Chapter 4
Evaluating Public (e-)Information Provision

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Abstract This chapter analyzes the Web sites of the environment departments of European local government signatories of the Aalborg+10 Commitments. It represents an example of evaluating a first category of e-participation, that is, electronic access to information. The aim is to establish the extent to which the signatories make use of the Internet to promote e-participation and environmentally friendly behaviors among their citizens. Our results show that the developments in e-participation are higher in those areas just giving information than in areas of interactive communication. The Internet, as a tool to revitalize the public sphere, is still limited to those countries with higher levels of transparency and a culture of citizen engagement.

4.1 The Role of ICTs in Sustainable Development Policies

Collective interventions due to global issues like climate change should not exclusively rely on global approaches but can also be undertaken on smaller scales (Ostrom 2009). Household consumption patterns and behavior have a major impact on natural resource stocks, environmental quality, and climate change. Furthermore, projections indicate that these impacts are likely to increase in the near future (OECD 2011). So, although sustainable development is a global philosophy[1], it must also be related to local issues, and it needs citizens to become involved (Cuthill 2002).

[1] 1992 Earth Summit in Rio, Kyoto Protocol 1997, Copenhagen Climate Change Conference 2009, and 2012 Rio+20 Conference.

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Evolution towards a sustainable community may be achieved by empowering citizens to take responsibility and action for their own "backyards" (Cuthill 2002). In environment-related activities, citizens may not only be consulted on governmental action, but they have to make their own contribution by changing their behavior as well (for example, among others, as regards responsible consumption and lifestyle choices, waste avoidance, reduction in energy consumption, and reduction in private motorized transport). A citizen who is well-informed about environmental policies and initiatives can be part of the global effort in environmental protection (e.g., by recycling). In this context, the use of information and communication technologies (ICTs), and particularly the Internet, may have an important role in informing, educating, and empowering citizens, helping to develop a "critical consciousness" about sustainability and climate change. Thus, the use of Internet-based platforms, such as local government Web sites, can emerge as a cost-effective mitigation policy in reducing CO_2 emissions by actively involving citizens in the fight against climate change. In this chapter, the offerings of these Web sites are used as examples to evaluate one of the first categories of e-participation, that is, participation via electronic access to information.

After signing the Aarhus Convention in 2003, the European Commission launched a directive on public access to environmental information as well as a directive on public participation with respect to environmental plans and programs. However, the analysis of the implementation of citizen participation shows that, in most countries, procedures for active participation remain less developed (Royo et al. 2011; Yetano et al. 2010). The United Nations e-Government Survey devoted a special section to examining the efforts made by member states in providing environment-related online information and services and related opportunities for citizen engagement (United Nations 2012). Their findings indicate that, at the central level, the majority of countries provide online information or education to citizens regarding the environment. However, few countries provide features designed to proactively notify citizens about environmental issues, and the study concludes that citizen engagement on environmental issues is still in its infancy.

On a day-to-day basis, local government is the level of government closest to European citizens and has unique opportunities to influence individual behavior towards sustainability through the raising of education and awareness. Since the Aalborg+10 Conference in 2004, more than 700 local governments have signed the Aalborg Commitments and the number is still increasing[2]. Online citizen participation in local democracy depends, among others, on the opportunities offered by municipalities (Saglie and Vabo 2009). Therefore, analyzing the e-participation initiatives on offer becomes essential to understanding their level of diffusion and development. However, public sector literature has signaled that, on many occasions, public sector reforms or improvement initiatives are more rhetorical than real (Bouckaert and Peters 2002; Grizzle 2002; Kelly 2002). As some authors have pointed out (Hood 1995; Pollitt and Bouckaert 2000; Pollitt et al. 2007; Torres 2004), dissemination of public sector management innovations is influenced by the organizational and administrative culture, historical background, and legal structure. In

[2] See http://www.sustainablecities.eu/aalborg-process. Accessed 28 July 2015.

fact, the public administration style has been an important element in explaining the evolution of other areas of public sector reforms and the recent developments in e-government related to transparency, accountability, and e-participation (García-Sánchez et al. 2011; Pina et al. 2007, 2010).

In this chapter, we analyze the Web sites of the environment departments of the European local governments that have signed the Aalborg+10 Commitments. Among the countries in this study, we have identified five broad styles of public administration: Anglo-Saxon, Eastern-European, Nordic, Germanic, and Napoleonic (Hood 1995; Pollitt and Bouckaert 2000; Pollitt et al. 2007; Torres 2004). With regard to citizen participation developments, studies have characterized Anglo-Saxon, Nordic, and Germanic countries as showing greater developments in this area, while Napoleonic and Eastern European cities usually show a slower evolution in citizen participation (Allegretti and Herzberg 2004; Royo et al. 2011; Yetano et al. 2010). Hence, a priori, a higher level of development of e-participation can be expected in Anglo-Saxon, Nordic, and Germanic cities.

We aim to establish the extent to which European local governments are making use of the Internet in order to promote environmentally friendly behaviors among their citizens and to offer them opportunities for strengthening democracy by creating e-participation tools. Particular attention will be paid to the type of citizen participation being promoted through local government Web sites with regard to environmental issues: information, consultation, or active involvement (Martin and Boaz 2000; OECD 2001; Shand and Arnberg 1996). Specifically, this study answers the following research questions: (1) What is the level of use of e-participation by European local governments in promoting responsible behavior among citizens with respect to climate change? (2) Are European local governments using the Internet to promote higher levels of citizen participation and involvement or just to enhance transparency on environmental topics? and (3) Does the public administration style of European local governments affect the approach adopted in the use of e-participation with regard to environmental issues?

Local governments that have signed the Aalborg+10 Commitments have demonstrated a political commitment that signals the intangible preconditions on which more specific activities can and must build. Regarding the general evaluation framework for e-participation presented in Chap. 2 of this volume, our analysis focuses on components representing "activities" carried out and "outputs" obtained, such as the different offerings of information provision and communication and their usability and accessibility. In this chapter, we do not analyze the use of these Web sites by citizens or the changes in attitudes and/or behavior derived from their use, but we focus on the outputs as a precondition in order to achieve outcomes and impact.

4.2 The Aalborg+10 Commitments

The Aalborg Commitments are an initiative sponsored by the European Commission to provide support in implementing European strategies and policies for sustainable development. In the First European Conference on Sustainable Cities and

Towns, which took place in Aalborg (Denmark) in 1994, the *Charter of European Cities and Towns Towards Sustainability* (the "Aalborg Charter") was adopted as a framework for the delivery of local sustainable development. A group of ten networks of cities and towns that were active in sustainable development (such as Eurocities and ICLEI) have also joined this initiative.

The Aalborg Commitments were adopted in 2004, as a follow-up to the Aalborg Charter. The Commitments envisage "cities and towns that are inclusive, prosperous, creative and sustainable, and that provide a good quality of life for all citizens and enable their participation in all aspects of urban life." Signatories voluntarily agree to: (1) produce a review of their city within 12 months; (2) set individual environmental targets, in consultation with stakeholders, within 24 months; (3) monitor progress in delivering the targets and regularly report to their citizens.

There are ten Aalborg Commitments (see http://www.sustainablecities.eu), and they incorporate sustainability in a very broad sense. They have a strong focus on environmental protection and highlight the importance of citizen participation, although they do not specify the mechanisms or tools that should be adopted and leave much leeway to municipal governments in deciding how to put the commitments into practice. The first commitment (governance) deals with participatory democracy and other commitments deal with environmental protection, including the second (local management towards sustainability), the fourth (responsible consumption and lifestyle choices), and the sixth (better mobility, less traffic). As shown by Portney (2013), sustainability is a multidimensional concept and not all cities have the same environmental problems but, in any case, signatories are expected to promote both citizen participation and environmental protection.

Most of the items selected for analysis in this chapter have been drawn up from the lists of the Aalborg Commitments and the European Commission framework *Cohesion Policy and Cities* (European Commission 2006). Other relevant items usually included in the analyses of the content of local governments' Web sites have also been taken into account, as shown in the next section.

4.3 Methodology

Comparability of the cases has been maximized by selecting cities which have signed the Aalborg Commitments and that meet certain requirements in terms of population and country of origin. By January 2011, a total of 644 local governments had signed the Aalborg Commitments. These local governments included cities, regions, provinces, and other types of local government. They belonged to 35 different countries (some of them non-European, such as Egypt, Israel, Morocco, Senegal, and Tunisia). The sample of our study was defined as European cities of over 50,000 inhabitants, but we had to limit the number of cities studied in Italy and

Spain[3]. In this way, our final sample is made up of 67 European cities. The countries covered and number of cities per country are as follows: Austria (1), Belgium (1), Bulgaria (2), Denmark (3), Estonia (3), Finland (5), France (4), Germany (5), Greece (4), Iceland (1), Italy (8), Latvia (1), Lithuania (2), Norway (3), Portugal (3), Spain (7), Sweden (8), Switzerland (2), and the UK (4). Larger local governments were selected for this study as they are usually the most innovative in the adoption of new technologies and, at the same time, they have more need of them because the distance between the governors and the governed is greater (Bonsón et al. 2012; Norris and Moon 2005).

We carried out a comprehensive Web content analysis of the cities selected, combined with a study of the documentation provided on their Web sites. The Web sites were accessed during February–April 2011 and 134 items were analyzed (see Tables 4.1, 4.2 and 4.3). Most items included on the Web sites are rated "1" if they appeared on the Web site and "0" if not. Some items scored 0.5 if they partially fulfilled the coding criteria[4]. This method had been previously applied by Pina et al. (2007, 2010) and Torres et al. (2006) in analyzing local government Web sites.

We assessed the level of development of e-participation regarding environmental issues by grouping the 134 items into four different dimensions: transparency, interactivity, usability, and Web site maturity. Most of the items analyzed belong to the transparency and interactivity dimensions, the two key dimensions of the study. As indicated previously, citizen participation is usually classified into three categories (information, consultation, and active participation/cooperation). The transparency dimension is related to the first category (information) which, in our opinion, is a basic precondition to citizen participation but needs to be distinguished from the two other categories. As it is difficult in practice to draw a clear distinction between consultation and active participation (OECD 2001), our interactivity dimension includes items related to these two categories of citizen participation. The other two complementary dimensions analyze the usability of Web sites and aspects related to Web site sophistication.

Transparency (71 Items) on Web sites refers to the extent to which an organization makes available information about internal working, decision processes, and procedures (Pina et al. 2007). Transparency is the literal value of accountability: accountable bureaucrats and/or organizations must explain or account for their

[3] In Italy and Spain, the inclusion of all the signatory cities with more than 50,000 inhabitants would have distorted the composition of the sample. According to García-Sánchez and Prado-Lorenzo (2008), the number of municipalities that have signed the Commitments in Italy and Spain is so much higher than in other countries that it cannot be assumed to be realistic. Public management literature (Hood 1995; Pollitt et al. 2007; Torres 2004) often distinguishes southern European countries for adopting symbolic policies. So, in these two countries, only the five most populated cities have been included, together with some other cities with a good reputation regarding sustainability and environmental policies (see http://www.sustainablecities.eu). Accessed 28 July 2015.

[4] All the coding was undertaken by one person with previous experience in Web site analysis. Therefore, inter-coder reliability is not a problem in this research. A full crosscheck of the coding criteria was carried out by the three authors with the first five cases to ensure the quality of the process.

Table 4.1 Transparency dimension: average of cities' scores (%)

1. Transparency-accountability	*71.2*
1.1. General information about the department	*67.3*
Address and telephone number of the department	91.0
Department organization chart	53.0
Number of employees	37.3
Budget	86.6
Annual report about sustainability/the environment	58.2
Mission statement/vision for the department	77.6
1.2. Citizen consequences	*82.8*
Information about environmental procedures (permits, …)	89.6
Provides instructions on how to complete these actions	89.6
Provides a searchable index for downloadable forms or forms to submit online	88.1
Provides instructions for appealing against decision-making processes or gives the address of an ombudsman inside the department or local government	64.2
1.3. General information about environmental issues	*74.5*
Strategic plan for a sustainable city/about environment-related topics	97.0
Information about causes and probable impacts of climate change	94.0
Index for reports, publications, regulations, …	80.6
Drafts of new regulations regarding sustainability/the environment	37.3
All environmental publications are available in electronic format for free	91.0
Participation in national or European environmental networks/projects	97.0
Agenda 21 project and information	83.6
Agenda 21 schools' program and information	79.1
Information about activities/initiatives/programs linked to Agenda 21	83.6
Policies for sustainable local public service delivery (clean energy, …)	92.5
Local government's sustainable procurement policy	92.5
FAQ (frequently asked questions) about environmental topics	31.3
Glossary for technical or difficult terms related to environmental topics	3.0
What's new or news section about environmental matters	80.6
1.4. Information about specific policies and initiatives	*74.3*
1.4.1. CO_2/energy	*69.0*
General information about CO_2/energy consumption	71.6
CO_2/energy consumption reduction policies	70.1
CO_2/energy consumption reduction projects (requiring the involvement of citizens/businesses/public sector entities)	65.7
Information/advice about how to reduce emissions	70.1
Links to local government agencies or to other organizations	67.2
1.4.2. Water	*54.9*
General information about water consumption	52.2
Water consumption reduction policies	52.2
Water consumption reduction projects (requiring the involvement of citizens/businesses/public sector entities)	50.7
Information/advice about how to reduce water consumption	52.2
Links to local government agencies or to other organizations	67.2
1.4.3. Waste management/recycling	*88.8*
General information about waste management/recycling	91.0

Table 4.1 (continued)

Recycling or waste management policies	91.0
Recycling or waste management projects (requiring the involvement of citizens/businesses/public sector entities)	91.0
Information/advice about how to recycle	91.0
Location of "household waste recycling centers"	83.6
Links to local government agencies or to other organizations	85.1
1.4.4. Air quality	*72.8*
General information about air quality	80.6
Air quality policies	77.6
Air quality projects (requiring the involvement of citizens/businesses/public sector entities)	71.6
Information/advice about how to improve air quality	58.2
Links to local government agencies or to other organizations	76.1
1.4.5. Transport and mobility	*80.1*
General information about transport and mobility	89.6
Transport policies (existence of a mobility plan)	89.6
Transport projects (requiring the involvement of citizens/businesses/public sector entities)	86.6
Information/advice about how to improve transport behavior	89.6
Information (or link to information) about the public transport network (bus, trams, trains, ...)	92.5
Information about cycle ways	83.6
Public bicycle stations	79.1
Information about other measures to avoid cars in the city center (P&R spaces, etc.)	65.7
Public transport with low emissions (bus, tram, …)	88.1
Information about advantages/benefits/subsides for cars with low emissions	31.3
Links to local government agencies or to other organizations	85.1
1.4.6. Parks and green spaces	*78.5*
General information about parks and green spaces	80.6
Green space policies	77.6
Green space projects (requiring the involvement of citizens/businesses/public sector entities)	77.6
Location of parks and green spaces	80.6
Links to local government agencies or to other organizations	76.1
1.4.7. Noise pollution	*64.6*
General information about noise pollution	67.2
Noise pollution policies	64.2
Noise pollution reduction projects (requiring the involvement of citizens/businesses/public sector entities)	64.2
Information/advice about how to reduce noise pollution	62.7
1.5. Indicators and data about sustainability	*32.3*
Sustainability indicators defined	38.8
Objectives and time frame established	31.3
Sustainability indicators reported (data for only one recent year, several years…)	26.9

Table 4.1 (continued)

1.6. Information about citizen participation processes in environmental issues	*43.8*
Information about current participatory processes (online/offline) regarding environmental/sustainability policies	55.2
Information about the level of participation and results of past participatory processes (online/offline)	47.8
Information about future (expected) participatory processes	28.4

Table 4.2 Interactivity dimension: average of cities' scores (%)

2. Interactivity-citizen dialogue	*39.2*
2.1. Obtaining information from the department	*68.1*
Department's general e-mail	79.1
Sub-units' e-mails	55.2
Individual employees' e-mails	55.2
Searchable database for reports, publications, etc.	80.6
Online request for information or publications	70.1
2.2. Development of e-services	*67.2*
Forms for downloading	92.5
Provides online form completion and submission	95.5
Online payment of utility bills, taxes, fines or other government obligations	85.1
Possibility of making an appointment with officials or staff	6.0
Provides link to appeals process for decisions and/or an ombudsman	56.7
2.3. Services to provide periodic information	*29.9*
E-mail alerts about new reports/news about environmental topics	19.4
RSS feeds (about new reports/news) about environmental topics	51.5
SMS alerts about issues of interest	11.2
Possibility of redistributing the contents of the Web site through blogs or social networks	47.0
Periodic electronic journal about sustainability	30.6
Information about air quality regularly updated on the web	73.1
Information about water quality regularly updated on the web	3.0
Information about noise pollution regularly updated on the web	3.0
2.4. Projects with online participation (or possibility of signing up to a project online)	*9.3*
CO_2/energy	7.5
Water	6.0
Waste management/recycling	6.0
Air quality	4.5
Transport and mobility	10.4
Parks and green spaces	10.4
Agenda 21	10.4
e-Participation processes in the last year	19.4
2.5. Initiatives to promote responsible behavior	*45.0*
Location of "household waste recycling centers" on an interactive map	48.5
Simulators (for example, of household electricity consumption)	32.8
Journey planner (public transport)	53.7

Table 4.2 (continued)

2.6. Initiatives to allow citizens to express their opinion regarding sustainability	*43.5*
Complaints/suggestion boxes (Web site)	98.5
Chat/instant messaging	9.0
Asking for feedback/opinions about specific topics (by e-mail; forms)	53.7
e-Consultation (short opinion surveys yes/no; specify preferences)	56.7
e-Consultation (Web survey more than one or two questions or just specify preferences)	53.7
Blogs	13.4
Web forum	26.9
Facebook page/group for environmental topics (or other type of social network)	32.8
Activity on Facebook official page (1 last week; 0.5 last month; 0 otherwise)	47.0
2.7. Initiatives to participate in sustainability plans	*25.4*
e-Rulemaking	25.4
e-Petition system (or e-petitions accepted)	25.4

Table 4.3 Usability and Web site maturity dimensions: average of cities' scores (%)

3. Usability	*61.2*
Provides other-language access to the Web site	46.3
Site map	82.1
A to Z index (alphabetical order index)	41.8
Search engine	97.0
Help section	46.3
Homogeneity of the different subpages	95.5
Provides a text-only or accessible version of the Web site	59.7
Provides audio access to the Web site for the visually impaired	20.9
The Web site contains some conformance icon that guarantees compliance with some accessibility standards	61.2
4. Web site maturity	*54.4*
No broken links	77.6
Provides the date of publication ("last updated") on the main page of the department (or in a key subordinate page), and it has been updated within the last month	83.6
Content arranged according to different topics (versus content arranged according to the hierarchical structure of the department)	94.0
Credit card payments	85.1
Secure servers (https://...)	91.0
Private areas with passwords are used in order to access personal information	91.0
Site entails the use of digital signature for transactions	88.1
Live broadcast of important speeches or events	19.4
Privacy policy	56.7
Security policy	41.8
Interactive database of indicators	4.5
Indicators downloadable in Excel format	4.5
Audio/video files for environment-related activities	19.4
Possibility to comment on those audio/video files	4.5

actions. The items checked in this dimension are grouped into six broad categories, which deal with: general information about the environment department; explanations and instructions regarding the requirements imposed on citizens resulting from the department's activities (citizen consequences); general information about environmental issues; information about specific policies and initiatives; indicators and data about sustainability; and information about citizen participation processes in environmental issues.

Interactivity (40 items) is a measure of the degree of immediate feedback and of the development of possibilities to interact with the environment department, either through online services or through citizen dialogue and e-participation initiatives. The items analyzed are classified into seven categories related to: possibilities of obtaining information from the department; development of e-services; services to be updated with periodic information; projects with online participation (or the possibility of signing up to a project online); initiatives to promote environmentally friendly behaviors; initiatives to allow citizens to express their opinions regarding sustainability processes; and initiatives to participate in sustainable planning.

Usability (9 items) refers to the ease with which users can access information and navigate the Web portal (Gant and Gant 2002). We have included this dimension since Web portals deliver value to users according to the accessibility and usability of the specific contents. The features included in this section refer to general characteristics of the local entity Web site and online facilities for people with some kind of disability. Lastly, *Web site maturity* (14 items) embraces those aspects that indicate a high degree of Web site sophistication, such as, among others, no broken links, regular updating of the Web site, credit card payments, and secure servers.

The partial scores in transparency, interactivity, usability, and Web site maturity were obtained by totaling the individual scores for each item in each dimension and dividing the total by the maximum possible score in each dimension. The total scores of the Web sites by city were obtained by adding the scores of "transparency," "interactivity," "usability," and "Web site maturity" with weights of 40 % for the first two dimensions and 10 % for the last two. The first two dimensions are the most important in this research because they measure the development of e-participation on environmental topics. The last two are complimentary dimensions that represent the capacity of the local government Web site to support e-participation developments. Thus, analysis of the development of e-participation requires the study of these four dimensions, but with an emphasis on transparency and interactivity dimensions. This weighting method was previously used by Pina et al. (2009; 2007). According to O'Sullivan et al. (2007), index definitions should be consistent with past research unless a rationale exists for doing otherwise. Given these scores per city, to assess the homogeneity of e-participation options within each country, we calculated a total score per country, including also the standard deviation.

To analyze the data obtained through the Web site content analysis, we first carried out a descriptive analysis to provide a general perspective of the use that European local governments make of the Internet to educate citizens about responsible consumption patterns and behavior, and to foster citizen participation in environment-related activities and policies. In order to test the hypothesized influence of

the public administration style (as a proxy of the culture of transparency of each local government) on climate e-participation developments, the Mann–Whitney test was used.

4.4 Analysis of Results

4.4.1 Descriptive Statistics

In the transparency dimension (see Table 4.1), the category related to service delivery ("citizen consequences", that includes explanations of and instructions regarding the requirements imposed on citizens resulting from the department's activities) is the most highly developed. High scores were also obtained with regard to general information about environmental issues and information about specific policies and initiatives (waste management/recycling, air quality and transport and mobility). Conversely, the items included in "indicators and data about sustainability" and "information about citizen participation processes in environmental issues," which would allow citizens to have access to updated data about the state of the environment and past and future participatory processes on this matter, presented levels of implementation below 45%. So, the disclosure levels are lower when greater effort is required to elaborate on the information or when it is related to participatory processes.

As regards the interactivity dimension (see Table 4.2), we clearly see that there is an important drop in the global mean (39.2 versus 71.2% for transparency). The categories related to the possibility of obtaining information from the environment department and the development of e-services are the most developed, with average scores of 68.1 and 67.2%, respectively. Only three items have been implemented by more than 90% of the cities analyzed: forms for downloading, online completion and submission of forms, and complaints/suggestion boxes. The least-developed group of items are those related to the possibility of receiving periodic information about environmental topics (29.9%), the existence of projects with online participation or the possibility of signing up to a project online (9.3%), and initiatives to participate in sustainability plans (25.4%). Intermediate scores, around 45%, are obtained in the categories "initiatives to promote responsible behavior" and "initiatives to have a say in sustainable processes." We again see important variations in the categories, with a sharp decrease in those that imply opening the debate to citizens (e-rulemaking and e-petitions) and the existence of projects with online participation.

Similar results can be found in the usability and Web site maturity dimensions (see Table 4.3). Usability shows a high degree of development in technical items, such as the search engine, the homogeneity of subpages, and site map, but low percentages of development in those items which enhance the accessibility of Web sites and bring about social inclusion, such as text-only or accessible versions, audio access for the visually impaired, different languages, or compliance with inter-

national accessibility standards. Likewise, in the "Web site maturity" dimension, the technical items (no broken links, published date) and those related to service delivery (credit card payments, secure servers for transactions, private areas, digital signature) are the most developed, whereas the items related to innovation and citizen participation, such as live broadcast of important speeches or events, interactive database of indicators, indicators downloadable in Excel format, audio/video files for environment-related activities and the possibility of commenting on them, show the lowest scores.

The average total score of the sample is 55.7% (see Table 4.4), and since 134 e-participation items were analyzed, this result shows a moderate degree of development of e-participation among the biggest European cities that signed the Aalborg Commitments. The transparency of local governments on internal working and decision processes dealing with procedures to achieve environmental commitments is the dimension that scores the highest average value (71.2%). On the contrary, the possibility of citizens interacting online with the corresponding local government department is the dimension with the lowest score, only 39.2%. The other two dimensions, usability of the Web portal and sophistication of the Web site, have values quite close to the average e-participation score.

Table 4.4 Scores of e-participation dimensions by country

Country	Trans.	Inter.	Usab.	Mat.	Total	Max.	Min.	SD
Germany	93.0	52.5	83.3	58.6	72.4	76.2	71.2	2.2
UK	90.5	50.6	80.6	55.4	70.0	75.3	65.8	5.1
Sweden	82.2	51.1	80.6	55.4	66.9	74.2	60.3	5.4
Denmark	85.0	47.1	75.9	54.8	65.9	71.1	62.7	4.7
Belgium	80.3	41.3	94.4	50.0	63.1			
Norway	78.4	40.8	83.3	57.1	61.7	66.2	59.4	3.9
Austria	73.2	40.0	94.4	64.3	61.2			
Latvia	76.1	42.5	38.9	57.1	57.0			
Switzerland	86.6	33.1	50.0	39.3	56.8	58.3	55.4	2.0
Spain	76.5	34.1	57.9	58.2	55.8	70.2	29.4	11.0
France	73.4	34.1	65.3	60.7	55.6	66.5	47.8	8.3
Italy	70.4	35.9	41.7	56.3	52.3	72.4	14.7	17.6
Finland	70.7	29.5	54.4	41.4	49.7	59.4	40.6	7.6
Portugal	59.6	28.3	48.1	57.1	45.7	68.1	30.4	19.5
Iceland	71.8	31.3	50.0	50.0	51.2			
Estonia	45.1	36.7	35.2	54.8	51.2	53.8	23.0	16.4
Lithuania	54.9	35.0	50.0	42.9	45.3	53.1	37.4	11.0
Bulgaria	33.1	28.8	38.9	53.6	34.0	34.6	33.4	0.9
Greece	21.1	33.4	40.3	53.6	29.5	39.8	12.2	12.7
Mean	*71.2*	*39.2*	*61.2*	*54.4*	*55.7*	*76.2*	*12.2*	*14.6*
SD	*22.3*	*12.3*	*21.8*	*12.3*	*14.7*			

Abbreviations: *Trans*. Transparency, *Inter.* Interactivity, *Usab*. Usability, *Mat*. Maturity, *Max*. Maximum, *Min*. Minimum, *SD* Standard Deviation

Table 4.4 summarizes the scores of the local government Web sites by country[5]. We have classified the countries into three groups, based on whether the cities in each country are above or below the average score:

a. All cities above the average: central and northern European countries (Germany, the UK, Sweden, Denmark, Belgium, Norway, Austria, and Latvia).
b. Some cities above and some cities below the average: southern European countries (Spain, France, Italy, and Portugal), Switzerland and one more country that could be considered an outlier among Nordic countries (Finland).
c. All cities below the average: the countries on the periphery of the European Union (Iceland, Estonia, Lithuania, Bulgaria, and Greece).

The high scores obtained by countries within the first group are worth highlighting, all of them ranking above the average in all dimensions, in particular, Germany, the UK, Sweden, and Denmark. On the contrary, in the third group, the cities show very poor figures with scores below the average in all researched dimensions. Finally, the countries of the second group combine cities that are within the first positions in the ranking, with other cities that are at the bottom of the ranking (see Table 4.5). In general, the cities in the first group present the lowest levels of dispersion in the level of development of e-participation on environmental topics, so the cities in these countries show homogenous patterns within each country, whereas countries in groups 2 and 3 present a high degree of dispersion in the total scores. Portugal and Italy are the countries with the highest levels of dispersion (for instance, as can be seen in Table 4.5, two Italian cities occupy the fourth and the penultimate positions in the ranking). It should be remembered that, in some countries, e-participation on environmental topics has homogenous development at the local level, whereas there are other countries with quite heterogeneous development. This finding is consistent with the development in other public sector reforms, thus the explanation of environmental e-participation seems to have a country component.

If we consider e-participation concerning environmental issues in the cities of the sample, taking as the reference point the average score of 55.7%, we see, in Table 4.5, that 39 cities (60% of the sample) reach a figure higher than the average score. Most local governments obtain transparency scores of over 75% (44 local governments). On the contrary, the maximum score obtained in interactivity is 65% and only 12 local governments obtain scores over 50% in this dimension. These results show a good disposition among local governments in making use of the Internet to provide information and promote the responsible behavior of citizens towards climate change. However, the opportunities for active e-participation are still limited because local government Web sites have not yet fully exploited interactive tools and citizen dialogue applications.

[5] These results have to be taken with caution, as the number of cities analyzed per country differs and in some cases (Belgium, Austria, and Latvia) only one city has been analyzed. However, this grouping has exploratory value for an initial interpretation of the results.

Table 4.5 Ranking of cities and scores for e-participation dimensions (%)

City	Country	Trans.	Inter.	Usab.	Mat.	Total	City	Country	Trans.	Inter.	Usab.	Mat.	Total
Hamburg	GER	94.4	63.8	72.2	57.1	76.2	Bologna	ITA	83.1	33.8	55.6	64.3	58.7
Leicester	UK	94.4	57.5	88.9	57.1	75.3	Nantes	FRA	78.9	37.5	55.6	64.3	58.5
Malmö	SWE	85.9	61.3	88.9	64.3	74.2	St. Gallen	SWI	87.3	33.8	55.6	42.9	58.3
Ferrara	ITA	90.1	60.0	66.7	57.1	72.4	Madrid	SPA	78.9	30.0	66.7	71.4	57.4
Stockholm	SWE	85.9	45.0	100.0	100.0	72.4	Riga	LAT	76.1	42.5	38.9	57.1	57.0
Heidelberg	GER	91.5	48.8	94.4	64.3	72.0	Geneva	SWI	85.9	32.5	44.4	35.7	55.4
Göteborg	SWE	87.3	55.0	88.9	57.1	71.5	Malaga	SPA	80.3	33.8	33.3	57.1	54.7
Aberdeen	UK	93.0	53.8	77.8	50.0	71.5	Lahti	FIN	76.1	33.8	44.4	50.0	53.4
Kaiserslautern	GER	91.5	50.0	83.3	64.3	71.4	Tartu	EST	59.2	50.0	38.9	57.1	53.3
Barcelona	SPA	93.0	47.5	72.2	78.6	71.3	Genova	ITA	76.1	38.8	22.2	50.0	53.1
Neu-Ulm	GER	91.5	51.3	83.3	57.1	71.2	Kaunas	LIT	63.4	42.5	50.0	57.1	53.1
Freiburg	GER	95.8	48.8	83.3	50.0	71.1	Hammeenlinna	FIN	77.5	26.3	50.0	50.0	51.5
Aalborg	DEN	91.5	50.0	94.4	50.0	71.1	Reykjavik	ICE	71.8	31.3	50.0	50.0	51.2
Almada	POR	88.7	46.3	72.2	64.3	67.6	Orleans	FRA	67.6	25.0	72.2	57.1	50.0
Norrköping	SWE	76.1	65.0	83.3	28.6	67.6	Tallinn	EST	53.5	40.0	50.0	64.3	48.8
Glasgow	UK	91.5	46.3	66.7	57.1	67.5	St. Etienne	FRA	60.6	31.3	61.1	50.0	47.8
Kristiansand	NOR	77.5	51.3	83.3	64.3	66.2	Pamplona	SPA	69.0	25.0	50.0	50.0	47.6
Paris	FRA	86.6	42.5	72.2	71.4	66.0	Napoli	ITA	57.7	28.8	50.0	71.4	46.7
Edinburgh	UK	83.1	45.0	88.9	57.1	65.8	Palermo	ITA	71.8	26.3	27.8	42.9	46.3
Vasteras	SWE	87.3	41.3	77.8	64.3	65.6	Kotka	FIN	66.2	21.3	50.0	35.7	43.6
Odense	DEN	87.3	42.5	72.2	57.1	64.9	Tampere	FIN	52.1	23.8	66.7	35.7	40.6
Reggio Emilia	ITA	90.1	46.3	44.4	57.1	64.7	Halandri	GRE	26.8	40.0	66.7	64.3	39.8
Brussels	BEL	80.3	41.3	94.4	50.0	63.1	Coimbra	POR	50.7	26.3	33.3	50.0	39.1
Saragossa	SPA	84.5	38.8	72.2	64.3	63.0	Alytus	LIT	46.5	27.5	50.0	28.6	37.4
Jönköping	SWE	76.1	60.0	50.0	28.6	62.3	Cornellá	SPA	45.1	25.0	55.6	35.7	37.2
Rome	ITA	83.1	46.3	44.4	57.1	61.9	Patras	GRE	26.8	33.8	61.1	64.3	36.7
Kolding	DEN	76.1	48.8	61.1	57.1	61.7	Trikala	GRE	29.6	42.5	22.2	50.0	36.1
Umea	SWE	81.7	40.0	77.8	50.0	61.5	Bourgas	BUL	29.6	33.8	50.0	42.9	34.6
Vienna	AUT	73.2	40.0	94.4	64.3	61.2	Sofia	BUL	36.6	23.8	27.8	64.3	33.4
Vaxjo	SWE	77.5	41.3	77.8	50.0	60.3	Ponta Delgada	POR	39.4	12.5	38.9	57.1	30.4
Seville	SPA	84.5	38.8	55.6	50.0	59.9	Narva	EST	22.5	20.0	16.7	42.9	23.0
Stavanger	NOR	78.9	35.0	83.3	57.1	59.6	Ancona	ITA	11.3	7.5	22.2	50.0	14.7
Trondheim	NOR	78.9	36.3	83.3	50.0	59.4	Thessaloniki	GRE	1.4	17.5	11.1	35.7	12.2
Turku	FIN	81.7	42.5	61.1	35.7	59.4	*Average*		*71.2*	*39.2*	*61.2*	*54.4*	*55.7*

4.4.2 Hypothesis Testing: Importance of the Public Administration Style

As differences among countries seem to follow a path similar to other public administration reforms, the statistical significance of those differences among administration styles was tested. Table 4.6 shows the average e-participation indexes in the five public administration styles along with the standard deviations. As can be seen, on average, Anglo-Saxon, Germanic, and Nordic cities present the highest scores and the lowest standard deviations. We analyzed the results of the Mann–Whitney test of the difference in the means among the public administration styles. As can be seen, Anglo-Saxon and Germanic cities are those which present the highest e-participation indexes (with no significant differences among the two groups). Nordic cities present slightly above-average scores, whereas Napoleonic cities present slightly below-average scores (and the highest levels of dispersion in the total scores). Lastly, Eastern European countries are those presenting the lowest scores.

Table 4.6 Mann–Whitney tests

Means	Transparency	Interactivity	Usability	Maturity	Total
Anglo-Saxon	90.5	50.6	80.6	55.4	70.0
Nordic	78.7	42.6	72.2	51.8	60.9
Germanic	88.9	46.1	76.4	54.5	67.1
Napoleonic	64.3	34.2	51.9	56.9	50.3
Eastern European	48.4	35.0	40.3	51.8	42.6
Standard deviations	Transparency	Interactivity	Usability	Maturity	Total
Anglo-Saxon	5.1	6.0	10.6	3.6	4.3
Nordic	8.7	12.3	16.9	15.9	9.2
Germanic	7.1	10.3	18.0	10.8	7.6
Napoleonic	26.3	11.6	20.2	10.6	15.7
Eastern European	18.1	10.5	12.5	12.5	12.1
Mann–Whitney test (asymptotic significance)					
	Transparency	Interactivity	Usability	Maturity	Total
Anglo/Nordic	0.009[a]	0.152	0.348	0.400	0.044[b]
Anglo/German	0.729	0.496	0.864	0.790	0.610
Anglo/Napoleonic	0.009[a]	0.010[b]	0.009[a]	0.762	0.007[a]
Anglo/Eastern	0.007[a]	0.017[b]	0.005[a]	0.927	0.007[a]
Nordic/German	0.006[a]	0.541	0.504	0.362	0.154
Nordic/Napoleonic	0.185	0.031[b]	0.001[a]	0.098	0.013[b]
Nordic/Eastern	0.000[a]	0.169	0.000[a]	0.678	0.001[a]
German/Napoleonic	0.001[a]	0.011[b]	0.006[a]	0.702	0.005[a]
German/Eastern	0.001[a]	0.082	0.003[a]	0.664	0.001[a]
Napoleonic/Eastern	0.054	0.844	0.086	0.399	0.116

[a] Differences statistically significant at the 1% level
[b] Differences statistically significant at the 5% level

4.5 Discussion and Conclusions

This chapter analyzes the level of development of e-participation in environmental topics in the European local governments that have signed the Aalborg Commitments. Our results show that, similar to other citizen participation studies (Yetano et al. 2010), the developments in e-participation are higher in those areas related to giving information to citizens (that which we have called the transparency dimension). It is noticeable that when the provision of information requires greater effort by the local governments, such as the disclosure of sustainability indicators (see Table 4.1, Sect. 1.5), the level of disclosure decreases.

As regards interactivity, we have seen that more than two thirds of the cities provide contact information for the departments and some kind of e-services. But, again, as the items related to interactivity become more developed and require greater efforts from local governments, the number of cities providing these interactive tools is sharply reduced: Only about 45 % of the cities offer initiatives to promote responsible behavior or to capture citizens' opinions, just 30 % provide periodic or continuously updated information, and less than 10 % have online citizen participation programs.

Similar results have been found for Web site maturity and usability. These levels of development show that local governments are usually willing to develop e-participation tools when they do not require significant effort by them. Nevertheless, opportunities for active participation, up-to-date indicators, or e-petition initiatives are hardly developed. So, the creation of an interactive e-dialogue still seems to be a pending issue for European local governments fighting against climate change. If this seems to be the case even for local governments actively committed to promoting citizen participation in environmental topics (cities that are signatories of the Aalborg Commitments), the general situation among local governments is very probably gloomier than our results show.

The comparison among countries shows two types of behavior (as said before, these results have to be taken with caution, as the number of cities analyzed per country differs and in some cases only one city has been analyzed): those countries in which the cities show similar behavior and others with great variations. This suggest that becoming a signatory of the Aalborg Commitments does not always foster the development of e-participation in environment-related initiatives and that local government characteristics need to be studied to understand the developments in this area (see, for example, Brody et al. 2008; Portney 2013; Zahran et al. 2008). In this sense, it could be argued that the signing of the Aalborg Commitments, in some cases, becomes merely window dressing in order to show an image of modernity, global citizenship, and commitment towards the environment and citizen participation, without promoting significant changes in government-to-citizen relationships.

Traditionally, public administration style has helped in understanding the differences in public sector reforms (Pina et al. 2007). We have seen that this classification is also useful in explaining the differences in e-participation related to environmental issues; Anglo-Saxon, Nordic, and Germanic cities being among the

leaders in this regard. According to our results, German cities are the leaders in this area, which is usually the case in e-participation (Yetano et al. 2010), but not in other public sector reforms (Pina et al. 2009). We also have to note that Germany, the UK, and the Nordic countries have a long history of environmental awareness (Ball 2002; Cooper and Pearce 2011; EIU 2009). Napoleonic and Eastern European countries showed the same low-adoption rate typical of other public sector reforms. In the case of Eastern cities, they have less experience with environmental policy (EIU 2009), but the use of e-participation can be an effective tool in dealing with the problems arising from decades of environmental neglect during the communist period. The greater variations in the e-participation indexes are found in those styles with lower levels of development, where some *islands of innovation* can be found.

Our results have shown that, to some extent, public administration style seems to be conditioning the level of development of environment-related e-participation initiatives (including climate issues) among European local governments. In this way, the theoretical claims that indicate that the Internet is going to foster a revitalization of the public sphere should be taken with caution—at least as far as local government-initiated activities are concerned. Some advances have been observed, but to date they are still limited to those countries and cities with higher levels of transparency and a culture of citizen engagement. Thus, it does not seem feasible that the strategic use of the Internet is going to lead to a revolution in government-to-citizen relationships or a convergence in governance styles and decision-making structures (at least in the short term). Germany, Austria, and Spain, the countries of the e2d project, show different behavior. While German and Austrian cities have shown greater development in environmental e-participation, Spain is among those countries with varying degrees of adoption. The public administration style is helpful in explaining these differences, as southern European countries have often been accused of adopting symbolic policies.

Overall, these results indicate that membership of environmental associations does not equal action. Future studies should compare cities that are members of environmental associations with non-members in order to confirm the *soft* effect of the membership. Finally, this research also points to the need for legislators and environmental associations to consider further improvements in current environmental agreements in order to achieve in-depth changes within local governments.

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