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# **SURVEY ON ENVIRONMENT TELEMATICS APPLICATIONS (EU)**

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(TR 4101/IN 4101)**

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**SURVEY ON ENVIRONMENT TELEMATICS  
APPLICATIONS (EU)**

**DELIVERABLE D 2.3**

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## 1 EXECUTIVE SUMMARY

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The survey was conducted in the context of the CAPE project. CAPE (Co-ordinated Action for Pan-European Transport and Environment Telematics Implementation Support) is a European Union (EU) funded project that aims to encourage the greater use of telematics technologies in Western, Central and Eastern Europe.

One key objective of the CAPE project is to survey the needs and priorities among CEE and EU local and regional authorities for transport and environment telematics solutions.

Within Work Package 2 “Analysis of Status and Framework of Telematics Implementation” of the CAPE project three quantitative (questionnaire) surveys of the status and priorities of telematics solutions in CEE and the EU were prepared:<sup>1</sup>

- Survey on Transport Telematics Applications in CEEC
- Survey on Environment Telematics Applications in CEEC
- Survey on Environment Telematics Applications in the EU

The present survey has focused on the analysis of the current status and future priorities of Environment Telematics use in authorities from European Union member states.

### **Response rate**

The survey is based on a representative sample of all environment authorities in the 15 EU member states.<sup>2</sup> In comparison to the two CAPE CEEC surveys, the response rate of the EU survey on Environment Telematics is lower. 124 or 10% of the 1200 questionnaires sent out were answered. However, this is still a substantial number, considering the level of detail in the questionnaire, and it certainly resulted in the best empirical database currently available on the subject.

Under- or over-represented are mainly small countries, which have (in terms of overall numbers) only a marginal effect on representativeness; there is also no systematic bias in terms of geography, city size or authority type. Overall the survey can therefore be considered to be reasonably representative to allow at least indicative conclusions on major trends of environment telematics use on the European level. Throughout the report, qualifications are made to highlight any differences between Northern/ Southern European authorities, cities of different sizes or members of European networks vs. non-networking authorities.<sup>3</sup>

### **Key environment indicators**

Information on a set of basic environmental indicators was requested to provide some factual information on the state of the environment in European cities and regions.

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<sup>1</sup> Also available are country reports for each of the ten CEE Countries prepared by CAPE. Outside the scope of CAPE, a quantitative (questionnaire) survey on transport telematics use in the EU was prepared by the European Digital Cities (EDC) Project.

<sup>2</sup> See Annex II for details.

<sup>3</sup> Members of networks, such as POLIS, Car Free Cities, Eurocities, Telecities etc. are represented by about 25% of the questionnaires in the survey sample.

The use of filtering installations among main polluters (e.g. industry) in EU cities is fairly high (more than 60%). This holds particularly true for North European authorities. Nonetheless, insufficient air quality seems to be a major issue in many EU authorities. One fourth of the authorities had incidents of critical air quality in 1998. The frequency of critical air quality levels is particularly high in large authorities. These air quality problems seem to be mainly due to transport-related air pollution.

In the majority of the EU authorities sewage treatment systems are well in place. However, the level of sewage treatment systems is in general higher in North European authorities. In 61% of the North European authorities more than 90% of the households are connected to a sewage treatment system, whereas this is true for only 38% of authorities in the South of Europe.

Insufficient water quality does not seem to be a major problem among EU authorities. However, 11% of authorities have still had problems of insufficient drinking water quality.

The overall amount of domestic waste in EU authorities has not changed considerably over the last two years, whereas authorities from Southern Europe have experienced an average increase of domestic waste of about 2% in the 1996-97 period. The rate of domestic waste which is land-filled is higher in South European authorities (60%) than in Northern Europe (47%). The proportion of domestic waste in EU authorities which is incinerated, is about 16%, while almost 18% of domestic waste are recycled or composted.

### **Key environmental problems**

Waste-related problems (like “illegal waste dumping”, “dealing with sludge from waste water plants” and “rising levels of domestic waste”) are undoubtedly perceived to be the most important short-term problems. South European authorities in particular are facing problems of waste management.<sup>4</sup>

As in CEEC authorities, the most important long-term problems in the EU are seen in traffic-related issues like noise and air pollution caused by traffic.

In contrast to short-term problems, the importance of long-term problems is generally rated higher by authorities in Northern Europe. It seems, that North European authorities have less pressing short term problems (or consider that environmental problems need a longer time to be solved).

Future environmental policy action of EU authorities is expected to focus mainly on strategies for better traffic management. Other major future priorities include waste management and the protection of natural habitats.

Integrated Environmental Action Plans are far from being implemented in all EU authorities. About 20% stated that there are no formal policy plans in force and half of the authorities have only implemented sectoral plans for certain areas.

### **Impacts of telematics use**

The perception of major impacts of telematics use in EU authorities is quite similar to that of CEE authorities. Most of the responding decision-makers believe that a more intensive use of telematics will improve the quality of public services. Almost half of the authorities expect that by means of telematics, public awareness of environmental issues, decision-making processes and public participation can be improved. However, the concrete problem-solving capacity of telematics for the most pressing problems is considered to be limited. Less than one third of the authorities expect that telematics systems can significantly help to improve waste management and only 19% believe that telematics can reduce negative effects of transport (i.e. the key problems).

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<sup>4</sup> In CEEC authorities also waste management issues were identified as the most acute environmental problems.



The role of telematics is therefore rather seen as a "general service improvement tool" rather than as a concrete problem-solving tool with significant impacts. This indicates a considerable lack of awareness of the potentials of telematics-based solutions to environmental problem among public sector decision-makers (and indicates the crucial role of experience exchange projects such as CAPE).

Authorities from Southern Europe generally see higher potentials of telematics use for solving environmental problems.<sup>5</sup>

In addition to the lack of financial resources, which is by far the most important obstacle to further telematics uptake among EU authorities, other major obstacles are seen in a lack of up-to-date information on how to apply telematics technologies and in insufficient political support.

### **Data availability and basic data handling**

Environmental data availability in EU authorities has already reached a high level in many areas. Data on "main pollutants of drinking water", "meteorological conditions", "main pollutants of air" is considered to be sufficiently available in 60 to 70% of the authorities. However, the availability of data related to "traffic noise", "non-point sources of pollution", "traffic flows" and "hazardous waste deposits" still seems to be too low.

The highest priority for the future provision of environment-related data is seen in the areas of air pollution" and "energy consumption".

The implementation of environmental data handling technologies is still incomplete in EU authorities; in many authorities these are only partly implemented or work on a trial basis.

Visualisation of data in maps and graphics as well as integrated electronic data bases are at least partly implemented in more than 70% of EU authorities and around 60% already have experience with data exchange networks between different institutions.

### **Telematics support for key applications**

Environment telematics applications are not yet commonly employed in EU authorities. Current deployment levels are highest in the areas of "waste management" and "modelling of ambient air quality". Telematics support is particularly low in areas such as: "tracking and tracing of dangerous goods transports", "integration of air quality and traffic management", "decision support systems" and "risk and emergency management". The use of telematics systems generally is more widespread in North European authorities.

The highest priority for implementing telematics systems in the future is seen in the area of "waste management" (41%), especially in the South of Europe (53%).

### **Basic technologies**

In most environmental authorities e-mail systems have already been installed. GIS are used in more than 75% of the authorities. The use of these technologies will increase further within the next years. The current implementation of advanced technologies such as "high speed multimedia networks", "expert systems/artificial intelligence" or "satellite image processing/remote sensing" remains very limited.

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<sup>5</sup> The same is true for CEE authorities.

## **Training**

Training staff in the use of modern technologies needs to be improved, since more than half of the respondents stated that they only know some basic concepts or have limited or no knowledge of environmental technologies.

Support to employees in learning how to use new technologies is limited in most of the EU authorities. The majority of the authorities pointed out that either little or no training is available or employees can only receive some basic training.

## **Delivery of information services**

Services of information dissemination to the public seem to be most widespread in the areas of “key local air pollutants” and “general information to improve environmental awareness”. At least 70% of the authorities provide this information to the public (via any “medium”).<sup>6</sup> Information on air quality forecasts and noise pollution levels is only provided by about 40% of the authorities.

Generally environmental decision-makers highly appreciate making use of the Internet for information provision. In more than two thirds of the EU authorities own Internet sites are available and another 27% have the intention to set up their own site in the near future. More than 40% offer environment information services via the Internet.

Public access information kiosks are in operation in about one third of authorities, or 57% of all large authorities over 250.000 inhabitants. One out of five authorities use information kiosks to deliver environment-related information. The importance of these kiosks will rise in the future, particularly in large cities.

Interactive services via Internet are available in 38% of the responding authorities and facilities such as public-access kiosks or terminals which allow for an interactive dialogue between the citizen and the administration are found in 17% of the authorities.

However, many authorities from the EU are concerned about electronic delivery of environmental information. More than half of the EU authorities are worried about user friendliness of services and the complexity of environmental information.

## **Future interests**

With regard to seminars and conferences, future interests focus mainly on “environmentally friendly traffic management”, this being the application mentioned most often. Other areas of high interest for future telematics use are “managing contaminated land sites” and “domestic waste management”. In general, large cities (of more than 250.000 inhabitants) are more interested in learning more about telematics applications.

In terms of technologies, public information systems and Geographic Information Systems attract the highest interest among EU authorities. For “data exchange”, “decision support systems” and “advanced modelling and simulation techniques” still more than 60% of the authorities would like to receive more information.

Non-technical interests focus on “raising public awareness for the environment” and “environmental impact assessment”.

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<sup>6</sup> This should however not be interpreted as a statement on the quality of information or ease of access.

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## 2 INTRODUCTION

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### 2.1 CONTEXT OF THE REPORT

While considerable knowledge is available for transport telematics-related issues in the EU, the empirical basis on the status and future requirements in the area of environment telematics among cities and regions is unsatisfactory. So far, only limited information on the current status and framework of telematics implementation in the field of the environment is available for EU countries.

CAPE (Co-ordinated Action for Pan-European Transport and Environment Telematics Implementation Support) is a European Union (EU) funded project that aims to encourage the greater use of telematics technologies. The project intends to generate support for local and regional governments across Europe, and to help the European Commission to increase the implementation of IT (information technology) solutions at the municipal and regional levels all over Europe.

CAPE's goals are twofold:

First, the project aims to benefit local authorities in Central and Eastern Europe (CEE) and the EU by raising their knowledge on viable telematics applications and facilitating their implementation at the local level.

In CEE countries, CAPE is targeting public authorities who could profit most by applying efficient and low-cost telematics systems in the areas of transport and environment, while in the EU, CAPE is aiming to reach authorities who are often not yet fully aware of the potentials of advanced environmental telematics for improving environmental management.<sup>7</sup>

Tools for the dissemination of project results will be:

- good practice inventories in environment and transport telematics
- conferences serving as dissemination and consensus forming events, on a strategic level
- workshops providing an opportunity to exchange concrete technical information and experiences and to build networks both between the EU and CEE
- an Internet webpage containing announcements, reports and databases of the project ([www/rec.org/REC/Programs/Telematics/CAPE/CAPE.html](http://www/rec.org/REC/Programs/Telematics/CAPE/CAPE.html))

Secondly, CAPE will survey the needs and priorities among CEE and EU local and regional authorities for transport and environment telematics solutions and through this, encourage future involvement in the European Union's 5th Framework Programme (FP5) for Research and Technological Development (RTD).

Within Work Package 2 "Analysis of Status and Framework of Telematics Implementation" of the CAPE project, three quantitative (questionnaire) surveys on the status and priorities for telematics solutions in CEE and the EU were conducted:

- Survey on Transport Telematics Applications in CEEC
- Survey on Environment Telematics Applications in CEEC

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<sup>7</sup> The area of transport telematics is not addressed in the EU part of the CAPE project.

- Survey on Environment Telematics Applications in the EU

This report is one element of Work Package 2 and comprises the results of the survey analysis on Environment Telematics in EU countries. The survey on environment telematics is based on a detailed questionnaire, which has been sent to local and regional authorities in the fifteen EU member states.<sup>8</sup>

## 2.2 METHODOLOGICAL BACKGROUND OF THE SURVEY

For the mailing of the questionnaire on Environment Telematics in the European Union, the following data sources were used:<sup>9</sup>

- Data supplied by POLIS, ISEP and other supporting European local authority networks (Eurocities, Telecities, Car Free Cities) which tend to be (positively) biased towards more active and technologically advanced authorities.
- Complementary data extracted from the European Local Government Organisation (ELGO) data base.

In order to ensure the representativeness of the survey, approximate target numbers were determined according to the relative share of population for each country in relation to overall EU population.

The questionnaires were sent out to 1200 EU authorities in October 1998. Translations of the questionnaire were prepared for the five most common languages (English, French, German, Spanish, Italian). In November/December 1998 all authorities not having responded were reminded by mail to answer the questionnaire. Additionally many authorities were asked by telephone to participate in the survey, especially in areas where initial response was low.

A Microsoft ACCESS-data entry mask was supplied by Rupprecht Consult. Data entry was done by POLIS and finished in January 1998.<sup>10</sup>

## 2.3 SURVEY RESPONSE

The questionnaire was answered by 124 (approximately 10%) of the recipient authorities. For all large EU countries the representativeness of the survey sample is acceptable. However, in many small EU countries, only a few large cities took part in the survey, meaning that the different authority size segments are not well balanced.

The survey sample is acceptable in terms of the constitutional role of the authorities. Respectively one third of the questionnaires was answered by independent cities, one by municipalities forming an administrative part of a larger regional authority. Regional authorities were represented by 23% of the responses.

Respondents are mainly managers or experts from the administration (87%). Only a few questionnaires were answered by members of mayors' staff or elected representatives.

Network members make up one quarter of the respondents.

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<sup>8</sup> See Annex IV.

<sup>9</sup> For further information on selection criteria, survey response and representativeness see Annex I.

<sup>10</sup> For further information on procedures for the questionnaire survey see: Annex I.

## 2.4 GENERAL REMARKS ON THE ANALYSIS

In general, the overall results are presented for the survey on environment telematics in EU authorities. Any observed deviations from the EU overall pattern in any of the basic sub-sets of the sample are separately reported for:

- geographic segments: Southern Europe (France, Spain; Portugal, Greece, Italy) and Northern Europe (Denmark, Sweden, Finland, Great Britain, Ireland, Netherlands, Germany, Belgium, Luxembourg, Austria).
- City size segments: the first segment includes cities under 100.000 inhabitants and the second authorities between 100.000 and 250.000 inhabitants. The third segment comprises large towns with a population of at least 250.000.
- Cities being a member /non-member of at least one local authority network, such as Eurocities, Car Free cities, POLIS.

In order to ensure readability and also for methodology reasons, results have not been differentiated on a country-by-country basis.

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### 3 FACTUAL INFORMATION ON THE ENVIRONMENT

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Initially, authorities were requested to provide some information on key indicators on the state of the environment.

The key indicators refer to:

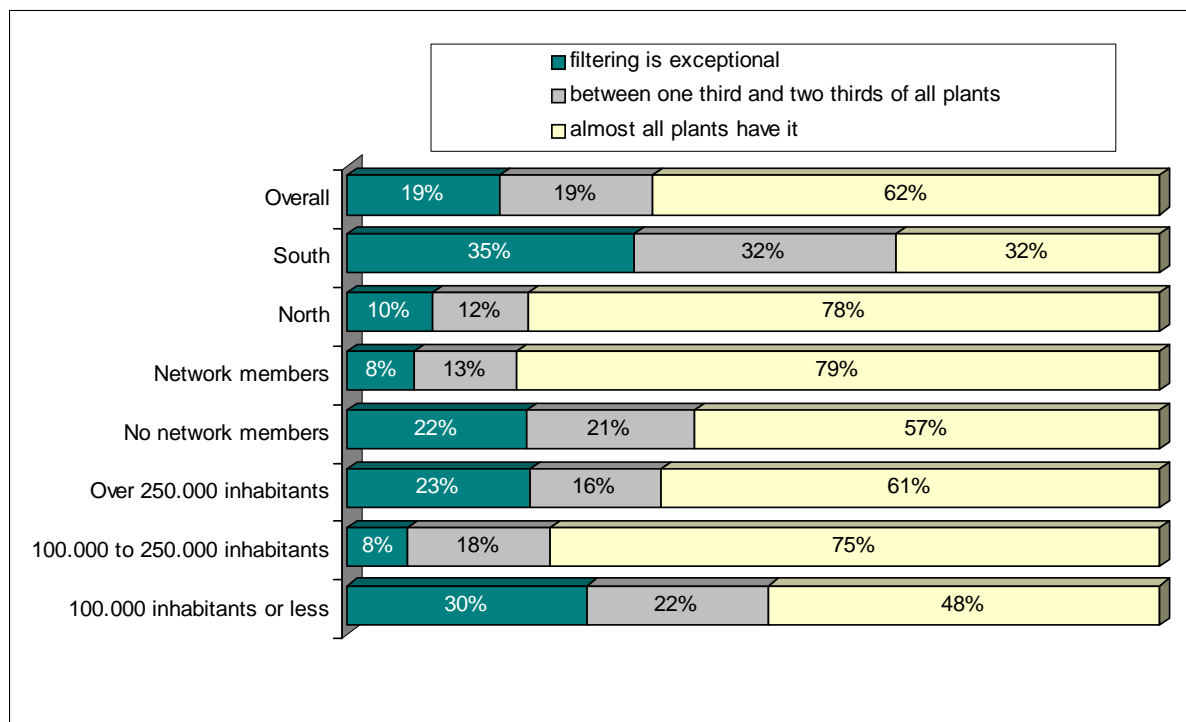
- Use of filtering for dust and gaseous emissions in industry plants and central heating stations
- Critical air quality levels during the previous 12 months (i.e. information of the public was required by national law)
- Percentage of households connected to a sewage treatment system
- Incidents of insufficient drinking water quality (i.e. immediate action was required by national law)
- Development of domestic waste volumes
- Domestic waste treatment

By means of these key environment indicators, it is possible to compare the relative state of the environment and to establish the extent of environmental policy implementation measures.

### 3.1 INSTALLATIONS FOR FILTERING

More than 3 out of 5 EU authorities stated, that almost all main polluters, such as industry and central heat generating stations, are equipped with installations for filtering. In 19% of the cases, the installations for filtering are less widely available. Figure 1 clearly shows that the application of filtering installations seems to be more widespread in network member cities and North European authorities.<sup>11</sup>

Figure 1: Level of installations for filtering (by region, network-membership and authority size)



### 3.2 AIR QUALITY

The second question referred to critical air quality levels reached during the last 12 months and whether the authorities were legally obliged, according to their own national laws, to inform the public.

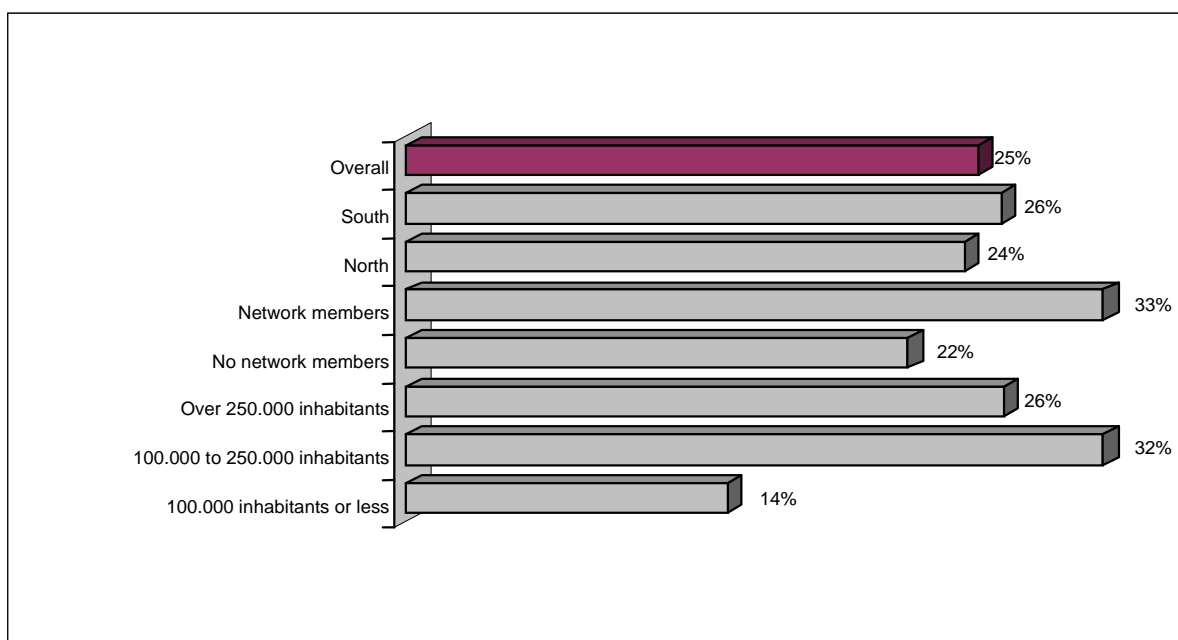
A quarter of the EU authorities claimed to have had critical air quality incidents in 1998. Not surprisingly, the frequency of critical air quality levels is higher in large cities. 14% of the authorities with less than 100.000 had some problems relating to critical air quality levels, whereas in the segment of medium-sized authorities already 32% claimed to have had critical air quality levels.<sup>12</sup>

The most likely reason for these often high levels of air pollution is growth in road transport. Between 1980 and 1995, energy use in the transport sector increased by more than 40%, industrial energy use fell 8% and other fuel use grew by 7%.

<sup>11</sup> The basis for percentages is N=101.

<sup>12</sup> The basis for percentages is N=118.

Figure 2: Critical air quality levels in the previous 12 months



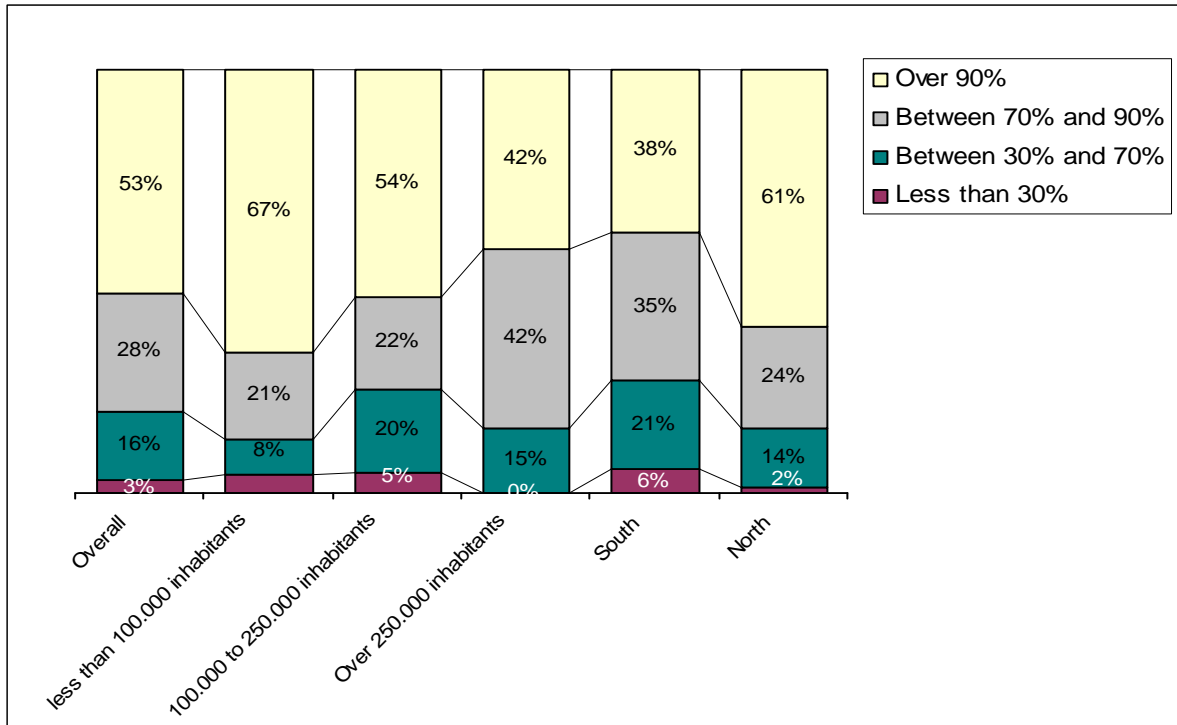
### 3.3 SEWAGE TREATMENT

More than one out of two authorities stated that the vast majority (more than 90%) of the households are connected to a sewage treatment system. In another 28% of the cases, between 70% and 90% of the households are integrated into the municipal sewage treatment system. In only 3% of the authorities the percentage of households connected to a sewage treatment systems is below 30. Contrary to Central and Eastern European Countries, cities in the EU lacking in sewage treatment are mainly large cities. Sewage systems are better in North European authorities. While 61% of the North European authorities answered that more than 90% of their households are connected to a sewage treatment system, this was stated by only 38% of the authorities from Southern Europe.<sup>13</sup>

<sup>13</sup> The basis for percentages is N=100.



Figure 3: Percentage of households connected to a sewage system

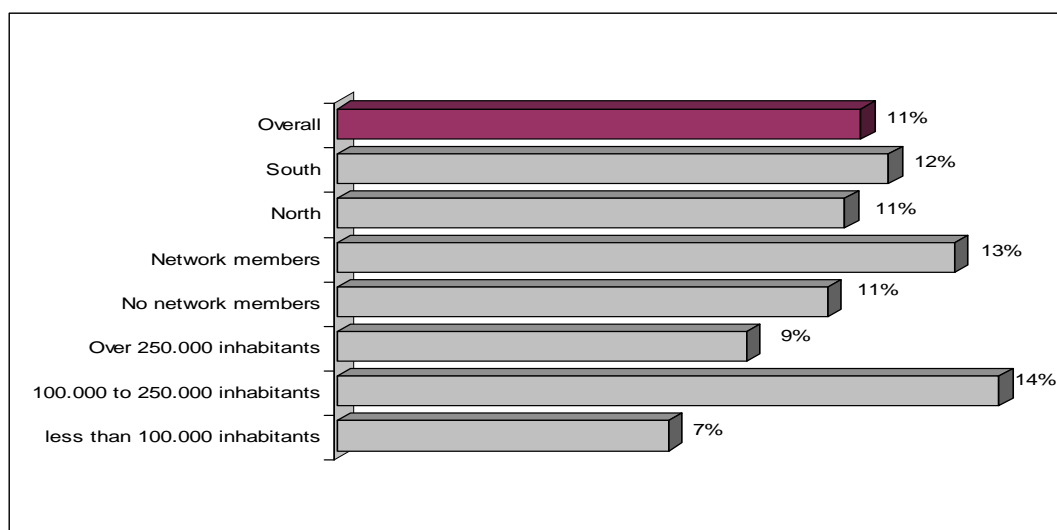


### 3.4 DRINKING WATER QUALITY

Looking at the indicators for drinking water quality, the survey reveals that 11% of the authorities have experienced incidents of insufficient water quality during the last 12 months. In terms of geographical location, no significant differences could be identified. Authorities responsible for between 100.000 and 250.000 inhabitants seem to experience a special situation with around 14% of them stating that incidents of insufficient drinking water quality occurred within their authority in the last 12 months.<sup>14</sup>

<sup>14</sup> The basis for percentages is N=115.

Figure 4: Incidents of insufficient drinking water quality in the last 12 months



### 3.5 DOMESTIC WASTE

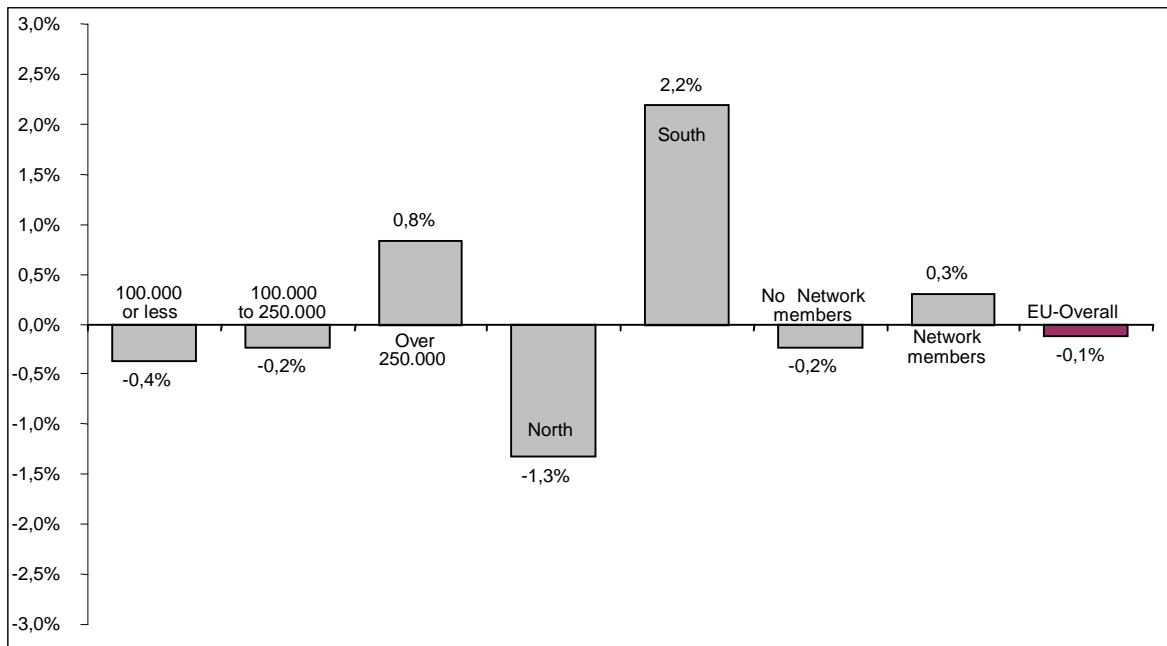
According to the European Environment Agency<sup>15</sup>, total waste generation in OECD Europe increased by approximately 10% between 1990 and 1995. However, it seems that increase rates are getting smaller over the past years.

On the basis of the results of this survey, the overall annual amount of domestic waste in EU authorities was constant in the period of 1996/ 1997. In North European authorities the annual amount of domestic waste has decreased slightly by 1% between 1996 and 1997, whereas in authorities from Southern Europe, the average growth rate was about 2%.<sup>16</sup>

<sup>15</sup> European Environment Agency: Europe's environment – the second assessment, 1998

<sup>16</sup> The basis for percentages is N=86.

Figure 5: Average change in domestic waste 1996/97 (by authority size, region and network membership)

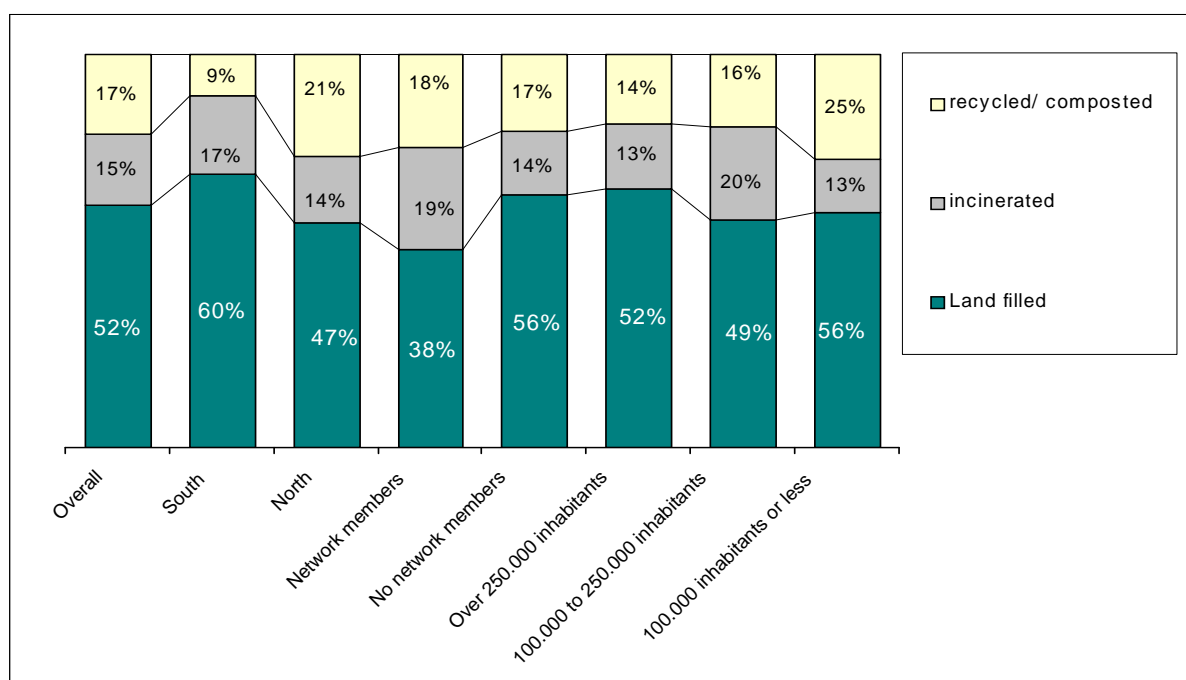


### 3.6 DOMESTIC WASTE TREATMENT

The last indicator provides some information on domestic waste treatment, i.e. whether it is generally land-filled, incinerated, or recycled/ composted. Figure 6 shows that more than half of the domestic waste (52%) of West European authorities is land-filled. The proportion of domestic waste which is treated in incineration plants is about 16%. According to the survey, almost 18% of domestic waste is recycled or composted. The percentage of waste which is disposed in landfills is generally higher in smaller cities and also in South European authorities. On average, 60% of the domestic waste in South European authorities is land-filled.<sup>17</sup>

<sup>17</sup> The basis for percentages is N=91.

Figure 6: Domestic waste treatment



### 3.7 SUMMARY

The main survey results, related to the key environment indicators are:

- The level of filtering installations among main polluters in EU cities or regions in the sample is fairly high (more than 60%). This is particularly true for North European authorities.
- Insufficient air quality seems to be a major issue in many EU authorities. One fourth of all authorities had some critical air quality incidents in 1998.
- In the majority of the EU authorities sewage treatment systems are well in place. However, the level of sewage treatment systems is in general higher in North European authorities. In 61% of the North European authorities more than 90% of the households are connected to a sewage treatment system, whereas this is true for only 38% of the authorities from Southern Europe.
- Still 11% of EU authorities had some serious problems of insufficient drinking water quality.
- While the overall amount of domestic waste in EU authorities has not varied in the last two years, authorities from Southern Europe have experienced an average increase of domestic waste of about 2% in the period 1996-97.
- The proportion of domestic waste that is incinerated is about 16%, whereas almost 18% of domestic waste are recycled or composted. The amount of land-filled waste is 52% overall, and about 60% in South European authorities.

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## 4 KEY PROBLEMS AND POLICY AREAS

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In the following part of the questionnaire, EU cities were asked to describe their view concerning environmental problems and their approach to deal with them. After an open question on their personal perceptions of the three most important problems related to the environment, respondents were

requested to give their viewpoint on the importance of environmental problems within their authority in “multiple choice” questions.

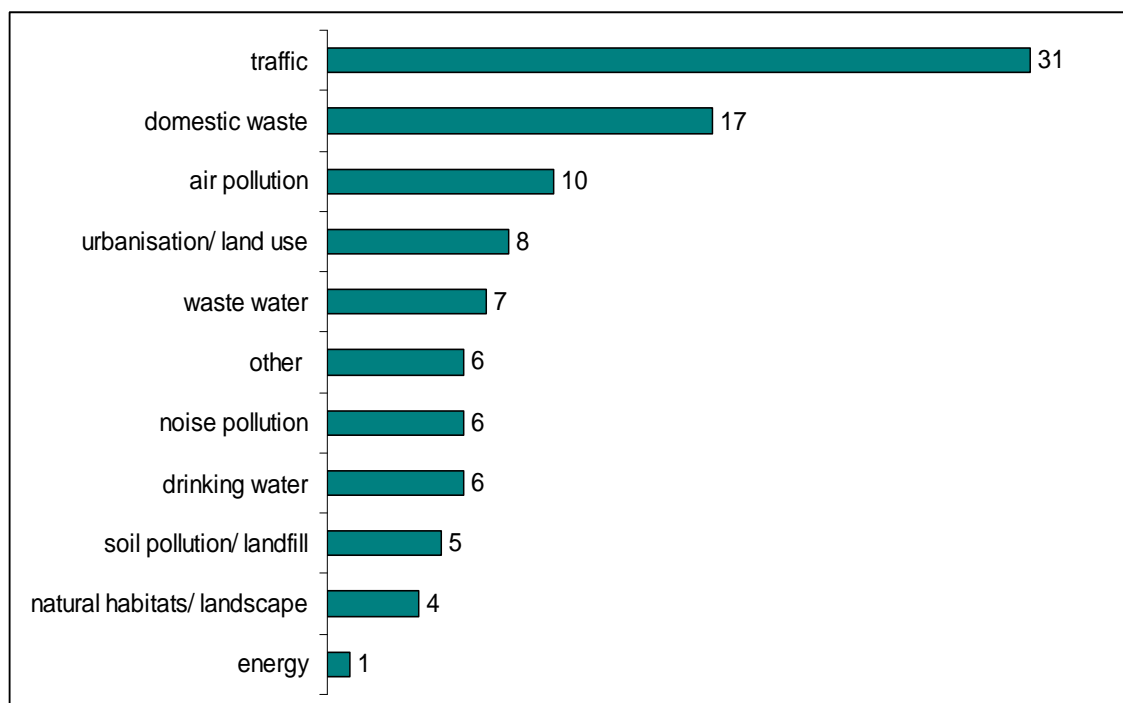
These answers were expected to serve as a basis for evaluating to what extent authorities believe that modern information and communication technologies can help solve the most pressing environmental problems.

#### 4.1 KEY ENVIRONMENT PROBLEMS

The most important environmental problems (as perceived by environmental decision makers ) are traffic-related issues. While 31% mentioned problems related to transport as “most pressing”, around 17% named a (domestic) waste-related issue as their most pressing environmental problem.<sup>18</sup>

After that the problems with higher relevance are seen in the areas of air pollution (9%), urbanisation/land use (7%) and waste water (7%).

Figure 7: Most important environmental problems (in percent)



Subsequently, respondents were requested to provide, from a given list of common environment-related problems, an indication of whether they are for their authorities:

- not an important problem at the moment
- a short-term problem (“which can be solved in the next 2-3 years”), or
- a long-term problem (“which takes many years to be solved”).

In addition, respondents were supposed to state whether these issues were a priority area in future policies.

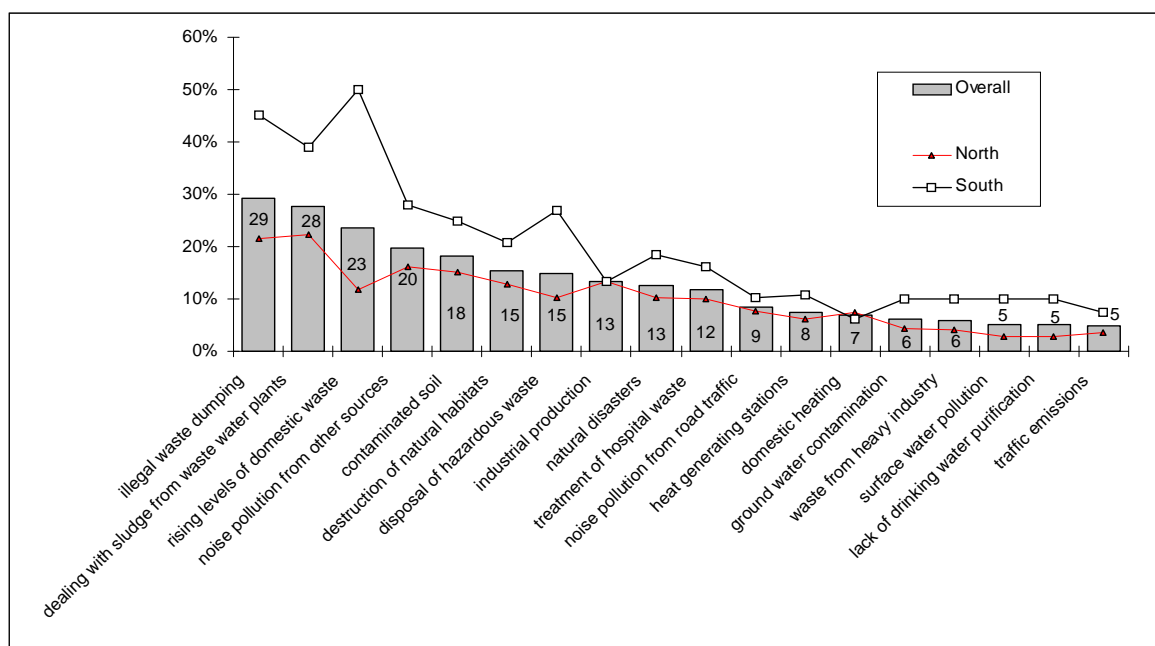
<sup>18</sup> The basis for percentages is N=103.

As a problem which is considered to be important and can be solved in the next 2-3 years, waste is named most frequently. “Illegal waste dumping” is mentioned by 29% of the authorities, followed by:

- “dealing with sludge from waste water” (28%),
- “rising levels of domestic waste” (23%)
- “noise pollution from sources other than road traffic” (20%).

Figure 8 clearly shows that in general much more South European than North European authorities claim to have short-term environmental problems. In particular, waste-related problems obviously seem to be much more acute for South European cities. 45% of the authorities from Southern Europe perceive illegal waste dumping as an important short-term problem, and 50% even stated rising levels of domestic waste.

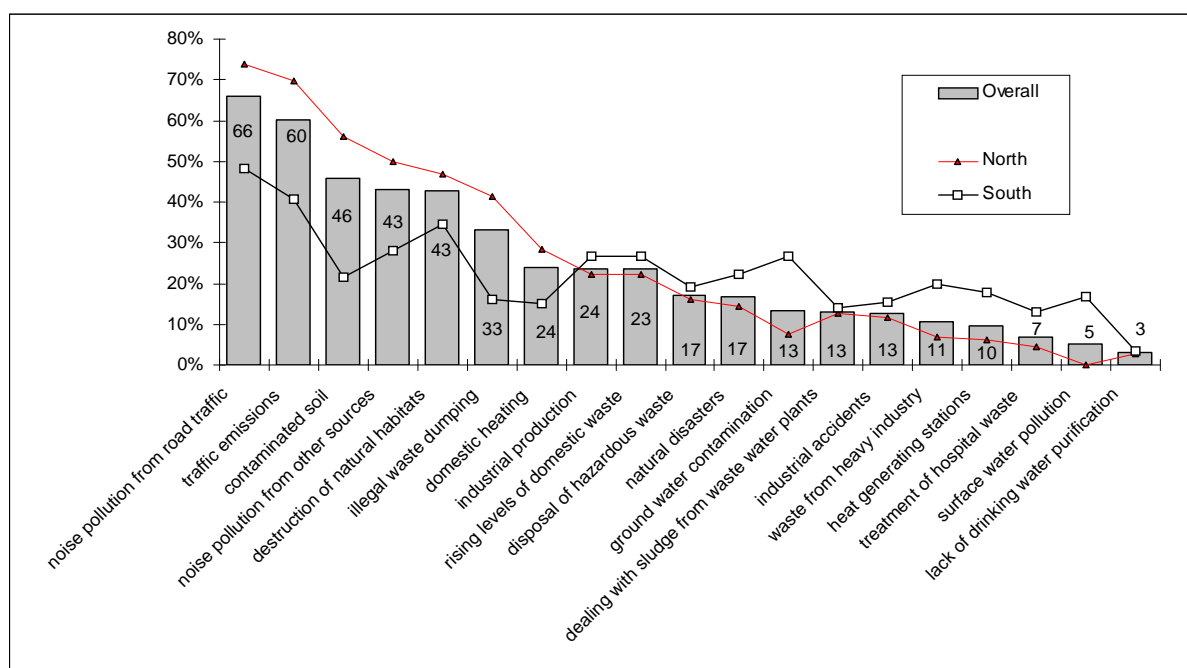
Figure 8: Most important short-term problems (by region)



Concerning long-term problems that need “many years to be solved”, traffic-related issues are seen as the most important problems by far. More than 60% of all authorities in the sample state that noise pollution from road traffic and traffic emissions are important long-term problems. Other important problems which cannot be solved short-term are “soil contamination” (46%), “noise pollution from other sources” and “destruction of natural habitats” (each 43%).

It is striking that all these problems are mentioned more by North European than South European authorities. This might indicate that North European authorities are not facing so many acute short-term environmental problems as South European authorities or that North Europeans generally believe that environmental problems can be solved only on the long run.

Figure 9: Most important long-term problems (by region)



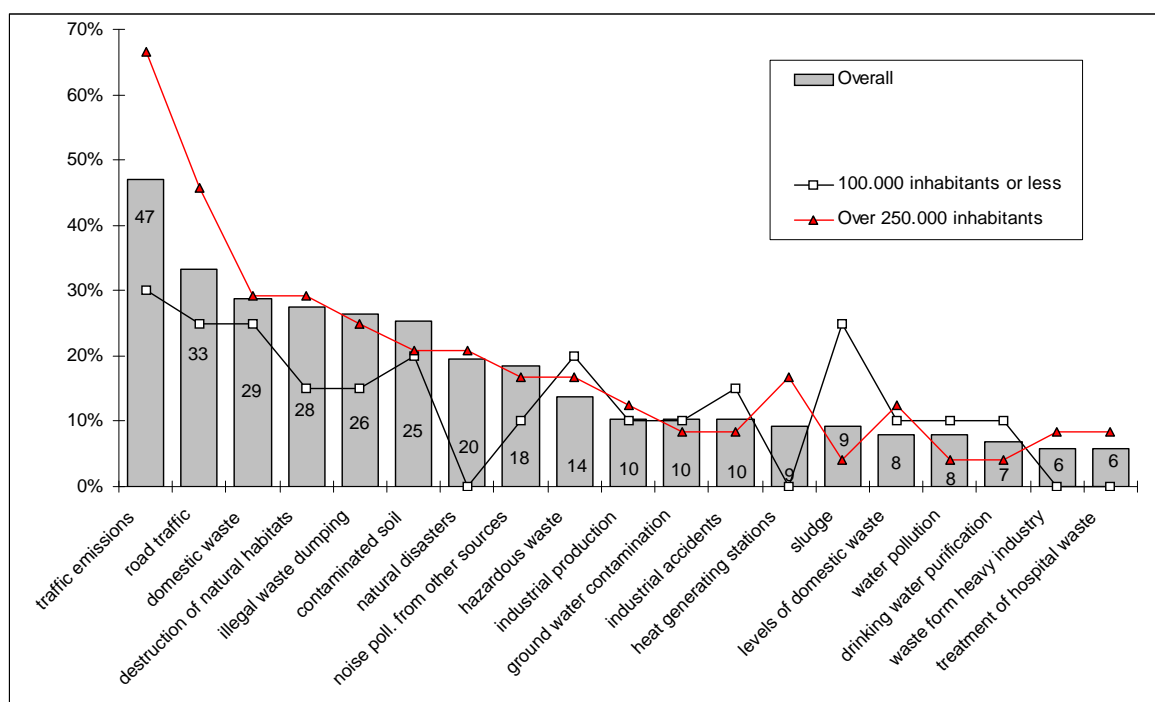
Priority areas in future environmental policies mainly correspond to the most important long-term problems. Measures to fight against traffic-related problems turn out to have highest priority. 47% of the authorities have the intention to reduce traffic emissions and one third see the measures against noise pollution from road traffic as a priority area. Again transport-related issues are considered to be much more important in North European authorities and in large authorities. Other priorities can be found in the area of:

- “domestic waste management” (29%)
- “protection of natural habitats” (28%)
- “prevention of illegal waste dumping”(26%)

Policies on emergency management are of comparatively low priority and mainly for natural disasters (20%) .

Clearly, traffic and waste are the most acute environmental problems for regional and local EU authorities and are priorities for future policies.

Figure 10: Priority areas in future policies (by authority size)



## 4.2 ENVIRONMENT ACTION PLANS

What is the percentage of EU authorities with an overall environmental action plan, which addresses the major environmental problems?

29% of the authorities stated that there is an environmental action plan in force. One out of two authorities answered, that an environmental action plan does not exist, but there are sectoral plans for certain areas in force. Another 21% indicated, that no formal policy plans exist.<sup>19</sup>

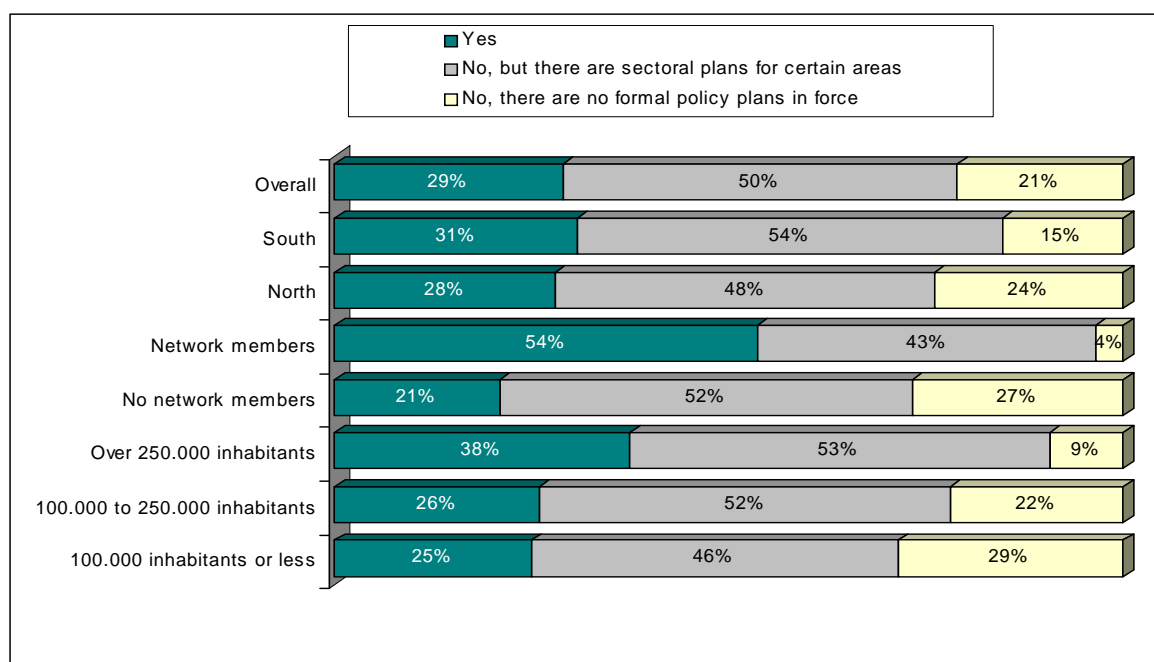
Integrated environmental policy strategies are much more often practised in cities over 250.000 inhabitants (38%) as well as in cities that are members of European networks (54%).

Regional differences are not very marked.

<sup>19</sup> The basis for percentages is N=114.



Figure 11: Environmental action plan (by network-membership and authority size)



### 4.3 SUMMARY

Concerning the perception of environmental problems, it was found out, that:

- Waste-related problems (such as “illegal waste dumping”, “dealing with sludge from waste water plants” and “rising levels of domestic waste”) are undoubtedly considered as the most important problems at short-term. In particular South European authorities are facing problems linked to waste management.<sup>20</sup>
- In general, many more South European than North European authorities claim to have short-term environmental problems. Apparently, South European authorities appear to be facing more acute environmental problems, which require immediate action, while action in the North appears to be concentrating on long-term problems.
- Like in CEEC authorities, the most important long-term problems are seen in traffic-related issues, such as noise and air pollution caused by traffic.
- In contrast to short-term problems, the importance of long-term problems is generally higher rated by North European authorities. It seems, that North European authorities have less pressing problems and are mainly convinced that environmental problems need many years to be solved.
- As regards future environmental policy action, EU authorities mainly want to focus on strategies for a better traffic management. Other major priorities refer to waste management and the protection of natural habitats.
- Environmental Action Plans are far from being implemented in all EU authorities. About 20% stated that there are no formal policy plans in force and half of the authorities have only sectoral plans for certain areas implemented.

<sup>20</sup> Also in CEEC authorities waste management issues were identified as the most acute environmental problems.

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## 5 IMPACT AND RELEVANCE OF TECHNOLOGY

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Having established the nature of environmental problems, respondents were requested to give a personal opinion on the short-term impact (2-3 years) of telematics in different areas of environmental policy as being low, moderate or high.

This question should help to clarify where authorities expect new technologies to have the greatest impact and how these technologies might contribute to solve their most pressing problems.

Additionally, respondents were asked to name the most important benefits of and obstacles to implementing telematics systems.

### 5.1 IMPACTS OF TELEMATICS ON ENVIRONMENTAL MANAGEMENT

Around 45% of the responding decision-makers noted that telematics systems can help to<sup>21</sup>

- enhance public awareness of environmental issues
- improve internal education and training opportunities and
- ensure more effective decision making processes.

Other significant positive effects of telematics are seen in the increase of public participation.

The potential of telematics for reducing those problems which were previously identified as most important, are in general considered to be limited.

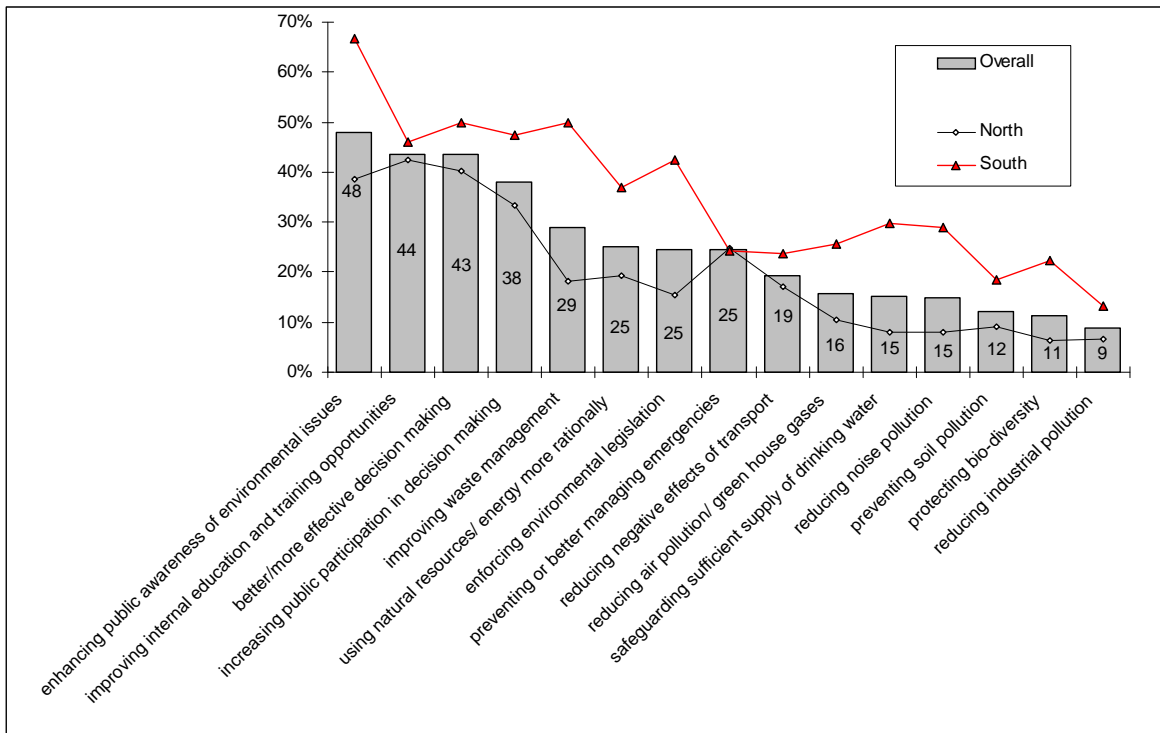
While 29% of the authorities stated that telematics will have some positive effects on improving waste management, only 19% believe, that telematics systems will help to reduce negative effects of transport. Concerning noise and soil pollution, only 15% of the authorities or less think that the application of telematics systems will have a significant impact.

It is interesting to note, that South European authorities generally rate the impacts of telematics much higher than authorities from North European countries. 67% of South European authorities consider, for instance, that telematics technologies have a significant potential to enhance public awareness of environmental issues, compared to 39 % in the North.

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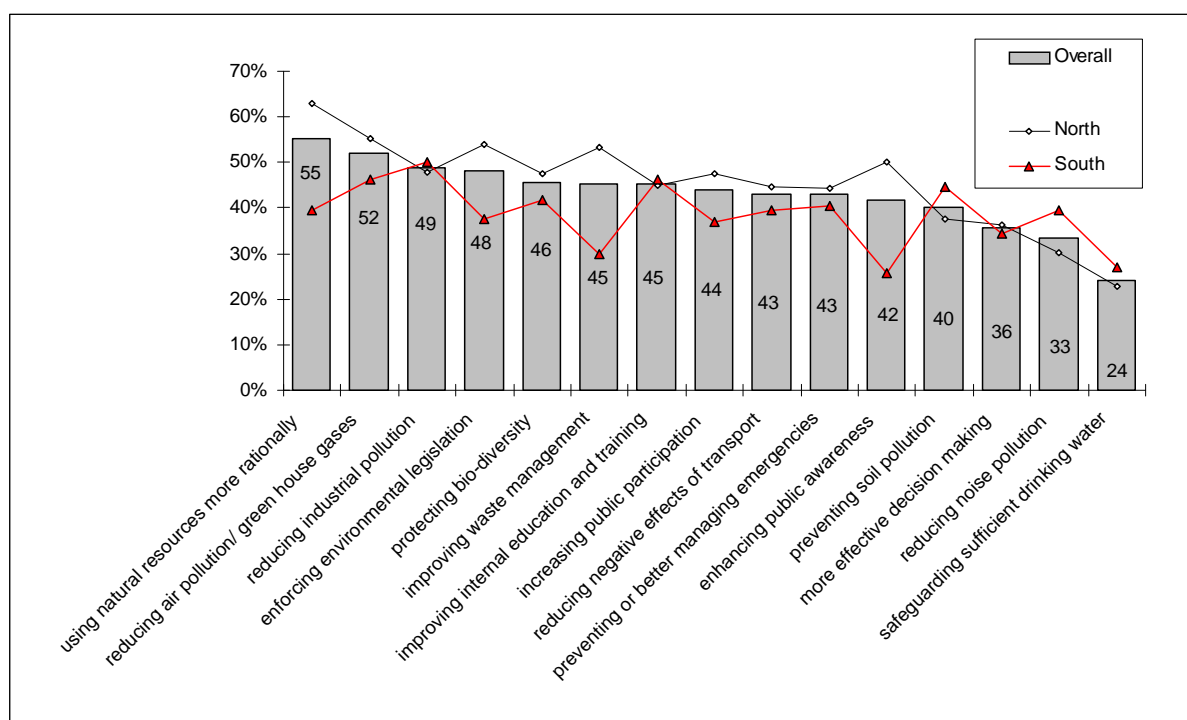
<sup>21</sup> The basis for percentages is N=117.

Figure 12: Significant impact of telematics systems (by region)



When looking at those areas, where the impact of telematics is estimated to be moderate (i.e. “some benefits are expected”), “more rational use of natural resources and energy” is mentioned most often (55%). Other areas, where the impact of telematics is expected to be moderate are “reducing air pollution” (52%) and “reducing industrial pollution” (49%). More than 40% think, that telematics use will have some benefits on improving waste management and reducing negative effects of transport and one third of the respondents answered that telematics will have some moderate effects on the reduction of noise pollution.

Figure 13: Moderate impact of telematics systems (by EU-region)



## 5.2 BENEFITS AND OBSTACLES

In order to better understand what EU authorities expect from telematics, and where the major difficulties lie in implementing them, respondents were asked to rank the major 5 benefits and obstacles relating to the implementation of telematics systems. The statistical mean for each variable (benefit/obstacle) was calculated (1= highest value).<sup>22</sup>

From this ranking of benefits no very marked differences could be identified. However, it becomes clear again that EU authorities see the major effects of telematics in improving services to the public. The greatest benefits of a more intense use of telematics are seen in a generally higher quality of public services (2,6) and in a better access for citizens to environmental information (2,6).

Other important benefits, expected from using information and communication technologies are:

- “improved planning/decision making” (2,7)
- “greater awareness of environmental issues” (2,9)
- “better co-operation with other institutions” (3,0)
- “higher enforcement rate of regulations” (3,1)
- “improved internal communication” (3,2)
- “better technical integration” (3,2)
- “improved outside image of authority” (3,3)
- “greater cost-efficiency” (3,4)

<sup>22</sup> The basis of calculation is N=109.

The implementation of environment telematics applications still has to face a number of obstacles. Among responding authorities the lack of public funding (1,9) is considered to be by far the most important obstacle, followed by "difficulties in supplying up-to-date and relevant information" (2,5), and "lack of political support" (2,9).

Other important obstacles are:

- "technical problems" (3,1)
- "problems of institutional/ interdepartmental co-operation" (3,1)
- "complexity of new services" (3,2)
- "legal problems" (3,2)
- "lack of awareness" (3,2)
- "opposition from polluters/ lobbies" (4,2)

The missing financial resources as a major obstacle always has to be seen in relation to the perceived general deficit of political support and the low level of available information for public service delivery.

### 5.3 SUMMARY

Concerning the perception of impacts of using telematics, it is worth mentioning that:

- Most of the authorities believe that greater use of telematics will improve the quality of public services. Almost half of the authorities expect that by means of telematics, public awareness of environmental issues, decision-making processes and public participation can be improved.
- The problem-solving capacity of telematics for the most pressing problems is, however, considered to be limited. Less than one third of the authorities think that telematics systems can help to improve waste management significantly and only 19% believe that telematics can reduce negative environmental effects of transport<sup>23</sup>.
- Authorities from Southern Europe generally see higher potentials of telematics use for solving environmental problems. The same is true for CEE authorities.
- Besides the lack of financial resources, which is considered to be by far the most important obstacle to further telematics uptake among EU authorities, other major obstacles are seen in missing up on data information (for services) and the lack of political support.

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<sup>23</sup> This perception of major impacts of telematics use in EU authorities is quite similar to that of CEE authorities.

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## 6 INTERNAL USE OF TELEMATICS SYSTEMS

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An important goal of this questionnaire was to analyse the readiness of authorities to implement environment telematics applications. Preparedness to do so is dependent on a number of issues:

- availability of environmental data
- use of state-of-the-art (basic) data management tools
- degree of current technology and support for major applications
- level of expertise of staff in telematics/ level of supplied training

Authorities were first asked to give some details on the availability of environmental data and the technologies used to handle and analyse this data. Then authorities were required to outline the internal use of data handling and the application of specific technical systems.

This information on the availability of basic information tools and technologies was also used to establish more targeted strategies to improve the dissemination of environment telematics solutions to the project target groups.

### 6.1 DATA AVAILABILITY

According to figure 14, the “data availability” on environmental legislation is best.<sup>24</sup> 70% (79% of the North European authorities) stated that they have good and direct access to data on environmental legislation.<sup>25</sup>

Other areas, where the availability of environmental data is perceived to be “sufficient”, are:

- “pollutants of drinking water” (68%)
- “meteorological conditions” (65%)
- “main pollutants of air” (63%).

For the authority size segments, geographic areas and network membership, no clear differences could be identified.

Areas with the lowest level of data availability are:

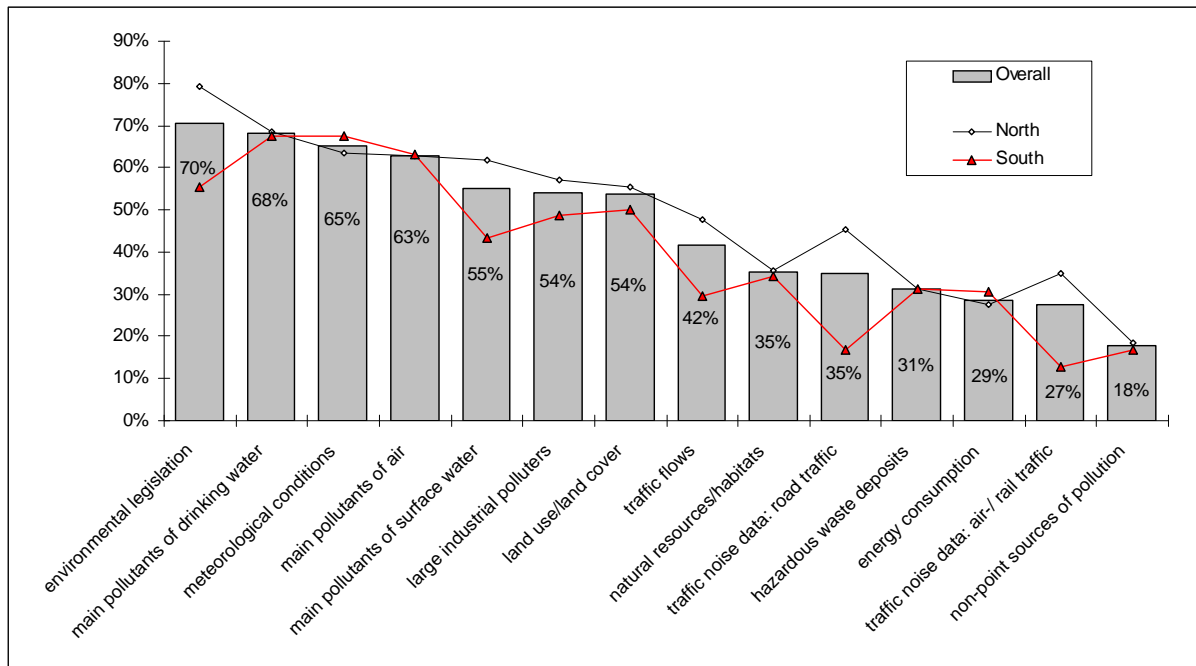
- “non-point sources of pollution” (18%)
- “traffic noise data: air and rail traffic” (27%)
- “energy consumption” (29%)
- “hazardous waste deposits” (31%)

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<sup>24</sup> The basis for percentages is N=110.

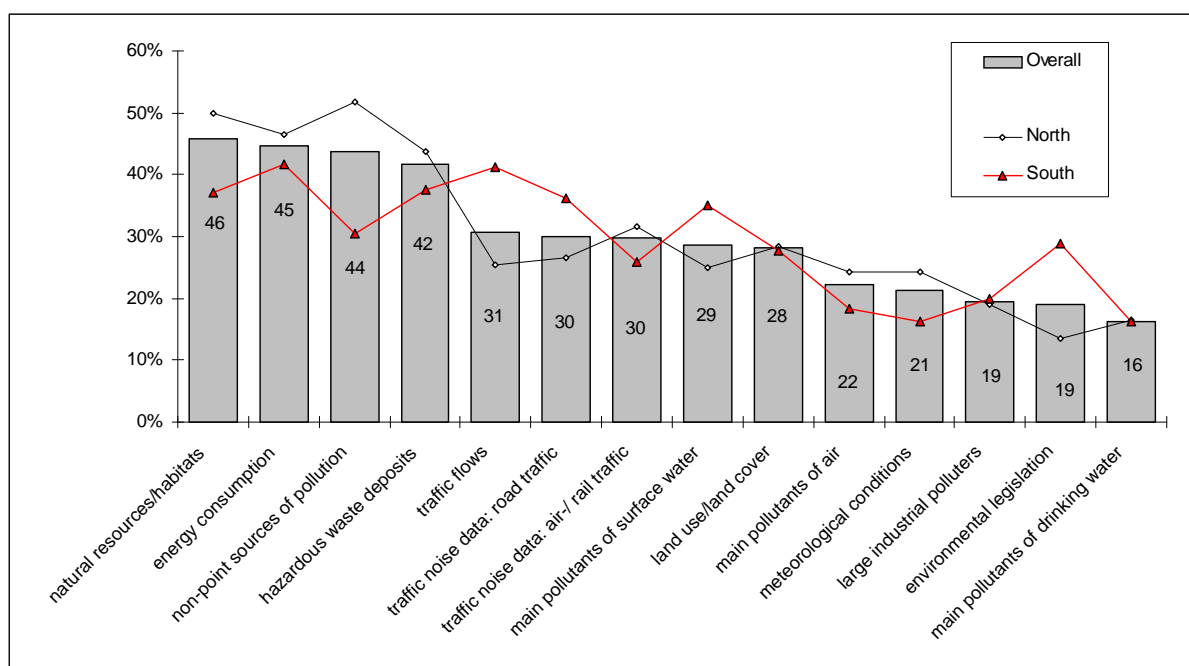
<sup>25</sup> The item on legislation, although not “data” in the narrow sense, was included as a “test” to establish the overall level of access of environmental authorities.

Figure 14: Environmental data sufficiently available (by region)



Areas, where the availability of data is only incomplete, are “natural resources/habitats” (46%), “energy consumption” (45%), “non-point sources of pollution” (44%) and “hazardous waste deposits” (42%).

Figure 15: Environmental data only partly available (by region)



Concerning the future provision of environment-related data, “air pollution data” is identified to be the first priority among EU authorities. 40% of the authorities would like to improve data availability in this area.<sup>26</sup>

Other main priority areas, for which authorities want to improve data availability are:

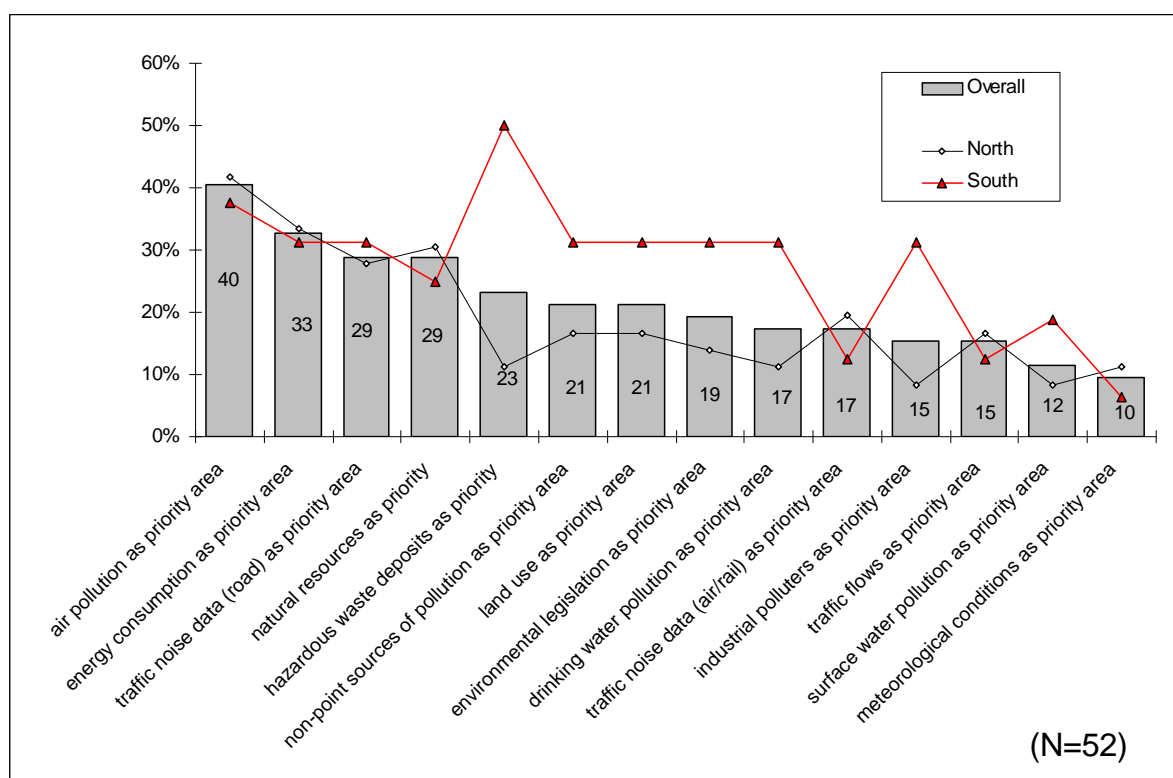
- “energy consumption” (33%)
- “traffic noise ” (29%)
- “natural resources/habitats” (29%)
- “hazardous waste deposits” (23%)

According to figure 16, the provision of data on “hazardous waste deposits” seems to be a very high priority for South European authorities.

<sup>26</sup> The basis for percentages are all respondents stating any item in this question as a priority area; N=52. Possibly some respondents had not understood that the last column in the questionnaire was not to be answered as an alternative to the previous three columns, but rather as an additional option to "tick".



Figure 16: Future priorities in environmental data collection (by region)



## 6.2 TECHNOLOGIES FOR HANDLING ENVIRONMENTAL DATA

The full implementation of basic technologies for handling and analysing environmental data still seems to be quite limited. However, in most of the authorities essential technologies are already partly implemented or work on a trial basis.<sup>27</sup>

Visualisation of data in maps or graphics is “fully available” for almost one third and “partly available” for half of the respondents.<sup>28</sup> 75% of the authorities use integrated electronic databases, but in only 25% of the cases this technology is considered to be “fully implemented”. “Data exchange networks with other institutions” as well as “integration of archival records of past states” are in use in around 60% of the authorities<sup>29</sup>, but mainly on a trial basis. One out of four of the surveyed cities and regions use integrated electronic data bases and 17% have integrated archival records of past states. A complete data exchange network with other institutions exists in 16% of the cases. Metadata is available in about one third of all authorities and “integrated 3D/4D analysis” by only less than 20%, although again mostly insufficiently.

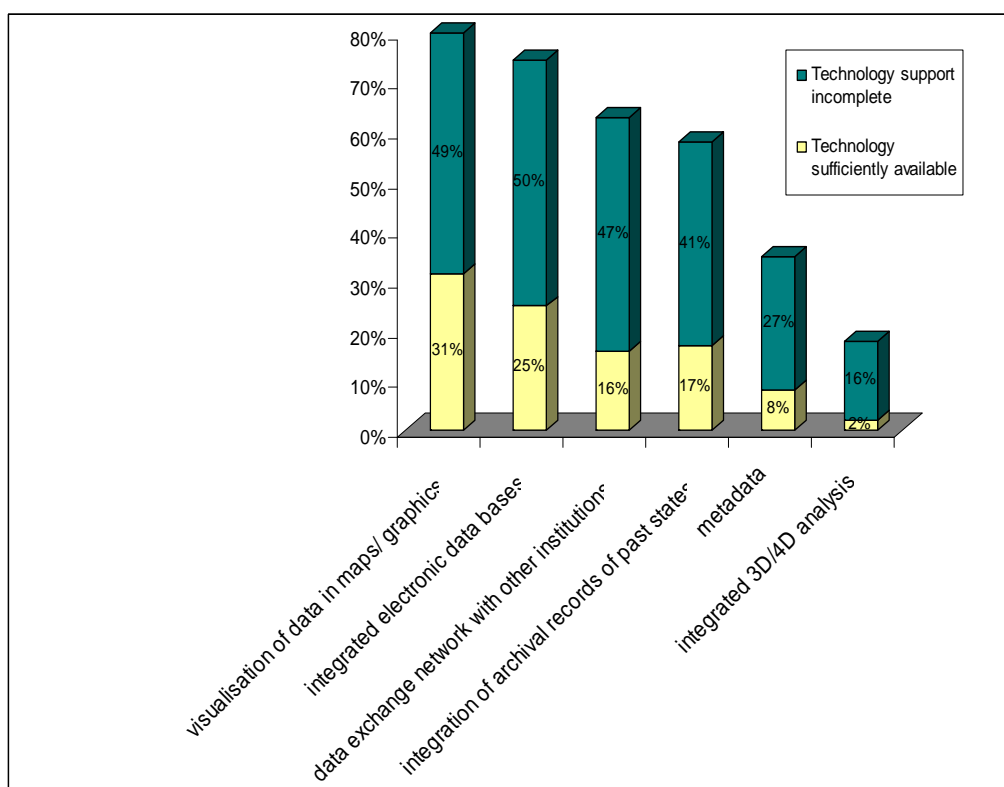
According to the survey, the availability of technologies for data handling seems to be fairly independent from geographic location, size of authority and network membership.

<sup>27</sup> The basis for percentages is N=105.

<sup>28</sup> There is obviously an (intentional) subjective element in this response.

<sup>29</sup> Sum of “fully” and “partly” technology-supported.

Figure 17: Technologies for data analysis partly or sufficiently available



The main future priorities of applying these technologies are undoubtedly the “use of integrated electronic data bases”, as well as the “visualisation of data in maps and graphics”. Almost 60% of the authorities see these technologies as a priority area in future policies.<sup>30</sup>

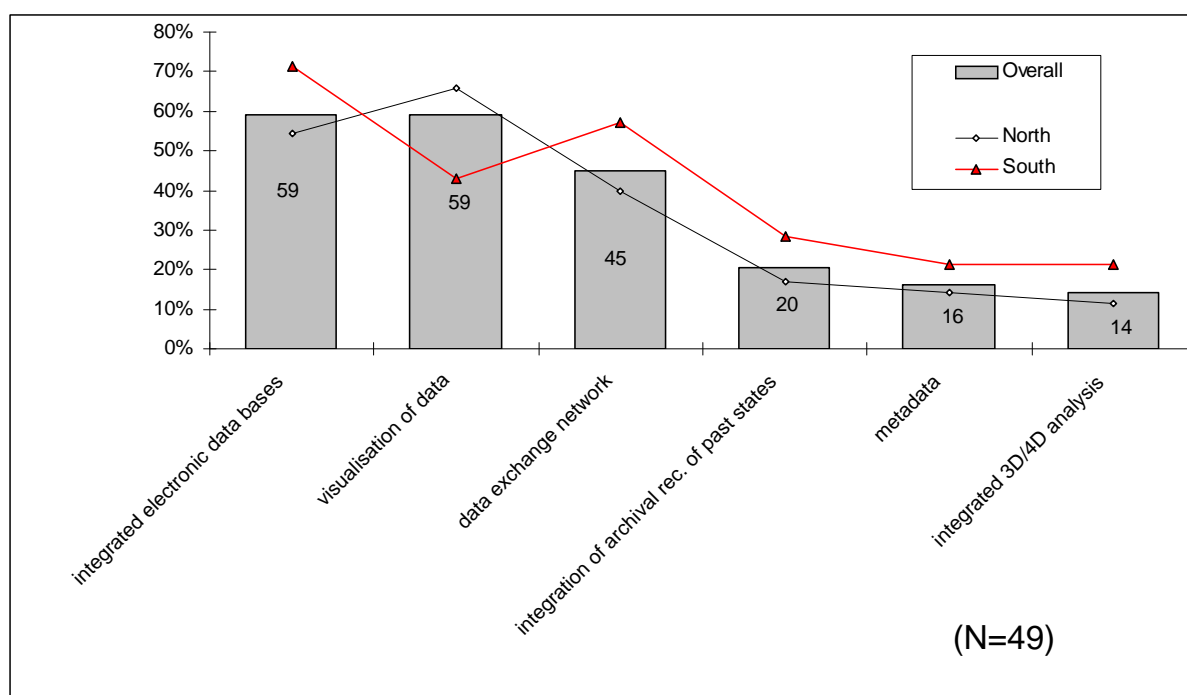
Especially the introduction of integrated electronic data bases seems to be of high interest in South Europe and in large cities (over 250.000 inhabitants).

Another major priority is the establishment of data exchange networks with other institutions (45%).

Analysis of past data (e.g. for prediction, establishment of long-term trends), use of metadata and integrated 3D/4D analysis is a priority only for a minority of authorities (20 - 14%).

<sup>30</sup> The basis for percentages are all respondents stating any item in this question as a priority area; N=49. Possibly some respondents had not understood that the last column in the questionnaire was not to be answered as an alternative to the previous three columns, but rather as an additional option to "tick".

Figure 18: Future priorities in technology use (by EU-region)



### 6.3 TELEMATICS APPLICATIONS

In question 18, decision makers were requested to provide information on the current status of telematics support in key application fields. According to figure 19, telematics systems in the environment field are not yet commonly used among EU authorities.<sup>31</sup>

27% of the authorities stated, that waste management is “fully” technology supported. In the area of modelling of ambient air quality, telematics systems are “fully” installed in 22% of the cases, whereas the full use of telematics for air quality forecasts and monitoring of ground water exists in about 15% of the authorities.

For these application fields, full telematics support occurs more often in large cities. In general the full use of telematics systems seems to be far more widespread in North European authorities.

The areas, where telematics support is lowest, are:

- tracking and tracing of dangerous goods transports
- integration of air quality and traffic management
- decision support systems
- risk and emergency management

<sup>31</sup> The basis for percentages is N=103.

Figure 19: Application fields with full telematics support (by region)

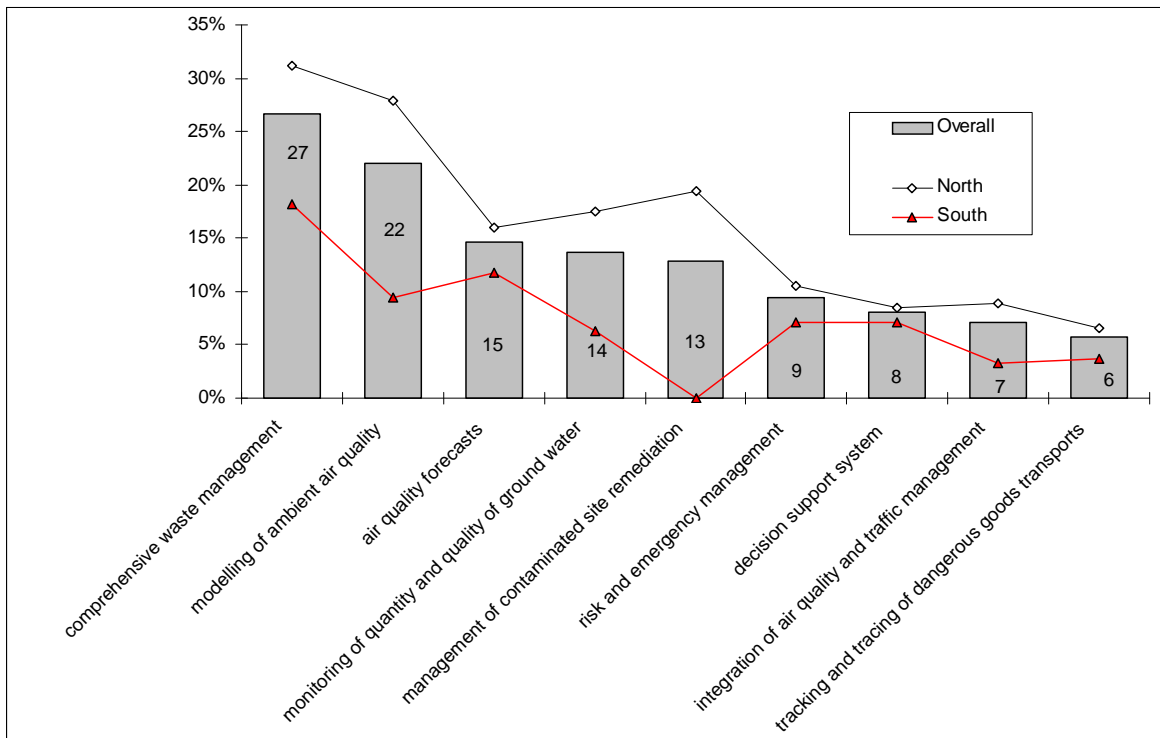
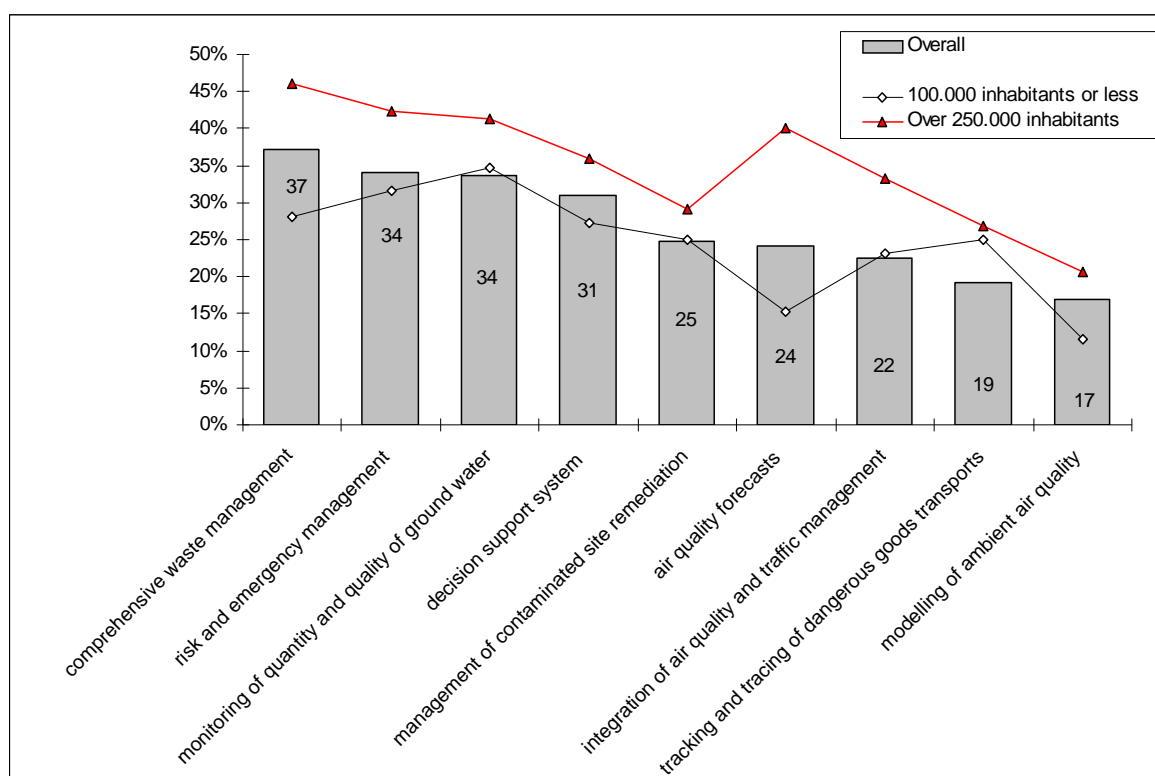


Figure 20 provides information on those areas, where telematics are only partly implemented. In 37% of the authorities, waste management is partly supported by telematics systems. Approximately every third authority has made some first experiences with telematics in the following application fields: “risk and emergency management”, “ground water monitoring” and “decision support system”.

In large cities the level of telematics support is generally far above average.

Figure 20: Telematics applications partly implemented (by authority size)



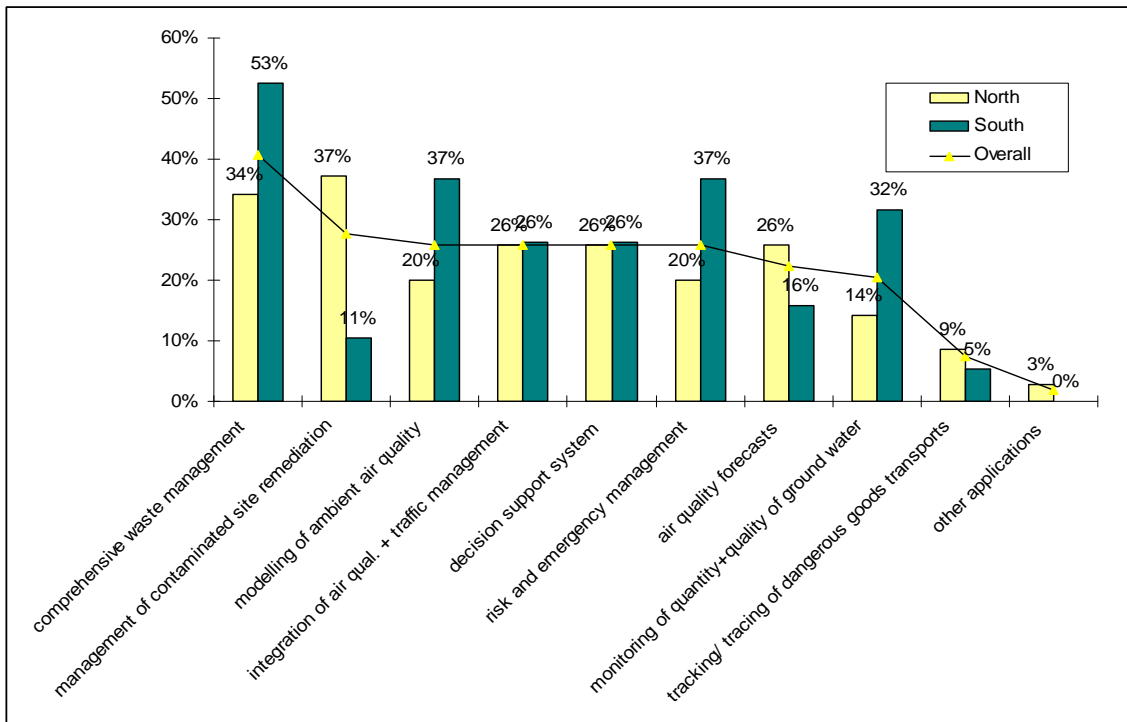
According to figure 21, the greatest interest for future telematics support, lies in the area of “comprehensive waste management” (41%). In particular authorities from South European countries have strong intention to use telematics for comprehensive management of domestic waste (53%).<sup>32</sup>

In the following areas, still one fourth of the authorities have a particular interest in implementing telematics systems in future:

- “management of contaminated site remediation”
- “modelling of ambient air quality”,
- “integration of air quality and traffic management”,
- “decision support system” as well as
- “risk and emergency management”

<sup>32</sup> The basis for percentages are all respondents stating any item in this question as a priority area; N=54. Possibly some respondents had not understood that the last column in the questionnaire was not to be answered as an alternative to the previous three columns, but rather as an additional option to "tick".

Figure 21: Future priorities for telematics application



#### 6.4 GENERAL TELEMATICS USE

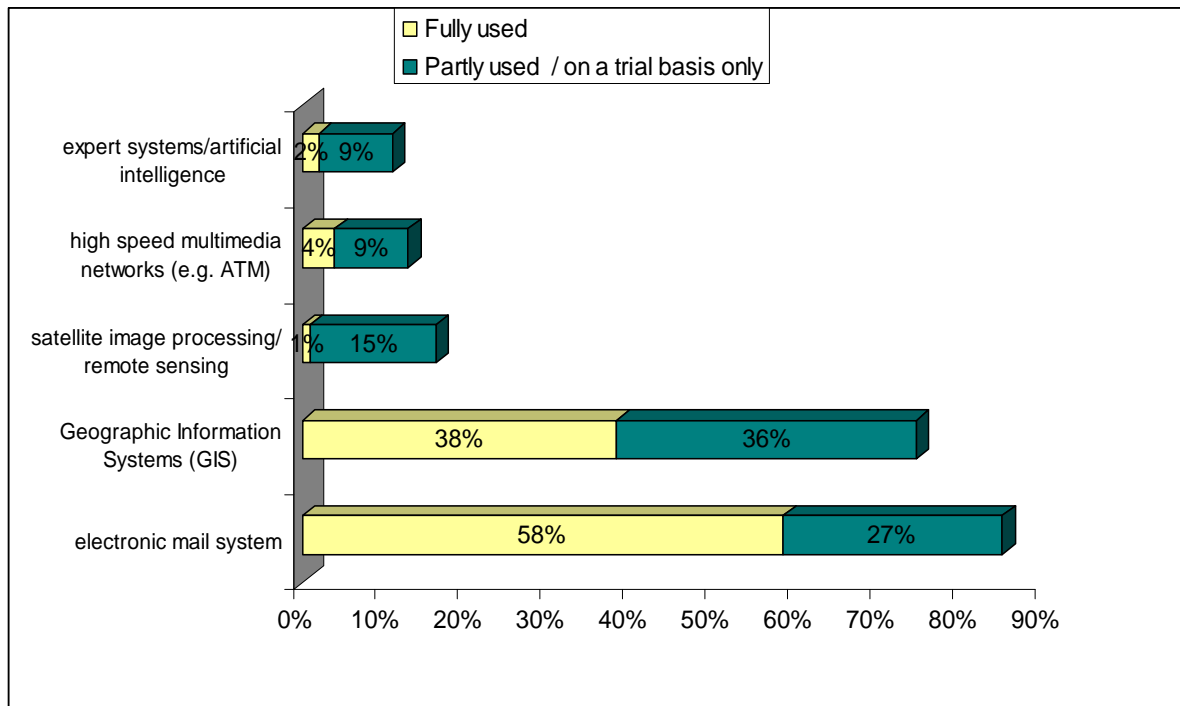
As far as the use of general telematics concepts is concerned, it turns out that e-mail systems and Internet as well as Geographic Information Systems are fairly widespread in environment departments in the EU. In 58% of the authorities an electronic mail system is fully installed and in another 27% this system is partly available.<sup>33</sup>

Geographic Information Systems are fully used by 38% and in another 36% of the authorities GIS is at least partly implemented or works on a trial basis. According to figure 23, the application of these systems is more common in large cities.

Other technologies like “high speed multimedia networks”, “expert systems/artificial intelligence” or “satellite image processing/remote sensing” are only used very rarely.

<sup>33</sup> The basis for percentages is N=113.

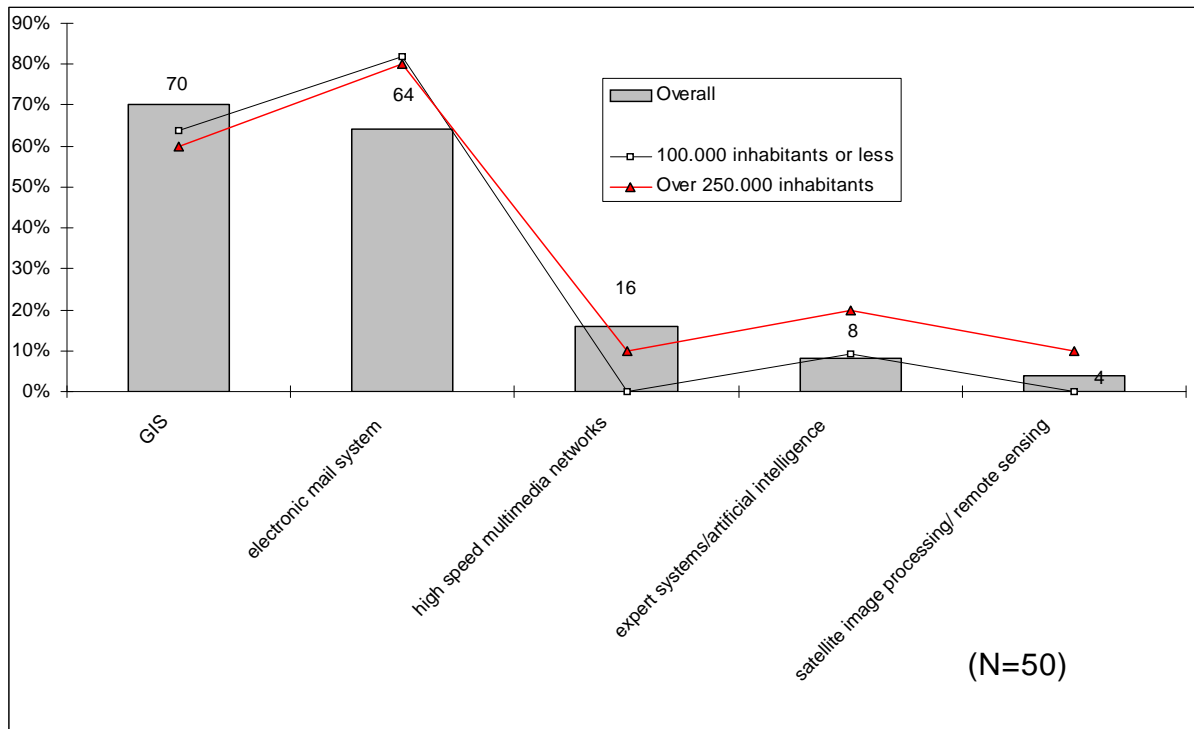
Figure 22: Use of general telematics



The main future priorities are intensified use GIS and e-mail/ Internet. For the other technologies, the interest is very low.<sup>34</sup>

<sup>34</sup> The basis for percentages are all respondents stating any item in this question as a priority area; N=50. Possibly some respondents had not understood that the last column in the questionnaire was not to be answered as an alternative to the previous three columns, but rather as an additional option to "tick".

Figure 23: Future priorities for general telematics (by authority size)



### 6.5 PERSONAL LEVEL OF EXPERTISE

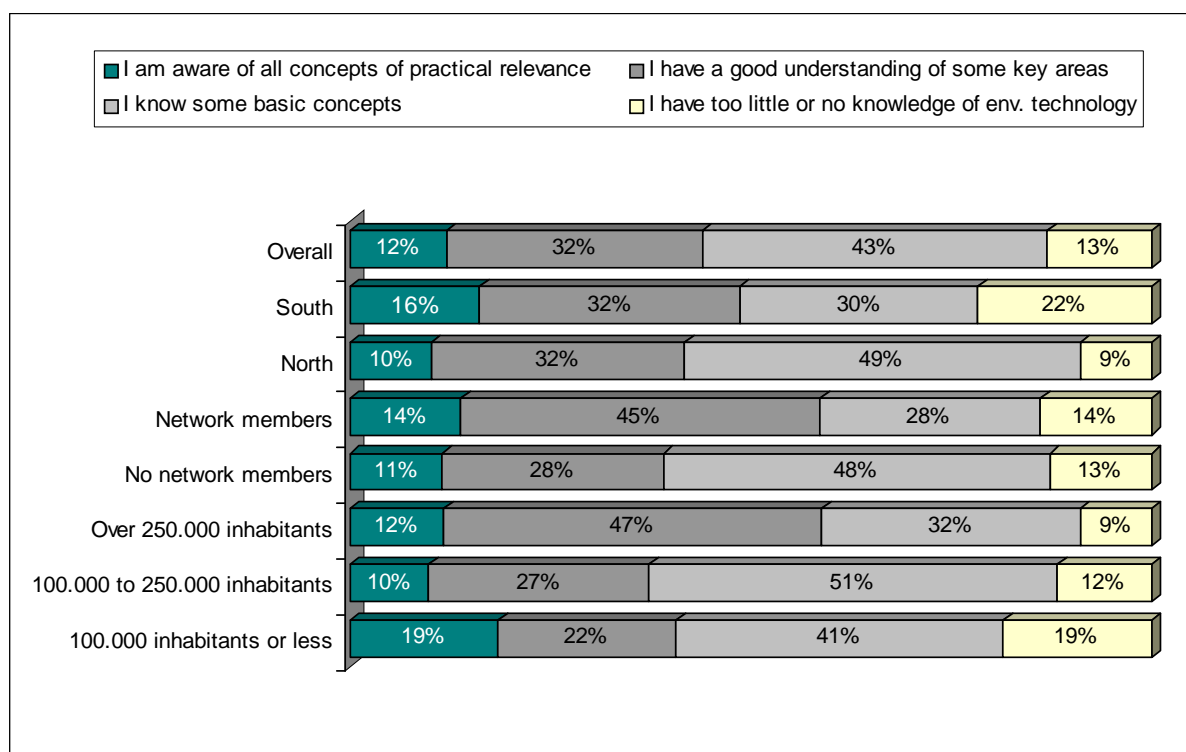
The perceived personal level of expertise in EU authorities for applying modern information and communication technologies in the area of the environment is low.<sup>35</sup>

Only 12% of decision makers claimed the authorities cited that they are aware of all concepts of practical relevance. Approximately one third of the respondents pointed out, that they have a “good understanding of some key areas” of telematics use. According to the survey, another 43% of the respondents “know some basic concepts”, whereas about 13% stated that they have “too little or no knowledge of environmental technology”. It is striking that the percentage of those, having no knowledge is much higher for South European authorities (22%), and higher among network members and in large authorities.

<sup>35</sup> The basis for percentages is N=116.



Figure 24: Personal level of expertise



## 6.6 TRAINING SUPPORT

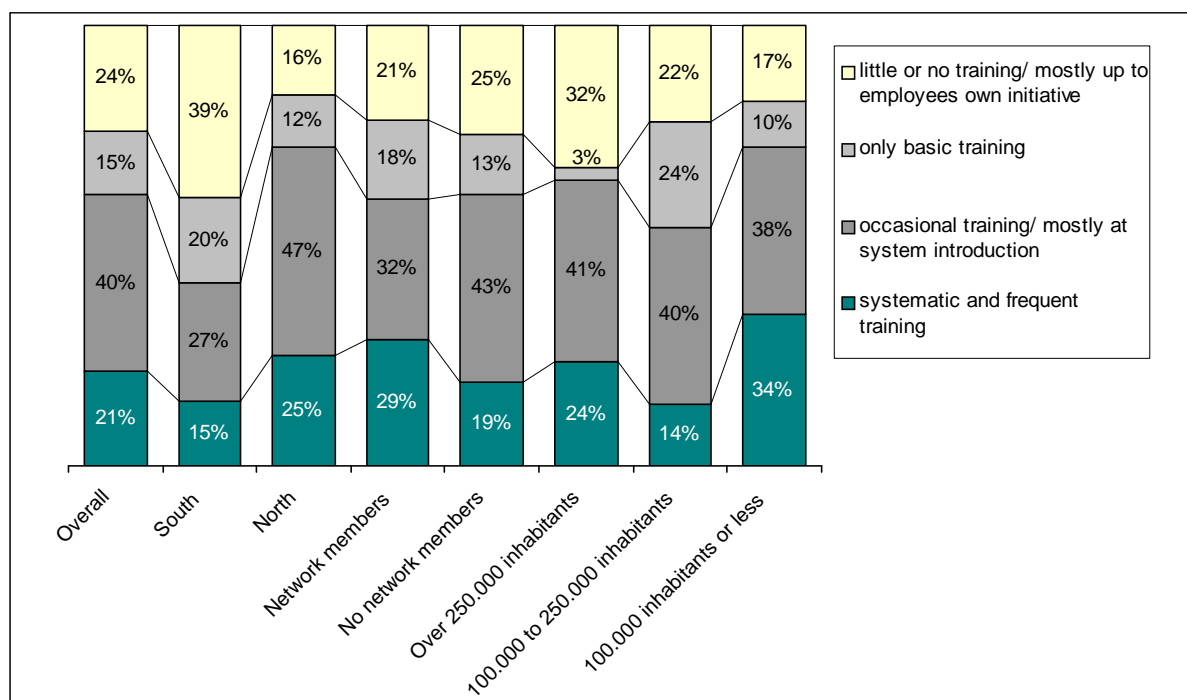
The survey shows, that the support of employees in environment departments for learning how to use new technologies needs improvement.

In one quarter of all authorities (24%), only little or no training is available. Another 55% pointed out that their employees can only get basic training sessions (15%) or occasional training, mostly for system introduction (49%). Only 21% of the respondents said that staff receive systematic and frequent training.<sup>36</sup>

The level of training for using new technologies is particularly low in authorities from the South of Europe. While 16% of the North European authorities stated, that they only have little or no training, this was the case for 39% in the authorities from Southern Europe.

<sup>36</sup> The basis for percentages is N=117.

Figure 25: Training opportunities within the authority



## 6.7 SUMMARY

The main findings of the survey on availability of environmental data and (basic) technologies are:

- Environmental data availability in EU authorities has already reached a high level in many areas. Data on “environmental legislation”, “main pollutants of drinking water”, “meteorological conditions” “main pollutants of air” is “sufficiently available” in between 60 and 70% of the authorities.
- However, the availability of data related to “traffic noise”, “non-point sources of pollution”, “traffic flows” and “hazardous waste deposits” still seems to be low.
- The highest priority for the future provision of environment-related data is seen in the areas of air pollution” and “energy consumption”.
- The full implementation of technologies for handling environmental data is not yet very common among EU authorities. But in many authorities key technologies are at least partly implemented or work on a trial basis.
- The visualisation of data in maps and graphics as well as the integrated electronic data bases are at least partly implemented in more than 70% of the EU authorities and around 60% of the authorities have already experience with the application of a data exchange networks between different institutions.

In terms of use of telematics systems and other technologies, the survey found out that:

- The use of environment telematics applications in EU authorities is extremely limited. Only one quarter of respondents claim full telematics support for any major area (27% for “waste management”, and 22% for “modelling of ambient air quality”.
- Telematics support is particularly low in areas such as: “tracking and tracing of dangerous goods transports”, “integration of air quality and traffic management”, “decision support systems and risk and emergency management” (below 10%).

- The use of telematics systems is generally more widespread in North European authorities.
- The highest priority for implementing telematics systems in future is seen in the area of “waste management” (41%). This is particularly true for South European authorities (53%).
- In terms of basic general telematics, the majority of authorities is using e-mail. GIS is used in more than 75% of the authorities. Their use of these technologies will further increase within the next years. The current implementation of technologies like “high speed multimedia networks”, “expert systems/artificial intelligence” or “satellite image processing/remote sensing” is very limited.
- The training of staff on how to use modern technologies needs to be improved, since more than half of the respondents stated, that they only know some basic concepts or have limited or no knowledge of environmental technologies.
- The support of employees in learning how to use new technologies is limited in most of the EU authorities. The majority of the respondents pointed out that either little or no training is available or their employees can only get some basic training sessions.

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## **7 DELIVERY OF INFORMATION AND PUBLIC SERVICES**

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A key objective of the survey was to analyse the nature of information and services provided to the public and the technical platforms used to deliver these. The aim was to get an overview of the current technical framework in EU authorities and the future potentials for telematics in the dissemination of environmental information.

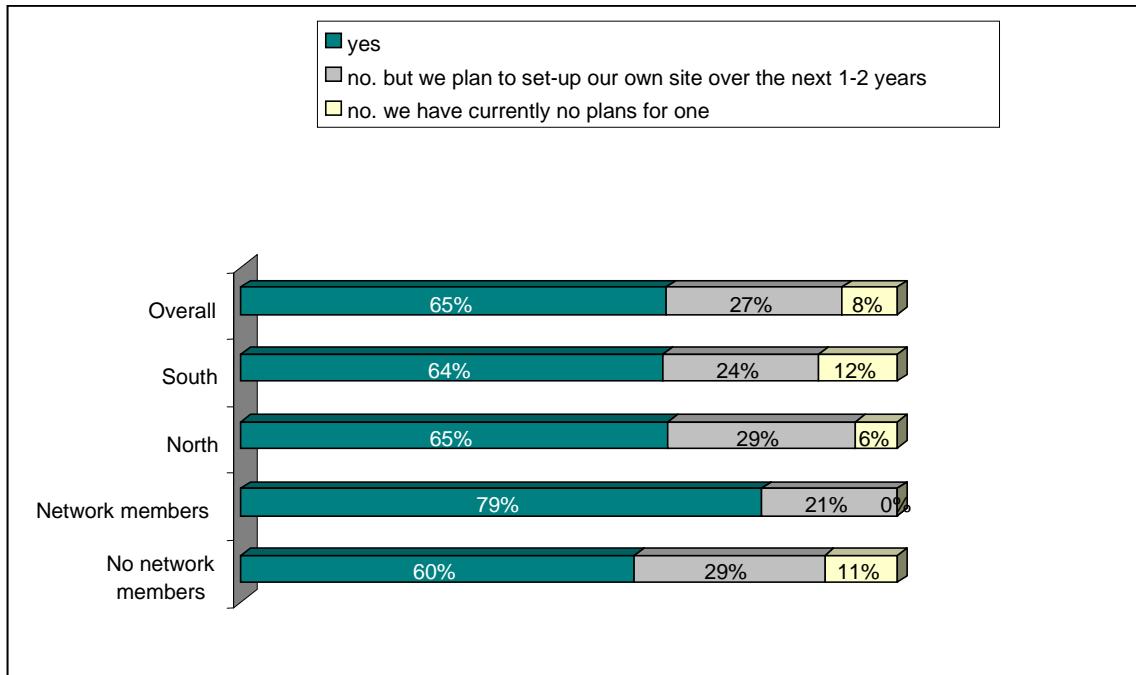
### **7.1 INTERNET SITES AND INFORMATION KIOSKS**

Internet is being discovered by the majority of the EU authorities as a useful means for information dissemination. Approximately 65% of the authorities already provide their own Internet sites. Among networks members, there are even 79% maintaining an Internet site. Almost all remaining respondents (27%) stated that they are planning to set up their own site over the next 1-2 years. Only 8% (12% of South European authorities) currently do not have the intention to develop an own Internet presence.<sup>37</sup>

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<sup>37</sup> The basis for percentages is N=119.

Figure 26: Authorities maintaining their own Internet site (by region, network-membership, authority size)

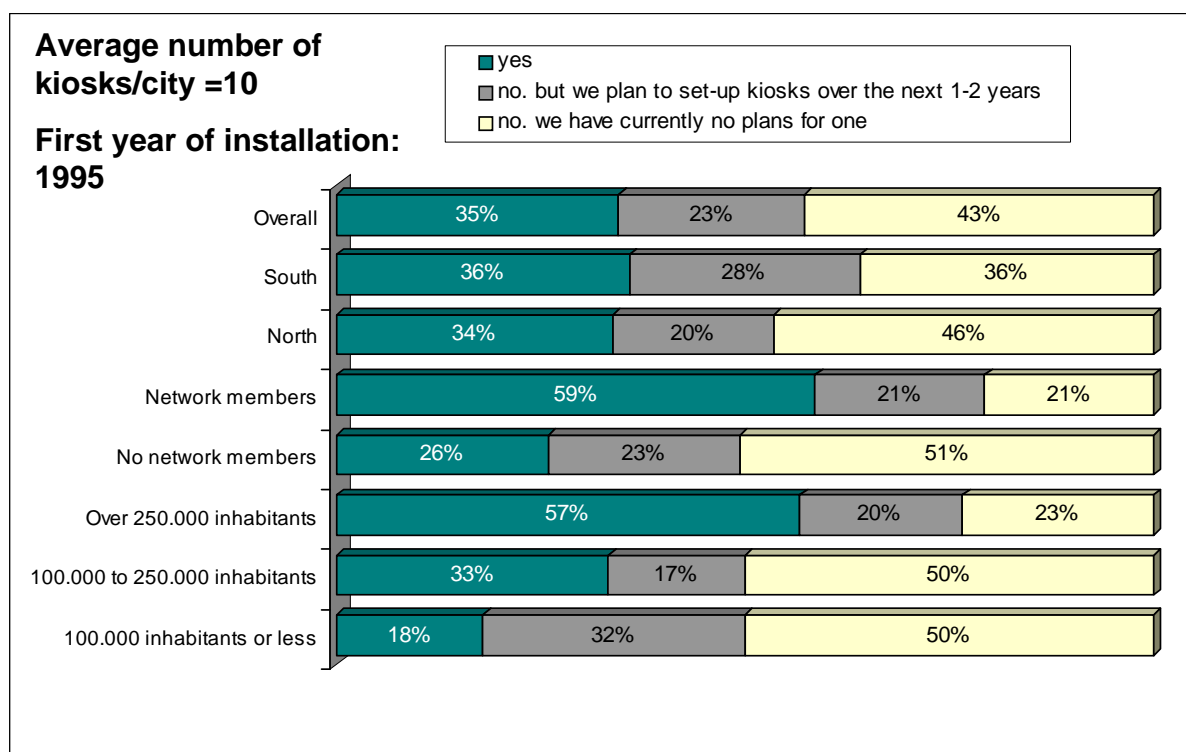


Publicly accessible information kiosks exist in about 35% of all EU authorities. In large cities with more than 250.000 inhabitants, the availability of kiosks is more common (57%). The same is true for network members (59%). Another 23% answered that they are planning to set up kiosks within the next one or two years, whereas 43% have no such plans. The percentage of those authorities having no plans is particularly high among non-network members (51%) and North European authorities (47%).<sup>38</sup>

The average number of kiosks is however small, at 10 per authority.

<sup>38</sup> The basis for percentages is N=110.

Figure 27: Citizens have access to information kiosks/ terminals



## 7.2 DISSEMINATION OF INFORMATION

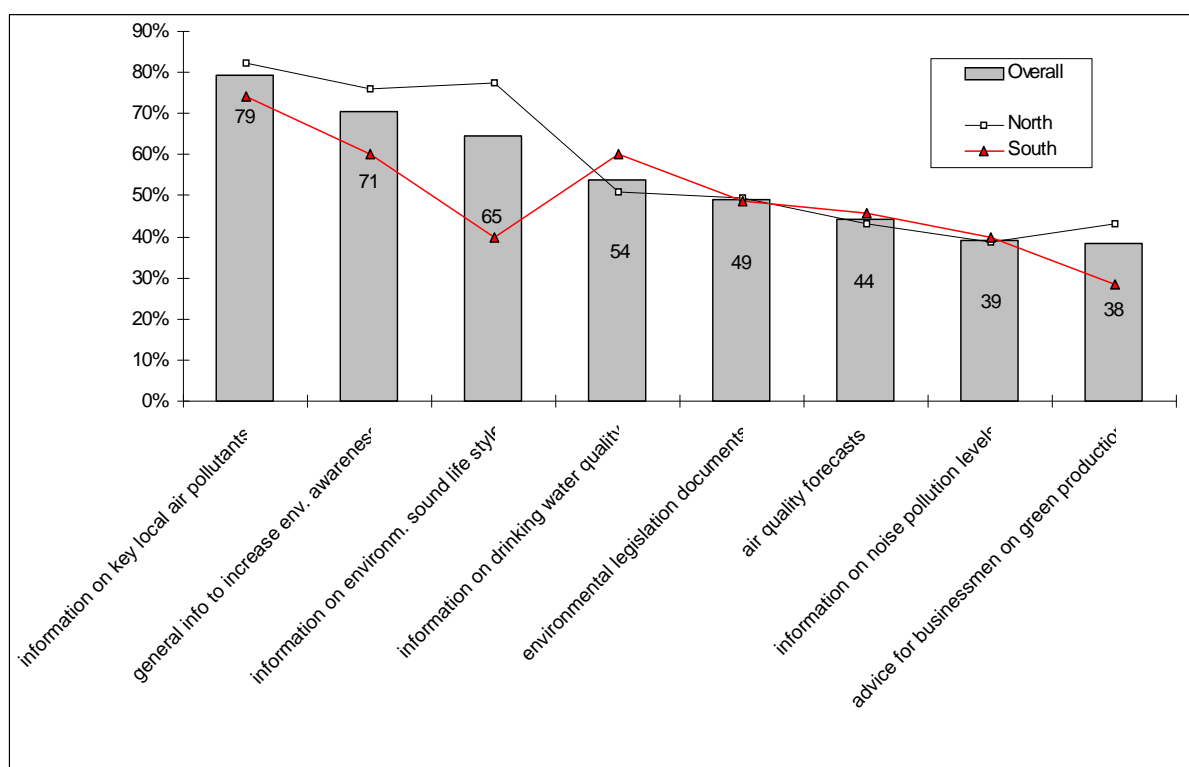
Question 23 gives an overview of what kind of information is provided most often to the public<sup>39</sup>.

Almost 80% of the authorities supply information on key local air pollutants, 71% disseminate general information to increase environmental awareness, and 65% on environmentally sound lifestyles. For these three areas the level of information provision is slightly higher among North European authorities. Information on air quality forecasts and on noise pollution levels are available in around 40% of the authorities.<sup>40</sup>

<sup>39</sup> It is not possible, however, to evaluate the quality of that information.

<sup>40</sup> The basis for percentages is N=102.

Figure 28: Information services on environmental issues (by region)



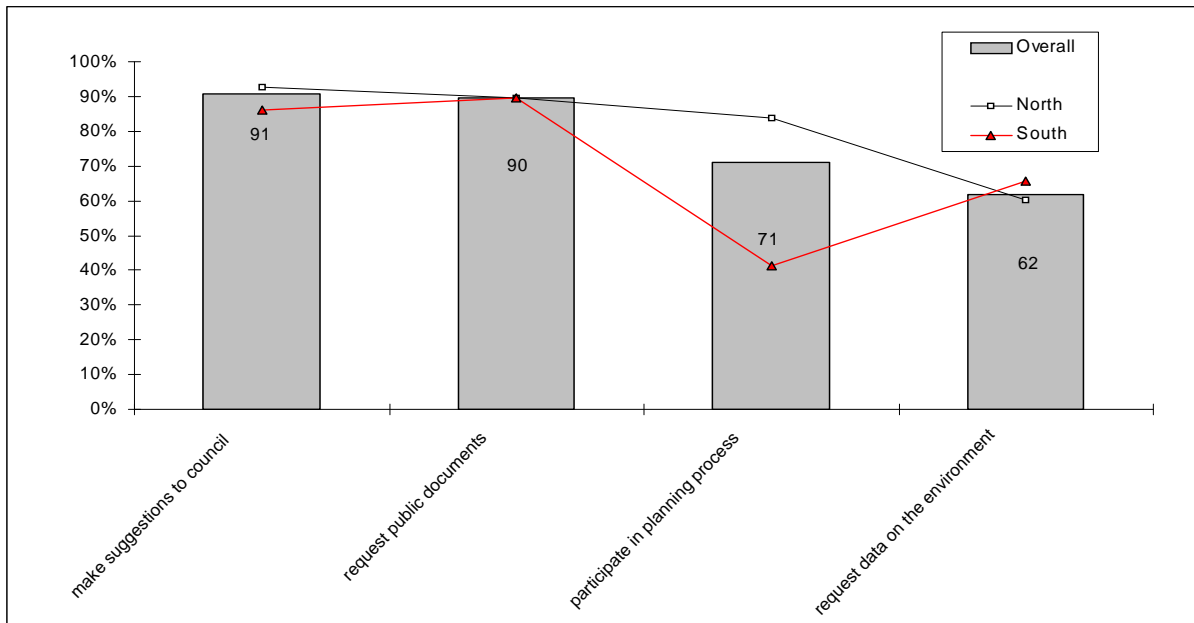
### 7.3 DELIVERY OF PUBLIC SERVICES

In total, 90% of the environment departments accept complaints or suggestions or follow requests for public documents (e.g. environmental reports). In 60 - 70 % of authorities the ordering of municipal services (e.g. collection of toxic waste) or participation in planning processes is possible. The latter seems to be much more important in authorities from North European countries.<sup>41</sup>

A very wide understanding of “interactive services” was obviously adopted by respondents. Obviously any telephone complaint is included in these figures. The level of actual “services” is considerably lower (cf. next section).

<sup>41</sup> The basis for percentages is N=97.

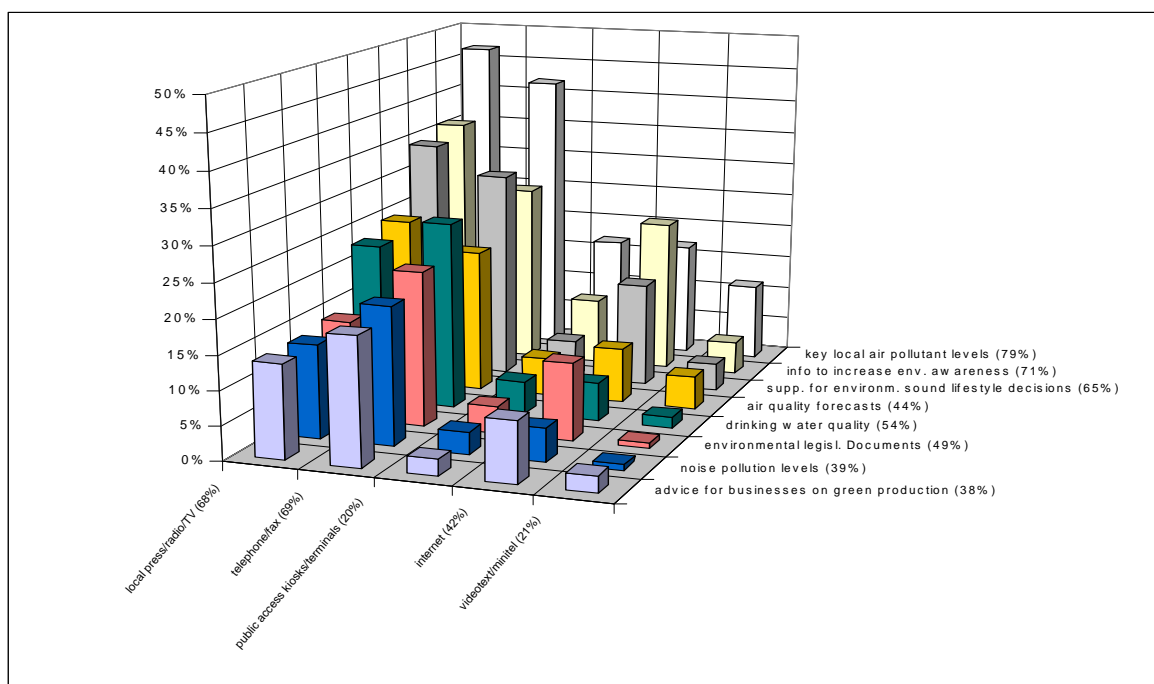
Figure 29: Delivery of interactive public services (by region)



#### 7.4 TECHNICAL PLATFORMS

“Telephone/fax” and “local press/radio/TV” are the most common media to deliver information services. Almost 70% of the authorities state, that information can be received via these two media. This does not mean, that information is being delivered regularly via these technical platforms. It only reflects that information delivery is generally possible. More than 40% of the EU authorities offer environmental information services by means of Internet and about 20% use the media videotext/minitel or information kiosks to deliver information. Internet and information kiosks seem to be more widespread in South European authorities, as well as among network members and larger cities.

Figure 30: Technical platforms for information services



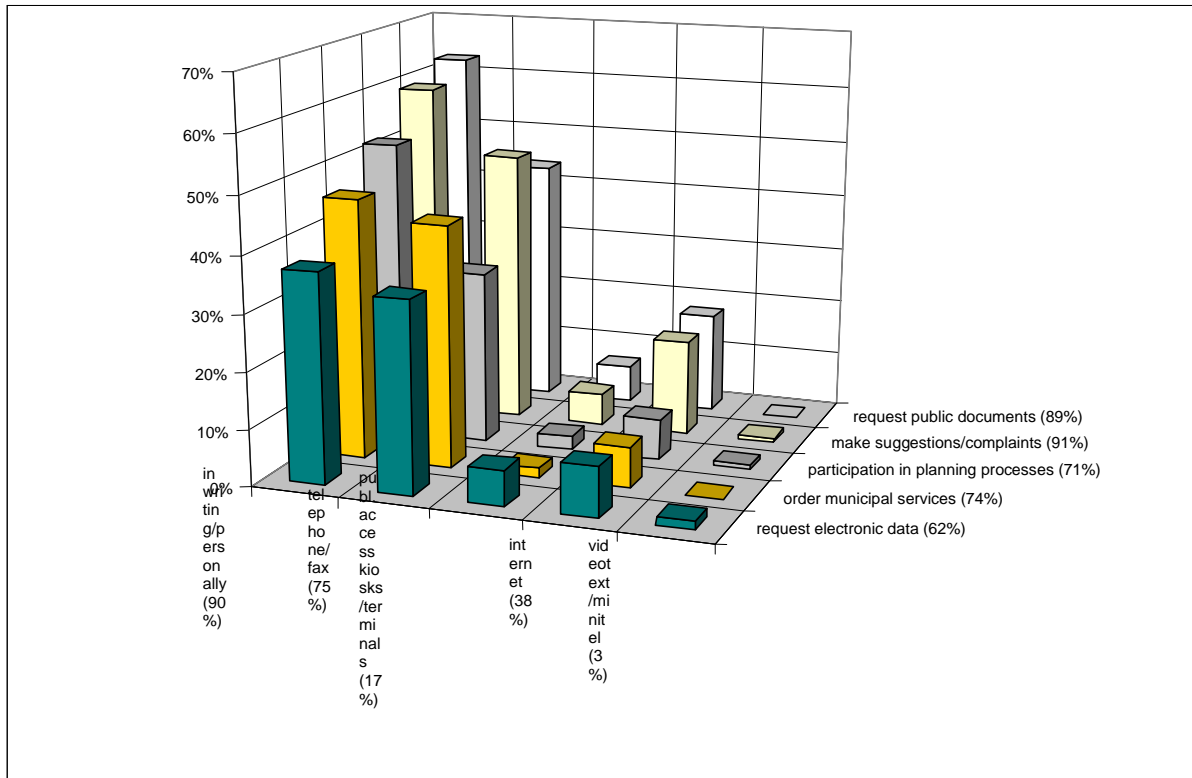
The interactive dialogue between the citizen and the administration via Internet is possible in 38% and via Public access kiosks/terminals in only 17% of the authorities. These technical platforms are more widely used among network members and larger cities. The use of videotext or minitel as a diffusion medium for environmental interactive services is very limited (3%).

As regards technical platforms for interactive services between the citizens and the public administration, approximately 90% stated that these services can be offered via writing or personal visits. Another important alternative for providing interactive services is by telephone or fax, which is possible in three out of four authorities.

Most “interactive services” are still delivered in traditional form, i.e. by writing or paying a visit to the authority (90%). But already three out of four authorities accept telephone or fax requests.



Figure 31: Technical platforms for interactive services

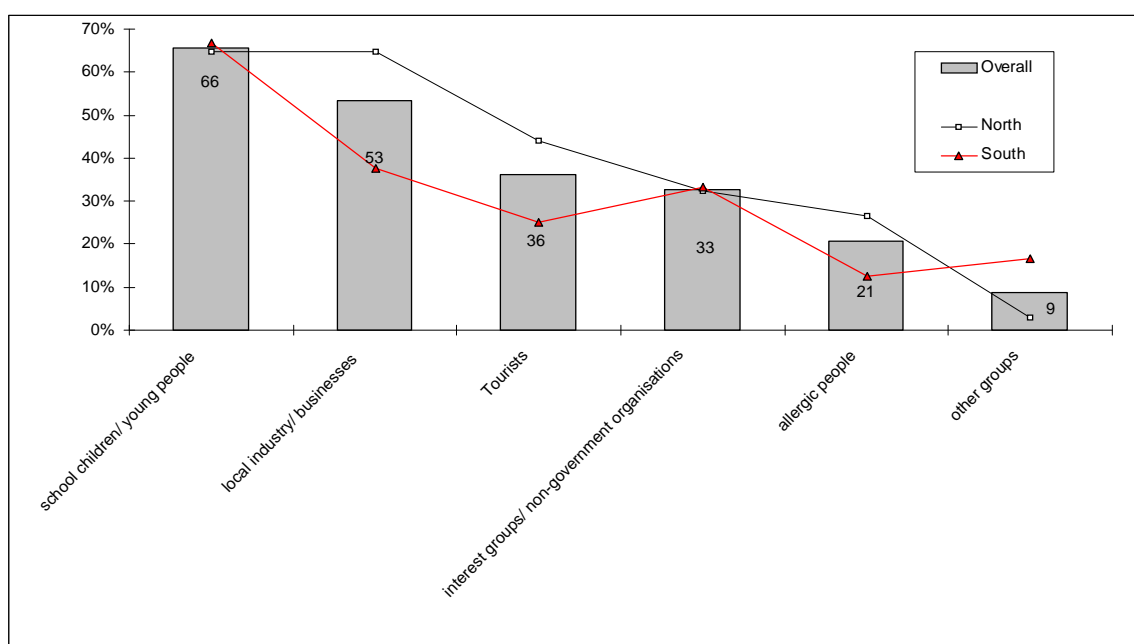


## 7.5 TARGET GROUPS

Only half of all respondents stated that they are offering target group specific services (47%). Of those who do, two thirds offer specific information services for school children/young people and more than 50% provide services especially for the local industry/businesses. For tourists and interest groups/non-governmental organisations, around 35% of the authorities stated, that they disseminate targeted information or interactive services. In general, the level of specific services seems to be slightly higher in North European authorities.<sup>42</sup>

<sup>42</sup> The basis for percentages are all respondents offering any target group specific services; N=58.

Figure 32: Services for specific target groups (by region)



## 7.6 CONCERNS

Only 16% of responding decision makers are not concerned about delivering environmental information services electronically. Two thirds pointed out, that they are worried about the user friendliness of these services (68%) or about the complexity of environmental information (65%). It is very striking, that 84% of South European authorities are concerned about the user friendliness of the information services, compared to 58% in the North.

Other major concerns regarding the provision of environmental services in electronic form, are seen in the

- “quality/content of information” (48%),
- “loss of personal interaction with citizens” (32%)
- “handling the increasing number of public information demands” (28%)

## 7.7 SUMMARY

The main findings related to the delivery of information services can be summarised as follows:

- The services of information dissemination to the public is highest in the areas of “key local air pollutants” and “general information to improve environmental awareness”. At least 70% of the authorities provide this information to the public. Information on air quality forecasts and noise pollution levels is only provided by about 40% of the authorities.
- Most EU authorities appreciate the Internet as an information medium. In more than two thirds of EU authorities own Internet sites are available and another 27% have the intention to set up their own Internet site in the near future. However only 40% actually offer environment information services via Internet.
- Public access information kiosks are in operation in about one third of the authorities (or 57% of all large authorities with more than 250.000 inhabitants). One out of five use information kiosks to

deliver environment-related information. The importance of these kiosks will rise in future particularly in large cities.

- Interactive services via Internet exist in 38% of the authorities and interactive dialogues between the citizen and the administration via public access kiosks is only possible in 17% of the authorities.
- Targeted information or specific interactive services are mostly provided for school children/young people (60%) and for local industry (50%).
- Many authorities from the EU have concerns relating to the electronic delivery of environmental information services. More than half of the EU authorities are sceptical about the user friendliness of environmental information services and the complexity of environmental information.

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## 8 FINANCING OF ENVIRONMENT TECHNOLOGIES AND SERVICES

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The main funding source for implementing new technologies are non funds of the authority<sup>43</sup>. Approximately every second authority used national/regional funds and about 15% could finance telematics projects by the help of European Cohesion or Structural Funds.

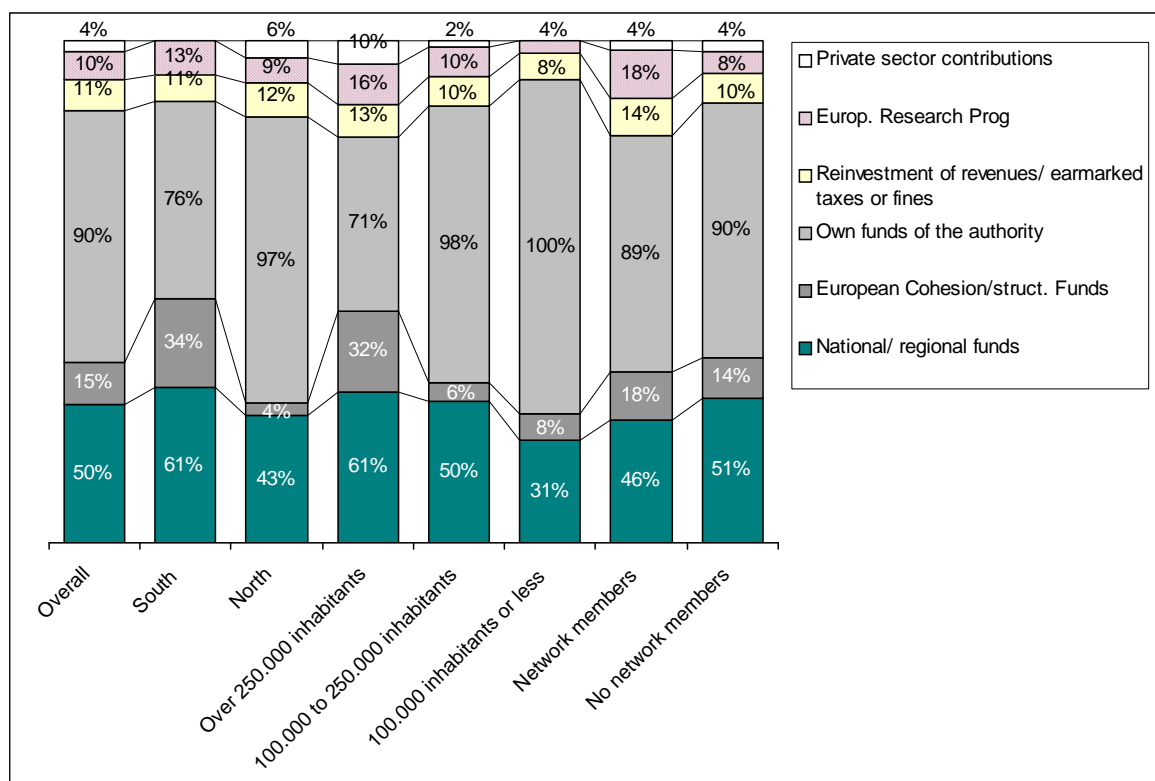
In 11% of the cases, new technology projects were partly supported by reinvestments of revenues, earmarked taxes of fines and 10% could use financial support from the European Research Programmes. Private sector contributions played a role in only 4% of the authorities.<sup>44</sup>

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<sup>43</sup> The analysis results only describe the use of sources of funding and not their relative importance.

<sup>44</sup> The basis for percentages is N=107.

Figure 33: Sources of funding of telematics projects



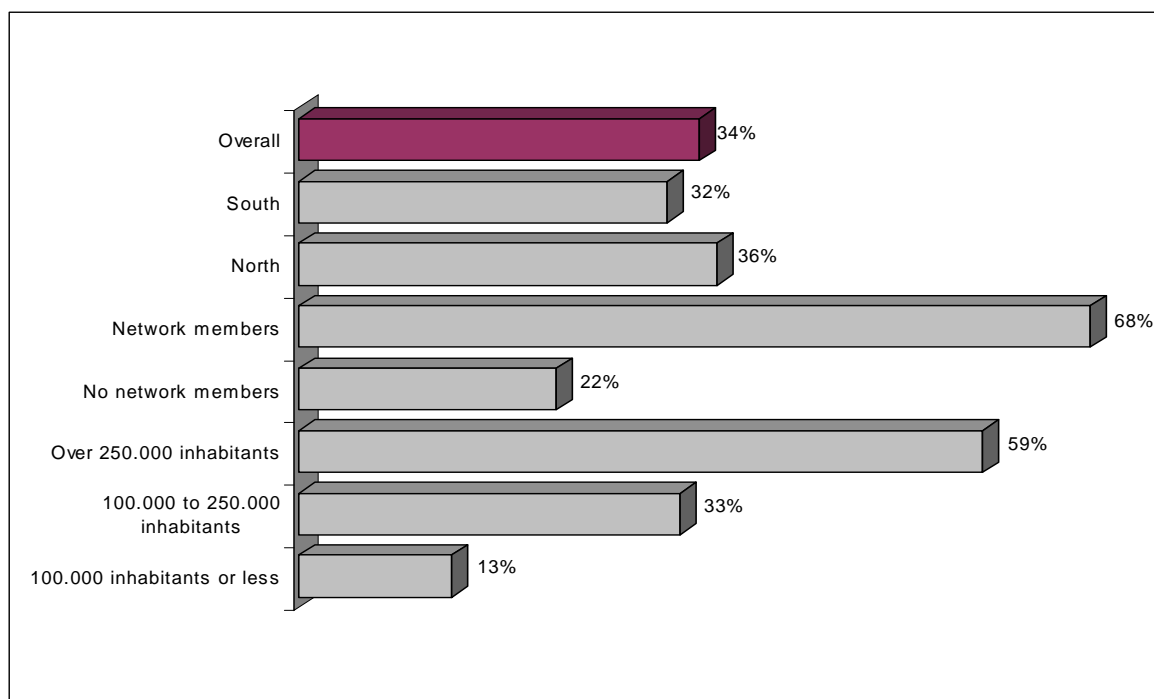
## 9 EUROPEAN COOPERATION

The question on participation in environment-related European Research and Development Programmes (in the last three years), was responded positively by 34% of the authorities. This percentage is far above average among network members and large cities (with more than 250.000 inhabitants).<sup>45</sup>

The experiences of the authorities in co-operation at European level, can be summarised as positive. 42% of the authorities stated that they have been fully or partly successful in working in European projects. Only 18% indicated that their work at the European level has been rather or completely unsuccessful.

<sup>45</sup> The basis for percentages is N=81.

Figure 34: Participation in European Research and Development Programmes (by region, network membership, authority size)



## 10 FUTURE INTERESTS OF THE AUTHORITIES

With regard to the conferences and workshops to be organised by the CAPE project during 1999, the future interests of EU authorities were identified. The question about the future interests makes it possible to give a summary of major priorities for future telematics applications, technologies and general issues of environmental policy.<sup>46</sup>

### 10.1 APPLICATION AREAS

The highest interest of environmental decision makers in telematics applications, is undoubtedly in the area of traffic management. 81% of the respondents pointed out that they would like to know more about telematics applications for improving environmentally friendly transport management.<sup>47</sup>

Other major areas of interest for telematics use are seen in “managing contaminated land sites” and “domestic waste management”, which are indicated by more than three quarter of the authorities. But also for telematics applications supporting the “monitoring and forecasting of air quality” and “risk assessment techniques” more than 60% of all authorities have stated an interest. The most important future interest among South European authorities, seems to be in the area of “domestic waste management” (90%) and “hazardous waste management” (77%).

<sup>46</sup> The basis for percentages is N=110 throughout this section.

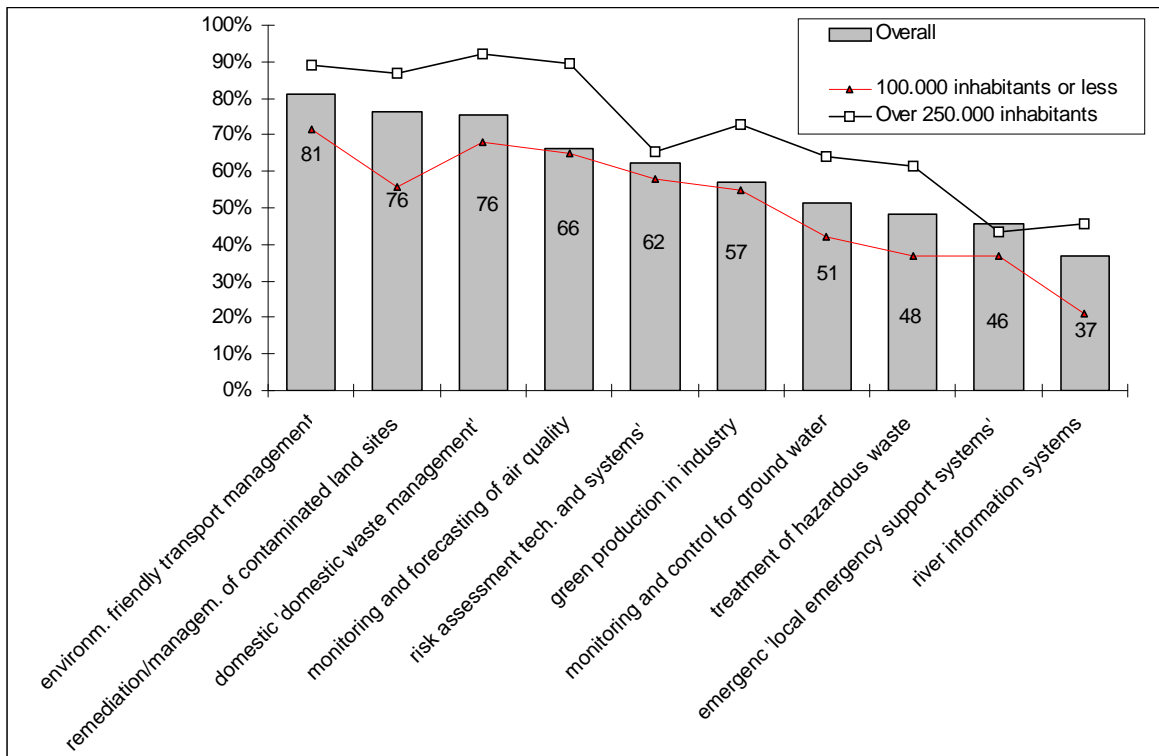
<sup>47</sup> The reported percentages in this section are somewhat inflated due to on average 40 missing responses per response item. If these missing responses were interpreted as indication of "issue not essential now" then percentages would be ca. 12% lower (i.e. for environmentally friendly transport the "real" percentage would be 66% rather than 81). The order of items would however remain unchanged.

Large cities with a population of more than 250.000, generally have a higher general interest for environment telematics applications. Their major priority for telematics use is in the area of domestic waste management.

The lowest interest of telematics systems seems to be in the following areas:

- “river information systems” (37%),
- “local emergency support systems” (46%)
- “treatment of hazardous waste” (48%).

Figure 35: Future interest in telematics applications

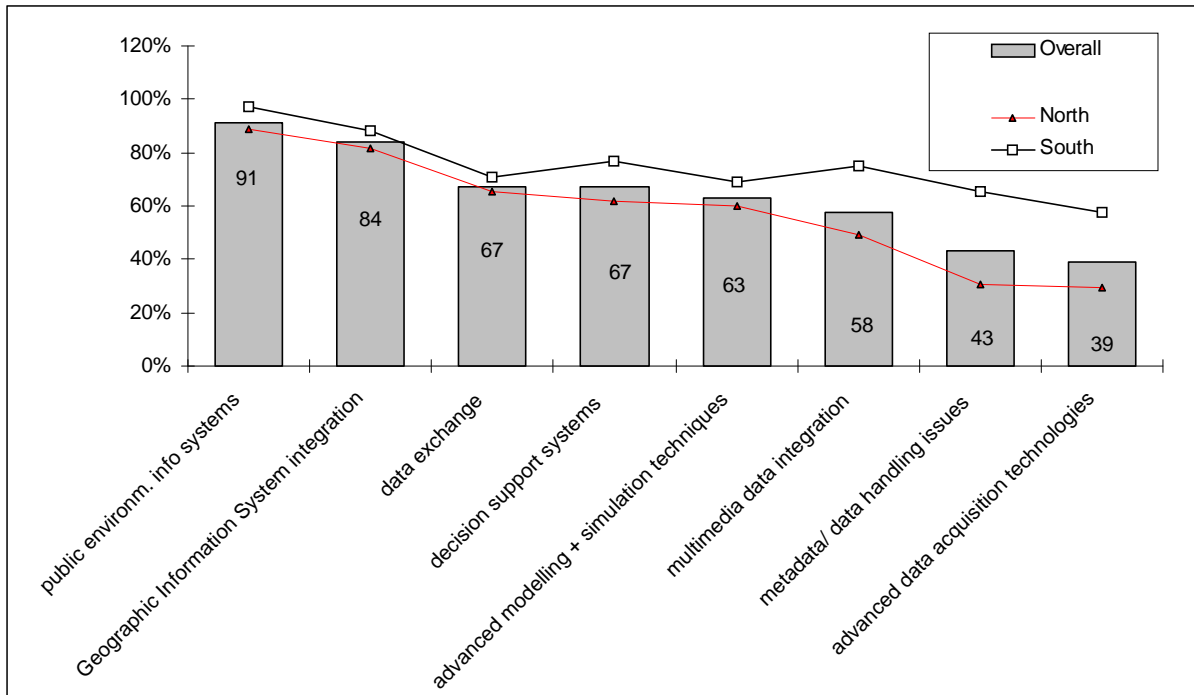


## 10.2 TELEMATICS SYSTEMS

In terms of telematics systems, authorities are mainly interested in learning more about public environment information systems (91%). But also integration of Geographic Information Systems (84%), “possibilities of data exchange” (e.g. transborder, across hierarchies) and “decision support systems” (each 67%) the future interests of EU authorities are particularly high. For advanced data acquisition technologies and metadata/ data handling issues, future interests turn out to be lowest (39%/43%).

According to figure 36, the interests for telematics technologies among South Europeans are in general much higher than in North European authorities.

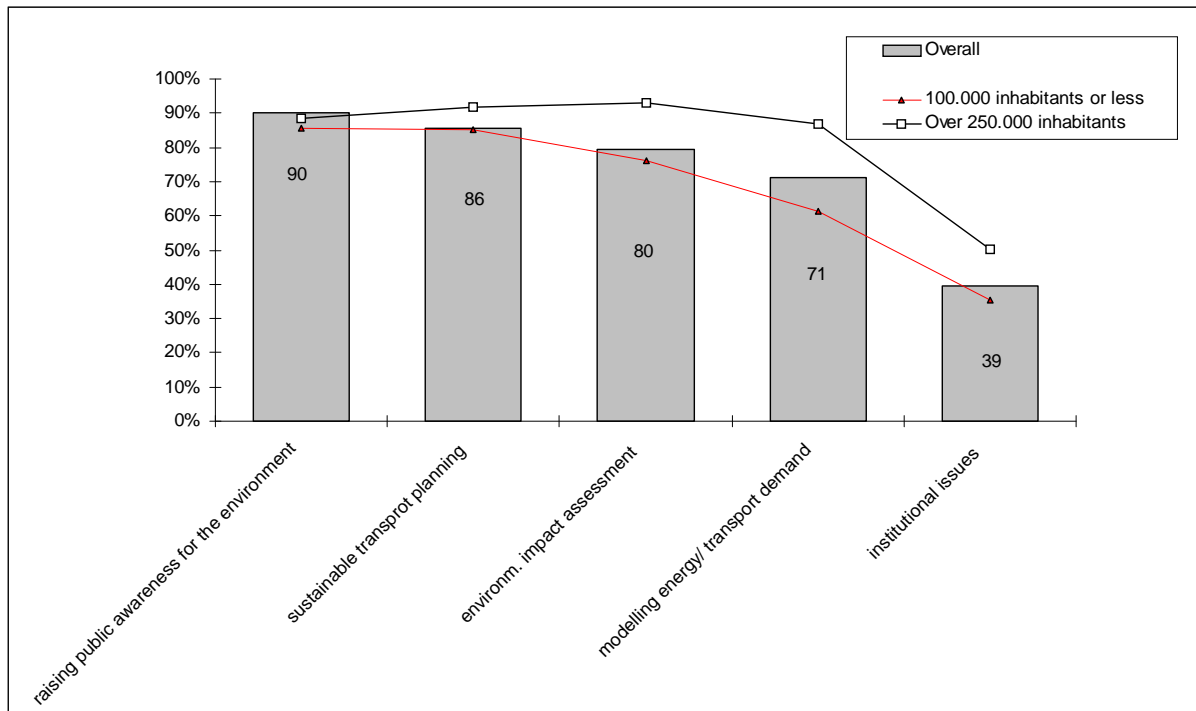
Figure 36: Future interest in technologies



### 10.3 GENERAL INTERESTS

The survey results make also clear, that the vast majority of decision makers would like to know more about new ways of raising public awareness on environmental issues (90%). 86% of the respondents are interested in working more deeply on sustainable transport planning and 80% would like to deepen their knowledge on environment impact assessment or demand modelling (71%).

Figure 37: Future interest in general topics



#### 10.4 SUMMARY

The major future interests with regard to seminars and conferences are:

- Future interests for telematics applications are highest in environmentally friendly traffic management. Other areas of high interest are “managing of contaminated land sites” and “domestic waste management”.
- Public environment information systems and Geographic Information Systems are those telematics applications, which attract the interest of more than 80% of the EU authorities. For “data exchange”, “decision support systems” and “advanced modelling and simulation techniques” still more than 60% of the authorities would like to get some more information.
- Generally, almost all EU authorities are interested also in knowing more about new solutions on “raising public awareness for the environment” and “environmental impact assessment”



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## ANNEX I: PROCEDURES FOR THE QUESTIONNAIRE SURVEY

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Prior to conducting the enclosed questionnaire survey, a contact database which would later serve as a mailing list was generated. This was to include full references to local and regional government environment and transport managers across all EU and CEE countries. The data was researched, selected and compiled during the summer of 1998 by the project consortium, while the survey results were compiled between November 1998 and January 1999. The methodology for this process is outlined below.

### DATABASE CREATION

For the mailing database of the EU Environment, the following data was collected:

- Data supplied by ISEP, POLIS and other supporting European local authority networks (Eurocities, Telecities, Car Free Cities) which tends to be (positively) biased towards more active and technologically advanced authorities.
- In addition data for the EU countries was extracted from the European Local Government Organisation (ELGO) database. In order to complement the systematically researched data sources with randomly selected data from missing or underrepresented countries and sectors, POLIS acquired the ELGO data from Newmedia Publishing for exclusive use within the CAPE survey.

The ELGO database is the only available systematic source of local and regional government information covering Europe. ELGO includes full contact information and population figures from all layers of local and regional government in all European countries. POLIS has acquired the following data for the purposes of the CAPE survey:

- Chief Executive Officers in authorities between 20,000 and less than 100,000 inhabitants for all EU countries; except for Spain, Portugal and Greece where elected representatives rather than officers were chosen due to the specific constitutional division of power in these countries and except for Finland, Ireland and Luxembourg where the lower limit of authority size was set at 5,000 due to the specific size structure of authorities in these countries.
- Responsible officers in environmental departments of authorities above 100,000 population for all EU countries.<sup>48</sup>

The selection on the basis of ELGO was also the basis for calculating sample sizes and for selecting random samples.

### SELECTION PROCESS

When establishing the EU Environment mailing database, the following criteria were defined:

- Target numbers for local authorities in all target countries were established in order to ensure representativeness in terms of overall population and authority size.
- The mailing focused on larger and medium sized authorities, since small authorities were considered less likely to have sufficient financial resources, responsibility and other means for implementing telematics systems.

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<sup>48</sup> ELGO contains department-specific information only from authorities above 100,000.

- The mailing database should be representative for all layers of local and regional level in order to allow general conclusions and internal distribution between large and small authorities in each country.
- All systematically researched data had preference over any data from ELGO as it was considered to be of higher quality and reliability.

To meet the requirement of representativeness, approximate target numbers for each country were determined by the relative share of population for each country in relation to overall EU population.

For the selection of contacts for the EU Environment mailing database, two sub-sets were defined:

- 812 representative contacts from the ELGO database were selected. The resulting mailing database contains a randomly selected “stratified sample” of local and regional authorities. It can be considered representative of all levels of local government institutions in all CEE countries.
- Other contacts were added from Polis, other urban networks and project participants to include also “advanced authorities”.

Both sub-sets were matched to avoid mailing of more than one questionnaire to one authority.

### **MAILING AND DATA ENTRY**

Rupprecht Consult (RC) provided an English and German version of the questionnaire and POLIS provided French, Spanish and Italian versions on that basis.

The mailing was done by the POLIS office: The questionnaires were sent out in Oct. 1998 and accompanied by a cover letter introducing the CAPE project and outlining the benefits of participating in the survey. In November/December 1998 all authorities not having responded were reminded by mail to answer the questionnaire. Many authorities were also contacted personally by telephone and asked to participate in the survey to further correct for imbalances.

A Microsoft ACCESS-data entry mask was supplied by RC. Data entry was performed by POLIS and finished in January 99.

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## ANNEX II: SURVEY RESPONSE AND REPRESENTATIVENESS

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### RESPONSE

In contrast to the two CAPE surveys in the CEE countries, the survey result of EU survey on Environment Telematics is comparatively low. 124 questionnaires, which means 10,4% of the questionnaires mailed were returned by the end of January. Due to the very low response rate after the first mailing in October 1998, it was decided to send out reminders to those cities not having responded. In December 1998, CAPE project partners started reminding many of the cities by phone or fax. The same was repeated in January, for areas of low response.

One important reason for the relatively low response rate is the fact, that many European cities have received numerous questionnaires within the last months, all asking for detailed information from administrative services. Many authorities simply do not see the possibility to follow all these demands. However, the size of the survey sample is considered to be sufficient to give a good overview of the current status and future priorities of Environment Telematics use in the EU.

About two third of the questionnaires were returned from North European authorities and one third from Southern Europe<sup>49</sup>. Ireland, Austria and Finland have by far the highest response rates. Considerably below average was the response from Belgium, Denmark, Italy and the Netherlands.

*Figure 38: Sample size and response rates*

Country	Questionnaires		Return rate
	Sent	Received	
Austria	26	8	30,8%
Belgium	42	2	4,8%
Denmark	21	1	4,8%
Finland	21	4	19,0%
France	172	12	7,0%
Germany	242	36	14,9%
Greece	34	3	8,8%
Ireland	9	3	33,3%
Italy	177	11	6,2%
Luxembourg	2	0	0,0%
Netherlands	61	2	3,3%
Portugal	32	3	9,4%
Spain	118	14	11,9%
Sweden	34	4	11,8%
U.K.	209	21	10,0%
Total	1200	124	10,3%

However, with respect to the representation of the different EU countries in the sample, in terms of population (in relation to the overall EU population size), only the following countries are underrepresented: United Kingdom, Belgium, and the Netherlands. Luxembourg is not represented at all in the survey. Countries like Denmark, Austria, Finland, Sweden, Portugal, Ireland, Greece and France are acceptably represented, although the total number of responses is fairly small. This is due to the fact, that in these countries, several large cities or only one very large city have participated in the survey. Also, the representation of Italy, Spain and Germany is acceptable.

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<sup>49</sup> Southern Europe included all Mediterranean countries, Northern Europe all other EU members.

## OVERALL REPRESENTATIVENESS

Essentially, imbalances of overall relevance are:

- low/high representation of several *small* countries
- misrepresentations in terms of authority size *within* countries
- low overall response.

However, all *large* countries are reasonably well represented (i.e. return rates are between 7 and 15%).

In order to compensate for imbalances in the final sample, ist sub-sets have been analysed separately in terms of:

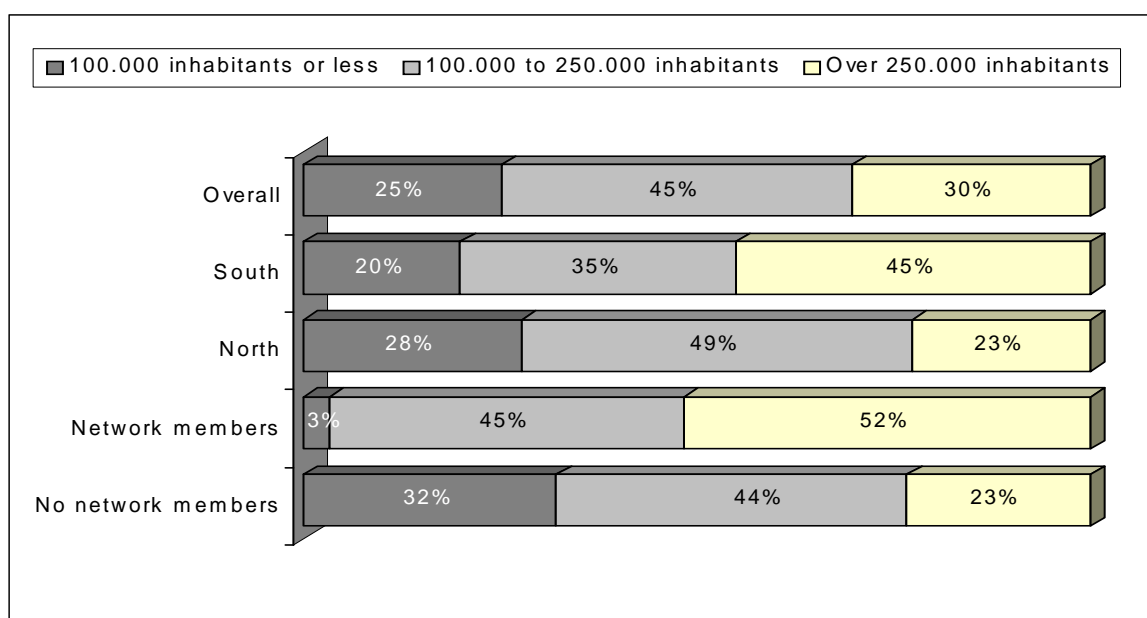
- authority size
- North/ South
- membership in European local authority networks

Whenever significant differences between these sub-sets become apparent, these are reported separately.

## DESCRIPTION OF SAMPLE

As regards authority size segments, the majority of the responded questionnaires were returned by authorities between 100.000 and 250.000 inhabitants (45%). Smaller authorities under 100.000 inhabitants are represented by 25% and 30% of the responses came from authorities with more than 500.000 inhabitants.

Figure 39: Authority size segments (by region and network membership)



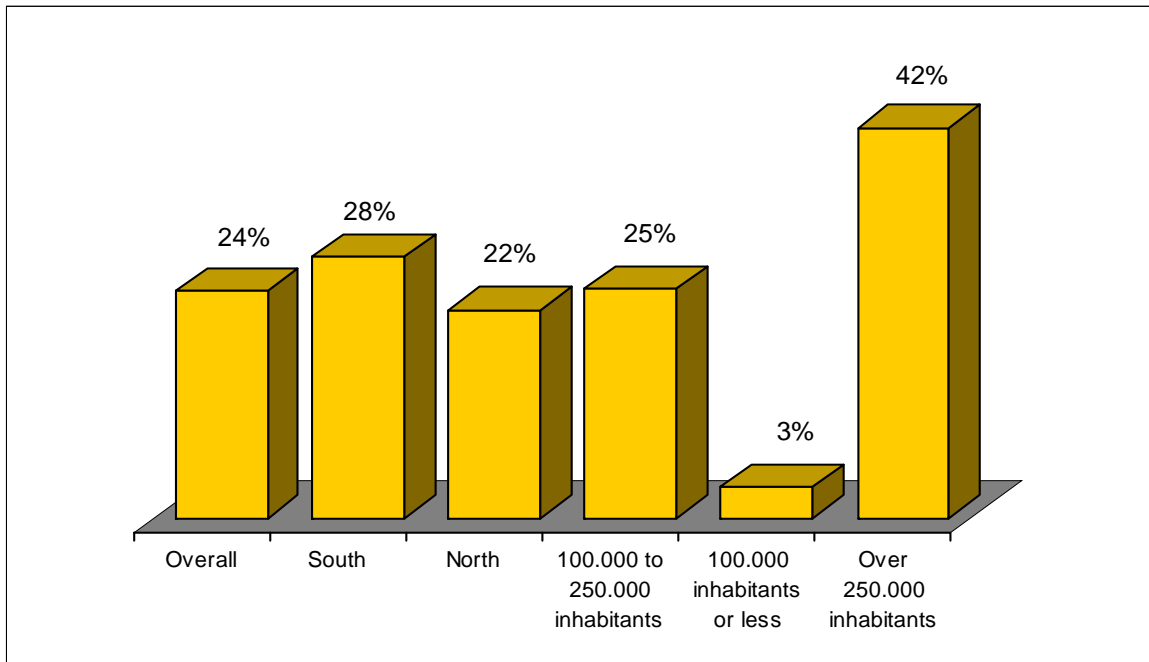
For judging the representativeness of the different authority size segments in the countries (see figure 43 in Annex III).

As figure 39 shows, there is a fair mix in terms of authority size.

Members of networks (such as POLIS, Car Free Cities, Eurocities, Telecities) are represented by almost one fourth of the authorities in the survey sample. These network cities are mainly medium-sized and large cities over 100.000 inhabitants.

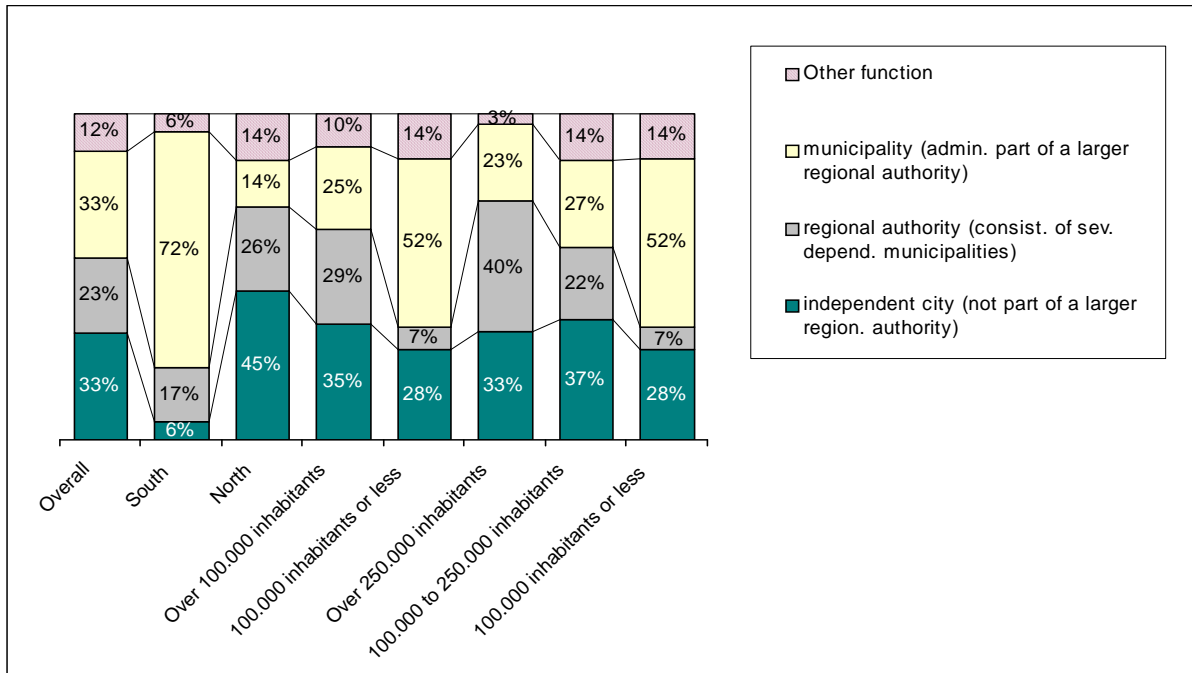
- Medium-sized to large authorities (i.e. above 100.000) dominate the sample.
- Differences between North/ South and network membership are not considered to be sample-specific, but are due to different size patterns in reality.

Figure 40: Network membership (by region, authority size)



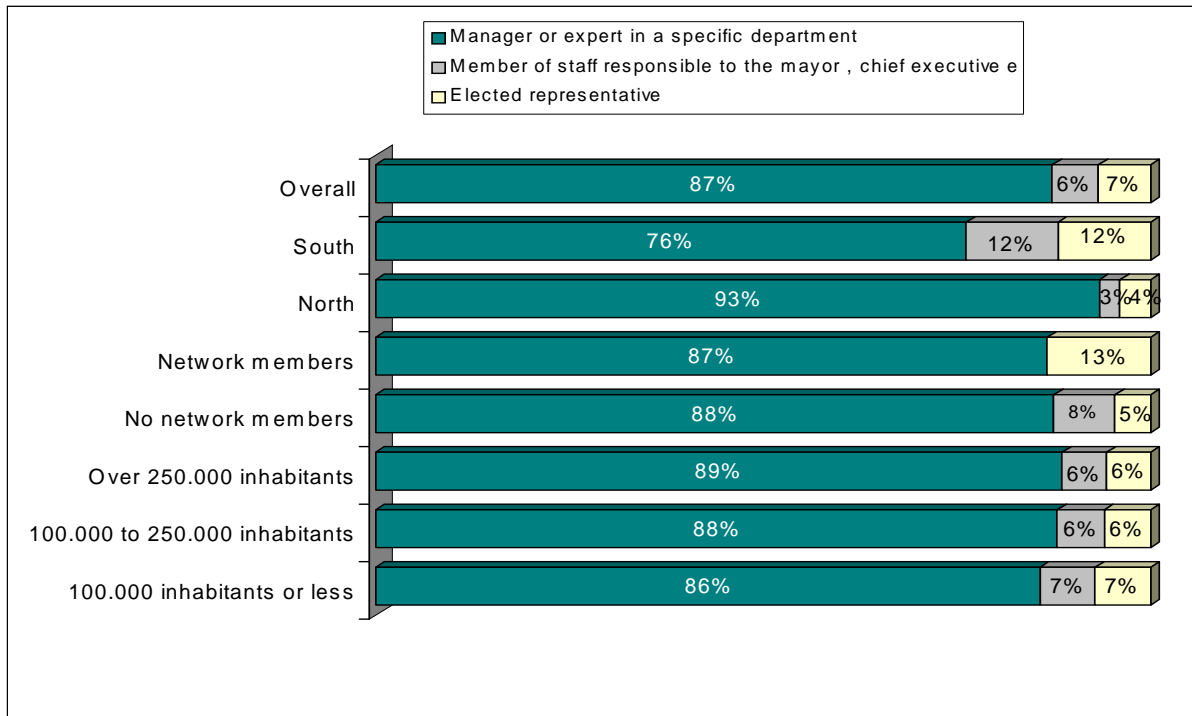
The survey sample mainly consists of questionnaires coming from local authorities. Respectively one third of the responses were returned by independent cities as well as by municipalities, forming an administrative part of a larger regional authority. Regional authorities are represented by 23% of the responses in the survey sample.

Figure 41: Institutional function (by region and authority size)



87% of the questionnaires were filled out by managers or experts in a specific department of the authority. Only 6% of the responses were returned by members of staff, directly responsible to the mayor or by chief executives. In only 7% of the cases, questionnaires were sent back by elected representatives

Figure 42: Respondent's role within the authority (by region, network membership, authority size)



**SUMMARY**

The survey sample of the CAPE survey on Environment Telematics in the EU can be described as follows:

- Compared to the two CEEC surveys, the response rate of the EU survey on Environment Telematics is low. 10% of the questionnaires were returned.
- The survey sample mainly consists of North European countries (approximately 2/3 of the authorities).
- Each fourth questionnaire was returned by authorities with less than 100.000 and 30% from authorities with more than 500.000 inhabitants.
- In the survey sample members of networks, such as POLIS; Car Free Cities Eurocities, Telecities are represented by about 25% of the questionnaires.
- Due to the low response rate, not all countries are well represented in the survey. However, all large countries are within the average return margin of 7 – 15 %.
- The survey sample is acceptable in terms of the role of respondents (i.e. mainly technical rather than political decision makers), and relating to the institutional function of the responding authorities
- In order to correct imbalances, analyses were carried out separately for sub-sets of the sample. Any differences are reported.

### ANNEX III: FIGURE ON REPRESENTATIVENESS OF THE SURVEY SAMPLE

 Figure 43 Representativeness of the survey sample <sup>50</sup>

ELGO Population-Figures (without very large supra-regional authorities)		ELGO-Database		Mailing		CAPE - Survey Sample		Total Population of EU-Overall		Share of authorities in sample (overall)
		Mean	Number of cities	Number of cities	Response rate	N of cities	Mean population	actual	in sample	
<b>Northern Europe</b>										
Belgium	small (below 100.000)	34.754	123			1	45.000			3%
	medium (100.000 to 250.000)	164.077	8			1	133.829			2%
	large (250.000+)	937.119	11			0				0%
	<b>Total</b>	<b>111.941</b>	<b>142</b>	<b>42</b>	<b>4,8%</b>	<b>2</b>	<b>89.415</b>	<b>2%</b>	<b>0,5%</b>	<b>2%</b>
Denmark	small (below 100.000)	39.031	54			0				0%
	medium (100.000 to 250.000)	202.275	5			0				0%
	large (250.000+)	392.083	12			1	615.000			3%
	<b>Total</b>	<b>110.198</b>	<b>71</b>	<b>21</b>	<b>4,8%</b>	<b>1</b>	<b>615.000</b>	<b>1%</b>	<b>2%</b>	<b>1%</b>
Germany	small (below 100.000)	42.212	673			7	47.229			23%
	medium (100.000 to 250.000)	149.019	274			23	148.501			43%
	large (250.000+)	437.749	95			6	650.833			17%
	<b>Total</b>	<b>106.359</b>	<b>1.042</b>	<b>242</b>	<b>14,9%</b>	<b>36</b>	<b>212.531</b>	<b>22%</b>	<b>21%</b>	<b>30%</b>
Ireland	small (below 100.000)	25.849	57			1	7.200			3%
	medium (100.000 to 250.000)	132.396	13			1	115000			2%
	large (250.000+)	456.312	2			1	352.000			3%
	<b>Total</b>	<b>57.044</b>	<b>72</b>	<b>9</b>	<b>33,3%</b>	<b>3</b>	<b>158.067</b>	<b>1%</b>	<b>1%</b>	<b>3%</b>
Luxemburg	small (below 100.000)	12.426	21			0				0%
	medium (100.000 to 250.000)					0				0%
	large (250.000+)					0				0%
	<b>Total</b>	<b>12.426</b>	<b>21</b>		<b>0,0%</b>	<b>0</b>	<b>0</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>
Netherlands	small (below 100.000)	37.568	187			1	59.500			3%
	medium (100.000 to 250.000)	136.311	21			0				0%
	large (250.000+)	1.133.487	15			1	720.000			3%
	<b>Total</b>	<b>120.583</b>	<b>223</b>	<b>61</b>	<b>3,3%</b>	<b>2</b>	<b>389.750</b>	<b>4%</b>	<b>2%</b>	<b>2%</b>
Austria	small (below 100.000)	35.575	20			6	38.171			20%
	medium (100.000 to 250.000)	158.913	6			0				0%
	large (250.000+)	1.600.000	1			2	900.000			6%
	<b>Total</b>	<b>120.925</b>	<b>27</b>	<b>26</b>	<b>30,8%</b>	<b>8</b>	<b>253.628</b>	<b>2%</b>	<b>6%</b>	<b>7%</b>
Finland	small (below 100.000)	15.477	224			1	5.350			3%
	medium (100.000 to 250.000)	176.299	16			2	185.000			4%
	large (250.000+)	503.534	7			1	500.000			3%
	<b>Total</b>	<b>39.726</b>	<b>247</b>	<b>21</b>	<b>19,1%</b>	<b>4</b>	<b>218.838</b>	<b>1%</b>	<b>2%</b>	<b>3%</b>
Sweden	small (below 100.000)	41.854	111			0				0%
	medium (100.000 to 250.000)	152.148	13			1	133.000			2%
	large (250.000+)	402.103	21			2	275.500			6%
	<b>Total</b>	<b>103.917</b>	<b>145</b>	<b>34</b>	<b>11,8%</b>	<b>3</b>	<b>228.000</b>	<b>2%</b>	<b>2%</b>	<b>3%</b>
United Kingdom	small (below 100.000)	59.420	254			5	57.480			17%
	medium (100.000 to 250.000)	146.149	210			11	143.800			21%
	large (250.000+)	558.598	80			4	376.836			11%
	<b>Total</b>	<b>166.309</b>	<b>544</b>	<b>209</b>	<b>10,1%</b>	<b>20</b>	<b>168.827</b>	<b>16%</b>	<b>9%</b>	<b>17%</b>
<b>Southern Europe</b>										
Greece	small (below 100.000)	41.072	78			1	25.000			3%
	medium (100.000 to 250.000)	161.783	6			1	120.000			2%
	large (250.000+)	717.850	2			1	770.000			3%
	<b>Total</b>	<b>65.233</b>	<b>86</b>	<b>34</b>	<b>8,8%</b>	<b>3</b>	<b>305.000</b>	<b>3%</b>	<b>3%</b>	<b>3%</b>
Spain	small (below 100.000)	38.933	266			4	42.777			13%
	medium (100.000 to 250.000)	163.571	48			5	174.400			9%
	large (250.000+)	785.501	50			5	457.449			14%
	<b>Total</b>	<b>157.920</b>	<b>364</b>	<b>118</b>	<b>11,9%</b>	<b>14</b>	<b>237.882</b>	<b>11%</b>	<b>9%</b>	<b>12%</b>
France	small (below 100.000)	37.327	393			2	28.900			7%
	medium (100.000 to 250.000)	161.360	63			6	152.579			11%
	large (250.000+)	678.738	84			4	1.889.500			11%
	<b>Total</b>	<b>151.572</b>	<b>540</b>	<b>172</b>	<b>7,0%</b>	<b>12</b>	<b>710.939</b>	<b>16%</b>	<b>23%</b>	<b>10%</b>
Portugal	small (below 100.000)	37.112	199			0				0%
	medium (100.000 to 250.000)	141.836	18			0				0%
	large (250.000+)	416.946	5			2	466.955			6%
	<b>Total</b>	<b>54.158</b>	<b>222</b>	<b>32</b>	<b>9,4%</b>	<b>2</b>	<b>466.955</b>	<b>3%</b>	<b>3%</b>	<b>2%</b>
Italy	small (below 100.000)	38.578	382			1	90.000			3%
	medium (100.000 to 250.000)	158.620	54			2	209.992			4%
	large (250.000+)	681.763	92			6	922.002			17%
	<b>Total</b>	<b>162.925</b>	<b>528</b>	<b>177</b>	<b>6,2%</b>	<b>9</b>	<b>671.333</b>	<b>15%</b>	<b>17%</b>	<b>8%</b>
<b>Total</b>	small (below 100.000)	<b>39.495</b>	<b>3.042</b>			<b>30</b>	<b>43.599</b>			
	medium (100.000 to 250.000)	<b>150.856</b>	<b>755</b>			<b>53</b>	<b>152.389</b>			

<sup>50</sup> Figures of the ELGO database on the number of medium-sized and large authorities are grossly misleading, because they include regional authorities, which were excluded for the CAPE survey.



**ANNEX IV: QUESTIONNAIRE ON ENVIRONMENT TELEMATICS  
IN THE EU**

**SURVEY ON THE USE OF ENVIRONMENT TELEMATICS IN EUROPEAN CITIES AND REGIONS:  
1000 decision makers state their priorities!**

Please respond by \_\_\_\_\_ and return the completed questionnaire to the following address:  
or fax to:

**Background information on your area and organisation.**

**1. Please give the following basic information for your city (or region)!**

Name of authority:<sup>51</sup> ..... Country: .....

Institutional function of your organisation?  Check the most appropriate box, please!

- an independent city (not subject to a larger regional authority)
- a regional authority (containing several dependent municipalities)
- a municipality (administratively subject to a larger regional authority)
- Other function ..... (✎ Please specify).

Population of city (or region):<sup>52</sup> ..... (✎ Please specify).

**2. Please provide some information on your organisation! ✎ Estimate the following figures, please:**

Number of employees (white collar only) ..... (✎ Please specify).

What is your organisation's total projected expenditure this year? ca. .... currency: .....

**3. Is your authority actively involved in any of the following European networks?  Check all appropriate boxes, please!**

- Car Free Cities                       Eurocities                       POLIS                       Telecities
- Other networks ..... (✎ Please specify).

**4. What is your role or primary responsibility in your organisation?  Check only the most appropriate box, please!**

- I am a **manager** or expert in the department which is responsible for ...
  - Environmental issues                       Public health
  - Technical services/ information technology                       European affairs
  - Economic development/ urban regeneration                       Town planning/ building/ architecture
  - Other department ..... (✎ Please specify).
- I am a member of **staff** directly responsible to the mayor, chief executive etc.
- I am an **elected** representative (e.g. mayor, councillor, chief executive)
- I have **another** role ..... (✎ Please specify).

**Some facts on the state of the environment.**

**5. What is the level of installations for filtering dust and gaseous emissions among main polluters in your authority (e.g. in industry and central heat generating stations)?  Check one box, please!**

- filtering is exceptional
- between one third and two thirds of all plants
- almost all plants have it

**6. Were there any critical air quality levels in your city (or region) during the last 12 months (i.e. the responsible authority was legally obliged to inform the public)?  Check one box, please!**

- No
- Yes, on ..... days. (✎ Estimate a figure, please!)

**7. What is the percentage of households connected to a sewage treatment system in your city (or region)?**

ca. .... % (✎ Estimate a figure, please!)

<sup>51</sup> If you prefer you can answer anonymously.

<sup>52</sup> Please note: Urban authorities please answer for your own authority's urban geographic area. Regional authorities please answer for your authority's entire area of responsibility.

**8. Were there any incidents of insufficient drinking water quality in your city (or region) during the last 12 months (i.e. the responsible authority was legally obliged to take immediate action)?**  Check one box, please!

- No
- Yes, on ..... occasions. (✎ Estimate a figure, please!)

**9. What was the annual increase/ decrease in domestic waste in your city (or region) in 1996/97?**

increase ca. + ..... % **OR:** decrease ca. - .....% (✎ Estimate a figure, please!)

**10. What proportion of domestic waste in your city (or region) is ...?** (✎ Estimate approximate figures, please!)

- land filled: ca. ....%
- incinerated: ca. ....%
- recycled/ composted: ca. ....%

**Key problems and policy areas**

**11. What do you feel are currently the three largest problems related to the environment in your own city or region (in order of priority)?** ✎ Please give a few keywords!

Our most pressing problem is: .....

Our 2nd most pressing problem is: .....

Our 3rd most pressing problem is: .....

**12. This is a list of some common environmental problems. How is your authority dealing with these?**

Check all applicable boxes for each area, please!

	This is <b>not</b> an <b>important problem</b> for us at the moment.	This is an <b>important</b> problem, which ... ... we can <b>solve</b> in the <b>next 3 years</b> .	... will take <b>many</b> <b>years</b> to be solved.	This will be a <b>priority area</b> in future policies.
low <b>air quality</b> due to pollution from:				
<b>traffic</b> emissions -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----
<b>heat generating</b> stations -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----
<b>domestic heating</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----
<b>industrial</b> production -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----
<b>noise pollution</b> from:				
<b>road traffic</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----
<b>other sources</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----
lack of high quality <b>drinking water</b> due to:				
<b>surface water</b> pollution -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----
<b>ground water</b> contamination -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----
lack of drinking water <b>purification</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----
dealing with <b>sludge</b> from waste water plants -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----
disposal of <b>hazardous waste</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----
rising amount of <b>domestic waste</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----
<b>illegal waste dumping</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----
waste from <b>heavy industry</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----
treatment of <b>hospital waste</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----
<b>contaminated soil</b> (e.g. from industrial sites) -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----
destruction of <b>natural habitats</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----
<b>industrial accidents/ emergencies</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----
<b>natural disasters</b> (e.g. floods) -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----
<b>other</b> (✎) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----
<b>other</b> (✎) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	---- <input type="checkbox"/> ----

**13. Is there an environmental action plan in force which addresses the major environmental problems of your city (or region)?**  Check one box only, please!

- Yes
- No, but there are sectoral plans for certain areas (e.g. air quality improvement)
- No, there are no formal policy plans in force.

**Impact and relevance of technology**

**14. What do you personally believe the impact of information and communication technologies might be in the next 2 - 3 years?**

Check one box for each area, please!

The impact will be ...	low (i.e. no or very little actual change)	moderate (i.e. some benefits are expected)	significant (i.e. major improvements will be achieved)
... in these areas ...			
reducing <b>air pollution</b> and <b>green house gases</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
reducing <b>noise pollution</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
reducing negative <b>effects of transport</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
safeguarding sufficient supply of <b>drinking water</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
improving <b>waste management</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
preventing <b>soil pollution</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
using <b>natural resources/ energy</b> more rationally -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
preventing or better managing <b>emergencies</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
protecting <b>bio-diversity</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
reducing <b>industrial pollution</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
enforcing <b>environmental legislation</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
improving internal <b>education and training</b> opportunities -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
better/ more effective <b>decision making</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
increasing public participation in <b>decision making</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
enhancing <b>public awareness</b> of environmental issues -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**15. In which areas do you think, technical improvements would most provide a benefit for the quality of the environment in your city (or region)?**  Please check the 3 items of greatest relevance!

- coordinated urban **traffic management**
- road **pricing/ access restrictions**
- improved **information to car drivers**
- better **information on collective/ non-motorised transport**
- increased **teleworking** (i.e. working from home through a computer network)
- extension of **electronic services** (to avoid travelling)
- cleaner production in **industry**
- other ..... ( Please specify).

**Internal use of telematics systems.**

**16. Which data for your city (or region) do you have direct access to?**  Check one box per area and check whether this is a priority in the future, please!<sup>53</sup>

	data sufficiently available	data incomplete	data not available	This will be a priority area in future policies.
main pollutants of: <b>air</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>drinking water</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>surface water</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>hazardous waste deposits</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>large industrial polluters</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>non-point sources of pollution</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>traffic noise data: road traffic</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>air traffic/ rail traffic</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>meteorological conditions</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>traffic flows</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>natural resources/ habitats</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>land use/ land cover</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>energy consumption</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>environmental legislation</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other data (  ) -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other data (  ) -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<sup>53</sup> Please include also data made available by other organisations for your own area!

**17. What technologies do you have available for handling and analysing data?**  Check one box per area and check whether this is a priority in the future, please!

	technology sufficiently available	technology support incomplete	Technology not available	This will be a priority area in future policies.
integrated or linked <b>data bases</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>
integration of <b>archival records</b> of past states -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>
data <b>exchange network</b> with other institutions-----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>
<b>visualisation</b> of data in maps/graphics-----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>
<b>metadata</b> / data catalogues to assist users -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>
integrated <b>3D/ 4D</b> (spatio-temporal) analysis-----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>
other (✍) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>

**18. Which applications are supported by information and communication technologies in your authority?**  Check one box per area and check whether this is a priority in the future, please!

	fully technology supported	partly supported/ on a trial basis only	not available	This will be a priority area in future policies.
modelling of <b>ambient air quality</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>
<b>air quality forecasts</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>
integration of <b>air quality and traffic management</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>
monitoring of quantity and quality of <b>ground water</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>
management of <b>contaminated site</b> remediation-----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>
comprehensive <b>waste management</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>
<b>decision support system</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>
tracking and tracing of <b>dangerous goods transports</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>
<b>risk and emergency management</b> (e.g. natural disasters) -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>
other (✍) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>

**19. Is your authority using any of the following technologies in the area of the environment?**  Check one box for each item and check whether this is a priority in the future, please!

	Yes, fully used.	Yes, but on a trial basis only.	No.	This will be a priority area in future policies.
Electronic mail system/ Internet -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>
Geographic Information Systems -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>
expert systems/ artificial intelligence -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>
satellite image processing/ remote sensing -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>
high speed multimedia networks (e.g. ATM) -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	----- <input type="checkbox"/>

**20. How would you rate your personal level of expertise in applying modern technology in the area of the environment?**  Check one box only, please!

- I am aware of all concepts of practical relevance.
- I have a good understanding of some key areas.
- I know some basic concepts.
- I have too little or no knowledge of environmental technology.

**21. In general, do you personally feel that your organisation is supporting employees in learning how to use new technologies?**  Check one box only, please!

- Systematic and frequent training.
- Occasional training/ mostly at system introduction.
- Only basic training.
- Little or no training/ mostly up to employees' own initiative.

**Delivery of public services/ and external communication.**

**22. In general, which technical systems is your authority using to provide public services?**

▪ Does your authority maintain its own Internet site?  Check the most appropriate box only for each question, please!

- Yes. Please specify address: http:\\ .....
- No. But we plan to set-up our own site over the next 1-2 years.
- No. We have currently no plans for one.

▪ Are any publicly accessible kiosks/ terminals available in your city/ region?

- Yes. When was the first one installed? ..... (✍ Add year, please).
- How many kiosks are there at the moment? Approx..... (✍ Add number, please).

- No. But we plan to set-up kiosks during the next 1-2 years.
- No. We have currently no plans for any.

**23. What information and services does your authority provide for the public? And which technical platform are you using to deliver them?  Check all relevant boxes for each item, please!**

Our citizens can get the following <u>information</u> : ... via ...	videotext or minitel	Internet	public access kiosks/ terminals	telephone/ fax	local press radio/ TV
key <b>local air pollutant</b> levels -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>air quality forecasts</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>drinking water</b> quality -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>noise</b> pollution levels -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
concrete support for environm. sound <b>lifestyle decisions</b> ---	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
general info to increase <b>environmental awareness</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
advice for businesses on <b>“green production”</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>environmental legislation documents</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other (✍) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other (✍) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Our citizens have access to the following <u>(interactive) services</u> : ... via ...	(interactive) videotext or minitel	Internet	public access kiosks/ terminals	telephone/ fax	in writing/ personally
<b>request electronic data</b> on the environment -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
order <b>municipal services</b> (e.g. collection of toxic waste) ----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
make <b>suggestions</b> to council/ register <b>complaints</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
participate in <b>planning processes</b> -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
request <b>public documents</b> (e.g. environmental reports) ----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other (✍) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other (✍) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**24. Are there specific services for any these groups?  Check all appropriate boxes, please!**

- School children/ young people
- Local industry/ businesses
- Tourists (not resident in our area)
- Other groups.....(✍ please specify)
- Allergic people
- Interest groups/ non-governmental organisations

**25. In delivering environmental information services electronically, are you concerned about any of the following?**

Check all relevant boxes, please!

- User friendliness of services.
- Complexity of environmental information.
- Handling increasing public information demands.
- Other concerns .....(✍ please specify)
- Loss of personal interaction with citizens.
- Quality of information content (e.g. up-to-date info).
- No**, we have no such concerns.

**Expected benefits and obstacles of using information and communication technologies.**

**26. What are the 5 major benefits that you expect from using information and communication technologies in the area of the environment?**

✍ Please rank the 5 crucial issues in the order of importance (1 = highest ... 5 = lowest)!

- Rank**
- ..... greater **cost efficiency**
  - ..... improved **internal communication / work flow**
  - ..... better **cooperation** with other institutions
  - ..... improved **planning/ decision making**
  - ..... higher rate of **enforcement of regulations**
  - ..... generally higher **quality** of public services
  - ..... better **access** for citizens to environmental information/ more “transparency”
  - ..... improved outside **image** of authority
  - ..... better **technical integration**
  - ..... greater/ improved **awareness** of environmental issues
  - ..... others ..... (✍ Please specify).

**27. What are the 5 major obstacles that you face in using information and communication technologies in environmental management?**

*Please rank the 5 crucial issues in the order of importance (1 = highest ... 5 = lowest)!*

**Rank**

- ..... insufficient **public funds**
- ..... **legal** problems
- ..... problems of **institutional/ interdepartmental cooperation**
- ..... difficulty in supplying up-to-date and relevant **information**
- ..... lack of **awareness** of services on the part of citizens
- ..... **technical problems**
- ..... **complexity** of new services
- ..... **opposition** from polluters/ lobby groups
- ..... lack of **political** support
- ..... others ..... ( *Please specify*).

**Financing of environment technology and services.**

**28. How much is your organisation planning to spend this year on environment-related ICT infrastructure, equipment, software, etc... (excluding internal costs and training)?**

*Please give an approximate figure! .....currency: .....*

**29. Which are the 3 main sources of funding your authority has mainly used in implementing new technologies in the past?  Check the 3 most relevant boxes, please!**

- National/ regional funds
- Own funds of the authority
- European Research Programmes
- European Cohesion/ Structural Funds
- Reinvestment of revenues/ earmarked taxes or fines
- Private sector contributions

**European Cooperation.**

**30. Has your authority participated in any environment-related European Research and Development Programmes in the last three years?**

- Yes
- No

**31. Generally, how would you summarise your authority's experiences of working on the European level?  Tick one box!**

- .....  .....  .....  .....  .....  
 fully successful          partly successful          neither/ nor          rather unsuccessful          completely unsuccessful

**Future Interests.**

**32. The CAPE project will be organising several conferences and workshops in the next 12 months. Which issues would you like to see on the agenda of these events? Please state your priorities!  Check one box per item, please!**

	key area of interest	not essential now
<b>applications</b>		
monitoring and forecasting of <b>air quality</b> .....	<input type="checkbox"/>	<input type="checkbox"/>
monitoring and control of <b>ground water</b> .....	<input type="checkbox"/>	<input type="checkbox"/>
<b>river</b> information systems .....	<input type="checkbox"/>	<input type="checkbox"/>
remediation/ management of <b>contaminated land sites</b> .....	<input type="checkbox"/>	<input type="checkbox"/>
<b>domestic waste</b> management .....	<input type="checkbox"/>	<input type="checkbox"/>
treatment of <b>hazardous waste</b> .....	<input type="checkbox"/>	<input type="checkbox"/>
local <b>emergency support</b> systems .....	<input type="checkbox"/>	<input type="checkbox"/>
<b>risk assessment</b> techniques and systems .....	<input type="checkbox"/>	<input type="checkbox"/>
" <b>green production</b> " in industry .....	<input type="checkbox"/>	<input type="checkbox"/>
environmentally friendly <b>transport management</b> .....	<input type="checkbox"/>	<input type="checkbox"/>
<b>technologies</b>		
advanced <b>data acquisition</b> technologies (e.g. satellite remote sensing) .....	<input type="checkbox"/>	<input type="checkbox"/>
advanced <b>modelling &amp; simulation</b> techniques .....	<input type="checkbox"/>	<input type="checkbox"/>
data <b>exchange</b> (e.g. transborder/ across hierarchies) .....	<input type="checkbox"/>	<input type="checkbox"/>
<b>Geographic Information System</b> integration .....	<input type="checkbox"/>	<input type="checkbox"/>
<b>multimedia</b> data integration .....	<input type="checkbox"/>	<input type="checkbox"/>
public environment <b>info systems</b> .....	<input type="checkbox"/>	<input type="checkbox"/>

- decision support systems -----  -----  -----
- metadata/ data handling issues -----  -----  -----
- general**
- environmental impact assessment/ scenario analysis -----  -----  -----
- modelling energy/ transport demand -----  -----  -----
- raising public awareness for the environment -----  -----  -----
- sustainable transport planning -----  -----  -----
- institutional issues (e.g. transborder cooperation) -----  -----  -----

**33. Would you also be interested in participating in any of the following activities?**

Please check all appropriate boxes!

- Targeted training sessions.
- Technical exhibitions.
- Staff exchange programmes.
- Technical on site visits.
- Receiving good practice guidelines/ training manuals.
- E-mail discussion forum.


**Thank you for participating in this survey!**

**34. Would you like to receive any of the following?  Please check all appropriate boxes!**

- the final report of this survey
- further information on the CAPE project

invitations to future events as ...

- speaker/ exhibitor
- participant

 **If yes, please give the contact details of the person to receive it:**

Name: .....


Organisation: .....


Postal address: .....

.....

Email: .....

**35. Would you suggest other persons to receive invitations for participation in future events?**

 Please provide their contact details below!

**Do you have any additional comments?  Please, write them below (if necessary, add a new page)!**