial
Biennial

7. Data collection method and sources

a) The share of population exposed to long-term high level of environmental noise is to be determined through the assessment of noise levels and the analysis of this information in conjunction with population maps. Noise levels are to be assessed using the noise indicators L_{den} and L_{night}, either by computation or measurement, or both.
   The day-evening-night noise indicator (L_{den}) is the noise indicator for overall annoyance. This shows an estimate of the number of people (in hundreds) living in dwellings exposed to each of the following bands of values of L_{den} in dB(A): 55-59, 60-64, 65-69, 70-74, >75, separately for road, rail and air traffic noise and for noise caused by industrial sources. The day is 12 hours, the evening 4 and the night 8.
   The night-time noise indicator L_{night} is the noise indicator for sleep disturbance. This shows the estimated total number of people (in hundreds) living in dwellings exposed to each of the following bands of values of L_{night} in dB(A): 45-49, 50-54, 55-59, 60-64, 65-69, >70, separately for noise coming from road, rail and air traffic and from industrial sources
   The general assessment framework laid down in the European Directive on the assessment and management of environmental noise can be used as a guideline. For detailed information on the methods of assessment of noise exposure proposed by the European Commission, please see the Annex I (Noise Indicators) and Annex II (Assessment Methods), Annex IV (Minimum Requirements for Noise Maps) of the Directive of the European Parliament and of the Council relating to the Assessment and Management of Environmental Noise (Directive 2002/49/CE from 25th June 2002).
b) The noise levels in selected areas of the municipality are to be determined through measurements taken at representative locations across the municipal area, allowing for data to be collected that corresponds to the indicators L_{den} nd L_{night}. The number of measurements can be determined by the local authority, but must be reported.
c) Information on the existence and level of implementation of a noise action plan is available from the local authority itself.

8. Form of reporting/presentation

a) The estimated number of people living in dwellings exposed to each of the following bands of values of L_{den} in dB(A): 55-59, 60-64, 65-69, 70-74, $\geq$75, separately for road, rail and air traffic noise and noise from industrial sources.
   The estimated total number of people living in dwellings exposed to each of the following bands of values of L_{night} in dB(A): 45-49, 50-54, 55-59, 60-64,

	45 - 49 dB(A)	50 - 54 dB(A)	55 - 59 dB(A)	60 - 64 dB(A)	65 - 69 dB(A)	70 - 74 dB(A)	≥ 75 dB(A)	Total measure number
L_{den}								
L_{night}								

65-69, >70, separately for road, rail and air traffic and for industrial sources.
The figures must be rounded to the nearest hundred (e.g., 5,200 = between 5,150 and 5,249; 100 = between 50 and 149; 0 = less than 50). The computation or measurement methods used for assessing noise exposure should be described.
The calculation methods or the measurement for the noise exposure evaluation should be reported.

b) The proportion of measurements corresponding to each of the above mentioned value bands of L_{den} and L_{night}, e.g:
The total number of measurements taken should be reported.

c) Figures corresponding to the percentage implementation for each single measure/action identified in the action plan/programme[27], using a two-column table:

Measure / Action	Level of implementation (%)
1. …	
2. …	

9. Examples of similar applications

The calculation of the share of the population exposed to high levels of environmental noise is not standardised yet, though several methods have been presented, including in a number of ISO standards and in various Member States Legislation. According to the European directive 2002/49/EC, the European Commission within the 1st of July 2003 will publish guidelines on the revised methods for the assessment of noise indicators, will provide emission data for aircraft noise, railway noise and road traffic noise on the basis of existing data and may develop guidelines providing further guidance on noise maps, noise mapping and mapping software.
The project TERM (Transport and Environment Reporting Mechanism promoted by the European Environment Agency) uses two similar noise indicators to evaluate traffic noise:

- % of population exposed to four transport noise exposure levels (L_{den}): 45-55, 55-65, 65-75, >75 dB(A);
- % of population highly annoyed by traffic noise of the various modes.

10. Questions to address/Future development

Are there any simple methods to calculate the indicator for communities with limited financial resources?
In the future, would it be useful to introduce another sub-indicator focusing on the perception of citizens of the level of noise they are exposed to, in order to see whether or not there is a discrepancy between actual measured noise levels and the perception of noise pollution?

11. Keywords

Environmental noise, noise pollution, noise exposure

Indicator n° 9

Sustainable Land Use

Headline indicator: Percentage of protected areas
Measurement:

a) Artificial areas: artificial surfaces as a percentage of the total municipal area
b) Derelict and contaminated land: extent of derelict land (area, m^2) and contaminated land (area, m^2)
c) Intensity of Use: number of inhabitants per km^2 of "urbanized land" area
d) New development: quota of new edification taking place on virgin area (greenfield) and quota taking place on derelict and contaminated land (brownfield in total area as soil projection) in % per year[28]
e) Restoration of urban land
1. Renovation/conversion of derelict buildings (total number)
2. Renovation, conversion of derelict buildings (floor surface in m^2)
3. Redevelopment of derelict land for new urban uses - including public green spaces (area, m^2)
4. Cleansing of contaminated land (area, m^2)
f) Protected areas as a percentage of total municipal area

[27] In accordance with the draft European Directive, the action plan must include, among other things, the following elements:
- any noise-reduction measures already in force and any projects in preparation;
- actions planned in the next five years, including measures aimed at preserving quiet areas;
- provisions envisaged for evaluating the implementation and the results of the action plan.

[28] As regards the concept of "new buildings" on greenfields and brownfields, the indicator explicitly refers to what has happened in the previous year.

1. Definition

This indicator is concerned with sustainable development, restoration and protection of land and sites in the municipality. Urban expansion tends to increase the urbanised area at the expense of virgin land and green areas. Moreover, in many European cities, the socio-economic transformation of the last century led to the abandonment of developed and contaminated land. Sustainable land use means efficient land use within the city through targeted urban development, minimising the take up of agricultural and natural land (greenfield sites), and enhancing developed land through restoration and upgrading.

Other definitions essential for the correct use of the indicator:

Municipal area: area under the administration of the Municipality (including rural areas; metropolitan areas should include the whole territory under administration);

Developed/urbanised land: land occupied by buildings, in a continuous or discontinuous manner, corresponding to the Corine Land Cover "artificial surfaces" category of land use;

Virgin land (greenfield): land "uncovered" by artificial surfaces, corresponding to any of CORINE land cover classes, except for "artificial surface";

Derelict building: building no longer in use; both their renovation and conversion have to be accounted as the sum of floor surface expressed in m^2 for each interested floor;

Derelict land (brownfield): part of developed/urbanised land (artificial surfaces) no longer in use (for housing, industry or services);

Contaminated land (brownfield): land affected by levels of pollution of the soil or subsoil that are high enough to require remediation before safe reuse is possible;

Protected areas: areas where vegetation and landscape are under specific protection and land cover can't undergo major changes.

2. Question

- Is the municipality committed to a sustainable land use policy, though targeting development, increasing land use efficiency, protecting underdeveloped land and ecologically sensitive sites and restoring and redeveloping derelict and contaminated land?

3. Context

A sustainable city is one that enhances the efficiency of land use within its territory, protects highly valued unbuilt land, biodiversity value and green areas from development and restores contaminated and derelict land (brownfield sites). Most cities and urban-regional authorities implement policies aimed at increasing urban densities through targeted development. There is also a wide range of policies at all levels for protecting sites with agricultural, landscape and ecological value and able to sustain biodiversity, as well as European policies for the restoration of derelict and contaminated land.

In order to monitor the sustainable use of the land, it is advisable to adapt data produced for all EU countries by the Corine Land Cover (see box). The first indicator will be the artificial areas one: it will give information on the size of the developed area as "artificial surfaces" and the percentage of the whole municipality area it corresponds to. The advantage of this indicator is its capacity to record both the effective protection of ecologically sensitive sites (Habitats Directive) and the restoration and reuse of derelict land: all policies aiming to limit the expansion of the city in agricultural or natural areas will allow a smaller exploitation of the areas not classified as "artificial surfaces".

To measure efficiency of land use an indicator of the intensity of use is envisaged. The indicator will be defined as number of inhabitants per ha of urbanised area. The first indicator only measures large-scale changes: an increase or reduction of just a few hectares of the artificially modelled areas makes little difference to the percentage. Neither can the density or quality of the developed area be deducted from the size of the developed area alone. Moreover, it does not record initiatives for the restoration of derelict or contaminated land intended to allow for its reuse - that is, when derelict sites are reused for new housing or productive activities, but the size of the 'artificial' area does not change. In order to monitor these phenomena, it is advisable to introduce other indicators: one is the proportion of new building taking place on virgin area (greenfield) and the fraction on derelict or contaminated land (brownfield).

To have a better understanding of the restoration and renovation activity some specific information should be supplied concerning:

- renovation: conversion of derelict buildings (floor surface in m^2);
- redevelopment for new urban uses, including public green spaces (area, m^2);
- cleansing of contaminated land (m^2).

Finally, it is advisable to monitor the capacity of the municipality to safeguard the areas of greatest ecological value through the creation of protected sites - in other words, through the introduction of legal instruments or constraints that guarantee land protection. In this case the appropriate indicator is the area of protected sites as a % of the total municipal area.

The first indicator records the large-scale phenomena (spatial and temporal), shows whether the urban deve-

Monitoring Land Use in Europe

Land use is monitored in Europe by means of the Corine Land Cover, itself a subprogram of the CORINE program. It includes thematic maps representing the area and dividing it into categories according to the way the land is used. The database is constituted by 44 categories of land use. Data are acquired through the interpretation of satellite photographs and processed by computers with the addition of supplementary data (maps, aerial photographs, statistics, local knowledge). The 44 categories are divided into groups, each having 3 levels. The main levels comprise:

1. artificial surfaces
2. agricultural areas
3. forests and semi-natural areas
4. wetlands
5. water bodies

For each of the main levels there are two lower levels: for example, in category 3 (forests and semi-natural areas), wooded areas (3.1) are distinguished from scrub and heath (3.2); in the wooded areas, broadleaf woods (3.1.1.) are differentiated from conifer forest (3.1.2).
Corine Land Cover database provides identification and mapping of the 44 categories for minimum mappable areas of 25 ha, using a map scale of 1:100,000. The existing database was created on the basis of satellite data collected at the beginning of the 1990s. Currently, the whole database is being updated for reference year 2000, using a similar methodology as in the past. A lowering of the digitalisation lower limit from 25 ha to 5 ha for some classes is proposed. In addition, a change of 5 ha of an existing class will be attributed for in the updated version. Furthermore, the updating process should be such that trend analysis with the previous version is feasible. Thus, it is carried out in terms of digitalisation (editing) of change only, rather than of an entirely new digitalisation.

lopment is of the dispersed or compact type - in the latter case, with a tendency to limit the use of land. The second measures the capacity of the city to begin processes of regeneration and avoid the waste of land. The third measures the ability of the city to protect biodiversity and the areas having greatest natural and landscape value.
Sustainability principles covered: 1, 3, 5, 6.

4. Targets

The increased efficiency and quality of urban environments should be firmly placed within the European Spatial Development Perspective (ESDP), attempting to connect physical aspects of sustainability with other key political agendas, such as social cohesion and economic competition within Europe. Urban regional authorities have played a vital role in developing the ESDP, which now provides a framework for much interregional planning activity within the EU and between EU and neighbouring countries.
There are, moreover, international agreements for the protection of certain biodiversity sites (the Ramsar Convention), in addition to European legislation having the same objectives (Habitats Directive 92/43/EC). In some countries local nature reserves are to be found, too.
Contaminated land is also subject to improvement targets. There are targets devised to direct new development to brownfield sites (e.g. 60% of new housing in the UK), while protecting green sites in most countries.

5. Unit of measurement

- artificial surface of the total municipal area: %
- extent of derelict land (m^2) and contaminated land (m^2)
- number of inhabitants per ha of urbanized land area
- newly built areas on virgin land and on derelict or contaminated land: % (the total must be 100%; only derelict land area - soil projection - must be considered, so that the restoration of 3 floors of a derelict building is equivalent to only one floor)
- renovation of urban land
  - renovation/conversion of derelict buildings (total number)
  - renovation, conversion of derelict buildings (floor surface in m^2)
  - redevelopment of derelict land for new urban uses - including public green spaces (m^2)
  - cleansing of contaminated land (m^2 and public expenditure)
- protected areas of total municipal area: %

6. Frequency of measurement

- the same as the updating frequency of Corine Land Use Database
- annual
- the same as the updating frequency of Corine Land Use Database
- annual
- annual
- annual

7. Data collection method and sources

The data on "Urbanised land" is obtained from CORINE EU sources (see box on Corine Land Cover): many muni-

cipalities, however, already use it for spatial planning.
The data on areas built entirely anew and the fraction concerning virgin land and derelict or contaminated land and the protected areas may be obtained from the plans and programmes of local authorities.
The calculation of the indicators is easy once the respective sizes of the different categories of land use and of the areas affected by restoration and decontamination schemes are known.
The geographical level to be considered is the whole area for which the local authority is responsible.

8. Form of reporting/presentation

- Bar graph for each period for which data is available.
- Bar graphs for each year
- Bar graph for each period for which data is available.
- Pie graphs for each year
- Bar graphs for each year
- Bar graphs for each year

9. Examples of similar applications

New housing development on brownfield sites as % of new housing is published each year in the *Bristol Quality of Life Report*, as is the total number of local nature reserves.
Norwich City Council publishes the amount of land developed from year to year, the proportion of this land that is on brownfield sites and the increase or reduction in greenfield sites compared to the previous year.

10. Questions to address/Future development

As regards efficiency of land use, it is possible to consider a larger number of indicators intended to verify various aspects in greater detail. The city of Oslo, the JRC and the EEA have suggested a number of indicators allowing a more complete examination of the questions at issue; today these appear to be problematic because of difficulties in data collection; however, they could be taken into consideration for the future. The city of Oslo's proposal is outlined below.

- efficiency of land use: intensity of use by use types:
  - employment (employees per ha industrial/business development)
  - transport (estimated passenger kilometres per ha transport infrastructure)
- availability of habitat
  - unbuilt area for habitat type or land cover

11. Keywords

development, restoration, regeneration, protection, derelict, contaminated, greenfield, brownfield, biodiversity, land use

Indicator n° 10

Products Promoting Sustainability

Headline indicator: Percentage of people buying "sustainable products"
Measurement:
a) Share of eco-labelled, organic, energy-efficient, certified timber and fair-trade products in total consumption.
b) Availability and market supply of eco-labelled, organic, energy-efficient, certified timber and fair-trade products.
c) Green purchasing of local authority.

1. Definition

The term 'eco-labelled, organic, energy-efficient, certified timber products' refers to products that are controlled and certified, according to certain criteria regarding ecologically sound production, distribution, use and disposal methods, by a recognised and independent organisation.
The term 'fair-trade products' refers to products that are controlled and certified, according to certain criteria regarding stable and fair production methods as well as healthy and stable working conditions, by a recognised and independent organisation.

Labelling systems
In the European Union, 'ecological products' can be identified by means of the 3 most common eco-label certification systems:

- Blue Angel (Germany)
  http://www.baluer-engel.de
- Nordic Swan (Nordic countries)
  http://www.svanen.nu/eng/ecolabel.htm
- EU-Ecolabel (European Union)
  http://europa.eu.int/ecolabel

This kind of labels is awarded to all products that prove to be environment-friendly at each stage of their life cycle: extraction of raw materials, manufacturing process, distribution (including packaging), use and final disposal.
'Eco-labelled products' are defined as those awarded one of the above labels. The EU label (a daisy printed on certified products) may be used for the following product categories: tissue paper, dishwashers, soil improvers, bed mattresses, indoor paints and varnishes, footwear, textile products, personal computers, detergents, copying paper, light-bulbs, portable computers, refrigerators, washing machines.

'Organic products' are controlled and certified by public and private certification bodies (each one has its own label) expressly designated by single national governments (EEC reg. no. 2092/91). On 31st December 1997 a new organic product labelling system came into effect. From that date onwards it has been possible to find three categories of products on the market: organic products, products primarily made with organic ingredients, and products made with ingredients coming from agriculture in the process of adopting organic methods.
'Organic products' are defined as those belonging to the first category (products in which at least 95% of the ingredients derive from agriculture using organic methods; only in this case may the product be explicitly labelled 'organic'). For further information, consult the IFOAM website: www.ifoam.org

'Energy-efficient products' have been identified in dir. 94/2/CE, 97/17/CE and 98/11/CE, which made energy-labelling compulsory for the following categories of products: refrigerators/freezers, washing machines, tumble-driers, dishwashers and domestic lightbulbs.
The label has to be clearly visible on the product and must contain details of the technical features of the model and its energy consumption, a specific eco-label logo (if this has been devised) and a concise indicator of the product's energy efficiency (and of washing and drying efficiency in the case of washing machines and tumble-driers), referring to seven different energy classes, ranging from A (lowest consumption) to G (highest consumption).
Products belonging to class A or class B are defined as 'energy-efficient products'.
The Forest Stewardship Council certification (FSC) is the independently-verified certificate for forest products which encompasses all stakeholders and interests in the social, economic and environmental spheres and can therefore be considered as the most sustainable label to have on timber and wood products (other label and claims do not seem to offer an unbroken guarantee of the chain of custody from forest to retailer). Each nation has a national body that can identify all producers, manufacturers and retailers of FSC goods.
Information on FSC and on national contact points is to be found on:
www.fsc-uk.demon.co.uk/fscinternationalinfo.html

'Fair trade products' are imported products certified by specific national labelling associations (Transfair, Max Havelar, Fairtrade, ...) which are part of the FLO (Fairtrade Labelling Organisations: www.fairtrade.net).
The FLO sets up unified criteria for fair-trade regulation - upon which the different national organisations have all agreed - specifying both the organisational and commercial modalities of the system of fair-trade labelling and fair production conditions for small farmers and people working in plantations/factories (decent wages, minimum health and safety conditions, ...).
The necessary requisites for obtaining the fair-trade label vary from one product to another. FLO's fair-trade criteria regard the following products: coffee, tea, cocoa/chocolate, honey, sugar, orange juice, bananas.
'Fair trade products' are those to which one of the above labels has been awarded.

2. Question

- To what extent do households and organisations, including local authorities, purchase products that promote sustainability?

3. Context

Eco-labelled, organic, energy-efficient, certified timber or fair-trade products involve the adoption of environmentally and socially sound solutions in farming, forestry, food industries and in other production processes. Households, businesses and the local authority can promote sustainability by buying these products. Focusing on products also connects to working conditions, e.g. health issues, fair wages, contracts and avoidance of child labour.
The purchase of these products generates business opportunities by making environmentally and socially sound goods profitable and more economically viable.
These products also connect local economies to producers all over the globe, contributing to more sustainable production methods as well as promoting small businesses, better working conditions and democracy in developing countries.
The Swedish government and other national governments have policies on green procurement, promoting and buying eco-labelled goods and services. This work is also being discussed within the EU. Several municipalities and cities are developing and adopting policies on green procurement. Bristol City Council has adopted a policy that implies buying certified timber/wood products and fair-trade tea - coffee for the use of the elected council, and promotes fair trade together with partners in the city to the public. Furthermore, the UK government is promoting the Ethical Trading Initiative with businesses in the country as part of the commitment to sustainable development world-wide.
Sustainability principles covered: 1, 2, 4, 5

4. Targets

Actions taken in order to encourage the consumption of 'sustainable products', except for particular procedures of "Green Purchasing" adopted by some local authorities, in general do not establish specific targets.

5. Unit of measurement

- Percentage of families that buy eco-labelled, organic, energy-efficient, certified timber and fair-trade products.
- Percentage consumption of eco-labelled, organic, energy-efficient, certified timber and fair-trade products measured as share of the total consumption of products in the same category/type (disaggregated by type of product and consumers' income level).
- Percentage of retail outlets selling eco-labelled, organic, energy-efficient, certified timber and fair-trade products as share of the total number of retail outlets (disaggregated by type of outlet).

6. Frequency of measurement

- annual
- annual
- annual

7. Data collection method and sources

In order to simplify data collection and to make their comparison more reliable, the methodology refers to a limited and clearly defined group of products:

- most involved in the 5 types of certification considered;
- least subject to seasonal variations in supply and demand;
- widely (and when possibly, daily) consumed;
- available at a large number of retail outlets.

a) Consumption

survey targeting consumers

Consumption data are collected by means of a survey to be carried out using a family logbook on a statistically significant sample of families (that is, a sample of families selected according to criteria of representativeness[29]).

The survey could obviously be linked to and managed with any other the local authority intends to develop - i.e. the one for indicators 1, 3 and 6, as suggested in the logbook structure; in this case the logbook has to be compiled by the family member who is in charge of shopping and going on errands for the family (must be answered having in mind the habits of the whole family).

Information useful for the evaluation of indicator 10 can be found at the beginning of the section relevant to indicator 10 (i.e. sex and age of the person that fill in the logbook and number of family's members).

After general questions regarding the interest (or reason for lack of interest) and the purchase (or reason for no purchase) of sustainable products, the survey focuses on the frequency of purchase of both different categories of products and different products, as shown in the following tables.

	EU Ecolabel	Organic (biological label)	Energy efficient	Fair trade	FSC (timber/wood)
Wood products					✘
Washing machines	✘		✘		
Refrigerators	✘		✘		
Light-bulbs	✘		✘		
Washing/cleaning detergents	✘				
Toilet/household paper	✘				
Coffee/Tea		✘		✘	
Cocoa/chocolate		✘		✘	
Fruit Juices		✘		✘	
Fruit/vegetables		✘			
Milk		✘			

[29] The sampling methodology is illustrated in detail in the logbook methodology sheet.

b) Availability, market supply

survey targeting distribution channels

The survey targeting distribution channels must seek general information, such as:

- the number and type of sales outlets (hypermarket, supermarket, retail) that sell 'sustainable products';
- the monthly average number of consumers overall served in each type of retail outlets (hypermarket, supermarket, retail);

and specific information related to different 'sustainable products' categories:

- the number of sustainable products sold out of total products sold disaggregated into category of 'sustainable products' and into type of retail outlet (hypermarket, supermarket, retail).

Finally, it is required the number of fair trade and organic food stores, in order to evaluate the spread of distribution channels entirely dedicated to these products.

c) Green purchasing of local authority

survey targeting the local authority

The survey intended for consumers should be supplemented by a specific survey seeking to obtain data about the % share of sustainable consumption for which the local government is responsible and about the existence of purchasing procedures that take into account the availability of 'sustainable products' and encourage the purchase of this kind of products.

Taking into account that the local government is a large-scale consumer, the request for information can be confined to the following items:

- purchasing procedures which have specific requirements that encourage the purchase of energy efficient electric/electronic appliances and ecolabelled and fair trade products;
- consumption of organic food in the catering sector (public canteens and school meals), essentially foodstuffs;
- use of recycled paper in the office sector.

	Usually	Rarely	Never
Eco-labelled			
Organic			
Energy efficient			
Fair trade			
FSC certified timber			

	Usually	Rarely	Never	Don't buy / eat at all
Washing machines				
Refrigerators				
Light-bulbs				
Washing/cleaning detergents				
Toilet/household paper				
Coffee/Tea				
Cocoa/chocolate				
Fruit Juices				
Fruit/vegetables				
Milk				
Wood products				
……*				
……				

8. Form of reporting/presentation

a) Consumption

- percentage of families buying 'sustainable products' (per category and per given product) out of total number of families
- percentage of families usually buying 'sustainable products' (per category and per given product) out of families buying 'sustainable products'

b) Availability

- availability of 'sustainable products' (number of retail outlets offering them and number of consumers daily served) and percentage of certified products (per type of retail outlet and per given product) out of total products sold
- number of specialised store (e.g. fair trade stores, organic stores, …) per 10,000 inhabitants

c) Green purchasing of local authority

- existence of procedures that encourage purchases of eco-labelled, organic, energy-efficient, certified timber and fair-trade products and public canteens that serve organic food
- use of recycled paper in local authority's offices

9. Examples of similar application

Variations of this indicator are used in a number of initiatives.

The Swedish government uses 'environmentally sound purchases' as one of 12 national green headline indicators. The indicator measures total annual value of per capita sales of eco-labelled goods and services in Sweden. It also reports total annual value of green public procurement/purchasing.

The Swedish Association of Local Authorities is developing green headline indicators for municipalities. Among these currently 24 indicators is the indicator 'municipality's purchase of eco-labelled foods' as a share of the total purchase of food.

Various local authorities attempt to measure the share of eco-labelled products, either bought by local households and/or as a share of the municipality's procurement. For example, as a part of its currently selected 18 local sustainability indicators, the city of Stockholm is indicating the consumption of eco-labelled foods by measuring the percentage of eco-labelled milk as a share of total sales of milk in Stockholm.

10. Questions to address/Future development

In the future, it may prove useful to include goods produced locally among the sustainable products to be considered, though possibly limiting them to agricultural produce for local foodstuffs and mineral water. In fact, the consumption of local products:

- reduces the emissions associated with transport requirements;
- reduces the use of unsustainable techniques associated with the requirements of food conservation;
- fosters cultural traditions associated with local products; and
- promotes the maintenance of agricultural uses of land and environmental conservation.

11. Keywords

Eco-label, organic, energy efficiency, fair-trade, green purchasing/procurement.

SURVEY METHODOLOGY INDICATORS 1, 3, 6 and 10

Introduction

There are various techniques for collecting data; these vary from a low level of citizen involvement to a much higher level, and may also involve integrated methods (e.g. workshops, followed by a survey and then by a focus group on specific issues, ...).

The method hereby suggested (taking the expectations of the European Indicator into account) is to carry out a survey on a representative sample, by means of a logbook that has to be self-compiled by a given member of the family, as specified below (see "sample" paragraph).

This survey allows to get the information needed to calculate indicators 1, 3, 6 and 10.

The idea behind putting these surveys together is that of reducing overall costs and the amount of time necessary to carry them out.

Distributing the logbook:

The logbook may be delivered to houses by a municipal/private messenger or by post; the "municipal messenger" option is preferable in case the municipality wants to increase the visibility of its commitment in environmental sustainability matters. In the latter case – postal shipment – the logbook may be accompanied by a letter written by the Mayor informing the citizens about the initiative, its aims and its importance for the local authority's decision making processes towards sustainability.

The distribution may also be preceded by a telephone notification aimed at involving and motivating interviewees to a greater extent.

Data collection:

Data can be collected in 3 different ways:

a) by the messengers: this offers the opportunity to carry out a first data quality check;

b) by phone interviews: it is suggested that an appointment be made in advance (by the messenger or by phone if the questionnaire has been sent by mail);

c) by mail: in this case it is necessary to extract a bigger sample, in order to ensure that the rate of return (necessarily greater than 30% in order to guarantee representativeness of responses with respect to initial sample) gives a number of answers that corresponds to those indicated below as representative for each population size.

Sample

First, individuals shall be extracted by random sampling from electoral precincts[29] – this ensures that people extracted are older than the legal age.

Second, families these individuals belong to are to be identified.

It is important to check that no two individuals belong to the same family, so that each family is associated to only one individual[30].

The random sampling technique guarantees a good representativeness of the universe if the sample size is as follows:

- population < 20,000 inhabitants: 700;
- 20,000 inhabitants population < 100,000 inhabitants: 850;
- population ≥ 100,000 inhabitants: 1,000.

Taking into account a presumed quota of 30-35% "non-respondents", in order to get back a representative sample of the above mentioned size, we strongly recommend to extract a sample at least approximately 50% greater than the number of respondents needed (e.g. 1,500 for 1,000; and so on). Otherwise, make sure all (or, at least, 90-95%) individuals/families extracted reply to your questionnaire[31].

In case the sample proves not to be representative of the social-demographic structure of the universe, results have to be weighted so that age and gender and geographic distribution are correctly represented.

In particular, where the administrative area considered is greater than a single municipality and corresponds to an association of municipalities or provincial districts, the sampling technique suggested is that of cluster sampling.

This technique requires the identification of homogeneous sub-areas (with respect to relevant variables such as geographic distribution, population size, ...) by means of a cluster analysis.

Subsequently two options are available:

a) the relevant centroid[32] per each homogeneous sub-area is identified and sampling is carried out on that so that results obtained can be safely extended to the whole relevant area.

b) once the homogeneous sub-area has been identified the analysis is carried out on this cluster, on

[29] It is suggested to extract 2 more samples, of the same size of the first, whose individuals may serve as "substitutes" for those of the first.

[30] If this is the case, substitute the 2nd family member with the "corresponding" individual extracted in the 2nd sample (i.e. the individual extracted with the same number).

[31] The minimum sample size, irrespectively of municipalities' dimension, is 500 interviewees.

[32] The centroid in this case corresponds to a municipality showing the average characteristics of the area considered.

the grounds that municipalities making it up are sufficiently similar to be considered as one single area.

Definition/identification of respondents

- Indicator 1: individuals extracted;
- Indicator 3: each member of the family for him/herself (one questionnaire per person);
- Indicator 6: parents if the family includes school-age children;
- Indicator 10: the family member who is in charge of shopping and going on errands for the family (must be answered having in mind the habits of the whole family).

Questionnaire: Indicator 1

These questions are to be answered ONLY by the person indicated as the recipient.
In case data are to be collected by a phone interview, it is important that the questionnaire has been completed before the interview takes place.

General information

a) Sex: M F
b) Age: _____
c) Occupation:
student employed unemployed pensioner

1.a) How satisfied are you with your municipality as a place to live and work?

Please tick one of the following.

Very satisfied Fairly satisfied
Fairly dissatisfied Very dissatisfied

1.b) Express your level of satisfaction with a percentage score (between 0 [very low] and 100 [very high])

Percentage score: _____

Please assign each question a percentage score (between 0 [very low] and 100 [very high]).

2) How satisfied are you with your social relationships?
3) How satisfied are you with the opportunities to practise your hobbies?
4) How satisfied are you with the basic services (such as health and social services, schools, public transport, ..) offered by your municipality?
5) How satisfied are you with the quality of the surrounding environment ?
6) How satisfied are you with the employment opportunities you have access to in your municipality?
7) How satisfied are you with the opportunities to participate in local planning and decision-making?

Please now rank the following areas / elements / items according to your personal value judgement (1=most important … 6=less important).

Ranking
… your social relationships
… opportunities to practise your hobbies
… basic services offered by your municipality
… quality of the surrounding environment
… employment opportunities
… opportunities to participate in local planning and decision making

Please, give a percentage score, between 0 [very low] and 100 [very high], to each of the items listed in question a):

a) In your neighbourhood, how frequent do you think it is to:
- chat with your neighbours?
- chat with people you meet in shops/markets?
- stop and chat with friends you meet up with in the streets?
- be in the habit of going to meeting places (pubs, churches, social centres, green areas)?

Now, please indicate – according to your personal value judgement – the 2 most important items from the list above (1=most important, 2=second).
1……
2……
Please, repeat the procedure for questions b) to g).

b) How safe do you think it is to:
- be at home with the door unlocked during the day?
- be at home with the windows open during the night?
- walk in main streets at night?
- walk in public open areas at night?

c) Assess the quality of the following services:
- sport facilities
- theatres and cinemas
- museums and exhibitions
- cultural associations
- libraries

d) How accessible are the following basic services?

- general practitioners
- hospitals
- social assistance to the underprivileged
- council housing
- policing
- public schools
- public transport

e) Assess the quality of the following:
- public parks and gardens and greenery in general
- built environment
- waste collection and street cleaning
- air quality
- noise level at night
- noise level in the daytime

f) What is your opinion on the following:
- professional training opportunities
- incentives to start-ups
- level of unemployment in your municipality
- distribution of wealth within your municipality
- local reinvestment of the wealth produced by the municipality

g) How effective do you think the following means are in playing a role in local decision making:
- participating in local (e.g. municipal, district level, …) consultation processes?
- being a member of an interest group (e.g. environmental and consumers associations)?
- submitting direct requests/claims to municipal relation offices?
- voting in local elections/referendums?
- organising/participating spontaneous demonstrations aimed at raising awareness on specific issues?

Questionnaire: Indicator 3

The tables making up the questionnaire are to be filled in by EACH family member (one questionnaire per person).
In case data are to be collected by a phone interview, it is important that the tables have been completed before the interview takes place.

General information
a) Sex: M F
b) Age: _____
c) Occupation:
student employed unemployed pensioner

Please answer the following with reference to the preceding weekday; if you think the preceding weekday is not statistically significant (e.g. ill, not at work, away on business), please refer to the last significant day. Please, choose a day according to these criteria and answer the following.

1) Fill in the following table:

Please include only the trips that can be associated with a reason that is not a simple walk around the neighbourhood or taking the dog for a walk.

2) Assess the quality of trips to/from work/school:

Please fill in the table assigning a value between 0 and 10

Trip no.	Reason/Type*	Mode of transport**	Place of departure	Time of departure	Place of arrival	Time of arrival	Distance covered (km)
1							
2							
3							
4							
N							

(*) Reason for the trip: • school • work • recreation/leisure (social relationships, private reasons, errands and other) • shopping • return trip.
(**) Mode: • walking • cycling • motorcycle or moped • private car (possibly specifying whether as passenger or driver) • taxi • collective transport (bus, tram, metro, local railway) • combined mode "park & ride"(exclusively in case of the combination use of a "private car and public transport").

Please note that trips on foot or by bicycle are not to be considered if carried out in combination with other modes; in fact in such cases the trip mode corresponds to the mode identified as the main one on the basis of distance covered.

	Walking	Cycling	Motorcycle	Car	Taxi	Collective Combined (park and ride)	TOTAL
Length/duration							
Comfort							

Trip no.	Parking place *	Number of passengers **	Reason for choice ***
1			
2			
3			
4			
N			

(*) Parking place: 1. toll-free parking; 2. private parking (toll required); 3. public parking (toll required).
(**) Number of passengers: during the trip, the private car carried: 1. only the driver; 2. the driver and one passenger; 3. the driver and more than one passenger.
(***) Reason for choice (2 reasons max): 1. higher speed; 2. higher comfort; 3. lower costs; 4. absence of alternatives (absence of acceptable public transport); 5. unfavourable weather conditions; 6. other (to be specified)/ no answer.

Only who answered either "car" or "combined mode" (park and ride):

3) Fill in the following table:

Questionnaire: Indicator 6

The following tables are to be filled in by parents with reference to EACH kindergarten – aged children and above, until the age when they are allowed to drive scooters (one questionnaire per child).
(In case data are to be collected by a phone interview, it is important that the tables have been filled in before the interview takes place).

General information

a) Age of the child: _____

Please answer the following with reference to the preceding weekday; if you think the preceding weekday is not statistically significant (e.g. the child was ill, etc..), please refer to the last significant day.
Please, choose a day according to these criteria and answer the following:

1) How does he/she go to school[33]?
- walking
- cycling
- by a collective transport*
- by private car**
- other

(*) 'Collective transport' refers to a school bus, school taxi or private car giving a lift to more than 2 children.
(**) 'Private car' refers to a private car giving a lift to 2 or less children.

Only who answered that the child goes to/from school by private car:

2) What is the reason for choosing to go by car?
- no other form of transport available
- length of journey to school/lack of time available
- unfavourable weather condition
- greater safety
- other

Questionnaire: Indicator 10

The following tables are to be filled in by the individual who is in charge of shopping and going on errands for the family and must be answered having in mind the habits of the whole family.
(In case data are to be collected by a phone interview, it is important that the tables have been completed before the interview takes place).

General information

a) Sex: M F
b) Age: _____
c) Number of family members: _____

1) Are you interested in 'sustainable products'[33]?
- YES
- NO

Only who answered NO:

a) Why are you not interested?
- don't know enough
- don't attribute any value

[33] 'Sustainable products' to be considered are: eco-label certified products, organic products, energy efficient products, fair trade products and FSC certified timber and timber by-products (Forest Stewardship Council).

2) Are you interested in buying 'sustainable products'?
- YES
- NO

i) Only who answered NO:

a) Why do you not buy them?
- high costs
- difficult to find
- different habits
- don't trust them

ii) Only who answered YES:

b) How often do you buy a 'sustainable product' belonging to the following categories?

Please fill in the following table:

c) How often do you buy the following 'sustainable products'?

Please fill in the following table:

	Usually	Rarely	Never
Eco-labelled			
Organic			
Energy efficient			
Fair trade			
FSC certified timber*			

(*) Forest Stewardship Council certification (FSC) is the certificate for forest products

	Type (*)	Usually	Rarely	Never	Don't buy/ eat at all
Washing machines					
Refrigerators					
Light-bulbs					
Washing/cleaning detergent					
Toilet/household paper					
Coffee/tea					
Cocoa/chocolate					
Fruit juices					
Fruit/vegetables					
Milk					
Wood products					
……(**)					
……					

(**) Please specify what category (eco-label certified products, organic products, energy efficient products, fair trade products and FSC certified timber and timber by-products) the product belongs to
(*) Please specify which product

Appendix 2

Groups for cluster analysis

Southern Europe

Country	Municipality
Greece	Georgioupolis
Italy	Municipio Roma XIII
Italy	Ostellato
Italy	Castagneto Carducci
Italy	Chioggia
Italy	Russi
Italy	Terni
Italy	Brescia
Italy	Pescara
Italy	Provincia di Pesaro e Urbino
Italy	Siena
Italy	Imperia
Italy	Provincia di Teramo
Italy	Mantova
Italy	Reggio Emilia
Italy	Parma
Italy	Lodi
Italy	Castrovillari
Italy	Asti
Italy	Cuneo
Italy	Provincia di Genova
Italy	Ravenna
Portugal	Faro
Spain	Aretxabaleta
Spain	Agaete
Spain	Alicante
Spain	Breña Baja
Spain	Mancomunidad intermunicipal del sureste de Gran Canaria
Spain	Pamplona
Spain	Seville
Spain	Barcelona
Spain	Zaragoza

Northern Europe

Country	Municipality
Denmark	Aarhus
Finland	Tampere
Norway	Oslo
Norway	Kristiansand
Norway	Stavanger
Sweden	Timrå
Sweden	Vaxjo

Central and Western Europe

Country	Municipality
Austria	Wien
Belgium	Antwerp
Belgium	None (research)
Germany	Bremerhaven
Germany	Saarbruecken
Germany	Wuppertal
Germany	Dresden
Germany	Leipzig
Germany	Cologne
Germany	Munich
Ireland	Dublin
The Netherlands	Den Haag
The Netherlands	Utrecht
The Netherlands	Amsterdam
United Kingdom	Hertfordshire County Council
United Kingdom	London Borough of Barnet
United Kingdom	Northumberland
United Kingdom	Leeds
United Kingdom	Aberdeen City Council
United Kingdom	Cambridge
United Kingdom	Sheffield
United Kingdom	Bristol City Council
United Kingdom	Plymouth City Council
United Kingdom	Birmingham
United Kingdom	Nottingham City Council
United Kingdom	London

Eastern Europe

Country	Municipality
Estonia	Tartu
Estonia	Narva
Hungary	Miskolc
Lithuania	Kaunas
Moldova	Ungheni
Poland	Gdansk
Poland	Growiec town
Poland	Elblag
Romania	Ploiesti
Romania	Baia Mare
Slovenia	Maribor
Ukraine	Nikolaev

Small Municipalities
(Population < 100,000)

Country	Municipality
Estonia	Narva
Italy	Asti
Italy	Chioggia
Italy	Cuneo
Italy	Provincia di Pesaro e Urbino
Moldova	Ungheni
Norway	Kristiansand
Portugal	Faro
Slovenia	Maribor
Sweden	Vaxjo
United Kingdom	Cambridge

Medium Municipalities
(100,000 < population < 400,000)

Country	Municipality
Estonia	Tartu
Finland	Tampere
Germany	Bremerhaven
Germany	Wuppertal
Hungary	Miskolc
Italy	Brescia
Italy	Parma
Italy	Pescara
Italy	Terni
Lithuania	Kaunas
Norway	Stavanger
Poland	Elblag
Romania	Ploiesti
Romania	Baia Mare
Spain	Alicante
Spain	Pamplona
The Netherlands	Utrecht
United Kingdom	Aberdeen City Council
United Kingdom	Plymouth City Council
United Kingdom	Nottingham City Council

Large Municipalities
(Population > 400,000)

Country	Municipality
Austria	Vienna
Belgium	Antwerp
Denmark	Aarhus
Germany	Saarbruecken
Germany	Dresden
Germany	Leipzig
Ireland	Dublin
Italy	Municipio Roma XIII
Italy	Provincia di Genova
Norway	Oslo
Poland	Gdansk
Spain	Seville
Spain	Barcelona
Spain	Zaragoza
The Netherlands	Den Haag
The Netherlands	Amsterdam
United Kingdom	Leeds
United Kingdom	Bristol City Council
United Kingdom	Birmingham
United Kingdom	Sheffield