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Executive summary

The Informed Cities Initiative (ICI) was funded by the 7th Framework Programme of the European Union (EU), under the acronym PRIMUS: Policies and Research for an Integrated Management of Urban Sustainability. The project ran for three years, from 1st May 2009 to 30th April 2012.

Section 1: Understanding Knowledge Brokerage for urban sustainability

This section introduces the theoretical context for the project and the concept of Knowledge Brokerage. The rationale underpinning the ICI was the need to bridge the gap between research at the European level, and policy-making at (and for) the local level. The EU-level perspective on knowledge brokerage has developed over the past five years in response to concerns that sustainability 'tools' developed for - and with - cities have not been fully utilised, indicating a failure of knowledge brokerage and knowledge exchange between researchers and policymakers.

The ICI aimed to enhance connectivity between research and policymaking in sustainable development, with a focus on tools for urban sustainability management. The project had two linked elements: improving processes for knowledge brokerage for urban sustainability, and the explorative application of two European monitoring tools for local governments. The two tools were:

- **Local Evaluation 21 (LE21):** an online assessment which analyses the quality of local management and governance processes for sustainability, the LE21 tool can serve as a guide for political decisions on improving local management and governance mechanisms;
- **Urban Ecosystem Europe (UEE):** a set of advanced sustainability indicators for local governments to measure their performance in response to the renewed EU Sustainable Development Strategy, the Urban Thematic Strategy and the Aalborg Commitments, serving as a basis for developing measurable targets and timeframes for the mid-term.

The ICI project was built around a series of events aimed at improving links between researchers and policy-makers: Informed Cities Fora, European Roundtables, and Implementation Workshops, which aimed to encourage local governments to use the tools.

Ten Implementation Workshops were held in: London, UK; Katowice, Poland; Sibiu, Romania; Brussels, Belgium; Rome, Italy; Turku, Finland; Madrid, Spain; Dessau, Germany; Coimbra, Portugal; and Belgrade, Serbia. Two Informed Cities Fora were held in Newcastle (2010) and Naples (2011); both Fora were attended by well over 100 participants. Three Informed Cities European Roundtables brought together national government ministries and agencies from a majority of EU Member States, who were responsible for national policies for urban sustainability management in their respective countries.

All of the events and meetings within the ICI initiative gave practitioners (staff from local, regional and national government) and academics the chance to explore discourses around knowledge brokerage for local sustainability.

Within knowledge brokerage discourses there are debates about the types of knowledge that can be transmitted and the processes that lead to knowledge transfer. The distinction between codified (or explicit) knowledge and tacit knowledge is a central theme:

- Tacit knowledge refers to *'all those pieces of knowledge which are not expressed and/or not expressible and/or not transmissible'* (Ancori *et al*, 2000, p.270).
- From a research perspective, it is often negative experiences that can provide the richest sources of data when trying to understand how to develop a successful approach to implementing policy.
- *'Best practice'* case studies can be sanitised leaving out the *'real world politics'*, which can be the crucial factors which determine the success or failure of initiatives.
- A key way to unlock this learning through *'worst or imperfect practice'* is through informal, *'off the record'*, knowledge exchange and the transfer of tacit knowledge.
- ICI activities aimed to facilitate familiarity and trust between practitioners and academics, so that the richest authentic sources of data about *all* experiences within the field of local sustainability could be unlocked.

Section 2: Approaches to monitoring sustainable urban development in Europe

This section provides an overview of existing approaches to monitoring sustainable urban development in Europe. It starts by outlining the European policy context of sustainable urban development, with a particular focus on the relevant EU policy framework and the emphasis it places on monitoring and evaluating sustainable development. The policy

framework on urban development has evolved rapidly over recent decades, and a common European framework for sustainable urban development has begun to form, with the initiation of a number of urban monitoring tools as a response to EU urban policy.

It goes on to present a summary and comparative analysis of seven key European sustainable urban development monitoring tools: the European Green Capital Award; The Covenant of Mayors; The Reference Framework for Sustainable Cities; European Capital of Biodiversity; Local Evaluation 21; The European Green City Index; and Urban Ecosystem Europe.

A number of key challenges to approaches to monitoring sustainable urban development emerged. Such monitoring currently relies on the voluntary application of tools by local governments, because the relevant EU policy framework has no EU Treaty basis. Successfully encouraging local governments to voluntarily apply a tool depends on several factors, including the relevance of the evaluation outcome, the effort required to apply the tool, and its usability.

There is also a lack of systematic co-ordination between existing monitoring tools, and few are available for continuous use. Most tools are no longer maintained when their funding ceases, which is a major source of frustration for local governments. As a result usage levels fluctuate over time and few - if any - tools are used on a constant basis by European local governments.

Most voluntary tools remain largely unused by the majority of (the almost 7000) local governments in Europe. Although Europe-wide use is not the aim of every tool – and indeed some tools deliberately target only a specific group of local governments - the lack of utilisation of monitoring tools is a concern, and may eventually undermine their legitimacy and creditability. The exception is the Covenant of Mayors, which has been applied on a broad scale across Europe.

Section 3: Local governments for sustainability and the use of tools

This section explores European local governments' knowledge and use of existing urban sustainability tools. A key issue is the burgeoning scale of sustainable development as a policy discourse over the past two to three decades, and the commensurate rise in the number of urban sustainability policy instruments (tools, accords, awards and agreements) created at supra-national level. For local governments, this has meant an almost overwhelming stream of initiatives to digest and respond to. A second factor is the EU's lack

of direct jurisdiction over nation states' urban policies; instead, its approach has been to encourage and 'nudge' nation states, regions and cities towards more sustainable pathways.

The ICI research highlighted the following key points about the current use of urban sustainability tools by European local governments:

- The global financial crisis has had a substantial negative impact on the capacity of many European local governments to engage with urban sustainability tools. The focus in many European nations is on maintaining the delivery of core services in very challenging circumstances.
- Some European local governments have difficulty accessing the necessary data to populate urban sustainability tools, especially when it involves accessing data controlled by the private sector.
- Knowledge of existing urban sustainability tools varies markedly amongst European local governments, both between and within nation states.
- The political will of local government leaders, and the personal dynamism of individual local government policy officers, are key factors regarding the likelihood that local governments will gain knowledge of and engage with tools.
- The terminology employed by specific tools can be a barrier to comprehensive usage across Europe, due to differences in national sustainability discourses.
- Some European local governments are very cautious about their sustainability performance data being released into the public domain outside of their immediate control, due to the potential for poor performance to cause political embarrassment.

Section 4: Explorative application of two monitoring tools

This section considers local governments' application of European monitoring tools. It aims to explore why monitoring tools are not applied by more local governments, and demonstrate the tools' potential and capacity. Two tools, Local Evaluation 21 (LE21) and Urban Ecosystem Europe (UEE), were selected for a Europe-wide explorative application by the Informed Cities Initiative (ICI).

The explorative application of LE21 and UEE aimed to involve 100 local governments representing at least 15 EU Member States. However, this target proved challenging, despite ICI members petitioning local governments through a number of channels. Economic

limitations, in the form of local resources needed for applying the tools, restricted participation. This was especially the case in countries like the United Kingdom, which during the explorative application was experiencing severe spending cuts at local government level. Ultimately, 57 local governments representing 18 European countries applied LE21, and 53 local governments representing 16 European countries applied UEE. 32 local governments applied both tools.

The development, character and methodologies of LE21 and UEE are described, along with their reliability and usability, and the specific challenges of applying each tool.

Section 5: Urban Ecosystem Europe: measuring environmental urban sustainability

This section reports the results of the explorative application of the Urban Ecosystem Europe (UEE) tool, which was developed to provide an integrated assessment of the European urban environment. 53 European local governments participated, by providing data relating to different aspects of the state of the urban environment and its management in their city

A number of key issues emerged from the application. In some cases local governments were not able to provide the correct data. There were two main reasons for this: firstly, there were different approaches to categorising data or collecting data in individual countries; and secondly, some local governments had weak or underdeveloped monitoring systems. Furthermore, local context is important. Although a variety of different tools, initiatives and programmes – as well as European Directives - have been developed in the last decade, with the aim of defining a common set of indicators for data collection and monitoring systems, significant differences still exist across Europe due to specific geographic, climatic, economic and cultural conditions.

Data availability problems were greatest in the following areas:

- Air pollution: monitoring networks vary greatly in terms of spatial distribution, and the sets of pollutants monitored, from city to city;
- Green areas, due to variations in their categorisation;
- Mobility: spatial and catchment areas can vary, especially for public transport. For example, when calculating how many citizens use public transport (passengers/inhabitants), some cities only count the municipality's inhabitants, while others consider the inhabitants of the urban agglomeration served by public transport;

- CO₂ emissions: some cities calculate only CO₂, while others consider all the greenhouse gases (expressed in terms of CO₂ equivalent);
- Waste: some cities collect data concerning both municipal and household waste production, collection and treatment, while other cities include only one of these.

Assessing and benchmarking complex issues and policies relating to the sustainability of the urban environment by reducing them to a set of quantitative indicators is a difficult task. However, it is possible to highlight some emerging trends in the data from the application of UEE.

Air quality is improving throughout Europe, although levels of particulate matter (PM₁₀) and ozone (O₃) remain a matter for concern. PM₁₀ levels were above the EU limit value in many cities - mainly in Eastern and Southern Europe - but the situation was particularly critical in big Southern cities, where annual mean concentrations were above the prescribed limit. The Italian air quality situation was critical in terms of O₃: seven out of the nine Italian cities involved in the survey exceeded the limit value.

Waste water treatment and potable water supply is generally well implemented throughout Europe, although leakages in the potable water distribution network are high in many cities.

Urban design, especially with regard to green urban areas and cycling networks, has received a lot of attention in recent decades as a key element in improving the quality of the urban environment. Availability of green urban areas is generally satisfactory, although there is a significant difference between Northern and Western cities, with the highest values of per capita green urban areas, and Eastern and Southern cities, with lower values. Cycling paths and lanes, and cycling network per capita follow the same geographic distribution. Values for these indicators are influenced by urban population density, with denser cities having a lower value even if the absolute amount of green areas is the same.

Mobility remains a major concern in European urban areas, affecting both the environment and human health. Trips by car (rate to total trips) exceed 50% in 15 of the 36 cities that submitted data. Cities with low rates of car use rely on public transport (mainly Eastern cities) and active transportation such as cycling or walking (mainly Southern and Western cities). Particularly in denser urban areas, a positive relationship can be found between a well developed cycling network and the number of cycle trips.

Energy efficiency and energy production from renewable resources has gained a lot of attention in recent years. District heating is widespread in Northern cities and some Eastern cities, while Southern and Western cities lead the rankings for installing solar power in public buildings.

Municipal and household solid waste management has achieved a satisfactory level for almost all cities, mainly thanks to the implementation of the Directive 2008/98/EC. Eastern cities and a few Southern cities have low recycling rates and high reliance on landfill. Some cities, mainly located in Northern and Western regions, have excellent separate collection rates: 12 cities exceed 50% and 27 exceed 35%; moreover 22 cities rely on landfill disposal for less than 30% of waste disposal.

Eco-management is an issue which has emerged recently in the field of urban sustainability. The number of local governments that have adopted a systematic procedure of departmental certification for environmental management is still low. Even if the European Commission implemented EMAS, some local governments have adopted national or sector specific environmental management systems. Procurement of recycled paper and organic food, as well as green vehicle use, are not directly related to the use of environmental management certifications.

Section 6: Requirements for a resilient local process for sustainable development

This section analyses data sampled from the explorative application of the Local Evaluation 21 (LE21) tool. The aim of the tool is to identify local governments' areas of strength and the challenges they face in developing a resilient local process for sustainable development.

The application of LE21 revealed a number of key findings. Firstly, in most local governments, local processes for sustainable development are not fully mainstreamed or incorporated into local plans, strategies and actions, even though the head of department, mayor, or chief executive is usually responsible for the administration of the local process for sustainable development. In order to be effective, a resilient local process for sustainable development needs to be integrated and mainstreamed into local plans, strategies and actions.

Furthermore, few local governments have a formal mechanism in their local action plan to assess the impact of individual projects on sustainable development, and few have formal mechanisms to assess the effectiveness of the municipal budget and the economic promotion policy in implementing sustainable development. Local governments do,

however, have formal mechanisms to assess the effectiveness of land use development plans and environmental protection policies in implementing sustainable development. The majority of the Northern and the Eastern local governments also have a formal mechanism to assess the effectiveness of their integrated urban development policies, whilst most Northern, Western and Southern local governments focus on the effectiveness of their transport policies when implementing the local process for sustainable development.

Most local governments have developed interdepartmental linkages within the local authority in order to promote sustainable development. This is often achieved via cross-departmental joint projects and cross-departmental working groups. Sustainable development is also promoted within local governments via cross-departmental mailing lists or newsletters, as well as formal contact between heads of departments. Local governments commonly utilise cross-departmental linkages in the administration of the local process for sustainable development, in order to respond to the holistic needs of sustainable development.

The basis for a stable local sustainable development process requires both long-term objectives and short-term actions. Even if most local governments have these ambitions, the local process for sustainable development is impeded by financial constraints: most local governments have not devoted sufficient resources for the management and implementation of sustainable development activities.

Section 7: Building on experience: learning from end users of tools

This section discusses the experiences of end users - largely local government officers – who were asked to reflect on the nature and relevance of the Local Evaluation 21 (LE21) and Urban Ecosystem Europe (UEE) tools. The results provide a comprehensive analysis of the positive impacts of such tools, as well as suggestions for potential improvements.

Based on the responses from local government representatives who had been involved in using the tools, four issues appeared to be especially significant: awareness and usefulness of European urban sustainability tools; availability of data; impact of tools' benchmarking results; and the existence of numerous tools for local sustainability.

A number of other issues are highlighted:

- Differences were apparent between old and new Member States regarding the perceived effectiveness of LE21. Most participants from Western and Southern Europe viewed LE21 as a little dated, too general and incapable of monitoring the effectiveness

of management processes. Conversely, representatives of Eastern European cities appreciated the focus on management process, describing this as an aspect which is often forgotten when analysing the performance of local governments in their countries.

- Despite largely positive views about UEE, the majority of participants thought that the level of co-ordination required gathering the necessary data was a significant problem.
- In terms of data management, many European local governments showed a lack of capacity to gather, handle or update data. Many experienced difficulties in obtaining data from external organisations or private companies, and compiling data within their administrations, due to a lack of capacity and co-ordination across local government departments.
- The wording of indicators can cause problems. Although UEE is available in seven different languages, a number of users experienced difficulties in understanding the content of the indicators, mainly because they differ from the ones used in their national statistics or because some aspects required by UEE are not measured in their countries at all.
- The majority of local governments do not use the existing tools consistently. This may be because of the time requirements to interact with the tools and collect the necessary data; also local governments can see no direct benefits from changing the way they work to include interacting with tools.

A key issue for participants is that of capacity. Local governments across Europe may be involved in numerous national and European initiatives at any one time, each of which is accompanied by separate and specific tools. The capacity of their staff to collate the data and undertake the associated tasks to populate all the separate tools needs to be urgently addressed.

A European Protocol on Indicators would facilitate effective compilation of data and comparison among cities by establishing a unique set of common indicators, thus ensuring that all European local governments measure the same elements.

Tools for local sustainability need to be developed and updated over time, according to evolving priorities, and within the limits of funding available. In the interests of avoiding duplication of resources or *'re-inventing the wheel'*, and ensuring that existing expertise is built upon, adapting existing tools is preferable to creating new ones.

Section 8: Case studies: knowledge brokerage in action in European cities

This section reports the findings from five European case studies of knowledge brokerage initiatives, in Newcastle, Norrköping, Oslo, Tilburg and Turku. The purpose, partners and achievements of each case study are described, as well as the results of interviews with key participants.

Analysis of common elements of these case studies has led to the identification of the following key cross-cutting themes for successful knowledge brokerage:

- All of the case studies build on strong existing, often informal, networks between practitioners and academics/researchers;
- Several case studies held a formal seminar or event at the outset of the formal brokerage process to gather key stakeholders together and discuss research priorities;
- Shared institutional goals, high levels of trust and good interpersonal relationships were associated with successful knowledge brokerage in all of the case studies;
- Adequate financial resources were viewed as essential in most cases, although the Newcastle example shows that knowledge brokerage can be achieved with limited financial resources;
- Physical proximity of key institutions in the brokerage process was viewed as an advantage, but not essential;
- The Turku and Tilburg examples illustrate that having a designated knowledge broker to drive the knowledge brokerage process is a significant advantage;
- Failure to keep an open mind and lack of willingness to truly co-operate were viewed as significant barriers to a successful brokerage process.

Section 9: Conclusions

This section begins by considering how tools for urban sustainable development – as outlined in Section 2 of this report – can assist with the five phases of integrated sustainability management: reviewing the baseline; setting objectives and targets; political mandate and resource allocation; implementation; and evaluating and reviewing progress (ICLEI, 2007). It goes on to discuss the need for co-operation between policy-makers and

researchers in achieving local sustainable development, how this can best be facilitated, and what the European Commission's role should be.

The following lessons are highlighted:

- Close co-operation between researchers and local government staff is essential to enhance the connectivity between research and policy-making in the target setting phase.
- Policy makers may not have either the time or the experience to read scientific papers thoroughly. There is a need to translate research outcomes into a format that enables policy makers and wider audiences to identify their content and value. Summaries, recommendations and key messages are suggested in many studies (European Commission, 2008; ODPM, 2005).
- Despite current political demands for evidence-based practice, university research may have a greater value if it is independent of the political process, emerges from the confines of a specific academic discipline, and is a peer-reviewed published output that is written in a style which is accessible to practitioners (staff from local, regional and national government).
- In practice, many cities participate in several schemes and try to adapt tools and identify pragmatic synergies between tools to suit their individual requirements.
- None of the existing tools for local sustainability fulfils all of the diverse needs of European local governments. Nor does it seem likely that the different actors responsible for the various tools will join forces and create a common European commitment and monitoring scheme for local sustainability.

The authors of this report recommend the adoption of an ideal *European commitment and monitoring scheme for local sustainability*, with the following 10 key features:

1. Full cycle support

The European commitment and monitoring scheme for local sustainability supports local sustainability management and governance in all five phases of the management and governance cycle: creating a baseline review; setting targets; obtaining political commitment; implementing actions to achieve the targets; and evaluating success and failure.

2. Advanced set of indicators

The European commitment and monitoring scheme for local sustainability is based on a manageable number of indicators mirroring local environmental, economic and social development in a balanced way. Data for these indicators will be relevant and available at the local level.

3. Integrated approach

The European commitment and monitoring scheme for local sustainability integrates different aspects of sustainable development rather than just listing them and tackling them individually. The focus is on developing a holistic approach to protect natural common goods and create decent living conditions for all citizens.

4. Common qualitative objectives

The European commitment and monitoring scheme for local sustainability includes, and is based on, a common set of qualitative objectives for any local government across Europe to commit to. The objectives are balanced and address key sustainability issues.

5. Tailored targets

The European commitment and monitoring scheme for local sustainability offers a procedure for local governments to set measurable targets which are comparable between cities and towns across Europe, and are flexible enough to suit different existing environmental, economic and social framework conditions.

6. Political commitment

The European commitment and monitoring scheme for local sustainability requires political commitment and accountability. Participation is based on a decision by the local council, and the commitments made via this decision are monitored.

7. Benchmarking

The European commitment and monitoring scheme for local sustainability awards highly performing cities and towns with political recognition and provides Europe-wide promotion. The specific focus of the performance criteria for awards changes regularly, and in a transparent way, in order to allow cities from various backgrounds to excel.

8. Guidance and resources

The European commitment and monitoring scheme for local sustainability is linked to a framework that provides technical guidance and access to resources to the participating local governments for the implementation of their commitments.

9. Individual feedback

The European commitment and monitoring scheme for local sustainability delivers individual feedback and results to each participating local government. The feedback is relevant to the city and facilitates further development of its local sustainability policies.

10. Aggregated European reporting

The European commitment and monitoring scheme for local sustainability delivers aggregated findings about the status of local sustainability at a European level. The monitoring system is set up in a way that does not require substantial extra effort at the local level to deliver data; access is open to the public and not controlled by any particular actor, organisation or institution.

The aims of an ideal *European commitment and monitoring scheme* for local sustainability are to discover and better understand changes in local sustainability. Accordingly, the check-list above should serve as a research agenda for the European Commission and offer a major opportunity for the development of common solutions to benefit all local governments in Europe.

Effective co-ordination of local sustainability between local governments, the scientific community and European institutions is a huge challenge in conceptual and practical terms. However, working together to meet this challenge is essential to reinforce the importance of sustainability issues and to promote their successful implementation to ensure the wellbeing of future generations.

Section 1: Understanding Knowledge Brokerage for urban sustainability

Introduction

Decision-making processes are constantly evolving in contemporary society. Case-specific scientific knowledge is of growing importance as a basis for decision-making, replacing ideological and other evaluations. Academic subjects like knowledge management are increasingly used within both private and public organisational decision-making, as well as in local governments' policy setting.

This has put pressure on local knowledge creation, collection, analytical usage and dissemination, both within the political system and among citizens. By their nature, local governments tend to be highly service-oriented at the expense of focusing on knowledge acquisition. Their limited resources and network governance structures can steer local governments towards co-operation with higher education institutions in order to find solid scientific evidence for their decision-making. These 'knowledge brokerage' processes are part of contemporary governance.

It is clear that the process of knowledge brokerage – the chain of knowledge – is not a one-way street. Knowledge flows between policy makers, academia and citizens in both directions in a dynamic functioning brokerage process.

The first section of this report provides the conceptual underpinning for the understanding of the knowledge brokerage processes within local governments, and especially within the sustainability policy sector. It explores knowledge brokerage in the context of policymaking for urban sustainability. While it acknowledges that there are debates on the nature of 'knowledge' itself, the focus of this section is to understand the processes by which knowledge is exchanged and shared between researchers and policymakers, as well as to analyse the factors and conditions that are required for successful knowledge brokerage.

This section begins by exploring the literature on knowledge brokerage in a broad sense, and considering how it is being applied in the social sciences, and more specifically in the field of urban sustainability policy. It goes on to examine the EU-level perspective on knowledge brokerage, which has developed in the past five years in response to concerns that sustainability 'tools' developed for – and with - cities have not been fully utilised,

indicating a failure of knowledge brokerage and knowledge exchange between researchers and policymakers. It discusses the European Commission's key role in funding a series of projects specifically focused on improving knowledge brokerage processes around urban sustainability, one of which is the PRIMUS project. Finally, the objectives of the project from which the Informed Cities Initiative (ICI) was born, and the key mechanisms employed to improve 'connectivity' between researchers and policymakers in local governments across Europe, are explored.

Development of debates on knowledge brokerage

In recent years, theories of knowledge brokerage have emerged in diverse academic fields including health, economic geography, and urban studies, with much of the early conceptual work taking place in Canada in relation to the health sector (CHSRF, 2003; see also McAneney *et al*, 2010, p.1493). Consequently, the literature on knowledge brokerage relates to a number of different areas, including health services and the management sector. In both of these contexts, discussions are around '*intermediary*' roles and '*boundary spanners*' (Robeson *et al*, 2008; Singh *et al*, 1994). Knowledge brokerage has been defined in the context of applied health research and policy as '*all the activity that links decision-makers with researchers*' by Lomas (2007, p.131). Knowledge brokers '*effectively construct a bridge between the research and policy communities*' (Nutley *et al*, 2007, p.63) by establishing a dialogue between organisations.

The policy community literature is much older than the knowledge brokerage debate and invites us to consider the relationship between decision makers and stakeholders in a wider perspective than just knowledge. In his seminal work on epistemic communities, Haas states that '*ideas inform policies*' and that '*policy choices are often made by discrete networks of actors*' (Haas, 1992, p.26). This analytical framework was constructed for use at an international level, but has gradually been developed into a general network analysis that can be applied at all societal levels. Djaugberg (1999) defines a policy network as '*an organisational arrangement created to facilitate the intermediation between state actors and organised interests*', and goes on to say that '*[p]olitical actors create a policy network when they exchange resources regularly*' (Daugbjerg, 1999, p.412). Organisations that enter a policy process are dependent on other organisations for resources in contemporary society (Daugbjerg, 1999); these resources include knowledge transferred between actors.

Another debate surrounds the role of social networking in knowledge brokerage processes. Social Network Analysis is used to analyse information and influence traits in policy processes between actors and across policy areas (McAneney, *et al*, 2010, p.1493). Social

network analysis helps us to understand to what degree actors are embedded in a specific network, but also *'how a structure emerges from the interactions of actors in the network'* (Behrend and Erwee, 2009, p.101).

Decision-making processes in contemporary societies, including those at local government level, are highly complex and involve many institutions. Rangachari (2009, p.134) notes that *'[c]omplex systems possess distinctive properties that set them apart from linear systems'*. These systems are defined in terms of relationships between actors, both inside and outside the core organisation. Furthermore, the systems are, at least to some extent, self-organising and show clear synergies created by the interaction. Local governments, as well as research organisations, can benefit from mutual co-operation within the local policy spheres.

According to Sheate and Partidário (2010), knowledge brokerage has become a strong driver in current sustainability discourses, with a substantial literature promoting the importance of knowledge sharing and transfer as a way of breaking down barriers that impede interaction, collaboration, and healthy communication. They emphasise the ability of organisations to determine access to, and transfer of, knowledge and enhance innovation, and this is linked to the need to approach multi-scale environmental problems in an effective way. A key challenge is how such approaches can be used to communicate essential information to decision makers about choices between alternative strategies, pressures on environmental and social issues, and consequences for sustainability (Vicente and Partidário, 2006).

Perhaps not surprisingly, there is no single universally agreed academic definition of knowledge brokerage, but different definitions contain similar features: capacity building; facilitating interpersonal and inter-organisational linkages; promoting access to evidence; building relationships of trust; setting agendas and common goals; clarifying information needs; knowledge creation; commissioning syntheses of research of high policy relevance; communicating and sharing advice; and monitoring the impact on the know-do gap (list adapted and based on van Kammen *et al*, 2006, p.609).

Knowledge brokering is seen as a central element of the human process of knowledge transfer, between both individuals and organisations. Information is moved from a source to a recipient and back in a dynamic process:

'Brokering focuses on identifying and bringing together people interested in an issue, people who can help each other develop evidence-based solutions. It helps build

relationships and networks for sharing existing research and ideas and stimulating new work'.

CHSRF, 2003

A central element is the actors within the process, especially knowledge brokers, described as *'people or organizations that move knowledge around and create connections between researchers and their various audiences'* (Meyer, 2010, p.118). The brokerage process links researchers and decision makers together, helps them to understand each other's working environment and its dynamics, creates new partnerships, and guides all actors to use research-based evidence as a basis for decisions (CHSRF, 2003).

However, this cannot lead to success unless supportive structures are embedded into the process. As van Kammen *et al* (2006, p.611) noted of a knowledge brokerage system in the Netherlands, *'two interrelated core elements to its success were: a carefully designed process to bring the scientific research community and policy-makers together; and an appropriate institutional embedding'*. Sheate and Partidário (2010, p.279) define such supporting structures as *'boundary institutions that straddle and mediate the divide between science and policy'*. They can also enhance the reciprocity of the process, meaning that decision makers are not just *'passive recipients of information, but participate in the research and learning process towards the sharing of knowledge'* (Sheate and Partidário, 2010, p. 279).

Universities and other higher education institutions are generally considered to be the most central actors and economic dynamos in the age of the information society; their role in the information economy has been compared to *'what coal mines were to the industrial economy'* (Castells and Hall, 1994, p. 231). This was initially most apparent in the domain of local economic development, but scholars have increasingly started to forge connections with several other sectors, for example sustainable development (May and Perry, 2011a, p.720). Universities are therefore *'implicated in local growth coalitions, not only as estate managers, but also as strategic actors, employers or providers of evidence to inform policy'* (May and Perry, 2011b, p. 352). Local governments are increasingly active in building networks with local higher education and research institutions - and vice versa - in order to promote local development and inform policy development. The development in this path has seen business–university, national government–university, and local government–university networking structures develop within a broad range of policy sectors.

In relation to the field of sustainability, Sheate and Partidário (2010, p. 278) argue that:

'Knowledge brokerage has become a strong driver in current sustainability discourses, with a body of literature in multiple scientific areas that is promoting the importance of knowledge sharing and transfer as a way of breaking down barriers that impede interaction, healthy communication and collaboration.'

This theoretical framework may be applicable to a complex policy and scientific setting, such as sustainable development.

Processes of exchanging knowledge

Within knowledge brokerage discourses there are debates about the types of knowledge that can be transmitted and the processes that lead to knowledge transfer. Within these debates, the distinction between codified (or explicit) knowledge and tacit knowledge is applied across a number of social science and management disciplines.

The term tacit knowledge refers to *'all those pieces of knowledge which are not expressed and/or not expressible and/or not transmissible'* (Ancori *et al*, 2000, p.270). Hartley and Allison (2002) elucidate the distinction between explicit and tacit knowledge:

'Explicit knowledge can be articulated in formal systems (e.g. language and mathematics) and captured in language-based records (such as those in libraries, archives and databases). Tacit knowledge cannot be precisely communicated through formal language systems i.e. it cannot be written down'.

Hartley and Allison, 2002, p.104

Tacit knowledge concerns the know-how, social skills and practical skills which make things function. The transfer of tacit knowledge often implies the need for geographical proximity to the source of the tacit knowledge (Henry and Pinch, 2000; Pinch *et al*, 2003). However, as technology advances, it may be that there are novel approaches to tacit knowledge transfer which challenge the requirement for physical proximity with a network or cluster.

Tacit knowledge is by definition intangible and hard to define. Research into how urban regeneration professionals in the UK source policy advice suggests that the tacit dimensions of knowledge are the most crucial and sought after. Wolman and Page (2002, p.493) assessed the plethora of *'best practice'* data that crossed the desk of UK regeneration practitioners. The following quote from an interviewee illustrates the importance of trust and informal information exchange in assessing the validity of material which claims to be *'best practice'* in a given field.

You get more honest assessments from informal contact with people you do know. They're less likely to "BS" you. These kinds of contacts and conversations are different from a public presentation at a seminar where they can't really say what happened because they have to look good. You're more likely to get the truth in an informal context.

(Wolman and Page, 2002, p.493)

This quote illustrates the filtering techniques used by practitioners to sift through multiple sources of 'best practice' data. Trust and effective interpersonal relationships seem to be at the heart of the information that is most valued by practitioners. Implicit within this research was the idea that only through strong personal relationships with trusted professional contacts can actors access the most sought-after tacit information.

There appears to be extreme pressure on local governments to be seen as 'succeeding' or 'successful', and local governments may be cautious about sharing experience which could possibly show them in a negative light or create negative coverage. This is understandable considering that they are political organisations whose key interest is to survive within the democratic process. From a research perspective, it is often negative experiences that can provide the richest sources of data when trying to understand how to develop a successful approach to implementing policy. It may be that the only way to unlock this learning through 'worst or imperfect practice' is through informal and 'off the record' elements of networks.

The richness of tacit knowledge is in the 'in between bits' which elucidate how to make a policy work, and what political strategies will combat those who say an approach or policy will not work. 'Best practice' case studies may be sanitised, leaving out the 'nitty gritty' or real world politics which may be crucial factors determining the success or failure of initiatives. Expanding on this, Bulkeley (2006), in her work on learning from best practice in an urban sustainability context, cites the work of Hartley and Allison (2002):

...where examples of best practice are used by officers to shape policy decisions and initiatives, this takes place in conjunction with more informal processes of socialisation, where tacit knowledge can also be gained, and where "the sharing of practical experiences and reflection on these experiences" enables the conversion of tacit to more explicit, transferable forms of knowledge.

(Hartley and Allison, 2002, p.113)

This socialisation process mirrors the concept of being '*in the know*' or in the right networks or clusters in the commercial world. Competitive advantage within the public sector for cities, local governments and regions may equally involve being part of key influential networks where tacit knowledge is debated, deconstructed and transferred.

More recently in the field of urban development, Nolmark *et al* (2009) argue that urban knowledge is about combining different perspectives (both practice and theory) with different approaches and disciplines. Importantly, they emphasise that knowledge is also produced outside university departments and research institutions, recognising the importance of '*non-institutionalised*' forms of knowledge and the need to be open to changes at '*street level*', as well as the existence of tacit knowledge. They argue that urban knowledge is '*action-oriented, multidisciplinary and contextually defined*'. However, they also go on to suggest that society appears to lack supportive structures for the co-production, co-management, and co-use of knowledge, which is needed to find innovative solutions for cities.

Nolmark *et al* (2009) refer to the '*urban knowledge arena*', which is a collective and creative approach, drawing on a mix of expertise from government, industry, academia and citizenry, and considering the most innovative approaches to facilitate a more knowledge-based urban management with multi-actor dialogue. They note that the:

(H)ighly complex realm of urban development requires greater efforts to be taken to ensure the integration of different forms of knowledge...in order to facilitate the development of socially cohesive and sustainable forms of urban development.

(Nolmark *et al*, 2009, p.16)

There is a key role to be played by networks and associations of cities and international organisations, as well as in European research policy-making activities, in addressing the divide between urban research and practice.

Roles of a knowledge broker

Using passive dissemination to share research evidence with decision-makers and practitioners has been widely acknowledged as ineffective (Knight and Lightowler, 2010). Ward *et al* (2009) consider the relationship between researchers and decision-makers in an approach they refer to as 'linkage' and 'exchange'. This model focuses on the development of positive relationships between researchers and decision makers, based on the understanding that involving policy makers in the research process is the best predictor for ensuring research is used (Lomas, 2000). Knowledge brokers act as intermediaries or

linkage agents, and the Linkage and Exchange model emphasises the role of interpersonal contacts and good communication skills. However, there is limited academic research which evaluates the effectiveness of the model. What is the role of a knowledge broker and what are the key factors required for successful knowledge brokerage? There is lack of knowledge about how brokerage works and what contextual factors influence its effectiveness. Ward *et al* (2009) identify some of the challenges of knowledge brokerage, including the lack of distinction between brokering roles, and the range of skills required to fulfil different roles. There seem to be a number of conditions which allow knowledge brokerage to succeed, which include: an appropriate range of stakeholders; resources, time and space for engagement and knowledge exchange to take place; conducive, open dialogue; awareness of the advantages of knowledge input; and willingness to make use of other forms of knowledge. Specific skills are required in order to fulfil this role: they need to be a storyteller, fixer, engineer and networker.

Funders of social science research use the phrase '*development of joint understanding*' to reflect the importance of developing together and sharing understanding. Research can play a part in policy making, but this is dependent on politicians that are willing to take action, sufficient resources, and opportunities to '*try out*' findings. The knowledge broker needs to be familiar with research and its findings in order to share it, and also needs to be able to facilitate engagement between actors, and identify appropriate links in order to make the research useful.

Complexity in knowledge brokerage

Research by the UK Overseas Development Institute [ODI] (Court and Young, 2006) highlights the issue of complexity, stating that there are many actors, levels, aspects, and phases involved in knowledge brokerage. Researchers need to understand the complexity of these processes, as each situation and context is different.

The ODI's RAPID programme (Research and Policy in Development) has four main themes: use of evidence in policy identification, development and implementation; improving communication; better knowledge management; promotion and capacity building for evidence-based policy. The programme refers to three 'sectors' - researchers, policymakers and practitioners – suggesting that these sectors are mutually isolated to the point of living in parallel universes. RAPID notes that the link between research and policy is not a linear one, i.e. it is not simply about shifting lessons or findings from research into the policy sphere, but is actually dynamic and complex, with two-way processes between research, policy and practice, shaped by multiple relations and '*reservoirs of knowledge*'. The key

question posed is, *'why are some of the ideas that circulate in the research/policy networks picked up and acted upon while others are ignored or disappear?'* RAPID identifies a number of inter-related factors regarding this question, including: political context (and topical relevance); evidence; links between policy and research communities; and the external context (socio-economic/cultural influences).

RAPID also emphasises the importance of links – communities, networks and intermediaries - in effecting policy change, and argues that the existing literature fails to appreciate the extent and impact of intermediary organisations and networks. The importance of impact has been picked up by research funders, yet there needs to be greater consideration of the subtle and longer-term impacts of knowledge exchange, such as the importance of enduring relationships, which are hard to achieve but nevertheless underpin the impact of applied research.

A further complexity in knowledge brokerage is that the process differs depending on the nature and area of research. If one is involved in doing policy-relevant research, then it could be assumed that relationships of personal trust already exist between researchers and policymakers, in terms of co-production and sharing of knowledge. As subsequent sections discuss, this issue of personal trust is fundamental to effective connectivity between research and policymaking.

Negotiating hybrid brokerage roles

Knowledge brokers are likely to have a hybrid role in universities and other research organisations with knowledge exchange taking place at various different levels. At the corporate level, knowledge exchange takes place between research organisations and external partners or stakeholders. At the level of individual research projects, researchers are likely to have 'hybrid' roles. For example, university researchers are expected to produce research, disseminate the findings, and have a sound knowledge of wider scientific debates within the research area. Work by SURF in the UK supports this argument, noting that:

The role of universities as knowledge producers is increasingly valued in this climate (of a 'knowledge economy'), with an emphasis upon their relationships with businesses, governments and society in general. Priority is increasingly being given to 'social robustness', 'relevance', 'user engagement' and 'knowledge transfer'.

(Marvin et al, 2010)

They propose that research needs to be conducted at an international level to meet the criteria of world-class excellence, and that it also has to be embedded in local and regional contexts if the kinds of economic, social, and environmental benefits expected from knowledge are to be realised. The arguments advanced here reflect the need for universities to ‘compete’ with other producers of knowledge, and to show why they are relevant in a context of climate change, economic downturn, and resource constraint.

SURF’s framework for context-sensitive knowledge exchange (2009) includes both *cultures of enquiry* (research) and *cultures of reception* (practice), and illustrates communication between these, involving active intermediaries and multiple modes of knowledge exchange. Within this framework, problems are defined and set jointly by stakeholders; knowledge is co-produced within continuous and interactive relationships between producers, funders and users; knowledge is communicated and is recognised to be tacit, embedded and embodied; varied mechanisms for knowledge exchange are in place, including seminars, placements, job-sharing and multi-media; knowledge is stored but is retrieved according to intelligence that is incorporated into organisational culture and practices; and knowledge exchange is fluid, active, and dynamic (also see Ward *et al*, 2009 and Lomas, 2007).

In Knight and Lightowler’s (2010) work on knowledge brokerage in higher education, they note that knowledge exchange, according to the ESRC, ‘*can involve a range of methods – from seminars to media relations, from placements to partnerships*’. They further note that brokering focuses on the interface between ‘*creators*’ and ‘*users*’ of knowledge, but also that brokering is designed to enhance access to knowledge by providing training to knowledge users; thus knowledge brokers are viewed as capacity builders.

Knowledge brokerage for sustainability policymaking: a European perspective

Debates about the nature of knowledge brokerage in the field of sustainability, as outlined by Sheate and Partidário (2010), have emphasised the need for practitioners and researchers to work together to address the requirements of urban sustainability, and these concerns have been reflected at European level in recent years. In 2004, the European Commission’s Research Directorate General stressed the enormous potential of research in helping moves towards the sustainable and equitable upgrading of urban areas, by bringing innovative and resilient solutions that enable local governments to reform their cities at lower cost (Eric Ponthieu, 2004¹, speech at the UN). In the past decade, substantial research and other

¹ Eric Ponthieu’s speech, ‘New Directions in European Research’, is available at: http://ec.europa.eu/research/environment/print.cfm?file=/comm/research/environment/newsanddoc/article_2085_en.htm

activities have been carried out with the financial support of the European Commission, in order to improve sustainability conditions in urban areas, and especially to develop and test tools and instruments that aim to help local governments improve their management of the urban environment. Many of these initiatives have viewed the urban environment in a holistic sense, using urban sustainability as a key term, and looking at the mechanisms of governance and capacity building that enable or prevent successful local implementation of environmental and sustainable policies in areas such as urban planning, energy, and transport. Examples include research projects implemented within the 5th Framework Programme's key action 'City of Tomorrow and Cultural Heritage', such as: LASALA (Local Authorities' Self-Assessment of Local Agenda 21); LASALA online (Local Authorities' Self-Assessment of Local Agenda 21 online), leading to the Local Evaluation 21 tool; DISCUS (Developing Institutional and Social Capacities for Urban Sustainability); and RELIEF (RELIable Information on Earthquake Faulting); among many others.

Framework 6 projects intended to directly support the Urban Thematic Strategy (UTS) and the Aalborg Commitments implementation were: TISSUE (Trends and Indicators for Monitoring the EU Thematic Strategy on Sustainable Development of Urban Environment); STATUS (Sustainability Tools and Targets for the Urban Thematic Strategy); and ACTOR (Aalborg Commitments Tools and Resources). Other issues were addressed by DEMOS (Democracy in Europe and the MObilisation of Society), and the SWITCH project (Sustainable Urban Water Management Improves Tomorrows Cities Health).

Projects carried out in the framework of the LIFE programme included PRESUD (Peer Review for European Sustainable Urban Development) or the European ecoBUDGET Pilot project; as part as the CIVITAS initiative, there was the RELAy project (REsearch for Local Action towards sustainable human settlements) and the Nanning International Conference on Sustainable Urban Development.

The results of these activities - most of which have had active involvement from the partners of the Informed Cities consortium - provide a pool of information on good practice, tools ranging from sets of indicators and guidelines to online assessment systems, and guidance on how to improve management and governance processes for sustainability at the local level.

Although these, and other programmes and projects such as Urban Ecosystem Europe [UEE], have provided a rich source of knowledge and applicable innovation in urban sustainability management, there is as yet no widely accepted and recognised mechanism

for linking this knowledge to day to day policy-making in local governments. The generation and use of new knowledge at the EU level apparently needs to find its way to the local level, not just through the activities of researchers, but through the activities of national organisations, local governments and researchers together, seeking to facilitate integration and to take relevant innovation to scale (World Urban Forum in Barcelona, Spain, 2004²).

The European Commission has been developing this approach towards sustainable development since 2007, starting with a workshop held by the EC on '*Research for Sustainable Development: How to enhance connectivity*' (EC 7-8 June 2007, report of Workshop in Brussels³). This workshop involved representatives of research agencies in Member States and associated Countries responsible for financing or managing research for sustainable development. The key aim was to explore the issue of connectivity in research for sustainable development, both in general and more specifically in relation to the Seventh Framework Programme. Underpinning this was the perceived need to change what was seen as a '*non-integrated approach to policy-making*' (as identified in the renewed EC Sustainable Development Strategy 2006). The weak connectivity between research and policy-making, which may endanger the achievement of EU sustainability objectives, is an important challenge to address, both at policy and research level. The concluding report from the workshop stressed that emerging innovative ways of linking research to policy development and implementation environments should be tested in order to exploit the '*untapped potential*' of research.

Rangachari (2009) notes that knowledge organisations are complex, not linear; this is also valid for organisations in the sustainable development field:

...(A) linear process does not work: there is not a clear domain of science, that produces knowledge, that feeds into or 'impacts' upon a separate system of policy. Rather, there is a set of multiple forms of knowledge, including a variety of research fields, which have to relate to a variety of policy areas and specific policies. The integration of both is most successful when there is a process of interaction rather than a one-way delivery of knowledge on the doorstep of the policy maker.

(Report of EC Workshop, Brussels, 2007)

² Full report available at: <http://www.unhabitat.org/categories.asp?catid=467>

³ Full details of workshop available at: Available at: http://ec.europa.eu/research/sd/pdf/background_info/report_halfman.pdf

A central recommendation that emerged from the workshop concerned the Commission's need to facilitate experimentation with knowledge brokerage to increase levels of connectivity between researchers and policymakers.

A report the following year by the European Commission (2008) on *Scientific Evidence for Policy Makers* provided further impetus for a European-level approach to supporting knowledge brokerage processes. The report identified three major categories of barriers to effective knowledge brokerage:

1. *Contextual*: Policy makers and researchers work in very different environments. Policy makers focus on practical solutions; researchers need to translate their research findings into readable, understandable, and policy relevant material.
2. *Structural*: Researchers are '*professionally motivated to achieve high quality, scientifically robust results, which may or may not have an immediate impact on society or on policy making*'. By contrast, policy makers operate in a political environment where impact is driven by short-term considerations dictated by electoral cycles (often three to five years). Therefore, policy practitioners '*must be able to respond quickly to sometimes rapidly evolving political and societal challenges*'.

For researchers, an added dimension is the need for '*academic validity*' of their research, which is normally achieved through peer review of research. Academics may strive to maintain an appropriate distance between research and policy to ensure that academic autonomy is maintained and that the research process remains objective and free from restrictive external influence. In striving for objectivity, academic researchers do not shy away from reporting unpalatable facts and data which practitioners may want to suppress or play down for political reasons; therefore academic research may provide a more critical analysis than private consultancy, for instance.

3. *Cultural*: Cultural factors mainly concern communication and accessibility. Academic researchers may have a more normative view about how the research process needs to evolve in a holistic manner. Conversely, policy officers may need to pursue a more pragmatic approach which reflects constrained budgets and restricted timescales.

Another European level report (European Commission, 2009d) provided additional evidence for the need to improve knowledge brokerage, showing the varying levels of success between EU countries. In the UK and in Scandinavian countries, there is a strong tradition of creating knowledge centres and other platforms functioning as a resource for researchers and governments. A very different picture emerges in Southern Europe, where countries are still linked to traditional academic research based on long-term vision, with no established agencies that fund external research, and relative autonomy.

The findings from these reports and subsequent recommendations were later translated into a topic of the 2008 Work Programme within Theme 6 Environment. Following this, a number of projects were funded by the EU under FP7 with the specific aim of addressing and improving knowledge exchange between research and policy making for sustainable development. These included PRIMUS, RESPONDER, CORPUS, PETUS, WATER DISS, STREAM, and STEP-WISE, among others.

PRIMUS: The Informed Cities Initiative on knowledge brokerage

The Informed Cities Initiative [ICI: making research work for local sustainability] was a European project which aimed to enhance connectivity between research and policymaking in sustainable development, with a focus on tools for urban sustainability management. The ICI was funded by the 7th Framework Programme of the EU, under the acronym PRIMUS (its full title being *'Policies and Research for an Integrated Management of Urban Sustainability'*), and ran for three years, from 1st May 2009 to 30th April 2012.

The concept underpinning the Informed Cities Initiative was the need to bridge the gap between research at European level and policy-making at (and for) the local level. The theme chosen for this co-ordination action was *'sustainable urban management'*, so as to highlight the ways in which the various policy areas of urban development (energy/water/waste, transport, planning and design, social inclusion) are integrated, rather than focusing on a single policy theme. This was based on the premise that the decoupling of environmental degradation and economic growth can only be achieved through better management and governance of all of the inter-dependent factors which make up urban development. Indicators and information systems, efficient and effective policy processes, and innovative public participation are the main instruments to achieve this, enabling us to set targets, gain wide acceptance, and implement behavioural changes in society. The project built on existing connections between local government networks involved in the European Sustainable Towns & Cities Campaign (ESCTC): ICLEI – Local Governments for Sustainability; Union of Baltic Cities (UBC); and the Council of European Municipalities and

Regions (CEMR). This led to the development of a new network or community of practice called the Informed Cities Network.

ICI has two separate but linked elements: improving processes for knowledge brokerage for urban sustainability, and the explorative application of two European monitoring tools for local governments. The two tools were:

- a) **Local Evaluation 21 (LE21):** an online assessment which analyses the quality of local management and governance processes for sustainability, and can serve as a guide for political decisions on improving local management and governance mechanisms.
- b) **Urban Ecosystem Europe (UEE):** a set of advanced sustainability indicators enabling local governments to measure their performance in response to the renewed EU Sustainable Development Strategy, the Urban Thematic Strategy and the Aalborg Commitments, providing as a basis to develop measurable targets and timeframes for the mid-term.

These tools were selected because they encompass a wide range of sustainability-related themes, and focus on the 'how' of urban management in different ways. While Local Evaluation 21 is designed for mass application with automatic web-based management and feedback to the users, Urban Ecosystem Europe requires a greater degree of input from users and, in return, allows greater depth in terms of data analysis and aggregation.

The original aim of the project was to recruit 100 local governments from across Europe to use both tools, through contacts with cities that had either previously applied the tools or that the research team already developed relationships with through other initiatives.

The project was built around a series of events aimed at improving links between researchers and policy-makers: Informed Cities Fora, European Round Tables, and Implementation Workshops. There were two Informed Cities Fora (in Newcastle, 2010 and Naples, 2011), bringing together European local government representatives and researchers/research organisations active in the field of local sustainability. Potential participants included local governments active in the European Sustainable Cities & Towns Campaign, the researchers involved in relevant FP5/6/7 funded projects, and the European Local Action 21 Round Table of national representatives.

An additional three Informed Cities European Round Tables brought together National government ministries and agencies from a majority of EU Member States, responsible for national policies for urban sustainability management in their respective countries, and constituting an important link between European research and local policy making. The first Round Table meeting discussed the outcomes of EU-funded research projects with the researchers involved, producing detailed information on the application of tools developed for the local level. The aim was to understand the different barriers to, and specific requirements for, the effective application of research results in each of the Member States.

The second meeting allowed a cross-European group of local governments to monitor and pre-evaluate the 'explorative application' of the two tools, UEE and LE21. It also provided a starting point for organising a series of national (country-specific) Implementation Workshops. The final meeting discussed the outcomes of the Fora and workshops, and the potential benefits of a future Round Table for participants. It also defined proposals to enhance future integration of the research results into national policies related to urban sustainability management in the Member States.

The aim of the Implementation Workshops, which were originally to be undertaken in 12 countries, was to offer tailored support for those local governments applying the tools for monitoring delivery of urban sustainability, thus demonstrating in practice the connectivity between research and policy-making. The idea was to bring together all the local governments from each country participating in the explorative application, researchers from the consortia involved in developing the tools, and other interested local governments from the same or neighbouring countries. The aim was to give local government representatives advice during the application phase, and to find out how connectivity between research and policy making works in practice. In reality, the recruitment of 100 cities was a far greater challenge than had been predicted – this is discussed further in a subsequent section - and the Workshops were in fact used to encourage local governments who had expressed an interest to utilise the tools.

In total, over 200 cities (local governments and/or research organisation) participated in the Informed Cities Initiative (see Table 1.1), through involvement in one or more of the events, or in using one of two tools. Figure 1.1 shows the geographic range of cities involved across Europe.

Figure 1.1 Map of cities that participated in the Informed Cities Initiative

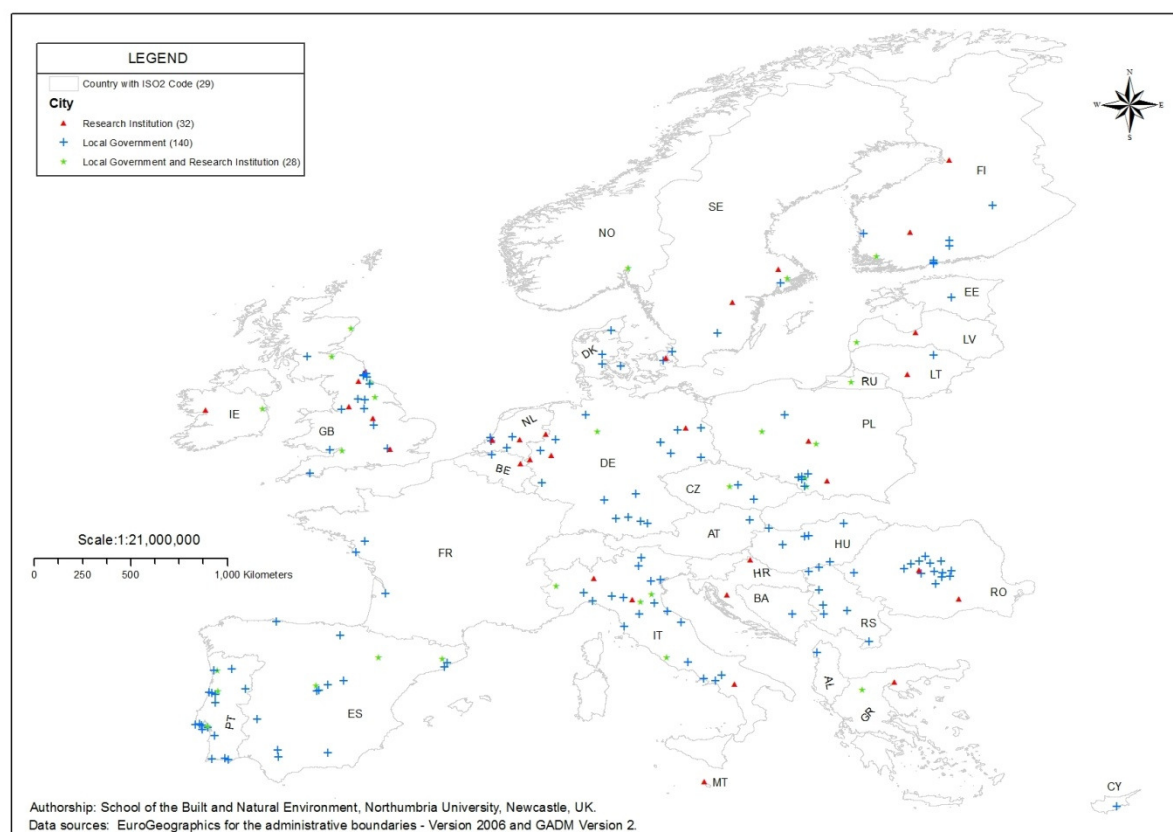


Table 1.1: Cities that participated in the Informed Cities Initiative

Country	Cities
Albania	Shkoder
Austria	Vienna
Belgium	Brussels, Antwerp
Bosnia	Sarajevo
Croatia	Cazovec, Zagreb
Czech Republic	Brno, Chrudim, Prague
Cyprus	Larnaca
Denmark	Aalborg, Albertslund, Copenhagen, Kolding, Lyngby, Odense
Estonia	Tallinn
Finland	Helsinki, Kausaali Oy, Kuopio, Lahti, Oulu, Pori, Tampere, Turku, Vantaa
France	Bordeaux, Nantes, Saint Hilaire de Riez
Germany	Augsburg, Berlin, Brauhaus Dessau, Bremen, Dresden, Dusseldorf, Eichenau, Hannover,

	Heinsberg, Leipzig, Munchenberg, Munich, Munster, Neu Ulm, Nurmeberg, Potsdam, Stuttgart, Trier, Wuppertal
Greece	Kozani, Thessaloniki
Hungary	Budaors, Budapest, Miskolc, Mosonmagyarovar, Szeged
Italy	Alessandria, Ancona, Avellino, Bologna, Bolzano, Ferrara, Firenze, Frosinone, Genova, Livorno, Milan, Modena, Naples, Padova, Parma, Rimini, Ravenna, Reggio Emilia, Region of Campania, Tito Scalo, Torino, Trento, Venice
Ireland	Dublin, Galway
Latvia	Liepaja, Riga
Lithuania	Kaunas, Panevezys
Malta	Nadur
Netherlands	Amsterdam, Delft, Enschede, Maastricht, Rotterdam, Schiedam, The Hague, Tilburg, Wageningen
Norway	Oslo
Poland	Bedzin, Bielsko Biala, Bydgoszcz, Jaworze, Katowice, Knurów, Krakow, Lodz, Mikolow, Poznan, Swietichowice, Warsaw
Portugal	Almada, Cascais, Coimbra, Condeixa a Nova, Faro, Figueira da Foz, Grandola, Lagos, Lisbon, Loule, Montemor-o-Velho, Montijo, Oeiras, Oporto, Ourem, Palmela, Sebugal, Sesimbra, Vila Real
Romania	Aiud, Avrig, Blaj, Brasov, Bucharest, Campulung, Fagaras, Odorheiu Secuiesc, Sacale, Sebes, Sfintu Gheorghe, Sibiu, Sighisoara, Targu Mures, Tarnaveni, Timisoara, Zarnesti
Russia	Kaliningrad
Serbia	Kragujerac, Sombor, Sremska Mitrovika, Szabadka, Uzice, Valjevo, Veszprem, Vranje
Spain	Arahal, Azuqueca de Henare, Barcelona, Fuenlabrada, Gijon, Getafe, Granada, Granollers, Guadalajara (Diputacion), Madrid, Seville, Vitoria-Gasteiz, Zaragoza
Sweden	Botkyrka Kommun, Helsinborg, Linköping, Norköping, Stockholm, Uppsala, Växjö
United Kingdom	Aberdeen, Billingham, Birmingham, Blyth, Bradford, Bristol, Cardiff, Durham, Edinburgh, Halton Borough, Gateshead, Glasgow, Leeds, Leicester, London, Manchester, Newcastle upon Tyne, North Tyneside Borough, Nottingham, Plymouth, Stockton on Tees, Sheffield, Sunderland, Uxbridge, York

This report

Sections 2 to 9 of this report set out and evaluate the findings from all aspects of the ICI, and provide an insight into the complex knowledge brokerage processes involved in the research-policy making interface.

Undertaking the project has highlighted a number of challenges for the partners as knowledge brokers (reflecting the different types of organisation they represent), both in terms of delivering a ‘successful’ project, and in considering the broader issues around and actors involved in knowledge exchange for delivering urban sustainability. These are discussed at relevant junctures throughout the report.

Section 2: Approaches to monitoring sustainable urban development in Europe

Introduction

Urban areas provide a home for around 75% of Europeans, and by 2020 approximately 80% of Europeans are expected to live in urban areas (European Environment Agency, 2010). Urban areas are therefore a core driver of European societal development.

Although there is no legal basis for urban policy in the treaties establishing the EU and the European Communities (European Commission, 2009e), the EU does support urban development, especially via the Directorates-General (DG) of Environment, Regio and Research. The importance of urban issues has been recognised and emphasised by successive presidencies of EU, in particular at the Informal Ministerial Meetings on urban development in Lille (2000), Rotterdam (2004), Bristol (2005), Leipzig (2007), Marseille (2008) and Toledo (2010). These Declarations recognise that urban challenges are increasingly complex and call for an integrated, holistic approach that encompasses the multiple dimensions of sustainable development in order to achieve a smarter, more sustainable and socially inclusive urban development. Recent Declarations also emphasize the need to support actors in urban development by promoting the use of evaluations, benchmarking studies, peer reviews, best practice, urban research and developing a minimum common set of sustainable development indicators⁴ in order to offer opportunities for reflection regarding progress and future challenges.

This section provides an overview of existing approaches to monitoring sustainable urban development in Europe. It does not present an exhaustive list of all European monitoring tools, but rather focuses on the characteristics featured in the most common monitoring approaches used by local governments in Europe. The tools described have been applied by local governments across Europe, and together offer a comprehensive assessment of some aspects of sustainable urban development. The emphasis is on tools for use in local government; therefore market-based monitoring tools, such as the European Eco-Management and Audit Scheme (EMAS), which was originally developed for use by companies, are excluded.

This section starts by presenting the European policy context of sustainable urban development, with a particular focus on the relevant EU policy framework and the emphasis

⁴ An indicator can be defined as 'a parameter, or a value derived from parameters, which point to, provides information about, describes the state of a phenomenon/environment/area, with a significance extending beyond that directly associated with a parameter value' (OECD, 2003).

it places on monitoring and evaluating sustainable development. It goes on to present seven key European sustainable urban development monitoring tools, including: their aims; the actors involved in their development and delivery; urban policies they are affiliated with; evaluation type; and target population. The section concludes by comparing the general characteristics of the monitoring tools in relation to certain criteria.

Policy framework for sustainable urban development

Sustainable development is a fundamental objective under the EU Treaties (European Council, 2001). In 2001 the European Council met in Gothenburg and agreed on a European strategy for sustainable development. The EU's Sustainable Development Strategy (SDS) was based on the principle that the economic, social and environmental effects of all policies should be examined in a co-ordinated way and taken into account in decision-making (European Council, 2001). The SDS recognised the importance of Local Agenda 21 as an effective means of building consensus for change at the local level. A commitment was made to review the SDS at the start of each new term of office (European Commission, 2005). The first review occurred in 2004, and the SDS was revised to emphasise the need for a stronger focus on effective monitoring (European Commission, 2005). The review also underlined the need to ensure that Member States' national sustainable development strategies align and integrate national actions with actions taken or proposed at European level. In 2006, the European Council adopted a renewed SDS for an enlarged EU, which outlined how the EU will more effectively live up to its long-standing commitment to meet the challenges of sustainable development (European Council, 2006). The renewed SDS emphasised policy coherence and the importance of integrating principles of sustainable development into policymaking at all levels, including the local level (European Council, 2006).

In 2007 the first progress report on the SDS was produced (European Commission, 2007). The report was based on Sustainable Development Indicators (SDIs) developed by the Commission. The SDI set provide a relative assessment rather than an absolute one, focusing on the direction of change towards practice that encompasses sustainable development (Eurostat, 2009). The current SDI set includes over 130 social, environmental and institutional indicators (Eurostat, 2011a). The indicators have been grouped into ten themes⁵, each with its own headline indicator, reflecting the key challenges of SDS (Eurostat, 2011a). The intention is to offer an overall picture of the EU's progress towards

⁵ The ten themes are: socio-economic development; sustainable consumption and production; social inclusion; demographic changes; public health; climate change and energy; sustainable transport; natural resources; global partnership; good governance (Eurostat, 2011a).

sustainable development in terms of the objectives and targets defined in the strategy (Eurostat, 2011a). Monitoring reports are published by Eurostat⁶ every two years. Most EU countries have developed a set of SDIs linked to their National Strategies for Sustainable Development, although only a few countries (Austria, Belgium, Germany, Switzerland, United Kingdom and Czech Republic) have developed regular SDI monitoring cycles (Gjoksi *et al*, 2010; Pisano *et al*, 2011).

The second EU SDS progress report highlighted the need to ensure a greater synergy with the Lisbon Strategy for growth and jobs, as well as more efficient monitoring through adopting mechanisms used in the Lisbon Strategy (European Commission, 2009a). The most recent progress report, published in 2011, was unable to conclude that general progress was being made in the implementation of SDS objectives and key challenges, or that the EU was moving in the direction of sustainable development. The headline indicators showed mixed results, with nearly half of the headline indicators moving in a moderately unfavourable direction (Eurostat, 2011b).

At a European level the urban dimension has been acknowledged by the Thematic Strategy on the Urban Environment, although without any binding EU obligations or legislation on urban environmental management (European Commission, 2006). This means that local governments are not legally required by the EU to manage their urban environment. The Thematic Strategy stated that urban areas play an important role in delivering the objectives of the SDS, and called for better management of urban areas by dissemination of best practice via effective networking between cities. It also suggested an integrated approach to managing the complex challenges of the urban environment, and emphasised the need for accessible data for progress monitoring. Other urban programmes under different EU Directorates run in parallel with the Thematic Strategy, such as the Urban Dimension in the Cohesion Policy and the EU Territorial Agenda, which promotes sustainable economic growth, and initiatives under various EU presidencies, such as the Rotterdam Urban Acquis, the Bristol Accord, the Leipzig Charter, the Marseille statement and the Toledo declaration.

The first steps towards supporting European sustainable urban development were taken when the European Commission adopted the strategy 'Sustainable Urban Development in the EU: A Framework for Action' (European Commission, 1999). The Framework stated that action must be taken at all levels of government, although the responsibility for action lay mainly with Member States and regional and local governments. The Framework outlined

⁶ Eurostat is the statistical office of EU and its task is to provide the EU with statistics at European level that enable comparisons between countries and regions.

the actions necessary to work towards a strategic, integrated and ultimately more sustainable approach to urban issues.

Table 2.1 Timeline for key sustainable development initiatives and policy documents

Year	Lead institution	Report/Initiative
1999	European Commission	Sustainable Urban Development in the EU: A Framework for Action
2001	European Council	EU Sustainable Development Strategy
2004	European Union	Informal ministerial meeting on territorial cohesion- Rotterdam
2004	European Commission	Review of the Sustainable Development Strategy
2005	European Union	Informal Ministerial meeting of European Ministers for Urban Policy - Bristol Accord
2006	European Commission	Thematic Strategy for the Urban Environment
2006	European Council	Revised EU Sustainable Development Strategy
2007	European Union	Informal ministerial meeting on urban affairs - Leipzig Charter on Sustainable Cities
2007	European Commission	Progress report of the EU Sustainable Development Strategy
2008	UNESCO	International Symposium – Marseille Statement
2009	European Commission	Progress report of the EU Sustainable Development Strategy
2010	European Union	Informal ministerial meeting on housing and urban development - Toledo Declaration
2010	European Commission	Europe 2020 Strategy and Monitoring Platform
2011	European Commission	Progress report of the EU Sustainable Development Strategy

In 2001 the European Council and European Parliament adopted the Community Framework for Co-operation to Promote Sustainable Urban Development to define exchange and implement good practices in the framework of Agenda 21 (European Commission, 2010b). This promoted the exchange of information and experience on sustainable urban development under the Community Framework, through the URBAN Community Initiative programmes. URBAN has enabled an integrated approach to be put into practice in around 200⁷ local governments around Europe, including cross-sectoral co-ordination, horizontal partnerships and increased local responsibilities (European Commission, 2009e). These programmes have been the subject of ex-ante, mid-term and ex-post evaluations in order to monitor progress (European Commission, 2009e).

⁷ Examples of participating local governments are available in the brochure 'Partnership with the Cities: The Urban Community Initiative'. http://ec.europa.eu/regional_policy/sources/docgener/presenta/cities/cities_en.pdf

The EU's Cohesion Fund and the Structural Funds⁸ are focal points in the sustainable development of urban areas in Europe. Approximately 6% of the EU cohesion policy budget in the period 2007-2013 - some 21.1 billion euros - has been earmarked for urban development (European Commission, 2011c). Cohesion Policy programmes mainstream an integrated approach, allowing all cities across Europe to be potential beneficiaries of funding by applying urban development principles (European Commission, 2009e). Structural Funds play a key role in underpinning the development and revitalisation of Europe's towns and cities (European Commission, 2011d). Other EU policies and initiatives, such as the 7th Framework Programme (FP 7) for Research, also contribute to and promote sustainable urban development. For example, FP7 enables EU-funded interdisciplinary research on the multifaceted sustainable urban development challenges recognised in the SDS. One intention of FP7 is to contribute towards promoting sustainable development and environmental protection. A key FP7 theme is to monitor its contribution to SDS goals via a web-based tool⁹ developed by DG Research (European Commission, 2011a). Another theme is to promote and develop mechanisms, such as impact assessment tools and indicators, to support coherent and informed SDS policy making (European Commission, 2011a).

The exchange of knowledge and experience between key actors in urban policy is supported via the URBACT (Urban Development Network) programme¹⁰. URBACT brings together national and regional authorities as well as cities from all EU Member States with the intention of improving the effectiveness of urban development policies in Europe and strengthening the common concept of integrated urban development, and thus contributing to the implementation of the SDS (European Commission, 2009e).

During the last two decades, urban policies have evolved and a common European framework for sustainable urban development has begun to form (European Commission, 2009e). The basis of the common European framework for sustainable urban development contains at least five dimensions (European Commission, 2009e):

- Wider integration of urban policies within local economies;
- A shift from government to governance, i.e. the inclusion of broader participation across different sectors in urban policies;

⁸ The Cohesion Fund and the Structural Funds are financial instruments set up to implement the Cohesion Policy, also referred to as Regional Policy of the EU. The Structural Funds comprise the European Regional Development Fund and the European Social Fund.

⁹ For more information of the web based tool please visit: <https://www.fp7-4-sd.eu/index.php>

¹⁰ The URBACT programme is supervised by a monitoring committee, the members of the committee is comprised of two representatives of each Member State involved in URBACT and the Commission is represented in the committee by the DG Regional Policy.

- An increasing focus within urban policies on empowering local inhabitants;
- A change from universal urban policies to more focused, area based policies;
- A stronger emphasis on the effectiveness of urban policies.

The 2007 Leipzig Charter was a foundation for the development of better urban policies at local level; it identified common principles and strategies for urban development policy as well as the use of an integrated urban development policy approach (Atkinson *et al*, 2011). There has also been a growing recognition of the significance of cities by the EU, whereby the role of cities has been emphasised from various perspectives, from being '*engines of regional development*' towards being '*central in achieving the goals of Europe 2020*' (Atkinson *et al*, 2011). Challenges are still abundant. There is no Treaty basis for EU urban policy, and implementing EU urban policy is voluntary, although EU policies have influenced the methods used by national and local governments in Member States to deal with urban issues (Atkinson *et al*, 2011). While it may be suggested that urban policies should reflect local need, a '*top-down*' approach may still be helpful. The array of urban programmes under different EU Directorates have been criticised for being poorly integrated and seldom building on one another (European Environment Agency, 2010), often emerging independently from different Directorates. Mainstreaming URBAN initiatives has proved to be demanding and only successful in certain Member States, such as France, Germany and the Netherlands (Atkinson *et al*, 2011). Furthermore, most activities under the Cohesion Policy intended for cities have been implemented in a sectoral manner, without taking into account the need for an integrated approach (Atkinson *et al*, 2011).

Common approaches to monitoring sustainable urban development in Europe

There has long been controversy on how to best measure, monitor and assess progress towards sustainable development (Hametner and Steurer, 2007). This debate is highly relevant when it comes to measuring, monitoring and assessing European sustainable urban development: not only does evaluation have to confront the 'ordinary' challenges associated with measuring something as vague and elusive as sustainable development (Basiago 1995; Hopwood *et al*, 2005; Hull, 2007; van Zeijl-Rozema *et al*, 2008), but also to consider vast contextual and structural urban variation. There are various challenges: converting sustainable development into a set of operational principles and indicators; methodical reliability and validity; and availability and comparability of data. At a European level, information on urban issues is fragmented, spread across different Directorates and often not compatible in terms of time or spatial dimensions (European Environment Agency, 2010). The assessment of European urban policies and the choice of indicators may be restricted by data availability (Keirstead and Leach, 2008; Donatiello, 2001). Some aspects

of urban society, such as culture, are difficult to measure using indicators. There may be a lack of comparable indicators that take into account contextual and structural differences amongst EU Member States. Finally, long time intervals between evaluations can make it difficult to interpret the data (LC-FACIL, 2009).

The European Commission has taken an active role in providing urban data for local governments across Europe. In 1988 the Urban Audit was launched by the Commission. It has been developed since 2001 by the Regional Policy DG with the support of Eurostat (European Commission, 2010a). In 2003, DG Regio launched the Urban Audit with the aim of providing comparable and reliable statistics and indicators for European cities. The Urban Audit contains almost 300 statistical indicators on subjects such as demography, social and economic aspects, environment and transport (Urban Audit, 2011). Urban Audit data is collected every three years in collaboration with national statistical offices. The first Urban Audit, in 2003, involved cities from 15 EU Member States. The second (2006-2007) involved 321 cities, representing all EU member states. A balanced and representative sample of European cities was selected, including capital cities, regional capitals, and large as well as medium-sized cities. The data can be used to view, rank and compare city profiles, thus offering long-term monitoring capability. However, data is collected only every third year, although annual data collection has been implemented for a small number of targeted variables (Urban Audit, 2011). In 2011 Urban Audit launched the Urban Atlas, encompassing data from 185 cities from all 27 Member States, and offering digital mapping to assess climate change risks and opportunities, and identify new infrastructure and public transport needs (Urban Audit, 2011).

Sustainable urban development monitoring tools

The seven tools shown in table 2.2 have been selected for further study. Each is described in detail in this section.

Table 2.2 Monitoring tools

Tools	Initiative	Year
The European Green Capital Award	Tallinn memorandum	2006
The Covenant of Mayors	European Commission	2008
The Reference Framework for Sustainable Cities	Marseille statement	2008
The European Capital of Biodiversity	Deutsche Umweltshilfe	2010
Local Evaluation 21 (Developed from the LASALA tool)	Consortium of European research partners	2000

The European Green City Index	Siemens AG	2009
Urban Ecosystem Europe	Ambiente Italia, research institute	2006

European Green Capital Award

The European Green Capital Award (EGCA) was launched in 2008 as a policy tool of the Commission and DG Environment to promote and improve urban living environments. The EGCA tool builds upon the Thematic Strategy on Urban Environment and encourages local governments across Europe to adopt a more integrated approach to urban management (EGCA, 2011). EGCA was originally an initiative of the Tallinn Memorandum, signed on behalf of a number of European cities in Tallinn in 2006 (EGCA, 2011). The EGCA recognises and rewards local efforts to improve the environment, economy and quality of life in cities (EGCA, 2011). The EGCA is given each year to a city which is leading the way in environmentally friendly urban living and which can act as a role-model to inspire other cities (EGCA, 2011). The tool is designed to encourage cities to improve the quality of urban life by emphasising the environmental aspect of urban planning and encouraging the exchange of best practice (European Commission 2010a). Local governments with more than 200,000 inhabitants in EU Member States, European Economic Area countries and EU Member State candidate countries are eligible to apply for the award (EGCA, 2011). In countries where there is no city with more than 200,000 inhabitants, the largest city is eligible to apply.

The basis of the evaluation is a set of indicator areas. Originally, this was a set of ten indicators, inspired by the ten European Common Indicators developed by the Commission, DG Environment and European Environment Agency and the Aalborg Commitments, although focusing only on environmental aspects. The current EGCA is assessed based on twelve environmental indicators (EGCA, 2011).

Table 2.3 European Green Capital Award indicators

Local contribution to global climate change	Local transport	Green urban areas incorporating sustainable land use
Nature and biodiversity	Quality of local ambient air	Noise pollution
Waste production and management	Water consumption	Wastewater treatment
Eco innovation and sustainable development	Environmental management of the local authority	Energy performance

The EGCA tool is voluntary and does not provide any funds to support the initiatives of participating local governments (EGCA, 2011). Cities can apply for the EGCA award online,

via an online application form available in three languages (English, French and German). The first EGCA award was first given to Stockholm in 2010. 71 cities across Europe have applied to the EGCA, with the latest (for 2014) gathering 19 applications from cities representing 14 European countries¹¹ (EGCA, 2011). The evaluation process for applications is a two-tier process lasting approximately five months and involving a peer review by a panel of international experts¹², after which three to four cities are shortlisted and invited to present their application before a jury, who will make the final decision. The EGCA evaluation criteria are based upon three objectives:

- 'Greenest city': the environmental performance of participating cities;
- 'Implementation of efficient and innovative measures';
- 'Communications and networking': cities are required to develop an ambitious communication strategy and programme of actions and events as part of their application; if awarded the title, the city must implement this programme.

Covenant of Mayors

The Covenant of Mayors (COM) was launched by the Commission in 2008 after the adoption of the EU Climate and Energy Package (COM, 2011). The COM supports local governments to voluntarily commit to increasing energy efficiency and using renewable energy sources by implementing sustainable energy policies. Signatories aim to meet and exceed the EU's 20% CO₂ reduction objective by 2020 (COM, 2011). They may be eligible for innovative funding schemes to implement their actions via the Cohesion and the Structural Funds, for example through the European Regional Development Fund (ERDF). European local governments of all sizes are eligible to apply; by November 2011 over 3000 local governments across Europe, representing over 140 million people, had signed the COM.

The signatories commit to prepare and submit, via an online submission system, a Baseline Emission Inventory (BEI), which quantifies the amount of CO₂ emissions as well as their principal sources and reduction potentials. The recommended baseline year for calculating the CO₂ emissions is 1990 (COM, 2011). After signing up, they have one year to submit a Sustainable Energy Action Plan (SEAP) outlining the key actions they plan to undertake (COM, 2011). If signatories fail to submit their SEAP on time they will be suspended from the tool. The SEAP is both a political document, defining a framework for the long-term objectives and showing they will be achieved, and a technical document using the results of

¹¹ The 14 countries are: Austria (Vienna); Belgium (Antwerp, Brussels, Ghent); Denmark (Copenhagen); Finland (Tampere); France (Paris); Germany (Frankfurt); Greece (Thessaloniki); Italy (Torino); Netherlands (Rotterdam); Romania (Brasov); Slovenia (Ljubljana); Spain (Zaragoza); Turkey (Bursa Municipality, Trabzon); and UK (Bristol, Newcastle, Stoke on Trent).

¹² The panel consists of 12 experts, each responsible for their own evaluation area.

the BEI to identify the most appropriate actions. In addition, it is intended as a communications and promotional instrument to address stakeholders (COM, 2011). Signatories are provided with a SEAP guidebook and signatories can upload their submission in their own language, although they are required to fill in the SEAP template in English. In addition to that they receive promotional, technical and administrative assistance from the COM Office, which is managed by a consortium consisting of the Committee of the Regions, the European Parliament and the European Investment Bank, as well as a range of regional and local actors such as Energy-Cities, Climate Alliance and Eurocities (COM, 2011). The Joint Research Centre (JRC) of the European Commission assists and provides signatories with scientific and technical support as well as operating a technical service helpdesk and evaluating submitted SEAPs. The SEAP serves as a baseline for monitoring future actions. Signatories commit to undergo regular assessments, which JRC is responsible for, and to publish implementation reports every two years after their submission (COM, 2011). Signatories' main achievements are published on the COM website, to promote good practice and offer benchmarking opportunities.

Reference Framework for Sustainable Cities

The Reference Framework for Sustainable Cities (RFSC), originally an initiative of the 2008 Marseille statement, is a response to the Leipzig Charter declaration about the need for a cross-cutting and analytical tool to assess and support the implementation of integrated, sustainable and cohesive urban development approaches (RFSC, 2011). The RFSC tool is a joint European initiative, steered by the French Ministry of Ecology, Energy, Sustainable Development and the Sea (MEEDDM), the Secretariat of URBACT, EU Presidency countries and the Commission (DG Regio) (RFSC, 2011). RFSC is supported by the French CERTU research body, Capgemini Consulting project management and the Dutch NICIS Institute (RFSC, 2011). RFSC is also supported by Member States, such as France and Germany, European networks of local governments (CEMR and Eurocities), and by the URBACT project LC-FACIL. It also has national support from central government ministries, national agencies, and other interest groups.

The RFSC aims to provide an interactive web tool to support cities to develop and monitor policies on sustainable urban development (Atkinson *et al*, 2011). The tool starts with a self-assessment on local governments' characteristics, features and existing actions to promote sustainable development. The broad range of questions aim to help local actors (politicians, city managers, planners) to review their approach towards sustainable development and reflect on existing priorities, as well as supporting and giving guidance to monitor implementation and evaluate the results (RFSC, 2011). RFSC is a flexible tool, which local

governments can adapt according to their differing political, geographic, economic, environmental and social contexts (RFSC, 2011).

The monitoring aspect of RSFC relies on a broad collection of indicators to monitor progress over time, although local governments are able to add their own indicators (RFSC, 2011). The indicators are linked to the four aspects of sustainability: economy, social, environment, governance. RSFC recommends a limited number of key indicators for the 25 main questions on sustainable urban development, linked to European targets such as the EU 2020 targets or to the European Common Indicators. RSFC's 'integrated approach' focuses on showing interdependencies and raising awareness about possible synergies and conflicts (NICIS, 2011). An expected added value for local governments is that the tool offers exchange of experiences, strategies and projects with other cities, and stimulates internal and external dialogue about sustainable and integrated urban development (NICIS, 2011). The RFSC tool has undergone a developmental and testing phase since 2009, overseen by NICIS and CERU and assisted by 66 European test cities from 23 Member States, reflecting the diversity of European cities in terms of size, function, type and challenges (NICIS, 2011). The main tasks were to consolidate, evaluate, improve and finalise the RFSC web tool and to ensure that it meets its overall targets (NICIS, 2011). The RFSC second interim report revealed that most test cities thought it did meet its objectives, and 80% stated that they would use the tool, or parts of it, regularly in the future (NICIS, 2011). The same report also revealed limitations: that the test cities viewed the prototype web tool as complicated and time-consuming; and that the prototype was available in only four languages (English, French, German and Czech).

The RFSC web tool should be fully operational online in 23 languages in 2012, enabling local governments to evaluate and develop sustainable urban development strategies, ensure integrated urban approaches, build their own monitoring systems, or review existing monitoring systems (RFSC, 2011).

European Capital of Biodiversity

The European Capital of Biodiversity (ECB) tool builds upon the successful German competition model for promoting the preservation of biodiversity in urban areas (ECB, 2011). ECB is coordinated by the German Environmental Aid (Deutsche Umweltshilfe e.V.) and supported through LIFE¹³. The ECB campaign is aided by a number of NGOs, such as the Regional Environment Centre in Slovakia, the Hungarian Lake Balaton Development Co-

¹³ LIFE is the EU's financial instrument in supporting environmental and nature conservation projects.

ordination Agency, the Spanish Fundación Biodiversidad Foundation and the Regional Agency for Nature and Biodiversity in Paris Region. The International Union for Conservation of Nature (IUCN) and Local Governments for Sustainability (ICLEI) also contribute. ECB strives to establish a common biodiversity monitoring system and to support local governments to fulfil legal compliance regarding nature and biodiversity protection (ECB, 2011). Following the successful German competition in 2010, where 124 local governments participated in the competition for the German Capital of Biodiversity, the ECB campaign attempts to improve on this model and transfer it to other European countries (ECB, 2011). The rationale is to promote the protection of urban biodiversity and motivate local initiatives for protection of the nature, as well as raising awareness among local governments. 43 Hungarian, 20 Slovakian, 68 Spanish and 80 French local governments have participated in the competition to become national capitals of biodiversity (ECB, 2011). The ECB campaign aims to promote national campaign winners at a European level.

The basis of the competition is a questionnaire, available in five languages (German, Hungarian, Slovak, Spanish and French), which participating local governments submit to the ECB campaign and are judged upon. The questionnaire consists of five main topic areas:

- 'Nature in the city';
- 'Environmental education and environmental justice';
- 'Protection of species and biotopes';
- 'Sustainable use of biodiversity';
- 'Concepts, communication and co-operation'.

One of the improvements of the original model has been to incorporate a biodiversity monitoring system, the basis of which is a set of biodiversity indicators, known as the Singapore Index¹⁴, developed by IUCN for local governments (ECB, 2011). The ECB campaign has reduced the number of indicators from 26 to 18, and adapted the Singapore Index to broaden its applicability amongst smaller cities. Implementing the original number of indicators would have posed challenges relating to data availability and limited resources (ECB, 2011). The scoring system for the Singapore Index, which is intended to benchmark progress, is not relevant to ECB due to the reduced number of indicators (ECB, 2011).

¹⁴ <http://www.cbd.int/authorities/doc/User%27s%20Manual-for-the-City-Biodiversity-Index27Sept2010.pdf>

Local Evaluation 21

The most prominent and systematic local initiative for promoting and monitoring sustainable urban development began in 1994 at the European Conference on Sustainable Cities and Towns (EC SCT) in Aalborg, Denmark. Conference participants signed the Aalborg Charter to acknowledge local governments' responsibility for many environmental problems humankind is facing, and to commit to integrate the principles of sustainable development in all their policies, and work towards sustainable urban development by engaging in Local Agenda 21 (LA21) processes (Aalborg Charter, 2011). More than 2600 local governments across Europe have signed the Aalborg Charter, and over 650 local governments have signed the Aalborg Commitments (Aalborg Charter, 2011). Members of the EC SCT Campaign have also pledged to use instruments, indicators and tools to monitor their efforts towards sustainable development (Aalborg Charter, 2011).

The creation of the Local Authorities Self-Assessment of Local Agenda 21 (LASALA) tool was a response to the LA21 policy framework and the commitment to evaluate LA21 processes. LASALA was initiated by a number of local government networks through the ESCTC. The project was financed by DG Research through FP5 Key Action 'City of Tomorrow and Cultural Heritage', and the LASALA consortium was made up of Local Governments for Sustainability (ICLEI), Northumbria University, Åbo Akademi University, Lisbon University, the Hungarian Regional Environmental Centre and Focus Lab in Italy.

Table 2.4 Aalborg Commitments

Governance Commitment to energizing the decision-making processes through increased participating democracy	Local management towards sustainability Commitment to implement effective management cycles, from formulation through implementation to evaluation
Natural common goods Commitment to fully assume the responsibility to protect, to preserve and to ensure equitable access to natural common goods	Responsible consumption and lifestyle choices Commitment to adopt and facilitate the prudent and the efficient use of resources and to encourage sustainable consumption and production
Planning and design Commitment to a strategic role for urban planning and design in addressing environmental, social, economic, health and cultural issues for the benefit for all	Better mobility, less traffic Recognise the interdependence of transport, health and environment and commitment to strongly promote sustainable mobility choices
Local health for action Commitment to protect and promote the health and wellbeing of citizens	Vibrant and sustainable local economy Commitment to create and ensure a vibrant local economy that gives access to employment without damaging the environment

<p>Social equity and justice</p> <p>Commitment to secure inclusive and supportive communities</p>	<p>Local to global</p> <p>Commitment to assume global responsibility for peace, justice, equity, sustainable development and climate protection</p>
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The LASALA tool is based upon the Aalborg Charter and therefore differs from the tools previously described, which were initiated in response to EU policies, such as the Thematic Strategy on Urban Environment, the EU Climate and Energy Package and the Leipzig Charter, or international conventions related to biodiversity. The LASALA tool was created to enable cities of all sizes in Europe to compare their internal development, both with other actors' equivalent processes and with normative aims that are embedded in the concept of sustainable development (Joas, 2007). The LASALA methodology comprised nine criteria which evaluated different aspects of a political process. Three of these criteria - identifying relevant topic areas (or problem areas) for the LA21 process, level of local commitment to the process, and resources available for the local process – focused on measuring capability for a successful process (Joas, 2007; Joas *et al*, 2005). The remaining six criteria - existing sustainable development plans, level of integrated approach, level of participation among the local residents, partnership between the local council and the community, level of public awareness of the problems in the local society, and level of continuity in the process - measured progress and milestones for a successful process (Joas, 2007; Joas *et al*, 2005). Nearly 150 local governments across Europe used the LASALA tool.

The LASALA evaluation tool has since been revised, updated, and technically upgraded to become an online tool entitled Local Evaluation 21 (LE21). Before LE21 went online in 2004, the tool was tested by a group of end users, the Commission and a reference group made up of researchers (Joas *et al*, 2005). This resulted in the evaluation questionnaire being simplified to enhance its usability, and a tenth criterion was added (*'what kind of progress has been achieved?'*), in order to measure tangible progress. LE21 is a voluntary self-evaluation tool, available in 20 different languages, and suitable for local governments of all sizes. LE21 data is collected on a web page, using data inputted by local governments. The data is automatically processed and analysed, providing local governments with a benchmarking report that identifies areas of progress and challenges in work towards sustainable urban development. LE21 is one of two tools selected for a European wide explorative application; a more detailed description of the tool is available in Section 4.

European Green City Index

The European Green City Index (EGCI) was developed and conducted by the Economist Intelligence Unit (EIU) and supported by the Siemens Company. The EGCI strives to assess and compare cities in terms of their environmental performance (EGCI, 2011). The EGCI differs from other tools in that it is not based on or reliant on voluntary submission from local governments; instead, the EGCI index is a result of independent research conducted by the EIU. EIU and external contributors collated data, mostly from publicly available sources, such as national statistical offices and local governments. Where gaps in data exist, the EIU produces estimates using national averages (EGCI, 2011). The EGCI was conducted in 2009 and was part of a wider global scheme; the same partners have conducted similar evaluations across the world, in Asia, Germany, Latin America, USA and Canada. There are also plans to conduct evaluations of African cities. The EGCI measures, assesses and compares the environmental performance of 30 leading European cities from 30 European countries. It uses 30 individual indicators per city on a range of environmental areas, covering aspects such as air quality, buildings, CO₂, energy, environmental governance, transport, waste, land use and water (EGCI, 2011). The index comprises 16 quantitative indicators measuring how a city is currently performing, e.g. energy consumption and recycling rate, and 14 qualitative indicators assessing cities' environmental aspirations, e.g. commitment to reduce CO₂ emissions or to increase share of renewable energy (EGCI, 2011). Because it is not based on voluntary application by local governments, or initiated as a response to policy frameworks, the tool is not available for local governments across Europe to apply; rather, cities are selected for inclusion by EIU.

Urban Ecosystem Europe

The Urban Ecosystem Europe (UEE) tool is the result of collaboration between DEXIA (a bank, which funded the initiative) and Ambiente Italia, a research consultancy and creator of the tool. The aim of UEE is to consolidate a periodical reporting system that offers local governments a voluntary assessment of their urban environment (Ambiente Italia, 2007). By analysing the prerequisites for a sustainable urban environmental development, UEE seeks to provide information about local response capacities to manage the urban environment (Ambiente Italia, 2007). UEE has been endorsed by several city networks, such as ICLEI (Local Governments for Sustainability), Climate Alliance and Union of the Baltic Cities, and is based upon the policy framework representing the Thematic Strategy of Urban Environment, the Leipzig Charter and the Aalborg Commitments (Ambiente Italia, 2007). The UEE assessment is based on a questionnaire that comprises 25 urban indicators. The indicators are derived from the Aalborg Commitments and are aggregated into six main themes (Ambiente Italia, 2007):

- Local action for health and natural common goods;
- Responsible consumption and lifestyle choices;
- Planning, design and better mobility, less traffic;
- Local to global: energy and climate changes;
- Vibrant sustainable local economy and social equity, justice and cohesion;
- Local management towards sustainability and governance.

UEE was conducted for the first time, in English and Italian, in 2006, analysing the urban environment in 26 large European cities representing 13 European countries. The exercise was repeated in 2007, involving 32 European cities representing 16 countries. The second application contained improvements around indicator feasibility and relevance (Ambiente Italia, 2007). In total, 32 local governments have applied the tool and of these over half (18) participated on both occasions. UEE was the second tool selected for the explorative application, and a more detailed description of the tool is available in Section 4.

Towards an Integrated Urban Monitoring in Europe

As outlined in this section, there exist an array of tools to monitor sustainable urban development in Europe, and although they differ in character and methodology, they all strive to provide and facilitate an evaluation of sustainable urban development. The various tools have different origins; some tools have been initiated in a Member State and then adopted to the whole EU, whereas others have been initiated at a European level. There is no systematic co-ordination between the tools, although several respond to the same policy framework, for example the Thematic Strategy on Urban Development, the Leipzig Charter or the Aalborg Commitments. While these policy frameworks emphasise an integrated approach to urban development, none of the tools offer the fully integrated approach that is sought, although many offer some elements of it.

Towards an Integrated Urban Monitoring in Europe (IUME) was an informal initiative launched by the European Environment Agency to tackle these issues. IUME is based on a voluntary collaboration between Directorate-Generals, including Environment, Regional Policy, Mobility and Transport, Employment, Social Affairs and Equal Opportunities. It also involves a number of research institutes, agencies, programmes, and associations representing the European local or regional governments, such as¹⁵ the European Joint Research Centre, Eurostat, the Dutch Environment Assessment Agency and the Council of

¹⁵ The complete list of IUME partners: GMES (Global Monitoring for Environment and Security); ESPON (European Observation Network for Territorial Development and Cohesion); Ambiente Italia (research institute); ICLEI (Local Governments for Sustainability); EUROCITIES (network of major European cities); METREX (Network of European Metropolitan Regions and Areas); IUCN (International Union for Conservation of Nature).

European Municipalities and Regions. The rationale of IUME is to function as a platform for various affiliated stakeholders and policy makers across Europe, and to develop a more coherent framework and reference for the existing monitoring approaches (IUME, 2011). The long-term vision of IUME is to enable more integrated urban assessment by identifying available data, data gaps, linkages between data sets, and appropriate tools (IUME, 2011).

Categorisation of sustainable urban development monitoring tools

Categorising sustainable urban development European monitoring tools which are inherently different – which have a different evaluation focus, form, and target population, and which vary in how difficult they are for local governments to apply - is challenging and difficult. Therefore, this categorisation attempt should not be viewed as comprehensive or exhaustive, but as a mere attempt to identify the strengths and limitations of the most common European monitoring tools. The categorisation does not consider the measurability of indicators or the suitability of methodologies applied by the various tools.

The categorisation is based on a set of criteria. The first three criteria – *‘type of evaluation’*, *‘evaluation area’* and *‘target population’* – aim to compare the general characteristics of the tools. Distinctions are made between tools that rely on indicators or targets, e.g. to reduce CO2 emissions, and those that are process-based, focusing on the on-going local process for sustainable development and measuring the entire public administration organisation, identifying strengths and areas for improvement. *‘Evaluation area’* addresses which aspects of sustainable urban development are and are not being monitored, while *‘target population’* identified the types of cities tools are designed for. Another focus of interest is whether tools are continuously and regularly applied over a long period of time, or *‘one-offs’* reliant on project-based financing with a limited timeframe.

Table 2.5 Categorisation criteria

Type of evaluation	Evaluation area
Target population	Required efforts to apply
Number of local governments which have applied	Evaluation outcome

The fourth criterion, *‘required efforts to apply’*, assesses the level of the input or effort local governments are required to commit to apply the tools. This may depend on the number of indicators or the need for cross-departmental data collection. The challenge here relates to the effort required by different local governments to apply, which may depend on the size of the city, city context and local capacity. An attempt was made to determine this based on the

information available on the various tools. In addition, in some cases representatives of specific tools were consulted in order to get an insight into the amount of work that is usually required from local governments when they apply the tool.

The fifth criterion, '*number of cities which have applied*' refers to the level of use of each tool by local governments; this may give an indication of the legitimacy of tools, as it could be argued that cities are more likely to apply tools that are viewed as being reliable and trustworthy. This is complicated by the fact that some tools are not eligible for all sizes of local governments, as well as the fact that in certain cases cities are selected for participation. However, this criterion was included to offer a general overview of the level of utilisation of the tools amongst the thousands of cities across Europe.

The sixth and final criterion, '*evaluation outcome*', compares the output of the evaluation, categorising local governments' tangible results from their participation in a certain tool, such as policy reviews, the identification of actions needed, or benchmarking opportunities.

Table 2.6 Categorisation of tools to monitor sustainable urban development

	Type of evaluation	Evaluation area	Target population	Required efforts to apply	No of cities which have applied	Evaluation outcome
European Green Capital Award	Indicator based	Urban environment	Large cities	Rather extensive	71	Measures to improve the urban environment
Covenant of Mayors	Target setting	Energy efficiency	All cities eligible	Rather extensive	> 3000	Identifies actions to reduce CO2
Reference Framework for Sustainable Cities	Indicator based	Holistic approach	All cities eligible	Testing phase	66 test cities	Various, e.g. reviews and develops the integrated approach of a strategy

European Capital of Biodiversity	Indicator based	Urban biodiversity	All cities eligible	Moderate	335	Assesses the status and actions for urban biodiversity
Local Evaluation 21	Process based	Urban governance	All cities eligible	Rather minimal	93*	Review of progress and challenges of the local process for sustainable development
European Green City Index	Indicator based	Environmental performance	Selected cities	Not reliant on voluntary submission from cities	30**	Measures and rates the environmental performance
Urban Ecosystem Europe	Indicator based	Urban environment	Medium and large cities	Rather extensive	32	Review of the local response capacity for urban environmental sustainability

* This number does not include the nearly 150 cities which applied the LASALA tool.

** The 30 cities were chosen by EIU and Siemens AG

Strengths and limitations of the monitoring tools

Most of the seven monitoring tools are based on a set of indicators, with the intention to assess the performance of local governments, identify actions for sustainable urban development, or review the challenges facing sustainable urban development (or a combination of the three). The set of indicators which the tools base their evaluation on usually encompass between 10 and 30 indicators, which can be either qualitative or quantitative, and are inspired or derived from a number of sources, for example the European Common Indicators and the Aalborg Indicators. The European Green Capital Award, the European Green City Index and the Urban Ecosystem Europe utilise to some extent the same indicators, although with different ambitions, which can create overlaps between the tools.

Most of the tools rely mainly on environmental indicators to the exclusion of vital socio-economic aspects, resulting in a rather one-dimensional evaluation of sustainable urban development which fails to deliver a holistic evaluation. Social, economic and institutional indicators are available; the EU's Sustainable Development Indicators set encompasses more than 130, and Urban Audit contains almost 300 statistical indicators. Reference Framework for Sustainable Cities, which is not yet fully operational and is scheduled to be launched in 2012, does aim to apply a holistic and integrated evaluation approach, utilising environmental, economic, social and governance indicators. Local Evaluation 21 incorporates a multidimensional approach, which is not based on indicators, but which assesses aspects of the local process for sustainable development, such as governance, stakeholder participation, and levels of implementation and progress in relation to the local process.

Most commonly, monitoring tools are designed for use by various different types of local governments. This is true for the Covenant of Mayors, Reference Framework for Sustainable Cities, European Capital of Biodiversity and Local Evaluation 21 tools. Exceptions are the European Green Capital Award and the Urban Ecosystem Europe, which are only applicable to larger cities, while cities were selected to the European Green City Index.

Most tools are not open for continuous use (a problem for many cities see Section 3 for further discussion). Only the Covenant of Mayors and Local Evaluation 21 are available to regularly be applied by local governments. The European Green Capital Award can be applied during a certain period of the year. Urban Ecosystem Europe cannot be applied on a regular basis, whereas European Capital of Biodiversity has so far been reliant on project financing, meaning that local governments have only been able to use it for the duration of the project.

Almost all monitoring tools rely on a voluntary submission by local governments. The only exception is the European Green City Index, which relies on independent research. To successfully encourage local governments to voluntarily apply a tool depends on important factors, including the relevance of the evaluation outcome, the effort required to apply it, and its usability. Most voluntary tools are available online in various forms, and are available in different languages to facilitate ease of use.

What sets the voluntary tools apart when it comes to the level of effort required is the type and number of indicators each tool utilises. European Green Capital Award, Covenant of Mayors and Urban Ecosystem Europe use indicators that require cross-departmental data,

which requires various sectors within the local governments to co-operate, and sometimes even to produce the data, as data is not always available at a local level. Lack of data is generally a barrier for monitoring tools, as not only does it require more effort from cities to apply the tools, but it also affects the reliability of the evaluation.

Tool methodology and design is also of relevance with regard to effort and usability. For example, Local Evaluation 21 is a fully automated online tool: the Local Agenda 21 co-ordinators complete a questionnaire and subsequently receive a report within three weeks, generated from a database, identifying areas of progress and challenges in the local process for sustainable development. The Reference Framework for Sustainable Cities also aims to be a fully automatic online tool that is easy to apply, versatile and adaptable to the local context.

Most voluntary tools remain largely unused by most of the almost 7000 local governments in Europe. Although Europe-wide use is not to be expected of every tool – and indeed some tools deliberately target only a specific group of local governments - the lack of utilisation of monitoring tools is a concern, and may eventually undermine their legitimacy and credibility. The exception is the Covenant of Mayors, which has been applied on a broad scale in Europe. Over 3000 local governments representing 140 million inhabitants (over a quarter of the EU population) have committed to reduce CO₂ emissions on their territories by at least 20% by 2020. This success may be due to several reasons. Climate change is at the forefront of the political agenda and combating climate change by setting tangible targets to reducing CO₂ emissions appears to foster competition among the signatories. Reducing CO₂ emissions creates a cleaner and more attractive urban environment and implementing the necessary energy efficiency actions saves local governments money. EU funds are available to implement these actions, for instance via the Structural and Cohesion Funds, which support local governments' commitment to EU energy and climate policy (COM, 2011). Success can also be attributed to fact that the tool receives institutional support from important 'actors', such as the European Commission, the European Parliament, the European Investment Bank and the Committee of the Regions, and is promoted by a large number of international and national associates. The COM tool is available to apply continuously, and emphasises the monitoring aspect, whereby a formal political commitment must be followed by concrete measures. Signatories accept that they will be required to report and be monitored on a regular basis, and understand that non-compliance means their involvement in COM will be terminated. In November 2011, 33 local governments were excluded because they failed to submit their Sustainable Energy Action Plan (SEAP) on time (COM, 2011).

Most tools offer various evaluation outcomes, including identifying and assessing actions, reviewing challenges, and developing strategies or policies for sustainable urban development. Offering local governments the chance to compare and benchmark their 'result' against similar-sized cities across Europe is considered successful by the Commission because it can foster competition and promote the exchange and implementation of good practice. The success of Covenant of Mayors may be partly due to this. The Covenant of Mayors also offers tangible targets, which are easy for cities to grasp, and measuring progress is facilitated by COM tools. However, benchmarking does have challenges and limitations: it may not be reliable and can be even misleading, especially when there is a lack of robust local data.

Conclusion

It must be acknowledged that the EU policy framework on urban development has evolved, and a common European framework for sustainable urban development has begun to form, with the initiation of a number of urban monitoring tools as a response to EU urban policy. However, urban monitoring is impeded by several challenges. Currently, monitoring relies on the voluntary application of tools by local governments, because the relevant EU policy framework has no EU Treaty basis. Accordingly, the use of monitoring tools is largely limited to the few local governments that are active in the field of sustainable urban development, with tools remaining unused by the majority of local governments across Europe. There is also a lack of systematic co-ordination between the monitoring tools, and few are available for continuous use. Moreover, none of the tools currently offers an integrated evaluation that encompasses all of the various aspects of sustainable urban development. This may be partly linked to data availability issues, and may also be a reflection of the sector-driven context where, for instance, most activities intended for local governments under the Cohesion Policy have been implemented in a sectoral manner.

Although the available monitoring tools have limitations and there are challenges facing their use, nonetheless they are good quality tools which provide evaluations of many vital aspects of sustainable urban development. A Europe-wide mass application of these tools is not expected, given the extreme diversity of the European urban realm. However, the limited use of monitoring tools among European local governments undermines not only the legitimacy and creditability of these tools, but also that of European sustainable urban development. The next section will elaborate on these issues, discussing local governments' knowledge and experience of European monitoring tools, and key issues emerging from local governments' use of the tools, including the match between the tools and local circumstances and needs.

Section 3: Local Governments for Sustainability and the Use of Tools

Introduction

This section explores European local governments' knowledge of and usage of existing urban sustainability tools. The primary data referenced in this section was gathered during the Connection, Linkage and Implementation Fora as part of the Informed Cities Initiative between 2010 and 2012.¹⁶

This section is divided into four parts. The first presents an overview of what we mean by the term 'tools' for governing urban sustainability. The second part outlines a typology to categorise leading European tools (and explains that for the purposes of this research project we focus specifically on monitoring tools). The third part discusses the extent to which existing tools developed in the past 10 years are utilised by European local governments and analyses why tools are often ultimately not used. The concluding part draws out key themes about the usage of urban sustainability tools and the brokerage process, from knowledge gained during the Informed Cities initiative.

Usage of existing urban sustainability tools

Urban sustainability tools are designed to inform local governments' decision-making processes and to allow cities to monitor their progress in moving towards sustainability. As highlighted in Section 2 there are many tools that have been developed in Europe that have been funded by the European Commission and other funders over the last two decades. Local governments in Europe have a wide range of options in terms of available tools from which to choose; however, this section will question how well existing tools fit the requirements of local governments in their attempts to respond to national and supra-national sustainability initiatives as well as to meet their own local political priorities. It is assumed that existing urban sustainability tools are being used regularly but from a research perspective evidence must be provided to substantiate this assertion. An alternative scenario could be that existing tools are not being fully utilised and some tools may not be used at all. As noted in Section 2, the importance of developing effective indicators and tools for urban sustainability has been identified as a strategic policy aim in a range of key European policy documents:

- European Governance White Paper (European Commission, 2001)
- Thematic Strategy on the Urban Environment (European Commission, 2006)

¹⁶ See Section 1 for a full explanation of the Informed Cities Initiative and the various phases of the research process.

- European Union, Sustainable Development Strategy (European Council, 2006)
- Declarations from Informal EU Ministerial Meetings (e.g. Leipzig Charter, 2007 and Toledo Declaration, 2010)

The same is true of the following 'grass roots' policy initiatives led by European local governments:

- Aalborg Charter (European Sustainable Cities & Towns Campaign, 1994)
- Aalborg Commitments (European Sustainable Cities & Towns Campaign, 2004)

The political momentum behind the policy discourse of urban sustainability over the past 20-30 years has led to a plethora of policy initiatives at the international level (see Table 2.1 in Section 2, which maps the key developments in urban sustainability policy over the past three decades). It is clear that as sustainable development has burgeoned in scale as a policy discourse, there has been a commensurate rise in the number of urban sustainability policy instruments (e.g. tools, accords, awards and agreements) created at supra-national level. For local governments this has meant an almost constant stream of initiatives that they have had to digest and respond to. In terms of urban sustainability policy there appears to be a significant amount of duplication, and a lack of co-ordination and joined-up thinking, between institutions operating at the supra-national level. A number of institutions - the United Nations, European Environment Agency, various Directorates of European Commission and national governments - are seeking to influence and shape this policy discourse. As highlighted in Section 2, the array of urban programmes under different EU Directorates has been criticised for lacking co-ordination and seldom building on one another (European Environment Agency, 2010).

Mapping existing 'urban sustainability' tools

In order to enhance understanding about how European local governments engage with the plethora of existing urban sustainability tools and initiatives, the ICI developed a comprehensive methodology to explore the nature of the relationship between local governments and tools for urban sustainability. The first step involved a desk-based review to identify and classify all existing European-funded (completed FP5 and FP6) projects which had developed tools for urban sustainability. The review identified 151 relevant European projects in which tools had been developed. The research team decided that 34 of the projects should be subjected to more detailed analysis. Co-ordinators and other key stakeholders from the 34 projects were invited to the first Informed Cities Forum in Newcastle (in April 2010) to share their knowledge about European local governments' engagement with and knowledge of urban sustainability tools.

Definitions of urban sustainability tools

The term 'sustainability tool' is an elastic and imprecise term which lacks clear definition (Hopwood *et al*, 2005 and Hull, 2007). Policy makers at the European level may believe that urban sustainability tools can help to make the ambiguous, ill-defined and sometimes intangible concepts of sustainability and sustainable development more understandable at the local level. However, it may be that a single definition of what we mean by 'tools' for governing urban sustainability is a long way from being realised. Employing a broad definition, 'tools' can encompass: sets of Indicators (e.g. European Commission, Sustainable Development Indicators [SDIs]), case studies (e.g. European Sustainable Development Network Case Studies)¹⁷, online assessment systems (e.g. Reference Framework for Sustainable Cities [RFSC]) and self-assessment approaches (e.g. Local Evaluation 21 [LE21]). These various tools can enable local governments to benchmark and monitor their progress against regional, national or European standards.

In 2004 the European Commission Directorate General Research stated that much had been achieved in the previous decade in terms of developing a range of robust and appropriate sustainability tools:

...many of the key concepts, tools, methods and technologies needed to bring about sustainable development in Europe's cities and regions have been built and tested, are in everyday use, and are available for policy-makers to apply in their own settings.

European Commission Directorate General Research (DG Research), 2004, p.7

This suggests that from the Commission's perspective, much of the developmental work in terms of creating effective tools and methodologies to monitor progress towards urban sustainability had already been completed. The need for effective tools for urban sustainability is not in dispute; the case for robust tools and indicators is made by the European Environment Agency:

Fragmented data on urban issues have hindered the development of coherent policies at all levels and the evaluation of their success by integrated urban assessments. There is a lot of local data, but it is often not comparable with other local data. At the European level, information on urban issues is patchy, spread across different directorates and often not compatible'.

¹⁷ European Sustainable Development Network Case Studies are available at: <http://www.sd-network.eu/?k=case studies>.

The European Commission (DG Research) and the EEA appear to hold conflicting views about the effectiveness of existing indicators and tools for urban sustainability. European policy documents and anecdotal evidence produced over the past decade suggests there is a multitude of effective urban sustainability tools available to European local governments.

The European Commission DG Research (2004, p.3) made it clear that, from its perspective, the necessary tools *were* readily available to European local governments as far back as 2004: *'EU research has created integrated tools to support the local decision-making process, putting sophisticated impact assessment, performance monitoring and external cost estimation within the grasp of every European city and region'*.

The EEA, by contrast, appears to disagree about the overall effectiveness of existing urban sustainability tools, stating that if the available quantitative and qualitative data is not of sufficient quality, by definition the existing tools will not be able to effectively evaluate and monitor progress on urban sustainability.

These divergent viewpoints suggest that at the very least the knowledge and usage of existing urban sustainability tools by European local governments and the quality of existing sustainability data are areas which are worthy of further academic research. The next part of this section considers whether existing academic research can provide more clarity to the debates about how widely and consistently existing urban sustainability tools are being used.

A thorough literature review conducted as part of the Informed Cities Initiative confirmed that there is currently limited published academic research about the usage of existing local sustainability tools by European local governments. The academic research which exists (Jensen and Elle, 2007; Jones and Patterson, 2007) is slightly dated but reports that in 2005 many of the existing tools for local sustainability were only being used by a *limited* number of European local governments and some tools were not being used at all. The overall conclusion from research by Jensen and Elle (2007) on the findings of the European Commission Framework Programme 5 (FP5) funded PETUS project (Practical Evaluation Tools for Urban Sustainability, 2002-2005) is that the voluntary use of tools to monitor urban sustainability was very limited amongst European local governments. The PETUS project looked at 60 different case study local governments on sustainable urban development in

eight European countries¹⁸. It found that because usage of tools is voluntary, usage levels fluctuate over time and few (if any) tools are used on a consistent basis by significant numbers of European local governments. Jones and Patterson (2007, p.264), reflecting on the PETUS project, state: *'Tools are often rejected for fear that they will take too long to complete or might not be the 'right tool for the use'*. Jensen and Elle (2007) went on to develop a framework to analyse why cities do not utilise tools, and later in this section a comparison of their findings is undertaken with the contemporary findings from the Informed Cities Initiatives to compare the findings of the two projects. The following sub-section first introduces and then analyses the typology of tools developed by Jensen and Elle.

Typology of tools

Over the last two decades, numerous 'tools' have been developed within Europe to measure progress towards better urban management and local sustainability. Jensen and Elle (2007) move the debate on from the complex academic task of attempting to define the term 'tool', to categorising existing urban sustainability tools into four types: process guides, calculation tools, assessment methods and monitoring tools (see table 3.1).

Table 3.1: Jensen and Elle's Typology of tools (2007)

Type of tool	Nature of tool
Process guides	Tools about how to manage a project or policy on sustainability: <ul style="list-style-type: none"> • Which phases to go through • How to involve stakeholders • Types of tools to use • How to analyse the situation etc Examples include: frameworks, environmental assessments, policies, strategies, programs and checklists
Calculation tools	Tools for calculating the environmental outcome from different types of solutions, products or procedures, in different sectors. Examples include: Life Cycle Analysis, economic and social evaluation tools, system simulation tools and other environmental calculation methods
Assessment methods	Tools to weight different aspects of sustainability (environmental, economic and social), in order to illustrate differences of priorities between different solutions Examples include multi-criteria assessment tools, evaluation procedures, surveys and public discussions
Monitoring tools	Tools for the selection of indicators and benchmarks for monitoring and policy formulation on sustainability. Also includes green accounts

Source: Adapted from Jensen and Elle (2007)

¹⁸ The PETUS (FP5) project contains case studies from eight countries - Austria, Belgium, Bulgaria, Denmark, Finland, France, the Netherlands and the United Kingdom.

The use of national tools by European local governments

At the ten national implementation workshops conducted as part of the ICI, participants from European local governments were asked to discuss their experiences of using national and local urban sustainability management tools. It became clear that there were a small number of national and local monitoring tools that were used regularly by the participating European local governments, usually because they felt the tools had a better 'fit' with their local circumstances. Some examples of the national and local tools that were identified in the workshops are outlined in table 3.2.

Table 3.2: Tools used at national and local level by European local governments

Name of Tool(s)	Country	Description
National Indicators for Local Authorities	England	Single set of 198 national indicators for English local governments ¹⁹ . The local authority agrees with central governments which targets it will be monitored against; only a minority of indicator have a direct sustainability focus (e.g. NI185, NI186 and NI188).
Territorial Indicator System (ISTAT)	Italy	A national statistical dataset collecting indicators disaggregated at local level for each of the Italian municipalities which are provincial seats. The indicators cover a wide range of themes - demographic, economic, social, environmental.
System Analiz Samorządowych (SAS) – (Local Government Analysis System)	Poland	No national tools/standards exist for monitoring sustainable development at the local level. Since 1996 the Polish Association of Cities has been developing the Local Government Analysis System . This is a database of indicators concerning local governments (cities, communes and poviats) and their services, drawn from public statistics and voluntarily disclosed by the cities. On average, 100 cities submit their data annually.
Observatorio de la Sostenibilidad de Espana	Spain	Annual report which monitors the environmental quality of all Spanish provinces analysing a range of sustainability indicators.
No specific tool a variety of local indicators utilised	Germany	National tools are not widely used but a variety of local tools are used by German cities and some Federal States provide their local governments with a common indicator set (Baden-Württemberg, Hessen, Thüringen and Bayern).

¹⁹ With the election of the Coalition government in the UK in 2010, the National Indicators for Local Authorities were axed. At the time of writing (April 2012) no alternative system has been put in place in England to replace the national targets and the Coalition government intimated that local governments would no longer have their performance assessed by national indicators.

Why do European cities use tools?

A number of reasons for using tools emerged from the Informed Cities Workshops and Fora. These included:

- To support decision-making and strategy development at local level
- To assist with benchmarking, monitoring and evaluation of progress
- As part of a longitudinal monitoring process (e.g. annual review of progress)
- To secure a 'green' badge or other form of sustainability accreditation
- Due to requirements under national or international guidelines/initiatives

Each of these reasons will now be considered in turn.

To support decision-making and strategy development at local level

Tools are essential monitoring aids to benchmark and assess progress and can add momentum to the end policy goal of a more sustainable future for European cities. However, reaching agreement on what is to be monitored and measured is often not straightforward. The 2011 United Nations Climate Change Conference in Durban and the ongoing controversy which surrounds the Kyoto Protocol highlight the difficulty of reaching binding international agreements about targets within the field of sustainable development. As the EU has no direct jurisdiction over nation states' urban policies, its approach has been to encourage and 'nudge' nation states, regions and cities towards more sustainable pathways. However, Jensen and Elle (2007, p.234) state that it is possible *'to see the emergence of tools as the establishment of a number of voluntary rules and standards since there is an absence of public regulation in the field'*.

To assist with benchmarking, monitoring and evaluation of progress

The majority of participating cities²⁰ in the ICI explorative application of tools were interested in benchmarking their performance against other European cities, particularly against cities that they perceived as comparator cities or members of their peer group, (e.g. cities in the Baltic Sea region).

As part of a longitudinal monitoring process

Representatives from Serbian local governments who attended the Belgrade workshop were keen to use tools as a central component of a longitudinal monitoring process and were

²⁰ Here, 'participating cities' are defined as cities that used either LE21 or UEE (or both) during the explorative application phase of the project.

anxious that tools would be maintained and could be used over successive years. Scandinavian cities concurred, with one participant stating: 'there is a need for a standardised tool that enables comparison with previous data'. However, the experiences of some cities (feedback from the Turku and Belgrade workshops) suggests that tools are often only maintained whilst core European or national funding is available; once core funding ceases, the maintenance of the tool ceases.

Serbian, Hungarian, Spanish, Dutch, Belgian and Scandinavian cities stated that they would prefer a single tool that was constantly maintained and used widely by cities across Europe, which would enable benchmarking and learning from good practice.

To secure a 'green' badge or other form of sustainability accreditation

Jensen and Elle (2007) suggest that there can be a political dimension to the usage of tools, since positive feedback from tools can provide external 'political' legitimacy for a project or initiative. Similarly, evidence from the national workshops conducted as part of the ICI suggests that although not the main consideration for using tools, it can be important for municipalities to secure a 'green' badge or label as a form of sustainability accreditation. German local governments at the Dessau workshop suggested more tangible benefits such as certification may offset some of the concerns from local governments about the time and effort required to collect and compile data for existing tools.

Due to requirements under national or international guidelines/initiatives

Finally, there can also be a degree of coercion applied with local governments being required by national governments or supra-national organisations to use tools. In the case of English local governments, for example, prior to 2010 they were obliged by national government to use certain tools. Serbian local governments at the Belgrade workshop stated that they now felt '*more implied pressure*' as an Accession State from the existing European Community Member States and the institutions of the European Union to use available urban sustainability tools and to make tangible progress on sustainability issues.

Why do local governments choose NOT to use tools?

When considering why existing tools are *not* used by European local governments, one factor is lack of knowledge about existing tools for urban sustainability among local governments. The findings from the ICI suggest that there are varying degrees of knowledge about existing urban sustainability tools across Europe (for a more in depth analysis of local governments' knowledge of tools see Section 7).

As discussed in Section 2, the European Commission is now attempting to synthesise existing knowledge about urban sustainability to support the development of some emerging generic tools (e.g. Reference Framework for Sustainable Cities [RFSC]; European Green Capital Award [EGCA] and Covenant of Mayors [COM]).

Another potentially significant reason for the limited uptake of existing tools is a lack of personal contact between researchers (academics and consultants) as developers of the tools, and practitioners (local, regional and central government officers) as 'end users' of the tools. Scandinavian cities highlighted this issue, reporting that the narrow local context is crucial for local policy-makers whereas academic researchers are often interested in the national or international scale or in the wider theoretical context. This asymmetry could stem from the way that academic research is assessed²¹.

Jensen and Elle (2007) identified broadly similar barriers to local governments utilising existing tools for urban sustainability:

- Lack of motivation and openness
- Little or no knowledge of the tool
- The tool is too complicated and/or requires too many resources
- Tools lack legitimacy, reliability and transparency
- The necessary data is not available or accessible

Each of these potential barriers is now considered in turn.

Lack of motivation and openness

Jensen and Elle (2007) state that motivation and openness depends on the openness of the political culture within the local government. During the explorative application phase of the ICI we found evidence of cities being very cautious about exposing themselves to external scrutiny from a Europe-wide research project. Some local governments appeared to be concerned about engaging with a tool that could potentially rank them in terms of performance and place them in (European) league tables. Ranking cities in league tables was not an objective of the ICI but some cities needed reassurance about the motives of the project, as they were worried that analysis of their data could generate a negative ranking which would be very difficult for local politicians to accept.

²¹ In the UK the forthcoming Research Excellence Framework (REF) ranks academic research in terms of its impact and significance, with 5 star research being deemed of outstanding quality and international significance.

In the ICI recruitment phase²², we found that some authorities questioned why they needed to alter what they were already doing, if there was no obligation or obvious tangible benefit (financial or accreditation) from using a particular tool. This concern appeared to be increasingly prevalent in the current economic climate where many authorities across Europe are being expected to provide services with diminishing budgets²³. For example, Flint and Raco (2012, p.6) state that local governments across England will see their overall budgets for 2011-14 cut by 28% and 'spending on the environment will fall by 29% from £2.9 billion in 2010 to £2.2 billion in 2014'. However, substantial budget cuts are not the case in all countries; for example, Norwegian respondents suggested that the Norwegian economy was very robust due to a budget surplus created by natural resources (oil and gas) and a much lower degree of exposure to the global banking crisis.

Little or no knowledge of the tool

Knowledge of existing tools amongst European local governments appears to vary depending on the national context. Among the cities that participated in the ICI, perhaps unsurprisingly Northern and Western and to a lesser extent Southern European cities appeared to have a greater knowledge of tools than cities in Eastern Europe. However, some Northern and Western cities showed a jaundiced and sceptical view of existing tools, whereas a growing number of Eastern European cities appeared enthusiastic about tools. These comments reflect general trends found during the ICI; however, there was still significant variability within the four European regions (Northern, Western, Eastern and Southern) and within individual nation states.

Capacity issues seem to be becoming more prevalent for many local governments due to finite time availability and to an increasing stream of new policy initiatives which require input from (sustainability) policy officers. A lack of resources within local governments to respond to lengthy self-evaluation tools was mentioned as a key barrier at the London, Belgrade and Dessau workshops.

²² During the recruitment phase, several hundred European local governments were initially sent a letter inviting them to a national workshop to discuss urban sustainability tools and offering them the opportunity to take part in the Informed Cities explorative application of tools. Subsequently, cities were contacted by telephone and e-mail to gather additional information and to resolve any queries about the research.

²³ The point about severe economic difficulties facing local governments was expressed strongly by participants in the London, Belgrade, Dessau and Madrid workshops.

The tool is too complicated and/or requires too many resources

Complexity is often a key barrier to local governments not using a tool. Often a generic European tool does not fit with the unique local and/or regional/national context. This can be due to the way that a city, region or national government collects quantitative data which may be incompatible with the data collection requirements of the European level tool(s). Currently many local governments across Europe are being forced to downsize as a result of the global financial crisis (and in some cases political reform) (Bulkeley and Kern, 2006). *The Guardian* (2011) reported that in 2010-11 the 353 councils²⁴ in England employed 1.6 million people and by the end of 2011, 145,000 of those council staff had been made redundant, a reduction of nearly 10% of the total local government workforce in England.

Feedback from the workshops (in Rome, Turku, Madrid and Belgrade) also highlighted issues around collaboration between local government officers within different local government departments and the need to move beyond a narrow 'silo' mentality. Strong collaboration between local government officers can be essential in order to draw together the necessary data to populate existing tools. This can prove a new and challenging task for some local governments. Serbian workshop participants reported that co-operation at the local level can be problematic 'when different interests collide' and for a growing number of local governments there was also the need to co-operate with outside agencies (e.g. private utility companies) to gather the necessary data and indicators. Private sector market forces have been introduced in place of traditional public utility provision and we have seen a trend of privatisation and '*municipalities withdraw[ing] from the provision of public utilities, particularly in relation to energy and transport*' (Bulkeley and Kern, 2006, p.2242).

Practically, at a European level it has proved very difficult to create a tool which 'works' for all the diverse countries in Europe. Even the language and terminology employed by tools can be problematic. A prime example came from the workshop in Katowice where the research team found that the concept of '*sustainable development*' is not widely used in Poland, where terms such as '*environmental protection*' and '*Local Agenda 21*' (LA 21) are more commonly used. Conversely, respondents at the London workshop stated that LA21 had almost disappeared from policy discourse in England, and that most LA21 initiatives had been subsumed under the theme of Sustainable Communities (via Sustainable Communities Strategies which all English local governments were expected to develop). Likewise, Finnish cities stated that LA 21 was a somewhat '*dated*' agenda and that issues relating to Climate

²⁴ In England there is currently a two-tier local government system which includes both local authorities and County Councils in some areas. The term 'councils' refers to both unitary and two-tier authorities. All the authorities would come under the category of 'local governments'.

Change adaptation and mitigation were now the primary focus of local governments' attention in Finland. The lack of consistency about the usage of terms such as LA21 can be explained by the fact that LA21 evolved as a policy tool in individual countries at different points in time over the last decade. Baker and Eckerberg (2008, p.4) state that in nation states which were 'early starters' for LA21, such as Sweden and the Netherlands, the policy had reached its peak by 2008, but that in other nation states such as Spain and many of the Eastern European countries, LA21 was in its infancy in 2008.

Tools lack legitimacy, reliability and transparency

The wide range of tools available to policymakers can make it difficult for local governments to select the most appropriate tool(s) for their individual requirements. Often policy makers are looking for a badge or label which will legitimise their work on urban sustainability, and are keen to find out which tool is supported by their national government or other validating bodies (e.g. Covenant of Mayors or European Green Capital Award). There can also be great variability in the relevance and quality of tools. Participants at the German workshop in Dessau questioned whether German local governments needed European indicators or, conversely, whether what was actually needed in Germany was a set of tailored national indicators to assess the performance of German municipalities. Respondents at the Dessau workshop stated that some of the air quality indicators which are currently used by existing tools (for example Urban Ecosystems Europe [UEE]) are no longer monitored by German local governments.

The necessary data is not available or accessible

The problem of gathering reliable quantitative data can be compounded by the fact that individual European countries can have significantly different sub-national governance structures. The following specific examples were highlighted during the Informed Cities research:

- Published data can be aggregated at the wrong spatial level. For example, in Romania data concerning air quality and noise pollution is monitored by central government and this data can be very difficult for local governments to access.
- There is a serious problem with regard to pan-European data comparison due to different means of measurement in individual European countries (London workshop).
- Serbian and Hungarian local governments do not have access to reliable data about energy resources and the consumption of energy (Belgrade workshop).
- Portuguese cities would have access to a high proportion of the quantitative data that would be needed to complete a comprehensive quantitative tool based on indicators such as UEE (Coimbra workshop).

- It is difficult for some cities to access private sector data to populate indicators. For example, participants at the workshop in Sibiu reported that Romanian transport companies may not be willing to reveal actual passenger numbers.

These findings support Jensen and Elle's (2007, p.246) finding that *'in general, too many tools require too much data, which can be a real obstacle to their use'*.

Use of urban sustainability tools by European local governments

In summary, this discussion has highlighted the following:

- The global financial crisis has had a substantial negative impact on the capacity of many European local governments to engage with urban sustainability tools. The focus in many European nations is on maintaining delivery of core service provision in very challenging circumstances.
- Some European local governments can have difficulty accessing the necessary data to populate urban sustainability tools, especially when it involves accessing data now controlled by private sector business.
- The knowledge of existing urban sustainability tools varies markedly amongst European local governments (between and within nation states).
- The political will of local government leaders and the personal dynamism of individual local government policy officers are key factors in the willingness of local government to gain knowledge about and to engage with tools.
- The terminology employed by specific tools can be a barrier to comprehensive usage across Europe, due to different national sustainability discourses.
- Some European local governments are very cautious about sustainability performance data being released into the public domain outside of their immediate control.

We now reflect on the findings from the Informed Cities Initiative to consider the current state of play in terms of the functions and capacity of local governments across Europe and their ability to respond to the rapidly evolving urban sustainability agenda.

Some tools can evolve and develop as they are adapted and tailored to fit the new challenges and requirements of the specific local context. Jensen and Elle (2007, p.245) state that 'tools are actually developed in use and through use, perhaps because official tools are too simplistic to use in a very local context'. This suggests that it is almost impossible to aim to develop a 'generic' tool that will fit the needs of all European cities: the vast majority of tools need to be fine-tuned to suit national, regional and local circumstances.

The Reference Framework for Sustainable Cities (RFSC, 2011) supports this standpoint and responds to it, stating:

*As an open and flexible instrument, the reference framework leaves it to the decision-makers to pick and choose what suits their political, geographic, economic, environmental and social situation. Some elements will be similar for many cities, others may be very different. Therefore, it is relevant to highlight that the reference framework is a toolkit to be **adapted** according to the particular situation of the city or municipality.*

In terms of key issues that need to be addressed by new and emerging tools, the EEA (2010) states harmonised approaches, tools and methodologies need to be developed to satisfy the following criteria for successful urban sustainability tools:

- To make data more comparable across Europe;
- To allow meaningful data integration despite different urban delineations in governance etc.;
- To facilitate comprehensive assessment of urbanisation and its impacts from a European or national perspective, taking account of the diversity of regions.

Moreover, Jensen and Elle (2007) argue that a number of relatively simple improvements could be made to increase awareness of tools and to increase usage:

- Information about available tools should be improved, including guidelines for users and information about the validity of the tool.
- National and local governments should provide better and more consistent data in terms of references, baselines and benchmarks.
- Tool developers should make simpler tools and involve the local end users more in the process.
- Tools have to offer tangible benefits to and impose pressure on decision-makers and end users if they are to be used.

These are all rational suggestions, but due to the events in the global economy over the past few years it may be that the majority of local governments in Europe are now facing a more challenging future than was envisaged when the Informed Cities Initiative was conceived in 2008. Some of the core foundations of urban sustainability and the wider sustainable development discourse are being openly deconstructed and challenged (Flint and Raco, 2012). These wider societal challenges are revisited in the concluding section of this report.

Section 4: Explorative application of two monitoring tools, Local Evaluation 21 (LE21) and Urban Ecosystem Europe (UEE)

Introduction

This section considers local governments' application of European monitoring tools. It aims to explore why monitoring tools are not applied by more local governments, and demonstrate the tools' potential and capacity. Two tools, Local Evaluation 21 (LE21) and Urban Ecosystem Europe (UEE), were selected for a Europe-wide explorative application by the Informed Cities Initiative (ICI). These tools were developed by ICI partners, ICLEI European Secretariat (LE21) and Ambiente Italia (UEE), in conjunction with local governments. Both tools are designed to be straightforward to apply, are available in various languages, and are applicable for most types of local government. The explorative application of LE21 and UEE aimed to involve 100 local governments representing at least 15 EU Member States. The process was supported by national workshops offering hands-on advice in applying the tools and enabling discussion of the contextual challenges of evaluating sustainable urban development. Data collection enabled the identification of areas of progress and challenges for local sustainable development.

The section begins by describing the development, character and methodologies of LE21 and UEE. It goes on to explore their reliability and usability, and concludes with a discussion of the specific challenges of applying these monitoring tools on a European scale.

Local Evaluation 21 (LE21)

LE21 is an automated self-evaluation tool to monitor local level governance towards sustainable development. It aims to help local governments monitor their progress and communicate this with different stakeholder groups. The tool is an adaptation and upgrade of an older self-evaluation tool, Local Authorities Self-Assessment of Local Agenda 21 (LASALA²⁵). The basis for the LASALA model can be found in the Public Administration Excellence Model (PAEM) and the Common Assessment Framework (CAF) (Joas *et al*, 2005). Both of these frameworks had an emphasis on the entire organisation, focusing on finding the strengths of an organisation and on enhancing long-term success across all policy sectors (Joas *et al*, 2005). Based on a process perspective, LASALA enabled evaluation of Local Agenda 21 (LA21) processes. Nine adapted criteria were developed, divided into 'enablers' (for a process) and 'results' (of a process):

- Identifying relevant topic-areas for the LA21 process (enabler)

²⁵ A summary of the LASALA and the LE21 tool is available in Section 2.

- Commitment to the process (enabler)
- Resources available (enabler)
- Existing sustainable development plans (result oriented)
- Level of integrated approach (result oriented)
- Level of participation (result oriented)
- Partnerships between the local council and the community (result oriented)
- Level of public awareness (result oriented)
- Level of continuity (result oriented)

The nine criteria – each weighted according to its importance or relevance - are considered necessary for a strong LA21 process (Joas *et al*, 2005). Each criterion comprises a set of sub-questions²⁶, and is scored on a scale from 0 to 100. LASALA and the revised LE21 are normative tools, meant to steer local governments' behaviour by enabling them to compare their development with the aims embedded in the Aalborg Charter principles. The intention is to provide local governments with an evaluation that identifies areas of progress and challenges in the process towards resilient sustainable urban development.

The development process for LE21 has taken place over several years, with steps being taken to refine it as a response to particular issues or funding opportunities. The limitations of LASALA have been an essential learning process in the development of LE21. The implementation process of LASALA revealed several shortcomings (Joas, 2007). Processing and benchmarking of responses from the nearly 150 participating local governments was conducted manually and was very time-consuming (Joas *et al*, 2005). Participating local governments had to complete a questionnaire in English; it was therefore necessary that the contact person, usually the co-ordinator of LA21, was fluent in English. Some users of the tool experienced language-related problems.

LASALA also required technical improvements to encourage its wider use across Europe, such as the translation of materials into other languages; it was translated into 20 languages of the European Union, including the new Member States joining the EU in 2004 (Joas, *et al*, 2005). It was also developed by linking the database to a self-assessment method, automatizing the benchmarking process, and by making both operational online (Joas *et al*, 2005). A tenth criterion was added to measure tangible progress: '*what kind of progress has been achieved?*' An additional interactive feature was added, so that stakeholder

²⁶ A full list of all the sub-questions and indexes is available in Section 6.

organizations could be involved in the self-assessment process by completing a shorter, adapted version of the questionnaire (Joas *et al*, 2005).

These updates of the LASALA tool created the basis of LE21. Before LE21 went online in May 2004, the tool was tested by local governments, local authority networks, the European Commission and a reference group made up by researchers (Joas *et al*, 2005). This led to further revisions: the questionnaire was simplified to enhance the usability of the tool and adapt it to an Internet context (Joas, 2007). The intention was that LE21 would be used regularly by hundreds of local governments across Europe, providing a wealth of automatically produced data for researchers.

LE21 is a fully automated Internet tool, needing only minimal database administration (Joas, 2007). The administrator of the tool is ICLEI, European Secretariat. Data inputted by local governments is automatically processed and analysed by the LE21 software. With each new 'input' the LE21 database is automatically updated. On completion of the exercise, the local government receives an evaluation report containing three elements. The first part evaluates the local government's response according to the ten criteria, and provides a normative evaluation of political and administrative processes for delivering sustainable development. The second part benchmarks the participant's result relative to comparable groups of respondents, for example other local governments within their own country or local governments of a similar size, as well as with all local governments that have undertaken the evaluation. The third part compares stakeholder organisations' input with the local government's responses in a few essential questions. If at least two stakeholder organisations complete the questionnaire, their 'comments' on the level of involvement is included in the evaluation report; however, their responses are not 'benchmarked' (Joas *et al*, 2005).

LE21 has not been adapted for the explorative application, and aspects of it may therefore be considered outdated. This reflects changes in context: the tool was developed at a point when there was a clearer European response to Local Agenda 21 framework policy and more support for local governments. Local Agenda 21 is now less of a priority for local governments, which are more focused on combating and adapting to climate change. LE21 still provides a mechanism for local governments to reflect upon their LA21 process or local sustainable development processes, and to benchmark their activities against those undertaken by other European local governments. LE21 may encourage and facilitate the transition of experiences of LA21 into policy processes and mechanisms to effectively deliver sustainable urban development.

Urban Ecosystem Europe (UEE)

UEE²⁷ seeks to provide an integrated evaluation of the urban environment in European local governments by focusing on their response capacity and needs (Ambiente Italia, 2007). UEE was created and developed by Ambiente Italia, a research consultancy, in conjunction with Legambiente, an Italian Non-Governmental Organisation. UEE has been developed and refined as a monitoring tool by applying reflective learning from local governments using the tool. It is available in Italian and English. UEE has been applied twice by local governments across Europe. In 2006, UEE was first used by 26 large European local governments, representing 13 European countries. In 2007, UEE was used a second time by 32 European local governments representing 16 nations. However, only 32 local governments have in total applied UEE, as 18 local governments have participated on both occasions.

In its first Europe-wide application, UEE used 25 urban indicators, selected for their relevance to the Thematic Strategy on Urban Environment and Aalborg Commitments (Ambiente Italia, 2007). They comprised environmental, economic and social indicators, grouped into six themes, and aimed to provide an integrated assessment of the urban environment.

Participation in UEE requires the completion of an Excel spreadsheet, usually by a key environmental contact person (within the local government) who acts as the local co-ordinator for UEE. It emerged during the first application that UEE placed an unacceptably high time burden on co-ordinators, who were obliged to interact with various local departments and agencies in order to provide the necessary data. The tool was refined before its second application in 2007: socio-economic indicators were limited and the primary focus was placed on urban environmental aspects; indicator feasibility and relevance was also enhanced (Ambiente Italia, 2007). Following the second application of UEE, the decision was made to exclude socio-economic indicators altogether, in order to reduce the burden on co-ordinators. This meant that UEE focused entirely on local governments' environmental response capacity.

²⁷ A summary of UEE is available in Section 2.

Table 4.1 UEE themes and indicators

Themes	Indicators				
Local actors for health and natural common goods	PM ₁₀ annual mean	NO ₂ annual mean	Noise map and noise reduction plan	Domestic water consumption	Inhabitants served by water treatments plants
Responsible consumption and lifestyle choices	Electric consumption variation	Amount of municipal waste produced	Municipal waste processed according to differentiated reuse collection schemes		Green public procurement procedures and purchasing
Planning, design and better mobility, less traffic	Passengers travelling on public transport within the urban area	Under-ground and tram lines in the urban area	Number of registered cars	Cycle paths and lanes availability	Public green areas availability
Local to global: energy and climate change	Setting of an energy balance and CO ₂ reduction target	Solar power generation in public buildings	Inhabitants connected to a district heating system		Climate and energy saving policies
Vibrant sustainable local economy and social equity, justice and cohesion	Demographic and old age dependency	Female employment		Population qualified at highest level of education	
Local management towards sustainable development and governance	EMAS and ISO 14001 certification for the local authority	Implementation of the Local Agenda 21 process	Electorate voting in city elections	City representatives who are women	

The two applications of UEE revealed that the tool was challenging for local governments to use. The decision to limit the focus of the tool in 2007 did not solve all of these problems. The need for cross-departmental co-operation within local governments in order to complete the spreadsheet led to a low response rate in some areas, such as private and public energy consumption, noise pollution and green purchasing. This may have been due to difficulties obtaining local data. The administrator chose to complement local governments' applications by utilising other data sources, including the European Topic Centre on Air and Climate Change, the European Environment Agency, the Urban Transport Benchmarking Initiative and the Association of Cities and Regions for Recycling and Sustainable Resource Management (Ambiente Italia, 2007). However, the new data had to be checked with governments, which prolonged the evaluation process as well as increasing time demands.

The administrator fed the data manually into a database, where it was ranked against European and international standards.

UEE offers an environmental profile of local governments in four parts, identifying their strengths and limitations concerning their urban environment. The first part presents the local government from a geographical and economical point of view, describing the local context in terms of inhabitants, size and density, as well as Gross Domestic Product (GDP). The second part is a ranking chart (radar graph) comparing local environmental performance of participating governments, in terms of nine key indicators:

Table 4.2 Environmental performance indicators

PM₁₀ annual levels	NO₂ annual levels	Solar power generation in public buildings
Water consumption	Public green areas availability	Availability of cycle paths and lanes
Passengers travelling on public transport within the urban area	Amount of municipal waste produced	Municipal waste processed according to differentiated reuse collection schemes

The third part is the indicator table, containing 14 key indicators measuring the local response capacity for environmental sustainable urban development, ranked according to the highest, the lowest and the mean value of participating governments.

Table 4.3 Local response capacity indicators

PM₁₀ annual levels (hot spots)	NO₂ annual levels (hot spots)	Inhabitants connected to a wastewater treatment plan (percentage)
Household water consumption (liter per inhabitant, per day)	Public parks and gardens (m ₂ per inhabitant)	Cycle paths and lanes (meters per 100 inhabitants)
Public transport passengers (passengers per inhabitants per year)	Lines of public transport by rail (meters per 100 inhabitants)	Electric consumption (2000 – 2005, percentage differences)
Solar plants in public buildings (kW)	Inhabitants connected to a district heating system (percentage)	Municipal waste production (kg per inhabitants per year)
Separated collection of municipal waste (percentage)		Use of recycled paper in offices (percentage)

The fourth part provides a general overview of the policies that have been implemented by the participating local governments with regard to climate change, noise pollution, governance and integrated management.

The UEE tool was adapted for the ICI explorative application. Its content was tested for reliability by three local governments (Bologna, Italy; Covasna, Romania; and Oslo, Norway).

To facilitate its wider use, the UEE spreadsheet was translated into French, German, Spanish, Portuguese, Polish and Romanian. The application also focused only on the core indicator set. The indicators were updated to enhance UEE's relevance, for example, responding to the European 2020 Growth Strategy²⁸ and being coherent with the indicators set used by the European Green Capital Award²⁹.

Suitability and usability of LE21 and UEE as monitoring tools

As evaluation tools LE21 and UEE differ in many respects. LE21 is a fully automatized self-evaluation tool designed for widespread use, offering a fast quantitative evaluation of local governments' engagement in local sustainable development processes, whereas UEE requires extensive manual input from the administrator as well as from local governments in order to provide an understanding of the local response capacity for sustainable development. Both tools were originally developed with specific target groups in mind: LE21 was developed as a response to LA21 processes, whereas medium and larger local governments comprised the population of interest for UEE.

Although the tools differ in character and in their objectives, both have been applied and tested by local governments, limiting random errors that may originate from the design of the tool, such as question order or word selection. Both tools have also in-built functions to minimise errors that may originate from misunderstandings. The LE21 web page has a section dedicated to frequently asked questions and a preview guide of the evaluation that offers local governments the chance to test the tool before using it. The UEE spreadsheet includes a glossary for every evaluation theme, to offer more detailed insight and understanding of the indicators used. The possibility for misunderstanding the terminology used is reduced by the fact that both tools are available in a number of European languages.

Using the tools

LE21 usually takes less than one hour to complete, although it requires considerable knowledge of the local process for sustainable development. The most likely respondent within a local government is a LA21 co-ordinator, although additional respondents may be involved. The LE21 software allows users to 'log in' on several different occasions, although the overall response should be completed within three weeks of the initial registration. There are several built-in mechanisms to ensure data quality: all users of the system are validated to minimise the possibility of 'fake' participants; and the LE21 software ensures that all questions are answered in a certain way by offering options for response and refusing to

²⁸ http://ec.europa.eu/europe2020/index_en.htm.

²⁹ www.europeangreencapital.eu A summary of the European Green Capital Award is available in Section 2.

accept partially completed answers. However, this has meant that many local governments that have started to apply the tool have not completed their applications, because they have not responded to all of the sub-questions. While this function was designed to ensure data quality, it has therefore resulted in lower usage of the tool. A third built-in control system is through enabling stakeholder input, which means local governments' responses, can be compared with the opinions of others. However, few local governments have invited stakeholders to apply the tool.

The UEE tool is less straightforward to apply. This is mainly because of the type of data required for completing the tool, which usually has to be collected by different local government departments, potentially involving numerous respondents and departments. The successful use of UEE depends on local governments' ability for cross-sector co-operation, which is determined by their capacity and ability to communicate across organisations.

There are also definitional problems within UEE. There is a lack of standardised definitions at a European level, for example in dealing with green areas or waste processing, which may result in misunderstanding among local governments. Earlier applications of UEE have demonstrated that questions regarding green areas or green spaces had been misunderstood because of differences in defining what constitutes a green area. These aspects may jeopardise the reliability of both the data and the tool.

Benchmarking opportunities

Both LE21 and UEE offer benchmarking opportunities; these are largely limited by the data they rely on rather than by the tools themselves. LE21 focuses on normative aspects, measuring and evaluating what is required for a successful and resilient local process for sustainable development. UEE, meanwhile, evaluates the capacity for sustainable development according to the standards set by International or European authorities. In benchmarking LE21 and UEE evaluations, relevant national differences should be considered, such as political and socio-economic differences, cultural contexts and norms and local government autonomy and capacity. It is important to recognise that progress towards sustainable urban development is not only a result of the actions taken by local governments.

Both LE21 and UEE have the potential to enhance our understanding of key themes for sustainable urban development. Both focus primarily on the environmental aspects of sustainable development; this is often the starting point for local governments in their quest for sustainable development, because this is the area where they have the power,

knowledge and experience to most readily secure change (Evans *et al*, 2005). LE21 and UEE can support local governments in their delivery and monitoring of sustainable development, offering decision-making support by identifying areas of progress and challenges, and facilitating their future work on sustainable urban development.

Applying LE21 and UEE in a European context

The Informed Cities Initiative aimed to involve a minimum of 100 local governments - representing at least 15 EU Member States - applying both LE21 and UEE. However, this target proved challenging, despite ICI members petitioning local governments through a number of channels. Ultimately, 57 local governments representing 18 European countries applied LE21, and 53 local governments representing 16 European countries applied UEE. 32 local governments applied both tools. The majority of local governments using UEE had more than 250,000 inhabitants, whilst the LE21 tool was mainly applied by smaller local governments with less than 250,000 inhabitants. In total, the explorative application involved 18 different European countries, with each country typically being represented by two to four local governments.

The explorative application was supported by national workshops, which offered a small group of local governments hands-on advice in the application of LE21 and UEE, as well as the opportunity to discuss the contextual challenges of evaluating sustainable urban development together with invited researchers and national representatives. The aim was to arrange 12 workshops in 12 different EU Member States. Ten workshops were ultimately arranged (one of which was outside the EU), the workshops were in: London, UK; Katowice, Poland; Sibiu, Romania; Brussels, Belgium; Rome, Italy; Turku, Finland; Madrid, Spain; Dessau, Germany; Coimbra, Portugal and Belgrade, Serbia. The Turku workshop was a combined event for the Baltic and Nordic countries, and took place in conjunction with a sustainable development conference involving participants from these nations.

The ICI team planned also to arrange one workshop in France, but this did not happen due to lack of take-up. One reason for this reluctance to engage from French cities was the Reference Framework for Sustainable Cities (RFSC³⁰). While ICI was arranging workshops across Europe and developing the explorative application, test cities were also being recruited for RFSC. This appeared to limit local governments' interest, especially in France: many local governments reported limited capacity to engage in the application of a single tool, not to mention applying three tools simultaneously. The use of monitoring tools by local

³⁰ A summary of the RFSC is available in Section 2

governments across Europe is limited, mainly because applying them is voluntary for local governments, therefore usage levels fluctuate over time and few (if any) tools are used on a constant basis by European local governments. Economic limitations, in the form of local resources needed for applying the tools, also restricted participation. This was especially the case in the United Kingdom, which during the explorative application were experiencing severe spending cuts in line with the new coalition government's targets to cut public expenditure by 25-40% (see Section 3 for further details).

There were problems getting local government representatives to participate in workshops in other parts of Europe, despite the ICI team offering subsidised travel, and in some cases complete reimbursement for travel costs. Many local governments had travel restrictions due to the national economic situation. Other factors that may have limited participation included lack of time to participate, perceptions about the lack of added value of participation, the short-term nature of the project, and the perceived lack of backing from the Commission. In some cases, mostly in Eastern Europe, an officer of the local government wanted to apply the tools, but was not given permission to do so by their local politicians. This may have been because of differing political priorities, or perhaps the fear of poor results and a low benchmarking position creating negative publicity for them.

Some potential barriers originate from the tools themselves. Certain governments thought LE21 was not relevant to their needs – perhaps because their focus had shifted from process to outcomes - and questioned the added value of applying it. LE21 was criticised for failing to challenge local governments' monitoring, measuring or delivery of sustainable development. These issues were more often raised by Northern and Western cities. Some Eastern governments felt LE21 was irrelevant to them because it largely derives from the Aalborg Charter – with which many Eastern European local governments are not familiar. However, local governments across Europe thought LE21 was a useful tool for raising awareness about sustainable urban development.

Local governments did not question the relevance of UEE, but they did face challenges in applying it. It was viewed as complicated and time-consuming, and some local governments felt this undermined its value. Compiling the data required extensive input and cross-sector co-operation. Incompatible data was a problem for certain indicators, due to national differences in collecting data, and some data that was not available at all. This was a bigger problem for Eastern European countries. The comparability of UEE data was another issue, given that indicators did not necessarily fit the local context. Some participants suggested that UEE metrics were not robust, and merely provided proxies for some 'wicked issues'

concerning sustainable urban development. Concern about the weighting of indicators was also raised, and the influence this can have on evaluation results.

Section 5: Urban Ecosystem Europe: measuring environmental urban sustainability

Introduction

This section reports the results of the explorative application of the Urban Ecosystem Europe (UEE) tool, which was developed to provide an integrated assessment of the European urban environment. Data from a number of European cities has been processed in order to define a set of quantitative indicators for urban environmental quality. 53 European local governments voluntarily participated in this phase of the research, by providing data relating to different aspects of the state of the urban environment and its management in their city.

The results of the data analysis are reported in this section, using UEE indicators as sub-headings. Local sustainability indicators are categorised according to eight topics: air, water, urban design, mobility, energy, waste, noise and eco-management, which are the topics usually used in European guidelines concerning urban environmental assessment and management. A specific web platform has been developed containing all the data from the complete set of indicators, although this is currently only accessible to the 53 cities participating cities.

The values relating to a single indicator are shown using a bar chart to illustrate the relative performance of cities. However, definitive benchmarking or ranking of cities is not considered appropriate due to the inability to guarantee full data comparability. Differences between European local governments in the way data is collected and defined are discussed in detail later in this section. The purpose of the graphs and charts is to provide an overview of key trends and differences between European cities which are clustered according to their geographical location or population size.

Data collection took place between September 2010 and May 2011. Specific information was requested in different categories - city profile, air, water, urban design, mobility, energy, waste, noise, eco-management – along with the year of reference for each. The vast majority of the data received related to the period 2008-2010. From a methodological viewpoint, using data from three different years is not ideal, but should not significantly affect comparability. It is common practice for European datasets to use similar time intervals, e.g. the Eurostat Urban Audit database collates data into following time intervals: 1999-2002; 2003-2006; 2007-2009.

To minimise confusion and try to ensure cities provided comparable data for each category, a glossary and guidance notes were sent to each participating local government, and the spreadsheets used to collect the data were translated into several European languages (English, Spanish, French, German, Portuguese and Romanian).

Upon submission of the completed spreadsheets, the data was checked and if necessary further clarification was requested from the cities. In some cases local governments were not able to provide the correct data. There were two main reasons for this: firstly, there were different approaches to categorising data or collecting data in individual countries, and secondly, some local governments had weak or underdeveloped monitoring systems.

Although a variety of different tools, initiatives and programmes – as well as European Directives - have been developed in the last decade with the aim of defining a common set of indicators for data collection and monitoring systems, significant differences still exist across Europe due to specific geographic, climatic, economic and cultural conditions.

The problems with data availability are most significant in the following areas:

- Air pollution: monitoring networks vary greatly in term of spatial distribution, and the sets of pollutants monitored, from city to city;
- Green areas: there are many variations in the categorisation of accessible green areas;
- Mobility: spatial and catchment areas can vary, especially for public transport. For example, when calculating how many citizens use public transport (passengers/inhabitants), some cities only count the municipality's inhabitants, while others consider the inhabitants of the urban agglomeration served by public transport;
- CO₂ emissions: some cities calculate only CO₂, while others consider all the greenhouse gases (expressed in terms of CO₂ equivalent);
- Waste: some cities collect data concerning both municipal and household waste production, collection and treatment, while other cities include only one of these.

Participating cities

53 European cities applied UEE. Cities were clustered according to population size and geographical region. Participating cities were divided in three categories based on population size: Big (above 500,000 inhabitants): 19 cities; Medium (150,000 to 500,000 inhabitants): 20 cities; and Small (below 150,000 inhabitants): 14 cities.

The United Nations Statistics Division definition of European geographical regions was used as a baseline³¹. Participating cities (see figure and table 5.1) were divided into four regions:

- Northern (Denmark, Finland, Sweden): 10 cities
- Southern (Italy, Portugal, Spain): 17 cities
- Western (Belgium, France, Germany, Ireland, UK): 16 cities
- Eastern (Czech Republic, Hungary, Latvia, Poland, Romania, Serbia): 10 cities

Minor changes were made to the UN classification in order to define more homogeneous clusters in terms of environmental issues. Latvia has been put in the Eastern region due to the level of environmental legislation implementation and environmental performance of Latvian cities.

It is important to underline the fact that participation in the exercise was voluntary, and local governments who are more committed to environmental issues are more likely to have taken part. This is substantiated by the fact all but four participating cities have been involved in at least one other similar European initiative, e.g. 19 'big' and 'medium' cities have applied for the European Green Capital Award. Such participation is likely to lead to a more developed capacity within the city to deal with the large scale data requests. Small and Eastern cities, which are less used to participating in EU projects, showed a lower rate of response to the UEE questionnaire. It is possible that the results of the exercise are biased as a result of this, giving a falsely positive view of data availability within European local governments.

³¹ [http://unstats.un.org/unsd/methods/m49/m49regin.htm#europe.](http://unstats.un.org/unsd/methods/m49/m49regin.htm#europe)

Table 5.1: Cities that applied UEE

N Denmark	Big	Kobenhavn	W Belgium	Medium	Antwerpen
N Denmark	Medium	Aalborg	W France	Big	Nantes
N Denmark	Medium	Odense	W France	Medium	Bordeaux
N Finland	Big	Helsinki	W Germany	Big	Bremen
N Finland	Medium	Vantaa	W Germany	Big	Dresden
N Finland	Medium	Turku	W Germany	Big	Nuremberg
N Finland	Small	Kuopio	W Germany	Medium	Münster
N Sweden	Big	Stockholm	W Germany	Medium	Augsburg
N Sweden	Small	Helsingborg	W Ireland	Big	Dublin
N Sweden	Small	Vaxjo	W Netherlands	Big	Amsterdam
			W Netherlands	Big	Rotterdam
S Italy	Big	Torino	W UK	Big	Glasgow
S Italy	Big	Napoli	W UK	Big	Sheffield
S Italy	Big	Genova	W UK	Medium	Bristol
S Italy	Medium	Bologna	W UK	Medium	Leicester
S Italy	Medium	Firenze	W UK	Medium	Plymouth
S Italy	Medium	Parma			
S Italy	Small	Ravenna			
S Italy	Small	Ferrara	E Czech Rep.	Big	Praha
S Italy	Small	Bolzano	E Czech Rep.	Small	Chrudim
S Portugal	Medium	Porto	E Latvia	Small	Liepaja
S Portugal	Medium	Oeiras	E Poland	Big	Poznań
S Portugal	Small	Faro	E Poland	Medium	Bydgoszcz
S Spain	Big	Barcelona	E Poland	Small	Knurow
S Spain	Big	Zaragoza	E Romania	Medium	Timisoara
S Spain	Medium	Vitoria Gasteiz	E Romania	Small	Sfintu Gheorghe
S Spain	Medium	Granada	E Serbia	Small	Valjevo
S Spain	Small	Granollers	E Serbia	Small	Vranje

Figure 5.1: Map of cities that participate in UEE

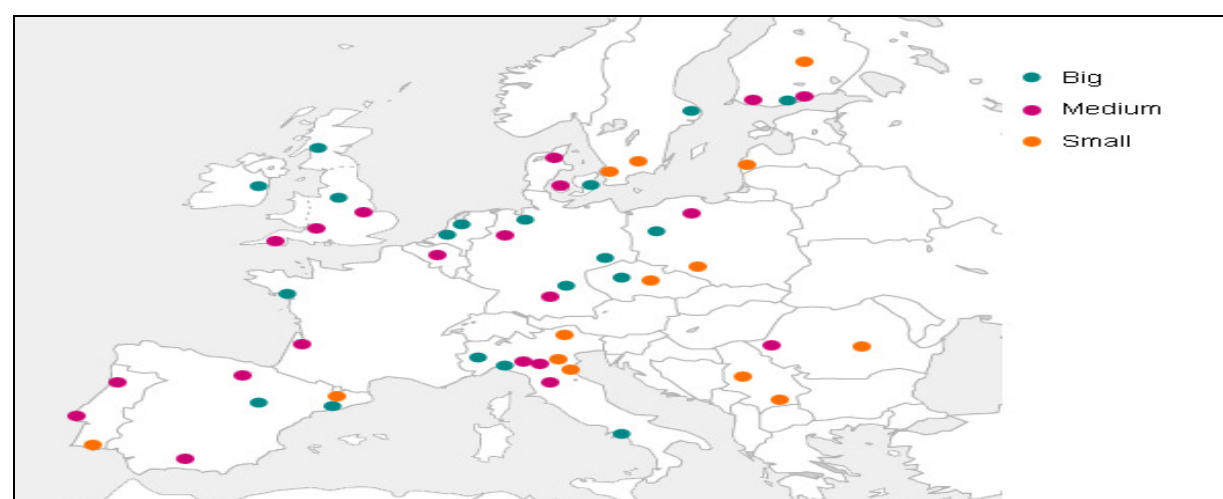


Table 5.2 Distribution of participating cities based on size

	big	medium	small
northern	3	4	3
southern	5	7	5
western	9	7	0
eastern	2	2	6

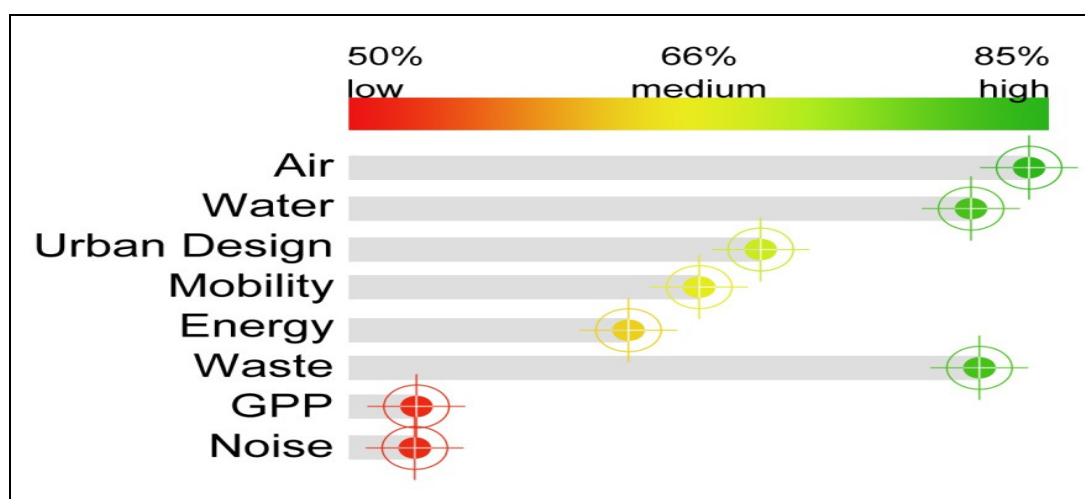
Cross category analysis (see table 5.2) highlights that, while in northern and southern regions the sizes of participating cities are fairly equally distributed, we find a prevalence of small cities in the eastern region and a dominance of big and medium cities in the western region.

Data availability

More than 40 participating local governments submitted data on air, water, urban design and waste management. As figure 5.2 shows, mobility, energy, noise and eco-management data was more problematic to collect. Data availability is likely to be linked to the fact that some fields of urban management (air monitoring, waste management, water sanitation) are strictly legislated and standardised by European directives, so common assessment and management standards have already been defined. This is not yet the case for eco-management, green energy and elements of mobility, which are currently largely left to the discretion of individual local governments. Therefore, data availability in these fields is mainly dependent on local governments' level of engagement in environmental issues both on the local and global scale, as well as their economic resources and technical competence.

In terms of wider trends, the UEE data suggests that Northern cities were able to provide a wider range of data. This is likely to be due to more well-established engagement with environmental issues and the implementation of monitoring policies that require baseline data. Conversely, Eastern cities are in some cases still trying to catch up with European standards.

Figure 5.2: Data availability



Air: The data requested from cities concerning air quality included PM₁₀, NO₂ and Ozone; the set of pollutants, as well as the indicators used, has been clearly defined by Directive 2008/50/EC. Although the Directive defines a wider number of pollutants for targets and monitoring, these three have been selected as the most commonly used in air quality indices definitions³². The data shows that almost all responding cities have a well-structured monitoring network in urban areas. Only four cities, all in the Eastern area, did not submit any data relating to air quality. 26 cities declare they have an air quality plan.

Water: Almost all the cities were able to submit some data about waste water treatment and water consumption (domestic per capita consumption). However, water treatment data was incomplete. For example, only eight cities – including three German ones - provided data about treated water reuse.

Urban design: Data on total surface of green urban areas and natural areas was available for almost all the cities (51 and 48 respectively); data about cycling lanes is generally known, although there was less availability of data on the number of trees and pedestrian areas.

Mobility: As stated previously, data on mobility was not consistent amongst the participating local governments. 35 cities out of 53 provided figures about the number of urban passengers. Modal split data was not always complete, and the level of data availability got

³² According to the European Environment Agency, “in Europe, emissions of many air pollutants have fallen substantially since 1990, resulting in improved air quality over the region. However, since 1997, measured concentrations of particulate matter, nitrogen dioxide and ozone in the air have not shown much significant improvement” (<http://www.eea.europa.eu/themes/air/intro>). According to EEA's data, SO₂ and Lead in Europe are not anymore considered as a primary threat to human health, as the emissions have dropped in the last 20 years, so they have not been considered in this survey.

worse as the requirements become more specific. 36 cities provided data on the modal share of car trips within the whole administration area, while only 20 cities provided data related to systematic trips and only nine for systematic trips within the inner city area. 15 cities provided no information on modal split across all trips within whole administrative area.

Energy: Energy usage data illustrates that monitoring in the energy sector needs to be improved, especially in relation to public buildings. 42 cities (79%) monitored their greenhouse gas emissions (CO₂ equivalent or CO₂ emissions, 28 and 14 cities respectively) and about 30 cities submitted disaggregated data about electricity consumption and electricity production through renewable sources in public buildings. However, only 15 cities (28%) provided data on the energy consumption of public buildings.

Waste: Given the traditionally well-structured European legislation concerning waste collection and treatment, data about waste was generally complete; only two cities, both located in the Eastern region, did not have any data about waste.

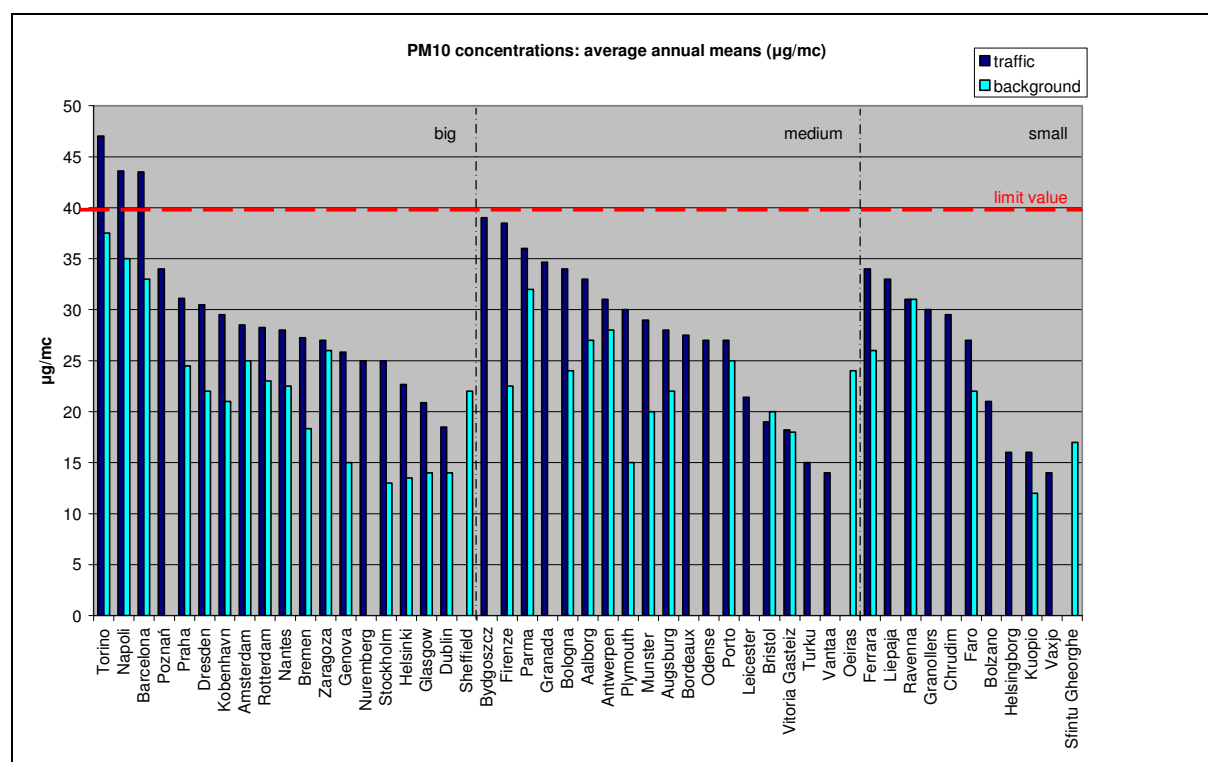
Noise: 37 cities stated that they had urban noise maps, and 25 cities had a noise plan; the proportion of the population exposed to noise level exceeding the current legislative limit was known in around 30 cases.

Eco-management: Binding procurement policies for green or sustainable products have been implemented in 14 cities, while 18 cities have non-binding regulations. The ratio of recycled paper purchased in local government offices was known in 32 cities. Around half of cities provided data on how many public offices or public companies have ISO 14001 or EMAS certifications.

Air

All air quality indicators showed a very high level of data availability: 91% of data was provided regarding fine particulate matter (PM₁₀) and nitrogen dioxide NO₂; and 85% regarding ozone. PM₁₀ concentrations monitored by traffic stations were available for 87% of cities, and background stations values for 64% of cities. Data on NO₂ concentrations monitored by traffic stations was available for 87% of cities, and background stations values for 74% of cities.

Figure 5.3: PM10 concentrations



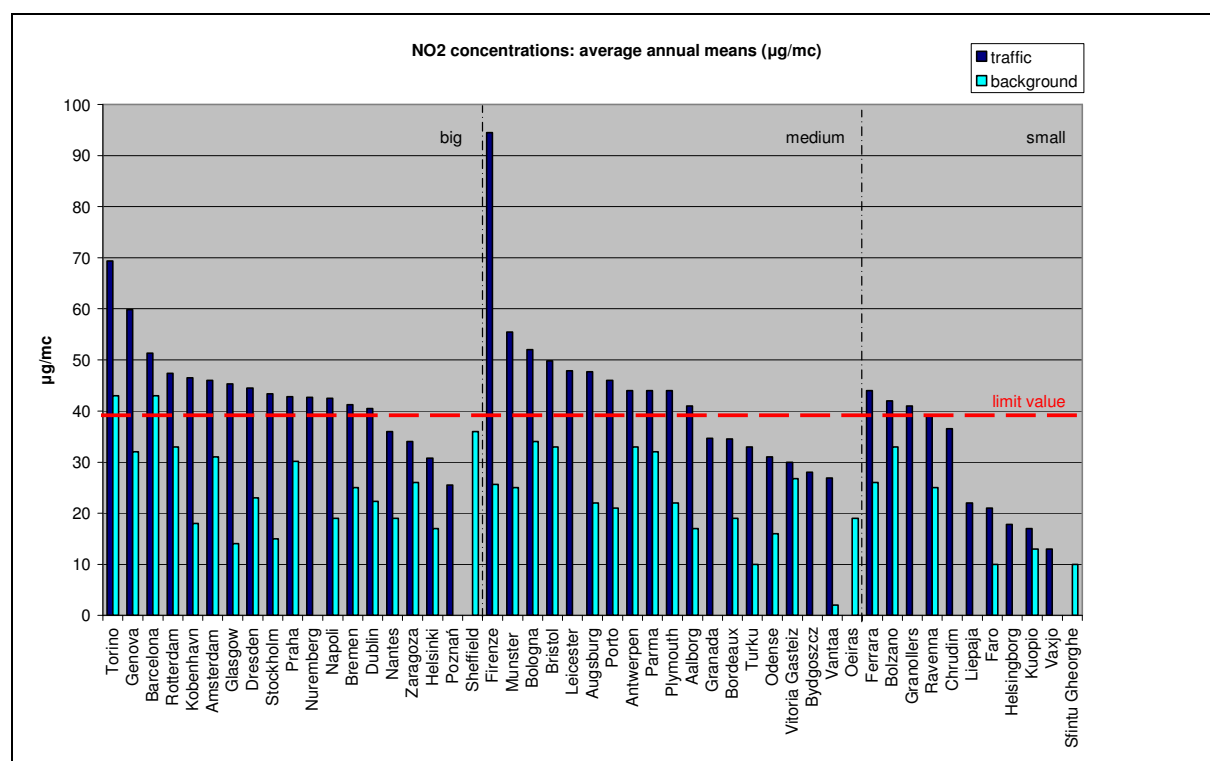
With regard to particulate matter (PM10) concentrations (see figure 5.3), the situation seems to be critical in some European cities: the limit value³³ relating to the maximum number of days per year (35) with a daily mean over 50 µg/m³ has been exceeded in 19 cities (40% of cities with available data).

The average values over the limits monitored by traffic stations have been registered only in Southern and Eastern cities. Italian cities show the most critical situation: eight of nine cities have at least one monitoring station above the limit value, and in five cities the average values registered in background stations exceed the limit value for over 35 days.

³³ Limit values related to PM10, NO₂ and O₃ refer to Directive 2008/50/EC.

Annual mean concentrations show a more positive picture, with the 2010 limit value of $40 \mu\text{g}/\text{m}^3$ being exceeded in only three cities. There are no background average values above the limit. These two indicators - exceeding limits and concentrations - represent different phenomena, with the former describing critical and precise events, and therefore showing higher variability, while mean concentration describes an average annual situation. Referring to the World Health Organisation (WHO) target of $20 \mu\text{g}/\text{m}^3$, only eight cities (16%) have all the monitoring stations within this value.

Figure 5.4: NO₂ concentrations



The annual mean for nitrogen dioxide (NO₂) concentrations registered by the worst monitoring station (see figure 5.4) is above the limit value of $40 \mu\text{g}/\text{m}^3$ in 32 cities (65% of cities with available data)³⁴. The average values of traffic stations also exceed the limit: in 28 cities (61%) these are above $40 \mu\text{g}/\text{m}^3$.

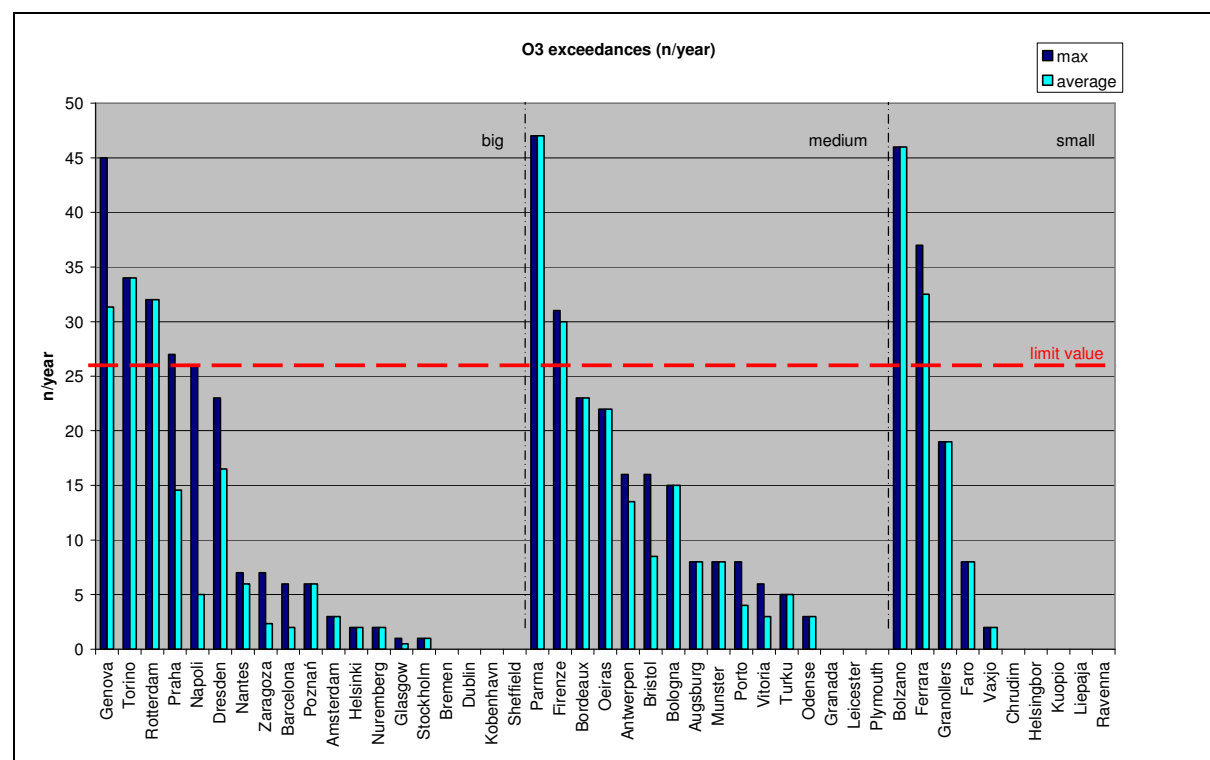
Big and medium cities recorded the highest concentrations, but small Southern cities (Italian and Spanish) exceed the limit, with one exception. The worst 'hot spots' are in Italy and the UK. In Torino and Barcelona, the background stations' average values exceed the limit.

The situation is improving in relation to ozone (O₃) concentrations (see figure 5.5), with Southern areas being most affected. The limit value related to the maximum number of days

³⁴ Limit value related to 2010. Some data reported by cities refers to 2009.

per year (25) with a maximum eight hours' mean over $120 \mu\text{g}/\text{m}^3$ has been exceeded only in nine cities (20% of cities with available data). Seven of nine Italian cities have at least one monitoring station above the limit value, and in six cities the average values exceed the limit.

Figure 5.5: Cities exceeding O₃ limits



Water

Data availability is generally high in this area, due to the fact that such data is necessary to guarantee the management of an adequate water sanitation and potable water supply system. However, information about waste water reuse and rain water reuse is seldom available; in many cities this aspect of water policy, relating to water cycle efficiency, is a new area, and well-structured monitoring systems do not yet exist. The highest rate of data availability (94%) was for the proportion of inhabitants connected to the wastewater network, compared to wastewater network typology (83%) and treatment (79%). This may be due to the fact that the various sets of indicators have different levels of specificity and complexity.

The percentage of inhabitants connected to a wastewater network is generally high; only eight cities (16% with available data) have a connection rate below 85%. Almost all of these are located in Eastern and Southern Europe. In 34% of cities, over 90% of the network is separated (see figure 5.6), and 60% of cities have over 50% of separated network. 17% of cities stated that they had no separated network.

Figure 5.6: Separated wastewater network

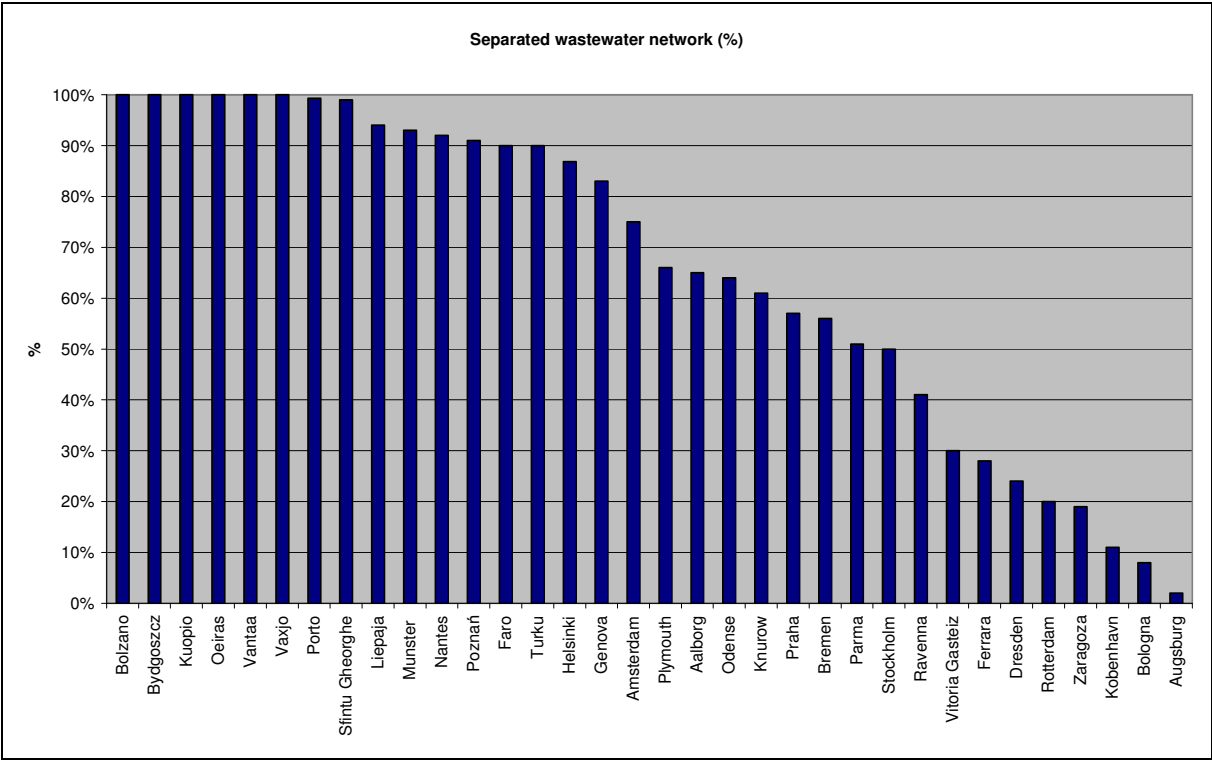
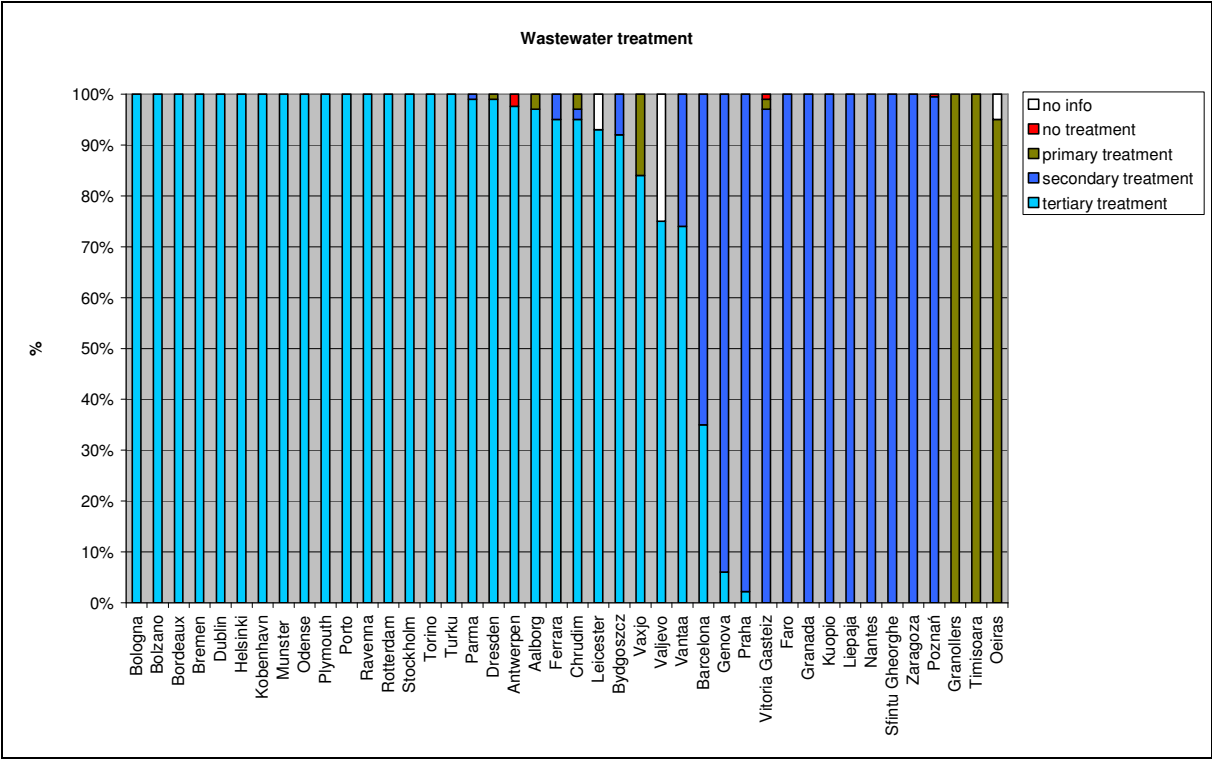


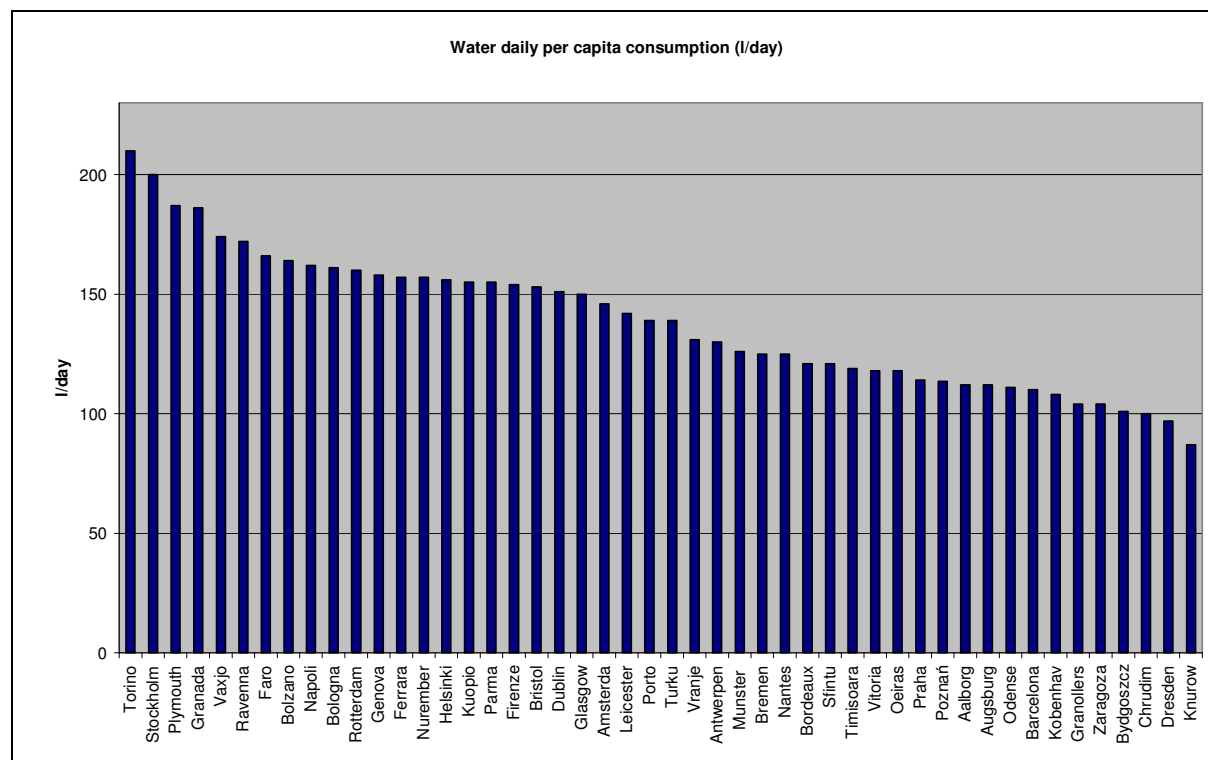
Figure 5.7: Wastewater treatment



Data regarding wastewater treatment is generally positive (see figure 5.7): 85% of cities have high levels (over 95%) of wastewater subjected to secondary treatments (removal of

organic matter) or tertiary treatments (allowing rejection into a highly sensitive or fragile ecosystem).

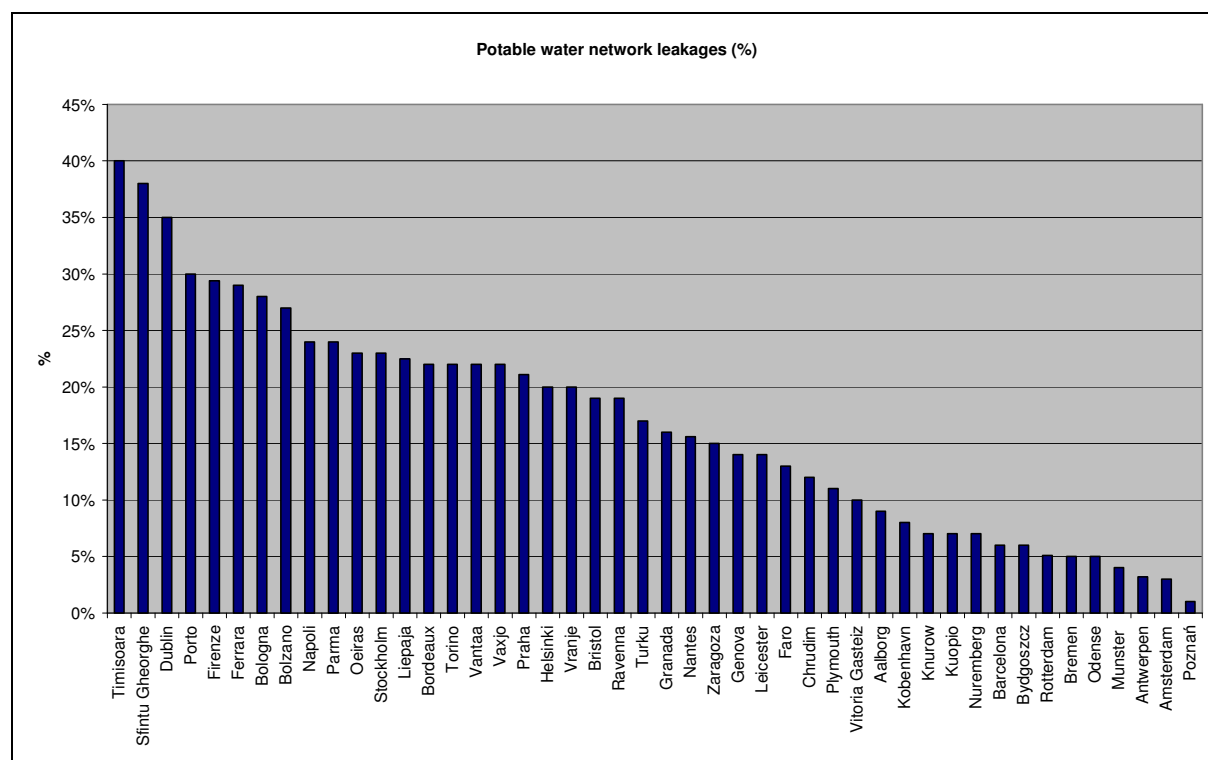
Figure 5.8: Water daily per capita consumption



Household potable water consumption (per capita) and distribution network leakages indicators were highly populated (92% and 89% respectively). Per capita potable water consumption - the quantity of potable water each person uses per day (see figure 5.8) - is highly varied, ranging from about 100 litres/inhabitants (l/inh) day to 210 l/inh day. This is an average value, representing the total potable water used domestically by the municipality's population in a year, divided by 365 days. Six cities, mostly Southern ones, had consumption above 170 l/inh, while another six were around 100 (Knurow having the lowest absolute level, of 87 l/inh). 57% of cities declared consumption levels below 150 l/inh. All the Eastern cities lie in this part of the ranking, but no Italian ones do. These results can be related to historical data on water consumption in Europe. According to the UNEP-DEWA report, 'Freshwater in Europe - facts, figures and maps' (2004), potable water prices are lower in Southern Europe (especially in Italy) compared to Western and Northern European countries, which could lead to less careful consumption. Eastern cities have lower consumption levels, which may be due to lower quality of life standards.

Distribution network leakages were high (over 30%) in four cities (see figure 5.9); 32% of cities have leakages below 10%, and 15% below 5%. With the exception of Barcelona, no Southern cities had less than 10% leakages.

Figure 5.9: Potable water network leakages



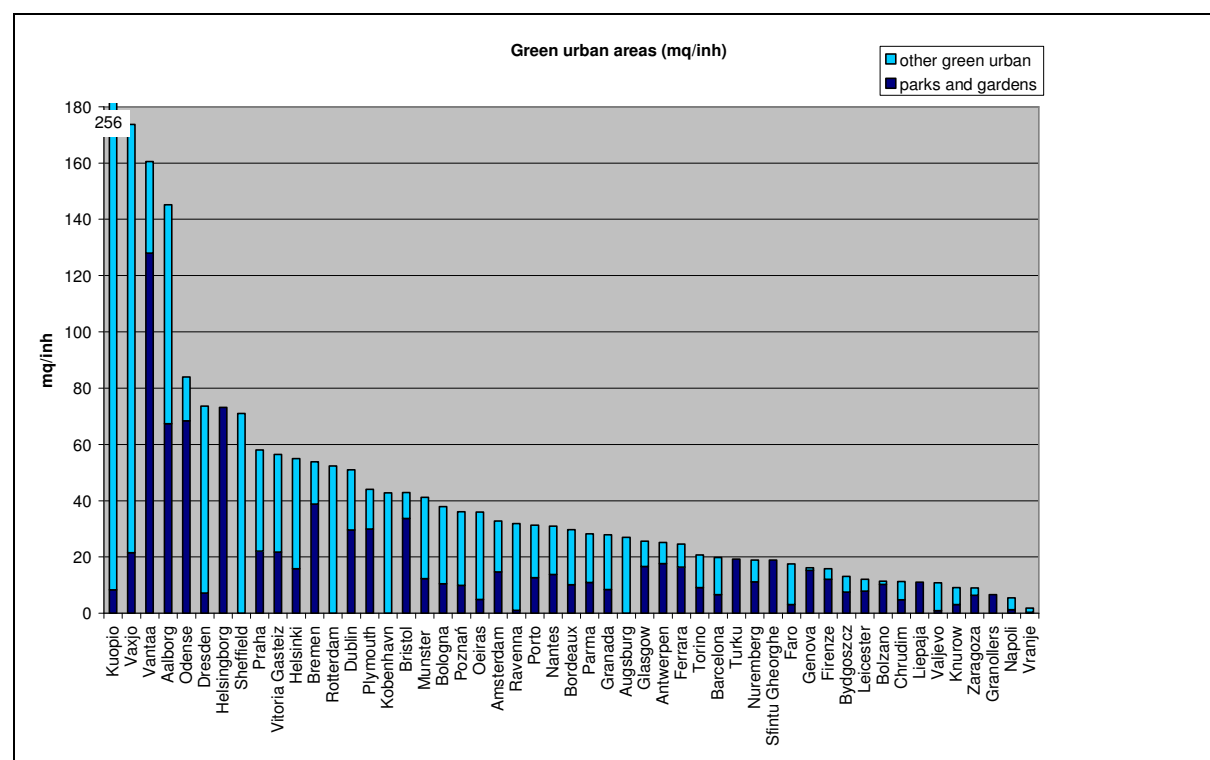
Urban design

Data availability for green urban and natural areas was very high (87-96%). Data on green urban areas is a required standard in urban planning, therefore it is usually monitored and easily accessible to local governments, although classification can differ substantially between cities. Moreover, green areas play a key role in the communication of urban life standards and environmental quality, so they receive significant attention from local governments.

Prevalence of parks, gardens, and green urban areas (see figure 5.10), measured in square metres per inhabitant, is higher in medium and small Northern cities with low population density. The cities with the highest per capita availability of parks and gardens are Vantaa, Helsingborg, Odense and Aalborg, while those with the highest total green urban areas (including parks and gardens, recreational urban areas and peripheral parks) are Kuopio, Växjö, Vantaa, Aalborg and Odense. Variability of composition of green urban areas within a

city – with some cities having more parks and gardens, and others having different types of green area - may have led to confusion in the categorisation of green areas³⁵.

Figure 5.10: Green urban areas



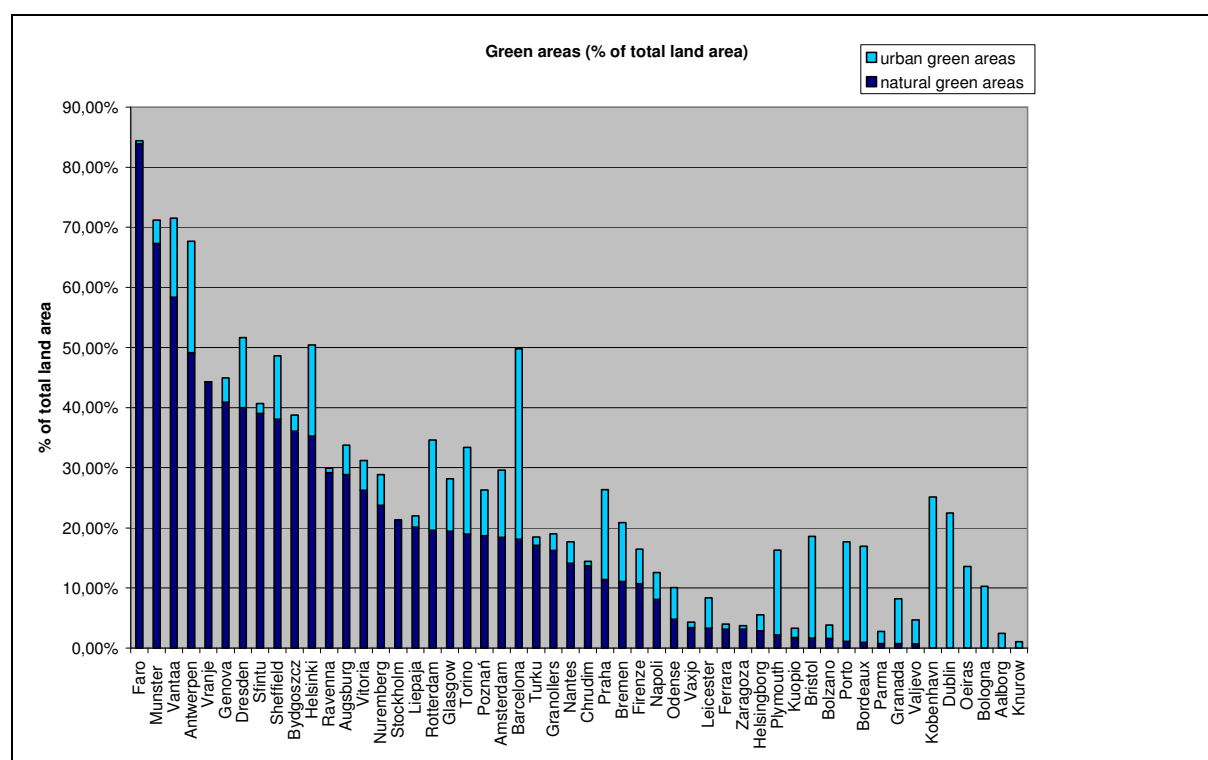
In 11 cities, each inhabitant had more than 20 m² of parks and gardens. In 30 cities, parks and gardens per capita availability was between 5-20m², while in six Southern and Eastern cities, it was lower than five. Urban green area per capita was high (above 50 m²) in Northern and Western cities plus Prague and Vitoria Gasteiz, ranged from 15-50 m²/inh in 26 cities, and was lower in 11 Southern and Eastern cities.

Even if the absolute value in hectares of green urban areas was higher in big and dense urban cities (e.g. Prague, Sheffield, Dresden, Helsinki, Barcelona), the use of this indicator - ratio of green space to inhabitants - inevitably favours smaller and more dispersed cities.

Conversely, green urban areas measured as the ratio to total administrative land area (see figure 5.11) are higher in big and medium Western, Northern and Southern cities (e.g. Barcelona, Copenhagen and Dublin), and lower in small and medium Eastern, Southern and Northern cities.

³⁵ For example, in the city of Kuopio (as in other Northern countries), so called 'everyman's rights', that allow free access to woods and land owned by somebody else, can cause difficulties when calculating green areas.

Figure 5.11: Green areas



Cycling also features within the urban design category. The number of trips carried out by bicycle depends on various factors including the existence of a well-planned cycling network, cultural habits, and urban density.

Among the nine cities having the highest share of bicycle trips - above 20% - in the whole administrative area are big and medium sized cities in Northern and Western Europe and two small southern cities (Bolzano and Ferrara). Of these, fewer than 40% of trips were made by car in Amsterdam, Munster, Bolzano, Copenhagen, Bremen, Antwerp and Stockholm.

Bicycle trips in the inner city are more prevalent in the big and medium cities of Northern and Western Europe. In Stockholm, Amsterdam, Munster, Odense and Bremen, more than 29% of trips were by bicycle. However, it must be stated that relatively few cities (28%) provided data on modal share, therefore the rankings could exhibit bias.

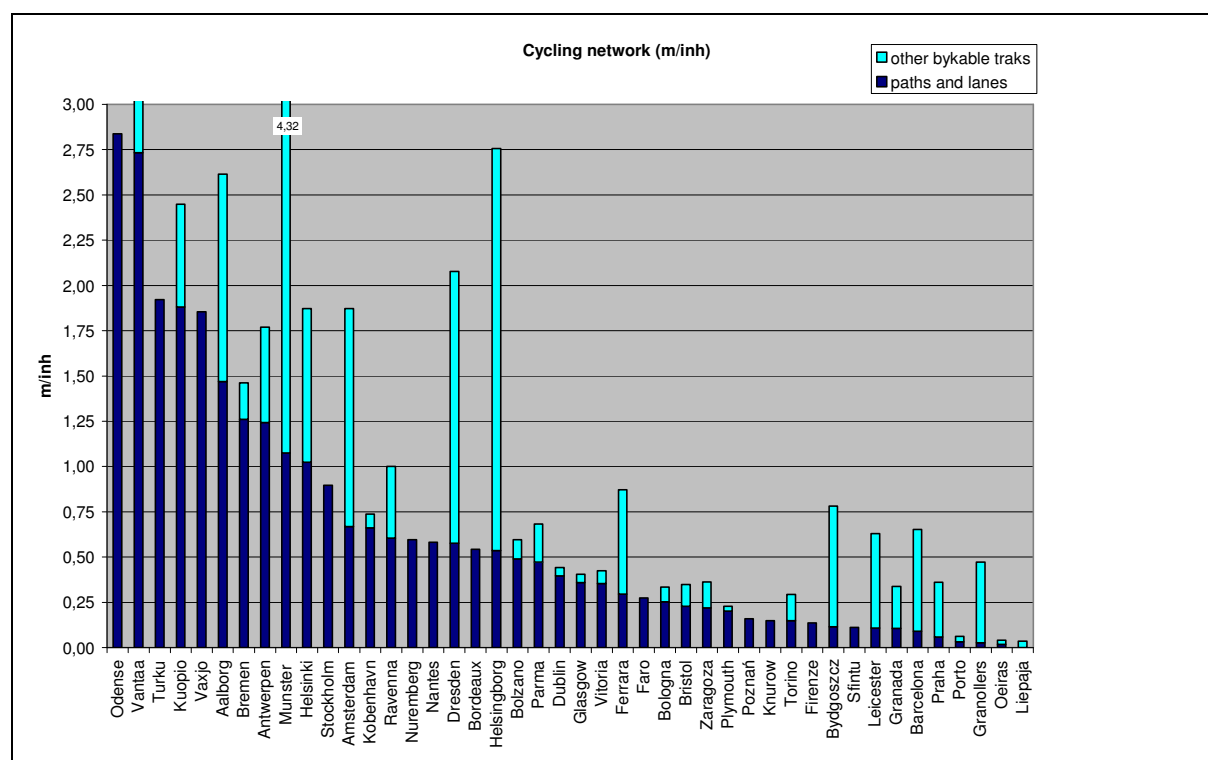
A cross-comparison of modal share and cycling network and infrastructures enables further observations. The absolute value of kilometres (km) of cycling paths and lanes is higher in big and medium cities of Northern and Western Europe (e.g. Stockholm, Bremen, Helsinki, Antwerp and Vantaa). In medium and small Northern cities, paths and lane systems have a total length above 100km. However, if one considers the absolute value of kilometres of

cycling network (inclusive of cycle paths, lanes and traffic calming streets), the highest values are seen in Munster, Amsterdam, Helsinki, Dresden, Barcelona and Vantaa.

The amount of cycling networks in kilometers can be displayed as a ratio to inhabitants or to territorial area, in order to compare different cities and population densities. The metres per inhabitant of cycling network are higher in Munster – which, as noted above, has high bicycle and low car modal share – followed by four medium and small Northern cities that, despite the positive cycling network indicator, do not have high bicycle modal share.

In terms of metres per inhabitant of cycling paths and lanes (see figure 5.12), at the top of the ranking we find five medium and small Northern cities (more than 1.8 km/inhabitant). These cities do have a lot of cycling paths and lanes (150-540km), but they also take advantage of the size of the territorial area and the low number of inhabitants. There does not appear to be a direct link between good performance related to cycling infrastructure and modal share of trips made by car, which remains above 48% in all these cities.

Figure 5.12: Cycling network



When considering cycling paths and lanes with respect to the administrative area (m/km^2), a different picture emerges. In this case, the leading cities are medium and big Northern and Western cities, which have many kilometres of paths and lanes and are characterised by high density. Here, there is a positive relationship with modal split, as the first three cities –

Antwerp, Stockholm and Copenhagen – have high bicycle share while car share of trips remains below 40%.

Overall, one can observe that some medium and big cities in Northern and Western Europe have a well-structured cycling network that positively influences the modal split in favour of bicycle trips, leading to fewer car trips. Munster is the highest performer, with a bicycle share of 38%, followed by Amsterdam, Copenhagen, Bremen and Stockholm. Conversely, there is a group of medium and small Northern cities (e.g. Odense, Vantaa, Turku, Kuopio and Växjö) – characterised by wide territorial area and low density – in which a huge system of cycling paths and lanes has been achieved, yet where car use remains high³⁶.

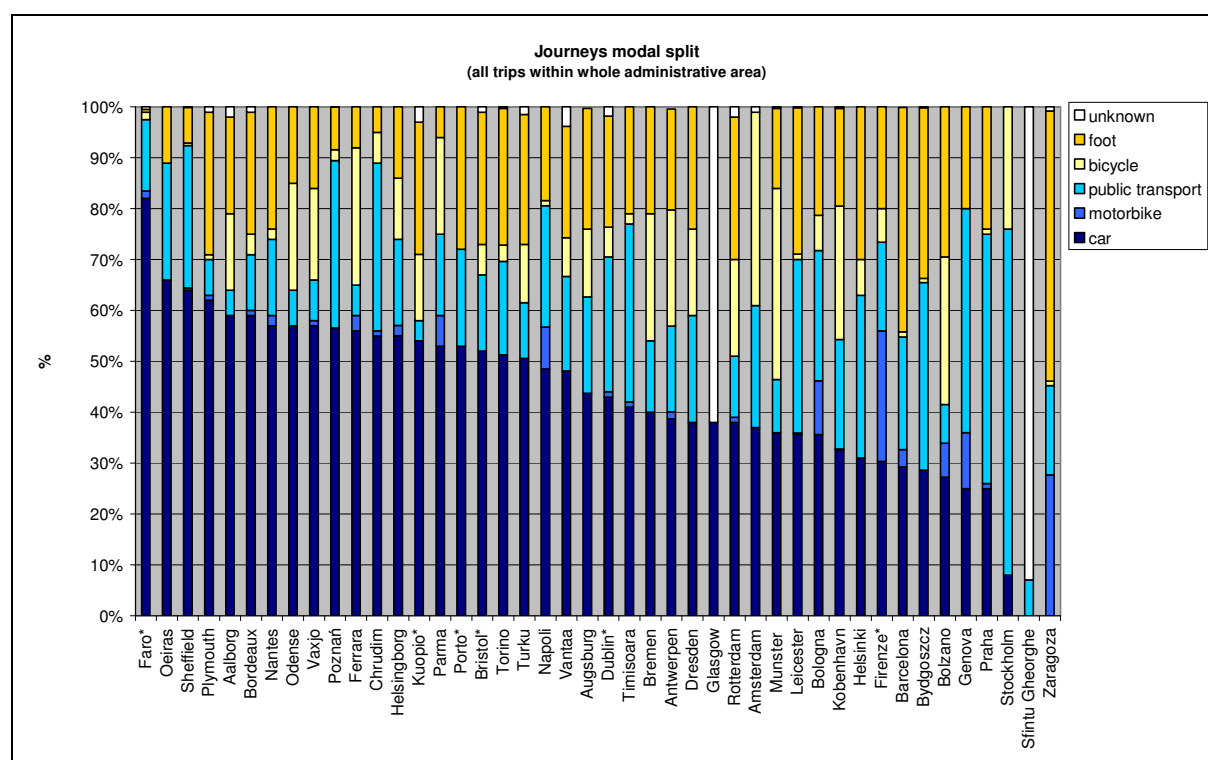
Mobility

The availability of mobility data ranges from 50-65% of participating cities, with data robustness affected by variability in data collection and availability; reference area and trip typology considered are not always comparable. Mobility data related to modal share can be collected at the municipal level (whole administrative area) or at the inner city level with regard to either all trips or only systematic trips. The reference area for urban public transport networks may be defined as the administrative area only or as the aggregate urban area, including inhabitants commuting from neighbouring territories.

Modal split data (see figure 5.13) relating to all trips within the whole administrative area are available for 68% of cities. 38% of cities provided data on systematic trips within the whole administrative area, 34% of cities on all trips within inner city, and 17% of cities on systematic trips within the inner city. Only two cities (Prague and Helsinki) provided all four categories of data. Data referring to urban public transport passengers was submitted by 66% of cities, and total passengers (urban and extra urban) by 45% of cities.

³⁶ Indicators describing the cycling network span the urban design field and the mobility field. Cycling is both a leisure activity and a transportation mean. The UNEP initiative “Share the road” calls for systematic investments in walking and cycling infrastructure, it recognises that in densely populated urban areas this will have positive impacts on mobility opportunities and generate improvements from both the social and environmental point of view (<http://www.unep.org/transport/sharetheroad/>).

Figure 5.13: Journeys modal split



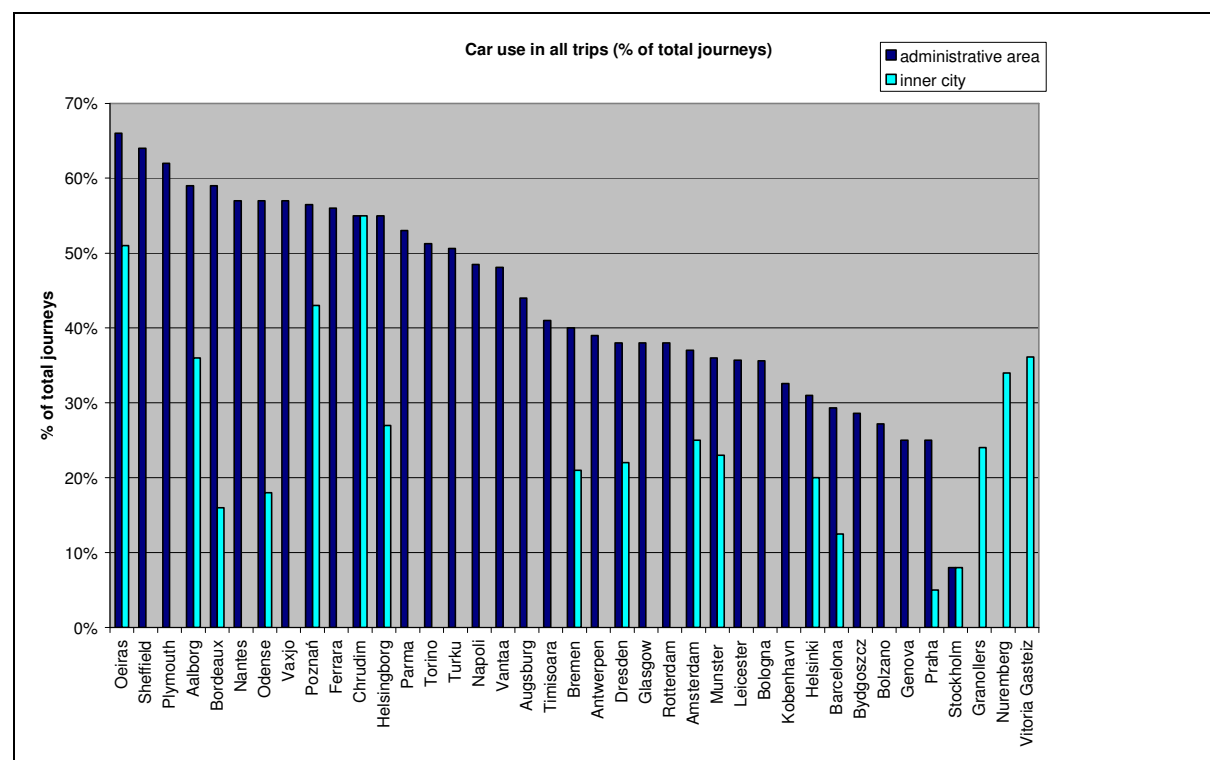
Modal split data for all trips within the whole administrative area shows that the threshold of 45% of journeys by car is shared evenly between participating cities. High values of car usage are generally related to low public transport share – as in the case of Faro, Plymouth, Aalborg and Bordeaux – or to low bicycle and walking habits (Oeiras and Sheffield). Cities in which car use is low usually have more trips by public transport – as Stockholm, Prague, Genova, Bydgoszcz, and Helsinki - or more cycling and walking, as in Bolzano, Barcelona and Copenhagen.

With regard to public transport use, data showing the number of passengers per inhabitant, as well as the kilometres traveled per inhabitant, both show a huge variation between small cities, which have lower values, and big/medium sized cities, with higher values. Among the medium and big cities, there is a dominance of Eastern cities.

Good performances in network kilometres and kilometres travelled per vehicle are associated with good performances in the passengers/inhabitants indicator in Prague and Helsinki. Prague has the highest value of passengers/inhabitants (771) as well as a strong public transport modal split share (49%) and a low car share (25%). 56% of Prague's public transport network is rail-based (tram and underground), even though only 13% of the bus fleet is 'green' (electric, hybrid, natural gas and LPG powered). Helsinki has a very well developed infrastructure network and high km/vehicles value; this is reflected in good

performance in passengers/inhabitants and a medium-high public transport share (32%). Public transport is mainly based on buses, all of which are low emissions vehicles. Only 5% of the network is rail-based.

Figure 5.14: Car use in all trips



Although Barcelona has a very good network and the best value of km/vehicles travelled, it has low passengers/inhabitants compared to the other big cities, and a medium-low public transport modal split share (22%). Meanwhile, car use is very low (see figure 5.14). Only 10% of the public transport network is rail-based and less than 40% of the bus fleet is green.

Among medium sized cities, Antwerp has a well-developed network and good data regarding km-vehicles travelled. It has a high value of passengers/inhabitants (313), although public transport modal split share (see figure 5.15) is low (17%). Timisoara, conversely, has the highest passengers/inhabitants value (452) and a positive public transport modal split share (35%), although it does not have a strong infrastructure network and it has a low km/vehicles value. The network is 45% rail-based, with a successful tram system.

Among small cities, Liepaja has the highest passengers/inhabitants value (254) and a good infrastructure network. Bolzano has generally positive km/vehicles and passengers/inhabitants data. Public transport is solely bus-based, with 61% low emission vehicles.

Figure 5.15: Public transport passengers

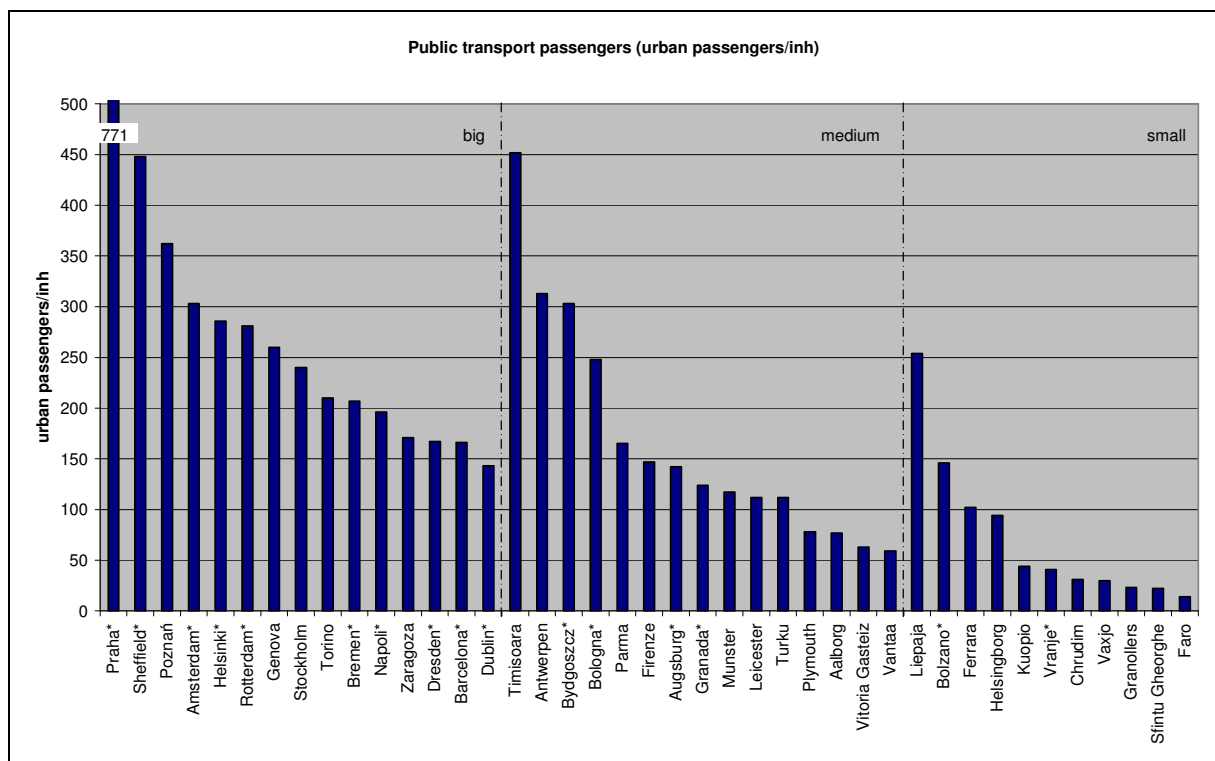


Figure 5.16: km traveled by public transport

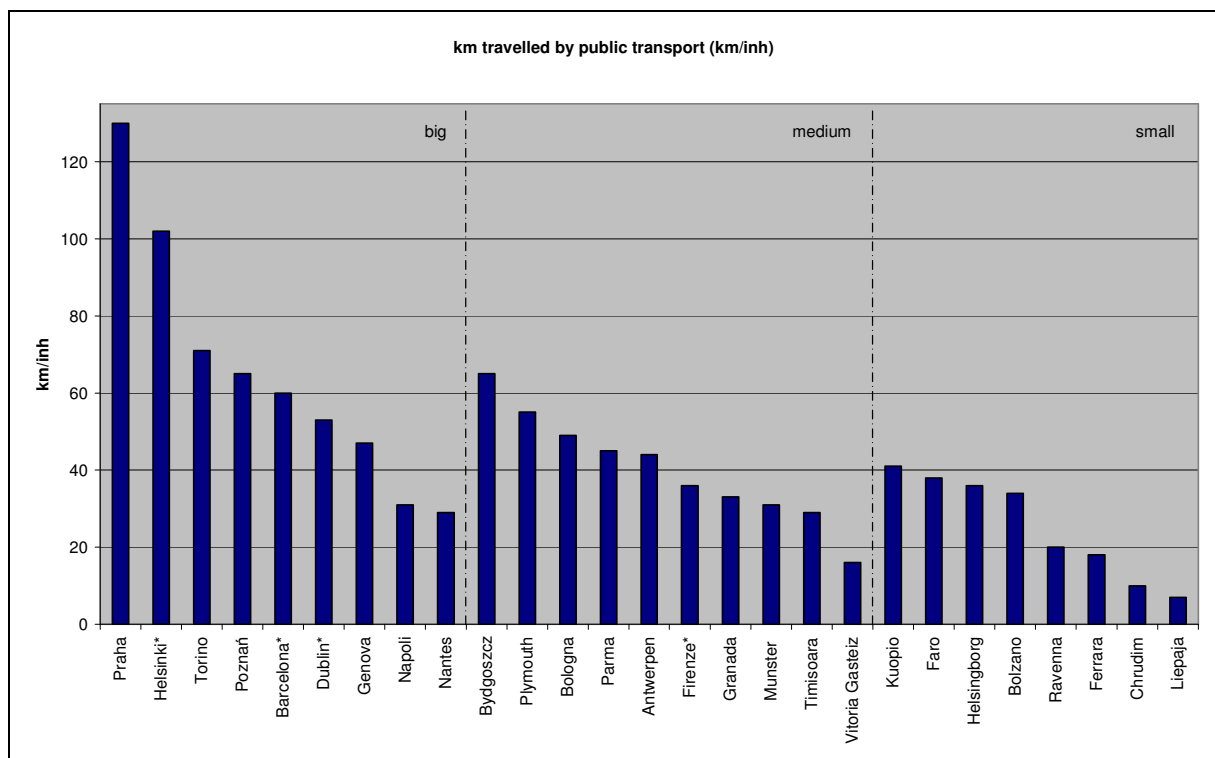
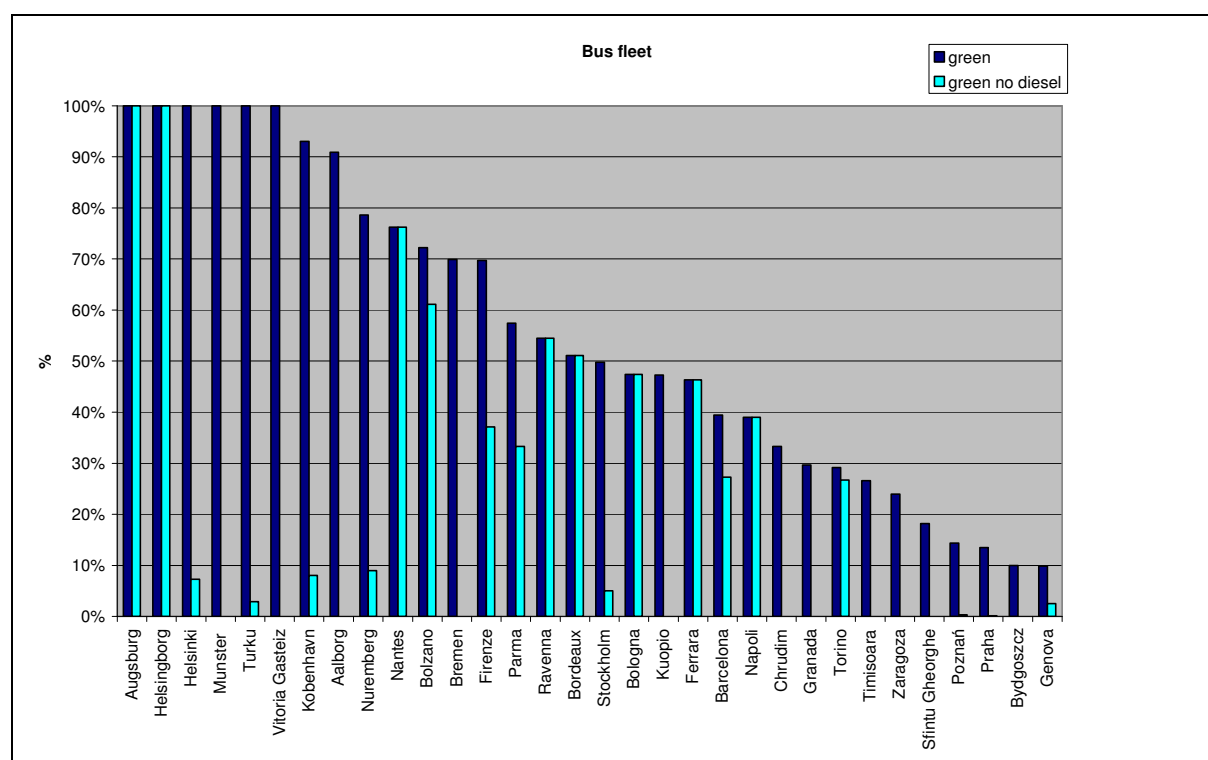


Figure 5.17: Bus fleet



The proportion of 'green' bus fleets (not including green diesel – see figure 5.17) is highest in Augsburg and Helsingborg (100%), in two French cities (Nantes and Bordeaux), and four Italian cities (Bologna, Bolzano, Parma, Ravenna).

Energy

Energy consumption patterns in European cities was ascertained through a set of indicators representing CO₂ emissions and targets, energy consumption, energy-saving and renewable energy-production technologies (district heating, solar thermal panels, solar photovoltaic panels), and green energy purchasing and energy consumption in public buildings.

CO₂ emissions data have been provided by 80% of cities. 28 cities (53%) calculated emissions as CO₂ equivalent, while 14 cities (26%) calculated CO₂ emissions only³⁷. Despite high data availability in recent years, CO₂ and CO₂ equivalent emissions data are characterised by high variability, due to the multiplicity of factors that can influence the calculation, including climate conditions, economic framework, and differences in methods of calculation. Therefore, the use of CO₂ per capita emissions as a primary indicator can be

³⁷ While CO₂ is the principal anthropogenic greenhouse gas that affects the Earth's radiative balance, there are various other greenhouse gases that have global warming potential (GWP). For this reason, the CO₂ equivalent could provide a more realistic picture of the impact cities have on the global climate. The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated GWP. As CO₂ and other greenhouse gas emissions are measured in millions of metric tons, the calculation of the indicator as ratio of total municipality's emissions per inhabitant lead to the use of tons per inhabitant (t/inh) as the unit of measure.

problematic. CO₂ emissions attributable to transportation show lower variability, as the set of influencing factors is reduced. CO₂ equivalent emissions (see Table 5.3) have the highest variability, ranging from 2,51 to 11,10 tons/inhabitants (t/inh). 12 cities have emissions below 5 t/inh, while 12 other cities are above 8 tons. Although there are no signs of a correlation between emissions and city size or geographic location, a positive relationship between high urban density and low emissions was observed.

Table 5.3: CO₂ equivalent and CO₂ emissions, trends and targets

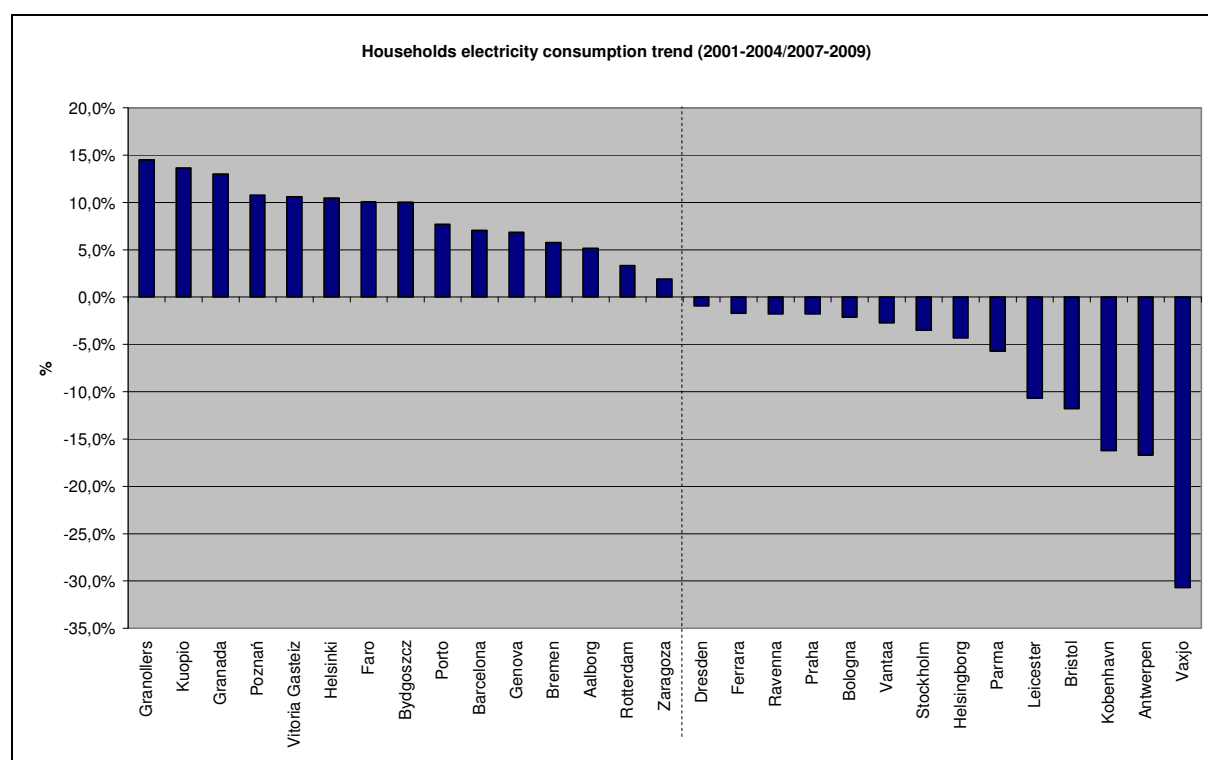
	CO2 emissions										
	year	CO2 eq	CO2 eq	CO2 eq	CO2 eq	year	CO2	CO2	CO2 var	CO2 var	reduction target
		t/inh	transport	var 2000	var 1990		t/inh	transport	2000	1990	
				%	%				%	%	description
Aalborg						2007	5,80	2,60	-5%	-25%	carbon neutral by 2050
Amsterdam	2006	6,60	2,20		12%						-40% 1990-2025
Antwerpen	2007	8,98	3,16	-2%							-20% 2005-2020
Augsburg	2007	7,60		-6%							-50% 1990-2030
Barcelona	2008	2,51	0,66								-20% 2008-2020
Bologna						2009	6,45	1,66	-4%	16%	-20% 2005-2020
Bolzano		9,70	3,00								< 2 t/inh before 2030
Bordeaux	2007	6,52	3,52								
Bremen						2005	10,13	2,32		-7%	-40% 1990-2020
Bristol	2008	5,40	1,05								-40% 2005-2020
Bydgoszcz	2009	10,07	1,92								-18,7% 2005-2020
Chrudim											
Dresden	2009	10,10	2,50	-5%	-34%						-50% 1987-2010
Dublin						2006	9,70	2,40			> -20% 2006-2020
Faro											
Ferrara											
Firenze						2005	6,94				-20% 2005-2020
Genova						2009	2,10	0,54	7%		-23,7% 2005-2020
Glasgow						2007	7,10	1,40			
Granada	2007	4,66	2,10								-20% 2007-2020
Granollers	2009	4,38		-28%	-20%						-20% 2005-2020
Helsingborg	2007	4,60	2,10	-45%	-64%						-85% 2005-2050
Helsinki	2009	5,40	1,20	-8%	-26%						> -20% 1990-2020
Knurow											
											-20% 2005-2015; carbon neutral by 2025
Kobenhavn	2010	4,70	0,90								-40% 1990-2020
Kuopio	2009	11,10	1,50	-15%	-13%						-40% 1990-2020
Leicester						2008	6,30	1,10		-22%	-50% 1990-2025
Liepaja											
Munster	2006	8,20	1,94		-10%						-40% 1990-2020
Nantes	2003	4,79	1,32		13%						-25% 1990-2025
Napoli											
Nuremberg	2008	7,40	1,90	-22%	-31%						-40% 1990-2020
											-50% 2007-2025?; carbon neutral by 2050
Odense						2007	8,80	2,64			
Oeiras	2007	4,35	1,93								
Parma	2009	10,95	2,46	44%	54%						-0,16%
Plymouth						2008	5,50	1,30			-50% 2007-2020
Porto						2008	5,60	2,00			-45% 2004-2020
											reduce annual emissions by 10-12% compared to 2002 or 2003
Poznań	2005	8,10	1,70	8%							
Praha	2009	7,62	1,27	1%							
Ravenna											-20% 2007-2020
Rotterdam						2010	7,70	1,80		5%	-50% 1990-2025
Sfintu Gheorghe											
Sheffield	2007	6,50	1,10								-30% 2005-2020; -60% 2005-2050
Stockholm	2005	4,00	1,30		-26%						-25% 2005-2015; carbon neutral by 2050
Timisoara											
Torino						2005	5,66	0,81		-13%	-41,9% 1990-2020
Turku	2007	9,35			-13%						-30% 1990-2020
Valjevo											
Vantaa	2009	6,60	1,80	2%	-6%						-20% 1990-2020
											-55% 1993-2015; carbon neutral by 2030
Vaxjo						2009	3,01	2,36	-16%	-34%	
Vitoria Gasteiz	2008	3,60	1,06								-25,7% 2006-2020
Vranje											
Zaragoza	2005	3,56	0,79								-15% 2005-2015

The availability of data which enables trends in CO₂ emissions to be tracked is low (16 cities reported from 2000 data, and 20 cities reported 1990 data). However, the available data shows that the majority of the cities able to provide this data are reducing their emissions. This is probably attributable to the focus that some cities dedicate to the issue of reducing emissions: municipalities with a strong commitment to environmental issues are more likely to be able to provide the trend data. Considering the year 1990 as a baseline, the variation ranges from +54% to -64%; 15 out of 20 cities have a trend of decreasing emissions. Cities that show a decrease in emissions are located in Northern and Western Europe, plus Torino and Granollers (Southern). Considering the year 2000 as a baseline, trends still show decreasing emissions, although this is less pronounced. Historical data on CO₂ emissions were not available for cities located in Eastern Europe, except for Prague and Poznań (year 2000).

Emissions reduction is a global target to combat climate change, and more precise reduction targets have been defined by the European Union. The EU's Climate Change 20-20-20 package, which aims to ensure that the EU will achieve its climate targets, is defined as a target of 20% reduction in greenhouse gas emissions by 2020. 13 cities (out of 39 respondents) have adopted this target; 6 of the 10 cities located in Northern Europe aim to become carbon neutral in the long term (2025-2050); 16 cities set a more ambitious target compared with the -20% (30-40% by 2020-2040). Eastern cities, with the exception of Bydgoszcz and Poznań, have yet to set targets.

Household electricity consumption data (see figure 5.18) was provided by 60% of participating cities. The amount of electricity consumed is extremely variable, ranging from 359-3,700 kWh/inh. High consumption levels were mainly observed in Northern and Western cities (eight cities, plus Porto, had consumption rates higher than 2,000 kWh/inh) while low consumption characterised Eastern and Southern cities.

Figure 5.18: Household electricity consumption trend



Of particular interest is the comparison between household electricity consumption's variation trends (from 2004 to 2009), which are increasing in Southern and Eastern Europe, and decreasing in Northern and Western Europe. Trying to interpret this trend is difficult as electricity consumption can be affected by a wide range of factors. Despite the general trend of increasing electricity consumption³⁸, city-specific trends in Northern and Western cities can be explained by a shift in heating technology, efficiency gains and rising prices³⁹.

With regard to district heating, data availability is 53% concerning connected inhabitants (see figure 5.19) and energy produced (see figure 5.20), and only 38% concerning district heating fueling. Therefore, district heating technology is widespread in Northern Europe: all the ten Northern cities involved have more than 60% of inhabitants connected. Northern cities have also the highest energy generation quantity per inhabitants, followed by Western and Eastern cities.

³⁸ According to IEA-OECD report 'Energy use in cities' (2008) the household electricity demand in cities is projected to grow at an average annual rate of 1.4% to 2030.

³⁹ As the European Environment Agency explains in 'Final electricity consumption by sector' 2011 report, 'in 2008, the household electricity consumption was increased by 1.8 % compared to 2007. However some countries such as Belgium (-8.6%), Portugal (-3.0 %), Sweden (-1.8 %), Slovakia (-1.54 %), Finland (-1.50%), Norway (-1.25%) and Germany (-0.43%) reduced their consumption as a result of a combination of mild winter weather and high electricity prices'.

District heating involves highly efficient energy production and distribution, especially when fuelled through clean energy sources (e.g. natural gas, biomass, geothermal). Four cities in Western Europe have district heating systems partially fuelled by green energy – primarily natural gas and biomass (24% in Augsburg) – although the number of inhabitants connected to these systems is not as high as in Northern cities. Nine of the 10 Northern cities which have the highest rate of connected inhabitants and the highest energy production per inhabitant fall below the threshold of 50% of oil and coal fuelled district heating. Conversely, coal fuels more than 50% of district heating in four cities (three Eastern cities and one Northern city), as does oil in one Eastern city (Vranje). Energy recovered from waste incineration covers the majority of municipal district heating fuelling in four cities (Barcelona, Bologna, Bolzano and Nantes), and this is becoming more widespread.

Figure 5.19: District heating connected inhabitants

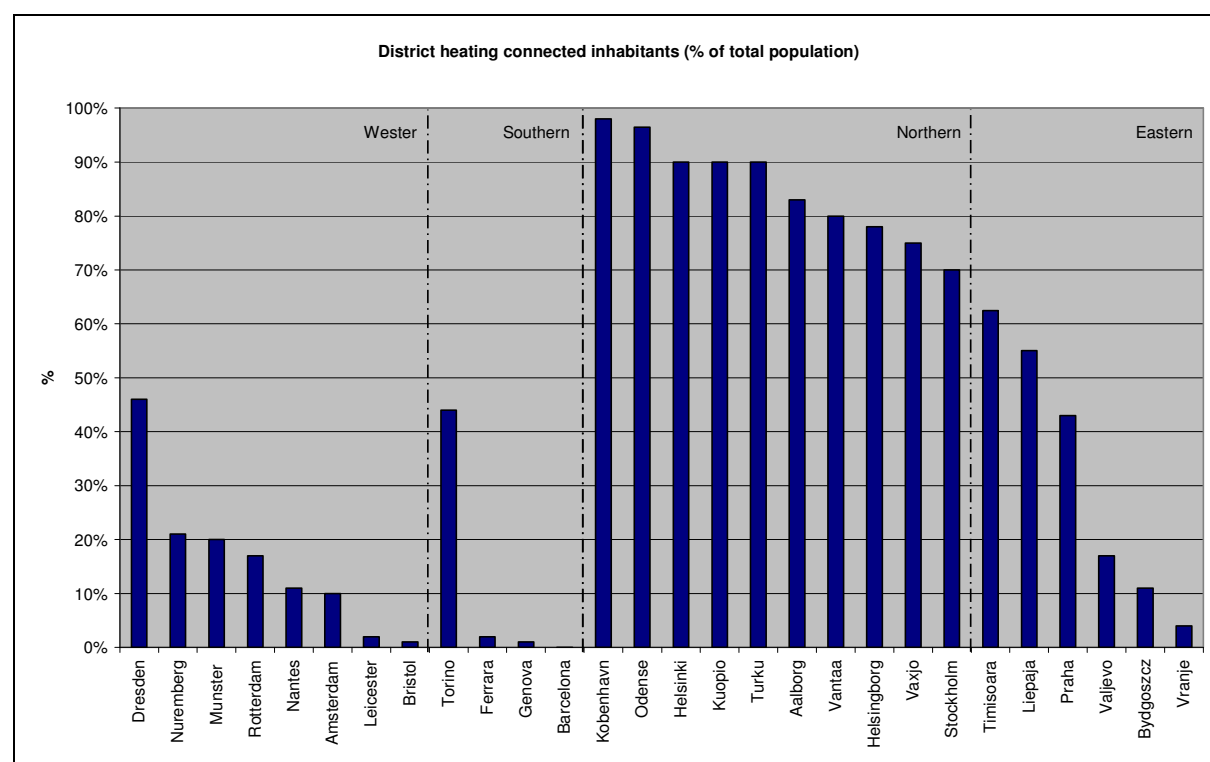
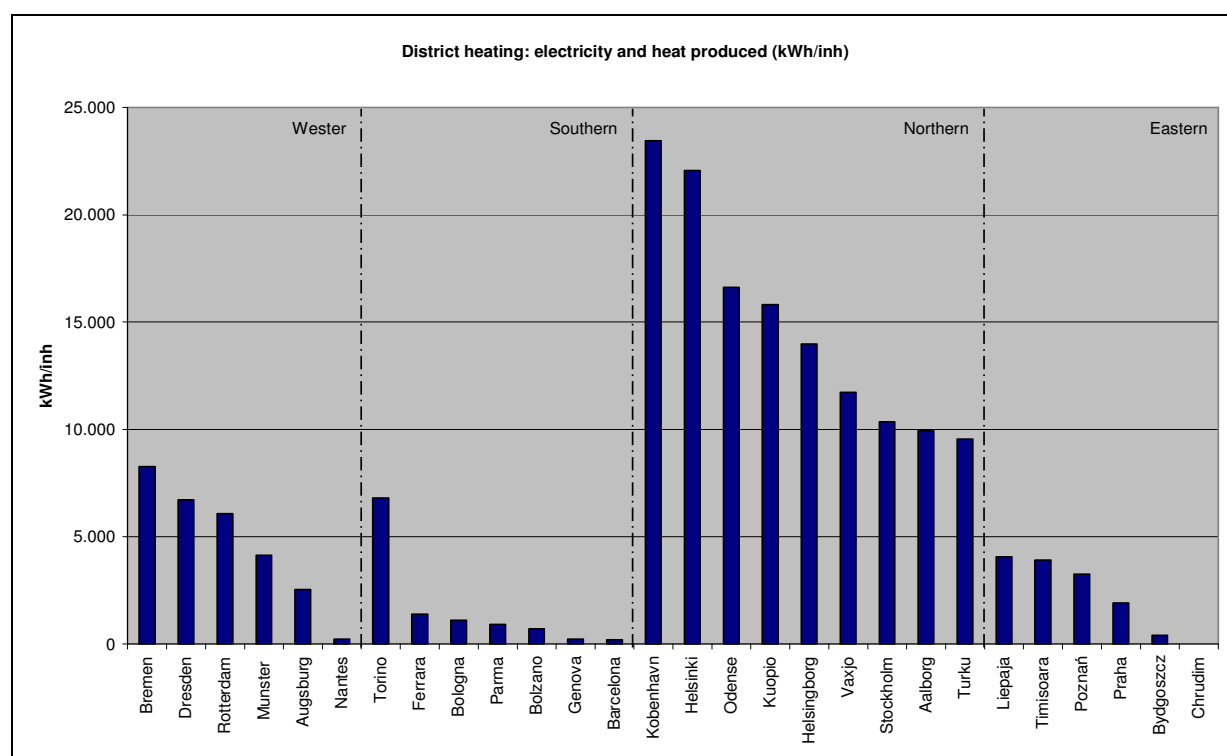
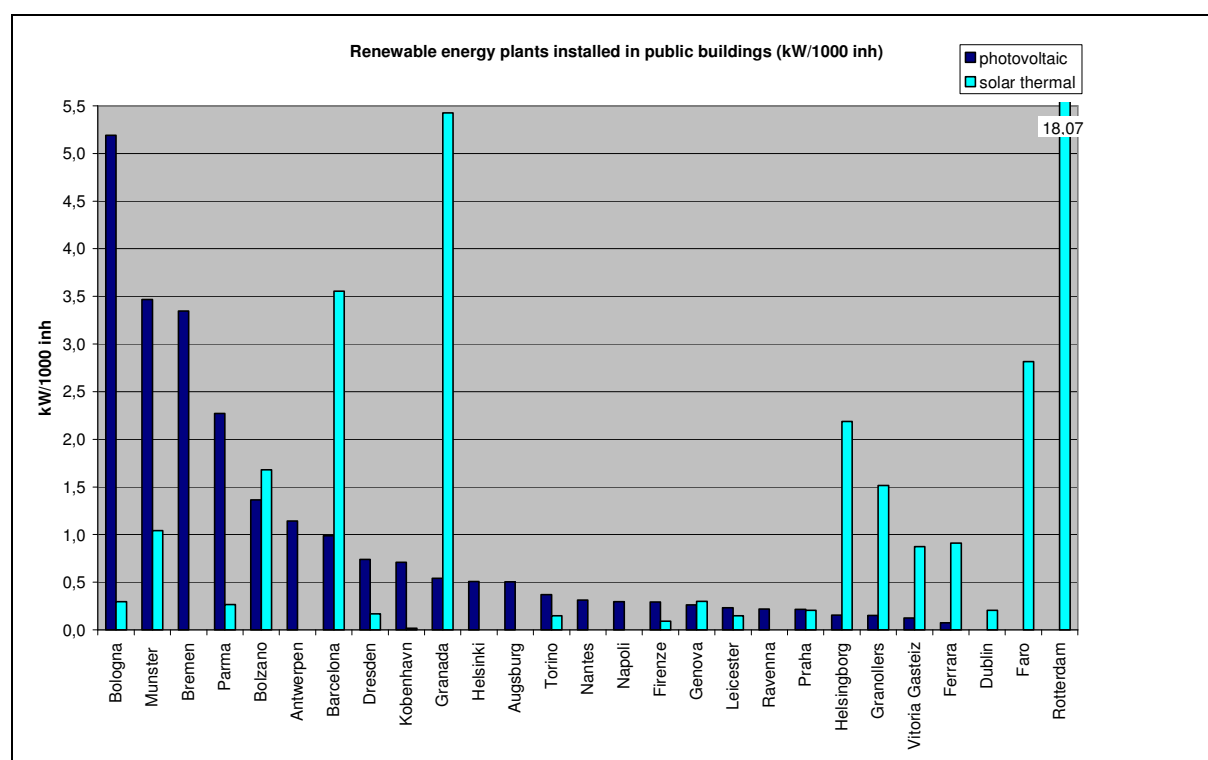


Figure 5.20: District heating: electricity and heat produced



There was low data availability for the data set on local governments' efforts to implement strategies to support sustainable energy policies, especially for public building monitoring. Monitoring of energy consumption in public buildings is systematic (more than 80%) in 12 cities – mainly located in Northern and Western Europe – and covers more than 50% of public buildings in 15 cities. Data relating to public buildings' consumption is commonly related to local authorities' eco-management strategies, whose implementation in many cities is still in the embryonic stage. Among the 15 cities monitoring more than 50% of public building's energy consumption, only six (Bydgoszcz, Helsinki, Copenhagen, Leicester, Stockholm, and Ferrara) have systematically implemented ISO 14001 or EMAS, while others have implemented environmental management schemes for public departments. In terms of green energy purchasing, in 13 cities more than 60% of purchased energy is green (mainly in Northern and Western Europe and Northern Italy – see figure 5.21).

Figure 5.21: Renewable energy plants installed in public buildings



Solar thermal plants were installed in 20 cities, mainly in Southern Europe, while 25 cities had photovoltaic plants, mainly in Southern and Western Europe. Considering both solar thermal and photovoltaics, Barcelona and Munster have installed the greatest amount.

Some medium and big cities in Southern Europe and Germany have installed significant amounts of solar power plants, including Rotterdam, Granada and Barcelona, each of which has installed more than 1,200kW of solar thermal power. Bologna, Bremen and Barcelona have installed significant amounts of photovoltaic power. These results aside, the proportion of solar thermal power installed is lower overall than for photovoltaic power. Solar power may perform better in Southern areas due to higher radiation. However, photovoltaic power is more popular in Western countries such as Germany, where feed-in tariffs and integrated energy and climate programmes have boosted photovoltaic plant installations, while mandatory requirements for new construction are sustaining the solar thermal sector⁴⁰.

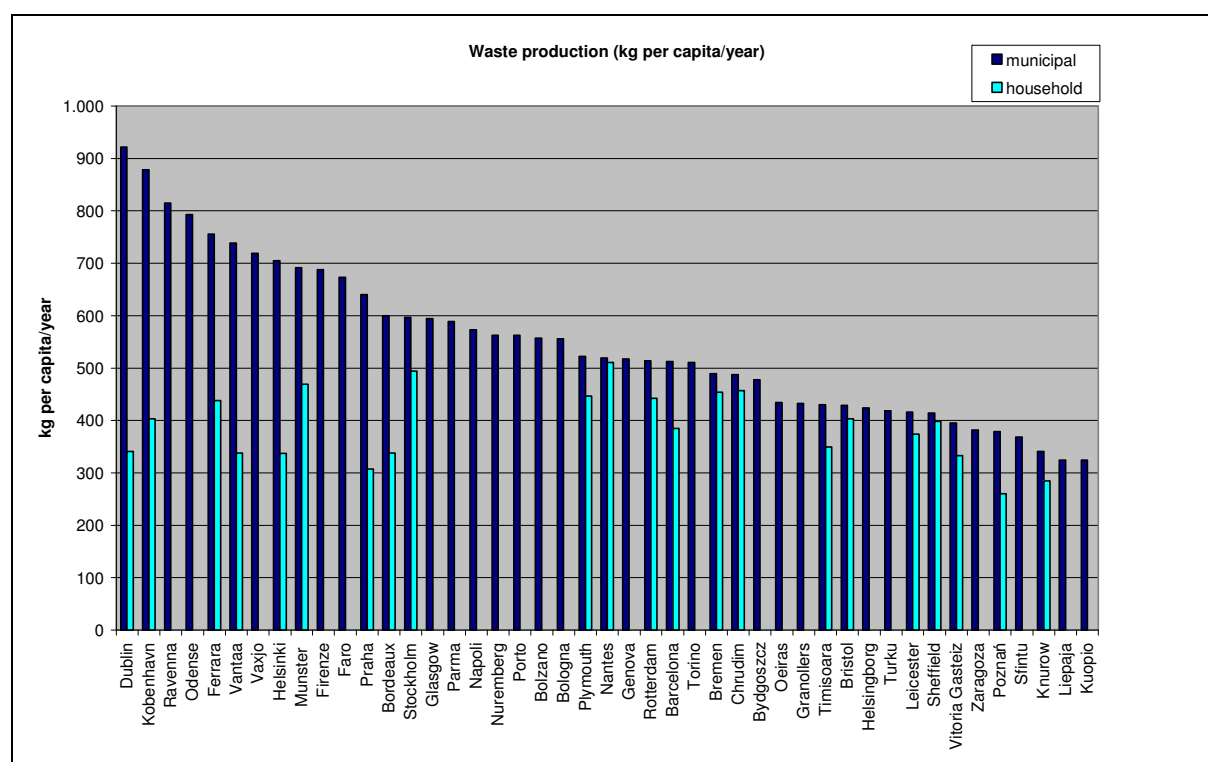
⁴⁰ According to the Renewables 2011, Global Status Report, 'Germany enjoyed financial new investment of \$6.7 billion in 2010, but this was dwarfed by its \$34.3 billion in small scale projects, mainly rooftop solar PV', moreover 'Bloomberg New Energy Finance (BNEF) estimates that 86% of the investment in small-scale solar took place in countries that have introduced feed-in tariffs. Germany, which continues to have the world's largest solar PV market, took the lead with a 57% global 36 investment share'.

Waste

Waste production, collection, treatment and disposal can be assessed at household level or municipal level. Municipal waste includes ‘waste from households, as well as other waste which, because of its nature or composition, is similar to waste from households’⁴¹. According to this definition, waste from commercial activities, such as restaurants and street cleaning, is included.

Data concerning waste was widely available. Total waste production data (see figure 5.22) was available at both household and municipal level in 22 cities out of 53. Only two cities – both located in Eastern Europe – did not provide any data about waste production. Municipal waste data was more readily available (40 cities) than household waste data (25 cities).

Figure 5.22: Waste production

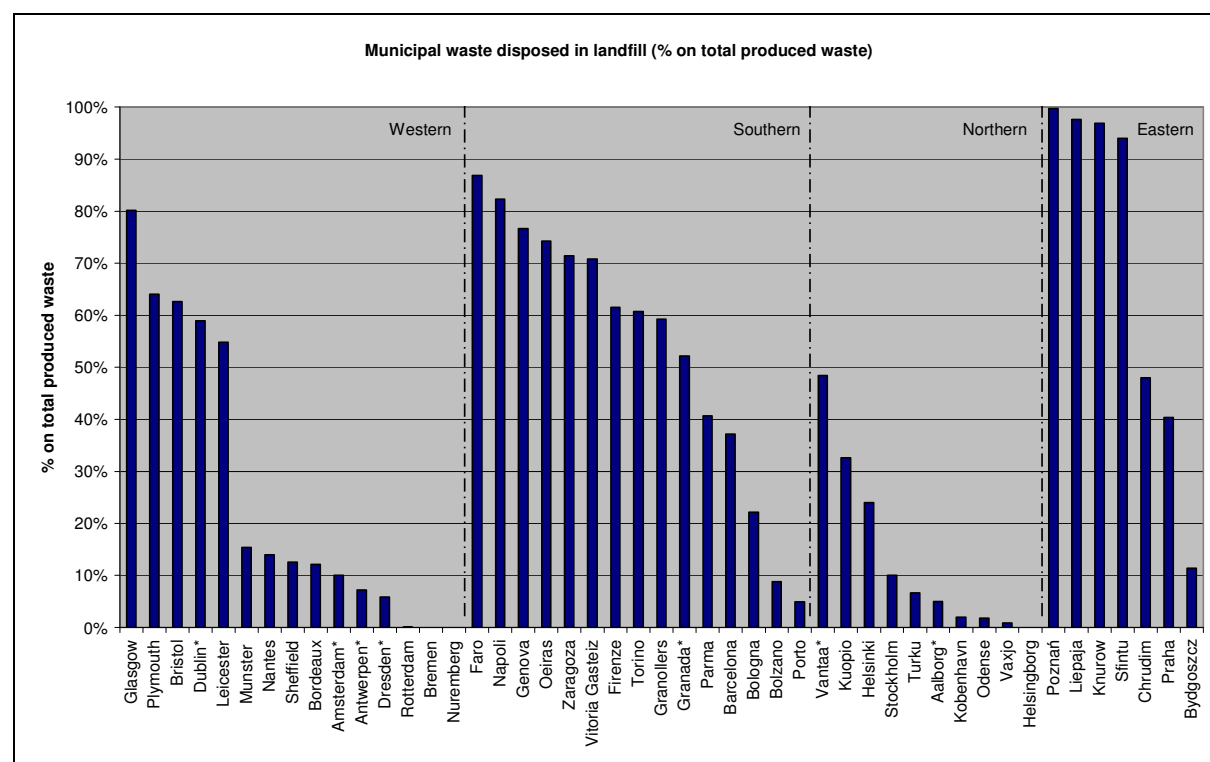


Even when not taking into consideration the outliers, municipal waste levels are highly variable, ranging from around 300 to 800kg/year, while household waste production ranges between 300 and 500kg/year. In some cases there is a substantial disparity between municipal and household waste quantities. Eastern cities do not appear in the higher part of the municipal waste production ranking and, excluding Prague, all remain below 500kg/year. Current European legislation encourage reducing waste disposal in landfill, and the ratio of waste disposed in landfill is therefore a sensitive indicator. Cities in Northern Europe,

⁴¹ Directive 1999/31/EC

Germany and the Netherlands generally have very low levels of municipal waste disposed of in landfill (see figure 5.23). Conversely, cities in Eastern Europe, United Kingdom and Southern Europe (apart from Bolzano and Porto) show a poor performance. Four out of seven Eastern cities stated that nearly all of their waste went to landfill.

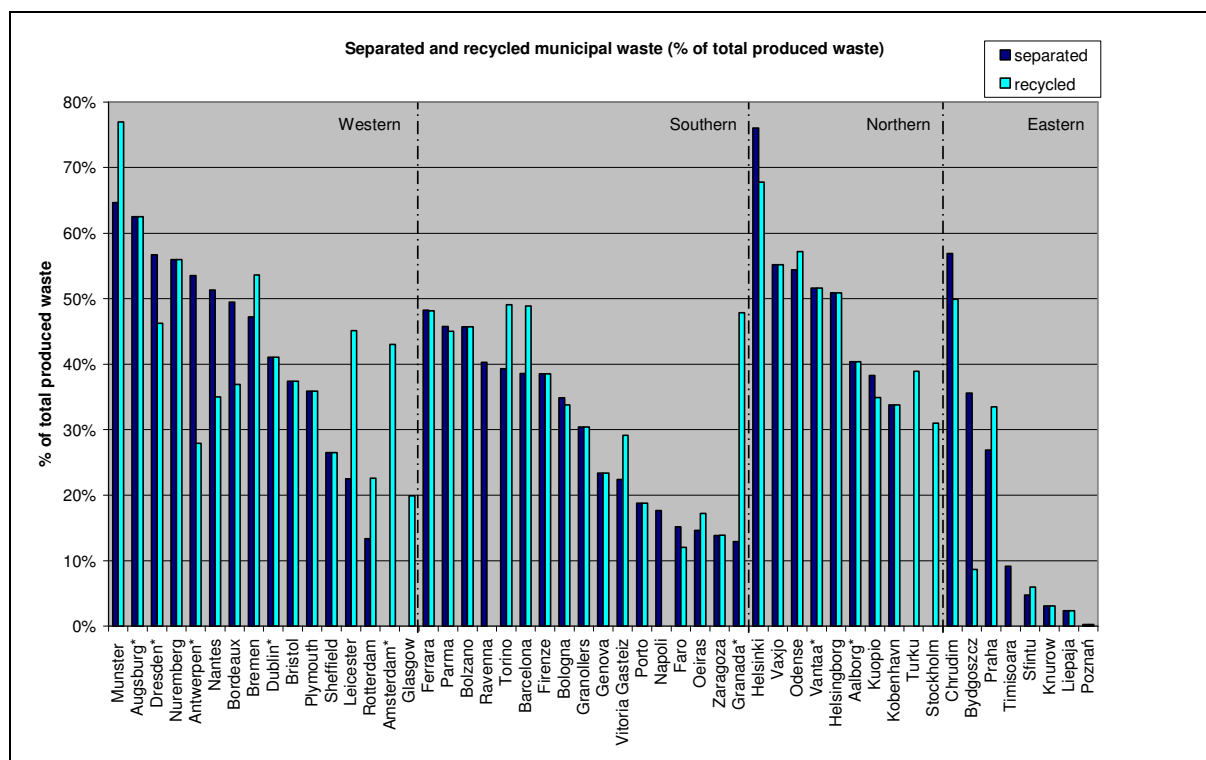
Figure 5.23: Municipal waste disposed in landfill



Waste not disposed of in landfill may be recycled or incinerated. In some cases, low levels (less than 15%) of landfill disposal are linked to high reliance (more than 50%) on incineration. In such cities, recycling rates range between 20% and 40% (Rotterdam, Porto, Copenhagen, Sheffield, Aalborg, Turku, Ferrara, Nantes and Bordeaux).

Cities showing the best performance (above 50%) in waste separate collection and recycling are mainly located in Northern Europe and Germany (see figure 5.24). Cities in the Netherlands and Belgium had values of 40-50%. Southern European cities had, on average, low performances, but Barcelona and cities in Northern Italy declared recycling rates of 30-50%. In Eastern cities recycling rates were generally very low. Eastern Europe countries are starting to face waste disposal problems and are under pressure to improve their legislation and infrastructures. In seven cities, a considerable variation - of more than 10% - was observed between levels of separately collected and recycled waste. Of these, in Munster, Leicester and Granada, recycling was more prevalent, while in Antwerp, Nantes, Bordeaux and Bydgoszcz, it was less so.

Figure 5.24: Separated and recycled municipal waste



Eco-management

Data related to eco-management was less freely available than that for other indicators. Data availability on Green Public Purchasing (GPP) ranged from 32% (organic food) to 62% (recycled paper), while information about the public fleet was provided for 70% of cities, and half of cities provided data about environmental management schemes developed by public authorities and public companies.

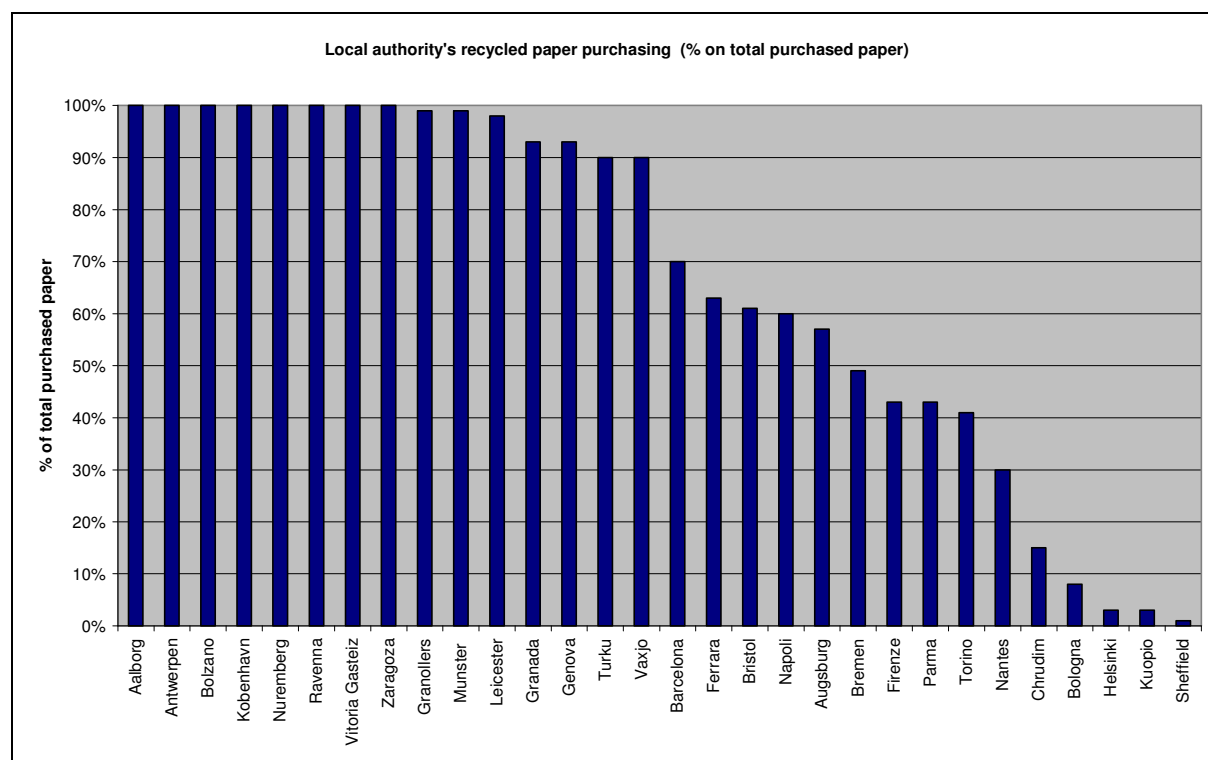
14 out of 53 cities had binding regulations in terms of GPP (most of these were Southern and Western cities – see table 5.4), while 18 did not. Eastern cities usually did not have binding regulations, and generally had low levels of GPP. ‘Green products’ showing the best take-up among local governments were photocopiers, printers and washing/cleaning products; respectively 20 and 18 cities (about 50% of cities with available data) stated that they bought these products always or usually. Aalborg and Kuopio (North), Bremen and Nantes (West) and Bolzano and Ferrara (South) appeared to be most committed to purchasing ‘green products’.

Table 5.4: Local governments' 'green products' purchasing

		<div><div></div><div></div><div></div><div></div><div></div></div> <div>alwaysusuallyhalfrarelynever</div>							
		Categories of products							
		policies	Photocopie r/printer	Washing/Ci eaning detergents	Building materials	Office furniture	School furniture	Food	toilet towels
M N Aalborg		binding							
B W Amsterdam									
M W Antwerpen		not binding							
M W Augsburg		binding							
B S Barcelona		binding							
M S Bologna		not binding							
S S Bolzano		binding							
M W Bordeaux									
B W Bremen		not binding							
M W Bristol									
M E Bydgoszcz									
S E Chrudim									
B W Dresden									
B W Dublin		not binding							
S S Faro									
S S Ferrara		binding							
M S Firenze		not binding							
B S Genova									
B W Glasgow									
M S Granada		binding							
S S Granollers		binding							
S N Helsingborg		not binding							
B N Helsinki		not binding							
S E Knurow									
B N Kobenhavn		binding							
S N Kuopio		not binding							
M W Leicester		binding							
S E Liepaja									
M W Munster		binding							
B W Nantes		binding							
B S Napoli									
B W Nuremberg		binding							
M N Odense									
M S Oeiras									
M S Parma		not binding							
M W Plymouth		not binding							
M S Porto									
B E Poznań									
B E Praha									
S S Ravenna		not binding							
B W Rotterdam		not binding							
S E Sfintu Gheorghe									
B W Sheffield		not binding							
B N Stockholm		binding							
M E Timisoara									
B S Torino		not binding							
M N Turku		not binding							
S E Valjevo									
M N Vantaa		not binding							
S N Vaxjo		not binding							
M S Vitoria Gasteiz		binding							
S E Vranje									
B S Zaragoza		not binding							

Use of recycled paper is increasing (see figure 5.25): 15 cities declared that they purchased more than 90% recycled paper, and in 38% of cities, 50% of purchased paper is recycled. These cities are equally distributed among Southern, Western and Northern regions.

Figure 5.25: Local governments' recycled paper purchasing



Organic food public procurement is difficult to measure in quantitative terms, although it was less widespread than for recycled paper, and was most concentrated in Southern cities. For example, in four Italian cities more than 70% of meals served in public canteens were partially or totally organic.

With regard to the public service fleet, green vehicles (natural gas, electric, hybrid and LPG powered) were less common in Southern and Northern cities (see figure 5.26). In nine cities more than 30% of the public fleet was 'green'; Augsburg, Helsingborg, Växjö and Bologna exceeded 60%.

Environmental certification of local government departments and public companies remains limited (see figure 5.27), and only a few local governments appeared strongly committed to doing this. Eight cities had developed environmental management schemes in almost all their departments, while another ten cities done so in only a few departments. Generally, ISO and EMAS certification systems had been adopted, but some cities had developed different

criteria (IMS, *ecoBUDGET*, WWF Green Offices etc.) that bore a stronger relation to the local territory or were able to provide a simplified environmental management system.

Figure 5.26: Local governments' green fleet

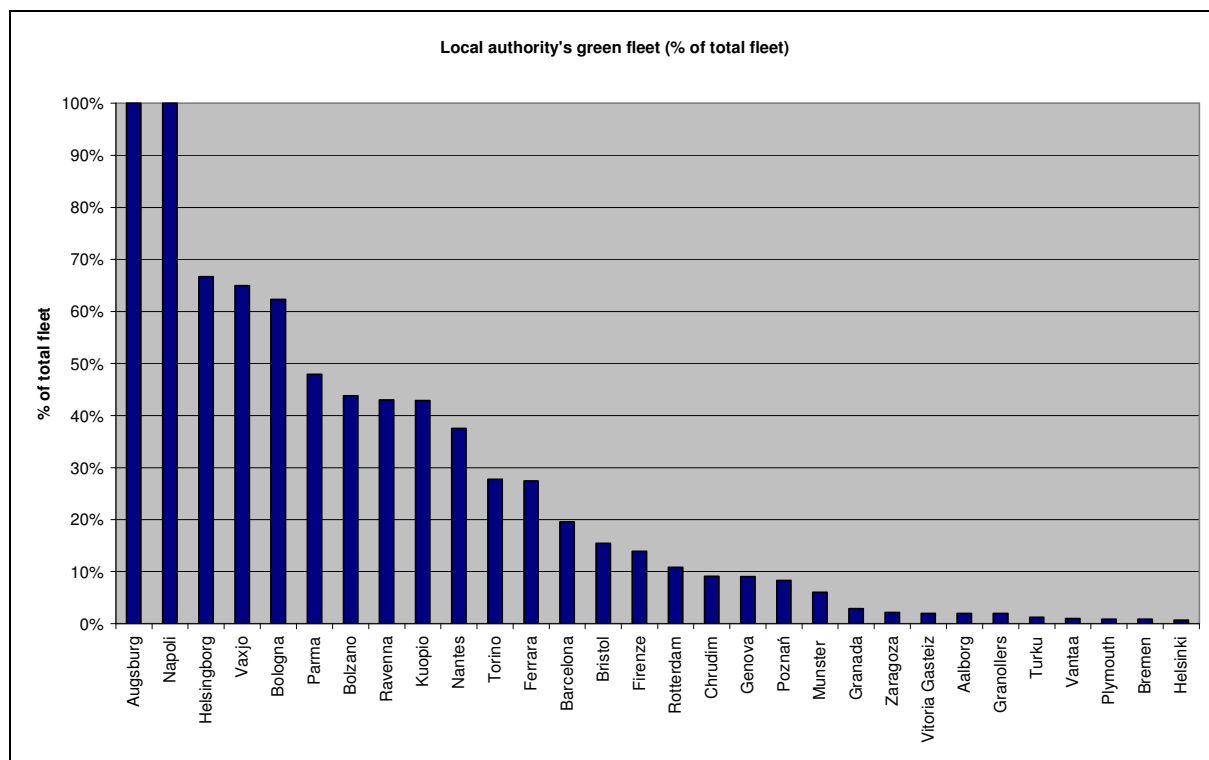
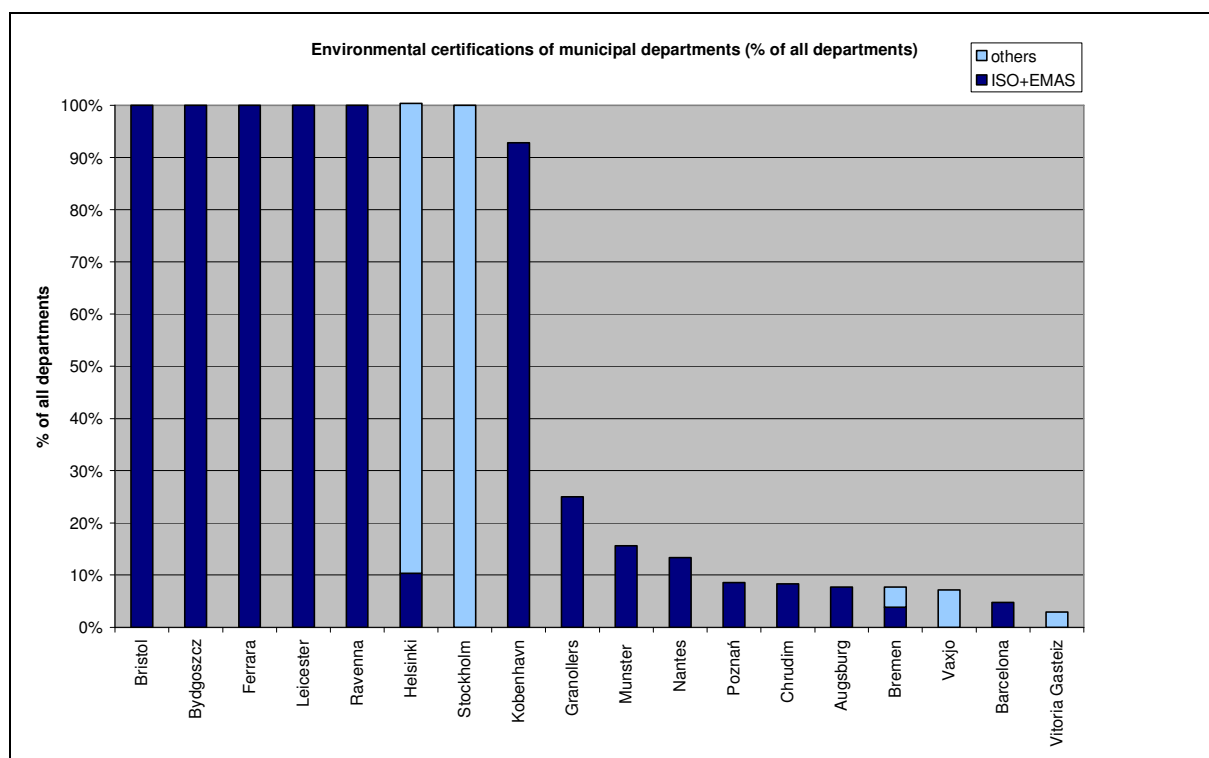


Figure 5.27: Environmental certifications of local government departments



Conclusions

It is clearly not easy to assess and benchmark complex issues and policies relating to the sustainability of the urban environment by reducing them to a set of quantitative indicators. However, it is possible to highlight some trends emerging from this application of UEE by European cities.

Air quality is improving throughout Europe, although levels of particulate matter (PM₁₀) and ozone (O₃) remain a matter for concern. PM₁₀ levels were above the EU limit value in many cities - mainly in Eastern and Southern Europe - but the situation was particularly critical in big Southern cities, where annual mean concentrations were above the prescribed limit. The Italian air quality situation was critical in terms of O₃: seven out of the nine Italian cities involved in the survey exceeded the limit value.

Waste water treatment and potable water supply is generally well implemented throughout Europe, although leakages in the potable water distribution network remain high in many cities: in 19 cities network leakages exceed 20% and in three cities they exceed 30%.

Urban design, especially with regard to green urban areas and cycling networks, has received a lot of attention in the last decades both from the planning and the communication perspective, as a key element in improving the quality of the urban environment. The availability of green urban areas is generally satisfactory, although there is a significant difference between Northern and Western cities, with the highest values of per capita green urban areas, and Eastern and Southern cities, with lower values. Cycling paths, lanes and cycling network per capita availability follow the same geographic distribution. It must be emphasised that values for these indicators are influenced by urban population density, with denser cities having a low value even if the absolute amount of green areas is the same. The compact city concept aims to achieve high inner-city densities, resulting in less area per person, reducing the urban sprawl and saving open space for nature.

Mobility remains a major concern in European urban areas, affecting both the environment and human health. Trips by car (rate to total trips) exceed 50% in 15 of the 36 cities that submitted data. Cities with low rates of car use rely on public transport (mainly Eastern cities) and active transportation such as cycling or walking (mainly Southern and Western cities). Particularly in denser urban areas, a positive relationship can be found between a well developed cycling network and the number of cycle trips.

Energy efficiency and energy production from renewable resources has gained a lot of attention in recent years. District heating is widespread in Northern cities and in some

Eastern cities, while Southern and Western cities lead the rankings for solar power installed in public buildings.

Municipal and household solid waste management have achieved a satisfactory level for almost all cities, mainly thanks to the implementation of the Directive 2008/98/EC. Eastern cities and a few Southern cities have low recycling rates and high reliance on landfill. Conversely, some cities, mainly located in Northern and Western regions, reached excellent separate collection rates: 12 cities exceeded 50% and 27 exceeded 35%; moreover 22 cities rely on landfill disposal for less than 30% of waste disposal.

Eco-management is an issue which has emerged recently in the field of urban sustainability. The number of local governments that adopted a systematic procedure of departmental certification for environmental management is still low. Even if the European Commission implemented EMAS, some local governments have adopted national or sector specific environmental management systems. Procurement of recycled paper and organic food, as well as green vehicle use, had no direct relationship with the use of environmental management certifications.

Section 6: Requirements for a resilient local process for sustainable development

Introduction

By disseminating information and nurturing understanding, Local Agenda 21 (LA21) forms a highly influential mechanism for local capacity building for sustainable development (Evans *et al*, 2005). More than 2600 local governments across Europe have signed the Aalborg Charter since its launch in 1994, and over 650 have signed the Aalborg Commitments, which list the key themes for sustainable urban development (Aalborg Charter, 2011). Signatories acknowledge that local governments are the drivers of sustainable development and that the work on the local processes for sustainable development requires a long-term commitment and vision among local governments. However, this work is seldom straightforward, but is rather a result of complex and intertwined processes, often requiring incremental and pragmatic action (Evans *et al*, 2005).

This section analyses data sampled from the explorative application of the Local Evaluation 21 (LE21) tool, which is derived from the Aalborg Charter. The aim is to identify local governments' areas of strength and the challenges they face in developing a resilient local process for sustainable development. The section concludes by reflecting on the development of LA21, the changes and progress that have occurred since its introduction, and how this may have affected local governments' processes for sustainable development.

Analysis of LE21 evaluation data

LE21 assesses local governments' processes for delivering sustainable development using eleven criteria to build an overall picture of local sustainable development processes. Each criterion relates directly to the Aalborg Charter and thus has a perceived relevance to achieving a resilient local process for sustainable development. Each criterion contains a number of sub-questions (see table 6.1). Assessment against the criteria produces scores between 0 and 100, with higher scores denoting a stronger performance. A criterion score around 25 means the local government has fulfilled the criterion's normative requirements to a low extent, while a score in the range of 50 denotes that they have been fulfilled to some extent, and a score around 75 denotes a high extent.

In the overall evaluation of local governments' processes for sustainable development - based on responses to the LE21 self-assessment questionnaire - each criterion is weighted according to its perceived relevance and importance in the LA21 process. For example, the

progress criterion, which assesses the level of new activities initiated or policy changes that have taken place as a result of the local process for sustainable development, is deemed to have the greatest relevance, therefore it has the highest weighting in the overall evaluation.

It must be emphasised that this analysis is based on local governments' performance in relation to each criterion; it thus does not consider the overall evaluation or the weight each criterion is assigned. The analysis focuses on areas of strength and challenges in relation to each criterion. In order to provide explanatory data for the LE21 aggregated criterion scores, the analysis also utilises raw LE21 data, which have been aggregated from the criterion sub-questions. This data was compiled into a database with the help of the Statistical Package for Social Sciences (SPSS), enabling an analysis of selected sub-questions.

Table 6.1 LE21 evaluation overview

Criterion	Sub questions
Local Relevance (4*)	What are the five main sustainable development (SD) concerns in your municipality? Has the local process for SD comprised a detailed assessment of local priority concerns? If YES, did the process comprise of (a) a detailed data analysis or (b) consultation with community representatives?
Political Commitment (8*)	Are the local priority concerns addressed by the local action plan (LAP) for SD? Is the municipality a signatory of the Aalborg Charter (AC)? If YES, to what extent does the AC guide the decision-making process of the local council? Is there a council decision to start the current local process for SD? Is there a council decision to adopt the LAP for SD? Does the mayor/chief executive have an active role in the local process for SD? Who is politically responsible for the local process for SD?
Resources (12*)	How does the local authority support the management of the local process for SD in terms of resources? Are these resources regularly provided? Are these resources sufficient to support the local process for SD? How does the local authority support the implementation of the LAP for SD in terms of resources? Are these (implementation) resources regularly provided? Are these resources sufficient to support the implementation of the LAP for SD? In which way, and to what extent, have external professionals been used in the last two years to assist the local process for SD? Do other actors contribute to the management of local process for SD in terms of resources Do other actors contribute resources to the implementation of the LAP for SD?
The Local Action Plan for Sustainable Development (4*)	Does your municipality have a LAP for SD? Does the LAP for SD contain a community-based multi stakeholder vision, strategic goals, quantitative targets, concrete measures/projects?
Implementation Management (8*)	To what extent is the LAP for SD being implemented? How often is the implementation of the LAP for SD evaluated? Do the results of the evaluation impact on the further implementation of the LAP for SD? Does your local authority use indicators to monitor progress towards the vision, goals and targets of the LAP for SD?
Participation (8*)	Is there an explicit strategy in your local authority for improving participation of citizens in decisions-making process? Which stakeholder organisations have been involved, and to what extent, in your local process for SD? What approaches have there been in the last two years to organize stakeholder participation in the local process for SD? What mechanisms are in place to feed the results of the local process for SD into local

	<p>policy-making?</p> <p>Have specific steps been taken involve women, disabled, ethnic minorities, youth/children, elderly people, unemployed and the economic sector?</p>
Partnership (8*)	<p>Does your local authority work for SD through partnerships?</p> <p>How many of these partnerships are established as formal organisations that require the partners to commit resources?</p> <p>How effective are do you feel that these partnerships are on promoting SD?</p> <p>Is the local authority networking on local SD issues with other local authorities?</p>
Awareness Raising and Training (8*)	<p>Does your local authority have a strategy for communicating SD issues?</p> <p>Does your local authority provide training and information on SD issues? If YES, what types?</p> <p>What methods does your local authority use in order to raise awareness of SD in the local community?</p>
Stability (8*)	<p>What is the timeframe of the local vision for SD?</p> <p>What is the implementation timeframe for your LAP for SD?</p> <p>Does the LAP contain goals/targets to be achieved within certain timeframes?</p> <p>For what period is financial support for your local process for SD secured?</p> <p>For what period is financial support for the implementation of the LAP for SD secured?</p>
Integrated Approach (12*)	<p>In the LAP for SD, is there a formal mechanism to assess the effects of individual projects on SD?</p> <p>Is there a formal mechanism to assess the effects of the municipal budget, land use plan, integrated urban development plan, economic promotion plan, environmental protection plan, transport plan, or other plans?</p> <p>To what extent has the local process for SD changed ways of working within the local authority?</p> <p>Are there mechanisms to ensure interdepartmental linkages within the administration?</p> <p>Who in the administration is responsible for the local process for SD?</p>
Progress (20*)	<p>What are the most significant new activities that have been initiated by the local process for SD?</p> <p>In which areas have the most significant policy changes taken place as a result of the local process for SD?</p>

* Score weight in the overall evaluation

The analysis clusters the results for each criterion into four regional groups⁴²: Northern Europe; Western Europe; Eastern Europe and Southern Europe. The purpose of the groupings is not to display regional differences, but to structure the analytical process and to simplify the presentation of results at key points. The regional groups have no political, legal, cultural, policy or economic coherence and there is no intention to ascribe such characteristics to them.

The performance of each regional group is calculated by aggregating the total scores of all local governments within the group, and the mean score is found by dividing this by the total number of local governments in the group. The result is an average criterion score for each regional group.

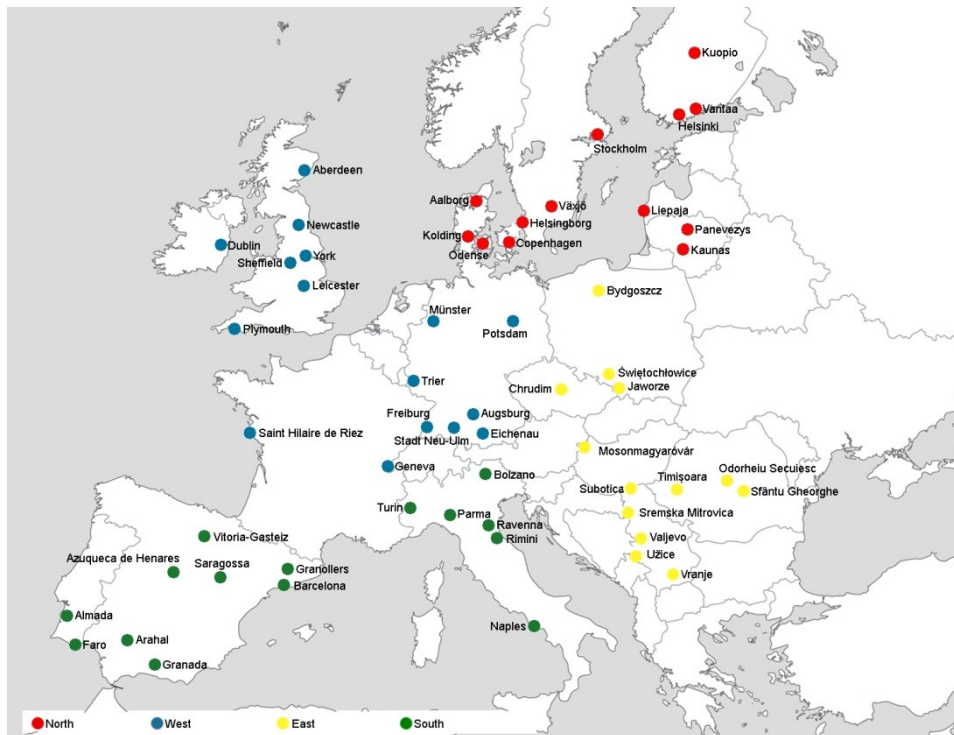
⁴² The presentation of city data according to four European regions follows the approach adopted in 'Governing Sustainable Cities' (Evans *et al*, 2005). The book reported on the findings of the DISCUS (Developing Institutional and Social Capacities for Urban Sustainability) research programme. The DISCUS research programme was a 'successor' of the LASALA (Local Authorities Self-Assessment of Local Agenda) project, which developed the 'original' version of LE21 tool.

Table 6.2 List of local governments that applied LE21

Northern Europe	Eastern Europe
<ol style="list-style-type: none"> 1. Aalborg, Denmark 2. Copenhagen, Denmark 3. Helsingborg, Sweden 4. Helsinki, Finland 5. Kaunas, Lithuania 6. Kolding, Denmark 7. Kuopio, Finland 8. Liepaja, Latvia 9. Odense, Denmark 10. Panevezys, Lithuania 11. Stockholm, Sweden 12. Vantaa, Finland 13. Växjö, Sweden 	<ol style="list-style-type: none"> 1. Bydgoszcz, Poland 2. Chrudim, Czech Republic 3. Jaworze, Poland 4. Mosonmagyaróvár, Hungary 5. Odorheiu Secuiesc, Romania 6. Sfântu Gheorghe, Romania 7. Sremska Mitrovica, Serbia 8. Subotica, Serbia 9. Świętochłowice, Poland 10. Timisoara, Romania 11. Užice, Serbia 12. Valjevo, Serbia 13. Vranje, Serbia
Western Europe	Southern Europe
<ol style="list-style-type: none"> 1. Aberdeen, United Kingdom 2. Augsburg, Germany 3. Dublin, Ireland 4. Eichenau, Germany 5. Freiburg, Germany 6. Geneva, Switzerland 7. Leicester, United Kingdom 8. Münster, Germany 9. Newcastle, United Kingdom 10. Plymouth, United Kingdom 11. Potsdam, Germany 12. Saint Hilaire de Riez, France 13. Sheffield, United Kingdom 14. Stadt Neu-Ulm, Germany 15. Trier, Germany 16. York, United Kingdom 	<ol style="list-style-type: none"> 1. Almada, Portugal 2. Arahall, Spain 3. Azuqueca de Henares, Spain 4. Barcelona, Spain 5. Bolzano, Italy 6. Faro, Portugal 7. Granada, Spain 8. Granollers, Spain 9. Naples, Italy 10. Parma, Italy 11. Ravenna, Italy 12. Rimini, Italy 13. Saragossa, Spain 14. Turin, Italy 15. Vitoria-Gasteiz, Spain

The 57 local governments that took part in the explorative application of LE21 represent 18 different European countries. The Northern European group comprises 13 local governments, representing Denmark, Finland, Latvia, Lithuania and Sweden. The Western Europe group consists of 16 local governments, representing Germany, France, Ireland, Switzerland and United Kingdom, whilst the Eastern Europe group consists of 13 local governments, representing Czech Republic, Hungary, Poland, Serbia and Romania. The Southern Europe group comprises 15 local governments that represent Italy, Portugal and Spain. Although the number of local governments in each regional group is similar, the explorative application of LE21 resulted in a skewed selection of local governments. The majority (66%) of the local governments that comprise the Northern, the Western and the Southern groups have more than 100,000 inhabitants, whilst most (77%) of the local government that comprise the Eastern European group have less than 100,000 inhabitants. This is not optimal and may ultimately affect the assessment of local governments' areas of strengths and challenges, as differences between the Eastern group and the other groups may not only derive from contextual differences but also from structural differences between local governments with different population sizes.

Figure 6.1 Map of local governments that applied LE21



In order to structure the analytical process and simplify the presentation of results, the analysis will display LE21 results along three themes. The first theme, *'Normative conditions for a resilient process for sustainable development'*, encompasses six criteria: *'Political Commitment'*, *'Local Action Plan for Sustainable Development'*, *'Stability'*, *'Resources'*, *'Implementation Management'* and *'Local Relevance'*. The intention is to assess local governments' contextual conditions against the normative conditions required for a resilient local process for sustainable development. The first theme therefore considers the following issues:

- Whether the local process been properly acknowledged and legitimised by the local political system;
- Whether a local action plan for sustainable development is produced and contains short-term actions and long-term objectives;
- Whether local governments are sufficiently committed through providing financial stability and sufficient resources for the management and the work on the local process;
- Whether local governments are efficiently implementing the local action plan for sustainable development;
- Whether the local process is relevant enough and addressing the main local priority concerns for sustainable development.

The second theme, '*Normative governance aspects for the local process for sustainable development*', consists of three criteria: '*Participation*', '*Partnership*' and '*Awareness Raising and Training*'. The intention is to assess local governments' normative requirements for governing the local process for sustainable development:

- Have local governments managed to integrate local stakeholders' perspectives into the local process, and thus legitimize the local process?
- Are local governments active and efficient enough in collaborating via networking with various international or national partners on issues related to the local process for sustainable development?
- Have local governments managed to provide, via training and awareness raising, a relevant understanding and knowledge of sustainable development issues among local government employees and stakeholders involved in the local process for sustainable development?

The third theme, '*Expected areas of progress*', includes two indices: '*Integrated approach*' and '*Progress*'. The intention is to assess:

- Whether the local governments have managed to mainstream and integrate the local process for sustainable development in local governments' plans, strategies and actions;
- The outcome of the local process: the level of new activities initiated or policy changes that have taken place as a result of the local process for sustainable development.

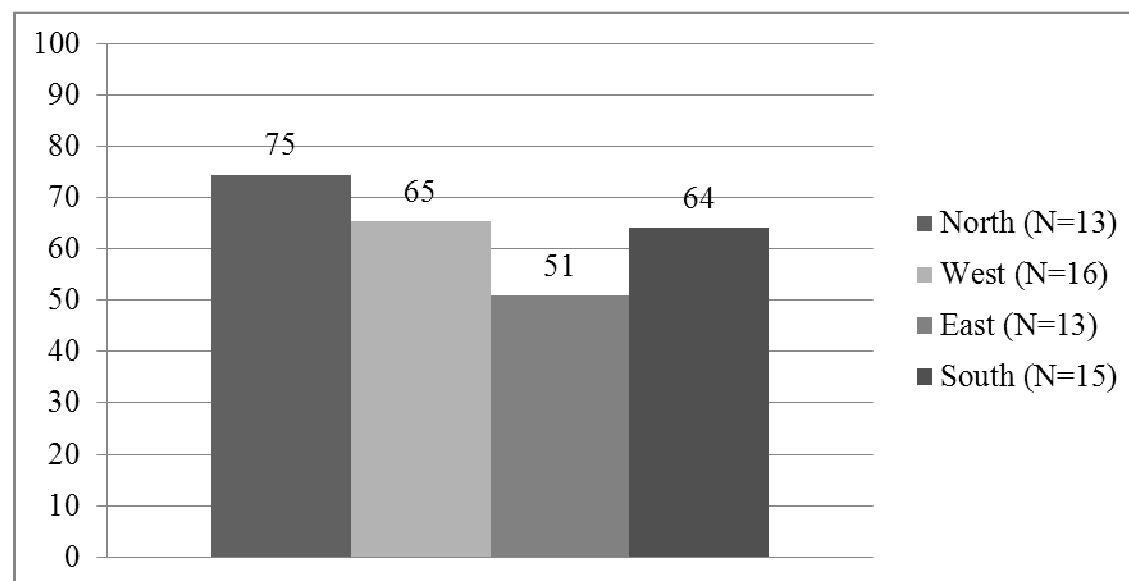
Normative conditions for a resilient local process for sustainable development

The importance of a local process for sustainable development has been acknowledged within most local governments' political systems, with 90% of the local governments that applied LE21 stating that there had been a local council decision to start the local process for sustainable development. However, only 77% reported that they had adopted an action plan for sustainable development. 92% of Northern group members have ratified both a council decision and an action plan. Western and Southern local governments have shown less commitment, with 73% of Western and 69% of Southern local governments having adopted an action plan, even though over 90% started their local process for sustainable development over a decade ago. Eastern local governments show a similar pattern to the Western and Southern local governments, although their local processes have mostly been initiated in more recent years.

The majority of the Northern (84%), Western (60%) and Southern (92%) local governments are signatories of the Aalborg Charter, and in most Northern and Southern local

governments, the Charter guides to some extent the decision-making process of the local government. In most Western local governments the Charter appears to have only a marginal effect on the decision-making process. Among the Eastern local governments the Aalborg Charter and the subsequent Commitments are less well known, as are also the principles of sustainable development. Accordingly, the overwhelming majority (92%) of the Eastern local governments are not signatories of the Aalborg Commitments.

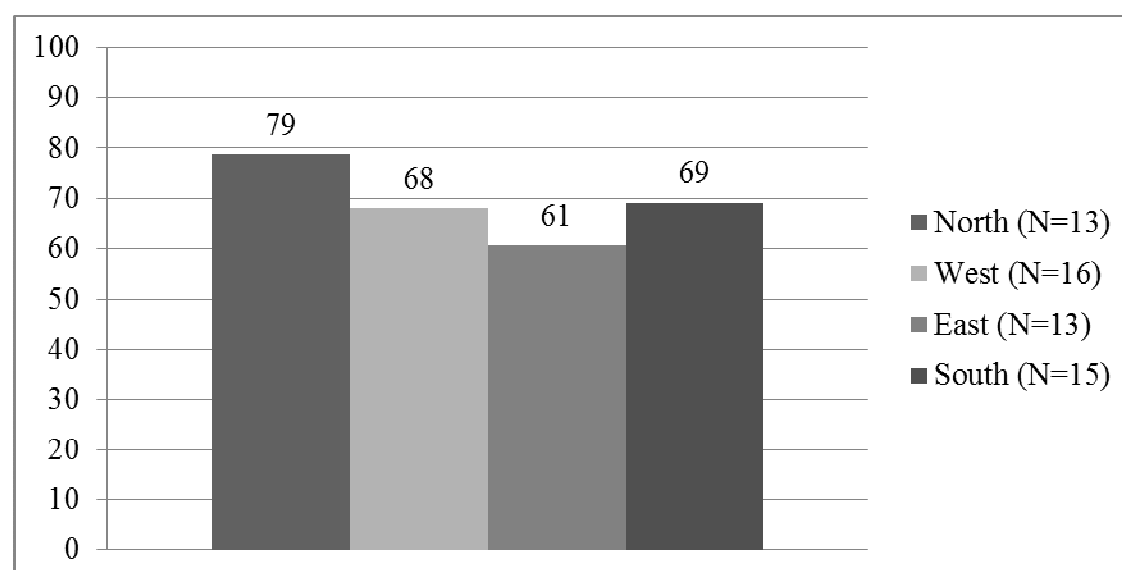
Figure 6.2 Political commitment scores



Political responsibility for the local process for sustainable development has normally been entrusted to a council committee in Northern and Western local governments, while the mayor usually has this responsibility in Eastern and Southern local governments. Especially among Eastern local governments, the mayor has an active role in the local process for sustainable development, whereas in other parts of Europe the mayor has less influence. Combining these elements of 'political commitment', it appears that Northern local governments demonstrate a higher political commitment towards the local process for sustainable development than the other regions.

While 77% of local governments have both produced and adopted a local action plan for sustainable development, 13% reported that they are in the process of producing one. Almost all Northern local governments (92%) had produced an action plan, as had the majority of the Western (73%), Eastern (67%) Southern (71%) group members.

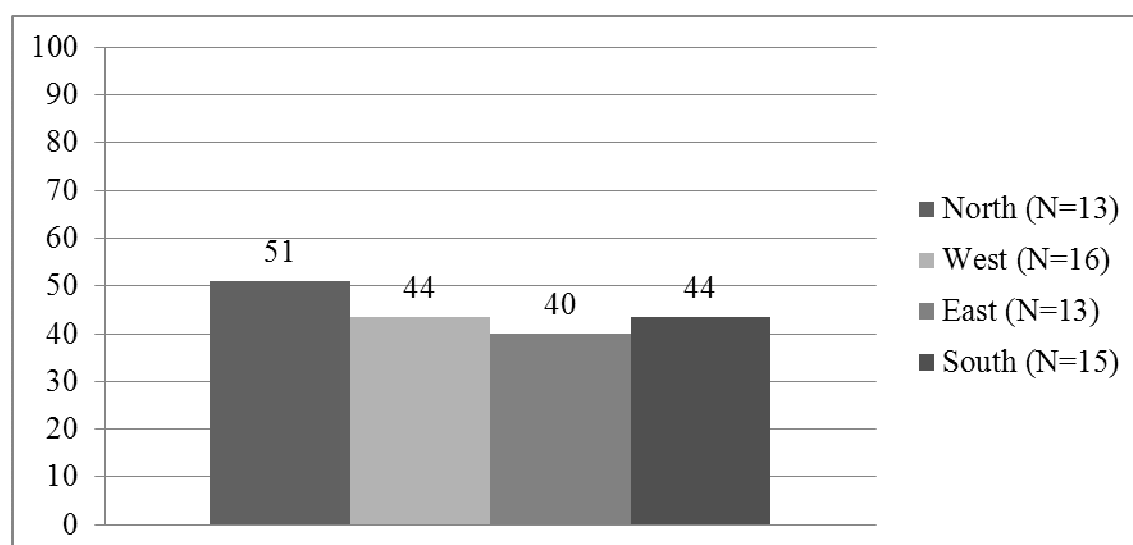
Figure 6.3 Local action plan for sustainable development scores



The majority of local governments have long timeframes for both their local vision of sustainable development and for the implementation of their local action plan. Most local government action plans have both short-term goals, to be achieved in one to three years, and long-term goals, to be realised within four to ten years. However, the longevity of the local process for sustainable development is not always reflected from a financial point of view; a number of Western (40%) and Eastern (50%) local governments have only secured financial support for a year to implement the local action plan. Northern (54%) and Southern (61%) local governments have greater financial stability, having secured financial support for two years or more. 33% of Western and Eastern local governments had the same level of financial stability. However, some local governments did not provide an answer to this particular question, especially among the Western (27%) and Southern (23%) groups.

The findings indicate that local governments do not offer a stable long-term context for the local process for sustainable development, in terms of the resources allocated to delivering action plans. The majority of local governments, especially in the Eastern group, are unable to demonstrate a stable context for the local process, and accordingly their scores are low.

Figure 6.4 Stability scores



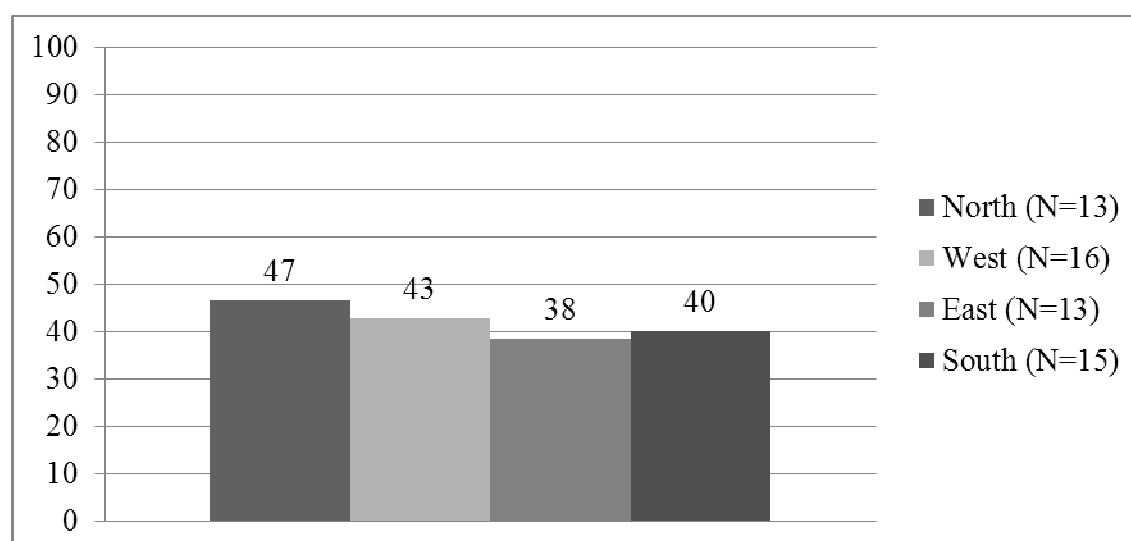
The management of the local process for sustainable development is generally supported in terms of various resources, such as specifically employed staff, time allocations from regular staff, budget allocation and in-kind support, although the majority of the Eastern local governments have not employed specific staff for the local process. Most local governments report that the resources provided are sufficient only *'to some extent'*.

Resources are provided for the management of the local process for sustainable development on a regular basis among only 46% of Northern local governments, although management usually involves support from other actors. In North Europe the private sector and local organisations and institutions support the process to some extent, while in Western, Eastern and Southern parts of Europe, regional or national government contributes to the local process. Among Eastern and Southern local governments the European Union supports *'to some extent'* the local process for sustainable development. The Eastern local governments are also aided to some extent by international organisations.

External professionals have assisted to the local process for sustainable development in the last two years, especially by providing expert advice on specific topics. However, local governments have tended not to use experts to facilitate stakeholder sessions or as on-going consultants in the local process, except in a few Eastern and Southern cases.

It appears that, while local governments provide various resources for both the management of the local process for sustainable development and for the implementation of the local action plan, local governments are not providing these resources regularly or sufficiently. As a result, most local governments do not score highly on this criterion.

Figure 6.5 Resource scores

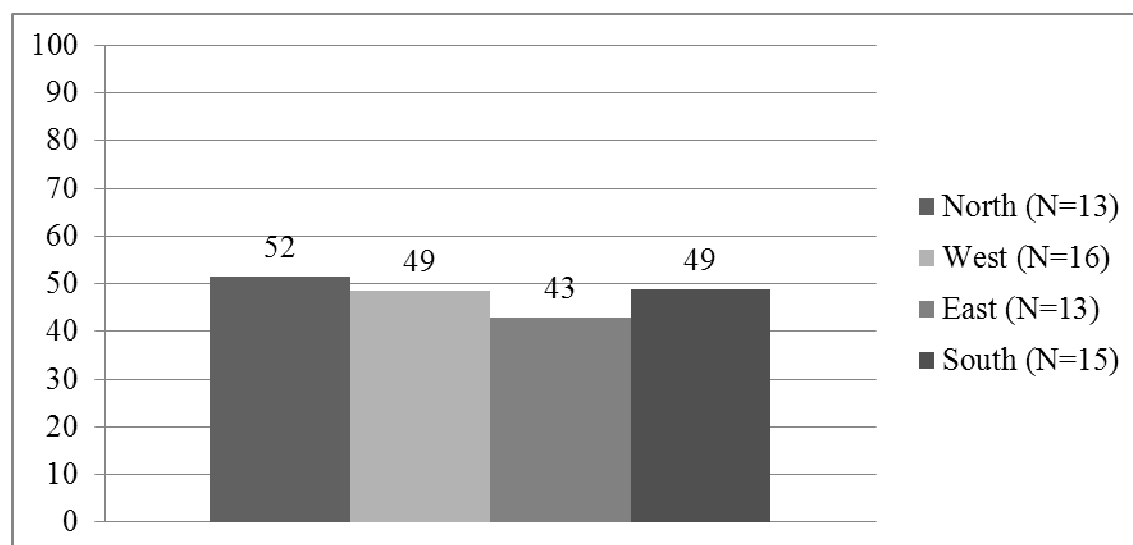


There are differences between regional groups in the extent to which the local action plan is being implemented. While most Northern (69%) and Southern (54%) local governments implement the local action plan to a '*high extent*', most Western (73%) and Eastern (58%) local governments implement the action plan to '*some extent*', with only a small number of Western (13%) and Eastern (8%) local governments reporting high implementation.

The implementation of local action plans for sustainable development is regularly evaluated by local governments. Local governments review their implementation either every year or every two to four years. While one third of Eastern local governments did not respond to this question, 42% of the Eastern group reported evaluating implementation annually. In most cases the results of evaluation do have an impact on future implementation of local action plans. This is true for 93% of both Northern and Southern group members.

In order to monitor progress towards the visions, the goals and the targets of the local action plan for sustainable development, 83% of local governments use indicators. The majority (91%) use locally-based indicators (and all of Northern and Western local governments do so). 68% also utilise nationally developed indicators, and this is especially common among Western local governments (83%). 8 % utilises European Common Indicators. European Common Indicators are mainly used among Southern (73%), Eastern (67%) and Northern local governments (42%), but few Western ones do so (8%). Few local governments (16%) use global level indicators.

Figure 6.6 Implementation management scores

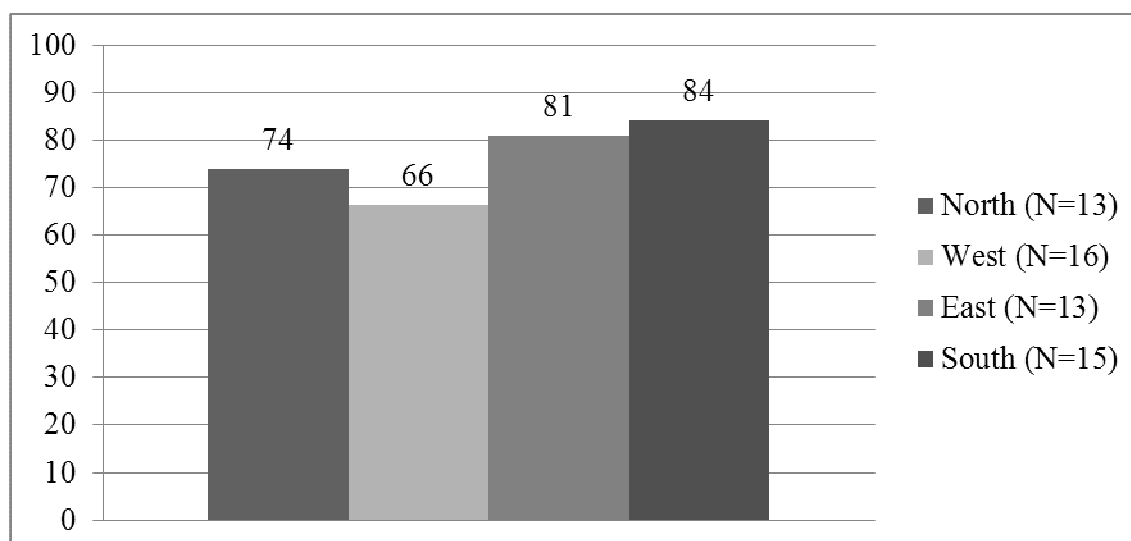


The majority of all local governments (85%) have included in the local process for sustainable development a detailed assessment of the local priority concerns. Generally this is achieved via both a detailed data analysis (96%) and consultation with community representatives (90%). The main local priority concerns differ between the regional groups of local governments. The majority of the Northern local governments consider eco-efficiency, especially energy, but also waste and pollution, along with a viable local economy and global climate protection as their main concerns. These concerns are also relevant for a majority of the Western local governments, with the exception of waste and pollution. Western local governments also rank social equity, in particular social cohesion, as well as urban management and issues around mobility as major concerns. Eastern local governments list two local priority concerns above everything else: the local economy (92%) and eco-efficiency in the form of waste and pollution (75%). Southern local governments list mobility (92%) and eco-efficiency (62%), in particular energy and waste and pollution.

Most local governments state that they are addressing their local priority concerns. This is especially so for Southern local governments, of which 93% report that they address their local priority concerns to a '*high extent*'. 58% of Eastern local governments report that they address their local priority concerns to a '*high extent*', while in Northern and Western local governments the percentages are lower (46% and 40% respectively).

From a '*local relevance*' perspective, therefore, local governments generally perform to the expected requirements for a resilient local process. In fact, all local government regional groups apart from Western ones meet these to a high extent, having both identified and addressed local priority concerns.

Figure 6.7 Local relevance scores



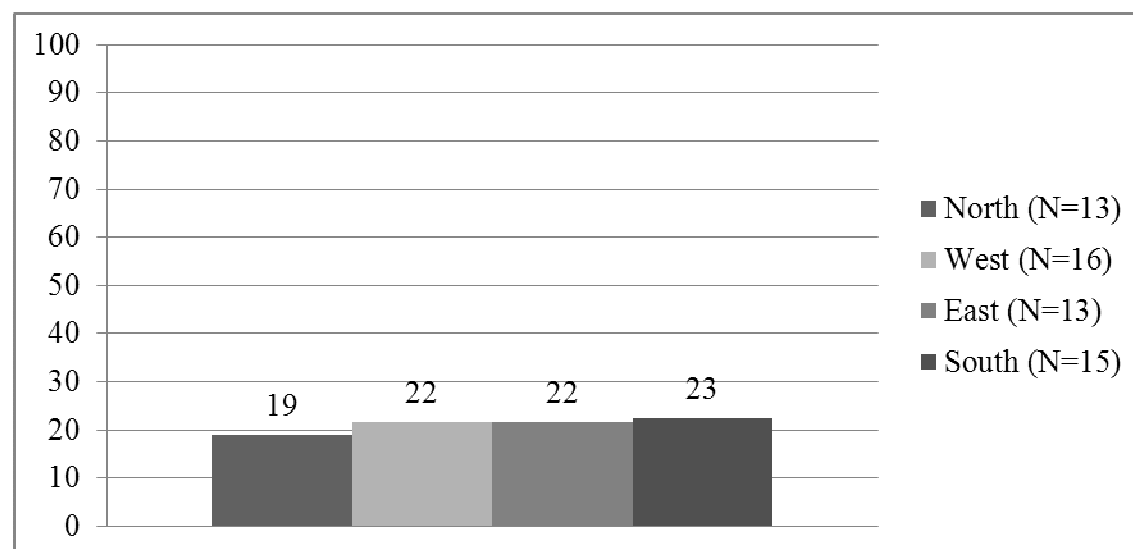
Normative governance aspects for the local process for sustainable development

The main actors in the local process include local politicians and officers, public services (health, police, local transport) and utilities (energy, water, waste services). Other stakeholders are also sometimes involved. Environmental organisations are involved in the local process *'to a high extent'*. Universities (or other educational institutions) and schools are involved in the local process *'to some extent'*. The involvement of local societal and economical stakeholders, such as business associations and companies, or marginalised local groups, such as disabled people, ethnic minorities, elderly people, unemployed people and women's groups, is generally reported as *'occasional'*. There are some differences between the regional groups. For example, in the Northern group, environmental organisations and groups that represent utilities participate to a *'high extent'*, while in the Southern group, environmental organisations, universities and schools participate to a *'high extent'*, and environmental organisations are *'rarely'* involved in Eastern European local processes for sustainable development.

Despite the limited participation from various local stakeholder groups in the local process for sustainable development, most local governments (70%) have an explicit strategy for increasing citizen participation in the decision-making process. In addition, most local governments have in the last two years *'occasionally'* arranged conferences, public hearings, stakeholder forums, workshops, roundtables or working groups, focus groups or surveys, in order to facilitate stakeholder participation in the local process for sustainable development. Furthermore, the majority of local governments have mechanisms in place to facilitate stakeholder activity, such as consulting with stakeholder organisations on council decisions, establishing steering groups for local process feedback, and ensuring an

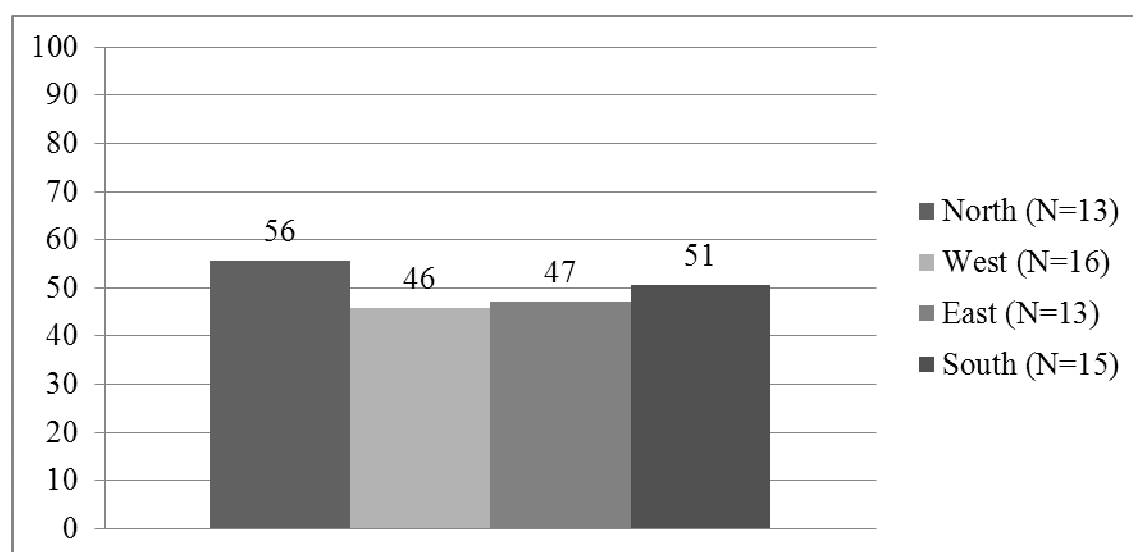
information flow between the council and stakeholder organisations. However, it could be argued that local governments have not sufficiently managed to integrate stakeholders' perspectives, and as such the credibility and legitimacy of the local process among affiliated stakeholders is at risk. This is evident from the participation criteria scores.

Figure 6.8 Participation scores



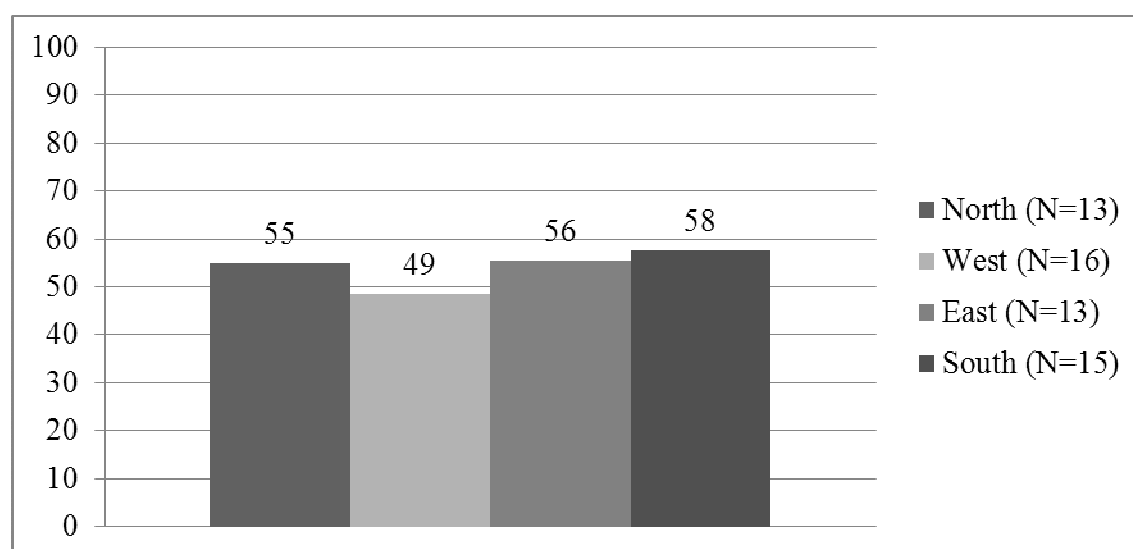
Most local governments are active in collaborating via various forms of public, private and civil society partnerships, and networking with a multitude of stakeholders at national as well as international levels on issues related to sustainable development. Local governments' networking encompasses partnerships with other local governments via regional, national or international organisations. However, these partnerships are rarely formalised in the sense of requiring partners to commit resources; most local governments report that they have chosen to commit resources only to a small number of partnerships. Most local governments report that these partnerships are effective in promoting sustainable development '*to some extent*'; although a higher proportion of the Southern local governments (46%) consider that their network partnerships have been effective to '*a high extent*'.

Figure 6.9 Partnership scores



Most local governments (72%) have a strategy for communicating sustainable development issues. Methods of communicating and raising awareness on issues related to sustainable development are varied, involving the local media, newsletters or leaflets, and (most often) websites. Public lectures, open days, exhibitions or events with specific target groups are occasionally used to raise local awareness of sustainable development issues.

Figure 6.10 Awareness raising and training scores



Local governments' provision of training on sustainable development varies. Generally, local governments provide training to 'some extent' to senior and other staff, but to a lesser extent to councillors and stakeholders involved in the local process. Northern, Eastern and Southern local governments are more active in providing training than their Western

counterparts, although this training is mostly provided to local staff. Training ranges from briefings or presentations to participation in conferences, and in a few cases professional development courses or study visits take place. Northern local governments provide the most varied forms of training.

In summary, local governments' methods of communicating sustainable development issues are generally varied and utilised to a high extent. However they only tend to provide training to a limited range of actors involved in the local process for sustainable development.

Expected areas of progress

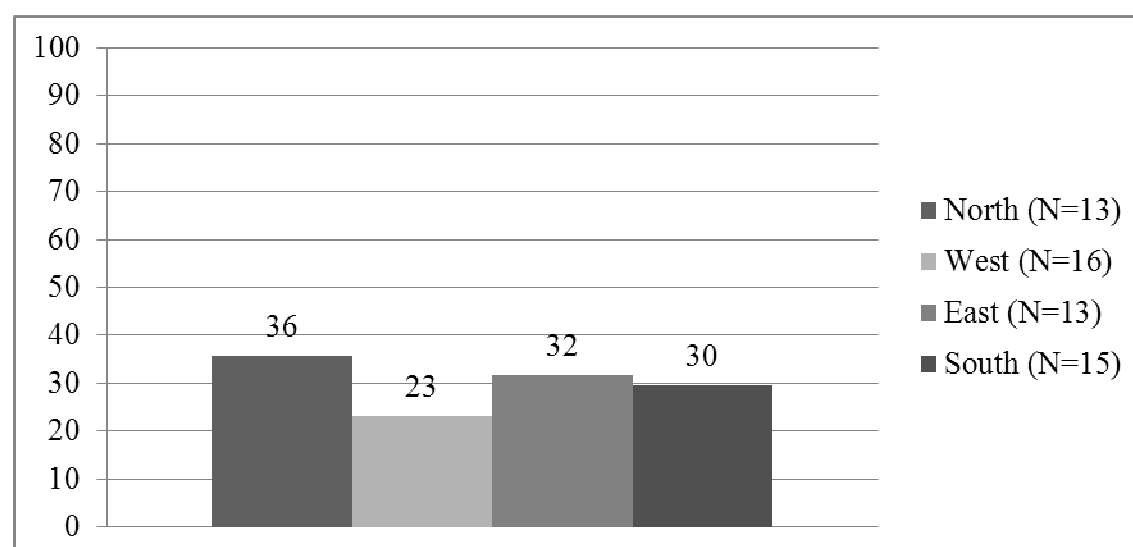
In most local governments, local processes for sustainable development are not fully mainstreamed and incorporated into local plans, strategies and actions, even though the head of department, mayor, or chief executive is usually responsible for the administration of the local process for sustainable development. Few local governments have a formal mechanism in their local action plan to assess the impacts of individual projects on sustainable development, and few have formal mechanisms to assess the effectiveness of the municipal budget and the economic promotion policy in implementing sustainable development. Local governments do, however, have formal mechanisms to assess the effectiveness of land use development plans and of environmental protection policies in implementing sustainable development. The majority of the Northern and the Eastern local governments also have a formal mechanism to assess the effectiveness of their integrated urban development policies, whilst most Northern, Western and Southern local governments focus on the effectiveness of their transport policies when implementing the local process for sustainable development.

Most local governments have developed interdepartmental linkages within the local authority in order to promote sustainable development. This is often achieved via cross-departmental joint projects and cross-departmental working groups. Sustainable development is also promoted within local governments via cross-departmental mailing lists or newsletters, as well as formal contact between heads of departments.

Just over half of local governments (57%) state that their local process has to '*some extent*' changed ways of working within the local government. However, few local governments (13%) report that the local process has changed the ways of working to a '*high extent*'. A considerable number of the local governments have limited accurate knowledge of their sustainable development progress, as local action plans lack mechanisms to assess the impacts of individual projects. Local governments also tend to have limited awareness of

how the local process for sustainable development is incorporated in local strategies or plans, and the effectiveness of a local government's main strategies, municipal budget and economic promotion policy are rarely assessed when implementing sustainable development. Consequently, there is a low level of integration and mainstreaming of the local process for sustainable development with other local policies.

Figure 6.11 Integrated approach scores



The local process for sustainable development has led to the initiation of new activities and policy changes within local governments. These new activities include work to address areas of concern for the respective regional groups. Activities that have been initiated by the local process include energy management, for instance increasing energy efficiency and promoting renewable energy resources, and natural resource management, such as protecting local biodiversity and improving the quality of air, water or soil. Initiatives within waste and pollution management, for example waste reduction strategies, improving local waste management and promoting recycling and reuse have also been introduced. Other new activities cover areas such as global climate protection: reducing CO₂ emissions and fossil fuel consumption, promoting public transport, cycling and pedestrian mobility. The new activities also include projects on social cohesion and health and safety aspects, such as air quality standards and noise reduction. Inner city development has also been on the agenda for most local governments.

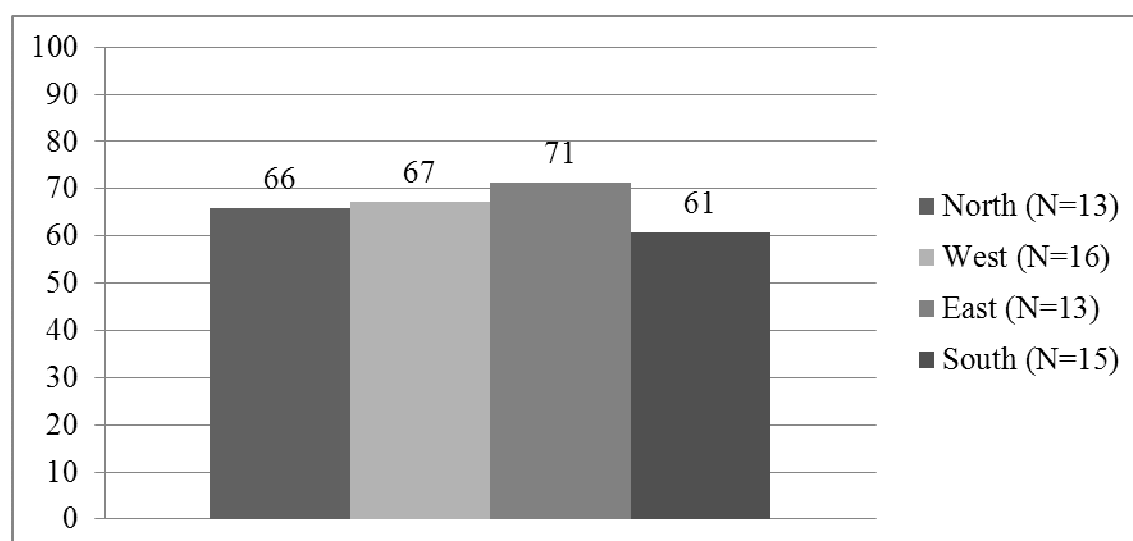
While new activities initiated through the local process have been similar across the regional groups, there are some areas where the regional groups have had different priorities. Most Northern, Western and Southern local governments have attempted to reduce fossil fuel consumption, for example by attempting to reduce demand for mobility and private car use,

whereas Eastern local governments have tended to focus on improving basic services, such as water, energy and transport, and also social services, such as health care, child care and social benefits. Northern local governments have been active in urban management, such as carrying out impact assessments on municipal policies, and adopting risk management and green purchasing policies.

Policy changes in local governments have also been in line with identified local concerns. However, given the different priority concerns among the various groups, the areas of policy change vary between local governments, although the most significant ones have occurred within energy, waste and pollution management. Northern local governments report that their most significant policy changes, in addition to these areas, relate to protecting the global climate, land use policies, and natural resource management. Although Northern local governments also view the local economy as an area for sustainable development, few policy changes in this area as a result of the local process for sustainable development. Western local governments' most significant policy changes have occurred within energy management, global climate protection, social cohesion, and local economic policies. Eastern local governments' major changes are related to economic policies and waste and pollution management. Although Eastern local governments did not report energy management as a main concern area, this is a policy area where considerable change has in fact taken place. Southern local governments report that natural resources, energy, waste and pollution management and mobility policy changes have occurred as a result of the local process for sustainable development.

Thus it seems that most Northern, Western and Southern local governments have experienced a broad range of policy changes across many policy areas such as sustainable lifestyle, global climate protection, land use, mobility and urban mobility tools. However, policy changes within Eastern local governments have been more limited and have included a few major areas, such as energy, waste and pollution management, the local economy and social cohesion policies.

Figure 6.12 Progress scores



Longevity of the local process for sustainable development

The normative requirements for a resilient and stable local process for sustainable development, as established by the Aalborg Charter, have been the focus of this section. Analysis of data originating from the LE21 tool has identified both challenges and strengths within local governments' processes for sustainable development in relation to these requirements. The key conclusions to be drawn from the LE21 findings are as follows:

1. The conditions for local sustainable development are not closely linked to the normative requirements. The basis for a stable local sustainable development process requires both long-term objectives and short-term actions. Even if most local governments have these ambitions, the local process for sustainable development is impeded by financial constraints: most local governments have not devoted sufficient resources for the management and implementation of sustainable development activities. In addition, local action plans for sustainable development are not fully implemented among local governments, which could eventually hinder the local process from being followed through.
2. Many local governments have made a political commitment towards the local process, supported by a council decision. This political ratification, along with the high level of political responsibility, the mayor or a council committee being responsible for the local process, should ensure that sustainable development remains high on the local agenda and has credibility for stakeholder organisations and the public.

3. Local priority concerns are usually identified thorough public and local stakeholder consultation, along with a detailed data analysis. Although the assessment has been detailed and participatory, ensuring the local relevance of the process for sustainable development, local priority concerns are generally not adequately addressed by local governments' action plans.
4. Some stakeholders' perspectives have been integrated into the local process; however, there is clearly a need for a broader range of participation across different sectors in order to incorporate different perspectives, ensure transparency and local ownership, and foster acceptance of the local process for sustainable development. Local governments usually have the capacity to include stakeholders' opinions and views in the local process, with formal and frequent mechanisms facilitating activity among stakeholders and ensuring that the successes and failures of the local process are fed into future local policy-making. Local governments also collaborate via private and civil society partnerships, and network with a multitude of national and international actors on issues related to sustainable development. However, these partnerships do not appear to effectively contribute to promoting sustainable development and the overall success of the local action plan.
5. Local governments' methods of communicating on issues related to the local process are frequent, relevant and varied, and should ensure that stakeholder organisations and citizens have a good awareness of sustainable issues and activities. However, local governments' provision of training is limited to a few actors. Provision of training to local stakeholders is generally low, and this may adversely affect capacity building in local governments, through lack of knowledge and understanding.
6. A resilient local process for sustainable development needs to be integrated and mainstreamed into local plans, strategies and actions. However, this is rarely the case. Local governments have a limited assessment of how sustainable development is incorporated into other local policies. This could result in the weakening of sustainable development as a guiding principle for local government work, meaning that the principles of sustainable development are applied infrequently or are even marginalized in local government.
7. It is, however, encouraging to note that local governments commonly utilise cross-departmental linkages in the administration of the local process for sustainable development, in order to respond to the holistic needs of sustainable development. The

local process for sustainable development has contributed to extensive and broad policy changes, and has initiated new activities in local government. Most local governments have achieved a balanced mix of strategic policy changes and visible policy action, which are relevant and link to local policy concern areas. Local activities are also spread across sustainable development areas, thus demonstrating a holistic approach to sustainable development initiatives.

Conclusions

Local governments' processes for sustainable development, in the form of new activities and policy changes, have mostly been in line with the normative expectations embedded in the Aalborg Charter. However, the local processes do not reflect the normative character of LA21 processes. As Rydin (2011) has argued, the banner of LA21, on which the principles of the local process builds upon, seeks to develop innovative participatory ways of engaging local communities and stakeholders with sustainable development. The intention of LA21 processes is to build local networks, drawing in a range of actors who would not normally be involved, and get them to interact and contribute to the development of local sustainable development policies. The LA21 processes can thus facilitate a change of local institutional behaviour and culture, and as such improve the governance of local processes for sustainable development (Joas *et al*, 2005). However, as demonstrated in this section, local processes for sustainable development do not usually incorporate a range of stakeholders representing the broader local community. This concurs with Rydin's point that *'local networking for sustainable development often foundered on the difficulties of maintaining the active engagement of so many different parties'* (Rydin, 2011, p. 52). The limited demonstrable outcomes from networking have been resource-intensive to maintain, and as a result, LA21 processes have often moved back inside local government, to be transformed into more recognizable strategy development and initiatives led by local governments (Rydin, 2011). The involvement of outside parties in these strategies and initiatives remains, but LA21 processes have become mainstreamed so that it reflects prevailing forms of local government and governance rather than being a distinctive exercise in bottom-up activism (Rydin, 2011).

Section 7: Building on experience: learning from end users of tools

Introduction

Stakeholder involvement is essential to the design of an effective and valued tool for local sustainability (ICLEI, 2010). The European Commission (2008) states that enhanced and ongoing engagement between researchers and end users (local government policy officers) is necessary at every stage of a tool's life cycle. The process of listening to the views and needs of end users not only improves the effectiveness of tools by gauging opinions and needs, stimulating communication and debate and contributing to the general brokerage process between research and policy making, but also meets the growing expectations of policy makers that their opinions are taken into account.

The aim of this section is to allow end users (largely local government officers) to reflect on the nature and relevance of the Local Evaluation 21 [LE21] and Urban Ecosystem Europe [UEE] tools, providing a comprehensive analysis not only of the positive impacts of such tools, but also of suggestions for improvements that were made during consultation, so that further research discussions and developments can be based on a strong participatory foundation. It poses some questions about the most appropriate tools for measuring local sustainability and delivering urban sustainability outcomes.

This section begins with an overview of end users' expectations, '*real-life experience*' and subsequent assessments of LE21 and UEE. It goes on to analyse the strengths, weaknesses, effectiveness and accessibility of the two tools according to end users. It then identifies five case studies of local governments with experience of using the tools and extracts some generic lessons for monitoring urban sustainability from these case studies. Finally, it offers some reflections on what is needed to achieve more effective use of tools for local sustainability – whether to use the tools as originally designed; whether to adapt them; whether to integrate them; and whether to develop new tools (van der Vost *et al*, 1999).

The primary data presented here was gathered by the project consortium during consultation with policy officers from European local governments. The consultation included:

- Online voting sessions (interactive multiple-choice questionnaires) involving over 200 respondents during the two Informed Cities Fora (in Newcastle, April 2010 and Naples, October 2011);
- Working groups and 'world cafe' sessions at the Informed Cities Fora;

- Ten national Informed Cities Implementation Workshops from September 2010 to April 2011 to gather feedback from local government officers and technical experts from environmental departments;
- Short questionnaires and phone conversations with policy officers from five local governments who have experience of using the tools;
- Other communication, e.g. questionnaires that all delegates at the 2nd Informed Cities Forum in Naples were asked to complete.

This consultation process helped to improve dialogue and connectivity between policy-makers and researchers (particularly the Consortium partners) and to facilitate learning about opinions and expectations of the tools.

The highest number of those who attend the two Fora came from universities and research institutes, closely followed by local governments and then national governments and organisations. Participants came from all EU Member States with the exception of Luxembourg. Regional distribution of participation was well distributed and not concentrated in Northern and Western countries; 30% of participants represented Eastern Europe.

Reflections on LE21 and UEE from end users

LE21 and UEE are urban management tools for use by local government officers. Launched in 2004, LE21 was developed as a monitoring tool for Local Agenda 21 processes. It is the updated, online version of the LASALA offline self-evaluation tool (see Section 2 for further details). Experience of using LASALA was used to improve LE21; recommendations included translating the tool into 20 European languages. The use of LE21 is confidential: each city decides if and how to share their results. UEE is available in seven languages (English, French, Spanish, Italian, Polish, Portuguese and Romanian). Based on the responses from local governments that used the tools, four issues were especially significant for consultation participants who had used the tools:

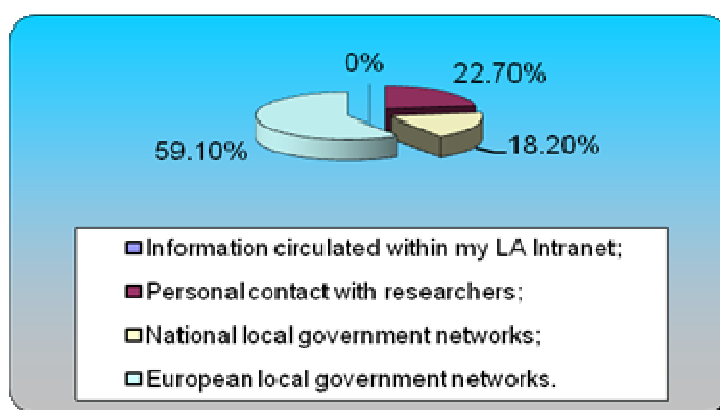
- Awareness and usefulness of European urban sustainability tools
- Availability of information and data
- The impacts of tools' benchmarking results
- The existence of many tools for local sustainability

Each of these issues will now be considered in turn.

Awareness and usefulness of European urban sustainability tools

Awareness of the available tools was a crucial starting point for participants, along with the evaluation of their usefulness and effectiveness. The evaluation process is not always straightforward: Sheate (2011) suggests that effectiveness is likely to be greatest where tools are used by those most motivated to use them. The data from discussions with policy-makers and researchers demonstrate a serious absence of information flow between the academic and political communities. 77% of policy officers who participated in the live voting sessions identified that they became aware of urban sustainability tools through either European (59%) or national (18%) local government networks. The second most important source of information about the tools was personal contact with researchers (23%) (see Figure 7.1).

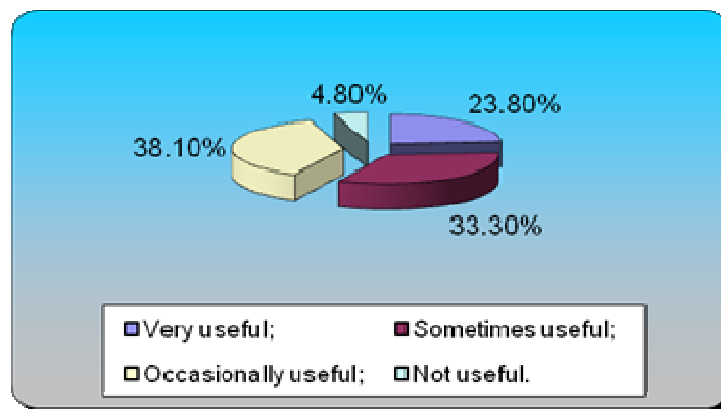
Figure 7.1: ‘How do you find out information about urban sustainability tools developed for local governments at European level?’ (Local governments only.)



Source: Voting session, 1st Informed Cities Forum

71% of policy officers felt that European urban sustainability tools were only occasionally (38%) or sometimes (33%) useful to local governments. In the case of researchers, a massive 91% believed that these tools were only sometimes (53%) or occasionally (41%) useful. Interestingly, whilst 24% of policy-makers found the tools very useful, researchers were pessimistic about their usefulness in helping to deliver sustainability (see Figure 7.2).

Figure 7.2: ‘How useful are European urban sustainability tools to your local administration in implementing sustainability?’ (Local governments only.)



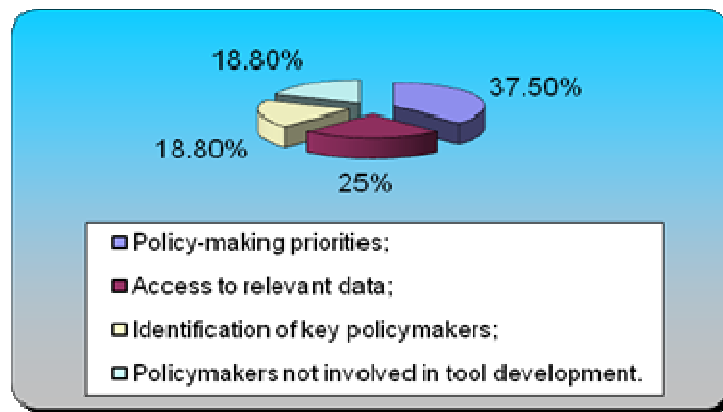
Source: Voting session, 1st Informed Cities Forum

Availability of information and data

In the voting, 38% of researchers stated that information on policy-making priorities is absent when developing tools, while policy-makers identified that researchers' poor comprehension of the policy process hindered collaboration and potential development of tools. Difficulties in developing channels of communication between the academic and political communities exist despite acknowledgement by both that such basic information is needed.

25% of researchers also identified access to relevant data as a missing ingredient when developing tools. At the national workshops, it was clear that some new Member States monitor most of the data (e.g. concerning air quality and noise pollution) at a central level and that gaining access to this data can be very difficult for local governments, due to devolution of central government responsibilities to regional or local governments not being in place or progressing too slowly.

Figure 7.3: ‘What information from local governments are you missing when developing a tool’ (Researchers only.)



Source: Voting session, 1st Informed Cities Forum

Not surprisingly, in many countries access to data also depends on co-operation with private companies (particularly given on-going privatisation of municipal services) or with regional authorities. Lack of access to the correct data, and to clear, up-to-date indicators, is a major obstacle to creating any monitoring tool, particularly one that would be applicable at European level.

Finally, whereas national workshop participants generally supported the need to co-operate from the earliest stages of developing a tool, they raised two further considerations. First, 38% of researchers believed that the non-engagement of policymakers (19%) and identification of key policymakers (19%) was an issue when developing tools. This is probably linked to the bureaucratic nature of local governments where staff responsibilities are often unclear and fragmented, or to differing time-scales of policy-makers and scientists. It has been highlighted (European Commission, 2008; Crishna and Przybycien, 2010) that researchers most often work to a different time-scale to policy-makers: while policy-making has to respond to immediate needs and challenges, research often delivers over the long-term (ODPM, 2005), although recently pressures have increased for academia to meet available funding. Second, end users felt that the development of new tools requires greater adaptability to the local context, including local language and appropriate terminology, although translation alone cannot achieve commonalities in local government structure and responsibilities, national legislation and existing frameworks.

The impacts of tools' benchmarking results

Although benchmarking has been introduced over the past decade in many European cities, many local governments still feel that making comparisons about environmental and sustainability issues (such as requested in UEE) is problematic (European Environment Agency, 2001). The organisational structure of local governments, the extent of their power

to implement their own regulations and laws, different ways of calculating and measuring indicators, and incompatible databases are some of the issues which participants felt need to be taken into account when benchmarking with UEE and LE21. In addition, some indicators may be too demanding in terms of the required data and the time/resources required for data collection.

The existence of many tools for local sustainability

The majority of participants felt that there is an abundance of urban sustainability tools currently available to cities but that co-ordination is essential so that the same data can be used for more than one European benchmarking tool, to avoid local governments being treated as “data dispensers”, duplicating effort to fill in different tools.

This section will now describe and analyse experiences of using (or reasons for non-use) of LE21 and UEE separately, taking account of their long-term impacts rather than just their immediate outputs.

Local Evaluation 21: Synthesis of key findings

Advantages

One of the most commonly mentioned advantages of LE21 was the participant receiving a personalised report, with a number of respondents considering this feedback very useful in improving their local sustainability processes. However, a few cities indicated that they would prefer to receive a certificate recognising their sustainability progress. This illustrates that cities can assign both an internally-oriented (to evaluate and improve local processes) and an externally-oriented (to promote the city’s achievements) role to local sustainability tools.

Most participants, particularly those from Eastern and Southern Europe, appreciated the fact that LE21 was available in their national languages, allowing those responsible for local sustainability issues to answer questions easily without resorting to external translation.

For most of the cities involved, LE21 was relatively easy to complete, thanks in particular to its user-friendly interface. Interestingly, the only countries to mention the fact that LE21 is free of charge as a major advantage were Romania and Poland, where there is very little national-level support for local sustainability, and no monitoring tools endorsed by the

government; thus any efforts to evaluate local sustainability usually involve private consultants. Some local governments, for example in Germany, complained that they lack the necessary financial and staff resources to provide the data required for monitoring.

As discussed in Section 3 some cities were reluctant to publish data in case of poor results which could potentially cause political embarrassment. LE21's internal self-assessment feature was therefore welcomed by some cities as a good tool to find out where cities stand and which areas need further improvement.

Recurrent problems and lessons learned

The landscape of local sustainability has changed considerably since LE21 was launched in 2004, and "Local Agenda 21" is no longer a main reference point for these processes. In some countries (e.g. Nordic countries and the UK) it has been replaced with different concepts (see Section 3), making the tool appear slightly out-dated; for example there were no references to the Aalborg Commitments adopted in 2004, and few references to climate issues that have been prioritised in recent years. Conversely, there are still some countries, including Poland, where "Local Agenda 21" as a policy term is more easily recognised than "sustainable development". Some terms that gained popularity in certain countries are virtually unknown in others, for example the Aalborg Charter is a familiar term in most Western, Northern and Southern, but not Eastern European cities. This creates difficulties in terms of formulating questions that are clear and relevant to all respondents.

These definitional problems relate to the broader issue of differing concepts of local sustainability. Sustainable development initiatives in most old Member States (EU-15) have moved from an environmental protection focus in the 1990s to a more holistic approach, increasingly encompassing social and economic issues and looking for fusion of all three dimensions of sustainability. Faced with the complexity of sustainable development challenges, most of the EU-15 countries have come to acknowledge the need to integrate sustainable development as a core cross-cutting issue in their policies. This contrasts with the new Member States, most of which have only recently become involved in this field, and where sustainable development is often environmentally-focused, with a sectoral approach and little policy coherence.

Other problems mentioned related to the methodology of the LE21 tool, for example not being able to answer questions with "don't know" or "not relevant", and the system's refusal to accept incomplete answers, which forces respondents to provide an approximate answer. This can have a negative influence on the reliability of the data, as well as on the feedback

given to local governments. However, this feature was introduced to prevent cases of missing data which would make generating the report and comparisons impossible. Another issue related to the flexibility of the tool, with some participants noting that it does not effectively address issues of geographic scale, focusing only on city-level sustainability, while in some cases it might be more effective to address the issues at neighbourhood or regional level.

Effectiveness

Differences between old and new Member States were also apparent when discussing the effectiveness of LE21. Most participants from Western and Southern Europe viewed LE21 as a little dated, too general and incapable of monitoring the effectiveness of management processes. Intensive self-evaluation tools however require resources that local governments often lack, including staff time. Conversely, Eastern European cities appreciated the focus on management process, as in their opinion this aspect is often forgotten in analysing the performance of local governments in their countries.

Most participants agreed that tools such as LE21 play an important role in improving policy-making, making it possible to learn from the activities undertaken so far. Some added that it could be useful as a checklist or starting point for evaluating local sustainability progress. Notably, the last part of the questionnaire, relating to progress, was added following the LASALA on-line testing phase. Representatives of UK municipalities expressed concern that LE21 does not really challenge local governments in terms of how they are monitoring, measuring and delivering sustainability, and may serve simply as an image-building exercise.

Another criticism concerned the focus on different aspects of sustainable development, instead of a more integrated and strategic approach. In countries where local sustainability processes are still in the early stages, a focus on concrete activities is needed in order to capture progress. Participants agreed that the benefits of using local sustainability management tools are not limited to evaluating progress: they also raise awareness of sustainability issues within local governments and among stakeholders, and identify data gaps.

However, out of 57 cities that completed LE21, only eight involved stakeholders, by inviting them to complete an anonymous questionnaire. Their answers were added to those from the local government to give an additional perspective on local performance⁴³. Among the most commonly involved stakeholders were local environmental NGOs and the education sector; others included political parties, church organisations, municipally-owned companies and advisory bodies.

Insights from practice

Two broad sets of issues were identified in the explorative application process:

- Benchmarking: European standards, regional comparisons and local context
- Who evaluates local performance: politicians, civil servants or citizens?

These are now further analysed in turn.

Benchmarking: European standards, regional comparisons and local context

Most of the cities were aware of a number of existing tools that could help them to monitor their local sustainability processes. However, the plethora of available tools is more confusing than helpful for local governments and most would welcome the development of a single, common European benchmarking tool. Such a tool would ideally offer comparisons both in spatial (for politicians) and temporal (for civil servants) perspectives. It would also require less staff time, as some end users are frustrated at being asked for different types of data each time.

Some local governments believe that it would make sense to compare cities on a regional basis (e.g. cities from the Baltic countries), while others want European-level comparisons. Many local governments mentioned the need to consider the local context, a feature difficult to accommodate in the Europe-wide benchmarking tool.

Who evaluates local performance: politicians, civil servants or citizens?

The second issue concerned the legitimacy of evaluating local sustainability processes. Most participants indicated that the answers to the questionnaire would differ depending on whether they came from policy officers or politicians. Even though the tool is targeted at policy officers answers can reflect individual perspectives. UK participants suggested that this might be an advantage, since comparing the responses to the questionnaire by different

⁴³ The answers from stakeholders were only included if there were at least two of them, to avoid compromising the anonymity of the responses.

players within local governments can offer new insights on local understandings of sustainability.

Another dimension of the legitimacy problem is to what extent external stakeholders, such as local environmental organisations and citizens, should be involved in evaluating local sustainability processes. Participating local governments differed in their opinions on this issue. Northern and Western European participants would like to see stakeholders more prominently involved in the evaluation process, while Southern countries (Portugal and Spain) lack any clear idea on how to work with stakeholders on these issues. However, the idea of integrating stakeholders' input into the evaluation was forwarded by the local governments themselves during the LASALA on-line testing phase. The question of legitimacy also touches on transparency and control over local data. Some participants agreed to have their data publicly available for comparison with data from other cities. Others mentioned the need to have their participation, as well as their data, reported in the explorative application approved by a superior.

UEE: Synthesis of key findings

Advantages

The main focus for local governments using UEE was the collection and analysis of relevant quantitative data. Political support is crucial to its implementation. A written note coming from a city's Mayor or Deputy Mayor was seen to positively influence take-up of the tool, particularly given current budget restrictions and staff cuts in local governments. Equally important is the motivational support and interest provided by leading management figures: if these actors change their motivation, move departments or change function, completion of or support for UEE may be directly affected.

Most of the European local governments who have used UEE emphasised its awareness-raising capacity, as it serves to communicate progress achieved by administrations openly to citizens and other stakeholders. Benchmarking with other cities can focus on certain areas of performance or can concern the whole UEE set of indicators. Such data could be a trigger for improvement, especially when the results are published to a larger European audience. Often the introduction of UEE helped to improve information exchange between departments in local governments, particularly in relation to technical departments.

Implementing UEE does not only involve ensuring that the organisational prerequisites have been created but also that the data for the first UEE questionnaire has been collected. The

potential that the UEE indicators offer in terms of benchmarking was also valued by users. Comparing the results against other European cities on a quantitative basis helps to improve understanding of the strengths and weaknesses of the sustainability processes implemented, as well as to establish priorities and targets.

Benchmarking facilitates the establishment of a baseline review, indicating the status of local sustainability, and supports policy-makers to identify failures and to adjust measures towards long-term local sustainability. The use of UEE indicators often supports policy-makers to provide a point of reference when comparing effects of development and at the same time to reinforce their decisions (e.g. to pursue more demanding targets or to develop projects based on long-term planning and development scenarios within a particular area of policy delivery).

Recurrent problems and lessons learned

Despite largely positive views about UEE, the majority of participants thought that the level of co-ordination required to gather the necessary data was a significant problem. Once the decision has been made to use the tool, it is necessary to agree who will collect and compile the necessary environmental data for each individual indicator, how and when it will be transmitted, and in what form it will be processed. Therefore, clarification of the data collection process does require quite intensive effort and cost during the preparation of the first UEE questionnaire.

As the main mechanism of UEE is the analysis of data through indicators, data access and management are key factors in this process. Many European local governments have experienced difficulties obtaining data from external organisations or private companies, and also in compiling data within their administrations, due to a lack of capacity and co-ordination across local government departments.

Southern European cities have proven active in managing environmental indicators efficiently, as they are required to periodically respond to national bodies or national environmental organisations which produce annual studies on their administrations' performances. Thus co-ordination of data in these countries was not as problematic.

In terms of overall data management, many European local governments showed a lack of capacity to gather, handle or update data. Some countries such as Germany suggested that financial support from within a project like the ICI would help them to compile the necessary data. Local governments across Europe are currently involved in numerous national and

European initiatives (each with separate tools) the capacity of their staff to collate the data and undertake the associated tasks to populate the tools needs to be urgently addressed.

It was also apparent that participants from new Member States were consistently more positive about UEE than those from EU15. It was also apparent that the lower the sustainability “intensity” at national level, the higher the support generally for the European tools. The European Commission has no power to influence or control the voluntary sustainability systems of national governments. Not surprisingly, participants from countries with national “sustainability gaps” particularly welcomed the use of tools at European level.

Effectiveness

UEE was seen by respondents as a monitoring and controlling instrument. With regard to the indicators, some local governments suggested following the structure of the *European Green Capital Award* application to ensure that the data compiled can also be used for other projects in order to make benefits proportionate to the work required to introduce, up-date and maintain the tool.

UEE was sometimes seen as too detailed and demanding. The diversity of data collection methods used and the division of responsibilities leads to ever-greater costs being incurred in terms of updating and gathering data. A universal collection and updating system for sustainability data would be a great help to European local governments. The lack of co-ordination between the various tools means that numerous data sets are required. Sometimes, because of this uncoordinated approach, the wording of indicators causes problems. Although UEE is available in seven different languages, users have experienced difficulties in understanding the content of the indicators, mainly because they differ from the ones used in their national statistics or because some aspects required by UEE are not measured in their countries at all.

Insights from practice

Publication of data and image of local governments

Respondents emphasised the importance of how different countries responded to data from their local government being publically available. Some cities valued the option of being openly benchmarked with other cities throughout Europe, in order to learn from their strengths and weaknesses, while others preferred this data not to be shared, especially when the reports produced by the tool show a weak performance. Conversely, those local governments who have demonstrated themselves to be strong performers in local sustainability value the positive publicity that sharing data can generate.

Common future monitoring scheme (European Protocol on Indicators) and adaptability to the local context

Most of the European local governments participating in the explorative application of UEE for the ICI mentioned the utility of the report provided by the tool, but also suggested the need to establish a common scheme in the future that would periodically review and monitor the data. In order to facilitate effective compilation of data and comparison among cities, a

European Protocol on Indicators would be needed. This Protocol should establish a unique set of indicators to ensure that all European local governments measure the same elements, although it was also suggested that not all cities in Europe need European indicators to measure their sustainability processes. Some countries such as Germany and France are only familiar with national indicators as their data is only used to develop national reports.

The indicators compiled in UEE do not always match the monitoring needs of local governments, as each country has unique governance structures, population figures and so on, and so indicators should also be tailored. In addition to doubts about the usefulness of a common scheme when it fundamentally needs to be responsive to the local context, it could also be an arduous challenge for researchers and policy-makers.

Case studies

In order to provide more in-depth analysis of local government officers' perceptions of LE21 and UEE, the report now identifies five case studies, one from each of the four European regions (North, South, West and Eastern), and discusses them in detail. The material for these case studies was derived from short structured questionnaires which were sent to respondents and follow-up phone calls.

Figure 7.4 The five case study cities

<i>The five case studies</i>	
Northern Europe	Eastern Europe
Vantaa, Finland	Bydgoszcz, Poland
Western Europe	Southern Europe
Augsburg, Germany	Ravenna, Italy
Dublin, Ireland	

Case study 1: Augsburg, Germany

Augsburg is a university town located in the south-west of Germany, with a population of 265,000 and a land area of 147 km². Augsburg has a strong history of progress toward sustainability, due to strong co-operation among stakeholders and intensive awareness-raising campaigns. The sustainability process is monitored by the Local Agenda 21 Co-ordination Office which provides guidance to the office of the Advisory Board for Sustainable Development and to a 23 *Citizen Fora* addressing issues such as welfare, health and climate protection.

National status: guidance, funding, institutional and legislative framework

The City of Augsburg organises itself according to its local needs, as the Local Agenda 21 implementation has not been directly supported by the central government. In Germany, the promotion of Local Agenda 21 processes has been delegated to a non-governmental body (Agentur für Nachhaltigkeit GmbH). The city receives informational support through newsletters produced by the German National Council for Sustainability, an institution which helps to explain, update and implement sustainable development strategies in Germany. This council aims to promote societal dialogue and is not a scientific advisory body. Further guidance and network opportunities come from the city's participation in the annual Netzwerk21 (Congress of German Municipalities and Local Actors), and through informative publications edited by the German Federal Environment Agency (UBA).

Interpretation of LE21 and UEE - usefulness, applicability and challenges

The City of Augsburg took part in the ICI explorative application by applying both LE21 and UEE. The evaluation report provided by LE21 was described as useful, but also “superficial” as it did not examine the local process in detail. The specific characteristics of the city were not taken into account, and therefore the report was not sufficiently informative. The incorporation of other important stakeholders' opinions was highly valued, but more time to collect their answers and integrate them into the tool would be welcome.

Augsburg did not encounter many difficulties compiling the data needed for UEE as the city already has a database comprising data on more than fifty indicators. However, the interpretation of UEE indicators was tricky. For example, when compiling data on the number of trees in the city, the tool does not specify whether only forest trees were to be counted, or if roadside trees also had to be included. There is also a need for social and economic indicators that UEE could not fulfil, as the tool is mostly environmentally-focused. Policy officers noted the limitations in terms of wider application, suggesting that social and economic indicators should be introduced to obtain more coherent and integrated outcomes.

Broader benefits

The main reason for the city of Augsburg to take part in both tools was to get involved in the ICI, and thus to connect with the international debates relating to the UN Rio+20 Conference on Sustainable Development.

Augsburg indicated its interest to use LE21 in the future if the tool is updated and also to use UEE. However, there is no political will to establish stronger links with the international level and no specific interest in European schemes. The local government has not signed the Covenant of Mayors initiative, or applied for the European Green Capital Award, considered to be very time-consuming in terms of data collection, conceptualisation of plans and strategies etc. It seems that active involvement at a national level is already an arduous task for the city which reduces their capacity to participate in European initiatives.

Case study 2: Bydgoszcz, Poland

Bydgoszcz is a city in the north of Poland, with a population of 356,637 (2010) and a land area of 175 km². Bydgoszcz is active in terms of environmental education and climate protection. Due to its involvement in the Local Accountability for Kyoto Goals project, the city was among the first in Poland to develop a community greenhouse gas emissions inventory. In 2010 it adopted a Climate Mitigation and Adaptation Plan, setting a target of 18.7% greenhouse gas emissions reduction by 2020 (baseline 2005). A year later the city signed the Covenant of Mayors.

National status: guidance, funding, institutional and legislative framework

The institutional and legislative framework for sustainable development in Poland is relatively weak and operates primarily at the national level. There is no funding or guidance available from the national government for delivering local sustainability. As the national government does not offer or endorse any tools for monitoring local sustainability performance and processes, Polish cities engaging in local sustainability depend on funding and guidance from European projects, as well as support of local non-governmental organisations and European local government associations.

Interpretation of LE21 and UEE: usefulness, applicability and challenges

Bydgoszcz found out about LE21 and UEE during the ICI Workshop in Poland. The decision to apply the tools was motivated by an interest in evaluating the city's performance in terms of sustainable development but also by an interest in comparing Bydgoszcz with other European cities. The city decided to apply both tools, considering them as complementary. In the case of UEE key challenges related to data accessibility (and clarity about the exact type of data that needed to be gathered; where it differed from what the city had collected in the past). Regarding LE21, some technical adjustments to the online tool were recommended to increase its usability.

Broader benefits

Bydgoszcz is interested in applying these or similar tools in the future, as they improve information flow and knowledge exchange within the city administration, and have the potential to improve knowledge exchange between city administration and researchers.

Case study 3: Dublin, Ireland

Dublin is the capital and largest city in Ireland, with 525,383 inhabitants and a land area of 115 km². In 2008 the city launched the Sustainable Dublin Initiative, moving from individual sustainability projects to a strategic, city-wide approach. In 2010 Dublin published its first Sustainability Report, now produced annually. Together with the 2011 report, a Sustainability Indicators Framework has been published. This document outlines sustainability indicators for the Dublin Region, based on a participatory review of existing international, national, regional and local indicators. The framework consists of 39 headline indicators organised under 10 themes with the aim of offering a shared vision of sustainability for the region, to baseline the current position of the region and monitor progress, to effectively communicate performance to policy-makers and citizens, and to allow international comparisons by releasing data transparently.

National status: guidance, funding, institutional and legislative framework

From the local governments' perspective, there is not enough support and collaboration in Ireland between the local and national level in the field of sustainable development. The funding to implement sustainability initiatives comes either from the regional bodies or from EU funding programmes such as Interreg.

In January 2012, the national body for promoting sustainable development, Comhar SDC, was integrated into the National Economic and Social Council, as part of national cost-saving measures. It remains to be seen how this change will impact on the scale of activities. There is no nationally agreed set of indicators for monitoring sustainable development at the local level. Existing legislation focuses mainly on environmental aspects (e.g. strategic environmental assessments).

Interpretation of LE21 and UEE: usefulness, applicability and challenges

Dublin invested a lot of effort in collecting data for UEE and felt that the city did not receive much in return. The local authority expected a final benchmarking report and interactive tools that would support further policy development in the city. However, they believe that tools such as UEE can be very useful if populated with up-to-date and reliable data from European cities. The process of compiling data was very challenging, due to gaps in data the city could provide and to comparability issues; when locally or nationally used definitions

differ from the ones used by other European cities. Dublin also raised the issue of verifying the quality of data submitted by cities. LE21 was considered too generic and therefore not very useful in evaluating local sustainability processes.

Broader benefits

Dublin participates in various European schemes but considers them to be geared towards promotional or political aims and therefore less relevant for research and development of the city. Regarding benchmarking exercises, they have participated in the Green City Index and Carbon Disclosure Project and considered both a good opportunity to compare their performance with cities outside Ireland. However, submitting data for different schemes is a difficult and time-consuming process and it would be more effective to have one common suite of indicators, possibly UEE, serving as the basis for benchmarking. Dublin strongly supports the concept of benchmarking local performance and believes that access to data from other cities is crucial in understanding achievements and shortcomings.

Case study 4: Ravenna, Italy

Ravenna, a city in the Emilia-Romagna region of Italy with a population of 159,497 and a land area of 653 km², has a lot of experience in environmental management. The municipality obtained EMAS Registration in 2010. Having a specific reference law, EMAS has tended to be used as a "general container" for other methods, such as, environmental accounting, green public procurement and reporting tools. However, whilst there are overlapping areas between the schemes, each is actually quite specific in scope. The 'Sustainability education, Agenda 21 and Environmental Management Systems' office was set up to provide a central role for linking assessment and management tools, in a common framework. The department focuses on facilitating a common understanding of sustainability both internally and externally. It was noted that very often the confusion around the terms sustainability and participation hinders implementation.

National status: guidance, funding, institutional and legislative framework

The Italian Local Agenda 21 Association, bringing together over 500 municipalities, regions, provinces and other local governments that work with Local Agenda 21 processes, was established in 1999 to link Italian municipalities to ongoing policy processes at the national, European and international level, while providing relevant support and training. Funded mainly by membership fees, it offers members 19 working groups which provide Ravenna with opportunities to network with other cities on specific issues. There is no financial assistance from national government to support the use of tools and no framework or

guidance. Ravenna was not obliged to report the use of the tools to the national government as the local-national relationship on monitoring processes appears to be weak.

Interpretation of LE21 and UEE: usefulness, applicability and challenges

LE21 was seen as an external assessment and monitoring tool. Although the term 'Agenda 21' is not regularly used, participatory processes are very important in the municipality and provide opportunities to involve external stakeholders and non-expert views. Although UEE requires a large amount of data, this was not seen as a major obstacle as the city has applied the tool for many years and has a good database, therefore the process of collecting data was already in place and cultural and operational barriers between officers and administrators had already been overcome. However, the interpretation of the indicators is a tricky issue: for example, there is no common agreement on how to calculate waste production, as Ravenna's industrial waste is included in the calculation. This creates additional challenges when comparing data or providing European-wide assessments.

There is no doubt that UEE and LE21 are complementary tools. However, policy officers in Ravenna note that the existence of good governance had not necessarily led to better performance. Good governance and multi-level governance can change ways of working, data collection methods and approaches, and can influence communication with citizens. Local governments must have an interest in liaising with other levels of government in their promotion of sustainability, but good governance alone cannot improve performance on specific issues such as air quality.

The data collection was seen as time-consuming and methods of calculating vary. The European Commission calls for clear, measurable key indicators. However, the instruments, tools and approaches all have different methods and approaches and the city is overloaded and confused. Decision-making is sometimes complicated by the presence of too much information.

Broader benefits

The city of Ravenna has won the EMAS award, signed the Covenant of Mayors and is currently preparing the Sustainable Energy Action Plan (SEAP). The responses of policy officers and administrators suggest that LE21 and UEE do not fit with such European schemes. UEE can be seen as a platform for data collection. However, only the initial, raw data can be re-used for other purposes.

The relationship with the local University is very weak. The local government tried unsuccessfully to co-operate with the faculty of Environmental Science about EMAS. The only contact with the University is through unpaid interns.

Case study 5: Vantaa, Finland

Vantaa, with a population of 203,177 and a land area of 240 km², is the fourth most populous city of Finland. The key document influencing the implementation of environmental and sustainability policies in Vantaa is the local strategy and economic plan, adopted by the city council and defining the guidelines for environmental management. The goal is to achieve cross-departmental co-operation on environmental issues in addition to individual department environmental programs. Vantaa also publishes a yearly report on local sustainability, based on a set of indicators used by the six largest cities in Finland.

National status: guidance, funding, institutional and legislative framework

The Finnish national government neither supports the use of tools for monitoring sustainability nor offers guidance. Monitoring tools have been developed at the local level by the cities with no national legislation or policy priorities. However, there are some projects funded by the Ministries or by Motiva Ltd, an expert company owned by the Finnish state promoting efficient and sustainable use of energy and materials. Other projects, such as KUHILAS, a carbon footprint calculator for municipalities, were partly funded by the national government and the Finnish Environment Institute (a research institute which serves as the national centre for environmental data in Finland). Moreover, Vantaa participates in collaborative projects with the national government and other local governments (e.g. on reducing emissions) and with Aalto University (e.g. on greening effects). The Association of Finnish Local and Regional Authorities consisting of all Finnish towns, cities and municipalities also gives support in several environmental projects as well as facilitating networking between cities. Apart from these short-term projects, Vantaa's budget will not allow it to execute large local sustainability initiatives on its own.

Interpretation of LE21 and UEE: usefulness, applicability and challenges

Responses from policy officers suggest that both tools are useful. LE21 is informative and enables benchmarking activities with other cities of the same size. Even though the results of the tool were not surprising, they confirmed a need to be more proactive and creative. In relation to UEE, some of its indicators are not relevant to Finnish conditions, in particular those on green and natural areas (e.g. trees are impossible to calculate given the huge forest area and no statistics of planted trees are available). However, other indicators were

considered innovative and the local government was considering including them in the local indicators set.

Broader benefits

Vantaa is a signatory of the Covenant of Mayors and has implemented the Sustainable Energy Action Plan (SEAP). Vantaa's SEAP was outlined before the implementation of LE21 and UEE. However, policy officers and administrators in the city see the potential benefits of both tools in the preparation phase of setting up activities and measures to achieve CO₂ reduction targets. To some extent, the two tools were seen as complimentary and both should be further developed. LE21 was seen as more suitable for use in a city like Vantaa, while UEE would need to be adapted to the local context.

Intrinsic nature of tools for monitoring local sustainability

The lessons learned from the concrete experiences of policy officers can enable a critical analysis of the tools and can be a guide to develop new tools and enhance existing tools. Before concluding, this report will examine three key factors that emerged from all five case studies:

Local sustainability and evolution

There are some basic characteristics that can be attributed to the concept of local sustainability and its tools. First, local sustainability is considered as a continuous, dynamic process, rather than an end-product. This means that *'sustainability in itself cannot be defined objectively beforehand, but that process-conditions and contextual factors should be derived from an equal representation, pluriform debate and informed discussion'* (Loorbach, et al, 2009). This also implies that local sustainability questions are to be interpreted as complex and holistic concepts.

Second, the notion of sustainability requires a 'horizontal' approach, encouraging more collaborative working among disciplines and departments of local governments and therefore helping to engage in interdisciplinary research and cross-departmental activities. This moves away from the traditional compartmentalisation (silos) and simplification of local administration work through individual departments. Also researchers need to engage in holistic rather than fragmented thinking and to find a pragmatic balance between real-life, cross-disciplinary problem-solving and the skills needed for a specific discipline.

Finally, given the complexity of challenges, tools for local sustainability need to develop and be updated over time, according to evolving priorities, within the limits of funding available for adapting existing tools, rather than creating new ones.

Local and institutional context

Much effort has been invested in collecting comparable data at European level for existing and newly-developed indicators and tools. The context in which the tools are used poses different challenges for their design and implementation. European cities vary in size, environmental, economic and cultural backgrounds, political cultures, and participatory traditions. This means that tools need to be flexible and responsive to contextual requirements and to adaptable to changing circumstances. In addition, there is a need for more integration of tools to existing planning and decision-making processes in order to achieve effectiveness (Sheate, 2011).

Involvement of end users

While the involvement of policymakers remains valid, more fundamental observations can be made. Responses from a wide range of policy officers proved how challenging it is to balance the different, often opposing views and to build a high-quality tool acceptable to users within such a complex setting.

In addition, the user community is not uniform (European Environment Agency, 2000); many different sorts of end users seek to use tools in different ways and for different purposes. While some policymakers want to use tools to guide their decisions, others need them simply for sustainability performance measurement and control. In some cases, they are used as diagnostic tools for internal assessment; in the case of good performers, they may be used mainly for external benchmarking and promotion.

Stakeholder involvement certainly strengthens communication between researchers and practitioners, and helps to improve understanding of the tools. Many comments, suggestions and even questions were raised about both tools. Officers held different views on how the tools should be used, what they should deliver, and how they should be managed and funded. This illustrates the difficulty of developing a single generic tool which would meet the needs of all European cities.

Conclusions

From the case studies and other data collected, some conclusions can be drawn from the feedback from local government policy officers. Even though LE21 and UEE have different

evolutionary histories and draw on different methodologies, common problems, challenges and overlaps can be identified.

Firstly, the growing demand for environmental information and clarity has led to the development of a plethora of instruments for monitoring, reporting and cross-sectoral checks. There is a much wider range of sustainability tools today than in the 1980s (Sheate, 2011). The best possible use of these existing tools should be pursued, before developing new tools to address local contexts and problems. In particular, if a local government wishes to improve local sustainability conditions by introducing LE21 and UEE, the interfaces between these (process-oriented and outcome-oriented) and other tools need to be considered.

Secondly, the fact that such tools are not recognised within the national performance outcomes⁴⁴ may lead to fewer local governments using European tools. Instruments need to be more flexible and adaptive to the specific needs of its users. When the implementation of LE21 and UEE is not seen as additional work, but is required by a national government or combined in a holistic environmental framework integrating other existing tools, the instruments could have a much greater impact and facilitate implementation over time.

Third, the choice of developing and using certain tools for monitoring sustainability is often difficult. Where the local government is already working with key indicators, LE21 and UEE will fit more smoothly because of the same background process and procedural ideas.

However, it is evident that the publication of data remains problematic. Nevertheless, in the long term, LE21 and UEE should be recognised not only as benchmarking tools but as management and governance-oriented instruments supporting decision-making.

LE21 and UEE are designed to promote positive change within the institutional arrangements of the local governments using them. Where these processes are promoted and made possible, they can be a potential driver for establishing a successful integrated management system. Working effectively with environmental indicators can have a significant impact on the environmental and sustainability performance of local governments. The self-evaluation tools could help the cities to assess their sustainability profile and organisational capabilities. However, the majority of local governments are not using the tools consistently because of the time requirements to interact with the tools and collect the

⁴⁴ Refer to Voting Session results, 2nd Informed Cities Forum, Naples, 26-27 October 2011 available at: http://informed-cities.iclei-europe.org/fileadmin/template/projects/primus/files/Live_Survey.pdf

necessary data or because local governments cannot see the direct benefits from changing the way they work to include interacting with tools.

Section 8: Knowledge brokerage in action in European cities

Introduction:

This section reports the findings from five European case studies of knowledge brokerage initiatives (for a discussion of the theory of knowledge brokerage, see Section 1). All the empirical data for this chapter was collected via structured questionnaires and follow up telephone interviews with key figures in the brokerage process within the five European case studies (Newcastle, Norrköping, Oslo, Tilburg and Turku).

Introduction to the case studies

The five case studies each contain unique insights into the development of successful knowledge brokerage processes. Each will be explored in turn, with common issues being highlighted in each case study, including:

- How knowledge brokerage works '*on the ground*' in different geographic locations across Europe
- The various theoretical models explaining the development of brokerage initiatives
- The key factors necessary to develop a successful brokerage process, according to practitioners involved in brokerage initiatives
- Barriers that can '*de-rail*' the brokerage process, as experienced by practitioners
- How brokerage processes can inform and assist in policy delivery for sustainable development and economic development

A literature review identified knowledge brokerage as being most widely used and most advanced in Northern and Western European countries. The selection of case studies reflects this, with all five coming from Northern or Western Europe. This does not mean that successful knowledge brokerage initiatives do not exist in Southern and Eastern Europe.

Case Study 1: Newcastle, United Kingdom



Figure 8.1: Signpost at Newcastle Civic Centre illustrating the proximity of both universities. (C) David McGuinness

Background

The City of Newcastle is in the north of England. It is the unofficial '*capital*' of the Tyne & Wear sub-region – which contains around 1 million people - with a population of approximately 278,000. Newcastle has two large universities and a significant student population. Northumbria University has over 34,000 students and Newcastle University around 20,000; during term time, 15-20% of the city's population is made up of students.

The key players in the brokerage process are Newcastle City Council [NCC], Newcastle University (particularly Newcastle Institute for Research on Sustainability [NIREs]), Northumbria University (particularly Sustainable Cities Research Institute [SCRI]) and the neighbouring local government of Gateshead Borough Council [GBC]. Private sector partners are involved in specific initiatives which are products of the brokerage process.

How does the brokerage process function in Newcastle?

The brokerage process in Newcastle functions at three levels:

1. High level meetings between the Council Chief Executives (NCC and GBC), senior management teams and the Vice Chancellors from both universities (Newcastle and Northumbria)
2. Meetings between senior council teams - Executive (Service) Directors [NCC] - and Deans of Faculties within the Universities, and joint management team meetings

3. Regular meetings between operational staff from the council and universities (policy officers, academics and researchers).

The brokerage process in Newcastle functioned on an informal basis for several years, but over the last two years there has been a concerted effort to formalise the process. The original impetus for the brokerage process was day-to-day contact between policy officers from NCC and academics at the two universities. Significantly, this interaction occurred at a very junior level within the institutional structures of each organisation. The formative stages of the brokerage process in Newcastle demonstrated the importance of having proactive individuals who assist the policy process by transferring information via *ad hoc* meetings.

Newcastle City Council has made a conscious policy *decision 'to open its doors and look outwards'* toward the City. Practically, this has meant NCC bringing partner organisations in to Chair council committees (e.g. its Green Capital Steering Group has an external Chair: the Director of NIRES). The brokerage process in Newcastle is not heavily restricted by the political process, whose overriding priority is policy delivery. The council leadership grants individual NCC policy officers the flexibility to seek out relevant knowledge from its partners in order to deliver its policies. Newcastle respondents considered NCC policy officers to be in a fortunate position, as they do not need political approval to develop programmes of co-operation with university partners. If collaboration makes sense and clearly aids policy delivery, then policy officers have the autonomy to make the necessary connections. In terms of formal links with the two universities, NCC is a key partner on specific University local, national and European research projects (e.g. e-mobility in the North Sea Region, INTERREG). It also funds PhD studentships, hosts student placements, and a high number of NCC staff have benefited from full and part time courses at both universities.

Timescale and formalisation of the brokerage process

Formalised Memorandums of Understanding are in the process of being signed between the two local governments (Newcastle and Gateshead) and the two universities (Northumbria and Newcastle). There is no set timescale for the brokerage process to operate; it is envisaged that collaboration between the institutions will be on-going, growing in strength and becoming more formalised as time progresses. The current funding environment in the UK, in both local government and academic circles, is extremely tough and the vast majority of brokerage occurs without designated funding. For local governments like NCC, resources for policy delivery are scarce, and central policy officers have been granted a '*filtering of information*' role, requiring them to evaluate initiatives before the Council decides whether or not to engage officers to deliver them. This screening phase is vital; a vast range of projects

are brought to the attention of NCC and it only has the resources to fund a limited number of projects; effectively the council is involved in strategically selecting 'winners'.

Key factors for creating a successful brokerage process

In the Newcastle case study, the following factors are associated with a successful brokerage process:

- Shared objectives between key partners, e.g. agreed end goals
- Excellent interpersonal relationships between key staff in the main institutions involved in the brokerage process
- A range of staff involved in the brokerage process, so that it is not reliant on a few key individuals
- High levels of motivation from all the participants: one respondent suggested it was *'very important that the 'will' to collaborate is there and networking is viewed as useful'*

Key barriers to the success of the brokerage process

In the Newcastle case study, the following factors were identified as potential barriers to an effective brokerage process:

- Lack of time for key staff to devote to the brokerage process
- Lack of funding, and failure to think innovatively in order to maximise existing funding
- Lack of clarity regarding the agenda and objectives of individual initiatives within the brokerage process
- Attitude of certain partners, who may be blinkered, heavy-handed, or only interested in pursuing their own objectives

Other significant features of the Newcastle brokerage initiative

Geographical proximity was reported by the respondents from NCC as a key factor in the success of the brokerage process in Newcastle. Three of the key institutions in the brokerage process are located in the City Centre, within about five minutes' walk of each other. This close proximity is viewed as a key reason for the high levels of informal contact between policy officers, politicians and University staff.

Equally significant is the wider context: Newcastle is a peripheral area within the national economic and geo-political context, a long way from the centres of power in London and South East England. The partners appreciate that they carry more political weight when acting in unison than each does alone. A change of political leadership is not viewed as a threat to the brokerage process in Newcastle. This occurred in May 2011 when control of NCC reverted to the Labour Party after eight years of control by their political opponents, the

Liberal Democrats. This has had little impact in terms of local policy objectives. Fundamental to a successful brokerage process in Newcastle is the fact that the central objectives of all the partners are broadly aligned.

Case Study 2: Tilburg, Netherland

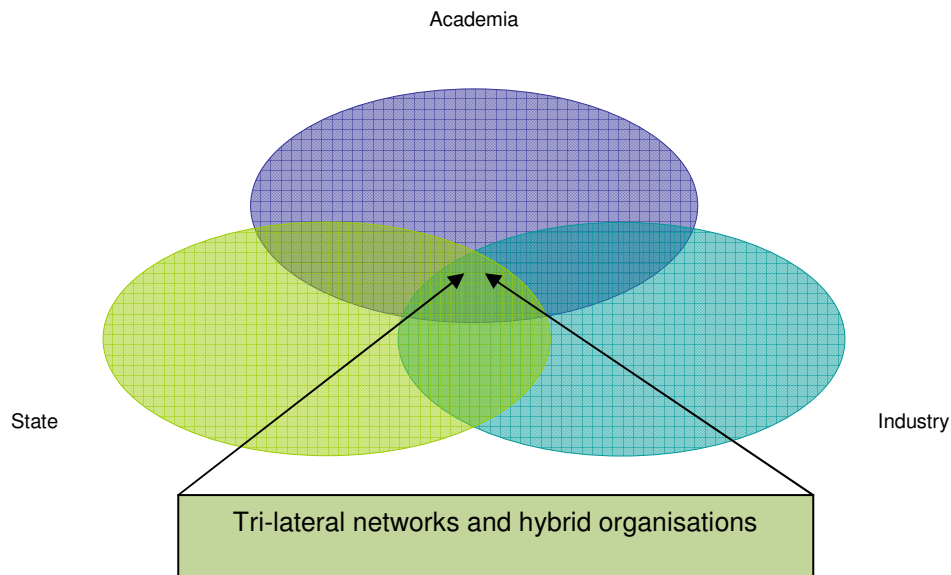


Figure 8.2: The Triple Helix approach adapted from Etzkowitz and Leydesdorff (2000)

Background

Tilburg is the sixth largest city in the Netherlands; it is located in the south, with an approximate population of 200,000 residents. It was formerly a heavy industrial city. Tilburg is the largest conurbation in the Midden-Brabant region, a grouping of ten local authorities. The brokerage initiative was started in 2007 by the former Mayor of Tilburg, who set out to re-invigorate the local economy by bringing together representatives from local government, the local business community, education and research. The subsequent *Midpoint* initiative is an alliance including a number of research and educational institutes, the local government and private sector companies in the region.

How does the brokerage process function in Tilburg?

The theoretical underpinning for the initiative is the triple helix approach (Etzkowitz, 2008; Etzkowitz and Ley 2000), which incorporates interaction across university, government and private sector industry institutional boundaries. Etzkowitz (2008) describes organisations like *Midpoint* as 'hybrid' organisations that act as a bridge between the institutional spheres of higher education, local governance and commerce.

At the outset of the initiative a significant amount of research and scoping was done to pinpoint the strengths of the Midden-Brabant region. The aim of the scoping process was to develop a stronger regional economic identity. Four key economic sectors were selected: Leisure, Logistics, Aerospace & Maintenance and Life sciences. For each of the four sectors, five common themes apply:

- Sustainability
- Labour market policies
- Safety
- Innovation and entrepreneurship
- Social innovation and societal value creation

The objectives of *Midpoint* are:

- To position the Central Brabant region as *the region* for social innovation
- To create an open source knowledge and development platform
- To stimulate an excellent business and living environment
- To develop a top institute for social innovation (TISIL)
- To stimulate and facilitate new governance processes

The Board Members of *Midpoint* (the Mayor, Rector Magnificus and Chief Executive Officers [CEOs]) run the brokerage process predominantly through their own personal networks. They develop and implement the high level programme philosophy (social innovation) and set out the programme lines of operation. The Board is supported by an advisory board of 30 key stakeholders. For the overall *Midpoint* project there is an Ambassador Network, a cross-cutting group of 10 people from across the initiative, whose aim is to ensure that the initiative does not descend into a silo mentality, and that cross-cutting initiatives are facilitated. The day-to-day operation of the *Midpoint* initiative is run by a Director, supported by individual programme managers.

Timescale and formalisation of the brokerage process

All stakeholders involved in the *Midpoint* initiative have signed the strategic Local Agenda 2011-2015 declaration. The *Midpoint* organisation has been set up with sustainability in mind and is meant to become independent in the long term. The brokerage process is an approach which the key stakeholders in the area are committed to continuing for many years to come. The initiative currently has designated funding of €25 million, which will secure the project until 2013; securing new funding is essential for the long-term future of the initiative.

Key factors for creating a successful brokerage process

The experiences of the *Midpoint* initiative suggest that the following factors are associated with a successful brokerage process:

- Adequate financial resources to fund the initiative for a number of years
- Sustained political support from all key stakeholders
- Highly-skilled programme and project management staff
- Enthusiastic local leaders who display strong support for the initiative
- A common interest and understanding with regard to the added value of co-operation

Key barriers to the success of the brokerage process

From the experiences of the *Midpoint* initiative, the following factors have been identified as potentially jeopardising the success of the brokerage initiative:

- An absence of quick wins, which are very important to build momentum and confidence
- Lack of flexibility. The brokerage approach demands a new way of thinking, and a new governance model. Political arenas are not always ready to make this change.

Other significant features of the *Midpoint* initiative

The initiative is being monitored on an on-going basis by a steering group where all the key stakeholders are represented. As yet, no individual reports have been produced for specific projects, but the Annual Report of *Midpoint* summarises the monitoring details for each project. A respondent from Tilburg suggested that a change in political leadership in the area would '*not really a big issue for Midpoint*'. There is a consensus that the issues identified by *Midpoint* '*are the big issues for the foreseeable future*', and these issues are not politically led. The same respondent thought that the role of individual personnel was crucial, suggesting that it was critical not to lose good project managers in the formative stages of developing a project cluster, as the individual project manager becomes a figurehead and is crucial to raising the profile of the cluster.

Case Study 3: Oslo, Norway

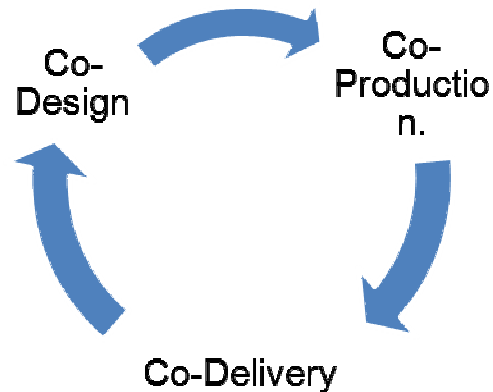


Figure 8.3: The process of co-design, co-production and co-delivery in Oslo

Background

Oslo is the capital of Norway and a city of approximately 600,000 residents; around 1.4 million people live in the Greater Oslo metropolitan area. In terms of the wider economic context, the national economy in Norway is very robust due to an economic surplus generated by oil and gas reserves. Norway does not face the same economic constraints on its local governments that are currently common elsewhere in Europe.

How does the brokerage process function in Oslo?

The brokerage process in Oslo focuses on CIENS, the Oslo Centre for Interdisciplinary Environmental and Social Research, which is a consortium of independent scientific partners. The CIENS group hosts 550 scientists from a broad range of scientific disciplines, who are employed by the nine institutes listed in table 1, and come together in a formal collaboration to make up CIENS.

Table 8.1: Scientific Partners in CIENS

Norwegian Institute for Water Research (NIVA)	Norwegian Institute for Urban and Regional Research (NIBR)
Institute for Transport Economics (TØI)	CICERO – Centre for Climate Research
Norwegian Meteorological Institute	University of Oslo
Norwegian Institute for Nature Research (NINA)	Norwegian Institute for Air Research (NILU)
Norwegian Water Resources and Energy Directorate (NVE)	

CIENS and Oslo City Council Department for Environment and Transportation are the two key partners in the brokerage process in Oslo; for specific projects other scientific partners and various divisions in the Oslo city administration are also involved. CIENS was established in 2006, and the formal brokerage process between CIENS and the City of Oslo started in 2008 with a strategic discussion about how to strengthen the links between the city and applied academic researchers. The key players in this development were the former Co-ordinator of Environmental Affairs at Oslo City Administration and the Director of Research at CIENS.

Good relations developed over many years between different research institutes in CIENS and various departments in the Oslo city administration (e.g. the Norwegian Institute for Water Research [NIVA] has a long established relationship with Oslo Water and Sewage Works). Until recently, co-operative activities between the partners have been only at an informal level. The CIENS umbrella is a start of a more formalized and systematic pattern for co-operation. Co-operation in the brokerage process in Oslo operates at both senior and junior level within the two partner institutions, with contacts and research activities involving each of the partners in the CIENS family and the City of Oslo's various departments.

A seminar was held in October 2009, involving three representatives from each institution, to begin the formal brokerage process. Over 80 participants from the City of Oslo and CIENS attended. Participants formulated project ideas and research objectives, which were then developed into a report, '*Environmental challenges and knowledge needs in Oslo*', which aimed to generate wider discussion about potential research activities. Subsequently, 11 project proposals in nine co-operation areas were identified. Examples include:

1. Eco-city Oslo - Oslo the recycling city
2. Blue and green structure - biodiversity and outdoor recreation
3. Social development for good neighbourhoods
4. Climate and environmentally friendly mobility
5. Mobilising the public & businesses to reduce Green House Gas (GHG) emissions
6. Eco-efficiency, management and administration

The planning team will meet regularly - at least annually - to assess progress and develop new collaborative research ideas. The brokerage process in Oslo has been developed on firm foundations, with a strong degree of '*strategic fit*' between the political strategy of the city administration and the mission statements of the university and CIENS. The brokerage process in Oslo also illustrates partnership principles of co-design, co-production and co-delivery:

- **Co-design:** Oslo and CIENS work together to design a research programme
- **Co-production:** Oslo and CIENS work together to carry out the applied research
- **Co-delivery:** Oslo and CIENS work together to ensure that the outputs from a programme or activity are delivered efficiently and effectively to achieve the desired outcomes and to ensure the research outputs are taken up by all partners

Timescale and formalisation of the brokerage process

The CIENS - City of Oslo co-operation is a brokerage process anchored strategically in the Environmental Policy and Urban Ecology Programme of the City of Oslo. The brokerage process in Oslo is currently relatively informal, with no formalised signed relationship between the partners, although there are some linked formalised agreements, relating primarily to Masters and PhD studentships between the University of Oslo and the City of Oslo. CIENS aims to continue the partnership for the foreseeable future, and establish a lasting formalised co-operation.

Key factors for creating a successful brokerage process

The experiences of the Oslo case study suggest that the following factors are associated with a successful brokerage process:

- The creation of 'win-win' situations for both partners in the brokerage process
- Good interpersonal relations between key personnel involved in the brokerage process

Key barriers to the success of the brokerage process

Three potential barriers to the successful functioning of the brokerage process were identified from the Oslo experience:

- Lack of funding for projects
- Lack of staff time and capacity to manage partnership relations
- Loss of key staff in the embryonic stages of the brokerage process (although this becomes less of a problem as the systems mature and stability improves)

Other significant factors about the brokerage process in Oslo

The brokerage process is still in a relatively embryonic phase. No fixed contact patterns have yet been established, although the plan is to establish a system of meeting on an annual basis. The new research projects will build on the strong tradition of bilateral links between departments in Oslo and each CIENS research institute. The proximity of the partner institutions, which are only 15 minutes apart, is seen as an important factor in the success of the brokerage process. A recent changes in Oslo's political administration was thought to have been beneficial to the brokerage process.

Case Study 4: Norrköping, Sweden



Figure 8.4: Members of the brokerage process meeting in Norrköping. (C) Peter Modin

Background

The municipality of Norrköping in the east of Sweden has a population of approximately 130,000, and is the eighth largest municipality in Sweden. Linköping University [LiU] is a significant university in Sweden with approximately 27,300 students. The university has two campuses, one in its home city of Linköping, and one in the neighbouring municipality of Norrköping.

How does the brokerage process function in Norrköping?

The key partners in the brokerage process are Norrköping municipality (the local government), LiU and local businesses. When the local publicly-owned energy company was sold to a private sector owner, the buyers created a fund for city development. Researchers can apply to the fund for financial support for their research projects. The Sustainable Norrköping research group submitted an application to the fund to enhance sustainable city development based on infra-systems. Prior to this, a dialogue was held with politicians, officials and local businesses to ensure the resulting initiative would be useful to all parties.

A key feature of the Sustainable Norrköping brokerage process is regular meetings of the members of a reference group consisting of officials from the municipality, local business representatives, members of the regional green technology association, and research staff from the university.

A research team at LiU has close contact with some of the departments of the municipality, especially the management department and the spatial planning department, but also with locally owned companies (e.g. water supply, water treatment, and biogas companies). In

October 2011 the research team at LiU held a conference on sustainable city development, which aimed to create a platform for networking and the exchange of experiences between researchers and practitioners, both in the public and private sectors. The conference, '*Sym City – Rethink the City*', was highly successful, putting Norrköping on the map as a leading sustainable city in Sweden. It was attended by delegates from all over Sweden, featured internationally-renowned speakers, and received widespread media coverage in Sweden.

The aim of the research programme, Sustainable Norrköping, is to contribute to decision making processes by providing research findings which allow practitioners to make evidence-based policy decisions. The Sustainable Norrköping research team also facilitate seminars, and are often invited to speak at the municipality's internal meetings and conferences.

An additional dimension of the research programme in Norrköping is the focus on making its research results more publicly available by utilising visualisation techniques. There is an advanced visualisation centre in Norrköping, which is a partnership between LiU and Norrköping municipality. The Sustainable Norrköping research team has just produced its first visualisation, which is open to the public, and shows how individuals' daily lives have an impact on technical systems. For example, waste in the sewage system can become fuel for buses, via conversion to biogas. Waste can also be redirected back to households as heat, via a district heating system. The aim of the Sustainable Norrköping initiative is to try to illustrate a fairly closed ecological system where many products are recycled and reused.

Timescale and formalisation of the brokerage process

Sustainable Norrköping was initially funded for two years. A further two years of funding has been agreed, but the research team express their hopes that this is just the beginning of a long and fruitful partnership. Additional funding will not be available from the research fund after 2013, as the fund set up by the utility company will be fully allocated, but the partners plan to develop joint research applications for funding.

The collaboration in Norrköping between research staff at LiU and policy staff in the local government has developed over a long time, as a result of research staff performing evaluations of the city's sustainability efforts and contributing to the development of a green technology promotion organisation, which is a collaboration between Norrköping city, Linköping city, LiU and local environmentally-driven companies. Sustainable Norrköping builds from this, but is a more systematic and focused collaboration that enables researchers and practitioners to explore different areas using the same approach.

Key factors for creating a successful brokerage process

Experiences in the Norrköping case study suggest that the following factors can contribute to a successful brokerage process:

- Effective communication between all the partners in the brokerage process
- Understanding each partner's situation and goals
- A high degree of trust between the partners in the brokerage process
- A willingness to try new approaches and to *'think outside the box'*

Key barriers to the success of the brokerage process

The Norrköping case study highlights the following the following issues, which could prove to be barriers to a successful brokerage process:

- Lack of available funding for the brokerage process
- Instability in local or national politics, meaning that the brokerage process and similar connectivity initiatives may not be viewed as priorities
- Individuals with a hidden agenda who attempt to exploit the brokerage process for their own purposes

Other significant information about the brokerage process in Norrköping

Collaboration within the Sustainable Norrköping project occurs on various different levels according to the development phase of the different projects within the research programme. The researchers from LiU define the project ideas and the content of the projects. However, these are then discussed and refined in collaboration with politicians and the business sector. A reference group meets twice a year for this purpose, consisting of representatives from local government departments (e.g. spatial planning, mobility, and business development), local businesses (e.g. energy and compost companies, and energy consultants), and a transport research institute. The team at Sustainable Norrköping has organised workshops on different themes, such as energy and transport planning, which are open to both officials and politicians; this, together with the reference group meetings, has led to many new connections or collaborations between the people working in Norrköping. A significant factor in Norrköping is the level of synergy between the political aims of the local government and the corporate mission of the University.

Case Study 5: Turku, Finland



Figure 8.5: Turku Cathedral. (C) Dave McGuinness

Background

Turku is a city on Finland's South West coast. It has a population of approximately 178,000 people, making it Finland's fifth largest city. The wider Turku region, with a population in the region of 300,000, is the third largest urban conurbation in Finland. The city of Turku is bilingual and contains two universities: Åbo Akademi, the only Swedish-speaking university in Finland, and the Finnish-speaking University of Turku.

How does the brokerage process function in Turku?

The brokerage process in Turku, the *Turku Urban Research Programme*, was initiated in 2007 between the Mayor of Turku and the Vice-Rector of Turku University. Prior to the brokerage process beginning, the University had been in discussions with the City of Turku to increase co-operation in urban research.

The official starting point for the brokerage process was a seminar entitled '*Development of urban research and urban policy*', held in Turku in February 2008. Speakers from Helsinki were invited to introduce the co-operation (brokerage) model that was being used in Helsinki. There was wide participation from local government, but only a few academics attended the event.

The result of this seminar was a decision to draft a joint initiative and co-operation model for the City of Turku and the local universities. The planning group included the Mayor and Vice-

Rector, who communicated frequently with the steering group, which included a number of academic and practitioners. The City Board made the decision to initiate the *Turku Urban Research Programme* in May 2008. The preparation phase began with a research study on urban research and city-university co-operation in Turku from 2003-2007. Based on the results, an outline of four broad research themes - the core around which the programme is organised - was drafted in November 2008, based on the study. The *Turku Urban Research Programme* was approved in August 2009. An undertaking was made to employ a Research Director of Urban Studies to manage the programme (i.e. to be 'the broker'). The broker's first tasks were to organise seminars and conduct interviews with key stakeholders in order to establish the city's research needs. The broker is employed by the University, and has offices in both the city's central administration and at the University of Turku. The broker described this dual base as a significant advantage, with an office in the city meaning s/he could have close involvement in strategic management of the city:

They feel I am part of the personnel and can discuss openly the strategically matters with me. It is easier to stay informed and suggest options how university co-operation could be involved early in the policy development process. I am often referred to as "a common resource" between the city and the universities.

The governing body is the Steering Group; it discusses all of the major decisions as well as the co-operation process. The Steering Group of *Turku Urban Research Programme* includes the Rector of the University of Turku (chairman), the Mayor of Turku (vice-chairman), three Vice-Mayors, the Strategic Manager of the City of Turku, a number of Professors in different disciplines, the Research Director of Urban Studies, and the Urban Policy Secretary of the City of Turku.

The brokerage process in Turku has two central goals:

- To increase the amount of academically-relevant urban research which provides policy advice to the city
- To enhance the exchange of information between the city and local universities about their work

The broker in Turku suggested that one of the most difficult tasks was keeping local authority staff and academics informed about each other's work and priorities. One tool to try to help this process which was developed in Turku is a new publishing series called *Tutkimuskatsauksia* (research reviews), which aims to publish topical research concisely and clearly for policy makers.

Timescale and formalisation of the brokerage process in Turku

The brokerage process in Turku is semi-formal. The governing body, the Steering Group of *Turku Urban Research Programme*, is jointly appointed. While the City Board approved the programme on behalf of the city, there was no equal decision made on behalf of the University, and no joint agreement has been signed. The City Board approved the current *Turku Urban Research Programme* for 2009-2012, and there is strong support for its renewal after this date. The current programme will be lengthened for a year, due to the city's on-going strategy process, and an updated version will be drafted next year.

Key factors for creating a successful brokerage process

The experiences of the Turku case study suggest that the following factors are associated with a successful brokerage process:

- High levels of trust and faith in the process from all participants
- Willingness to truly co-operate even if it requires extra effort and resources
- Willingness to develop new processes and to try challenging ideas
- Willingness to attempt to apply research findings to decision-making, and re-consider institutional goals if necessary

Key barriers to the success of the brokerage process

From the experience of the Turku brokerage initiative, the following factors are viewed as potentially jeopardising the success of brokerage processes:

- Inner power struggles and a politicisation of the process
- A lack of resources to adequately fund and manage the brokerage process

Other significant information about the brokerage process in Turku

The Turku respondent thought it was a good idea to have one, full time broker, whom everybody knows and can easily contact. Two areas for future development in the Turku brokerage process are formal mechanisms for staff to move between institutions (e.g. on secondments), and developing the informal networking element of the brokerage process, by hosting social and networking events to bring new interested parties into the brokerage process. In the experience of the broker, co-operation in Turku works well because of a willingness on all sides to find solutions and develop effective research ideas together.

Conclusion: key themes from the case studies

This section summarises the findings with regard to the key cross-cutting themes about successful knowledge brokerage that are apparent from the five case studies:

- All of the case studies build on strong existing (often informal) networks that existed between practitioners and academics/researchers
- Several case studies held a formal seminar or event at the outset of the formal brokerage process to gather key stakeholders together and discuss research priorities
- Shared institutional goals, high levels of trust and good interpersonal relationships were associated with successful brokerage in all the knowledge brokerage case studies
- Adequate financial resources were viewed as essential in most of the case studies, although the Newcastle case study shows that knowledge brokerage can be achieved with very limited financial resources
- The Turku and Tilburg examples illustrate that a designated knowledge broker is a significant advantage in terms of pushing the knowledge brokerage process forward
- Failure to keep an open mind and lack of willingness to truly co-operate were viewed as significant barriers to successful brokerage processes
- Physical proximity of key institutions in the brokerage process was viewed as a advantage by respondents, but not essential, providing that the distance between institutions was not too great

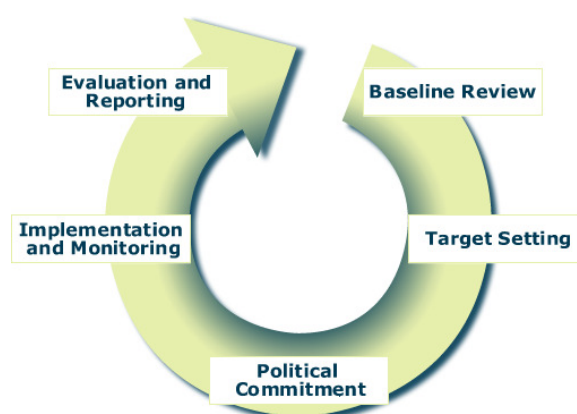
Section 9: New roles for researchers, policy-makers and European institutions: shaping local sustainability together

Introduction

The question of how best to deliver local sustainability has received sustained attention from researchers and policy makers in recent decades. Tools and methods to improve cities' sustainability processes have developed significantly during this time. Such tools may either be locally developed, or involve participation in a wider scheme, for instance at a national or European level. Locally developed tools may be highly specific to the policies and objectives of their city of origin, but wider schemes offer greater opportunities for sharing information and comparing progress. Schemes at European level are not intended to impose standardised solutions; rather they are designed as a common framework of reference offering guidance and comparison.

Integrated sustainability management typically comprises a logical cycle of five phases: a baseline review to take stock of the existing situation; the setting of objectives and targets; political mandate and resource allocation; an implementation phase; and evaluating and reviewing progress (ICLEI, 2007). However, there is no fixed sequence and the phases can vary. These five phases may together form a cycle or spiral of continuous improvement, with in-built feedback loops (see figure 9.1).

Figure 9.1: The Sustainability Cycle



This section investigates how the tools outlined in Section 2 of this report relate to each of these five phases of integrated sustainability management, with the aim of identifying which of the tools are most useful for local governments at each phase. Each phase is considered in turn. The section goes on to discuss the need for co-operation between policy-makers and

researchers in achieving local sustainable development, how this can best be facilitated, and what the European Commission's role should be. Data from the three participatory voting sessions at the two Informed Cities Fora and discussion at National Implementation Workshops is drawn upon.

How local sustainability gains importance in the political and research agenda: preparation and problem structuring phase

The early stages of formulating a local approach to achieve sustainable development can be crucial. Initial creation of a structured organisational set-up and a framework of information can be highly advantageous for future development, by forming a basis for developing objectives and evaluating progress. This section addresses elements of the initial process, including organisational set up, optimising data and indicator sets, and identification of needs.

Organisational set-up

The organisational set-up necessary to progress toward sustainable development requires a team of individual workers who know their responsibilities and who work together towards common goals in a systematic and planned manner. The system in which researchers and policy makers define and elaborate strategies and targets must be carefully designed. In voting sessions at the First Informed Cities Forum (Newcastle 2011), both policy-makers (79%) and researchers (70%) thought that this should happen from the earliest stages of the policy cycle, so as to achieve universally understood policy definition and strategic direction.

The development of a flexible working group involving policy makers, researchers and practitioners, which incorporates and makes use of the existing structures in municipal administration research institutions, can be beneficial. The group can oversee and supervise the whole process. Such a group would not involve particular financial or political implications. Other intermediary bodies could help to support the linkage between researchers and policy makers, such as knowledge transfer organisations and networks.

Data and indicator sets

Once the decision has been made to work jointly towards local sustainability, the next step is to gather baseline data about the current situation: the status of local sustainability and what is being done by all departments. A baseline can be compiled from existing indicators and datasets, or from primary research. The quality of the data is imperative, as the baseline will inform the subsequent policy debate.

Approaches to setting a baseline and collecting data may be informed by existing policy or practice. For instance, the Aalborg Commitments can act as the basis of a framework for data collection. In other cases, tools developed by academic and research communities may be used, although it is important that they are able to 'translate' and appropriately disseminate such tools or approach, because *'the incredibly vast array of research and scientific tools will always exceed the reading and time capacity available to policy-maker'* (European Commission, 2009d).

Identification of needs

The challenge of sustainability is very evident in the process of selecting priorities and handling boundaries between disciplines and sectors. Taking forward plans and priorities with minimal compromise depends on finding ways to combine the different, and sometimes conflicting, needs of each sector.

The identification of problems, needs and priorities often develops from media or public perceptions of local issues (Jungwirth, 2011). The role of researchers in identifying needs can be *'challenging'* – influencing the setting of needs and priorities – or *'authoritative'*, if policy-makers need independent and neutral research to back up their proposal. Researchers can find it difficult to understand and react quickly to policy makers' needs, but may be able to overcome this by improving their understanding of policy priorities and working methods. Policy makers also need to take on board the local sustainable development research agenda. One of the conclusions of the ISSUES project (2011) was that the gap between what policy makers need and what they can quickly obtain provides an opening for researchers, which may help their work to make a genuine impact on society. An intermediary body (knowledge broker) may be the most effective means of communicating research needs from policy makers to scientists.

In the voting sessions, almost a third (32%) of local governments thought the prestige of scientific establishments was an important factor in the process. Similarly, researchers identified their academic credentials and neutrality as significant with regard to political struggles. Recourse to sound and impartial research findings can give confidence to decision makers and help legitimise their decisions (ISSUES, 2011).

Formulating objectives and targets for local sustainability policies

The formulation of objectives and targets for sustainable development may be a natural meeting point for research and policy making, in the sense that political will is expressed by targets based on scientific evidence. Decisions on direction and appropriate timescales must

be supported by thorough and objective study of realistic options and possibilities. However, proposed objectives and targets can reflect the subjective ambitions of different stakeholders with different and often contradicting interests. For this reason, setting targets is often a difficult step in the management cycle to be avoided or put on hold by local governments. Moving from the baseline review directly to the implementation of projects appears to be a much more convenient strategy. In reality, however, a fragmented portfolio of 'sustainability projects', in the absence of consensus on the overall plan, is not enough to achieve measurable and relevant improvements in the local sustainability situation.

Since the beginning of the twenty first century, target setting has become the key element of some large-scale schemes for local sustainability at the European level. By signing up to the Aalborg Commitments, for example, local governments commit themselves to fifty targets in ten thematic areas, and are obliged to regularly report back to the European Sustainable Cities & Towns Campaign on their achievement. Other schemes implicitly lead participating local governments to adopt pre-set targets - such as reducing CO₂ emissions by 20%, and delivering a Sustainable Energy Action Plan outlining how this will be achieved, when signing up to the Covenant of Mayors.

Developing objectives and setting targets

Objectives for sustainable development are usually qualitative in nature (e.g. *'more climate-friendly mobility'*), and are distinct from targets, which should be measurable and quantifiable (e.g. *'20% fewer cars entering the city centre per day'*). Objectives are usually relatively simple to formulate, with consensus normally being achieved easily across political parties and civil society stakeholders. Targets, however, can vary due to the very different specific local conditions in each local government. Targets often reflect the fragile balance between what is needed, what is possible and what is wanted. It is this balance that requires a strong and sensitive mediation from research, as the following examples illustrate.

What is needed: A Western European city with very high CO₂ emissions may need to drastically cut its emissions in order to help meet global reductions targets. Such a radical target will certainly be challenged as too radical, totally unrealistic, or utopian, if expressed by a political party or stakeholder group. Researchers can support the sensitive negotiation process of finding the right target for a particular city by presenting the physical necessities in a long-term perspective, underpinned by scientific data, and being neutral. They can help raise awareness of the magnitude of sustainability issues, move stakeholders to question their short-term interests, help them track progress, distil and capture lessons (UN-

HABITAT, 2008), and pursue more ambitious targets. By objectively explaining what is needed, they can push the local targets closer to what is achievable.

What is possible: The inhabitants of a Spanish city might need to limit their daily per-capita use of freshwater considerably, but Finnish citizens can be less restricted in controlling their water leakage. A heavily industrial city might be able to achieve tangible improvements of its air quality through technological modernisation, while a service-based university city has to fight hard to slightly reduce emissions coming mainly from car traffic. A fast-growing city might have much less margin for providing affordable housing than a shrinking one, but will have more financial resources available to invest in this target. Local targets for sustainability need to reflect the local geographic, physical and economic situation. Researchers can show the range of target values possible under given circumstances, helping to avoid both unrealistically ambitious and unnecessarily ineffective targets. Studies on likely changes to framework conditions form another indispensable source of information for local target setting processes. By outlining what is possible, researchers can influence what is needed and signal when and how a change of direction is necessary.

What is wanted might change over time, but it can also be influenced in the short term through information sharing and dialogue. Under exactly the same physical and economic framework conditions, different cities may set different targets. There may be various reasons for this. First of all, political decision-making is about setting priorities, which is not an easy task. 'Sustainable development' touches upon a broad range of policy areas, and no city can focus on everything at once. Whereas the '*Solar City*' might leave aside social segregation concerns, the council of '*Inclusive Town*' may accept a higher share of fossil energy production. Furthermore, different stakeholders usually have different opinions on whether targets are acceptable. Hardly any target can be achieved without the contribution of actors outside the local government, which suggests they should be involved in setting them from the start. Finally, what is wanted is strongly influenced by the current zeitgeist - the spirit associated with each period as well as the general societal consensus. Research - and researchers - can have a decisive influence on each of these three aspects: setting political priorities, changing stakeholders' positions, and attributing positive connotations to more sustainable lifestyles.

In order to enhance the connectivity between research and policy-making in the target setting phase of the management process, close co-operation between researchers and local government staff is crucial. Acting outside election terms, and to a large extent independently from political interests, researchers and other experts share the role of

advisors and facilitators with regard to both political actors and civil society. They provide the information and data needed by the other stakeholders to make up their own minds, argue for their viewpoints and finally achieve consensus. Because of their neutral role, researchers may be approached by different and opposing parties in the attempt to 'scientifically' underpin one or another party's viewpoint or to facilitate the solution of political conflicts and tensions. Political impartiality is imperative within research for this reason.

Ensuring progress is measurable

Unlike qualitative objectives, targets must be based on quantifiable units so that they are measurable. Local governments cannot measure all aspects of local sustainable development at once, so a selection of indicators must be made which gives political decision makers a fair idea of which aspects of local development are in line with sustainability objectives, and which are not. Any discussion about indicators must recognise two dangers: over-complexity and over-simplicity.

Some schemes for measuring local sustainability on the European (and national) level, such as the European Green Capital Award, are based on a number of key indicators along which the applicant city has to present its achievements, and which form the basis for comparison by the award jury. The Covenant of Mayors includes one common target for all applicants: to reduce CO₂ emissions by at least 20%. While such a simple aim assists the overall communication and presentation of the initiative, achieving this target might require one single measure from one local government, and a whole long-term action plan from another, depending on where their respective starting points are. Unless a local government is participating in a similar scheme, the process of defining indicators should ideally be conducted as a cross-departmental process, with decisions ultimately being based on the local context. Researchers can assist local government in making the right choice of locally relevant indicators, and in compiling the data needed to define measurable targets.

Ensuring political commitment

Decision making for sustainable development requires legitimisation by the elected council, especially when the consequences will impact upon the local budget. Measurable targets, although developed by a variety of local stakeholders, experts, officials and researchers, should always be adopted by the political decision-making body. In the eyes of researchers, however, this might lead to delays in the process, and potentially to weakened targets as a result of extensive political debate and potential compromise.

Political decision makers can be considered to be reflection of the local societal consensus. Consensus for sustainable development targets and measures is an iterative process of constantly evolving information, raised awareness and changed behaviour.

Local governments and researchers in the commitment phase

Understanding the different arenas in which policy making and research take place is one of the greatest challenges when trying to enhance the connectivity between the two. Asked about the main differences in their approaches towards sustainable development, researchers and local government representatives shared the view that the two systems – research and local government - function in very different ways. Researchers' role is to analyse long-term trends and recommend necessary actions to be taken, whilst policy-makers are bound to short-term electoral cycles that require successes and achievements to be presented in four to five years finite blocks. While any recommendations made by researchers need to be supported by scientific evidence, policy makers need to find the very fragile balance between representing the will to improve local circumstances, and taking their electorate with them on that path; otherwise they will simply not be re-elected (Evans *et al*, 2005).

Scientific evidence – as represented by the recommendations made by research - may not reflect societal agreement, represented by the decisions finally made by the political body. It appears that in the phase of creating political commitment, researchers and policy makers must stick to the rules of their respective systems. Only a credible, objective and scientific analysis of the situation will produce useful information that can lead to a shift in awareness among the local electorate; only a responsible political decision, balancing the needs and fears of different community groups, will create trust in political leadership towards sustainability. Together, policy-makers and researchers can accelerate the process of moving societal consensus towards more ambitious targets.

European schemes and decision making

Some of the schemes available at the European level for local governments to enhance their ambition towards sustainability make use of the demonstrative effect of political commitment. For example, both the Aalborg Commitments and the EU Covenant of Mayors require a decision by the local government (or an authorised politician) to join the scheme and adopt the related objectives and/or targets. As noted previously (in Section 3), local governments may use schemes to secure a 'green badge', as a form of sustainability accreditation, or to catch the attention of European institutions and national politicians.

Implementing and monitoring local sustainability projects and activities

The next phase is at the heart of overall task: carrying out the planned activities and measures. Implementation is a demanding task in terms of organising and co-ordinating all the parallel actions that need to take place. Effective communication and involvement among the working group is vital. Co-operation between stakeholders can help ensure that different actors buy in to the implementation process. Therefore, implementation depends on a firm foundation, which is a combination of the plan of activities, the preparation and problem-structuring phase, all underpinned by strong communication. Approval of the plan of activities and projects by the city council is a determining success factor, as it legitimises actions and lends them the required legitimacy.

Nevertheless, tensions can arise from differences in expectations among various actors on what the activities will deliver and how they will be managed and funded. In the next subsection the report addresses these fundamental questions: how to co-ordinate diverse measures? How to monitor and make adjustments?

Co-ordination of measures

In spite of the agreement on roles and responsibilities, there are numerous political and financial constraints that may limit or change the room for manoeuvre of policy-makers.

At the same time, scientific expertise of researchers may be more solicited or demanded and in some cases contested. In addition, other stakeholders, such as businesses and local companies may have contrasting needs concerning the transformation of the planned activities into commercial successes.

The three perspectives of policy-makers, researchers and operators are not mutually exclusive; rather they should focus on different aspects.

Co-ordination is a central requirement for making sustainable development projects and activities work. Deficits in co-ordination contribute significantly to other problems. Therefore, it is extremely important to avoid creating segregated actions and projects carried forward with different timetables by research institutions, city councils and businesses (e.g. transport companies, waste and landfill operators, etc.), and argue for the need to encourage synergies.

The above factors make the process more difficult to predict, even though legal requirements and the political approval oblige the actors to find compromises.

However, responsibilities and schedules relating to individual measures must be agreed upon within local administration and research institute by this stage. This is best carried out by the persons responsible in the individual local government sectors and academic departments and then confirmed in a high-level round of talks between senior managers. The instruction to begin this step is ratified by the flexible working group (see Section 8) discussed earlier which also reaches agreements with participants from outside the local administration. Self-imposed targets and voluntary commitments must be given a concrete form through announcement of planned measures that are to be implemented in the coming year.

The announced measures do not have to be completed in chronological order. Instead, a strategic plan should be produced which sets out the priorities for implementation and all relevant information, such as responsibilities, contact partners, and obligations for communication and regulation.

The process of monitoring

In parallel, and for the purpose of being able to measure and report the results, the implementation of the planned activities and projects should be monitored in an appropriate way and fed back to the politicians.

Practically, once the preparatory stages have been laid down, the working group can start to record the events that have actually occurred. The group can do this alone or in collaboration with other knowledge brokers. This role may be undertaken by boundary or network organisations or collective bodies. In the policy context these might include “science advisory committees, governmental research institutes, consultancy firms, and think tanks” (Holmes and Clark, 2008). This process allows stakeholders to see if actions are being implemented with positive results and can give some indications of future trends. If progress is poor, it allows partners to apply corrective measures while implementation is still in progress.

Therefore, in order to be able to engage in monitoring, actions need to rely on targets based on indicators as defined earlier. At this stage it is advisable to reflect on the original aims of the initiative, exploring the implicit and explicit assumptions made at the outset and making any necessary amendments to the process (re-working or even putting projects on hold) based on existing evidence about progress.

Elaborating on the findings from a series of national workshops at which policy-makers and practitioners jointly reviewed the impact of research tools on policy-making, new approaches are necessary to increase the use and relevance of foresight and predictive activities. Participants raised questions about how local governments can develop together with universities their institutional capacities to help prevent or mitigate events and adapt accordingly through better strategic foresight and appropriate forecasts of future scenarios.

Deviations and adjustments

As highlighted above, monitoring also involves the exchange of information with external actors. This includes them providing information about the extent to which voluntary commitment targets have been adhered to or attained through the introduction of measures. Misunderstandings can occur at this point or an actor may no longer be willing to fulfil its voluntary commitments due to short-term economic interests. In this case, the academic partner can act as a moderator and suggest a solution to the conflict. This assumes a certain capacity and role of the academic partner which may not be the case in practice. However, regardless of their role, it's important for researchers to consider this as an opportunity rather than an obligation, and to maximise the benefits from this position.

Sometimes deviations might be so serious that political leaders have to decide on the best way to continue. When this occurs, the cross-sectoral working group needs to inform the council of the situation. Acting upon this the council can determine the necessary corrective measures and, if necessary, could decide to bring in a supplementary budget.

Therefore, at this stage it is important to overcome barriers to long term thinking and policy due to the compartmentalised structure (silos) of both local government and academia. The field of sustainability policy cuts across several policy areas, affects a multitude of actors and is multi-disciplinary. The aims and objectives of different policy areas may prove challenging to reconcile with each other. The relevance of organisation, co-ordination and institutional factors needs once again to be carefully considered.

How to evaluate, report and learn from practice

The evaluation of the process is important for several reasons. It helps to learn from the past; it helps to improve the future process; it provides an assessment of planned and unforeseen circumstances; it supports in moderating conflicts; it justifies/legitimises the continuation or termination of the process.

Evaluation is not a one-off event, and should be a continual process, done before, during and after implementation:

- Before implementation (*ex-ante*), evaluation is needed in order to assist in making decisions on how the overall system will be implemented and the possible consequences of the planned targets and measures over a period of time,
- During implementation (*interim*) as a continuous process, evaluation enables local governments to progressively review and adapt the measures according to the changing circumstances in order to attain the desired targets and project objectives,
- After implementation (*ex-post*), evaluation is needed to retrace the planning and implementation process and results after the implementation of actions and measures. It might result in changes to the organisational set up of the local government, or it might result in changes to the future measures and targets themselves.

The analysis in this section will be outlined in three stages. First, it will focus on the evaluation of the process – whether science has been useful in policy development. Second, it will focus on the evaluation of outcomes, summarising the analysis of the measures and checking if the objectives have been met or are in the process of being met. Finally, it will help to identify the most appropriate communication and reporting strategy, pursuing the clear need for professional interpretation of scientific outcomes and will identify a number of different communication channels to be used.

Evaluation of process and outcomes

There are two forms of evaluation: one is more process-oriented, the other one more outcome-oriented.

The evaluation of the process is an important and critical step because, at this point, it becomes clear whether the co-operation has become a success or a failure. Co-operating researchers and policy-makers have familiarised themselves with the complex process and management procedures, which should remain stable to a certain extent over time. The evaluation of the process is about change. Change in this sense, refers to changed ways of working, changed structures, changed co-operation strategies and organisational culture. Researchers and policy-makers constantly interact and learn based on their own experiences and the experiences of colleagues and partners within an initiative (Jungwirth, 2011). The re-organisation of structures and the positive reaction to new situations and organisational frameworks imply constant improvement and facilitate later cycles.

The second evaluation is more goal-oriented. It is an assessment against the planned objectives, targets and general perspectives. Comparing the planned targets and the actual values does not just allow comparisons between target and performance values, i.e. an appraisal of the entire cycle. More importantly, what has been achieved must be measured against the medium-term or long-term targets, preventing the local government from losing sight of the planned route.

Both evaluations can imply changes in the political process and in the contents of the programme because they question the established routines and actions. In fact, the first integrated sustainability cycle leads to a general reflection about processes and activities. In addition, the implementation of specific activities always has implications on other activities. Therefore, it is fundamental to consider the relationship between one activity and another. In particular, concerning local sustainability these connections are important because cross-cutting issues (like sustainability) can only be solved through wide-ranging co-operation between different sectors.

Also European schemes have their evaluation activities, mostly based on a set of quantitative indicators, including the development of specific monitoring and reporting guidelines. The evaluation reports show the status and progress of sustainable development and related issues within a city. For example, those that have signed the *Covenant of Mayors*, need to submit an implementation report at least every second year after submission of their Action Plan for evaluation, monitoring and verification purposes. The monitoring and evaluation processes vary among schemes, based on time frequency, format-template, benchmarking characteristics, quantitative versus qualitative, technocratic or participative.

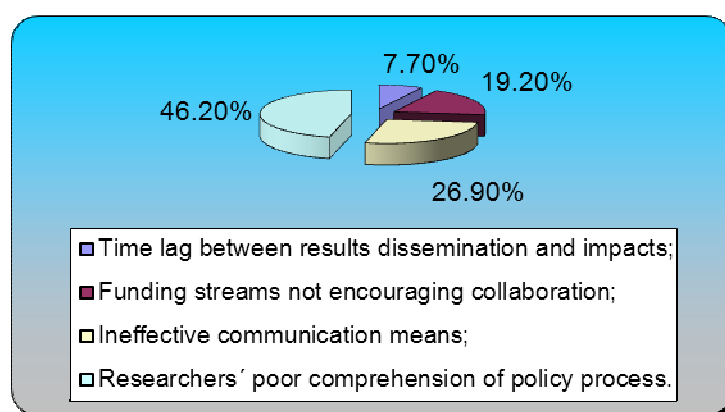
Communication and reporting strategy

The lack of effective communication, common understanding and common purpose between researchers and policy makers has been widely noted (European Commission, 2008; UNCTAD, 2006).

Policy makers are often unaware or unable to interact with relevant ongoing research and researchers often lack knowledge of the priorities and pressing issues for policy makers. Many factors can hinder such communication. Nearly half of local governments (46%) responding to the voting session conducted during the First Informed Cities Forum (see figure 9.2) highlighted that the most significant barrier to local government and researcher collaboration was researchers' poor comprehension of the policy process, followed by

ineffective communications means (27%). In an increasingly dynamic and inter-linked context, both local governments and universities are finding that their organisational structures need to be modified to avoid gaps and duplications and enhance co-ordinated local policy delivery. This is especially true for sustainability policies which are cross cutting and holistic in nature.

Figure 9.2: What factors hinder collaboration between researchers and local government policy makers? (local government respondents)



Source: Voting session, 1st Informed Cities Forum, Newcastle

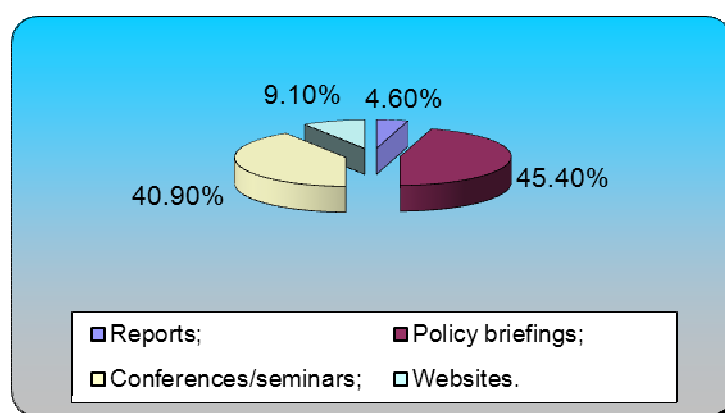
Perhaps not surprisingly both groups identified ongoing personal contact as their main form of communication. Alternatively, co-operation is in response to specific tenders/calls for proposals, encouraging once more the implementation of ad hoc, deliverable-based projects, in some cases remaining constrained as pilot projects.

How can the lessons learned through the evaluation be made more accessible? How can the findings be more innovatively reported and disseminated? As one of the main barriers to communication of research is lack of time available to professionals to read and digest the research findings, the accessibility of its findings are crucial factors in determining its use (ODPM, 2005).

As noted in section one, policy makers have neither the time nor the experience to read scientific papers thoroughly. Therefore, there is a clear need for professional translation of research outcomes into a language that enables policy makers and wider audience to identify its content and value, e.g. summaries, recommendations and key messages are suggested in many studies (European Commission, 2008; ODPM, 2005). All participants

involved in the voting session at the First Informed Cities Forum were asked to identify the most effective means for dissemination outcomes. There was near universal agreement (local governments 86% in total and researchers 88% in total) that either *policy briefings* (local governments 41% and 47%) or *conferences/seminars* (local governments 41% and researchers 47%) were the best means to present project outcomes. Interestingly both *reports* (local governments 5% and no researchers) and *websites* (local governments 9% and researchers 12%) were not considered effective means of dissemination (see figure 9.3).

Figure 9.3: What would be the most effective formats to present the outcomes of a project to a local government audience? (local government respondents)



Source: Voting session, 1st Informed Cities Forum, Newcastle

'Face to face' interventions such as presentations, conferences and workshops are an 'active' type of dissemination - they increase the likelihood of tools, methods and research results being used. With regard to the need for continuous two-way dialogue between policy makers and researchers, it has been noted⁴⁵ that the amount of policy makers being involved in writing interdisciplinary papers is quite low. Despite the current political demands for evidence-based practice, university research has higher academic value if it is written within the confines of a specific academic discipline and is a peer-reviewed published output.

Dissemination is also about developing new activities and solutions to enhance collaboration: policy for local sustainability is no longer developed by a small group of policy makers but needs to be legitimised by a large group of institutions. From this perspective, participants that were asked to identify the most effective approaches for disseminating projects to local governments, both groups highlighted the importance of *national networks*

⁴⁵ European Commission, Science-Environment Policy Interface Workshop, 3 December 2009, Brussels

(local governments 36% and researchers 35%), although 36% of local governments also believed that *European networks* (e.g. ICLEI) were equally important. Nearly, a quarter (24%) of researchers chose this option, with an equal number (24%) also choosing *existing local or regional government networks*, interestingly a slightly higher number of local governments (27%) chose this option. Finally, whilst 18% of researchers believed that *personal contacts* with local governments were effective for dissemination, no local governments chose this option.

Reports and articles by prominent experts (EEA, 2000) have argued for the need to create and consider a range of dissemination (knowledge) brokers. The role for such an organisation, having a foot in both camps, is to provide the link between research and policy. From the research side, this means putting the results of research into a policy context. From the policy side, it means helping to frame the policy context by drawing on authoritative research-based insights about effective ways of moving towards sustainability. Furthermore, it ensures broad dissemination to support policy development on local sustainability and benefits for the research community (access to its networks of suitable, interesting, non-academic groups with which to interact); it translates scientific information from scientists to policy-makers and communicates research needs from policy-makers to scientists.

Working together: linking European local sustainability schemes in practice

The practical experiences, and the feedback received from both local policy makers and researchers during the activities and events organised in the framework of the ICI suggest that there is a need for further development of the existing schemes for monitoring local sustainability at the European level. A promising approach for such further development would provide local governments with insights into how the strengths and benefits of each tool could be maximised in an integrated framework. The comprehensive approach of the *Reference Framework for Sustainable Cities*⁴⁶ and the personalised and aggregated reporting of *Local Evaluation 21*; the range of objectives of the *Aalborg Commitments* and the targets of the *Covenant of Mayors*; the integration of data of the *Integrated Urban Monitoring for Europe Initiative*⁴⁷ and the public recognition of the *European Green Capital Award*; and so on, could be connected together and adapted to be more responsive to local contexts.

⁴⁶ Reference Framework for Sustainable Cities, <http://www.rfsustainablecities.eu/>

⁴⁷ Integrated Urban Monitoring for Europe, <http://iume.ew.eea.europa.eu/>

What is clear is that none of the existing schemes and tools comprehensively fulfils all the diverse needs of European local governments, nor does it seem likely that the different actors responsible for the various tools⁴⁸ will join forces and create a common *European commitment and monitoring scheme for local sustainability*. As a consequence, local governments have to carefully consider which schemes best serve their requirements. In practice, many cities participate in several schemes and try to adapt tools and identify pragmatic synergies between tools to suit their individual requirements.

The authors of this report recommend putting in practice the following set of 10 key features of an ideal *European commitment and monitoring scheme for local sustainability*:

1. Full cycle support

The European commitment and monitoring scheme for local sustainability supports local sustainability management and governance in all five phases of the management and governance cycle, i.e. in creating a baseline review, setting targets, obtaining political commitment, implementing actions to achieve the targets, and evaluating success and failure.

2. Advanced set of indicators

The European commitment and monitoring scheme for local sustainability is based on a manageable number of indicators mirroring local environmental, economic and social development in a balanced way. Data for these indicators will be relevant and available at the local level.

3. Integrated approach

The European commitment and monitoring scheme for local sustainability integrates the different aspects of sustainable development rather than just listing them and tackling them individually. The focus is on a holistic approach of protecting natural common goods and creating decent living conditions for all citizens.

4. Common qualitative objectives

The European commitment and monitoring scheme for local sustainability includes and is based on a common set of qualitative objectives for any local government across Europe to commit to. The objectives are balanced and address key sustainability issues.

⁴⁸ In particular, this relates to the different Directorate-Generals of the European Commission that partly compete for local governments participating in their schemes, e.g. DG ENER for the Covenant of Mayors, DG REGIO for the Reference Framework for Sustainable Cities, DG ENV for the European Green Capital Award, etc.

5. Tailored targets

The European commitment and monitoring scheme for local sustainability offers a procedure for local governments to set measurable targets which are comparable between cities and towns across Europe, and are flexible enough to suit different existing environmental, economic and social framework conditions.

6. Political commitment

The European commitment and monitoring scheme for local sustainability requires political commitment and accountability. Participation is based on a decision by the local Council, and the commitments made via this decision are monitored.

7. Benchmarking

The European commitment and monitoring scheme for local sustainability awards strong-performing cities and towns with political recognition and provides European-wide promotion. The specific focus of the performance criteria for awards changes regularly, and in a transparent way, in order to allow cities from various backgrounds to excel.

8. Guidance and resources

The European commitment and monitoring scheme for local sustainability is linked to a framework that provides technical guidance and access to resources to the participating local governments for the implementation of the commitments.

9. Individual feedback

The European commitment and monitoring scheme for local sustainability delivers individual feedback and results to each participating local government. The feedback is relevant to the city and facilitates further development of its local sustainability policies.

10. Aggregated European reporting

The European commitment and monitoring scheme for local sustainability delivers aggregated findings about the status of local sustainability at a European level. The monitoring system is set up in a way that does not require substantial extra effort from the local level to deliver data; access is open to the public and not controlled by any particular actor, organisation or institution.

The aims of an ideal *European commitment and monitoring scheme for local sustainability* are to discover and better understand changes in local sustainability. Accordingly, the checklist above should serve as a research agenda for the European Commission and offer a

major opportunity for the development of common solutions to benefit all local governments in Europe.

Achieving local sustainability is an on-going process and the sustainability of cities requires a substantial collective effort, including joint initiative between EU agencies and institutions, clear co-ordination between actors in local government and research institutions, as well as critical inputs from citizens. As demonstrated in this concluding section, the idea of the linear view of communication between research and policy is outdated and a five-stage progressive model of research and evidence cycle is suggested. The researchers in the PRIMUS/Informed Cities Consortium have not engaged their audiences as passive participants, the aim of the project was 'co-development' of strategies from the preparation to the evaluation phase.

Although networks of researchers and policy-makers can take years to build up, new initiatives to deliver co-operation between research and policies are emerging. It is crucial that *'the drive for wider embedding of knowledge transfer within research is aimed not only at the way grants are funded, but also at the way the projects are evaluated in academia'* (Crishna and Przybycien, 2010).

This implies that mechanisms and processes need to be put in place from the earliest stages of the policy development to its assessment. In addition to the formation of cross-sectoral networks suggested earlier in this section, greater use should be made of secondments and/or placements to enable researchers to work in policy-making environment and the cross fertilisation of ideas (European Commission, 2008), enabling researchers to examine the decision-making context and the policy makers' needs and motivations. Subsequently, they could help to frame debates on possible new European schemes, by defining a scheme that best suits the needs of all stakeholders and supporting its implementation.

With regard to horizontal policy co-ordination, it is not obvious how the different schemes interact and fit with each other: this highlights the potential for poor integration of similar sustainability initiatives at the local and national level. It suggests that the special networks of policy-makers and researchers mentioned above should enhance co-ordination at the local level, balancing political criteria with scientific priorities.

Clearly, even if it can appear as a homogeneous body, the European Commission is not a monolithic institution (European Commission, 2006). The services and the Directorates-General involved in the development of schemes have different functions and different policy

priorities. Therefore, they have different approaches to research policy, its design and implementation, and research efforts can be dispersed at local, national and European level, with overlap and fragmentation. It is clear that there is a high level of interest and high expectations of the European cities involved in these schemes.

Effective co-ordination of local sustainability between cities, the scientific community and European institutions is a huge challenge in conceptual and practical terms. However, meeting this challenge is essential to reinforce the importance of sustainability issues and to promote their implementation for humanities future wellbeing.

Co-ordination is needed to address...challenges, to capitalise on the opportunities and to facilitate high quality research collaboration aimed at providing research evidence that underpins urban areas as a complex network system with high interdependencies of related economic, technological, social and ecological subsystems and with a long-term forward looking perspective

European Commission, 2011b

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