

E-participation and climate change in Europe: An analysis of local government practices.

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ABSTRACT

Citizens are demanding greater transparency and accountability from their governments, and seek to participate in shaping the policies that affect their lives. The diffusion of the Internet has raised expectations that electronic tools may increase citizen participation in government decision-making and stop the decline of trust in political institutions. This paper brings together two relevant topics, e-participation and climate change, analyzing the websites of the environment departments of European local governments that have signed the Aalborg+10 commitments, in order to establish to what extent European local governments are making use of the Internet to promote e-participation and environmentally-friendly behaviors among their citizens. Our results show that the developments on e-participation are higher in transparency than interactivity. The Internet as a tool to revitalize the public sphere is still limited to those countries with higher levels of transparency, and penetration of ICTs and a culture of citizen engagement.

Keywords: E-participation, Environmental protection, Climate change, Local governments, European Union, Aalborg+10 commitments.

1. INTRODUCTION

The advent and diffusion of the Internet has raised high expectations that new electronic tools may increase and improve citizen participation in government decision-making and stop the decline of political engagement and trust in political institutions. Information and Communication Technologies (ICTs) and, particularly, Internet-based technologies, are often considered a potential solution to these problems.

E-participation involves “the extension and transformation of participation in societal democratic and consultative processes, mediated by ICTs” [1]. The OECD [2] has highlighted the lack of systematic evaluation of citizen participation, concluding that there is an “evaluation gap” and that the “evaluation of public participation is still in its infancy” [3]. At the same time, public sector literature has signaled that, in many occasions,

public sector reforms or improvement initiatives are more rhetorical than real [4, 5]. Online citizen participation in local democracy depends on the opportunities offered by municipalities [6]. Thus, analyzing the offer of e-participation initiatives and the factors that affect the diffusion of e-participation becomes essential.

This paper brings together two relevant topics: e-participation and climate change. 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 [7].

While sustainable development is a global philosophy -Kyoto Protocol 1997; Copenhagen Climate Change Conference 2009-, it also must be related to local issues, and it needs citizens to become involved [8]. In environmental-related activities, the citizens should not only be consulted on governmental action, but they have to make their own contribution by changing their behavior as well (for example, reduction of energy consumption and of private motorized transport use). A citizen who is well informed on environmental policies and initiatives can himself be part of the global effort for environmental protection. What makes the environmental case even more interesting is that it is a common good and its protection is a right and an obligation for everyone. In this context, the use of ICTs, and particularly the Internet, may have an important role for information, education and empowerment reasons.

In this paper, we analyze the websites of the environment departments of European local governments that have signed the Aalborg+10 commitments. We aim to establish to what extent these local governments are making use of the Internet in order to promote environmentally-friendly behaviors among their citizens and offer opportunities for strengthening democracy by creating opportunities for e-participation. Particular attention will be paid to the type of citizen participation being promoted: informing, consulting or active involvement [9, 10]. Additionally, we analyze other contextual factors that traditionally have been used to explain the developments of public sector reform policies. Specifically, this study attempts to answer the following research questions:

1) What is the level of use of e-participation by European local governments in order to promote climate change responsible behaviors among citizens? 2) Are European local governments using the Internet to promote higher levels of citizen participation and involvement or just to enhance transparency? and 3) What factors promote the development of these tools at local level?

2. E-PARTICIPATION AND THE ENVIRONMENT

E-participation initiatives are seen as tools for new modes of governance [11] and for integrating civil society groups with bureaucracies [1]. Moving towards the network society and engaging with constituents is understood as a critical element of political legitimacy [12]. E-participation aims to support active citizenship with the latest technology developments, increasing access to and availability of participation in order to promote fair and efficient societies and governments [1]. E-participation efforts can take many forms [13] (e-informing, e-consulting, e-involvement, e-collaboration, e-empowerment), which reflect the three categories in which citizen participation is usually classified [2, 9, 10]: information, consultation and active participation (also known as cooperation).

Submitting complaints and proposals was seen as a basic and easy way to implement e-participation, which most governments have offered since the early days of e-government. Nowadays, a wide variety of tools are being used, including discussion forums, blogs, wikis, chat rooms, voting systems, and web and podcasts, in addition to the standard website and e-mail services [14]. Recent developments also include the use of Web 2.0 and social media tools.

Compared to traditional public spaces (i.e. face-to-face public square; political reunions, etc.), online spaces are open public spaces (generally, no geographical or temporal limitations exist) that allow for a non-centralized communication of many-to-many, where participants are free to express their opinions (in general, no censure and limits to expressing opinions are established) [15]. New media, especially the Internet, provide citizens with enhanced possibilities for gaining information and communicating with politicians, which altogether might potentially lead to a revitalization of the public sphere [16]. In this way, the use of the Internet becomes a very powerful tool to promote sustainable behaviors of citizens and governments. Both need to change the way of doing and planning and both are affected by the actions of the others. Information, consultation and active participation become extremely important in this area, and the use of the Internet can be of great help in order to achieve these three goals.

According to Ostrom [17], collective interventions due to global issues like climate change should not exclusively rely on global approaches, but can also be undertaken on smaller scales. The evolution towards a sustainable community may be achieved by empowering citizens to take responsibility and action for their own 'backyards' [8]. Developing a 'critical consciousness' about sustainability provides a platform for participation; for participatory processes to be successful, all participants need to possess appropriate skills [8].

The Agenda 21 is perhaps the most important blueprint for sustainable development into the 21st century. It goes further than just looking at the environment, understanding

sustainability in a broad sense in which social factors are seen as very important as well. Its basis were agreed during the Earth Summit at Rio in 1992, and signed by 179 Heads of State and Government. At Rio an undertaking was given that local councils would produce their own plans - their Local Agenda 21. This would involve consulting with the community, because it is the people in the area who have the local knowledge needed to make sensible decisions for their future.

Focusing on the environment and climate change, the 25th June 1998, in the Danish city of Aarhus, the UNECE (United Nations Economic Commission for Europe) Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) was adopted. The Aarhus Convention is a new kind of environmental agreement that: links environmental rights and human rights, acknowledges that we owe an obligation to future generations, establishes that sustainable development can be achieved only through the involvement of all stakeholders, links government accountability and environmental protection, and focuses on interactions between citizens and public authorities in a democratic context (www.unece.org/env/pp/). The Convention is not only an environmental agreement; it is also a Convention about government accountability, transparency and responsiveness.

Local governments are the level of government closest to citizens and have unique opportunities to influence individual behavior towards sustainability through education and awareness rising. Since the Aalborg+10 conference in 2004, more than 600 local governments have signed the Aalborg commitments and the number is still increasing (<http://www.sustainablecities.eu/>). The Aalborg vision envisages "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".

3. METHODOLOGY

Sample and data collection

The sample of our study was defined as European cities, bigger than 50,000 inhabitants that have signed the Aalborg Commitments, but limiting the number of cities studied in Italy and Spain¹. Bigger 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, as the distance between the governors and the governed is greater. 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 United Kingdom (4).

We have carried out a comprehensive web content analysis of the cities selected. The websites were accessed during February-April 2011, and 134 items were analyzed (see Tables

¹ In Italy and Spain, the inclusion of all the signatory cities with more than 50,000 inhabitants would have distorted the composition of our sample. So, in these two countries only the 5 most populated cities have been included and some other cities with a good reputation regarding sustainability and environmental policies.

1, 2 and 3)². Most items included in the websites are rated “1” if they appeared in the website and “0” if not. Some items could be scored 0.5 if they partially fulfilled the coding criteria.

Dimensions analyzed

We have assessed the level of development of e-participation regarding environmental issues by grouping the 134 items in four different dimensions: transparency, interactivity, usability and website maturity [18]. Most of the items analyzed belong to transparency and interactivity as key dimensions of the study.

Transparency (71 items) on websites refers to the extent to which an organization makes information about internal works, decision processes and procedures available [18]. Transparency is the literal value of accountability: accountable bureaucrats and/or organizations must explain or account for their actions to enhance the level of public trust and legitimacy [19]. **Interactivity** (40 items) is a measure of the degree of immediate feedback and development of possibilities to interact with the environment department of the local government, either through online services or through citizen dialog and e-participation initiatives. **Usability** (9 items) refers to the ease with which users can access information and navigate the web portal [19]. Lastly, **Website maturity** (14 items) embraces those aspects that indicate a high degree of website sophistication.

The partial scores in transparency, interactivity, usability and website maturity have been obtained by adding up the individual scores for every relevant item in each dimension and dividing the total by the maximum possible score in each dimension. The total scores of websites by city (Table 5) have been obtained adding the scores of ‘transparency’, ‘interactivity’, ‘usability’ and ‘website maturity’ with weights of 40 per cent for the former two dimensions, and 10% for the latter two, because of the relevance of each dimension. Given these scores per city, we have calculated a total score per country, including also the standard deviation to assess the homogeneity of e-participation within each country (see Table 4).

Statistical techniques

To analyze the data obtained through the website content analysis, we first carried out an exploratory analysis. Research on transparent and open government usually points to two critical success factors [20]: a culture of transparency embedded within the governance system and a transparency “readiness” factor -that is, factors such as technology penetration, the level of technological capabilities of government agencies, and the social and technology readiness of the populace. In order to understand what factors promote the development of e-participation at local level, univariate analysis has been used. The objective was to test the influence of the following factors on the development of e-participation initiatives: the public administration style³ (as a proxy of the

culture of transparency of each local government) and different variables related to the development of the information society (development of e-government and e-participation at central level, e-government use by citizens and internet penetration rate), as proxies for the transparency readiness factor. The population of each city, the human capital index and the level of corruption were also considered as potential explanatory variables. The influence of the public administration style was tested using the Mann-Whitney test (see Table 5), whereas the influence of the continuous independent variables was tested using Pearson correlations (see Table 6).

4. ANALYSIS OF RESULTS

On the transparency dimension (Table 1), the group of items related to service delivery (“citizen consequences”, that includes explanations and instructions of requirements imposed on citizens resulting from the department activities) is the most developed (83%). High scores are also obtained in general information about environmental issues and information about specific policies and initiatives (almost 75%). 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 process on this matter, present levels of implementation below 45%. This shows a reduction in the information when it requires greater effort of elaboration or when it is related to participatory processes.

TABLE 1. Transparency dimension.

1. TRANSPARENCY-ACCOUNTABILITY (71)	71.2
1.1. General information about the department (6) Address and telephone, organization chart, number of employees, budget, annual sustainability report, mission statement	67.3
1.2. Citizen consequences (4) Information about environment procedures, instructions on how to complete these actions, searchable index for downloadable forms or forms to submit online, instructions for appeal process for decisions or address of an ombudsman	82.8
1.3. General information about environmental issues (14) Strategic plan for a sustainable city, information about causes and probable impacts of climate change, index for reports and publications, drafts of new regulations regarding sustainability, environmental publications in electronic format for free, participation in national or European environmental networks/projects, Agenda 21 project and information, policies for sustainable local public service delivery, local government sustainable procurement policy, FAQs (environmental topics), environmental glossary, and What's new section	74.5
1.4. Information of specific policies and initiatives (41) CO ₂ /energy, water, waste management/recycling, air quality, transport and mobility, parks and green spaces, noise pollution	74.3
1.5. Indicators and data about sustainability (3) Sustainability indicators defined, sustainability indicators	32.3

² Tables 1 and 2 only include a summary of the items analyzed. The complete tables with data on individual items are available from the authors upon request.

³ In Europe, five broad styles of public management may be distinguished: Anglo-Saxon, Nordic, Germanic, Southern European and Eastern European countries. The literature on public sector management usually considers that Anglo-Saxon and Nordic countries have a long-standing reputation of public sector reforms, transparency and citizen engagement. On the contrary, Germanic, Southern

European and Eastern European countries belong to a more legalistic tradition and have been considered as laggards in introducing some public sector reforms. Notwithstanding, Germanic countries have a long-standing tradition of consultation with social partners [2]. So, a priori, a higher level of development of e-participation can be expected in Anglo-Saxon, Nordic and German cities.

targets and timeframe, sustainability indicators reported	
1.6. Information about citizen participation processes in environmental issues (3) Information about present participatory processes (online/offline), information about the level of participation and results of past participatory processes (online/offline), information about future participatory processes	43.8

(*) Between brackets: number of items in each dimension.

As regards the interactivity dimension (see Table 2), we clearly see that there is an important drop in the global mean of this dimension (39.2 versus 71.2% for transparency). The group of items 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% and 67%, 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 complaint/suggestion boxes. The least developed group of items are those related to the possibility to receive periodic information about environmental topics (30%), existence of projects with online participation or the possibility to joining in online (9%) and initiatives to participate in sustainability plans (25%). Intermediate scores around 45% are obtained by the subcategories "initiatives to promote responsible behavior" and "initiatives to have a say in sustainability". We again see important variations in the categories, with a great decrease when it comes to fully open the debate to the public (e-rulemaking and e-petitions) and the existence of projects with online participation.

TABLE 2. Interactivity dimension.

2. INTERACTIVITY-CITIZEN DIALOGUE (40)	39.2
2.1. Obtaining information from the department (5) Department general e-mail, sub-units e-mail, individual employees' e-mail, searchable database for reports, online request for information or publications	68.1
2.2. Development of e-services (5) Forms for downloading, online form completion and submission, online payments, online appointments with officials or staff, provides link to appeal process	67.2
2.3. Services to provide periodic information (8) E-mail alerts about new reports/news about environmental topics, RSS feeds, SMS alerts about , possibility of redistributing the contents of the web through blogs or social networks, periodic electronic journal about sustainability, information of air quality, water quality and noise pollution updated on the web	29.9
2.4. Projects with on-line participation (or possibility to join in online) (8) CO ₂ /Energy, Water, Waste management/Recycling, Air quality, Transport and mobility, Park and green spaces, Agenda 21, E-participation processes of last year	9.3
2.5. Initiatives to promote responsible behavior (3) Location of "recycling centers" on an interactive map, simulators (for example, of household electricity consumption), journey planner (public transport)	45.0
2.6. Initiatives to have a say in sustainability (9) Complaints/suggestion boxes (website), chat, asking for opinions about specific topics (by email; forms), e-consultation (short surveys yes/no; specify preferences), e-consultation (long surveys), blogs, web forum, Facebook page or other type of social network	43.8
2.7. Initiatives to participate in sustainability plans (2) E-rulemaking, e-petition system/e-petitions accepted	25.4

(*) Between brackets number of items in each dimension.

Similar results can be found in the usability and website maturity dimensions (see Table 3). Usability and website

maturity show a high degree of development in technical items (such as search engine, homogeneity of sub-pages and site map) and those related to service delivery (credit card payments, secure servers for transactions, private areas, digital signature), but low percentages in those items which are able to enhance the accessibility of websites and to bring about social inclusion (such as text only or accessible versions, audio access for the visually impaired, different languages or compliance with international accessibility standards) and other 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 possibility to comment on them).

The average total score of the sample is 55.7% (see Table 4), which shows a moderate degree of development of e-participation among the biggest European cities that have signed the Aalborg commitments.

The transparency about internal works and decision processes dealing with procedures to reach environmental commitments is the dimension that scores the highest average value (71.2%). On the contrary, the possibility of citizens to interact online with the corresponding local government department is the dimension with the lowest score, only 39.2%.

TABLE 3. Usability and Website maturity dimensions.

3. USABILITY	61.2
3.1 Access in different languages	46.3
3.2 Site map	82.1
3.3 A to Z index (alphabetical order index)	41.8
3.4 Search engine	97.0
3.5 Help section	46.3
3.6 Homogeneity of the different subpages	95.5
3.7 Text-only or accessible version of the website	59.7
3.8 Audio access to the site for people visually impaired	20.9
3.9 Compliance with accessibility standards	61.2
4. WEBSITE MATURITY	54.4
4.1 No broken links	77.6
4.2 Last updated within the last month	83.6
4.3 Content arranged according to different topics (versus the hierarchical structure of the department)	94.0
4.4 Credit card payments	85.1
4.5 Secure servers (https://...)	91.0
4.6 Private areas with passwords are used in order to access to personal information	91.0
4.7 Digital signature for transactions	88.1
4.8 Live broadcast of important speeches or events	19.4
4.9 Privacy policy	56.7
4.10 Security policy	41.8
4.11 Interactive database of indicators	4.5
4.12 Indicators downloadable in excel format	4.5
4.13 Audio/video files for environment-related activities	19.4
4.14 Possibility to comment those audio/video files	4.5

From the results reported in Table 4 (the scores of local government websites by country⁴) and the results by city, we have classified the countries in three groups, considering whether the cities in each country are above or below the total average score:

⁴ 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 been helpful in order to interpret our results.

1. All cities above the total average score: central and northern European countries (Austria, Belgium, Denmark, Germany, Latvia, Norway, Sweden and the United Kingdom).
2. All cities below the total average score: periphery countries (Bulgaria, Estonia, Greece, Iceland and Lithuania).
3. Some cities above and some cities below the total average score: Southern European countries (France, Italy, Portugal and Spain), Switzerland and one more country that could be consider an outlier among Nordic countries (Finland).

It is worth highlighting the high scores obtained by countries within the first group, being all of them over the average in all dimensions, in particular, Germany, United Kingdom, Sweden and Denmark. On the contrary, in the second group, the countries show very poor figures, being their scores below the average in all the dimensions, in most of the cases. Finally, the countries of the third group combine cities that are within the first positions in the ranking, with other cities that are at the bottom of the ranking. In general, the countries 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 each of these countries show homogenous patterns, whereas countries in group 2 and 3 present a high degree of dispersion in the total scores.

TABLE 4: Scores by country.

Country	Trans.	Inter.	Usab.	Mat.	Total	MAX	MIN	σ
GER	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
SWE	82.2	51.1	80.6	55.4	66.9	74.2	60.3	5.4
DEN	85.0	47.1	75.9	54.8	65.9	71.1	62.7	4.7
BEL	80.3	41.3	94.4	50.0	63.1			
NOR	78.4	40.8	83.3	57.1	61.7	66.2	59.4	3.9
AUST	73.2	40.0	94.4	64.3	61.2			
LAT	76.1	42.5	38.9	57.1	57.0			
SWI	86.6	33.1	50.0	39.3	56.8	58.3	55.4	2.0
SPA	76.5	34.1	57.9	58.2	55.8	70.2	29.4	11.0
FRA	73.4	34.1	65.3	60.7	55.6	66.5	47.8	8.3
ITA	70.4	35.9	41.7	56.3	52.3	72.4	14.7	17.6
ICE	71.8	31.3	50.0	50.0	51.2			
EST	45.1	36.7	35.2	54.8	51.2	53.8	23.0	16.4
FIN	70.7	29.5	54.4	41.4	49.7	59.4	40.6	7.6
POR	59.6	28.3	48.1	57.1	45.7	68.1	30.4	19.5
LIT	54.9	35.0	50.0	42.9	45.3	53.1	37.4	11.0
BUL	33.1	28.8	38.9	53.6	34.0	34.6	33.4	0.9
GRE	21.1	33.4	40.3	53.6	29.5	39.8	12.2	12.7
TOTAL	71.2	39.2	61.2	54.4	55.7	76.2	12.2	14.6

Looking at the data of the individual cities, most local governments obtain transparency scores over 75%. On the contrary, the maximum score obtained in interactivity is 65% and only 13 local governments obtain scores over 50% in this dimension. Our results suggest that in the initial steps of e-participation the importance given to transparency, interactivity, usability and maturity is similar, with few differences among them. When the cities want to improve in this regard, they start by improving transparency and usability (the dimensions that require less effort and costs), creating great differences in the developments of these two dimensions in comparison with interactivity and maturity, respectively.

Table 5 shows the average e-participation indexes in the 5 public administration styles and the results of the Mann-Whitney test of difference of the means among them. 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 Southern European cities present slightly below-average scores. Lastly, Eastern-European countries are those presenting the lowest scores.

TABLE 5. Mann Whitney tests.

Means	Trans.	Inter.	Usab.	Mat.	Total
Anglo	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
South	64.3	34.2	51.9	56.9	50.3
East	48.4	35.0	40.3	51.8	42.6
Mann-Whitney test (asym. significance)					
	Trans.	Inter.	Usab.	Mat.	Total
Anglo/Nordic	0.009**	0.152	0.348	0.400	0.044*
Anglo/Germanic	0.729	0.496	0.864	0.790	0.610
Anglo/South	0.009**	0.010*	0.009**	0.762	0.007**
Anglo/East	0.007**	0.017*	0.005**	0.927	0.007**
Nordic/Germanic	0.006**	0.541	0.504	0.362	0.154
Nordic/South	0.185	0.031*	0.001**	0.098	0.013*
Nordic/East	0.000**	0.169	0.000**	0.678	0.001**
Germanic/South	0.001**	0.011*	0.006**	0.702	0.005**
Germanic/East	0.001**	0.082	0.003**	0.664	0.001**
South/East	0.054	0.844	0.086	0.399	0.116

Note: ** Differences statistically significant at the 1% level;

* Differences statistically significant at the 5% level.

Table 6 shows the results of Pearson correlations among the continuous independent variables selected and the e-participation indexes elaborated. The results obtained indicate that in those countries where the level of development of e-government and e-participation at central level is higher, local governments obtain higher indexes in the e-participation indexes elaborated. Likewise, the relationship between the corruption rate and the participation indexes elaborated is also significant. The corruption figures range from 0 (highly corrupt) to 1 (highly clean). So, these results suggest that the less corrupt the country is, the more developed e-participation is at local level. Finally, the two variables related to the level of access of citizens to the Internet and the level of use of e-government by citizens are also statistically related to higher levels of e-participation

TABLE 6. Pearson correlations.

	Trans.	Inter.	Usab.	Mat.	Total
Log population	0.228	0.099	0.013	0.387**	0.207
E-gov central	0.399**	0.214	0.496**	0.120	0.399**
E-part central	0.321**	0.247*	0.403**	0.145	0.352**
Human capital index	-0.014	-0.063	0.064	-0.057	-0.025
Corruption	0.532**	0.324**	0.590**	-0.101	0.413**
E-gov use by citizens	0.410**	0.310*	0.472**	-0.054	0.418**
Internet penetration	0.514**	0.404**	0.596**	-0.07	0.533**

Note: ** Significant at the 1% level; * Significant at the 5% level.

5. DISCUSSION AND CONCLUSIONS

We aimed to analyze the level of development of e-participation in European local governments in relation to environmental topics and climate change and the factors that explain the level of development of these practices. In general terms, the use of e-participation in climate change is still in its infancy. A total average of 55.7% among cities that have

shown a public interest in climate change topics (Aalborg signatories) shows a low level of development in this area. This suggests that becoming a signatory of the Aalborg commitments not always fosters the development of e-participation in environment-related topics and that there are other variables that need to be studied to understand the developments in this area. In this sense, it could be argued that the signature of the Aalborg commitments in some cases becomes a window dressing behavior in order to show an image of modernity, global citizenship, and commitment towards the environment and citizen participation, but without promoting significant changes in government to citizen relationships.

Additionally, we aimed to see if e-participation in climate change was being used only to inform citizens about policies and practices (transparency) or also to promote debate and active participation (interactivity). Our results show that, similarly to other citizen participation studies [21], the developments on e-participation are higher in those areas related with giving information to citizens. It is noticeable that when this information requires a greater effort for the local government, the level of disclosure decreases.

Our results suggest that local governments show a positive behavior towards e-participation in climate change when the information to be disclosed can easily be obtained or the tools to be used do not require much effort on the part of the local government. Nevertheless, the offer of *real* participative projects, up-to-date indicators or e-petitions initiatives, among other initiatives to promote e-participation regarding environmental policies, are hardly developed.

So, the creation of a true e-dialog seems to be still a pending issue for European local governments fighting against climate change. If this seems to be the case even in local governments actively committed to promoting citizen participation in environmental topics, the general situation among local governments is very probably to be gloomier than our results show.

Traditionally, the public administration style has helped to understand the differences in public sector reforms [18]. We have seen that this classification is also useful to explain differences in e-participation related to climate change, being Anglo-Saxon, Nordic and Germanic cities among the leaders in this regard. According to our results, German cities are also among the leaders in this area, which is usually the case in e-participation [21], but not in other public sector reforms [22]. Southern and Eastern-European countries showed the same low-adoption rate typical for other public sector reforms. The comparison among countries suggests two types of behaviors: those countries with similar behavior within them and others with great variations. The greater variations are in those styles with lower levels of development, where some *islands of innovation* can be found.

In addition to the public administration style, we have looked for other explanatory factors. Our results have shown that the development of e-participation regarding environmental topics seems to be related to the level of development of e-government and e-participation at central level, the level of corruption, the level of access of citizens to the Internet and the level of use of e-government by citizens. In this way, the theoretical claims that indicate that the Internet is going to foster a revitalization of the public sphere must be taken with

caution. Some advances have been observed, but to date they are mostly limited to those countries and cities with higher levels of transparency and penetration of ICTs and a culture of citizen engagement. So, it does not seem feasible that 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).

Acknowledgments: This study has been carried out with the financial support of the Spanish National R&D Plan through research project ECO2010-17463 (ECON-FEDER) and of the European Science Foundation/ European Collaborative Research Projects through the project EUI 2008-03788.

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